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Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring

Annual Report

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EXECUTIVE SUMMARY

ES.1 Introduction

The Community Resource Planning, Prevention, and Monitoring Models (Community Resource) of the Health Care Innovation Awards (HCIAs) were created to enhance care coordination and access to health care through the use of health information technology (HIT), care coordination/patient navigation, and the delivery of preventive or health promotion services. The Centers for Medicare & Medicaid Services (CMS), through its Center for Medicare & Medicaid Innovation (CMMI), is implementing a new rapid-cycle evaluation to inform policy and program development. RTI International was selected to lead a comprehensive evaluation of the HCIA Community Resource awardees. The evaluation is designed to assess these interventions and provide CMMI with clear, defensible results to inform the design of current and future programs. This first annual report presents preliminary findings from RTI's site visits, document reviews, follow-up calls, and analysis of quantitative data obtained and cleaned by RTI through September 11, 2014.

ES.2 Overview of the HCIA Community Resource Awardees

The HCIA Community Resource awardees include 24 diverse organizations funded for a total of $162,622,080 over the 3-year implementation period. Diversity is a defining feature of the Community Resource awardees, both in the types of organizations represented and the types and scale of their innovations. HCIA Community Resource awardees include federally qualified health centers (FQHCs) and integrated health systems or hospitals, as well as several unique awardees (e.g., emergency medicine, health plans). Our initial assessment of awardees identified commonalities among innovations. Two-thirds of the awardees (18) are implementing innovations to impact care coordination through the use of staff in the role of care coordinator. Care coordinators have different titles (e.g., community health worker, promotora, patient navigator, case manager) and diverse backgrounds (from lay workers to paramedics), but their common function is to help patients access and use health care appropriately, manage the transition from hospital to ambulatory settings, avoid readmissions and visits to the emergency department (ED), and self-manage their condition or disease. Nearly half of the awardees (11) have HIT components that facilitate the exchange of information among providers and organizations, enhance decision making, or support data analytics. Several innovations (7) have components whose primary goal is to train a new kind of workforce, such as community health workers or data analysts. Section 2.1.1 describes the program components for each innovation and ***Table 2-1*** illustrates their diversity and commonalities.

ES.3 Overview of Evaluation Design and Methods

The primary objectives of the overall HCIA program are to identify, test, and disseminate service delivery and payment models; workforce development; and rapid deployment and scaling of new ventures. More specifically, the goals of the evaluation are to provide CMS with results that will assess the

- overall impact of HCIAs on achieving better health, better care, and reduced costs of care (i.e., the Triple Aim);
- implementation effectiveness and the potential to replicate, scale, and sustain these interventions in multiple types of settings and to specific subgroups (e.g., underserved or low-income populations); and
- workforce capacity and development and the impact on intervention effectiveness.

RTI's mixed-methods evaluation of the 24 HCIA Community Resource awardees (as a subset of all 107 HCIA program awardees) includes collection and analysis of qualitative and quantitative data. These data are assessed across all awardees in Section 2 and for each awardee in Section 3. The cross-awardee and individual findings will ultimately help answer the following overarching evaluation questions:

- To what extent have HCIA Community Resource awardee interventions affected each goal of better health, better care, and reduced costs?
- What are the *workforce issues* for each awardee and across similar awardees?
- What is the implementation effectiveness of each intervention and across similar interventions?

ES.4 Data and Methods

The HCIA Community Resource evaluation includes detailed assessments of each awardee's program and a cross-cutting evaluation that incorporates and integrates findings across clusters of similar interventions and across all 24 awardees. We are collecting and analyzing qualitative and quantitative data for each awardee to assess the impact of individual innovations and similar groups of awardees on key outcomes (total cost of care, hospitalizations, readmissions, and ED visits). In presenting findings for this report, we draw extensively from awardee documents, communications with awardees (e.g., planning and data calls), data collected during site visits, claims data, and awardee-specific data. The within-awardee analysis uses methods to identify and verify conclusions about a single awardee. The analyses of individual awardees have produced rich descriptions of each awardee's structures, processes, barriers, and facilitators in implementing the innovation, which are presented in ***Section 3***.

ES.5 Implementation Developments and Findings to Date

The extent to which awardees are able to implement their innovation as planned and reach a sufficient number of patients will be critical to assessing their impact on achieving better health, better care, and reduced costs for the targeted populations. The process and effectiveness of implementation have been the initial foci of the evaluation. RTI defines the implementation process as execution of implementation, organizational capacity, engagement of key staff and partners, and client recruitment and enrollment. The implementation process is best evaluated through a combination of data variables, including conformity to the operational plans, and capacity for implementing the innovation in a timely and effective manner. ***Table ES-1*** summarizes preliminary findings for each evaluation domain.

Table ES-1. Summary of HCIA Community Resource Evaluation Preliminary Findings by Evaluation Domain

Evaluation Domain[1]	Definition	Preliminary Findings
Innovation components	The characteristics of the intervention being implemented, including core components	Awardees include diverse organizations with structures that may not lend themselves to effective implementation. Program components across awardees include three major categories: care coordination with new staff positions, HIT, and workforce development. Innovations have varied levels of impact such that the measures of importance differ (e.g., patient, system, provider).
Program participant characteristics	A description of the priority participants being served by the intervention	Most awardees focus on adults who are high users of the health care system (e.g., ED visits) or people with chronic disease. Given the types of organizations in the HCIA Community Resource pool, there are participants who are uninsured (i.e., not receiving Medicare or Medicaid benefits). Few awardees focus on specific racial or ethnic populations but rather concentrate on the residents of the communities they serve.
Implementation process Execution of implementation	A comprehensive set of strategies and steps used by a health care organization when preparing for and executing the adoption of a health care innovation	Half of the awardees (12) were able to begin enrolling patients within 6 months of award. However, a few took more than a year to begin enrolling patients. The latest launch date was February 2014 (Bronx RHIO). Delays in program launch were due primarily to hiring and training staff, setting up systems for collecting data, and establishing contractual agreements for subcontracts or data sharing.

(continued)

Table ES-1. Summary of HCIA Community Resource Evaluation Preliminary Findings by Evaluation Domains (continued)

Evaluation Domain[1]	Definition	Preliminary Findings
Workforce development Hiring and retention Training	Staff education programs and efforts to provide staff with requisite skills for new programs	All the awardees had completed their hiring by July 2014; few experienced problems with high turnover or finding appropriate personnel. Staffing models that rely on students have high turnover rates and thus, stability, consistency, and orientation are challenges; awardees have recognized these issues and are working to address them. All awardees offered training to their staff, mostly on an ongoing basis; some, such as Asian Americans for Community Involvement, are tracking the effectiveness of training. About 4,200 individuals have been trained through HCIA.
Implementation effectiveness Fidelity Reach Dose	The extent to which the intervention has been implemented as planned, reached an adequate number of people and provided sufficient exposure of the program components	Most awardees have adhered to the original design of their innovation; major changes were usually precipitated by the loss of a critical partner or vendor. Specifying "reach" for each awardee has been difficult because it requires distinguishing the targeted population, enrolled populations, and populations actually served or impacted. Sources of reach data vary widely in quality and completeness across the awardees. Dose applies only to a subset of awardees whose innovations require multiple contacts with the client or patient; generalizing dose findings across awardees will be difficult because even similar innovations are sufficiently different to preclude a head-to-head comparison.

[1] Evaluation domains are defined in ***Appendix A***.
ED = emergency department; HCIA = Health Care Innovation Awards.

ES.5.1 Findings from Quantitative Data

RTI is using two types of quantitative data from awardees to assess the impact of innovations on key outcomes: claims data for Medicare and/or Medicaid beneficiaries, depending on who the awardee serves; and administrative or electronic health record data the awardee is collecting (which we have categorized as "other awardee-specific data" reflecting the variability of the types of data elements available across awardees). We are in the process of finalizing our assessment of all the available data sources and requesting data directly from each awardee. As those data are received, we will incorporate the findings into subsequent quarterly and annual reports. The following sections present descriptive findings from the quantitative outcome data requested and provided to RTI and cleaned by September 11, 2014.

ES.5.2 Findings from Claims Data

As part of a broad assessment of health care innovations, CMMI is assessing the impact of its programs, including those funded by HCIA, on four core measures:

- Health care spending per patient,
- Hospital inpatient admissions,
- Hospital unplanned readmissions, and
- ED visits.

Collectively, CMMI programs are anticipated to slow the increase in health care spending, reduce hospital admissions and readmissions, and prevent unnecessary ED visits. We are reporting these measures for all HCIA Community Resource awardees so that the collective impact of the awards can be assessed.

In this report, we present findings from Medicare claims for the following 9 awardees:

- Altarum Institute [Altarum],
- Bronx Regional Health Information [RHIO],
- Ben Archer Health Center [BAHC],
- Curators of the University of Missouri [Curators],
- Imaging Advantage,
- Northeastern University,
- Prosser Public Hospital District [Prosser],
- Regional Emergency Medical Services Authority [REMSA], and
- South County Community Health Center [South County]).

We provide Medicare data on the core measures for these awardees because they each: a) serve a significant number (more than 50 patients or more than 5% of enrollees) of Medicare beneficiaries, (b) have been enrolling patients for at least three quarters in 2013, and (c) provided patient identifiers by September 11, 2014

For the following reasons, it is not yet possible to generalize findings from the early Medicare results for the 9 awardees:

- First, across the awardees spending varies greatly, both in levels and relative to an awardee's trend line. Spending variation is driven, in part, by the patients each awardee has targeted: some awardees target patients who have had hospitalizations or had many ED visits before or during the innovation launch quarter. For example, the Northeastern/Lahey Health System innovation targets patients who have had hospitalizations for congestive heart failure; the REMSA innovation targets people at risk for ED visits; and the Prosser innovation targets people with several previous ED visits. These patients are considered high cost, so awardee spending per patient is higher than for other awardees.

- Second, for some awardees, the hospitalization or ED visit that triggers enrollment occurs during the enrollment quarter. Because of this timing, spending tends to increase during the enrollment quarter, making it appear that the innovation causes an increase in spending in the before-and-after framework of the charts.
- Third, most awardees have rolling enrollment, with enrollment gradually increasing over time. Thus, in the current data charts, some enrollees have only been participating in the innovation for part of the time since enrollment began. We are collecting additional data on enrollment dates and will incorporate these dates in future reports.
- Fourth, the innovations may not have immediate effects on health care spending or utilization. Many innovations focus on HIT or patient navigation, and their impact may not be immediate because it takes time for providers to incorporate new sources of information and for patient navigation to achieve changes in health care utilization.
- Finally, some innovations target specific conditions or services (e.g., diabetes or medical imaging services). Although the innovation may have a statistically significant impact on the spending, inpatient admissions, readmissions, or ED visits related to the condition or services, it may not have a statistically detectible impact on the variables at the total spending or utilization level, because the targeted condition or service accounts for only a small share of total spending or utilization.

In later reports, we will also provide condition- or service-specific spending and utilization data. The reasons for not comparing Medicare spending across awardees also apply to the other core measures. Therefore, we do not summarize these measures in this section. The results are shown in the individual awardee sections.

Our initial criteria for inclusion of Medicaid results in this report were: (a) serving a significant number of Medicaid beneficiaries (22 awardees met this criteria); (b) availability of Alpha-MAX Medicaid claims for at least 2 quarters after innovation launch (6 awardees met this criteria); and (c) patient identifiers available as of September 11, 2014. Although 6 awardees (BAHC, Delta Dental Plan of South Dakota [Delta Dental], Finity Communications [Finity], MPHI, Prosser, and REMSA) met all these initial criteria for inclusion in this report, delays in receiving crosswalks to link patient identifiers to Alpha-MAX files have postponed access to the Medicaid data. These data will be presented in the future reports.

ES.5.3 Findings From Other Awardee-Specific Data

We are in the process of working with sites to specify the necessary data and analyzing it as it is received. As of September 11, 2014, we have included awardee-specific data from 8 awardees:

- Altarum,
- Curators,
- Finity,
- Mary’s Center for Maternal & Child Care [Mary’s Center],
- MPHI,
- Prosser,
- Southeast Mental Health Services [SEMHS], and
- REMSA.

We are continuing to request data from awardees, and will incorporate findings into future quarterly and annual reports as we receive the data.

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1. INTRODUCTION

The Community Resource Planning, Prevention, and Monitoring Models (Community Resource) of the Health Care Innovation Awards (HCIAs) represent a bold initiative to enhance care coordination and access to health care through the use of health information technology (HIT), care coordination/patient navigation, and the delivery of preventive or health promotion services. The Centers for Medicare & Medicaid Services (CMS), through its Center for Medicare & Medicaid Innovation (CMMI), is implementing a new, rapid-cycle evaluation to inform policy and program development. RTI International (RTI) was selected to lead a comprehensive evaluation of the HCIA Community Resource awardees. The evaluation is designed to assess these interventions and provide CMMI with clear, defensible results to inform the design of current and future programs.

The HCIAs were established through the Patient Protection and Affordable Care Act of 2010 to implement innovative strategies to achieve the Triple Aim of (1) improving the experience of care, (2) improving the health of the population, and (3) reducing the cost of health care. Through its Innovation Center, CMMI is tasked with testing innovative health care payment and service delivery models that have the potential to improve health care in accord with the Triple Aim*.* To implement this directive, CMMI established the HCIAs to fund selected awardees to develop new service delivery and payment models that have the potential to drive system transformation and deliver better outcomes for Medicare, Medicaid, and CHIP beneficiaries, have promising models for workforce development, and have models that can be rapidly deployed or scaled to new populations. Initiated in July 2012, the HCIAs include a vast array of interventions that CMMI has categorized into similar types of strategies. The HCIA Community Resource interventions (n=24) focus largely on HIT, care coordination/patient navigation, and other unique efforts to more efficiently deliver timely, quality, and appropriate care.

CMMI seeks to better understand those models that can be replicated on a broader scale, in multiple types of settings, and to address health care issues for the overall population and for specific subgroups (e.g., underserved, low-income populations). To meet these objectives, the evaluation is designed to provide CMMI with results in a rapid yet rigorous way that identifies themes or common features of the interventions that lead to the short-term and intermediate outcomes most likely to affect the Triple Aim. RTI’s approach to the evaluation of this complex set of interventions is to use multiple sources of data to integrate and synthesize findings across programs. We have designed a comprehensive evaluation that incorporates qualitative and quantitative data to assess outcomes at the system, organizational, program, and participant (or patient) levels and to answer the following overarching evaluation questions:

- To what extent have HCIA Community Resource awardee interventions affected each goal of the Triple Aim: better health, better care, and reduced costs?
- What are the workforce issues of each awardee and across similar awardees?
- What is the implementation effectiveness of each intervention and across similar interventions?

This section presents an overview of the awardees included in our evaluation, the data and methods being used to conduct the evaluation, and the evaluation's challenges and limitations.

1.1 Overview of HCIA Community Resource Awardees

The HCIA Community Resource awardees include 24 diverse organizations funded for a total of $162,622,080 over a 3-year period (July 2011–June 2015). Diversity is a defining feature of the HCIA Community Resource awardees, both in the type of organizations represented and the type and scale of their interventions. HCIA Community Resource awardees include several federally qualified health centers (FQHC; n= 5), academic institutions (n=3), health plans (n=2), integrated health systems (n=2), hospitals (n=2) as well as several unique awardees (e.g., emergency medicine provider). Awards ranged from $1,270,845 (Ben Archer Health Center) to $14,991,005 (Mary's Center for Maternal and Child Care). The mean award across all 24 awardees is $6,743,861 and the median is $5,919,916. Details on the 24 awardees are provided in ***Table 1-1***.

Our initial assessment of the HCIA awardees identified commonalities among the interventions. Two-thirds of the awardees (n=18) are implementing innovations that include care coordination through the use of a care coordinator or patient navigator (i.e., CC/PN or CC/HIT). The care coordinators have different titles (e.g., community health workers, promotores, patient navigator, case manager) and diverse backgrounds (from lay workers to nurses or paramedics), but their common function is to help patients access and use health care appropriately, manage the transition from hospital to an ambulatory setting (or home), avoid readmissions and visits to the emergency department (ED), and self-manage their condition or disease. Of these 18, five awardees are implementing a combination of HIT innovations and patient navigation designed to improve care, increase efficiency, and reduce costs in other ways (i.e., CC/HIT). Six awardees are primarily relying on HIT to enhance care coordination (i.e., HIT).

Table 1-1. Summary of HCIA Community Resource Awardees

Awardee	Funding Amount	Program Type[1]	Organization Type	Proposed Participant Criteria[2]
Altarum Institute (Altarum)	$8,366,178	HIT	Research organization	Provider-level innovation (2,200 providers)
Asian Americans for Community Involvement (AACI)	$2,684,545	CC/PN	Community health center/ FQHC	Asian or Hispanic Medicare beneficiaries
Ben Archer Health Center (BAHC)	$1,270,845	CC/PN	Community health center/ FQHC	Residents in Dona Ana County, NM, with specific chronic diseases
Bronx Regional Health Information Organization (Bronx RHIO)	$12,689,157	HIT	Regional health information organization	Patients in system who consented to share information
Children’s Hospital and Health System (Children’s Hospital)	$2,796,255	CC/PN	Health plan	Members of the Medicaid HMO who have 2 or more ED visits in past 6 months
Curators of the University of Missouri (Curators)	$13,265,444	CC/HIT	Integrated health system	Adults with a PCP in their system
Delta Dental Plan of South Dakota (Delta Dental)	$3,364,528	CC/PN	Health plan	South Dakota American Indian children for dental care (≤9 years)
Eau Claire Cooperative Health Centers (ECCHC)	$2,330,000	CC/PN	Community health center/ FQHC	Residents of zip code 29203 with a chronic disease
Finity Communications (Finity)	$4,967,962	CC/HIT	Health technology solution	Medicaid beneficiaries in the Philadelphia area
Imaging Advantage	$5,977,805	HIT	Health technology solution	Provider-level innovation (126 ED providers)
Intermountain Health Care Services, Inc. (Intermountain)	$9,724,142	HIT	Integrated health system	Provider-level innovation (83 practices)
Mary’s Center for Maternal & Child Care (Mary’s Center)	$14,991,005	CC/HIT	Community health center/ FQHC	Medicaid FFS who are high cost/ high users of the health system
Michigan Public Health Institute (MPHI)	$14,145,784	CC/PN	Public health institute	Patients age 18+ eligible or enrolled in Medicare/ Medicaid with 2+ chronic conditions living in select counties in Michigan

(continued)

Table 1-1. Summary of HCIA Community Resource Awardees (continued)

Awardee	Funding Amount	Program Type[1]	Organization Type	Proposed Participant Criteria[2]
Mineral Regional Health Center (Mineral Regional)	$10,499,889	HIT	Hospital collaborative	Providers at 25 critical access hospitals
National Health Care for the Homeless Council (NHCHC)	$2,681,877	CC/PN	National nonprofit organization	Homeless high users of EDs living in 1 of 11 participating cities
Northeastern University (Northeastern)	$8,000,002	HIT	Academic/ university	11 health systems
Prosser Public Hospital District (Prosser)	$1,470,017	CC/PN	Critical access hospital	Patients with high medical system usage or a specific health condition
Regional Emergency Medical Services Authority (REMSA)	$10,824,025	CC/PN	Emergency medical services provider	Patients who are at high risk for readmission, users of emergency services located in Washoe County
South County Community Health Center (South County)	$7,060,843	CC/PN	Community health center/ FQHC	Current patients covered by Health Plan of San Mateo insurance plan
Southeast Mental Health Services (SEMHS)	$1,405,924	CC/PN	Mental health/ substance abuse provider	Residents of Prowers County, CO
University of Chicago (U-Chicago)	$5,862,027	CC/HIT	Academic/ university	Residents of Chicago's South Side who are patients of participating community health center
University of Miami (U-Miami)	$4,097,198	CC/HIT	Academic/ university	Students in schools with school-based health centers
Women and Infants Hospital of Rhode Island (W&I)	$3,261,494	CC/PN	Acute care hospital	Infants who spend at least 5 days in the neonatal intensive care unit
YMCA of the USA (Y-USA)	$11,885,134	CC/PN	National nonprofit organization	Medicare beneficiaries with prediabetes in a focus community

[1] Program type refers to awardees focused on care coordination, either through care coordination with a person (CC/PN), HIT, or both of these in combination to better coordinate care (CC/PN; CC/HIT).

[2] Participants listed are those originally proposed by the awardees. Since award, some of the awardees have refined their target populations, which we address in Section 2 and in each individual awardee section. We provide more details on the program participants included in each innovation in Section 2.1.2.

CC = care coordination; ED = emergency department; FFS = fee for service; FQHC = federally qualified health center; HCIA = Health Care Innovation Award; HIT = health information technology; HMO = health management organization; PCP = primary care provider; PN = patient navigator.

1.2 Overview of Evaluation Design

The primary objectives of the HCIAs are to identify, test, and disseminate service delivery and payment models that are effective in reaching the Triple Aim, and in identifying innovative models of workforce development and rapid deployment and scaling of new ventures. More specifically, the goals of the evaluation are to provide CMMI with results that will assess the

- overall impact of HCIAs on achieving better health, better care, and reduced costs of care (i.e., the Triple Aim);
- implementation effectiveness and the potential to replicate, scale, and sustain these interventions in multiple types of settings and to specific subgroups (e.g., underserved or low-income populations); and
- workforce capacity and development and the impact on intervention effectiveness.

1.2.1 Evaluation Design Development

RTI has developed materials throughout our evaluation planning process to guide selection and creation of data measures and methods, as well as the analytic approach to be completed within and across the 24 HCIA Community Resource awardees. We started by reviewing all documents that CMMI shared from the first phase of evaluation planning for the HCIA Community Resource awardees and searched for additional information in the grey literature (e.g., awardee Websites, Google searches) to better understand who the awardees are, the contexts in which they are operating, and characteristics of their organizational structures and processes. We assembled this information into a Microsoft Excel spreadsheet to compare and contrast the interventions and determine how best to approach the evaluation of each separately and as a group. As previously described, the majority of awardees fall into at least three clear clusters or groups of similar interventions (i.e., care coordination alone, HIT combined with care coordination, and HIT alone). Therefore, we have designed a pre-/post-cross-sectional evaluation for each awardee that includes comparison groups of participants as feasible as well as collection and analysis of both qualitative and quantitative primary and secondary data. We will prepare the data for a cross-awardee evaluation that will be completed to examine the impact of similar innovations on the primary evaluation questions (e.g., impact on Triple Aim).

In developing the evaluation design, RTI followed the five-step evaluation planning process developed by RTI researchers, which is illustrated in ***Figure 1-1*** (Holden and Zimmerman, 2009). The first 3–4 months of the evaluation focused on learning all we could about each of the 24 awardees and preparing for site visits that were conducted from April– August 2014. The primary purposes of the site visits were to validate our understanding of the programs, obtain detailed information about implementation progress to date, and thoroughly understand the data being collected by awardees that RTI could use to assess the innovation’s impact on key outcomes. As we learned more about the innovations and the overarching goals for each awardee, we worked to conceptualize program theory or rationale and understand the program's history and evolution (Holden & Zimmerman, 2008). As we reviewed the initial documents from awardees, we created a conceptual framework for the HCIA Community Resource evaluation to depict the intentions of each aspect of the innovations (***Figure 1-2)***.

Figure 1-1. Evaluation Planning Incorporating Context Model

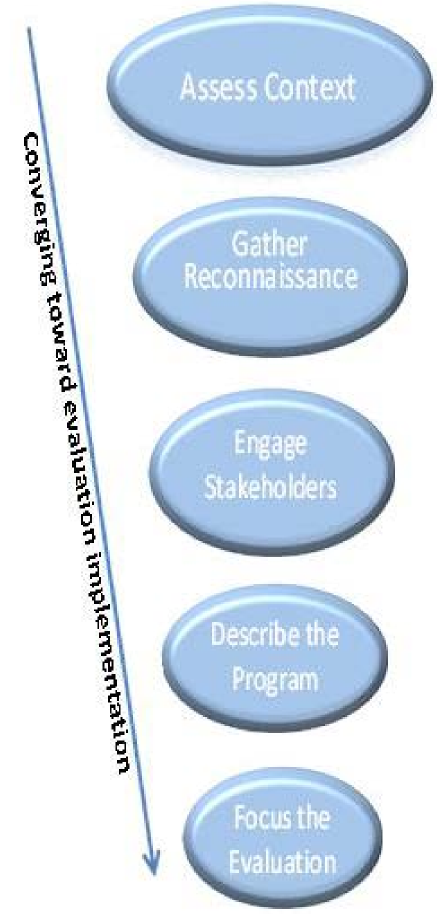
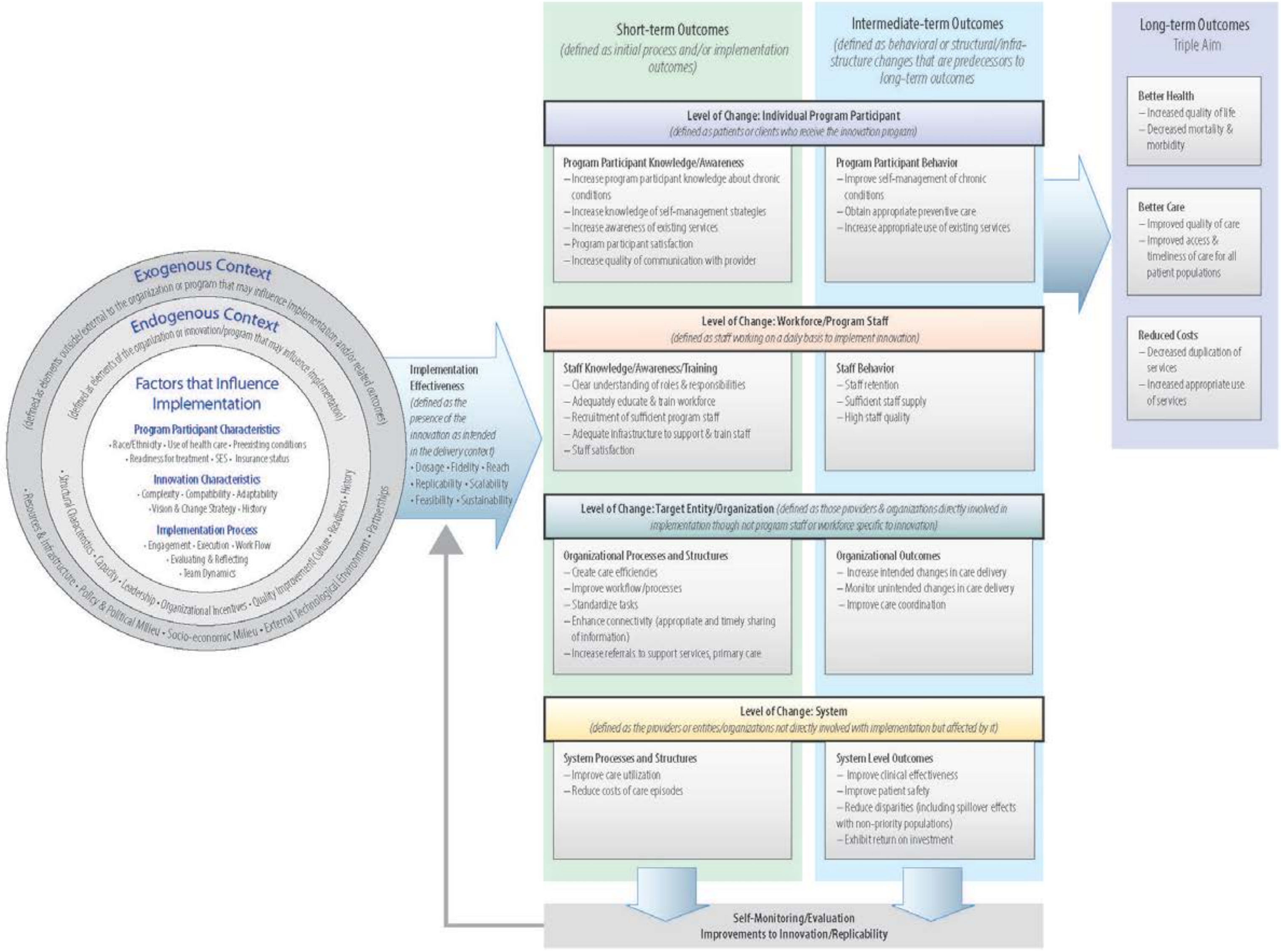


Figure 1-2. HCIA Community Resource Evaluation Framework



The theory of change illustrated in this conceptual framework implies that changes in long-term outcomes require initial changes in more proximal (i.e., short-term and intermediate) outcomes. We have organized these more proximal outcomes into levels of change such that we are assessing outcomes at the levels of (1) individual or patient/client; (2) workforce or direct program staff; (3) organizational or provider practice; and (4) system. We recognize that various factors will influence the degree to which these levels of outcomes can be impacted (and measured) for each awardee, including endogenous and exogenous contexts,characteristics of both the program participants and innovation itself, and the process of implementation the awardee used (depicted in the left side of the framework). All of these factors will influence the effectiveness of the implementation of each innovation, which in turn directly affects outcomes of the program. As we have worked to describe the individual awardee innovations and the HCIA Community Resource cluster overall, we have operationally defined each of these domains and subdomains of our framework ***(Appendix A)*** and specified measures for capturing key outcomes. The framework presented here served as our foundation for identifying and prioritizing outcomes to include in our methods and measures for the overall evaluation and for each individual awardee’s evaluation.

1.3 Data and Methods

Our proposed evaluation includes detailed assessments of each awardee’s program and a cross-cutting evaluation that incorporates and integrates findings across clusters of similar interventions as well as all 24 awardees. As shown in ***Appendix B***, we are using multiple qualitative and quantitative data sources to compile detailed information for each awardee to assess the impact of each individual innovation and on similar groups of awardees on the key outcomes of total cost of care, hospitalizations, readmissions, and ED visits. The following sections provide an overview of the evaluation measures being used to assess the HCIA Community Resource awardees, as well as the data collection methods currently underway.

1.3.1 Evaluation Measures

The types of measures RTI is using for this evaluation includes those provided by CMMI as priority and standard measures, measures to construct with claims data (i.e., Medicare or Medicaid), other awardee-specific measures that each awardee created and provided, and qualitative comparative analysis measures developed by the meta-analysis team for assessing the four major outcomes of the program (i.e., total cost, hospitalizations, readmissions, and ED visits). Our ongoing evaluation includes detailed assessments of each awardee’s program (presented in Section 3 of this report) and a cross-cutting evaluation that incorporates and integrates findings across all 24 awardees (Section 2). To assess the impact of these innovations, we have worked to define common measures to collect and/or analyze for each overarching evaluation question. These measures include those specified by CMMI as priority or standard measures that many awardees are collecting, those constructed using variables in Medicare and/or Medicaid claims data, and those RTI will construct from other awardee-specific data.

Priority and Standard Measures

As part of the overall HCIA evaluation, RTI will conduct a meta-analysis of measures that can be assessed across all or most of the awardees. As a first step in determining which measures can be assessed across awardees, both for the HCIA Community Resource awardees and all 107 awardees combined, CMMI established priority measures and standard measures and requested that awardees incorporate the measures, if feasible, in their self-monitoring plans. RTI's first task was to review the 24 HCIA Community Resource awardees' measurement plans and operational plans to determine the data being collected specific to each priority or standard measure (i.e., a list determined by CMMI as including those measures of greatest importance to assessing each innovation). ***Appendix C*** provides a summary of the priority and standard measures each awardee plans to collect and report to CMMI on a quarterly basis. We started with a total of 62 priority and 150 standard measures that CMMI has identified. Forty-six of the standard measures overlap with the priority measures. From this list, we identified 149 total potentially relevant measures and provided a list of those along with the names of the 24 HCIA Community Resource awardees who are collecting each. As awardees have begun to provide these data, we have incorporated those relevant to the evaluation into our reporting for each awardee (Section 3).

Constructed Measures from Medicare and Medicaid Claims

As part of a broad assessment of health care innovations, CMMI is assessing the impact of its programs, including those funded specifically by HCIA, on these four core measures:

- health care spending per patient,
- hospital inpatient admissions,
- hospital unplanned readmissions, and
- ED visits.

Collectively, CMMI programs are anticipated to slow the increase in health care spending, reduce hospital admissions, reduce avoidable hospital readmissions, and prevent unnecessary ED visits. We are reporting these measures for all HCIA Community Resource awardees so that the collective impact of the awards can be assessed. As discussed below, some awardees' innovations may not be focused on these measures. Other awardees' innovations target specific conditions (e.g., imaging, diabetes, etc.) and may have significant impacts on spending, admissions, readmissions, and ED visits for the targeted conditions but not have a statistically detectable impact on the measures at the aggregate level because the targeted conditions represent only a small fraction of total spending, inpatient admissions, and ED visits. The measures are calculated through analysis of Medicare and Medicaid fee-for-service claims using the definitions described below.

- **Health care spending per patient.** For Medicare beneficiaries, health care spending per patient includes Part A and Part B Medicare expenditures for people enrolled in the Part A and Part B fee-for-service program. The variable focuses on Medicare fee-for-service spending, so Medicare managed care (Part C) services are excluded, as are beneficiary copayments. Medicare Part D prescription spending is also excluded. Spending is reported on a per-person per-quarter basis. If a beneficiary is not enrolled for every month in a quarter, spending (except for hospital inpatient spending) is prorated to a quarterly basis using the number of days enrolled during the quarter. Because hospital inpatient admissions are both rare and expensive, spending is not prorated for hospital inpatient spending. Prorating is also not performed for beneficiaries who die during a quarter.

  For Medicaid beneficiaries, health care spending per patient is reported for fee-for-service beneficiaries. Beneficiaries are only included in the analysis for spending (and the other measures) during periods when they are enrolled in Medicaid.

- **Hospital inpatient admissions.** This variable measures hospitalization, the single most expensive component of health care spending. Patients kept overnight in observation beds are excluded from this measure. Inclusion criteria for the analysis are the same as for spending. Hospital inpatient admissions are not prorated based on the number of days eligible during the quarter. All-cause inpatient admissions are reported. The mean quarterly admission rate per 1,000 patients is reported.

- **Hospital readmissions.** Hospital readmission rates serve a dual purpose in evaluating HCIA impacts. Readmissions add to the costs of a prior hospitalization, and they often reflect a problem in the care provided during the first admission. All-cause readmissions are defined as a follow-up admission to any short-term acute general or long-term care hospital within 30 days of discharge from another hospital of the same type. We ignore multiple admissions within 1 day of an initial admission because these often represent transfers between hospitals. We define index hospitalizations that begin during the quarter and follow each index admission for 30 days, even when the follow-up period extends beyond the end of the quarter. Inclusion criteria for the analysis are the same as for spending. The readmission rate equals the number of readmissions divided by the number of index hospitalizations during the quarter. Planned readmissions are excluded from the calculation of the numerator. Quarterly mean readmission and ambulatory care-sensitive condition (ACSC) readmission rates per 1,000 admissions are reported.

- **ED visits**. ED visits are sometimes viewed as a symptom of the inability of the community's health care system to provide adequate preventive and ambulatory care visits. We report an all-cause ED visit rate that excludes ED visits resulting in an inpatient admission (which presumably represents unavoidable visits) and includes overnight ED visits without an inpatient admission. Inclusion criteria for the analysis are the same as for spending, and ED visits are also subject to the same prorating formula as for spending. The mean quarterly ED visit rate per 1,000 patients is reported.

Other Awardee-Specific Measures

In addition to Medicare and/or Medicaid claims, RTI is using other administrative or utilization data that awardees are collecting as part of their self-monitoring plan or within their electronic health records (i.e., hereafter labeled as "other awardee-specific data" reflecting the variability of the types of data elements available across awardees). Patient-level data from these two (or three) sources will be linked by patient identifiers provided by the awardees. Available quantitative data include cost (e.g., intervention costs, beneficiary out-of-pocket health care costs), claims (e.g., health care utilization), outcome data, and patient surveys (e.g., patient-reported outcomes and quality of care), which will be incorporated into the final analysis for each awardee, clusters of similar types of innovations, and for all 24 combined. Most of the awardee-specific data include measures for clinical outcomes of specific disease conditions that are proximal outcomes to the more distal outcomes of improved health.

Tables 1-2 through ***1-5*** show the awardee-specific measures, by health condition, identified as most relevant for the evaluation of each awardee's innovation during the post-site-visit data review meeting, regardless of whether RTI has received the data from the awardee. As shown in ***Table 1-2,*** diabetes-related measures are important for more than half of awardees (n=14). Of those, 12 awardees have data related to poor hemoglobin A1c control (i.e., percentage of patients with HbA1c > 9.0%). One-third (n=7) have data to calculate diabetic lipid and hemoglobin A1c profiles (i.e., percentage of patients with diabetes who received a hemoglobin A1c and lipid profile assessment during the measurement period). Smaller numbers of awardees have other measures (i.e., eye exam, foot exam, medical attention for nephropathy, and blood pressure management among those with diabetes). ***Table 1-3*** includes the cardiovascular-related measures relevant for the evaluation of each awardee's innovation. Cardiovascular-related measures are important for about one-third of awardees (n=9). Of these, nearly all (n=8) have data related to controlling high blood pressure (i.e., percentage of hypertension patients with blood pressure < 140/90 mm Hg) that will be useful for the evaluation. Smaller subsets of awardees have data related to coronary artery disease lipid control and beta-blocker therapy (n=4 and n=2, respectively).

Table 1-2. Diabetes-Related Measures To Be Assessed by Awardees[1]

Awardee	Poor HbA1c Control	Diabetic Lipid and HbA1c Profile	Diabetes Eye Exam	Diabetes Foot Exam	Diabetes Medical Attention for Nephropathy	Diabetes Blood Pressure Management
AACI	—	•	—	—	—	—
Altarum	—	—	—	—	—	—
BAHC	•	—	•	•	—	—
Bronx RHIO[2]	•	•	—	—	—	—
Children's Hospital	—	—	—	—	—	—
Curators	•	•	—	—	—	—
Delta Dental	—	—	—	—	—	—
ECCHC	•	—	—	•	—	—
Finity	•	•	•	—	—	—
Imaging Advantage	—	—	—	—	—	—
Intermountain	•	—	—	—	—	—
Mary's Center	•	—	—	—	—	—
Mineral Regional[1]	—	—	—	—	—	—
MPHI	•	•	—	•	—	—
NHCHC	•	—	—	•	—	—
Northeastern	•	—	—	—	—	—
Prosser	—	—	—	—	—	—
REMSA	—	—	—	—	—	—
SEMHS	—	—	—	—	—	—
South County	•	•	—	•	•	•
U-Chicago	•	—	—	—	—	—
U-Miami	—	•	•	—	—	—
W&I	—	—	—	—	—	—
Y-USA	—	—	—	—	—	—

[1] Data for 8 awardees are presented in Section 3 but RTI has not yet received all data necessary to assess these outcomes.

[2] Table was constructed prior to the measures being assessed during a post-site-visit data review meeting. Once that meeting has been completed, we will update this table.

— Not applicable.

Table 1-3. Cardiovascular-Related Measures Being Assessed by Awardees[1]

Awardee	Controlling High Blood Pressure	Coronary Artery Disease: Lipid Control	Beta-Blocker Therapy: Prior Myocardial Infarction or Left Ventricular Systolic Dysfunction
AACI	—	—	—
Altarum	—	—	—
BAHC	●	—	—
Bronx RHIO[2]	—	—	—
Children's Hospital	—	—	—
Curators	●	●	—
Delta Dental	—	—	—
ECCHC	●	●	—
Finity	—	●	●
Imaging Advantage	—	—	—
Intermountain	●	●	●
Mary's Center	●	—	—
Mineral Regional[1]	—	—	—
MPHI	—	—	—
NHCHC	●	—	—
Northeastern	—	—	—
Prosser	—	—	—
REMSA	—	—	—
SEMHS	—	—	—
South County	●	—	—
U-Chicago	●	—	—
U-Miami	—	—	—
W&I	—	—	—
Y-USA	—	—	—

[1] Data for 8 awardees are presented in Section 3 but RTI has not yet received all data necessary to assess these outcomes.

[2] Table was constructed prior to the measures being assessed during a post-site-visit data review meeting. Once that meeting has been completed, we will update this table.

— Not applicable.

Asthma-related measures are as important for the evaluation of six awardees (***Table 1-4***). These measures include well-controlled asthma (i.e., percentage of patients with asthma who have a forced expiratory volume in 1 second [FEV1] ≥ 80% predicted/personal best), asthma medication management, and percentage of patients with an ED/urgent care visit for asthma.

Table 1-4. Asthma-Related Measures Being Assessed by Awardees[1]

Awardee	Well-Controlled Asthma: FEV1	Medication Management for People with Asthma	Percentage of Patients with an ED/Urgent Care Visit for Asthma
AACI	—	—	—
Altarum	—	—	—
BAHC	—	—	•
Bronx RHIO[2]	—	—	—
Children's Hospital	—	•	—
Curators	•	—	•
Delta Dental	—	—	—
ECCHC	—	—	—
Finity	—	—	—
Imaging Advantage	—	—	—
Intermountain	—	—	—
Mary's Center	—	•	—
Mineral Regional[1]	—	—	—
MPHI	—	—	—
NHCHC	—	•	—
Northeastern	—	—	—
Prosser	—	—	—
REMSA	—	—	—
SEMHS	—	—	—
South County	—	—	—
U-Chicago	—	—	—
U-Miami	•	•	•
W&I	—	—	—
Y-USA	—	—	—

[1] Data for 8 awardees are presented in Section 3 but RTI has not yet received all data necessary to assess these outcomes.

[2] Table was constructed prior to the measures being assessed during a post-site-visit data review meeting. Once that meeting has been completed, we will update this table.

— Not applicable.

Table 1-5 includes the mental health, tobacco, and weight-related measures identified as relevant for the evaluation of some awardees' innovations. For the five areas assessed, which include screening for clinical depression, antidepressant medication management, tobacco use assessment/cessation intervention, adult weight screening and follow-up, and body mass index (BMI), at least one awardee and up to four awardees are reporting on any one of these measurements.

Table 1-5. Mental Health, Tobacco, and Weight-Related Measures Being Assessed by Awardees[1]

Awardee	Screening for Clinical Depression	Antidepressant Medication Management	Measure Pair: (1) Tobacco Use Assessment, (2) Tobacco Cessation Intervention	Adult Weight Screening and Follow-Up	Body Mass Index (BMI)
AACI	—	—	—	—	—
Altarum	—	—	—	—	—
BAHC	—	—	—	—	—
Bronx RHIO[2]	—	—	—	—	—
Children’s Hospital	—	—	—	—	—
Curators	—	—	—	—	—
Delta Dental	—	—	—	—	—
ECCHC	•	—	—	•	—
Finity	—	—	—	—	—
Imaging Advantage	—	—	—	—	—
Intermountain	—	•	—	—	•
Mary’s Center	—	—	—	—	—
Mineral Regional[1]	—	—	—	—	—
MPHI	•	—	•	—	•
NHCHC	—	•	—	—	—
Northeastern	—	—	—	—	—
Prosser	—	—	—	—	—
REMSA	—	—	—	—	—
SEMHS	—	—	—	—	—
South County	—	—	—	—	—
U-Chicago	—	—	—	—	•
U-Miami	•	—	—	—	—
W&I	•	—	—	—	—
Y-USA	—	—	—	—	•

[1] Data for 8 awardees are presented in Section 3 but RTI has not yet received all data necessary to assess these outcomes.

[2] Table was constructed prior to the measures being assessed during a post-site-visit data review meeting. Once that meeting has been completed, we will update this table.

— Not applicable.

In addition to those above, we identified measures that are unique to specific awardees. For instance, Finity is collecting data on the number of ultrasounds received for maternity care, Regional Emergency Medical Services Authority (REMSA) is collecting data on the number of ambulance transports to the ED, and Imaging Advantage is collecting data on exposure to radiation. These unique data will be reported for individual awardees, but will not likely be comparable enough to assess collectively among groups of awardees.

1.3.2 Data Availability

To construct the described measures, RTI must be able to access patient identifiers for people served by each awardee. We spent a large portion of time during the first year of the HCIA evaluation assessing measures and determining what data could be obtained from awardees and included in the evaluation. One of the challenges in accessing data from HCIA awardees is personal health information (PHI). Any dataset that is determined to have PHI (http://csrc.nist.gov/publications/nistpubs/800-66-Rev1/SP-800-66-Revision1.pdf) should be assessed for compliance with the Health Insurance Portability and Accountability Act (HIPAA), which safeguards patient information against use without consent. However, for RTI's evaluation of HCIA to demonstrate a relationship between the innovation and health care outcomes such as ER visits, readmissions, etc., we have to conduct analyses using claims—so accessing the patient identifiers is critical to our final results. We had to negotiate with each of the 24 awardees whether we could access their patient identifiers and, if not, what legal documentation had to be established between RTI and the organization to facilitate safely and securely sharing information.

Fortunately, RTI already had a number of solutions in place. We have a Business Associate Agreement (BAA) with CMMI to access datasets that have been preapproved, meaning (http://www.hhs.gov/ocr/privacy/hipaa/understanding/coveredentities/contractprov.html) a Data Use Agreement (DUA) is already in place between RTI and CMMI. We also have IT systems set up to meet the moderate levels required by the National Institute of Standards and Technology (NIST). These moderate-level requirements involve setting up systems to protect any PHI data we store. For this project, we established a secure server on which awardees can access and save their data and we then have a HIPAA-approved server to store the data and strip the identifiers once we have obtained the information we need from them. Only people with prior training and approval are able to access the identifiable data.

Even with these safeguards in place, some organizations were still concerned about sharing PHI with RTI and potentially violating HIPAA. When the awardees signed their contract with CMMI for HCIA funds, they agreed to Terms and Conditions (T&C) that require them to share data with RTI. However, some organizations believe that these T&Cs do not fully protect them from HIPAA requirements and, therefore, asked for a BAA and/or DUA to be established between RTI and the organization. For these reasons, RTI does not yet have patient identifiers from all of the HCIA Community Resource awardees as described below.

Patient Identifiers

As of October 2014, RTI has received patient identifiers from 20 of the 24 awardees (***Table 1-6***)*,* including patient identifiers from one of Northeastern's project sites and one of U-Chicago's clinical sites. In order to receive data that include PHI from awardees, we have worked with the RTI Privacy Officer to ensure compliance with HIPAA, including the 2013 Final Omnibus Rule. Under HIPAA guidelines, it is permissible for awardees to release PHI to RTI as a CMMI business associate without the need for the awardee and RTI to enter into a separate BAA. However, some awardees are requiring a BAA with RTI before they provide any PHI to RTI. Thus, RTI has entered into BAAs with three awardees (Finity, MPHI, and REMSA), and is continuing to work with two other awardees (Intermountain and YMCA) on BAAs and/or DUAs. We are also in the process of entering into a BAA with one of Northeastern's project sites, Cambridge Health Alliance.

Table 1-6. Availability of Patient Identifiers as of September 11, 2014[1]

Awardee Name	Patient Identifiers Uploaded	Notes
AACI	Y	—
Altarum	Y	—
BAHC	Y	—
Bronx RHIO	Y	—
Children's Hospital	Y	—
Curators	Y	—
Delta Dental	Y	—
ECCHC	Y	—
Finity	Y	BAAs between RTI and Finity and between RTI and Health Partners are complete.
Imaging Advantage	Y	—
Intermountain	Pending BAA	RTI is waiting for BAA paperwork from Intermountain; at the end of September, RTI sent a completed a due diligence form requested by Intermountain to be used to inform the BAA paperwork and we are awaiting a response from the awardee.
Mary's Center	Y	—
MPHI	Y	BAA between RTI and MPHI is in place.
Mineral Regional	N - NPIs uploaded	Mineral Regional provided NPIs.
NHCHC	N	CMMI discussed with NHCHC and determined they are unable to provide identifiers given the target population.

(continued)

Table 1-6. Availability of Patient Identifiers as of September 11, 2014[1] (continued)

Awardee Name	Patient Identifiers Uploaded	Notes
Northeastern (Lahey Hospital and Medical Center)	Y[2]	—
Prosser	Y	—
REMSA	Y	BAA between RTI and REMSA is in place.
South County	Y	—
SEMHC	Y	—
U-Chicago	Y	We received patient identifiers from U-Chicago and two of their three clinical sites; We are continuing to work with the remaining clinical site to get patient identifiers.
U-Miami	Y	—
W&I	Y	—
Y-USA	Pending BAA/DUA	The DUA paperwork has been signed by RTI and was sent to Y-USA at the beginning of October 2014; RTI is currently waiting on BAA paperwork from Y-USA.

[1] Data for 8 awardees are presented in Section 3 but RTI has not yet received all data necessary to assess these outcomes.

[2] We are working with each of Northeastern's project sites to request patient identifiers directly; to date, we have received patient identifiers from Lahey Hospital and Medical Center.

— Not applicable.

1.3.3 Claims Data Analysis

Once we obtain the patient identifiers, we can access Medicare claims data through the Chronic Conditions Data Warehouse (CCW) or access Medicaid through AlphaMAX. ***Table 1-7*** presents the proportion of current enrollees (through March 2014) by awardee for each type of payer source based on the data available and accessed by RTI through September 11, 2014. The data present a number of challenges that are important to explain. First, the number enrolled presented in Table 1-7 is based on data obtained in the Lewin database through March 2014 and includes participants served directly or indirectly through the awardee's innovation. For most awardees in Table 1-7, the number of individuals enrolled through March 2014 is very different from the number of patient identifiers provided to RTI as of September 11, 2014. We sometimes do not know the reasons for the discrepancies and are actively working with all awardees to determine how to best interpret their data. Some awardees then sent RTI data files with patient identifiers and the following inconsistencies may be present:

- Identifiers provided may be for patients who had no exposure (i.e., dose) to the innovation.

- Some awardees have given us only Medicare or Medicaid identifiers and we have no other data to which to compare the identifiers.

- Some awardees did not provide payer type but only patient identification numbers, so we have to assume that the identified matches correspond with Medicare or Medicaid (i.e., are privately insured individuals or people in managed care organizations).

- Some data sent by awardees have not been readily usable or do not match claims data. Examples are: identifiers with only 8 digits (9 are expected), data points that correspond to an observation rather than a patient, missing data, or otherwise unusable IDs.

Table 1-7*.* Payer Shares for Enrollees of Reporting Awardees with Direct and Indirect Program Participants Through Q7

Awardee	Individuals Enrolled[1]	# of IDs received[2]	Medicare (%)	Medicaid (%)
Altarum	354	*405,611*[3]	48	TBD
AACI	1,932	446	*23*	*77*
BAHC	2,387	988	95	TBD
Bronx RHIO	100	183,274[3]	43	TBD
Children's Hospital	2,354	*4,731*[3]	N/A	0[4]
Curators	9,129	9,839[3]	79	18
Delta Dental	5,227	*4,220*	N/A	0[4]
ECCHC	1,561	1,530	*4*	*50*
Finity	40,618	1,120[5]	TBD	0[4]
Imaging	11,363	38,907[3]	19	TBD[4]
Intermountain	379,392	49,841	*99*	*1*
Mary's Center	717	1,542[3]	N/A	100
Mineral Regional	3,857	25 CAHs[6]	*58*	*42*
MPHI	131	3,134[3]	47	TBD
NHCHC[7]	355	N/A	N/A	N/A
Northeastern (Lahey)	4,000	369	76	TBD
Prosser	581	514	49	TBD
REMSA (ATA)	5,734	259	28	TBD
SEMHS	309	652[3]	*6*	*94*[4]
South County	4,652	3,128	2	N/A[8]

(continued)

Table 1-7. Payer Shares for Enrollees of Reporting Awardees with Direct and Indirect Program Participants Through Q7 (continued)

Awardee	Individuals Enrolled[1]	# of IDs received[2]	Medicare (%)	Medicaid (%)
U-Chicago	17,644	12,427	*24*	*68*
U-Miami	11,063	118	N/A	62
W&I	787	334	N/A	0[4]
Y-USA	2,471	TBD[9]	TBD	N/A

[1] Source: Lewin Database, June 2014. Numbers represent number of persons enrolled in Q8. For University of Chicago, the cumulative number of enrollees is shown.

[2] As of September 11, 2014: Numbers in italics represent an estimate since awardees have not provided payer type for each identifier provided and/or RTI has not yet extracted data for these awardee’s participants and have only received Medicare IDs.

[3] The number of IDs provided by the awardee is higher than their reported enrollment numbers. RTI is working with the awardee to address this discrepancy and clarify counts for future reports.

[4] This awardee only includes Medicaid managed care recipients, and Medicaid Alpha-MAX data do not always include Medicaid managed care enrollees. If managed care claims are not available in Alpha-MAX, Medicaid data will need to come directly from the awardee.

[5] Identifiers for participants of Baby Partners.

[6] Critical access hospital identifiers received, no participant identifiers.

[7] No Medicare or Medicaid claims to be reported for this awardee.

[8] Medicaid patients in San Mateo County (where South County is located) are all enrolled in Medicaid managed care. Our analysis focuses on Medicaid fee-for-service enrollees because those are the enrollees for which there are claims in the CCW.

[9] RTI is awaiting a BAA and/or DUA with this awardee.

TBD= to be determined (data are not currently available or have not yet been verified by RTI); N/A= not applicable (no beneficiaries expected).

Currently, complete Medicare claims are available through the end of 2013. We present Medicare claims findings for those awardees that provided patient identifiers we could use and match with existing data in the CCW and that also provided a sample of at least 100 beneficiaries. ***Table 1-8*** provides details on the claims data presented for each awardee in this report and the reasons why specific awardees do not yet have claims data presented.

Availability of Medicaid claims varies by the state where awardees are located. Some states have data available through the second quarter of 2013, although claims for the final quarter may not be complete. Other states only have data available through 2011 or 2012; CMMI expects that all states will provide data more quickly in the future. We have received Medicaid patient identifiers for some of the awardees. To link these patient identifiers to Medicaid claims data stored in the Alpha-MAX database, we need a crosswalk matching the Medicaid patient identifiers to the Alpha-MAX patient identifiers. We have applied for access to the crosswalk, and we are waiting for the application to be approved throughout CMMI systems. For these reasons, claims data are not accessible to us for all 24 awardees.

Table 1-8. Presentation of Medicare and Medicaid Claims Data by Awardee and Reason for Exclusion in this Report

Awardee Name	Medicare Claims Analysis Presented	Medicaid Claims Analysis Presented	Reason for No or Limited Claims Presentation
AACI	—	—	Medicare sample too small
Altarum	Y	—	N/A
BAHC	Y	—	N/A
Bronx RHIO	Y	—	N/A
Children’s Hospital	N/A	—	N/A
Curators	Y	—	N/A
Delta Dental	N/A	—	N/A
ECCHC	N/A	—	N/A
Finity	N/A	—	Received managed care data from Finity; analysis in process
Imaging Advantage	Y	—	N/A
Intermountain	—	—	No patient identifiers received yet (BAA under negotiation)
Mary’s Center	N/A	—	N/A
MPHI	—	—	Complete data not yet received
Mineral Regional	—	—	Awaiting final set of identifiers
NHCHC	N/A	N/A	Most participants uninsured; no patient identifiers available
Northeastern (Lahey Hospital and Medical Center)	Y	—	N/A
Prosser	Y	—	N/A
REMSA	Y	—	N/A
South County	Y	—	N/A
SEMHC	—	—	Medicare sample too small
U-Chicago	N/A	—	Medicare sample initially expected to be too small; recent data suggest the sample size will be large enough
U-Miami	N/A	—	N/A
W&I	N/A	—	N/A
Y-USA	—	N/A	No patient identifiers received yet (DUA complete, BAA under negotiation)

N/A= Not applicable.
— Data not yet available.

Other Awardee-Specific Data

RTI has been working with awardees to identify and obtain any relevant patient-level data the awardees have obtained specific to the innovation. This process has been challenging and labor-intensive. To ensure we are requesting data most relevant for our evaluation, we used the site visits as a time to clarify the measures each awardee is collecting and how the data are captured. We took several steps after the site visit to specify the measures accurately and ensure we are obtaining comprehensive information for enrolled patients. Many awardees have a limited understanding of our need for accurate counts of patients (i.e., denominators) overall and by innovation component or patient characteristic. To calculate overall reach, we need to know the number of people the innovation could potentially impact (i.e., target population). However, some awardees consider their enrolled patients as their target population. For example, to calculate the number of diabetes patients receiving foot exams, we need to know the number of patients enrolled with diabetes. So, during the data call we often try to clarify the different denominators that will be used in the analysis. We also work with awardees to determine a feasible timeframe for them to provide the data to us. We aimed to obtain all data by the end of September 2014 or as soon as the awardee can provide it. We plan to obtain quarterly updates of data in time to include in each future quarterly report.

Awardees vary in their level of experience with data. Those less experienced do not always understand that some file formats are not useful for data analysis. For instance, we have received data in portable document format (PDF), which does not allow for the manipulation of the data directly. Even with relatively experienced awardees, we have encountered longer than expected timeframes for receiving data. As ***Table 1-9*** shows, we received data from eight awardees (i.e., Altarum, Curators, Finity, Mary's Center, MPHI, Prosser, REMSA, and SEMHS) by September 11, and results for those eight are included in Section 3.

Table 1-9. Status of Awardee Specific Data Availability as of September 11, 2014

Awardee Name	Awardee-Specific Data Provided to RTI by September 11, 2014	Notes
AACI	N	Data are expected from this awardee by late October 2014
Altarum	Y	N/A
BAHC	N	Data are expected from this awardee by late October 2014
Bronx RHIO	N	Waiting for additional data.
Children's Hospital	N	Data are expected from this awardee by late October 2014
Curators	Y	N/A

(continued)

Table 1-9. Status of Awardee Specific Data Availability as of September 11, 2014 (continued)

Awardee Name	Awardee-Specific Data Provided to RTI by September 11, 2014	Notes
Delta Dental	N	Data will come from claims only.
ECCHCs	N	Data are expected from this awardee by late October 2014
Finity	Y	N/A
Imaging Advantage	N	Data are expected from this awardee by late October 2014
Intermountain	N	Pending BAA; in the most recent communication Intermountain noted that they aimed to send the BAA paperwork to RTI the week of October 20, 2014.
Mary's Center	Y	N/A
MPHI	Y	N/A
NHCHC	N	RTI only expects aggregate level data from this awardee starting in January 2015.
Mineral Regional	N	Based on the site visit completed in mid-August, it is unclear if/what data will be available.
Northeastern	N	Working with project sites to request patient identifiers and other data.
Prosser	Y	N/A
REMSA	Y	N/A
South County	N	Working with project sites to request patient identifiers and other data.
SEMHS	Y	N/A
U-Chicago	N	Data are expected from this awardee by late October 2014
U-Miami	N	During a call among CMS, RTI, and U-Miami in late September 2014, U-Miami noted that not all of their data are currently available as they are continuing to transfer hardcopy data into their EHR system. They have hired an additional staff person to facilitate the transfer of information, and expect to be able to provide all the data requested by January 2015.
W&I	N	Working with project sites to request patient identifiers and other data.
Y-USA	N	Pending BAA/DUA; DUA has been signed by RTI; RTI is waiting for BAA paperwork from YMCA.
Total	8	N/A

N/A= Not applicable.

We are continuing to request data from awardees, and will incorporate findings into future quarterly and annual reports as we receive the data. Once the BAAs with Intermountain and Y-USA are in place, we will have a better understanding of when we will receive other data. We have already determined that two awardees will not provide patient identifiers for claims data analysis (NHCHC) or other data (Delta Dental) for the evaluation. Based on the site visit with Mineral Regional in mid-August 2014, it is unclear if/what data will be available. RTI will work with Mineral Regional to determine if the data related to measures identified as most relevant to our evaluation are available.

1.3.4 Analytic Approach

We plan to analyze both qualitative and quantitative data within each awardee and across all awardees. The within-awardee analysis uses methods to identify and verify conclusions about a single awardee. The analysis of individual awardees and their multiple sites have produced rich descriptions of each awardee’s structures, processes, barriers, and facilitators in implementing the innovation (see Section 3). These awardee sections include thorough descriptions of their progress in implementation of their innovation as well as analysis of quantitative data obtained and cleaned by RTI as of September 11, 2014. We describe here our methods for quantitative and qualitative analysis.

Quantitative Analysis

We plan to use a difference-in-difference modeling approach to estimate intervention effects on cost and resource utilization variable. For the purpose of this discussion, we present a linear regression model. However, depending on the outcome variable (e.g., binary, categorical, or count) a linear model may not be appropriate. In those cases, the evaluation will rely on nonlinear models instead. For example, for a binary outcome, a logit model can be used, whereas for a count outcome (such as ED visits or days hospitalized), a Poisson or negative binomial model is more appropriate. In what follows, the unit of observation is the beneficiary, and we assume that the data are longitudinal (i.e., repeated observations on individuals).

$$Y_{it} = (\alpha_0 + \alpha_1 * I_i) + (\beta_0 + \beta_1 * I_i) * POST_{it} + \delta_X * X_{it} + \varepsilon_{it}. \quad (1)$$

Here, Y_{it} is the outcome for individual *i* in time period *t* = 0, 1, 2,… In many cases, *t* will index the quarter, but depending on the data, we may observe some outcomes less frequently (e.g., annual measures of quality of care). The variable I_i (= 0,1) is an indicator variable for patient *i* being in the intervention group. The variable $POST_{it}$ (= 0,1) is an indicator for the post-intervention period. With only a single baseline (*t* = 0) and post-intervention (*t* = 1) observation, equation 1 represents a standard two-period difference-in-differences model. The vector X_{it} contains patient-level characteristics (e.g., age) that may affect outcomes. The last variable ε_{it} in equation 1 is a residual term that represents unobserved heterogeneity in the outcome.

In equation 1, the coefficient α_1 represents the baseline difference in outcome between the intervention and comparison groups. With a carefully chosen comparison group, we expect a priori that α_1 is equal to zero. The coefficient β_0 is the average difference in outcome for the comparison group between the baseline and post-intervention periods. In the intervention group, this difference or "trend" is $\beta_0 + \beta_1$. The difference-in-difference parameter is the difference in trends, or $(\beta_0 + \beta_1) - \beta_0 = \beta_1$. It can be used as a measure of program effectiveness.

Example with Propensity Score Weighting

Propensity score (PS) weighting can improve the design of observational studies before the analysis of outcomes is attempted. Equation 1 controls for differences in observed characteristics by inclusion of the vector X_{it}. We can provide an additional correction for imbalances between the intervention and comparison group by using PS weighting in the estimation of equation 1. The PS is the probability that a beneficiary is eligible for or participates in the intervention, conditional on a set of characteristics measured during the baseline period (Rosenbaum & Rubin, 1983). The PS will be estimated as predicted probability from a logistic regression of group status (1 = intervention, 0 = comparison) on covariates. The group-specific weights are then *1* for individuals in the intervention group and *PS/(1-PS)* for individuals in the comparison group.[1] The objective of weighting is to increase the comparability of the intervention and comparison groups before estimating the effects of the awardee model. Comparability is reflected by the extent to which covariate means are similar between the two groups.

Examples with Fixed Effects or Linear Time Trend

The simpler specification in equation 1 can easily be modified to accommodate different designs. If many quarters of data are available, a fixed effects (FE) version of the model can be used. This model does not deliver a single effectiveness estimate. Rather, it can track if and how intervention effects change over time. Because intervention effects can be expected to increase over time, especially if rapid-cycle evaluation allows an awardee to improve its model over time, the FE specification can deliver valuable information. Alternatively, linear time trend models can be used. Conducting multiple observations per individual makes it possible to eliminate time-invariant sources of endogeneity in the estimation, but doing so does not completely eliminate the possibility of selection on

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[1] Weighting the comparison group beneficiaries by the propensity score odds aligns them with those in the intervention group and allows us to estimate the "effect of treatment on the treated". In addition, the odds tend to be less variable than the inverse probability weights (1/PS and 1/[1-PS]) that are sometimes used to estimate average treatment effects, leading to better finite sampling behavior of the weighted estimator.

unobservables. In such specifications, we would introduce a linear trend, a dummy variable that switches from 0 to 1 when a patient starts participating in a program, and an interaction between the dummy and the linear trend. This segmented linear model or interrupted time trend model estimates the intervention effect in terms of an intercept (level) shift and slope (rate of change) shift that apply when patients start participating in the intervention. We will pursue additional statistical analyses across the topic areas that test the sensitivity of the basic findings to certain assumptions and that can provide a more detailed analysis. We will conduct these analyses in later annual reports. First, we can estimate quantile regression models for expenditures and possibly other outcomes. These models can help determine whether the intervention has a heterogeneous effect, depending on the quantile of the outcome distribution. Second, standard regression estimators can be sensitive to extreme observations, such as patients with extremely high health care expenditures. We propose to determine whether outlying observations unduly affect our inferences by also estimating equation 1 with a weighted *robust* regression estimator. This estimator further adjusts estimation weights to reduce the influence of extreme observations.

Strategy for Comparison Groups

Details on the comparison groups we plan to use for analysis are described in the awardee sections and summarized in ***Table 1-10***. The awardees' aims and characteristics are diverse, and our strategies for obtaining comparison groups vary depending on the innovation. In addition to comparing participants of each innovation before and after each innovation is launched, we will also seek to identify an applicable comparison group for each awardee as possible.

For awardees with direct patient participants or explicit eligibility criteria, we will identify similar types of patients to those enrolled in the innovation. First, we will obtain the finder file for the awardee's participants or demographic information provided by the awardee. We will then analyze patient demographics, characteristics, and disease conditions for intervention participants using information from the CCW or directly from the awardee. Using PS matching, we will then identify similar patients in the same or similar geographic areas based on characteristics such as age, gender, race, and chronic conditions who are not enrolled in the innovation. It is important to use local comparison groups (i.e., groups within adjacent zip codes or within-state comparisons), especially for Medicaid patients, because treatment and Medicaid coverage may vary by state. In certain cases, within-state or within-region comparison groups would not be possible (e.g., the W&I intervention operates in the state's two intensive care unit hospitals). Although PS matching is a useful correction strategy, it cannot match unmeasured contextual variables.

For awardees serving patient participants indirectly through providers, we will identify similar providers to those participating as part of the innovation. We will use PS matching to identify similar providers in the same health care network if possible or in the same geographic area based on characteristics such as medical specialty, age or years in practice, gender, race, practice type, and patient mix. Last, for awardees working with health care systems or hospitals, we will identify similar types of organizations to those participating in the innovation. We will also use PS matching as possible to identify similar organizations in the same or similar geographic areas based on characteristics such as size, ownership status, geographic location, and patient mix.

For a few awardees, no external comparison groups are available, so we will compare outcomes for patients (or providers) served by the awardee before and after the innovation is adopted.

Table 1-10. Awardee Comparison Groups

Awardee	Program Participants	Pre-Post Comparison	Possible External Comparison Group(s)
AACI	AACI patients	AACI innovation participants before and after the innovation is implemented	Medicare and Medicaid FFS beneficiaries in Santa Clara County, CA, who are not participating in the innovation
Altarum	Providers within United Physicians Network	Participating providers before and after the innovation is implemented	Providers in the catchment area who do not have access to nor received training for the Altarum clinical decision support system
BAHC	Patients diagnosed with a chronic disease or at risk of developing diabetes, vulnerable seniors, homebound individuals, young children, and hard-to-reach county residents in rural New Mexico	BAHC innovation participants before and after the innovation is implemented	Medicare and Medicaid FFS beneficiaries in rural New Mexico who are not participating in the innovation
Bronx RHIO	Bronx residents who have consented to share their information as part of the RHIO	Bronx RHIO innovation participants before and after the innovation is implemented	Medicare and Medicaid FFS beneficiaries in the Bronx who have not consented to share their information as part of the RHIO
Children's Hospital	CCHP members who have had 2 or more ED visits in the prior 6 months	CCHP innovation participants before and after the innovation is implemented	CCHP members who are eligible for but not participating in the innovation

(continued)

Table 1-10. Awardee Comparison Groups (continued)

Awardee	Program Participants	Pre-Post Comparison	Possible External Comparison Group(s)
Curators	Adult patients with a documented visit within 2 years prior of the innovation with a primary care provider in the University of Missouri Family and Community Medicine or General Internal Medicine Department	Curators innovation participants before and after the innovation is implemented	Medicare and Medicaid FFS beneficiaries in central Missouri who are not participating in the innovation
Delta Dental	South Dakota American Indian children under age 9, pregnant women, and people with diabetes	Delta Dental innovation participants before and after the innovation is implemented	Separate control groups for each type of patient composed of Medicaid FFS patients in South Dakota who are not participating in the innovation
ECCHC	Residents of the 29203 zip code area, which is the Eau Claire section of Columbia and Richland Counties	ECCHC innovation participants before and after the innovation is implemented	Medicaid FFS patients in surrounding 2 zip codes who are not participating in the innovation
Finity	All Health Plan Partner members for general wellness and those that are pregnant, have diabetes, or have hypertension for disease management programs	Finity innovation participants before and after the innovation is implemented	Separate comparison groups for each component of the innovation composed of plan members eligible for but not participating in the innovation
Imaging Advantage	ED providers and radiology staff in the Tenet Health System	Participating providers before and after the innovation is implemented by medical specialty	Separate comparison groups for ED providers and radiology staff composed of similar types of providers at Tenant who are not participating in the innovation
Intermountain	Physician practices (shared-saving model) Intermountain patients with a benefit score of 8 or greater (IndiGO), high-cost patients (population management)	Intermountain innovation participants before and after the innovation is implemented Participating physician practices before and after the innovation is implemented	Eligible Intermountain practices that did not join the shared saving model demonstration IndiGO-eligible patients who did not receive an IndiGO view Intermountain high-cost patients eligible for but not participating in the innovation

(continued)

Table 1-10. Awardee Comparison Groups (continued)

Awardee	Program Participants	Pre-Post Comparison	Possible External Comparison Group(s)
Mary's Center	High-cost, high-utilizing Medicaid beneficiaries (and those with safety net health care) prioritized based on chronic illnesses, diabetes, asthma, hypertension, or total cost of care	Mary's Center innovation participants before and after the innovation is implemented	Medicaid managed care beneficiaries in the District of Columbia who are not participating in the innovation
MPHI	Adult Medicare or Medicaid beneficiaries with at least 2 chronic conditions	MPHI innovation participants before and after the innovation is implemented	Medicare and Medicaid FFS adult beneficiaries in the 3 participating counties eligible for but not participating in the innovation
Mineral Regional	Critical access hospitals in Montana	Participating critical access hospitals before and after the innovation is implemented	Other critical access hospitals not participating in the innovation located in the state of Montana
NHCHC	Homeless people who have had 4 or more ED visits in the last 2 years	NHCHC innovation participants before and after the innovation is implemented	N/A: without claims data, RTI will not be able to conduct a comparison analysis
Northeastern	Health systems and patients receiving specific services at each health system	Innovation participants before and after each innovation being evaluated is implemented	To the extent possible, innovation participants eligible for but not participating in each innovation being evaluated
Prosser	Adults with a history of frequent ambulance calls, ED visits, readmissions, or observations within the Prosser system; and adults with chronic illnesses	Prosser innovation participants before and after the innovation is implemented	Patients identified by Prosser eligible for but not participating in the innovation, or Medicare and Medicaid FFS patients with similar characteristics in the catchment area not participating in the innovation
REMSA	Residents of Washoe County, as well as individuals in Washoe County who overuse the ED and ambulance services	REMSA innovation participants before and after the innovation is implemented ED admissions in Washoe County before and after the innovation is implemented (Nurse Health Line component)	Eligible patients identified by REMSA who declined to participate in the innovation (Ambulance Transport Alternative, Community Health Paramedic components)

(continued)

Table 1-10. Awardee Comparison Groups (continued)

Awardee	Program Participants	Pre-Post Comparison	Possible External Comparison Group(s)
South County	South County patients, with focus on those who have the Health Plan of San Mateo	South County innovation participants before and after the innovation is implemented	Medicare and Medicaid FFS beneficiaries in San Mateo County's Access to Care for Everyone Program who are not participating in the innovation
SEMHS	High-risk, high-cost, and chronically ill Medicaid, Medicare, and Child Health Plan Plus beneficiaries in Prowers County	SEMHS innovation participants before and after the innovation is implemented	Medicare and Medicaid FFS beneficiaries in rural eastern Colorado who are not participating in the innovation
U-Chicago	Individuals who live in 11 high-poverty zip codes in Chicago's South Side, receive a health care visit at a participating site, and for whom the CommRx system generated a HealtheRx during the health care visit	U-Chicago innovation participants before and after the innovation is implemented	Medicaid beneficiaries in areas of Chicago that are not served by U-Chicago's CommRx innovation Patients in the 11-zip areas targeted by the U-Chicago CommRx innovation who are not enrolled in the innovation (i.e., for whom the CommRx did not generate a HealtheRx)
U-Miami	School-aged children who attend the 9 schools that are part of the U-Miami Miller School of Medicine's Dr. John T. Macdonald Foundation School Health Initiative	U-Miami innovation participants before and after the innovation is implemented	Medicaid FFS children beneficiaries in Miami who are not participating in the innovation
W&I	High-risk preterm and full-term infants with a neonatal intensive care stay of 5 days or longer and their parents	Infants covered by Medicaid and treated at W&I prior to the launch of the innovation who have similar characteristics as the infants participating in the W&I innovation after the launch	N/A: explore the potential for similar infants from the surrounding states of Massachusetts and Connecticut
Y-USA	Medicare FFS and Medicare Advantage beneficiaries	Y-USA innovation participants before and after the innovation is implemented	Medicare FFS beneficiaries in the zip codes where the Y-USA innovation is being offered who are not participating Medicare FFS beneficiaries in other zip codes in the selected cities where the Y-USA innovation is being offered who are not participating

CCHP = Children's Community Health Plan; ED = emergency department; FFS = fee-for-service; FQHC = federally qualified health center.

Approach When Comparison Groups are Not Available

Comparison groups will be obtained prospectively or retroactively on a case-by-case basis by PS. If it is not possible to collect case-controlled data within the desired timeframe or to phase in the target population, we will still evaluate a program. In such cases, we may need to make stronger assumptions, and these assumptions may limit the credibility of the results. The options available to us in the absence of a comparison group are as follows:

- **Before and after comparison.** This entails measuring the outcome of interest before and after the intervention and taking the difference between the before and after outcome as a measure of the intervention's impact. Finding of a significant change before and after the intervention suggests that the intervention is a potential cause of the change. However, in the absence of a comparison group, we cannot rule out the possibility that the change in outcomes is caused by a non-intervention factor that happens to coincide with the intervention. General confounding trends at the state or national level, particularly those related to the ACA, could coincide with the implementation of an HCIA intervention.
- **Run and control charts.** Run and control charts are frequently used in quality improvement studies to visualize upward and downward trends in a time series and show the general picture of a process. Because run charts use the median as the centerline, they are less informative as a tool to understand changes in costs than control charts, which use the mean as the centerline. Control charts have the added advantage of using sigma limits to identify nonrandom patterns or special causes in the data rather than visual inspection alone. A possible shortcoming of both methods may be data availability, as one should have between 15 and 20 data points before constructing either chart for the purpose of identifying a shift in the process. This will require data to be available monthly or at least every 3 months. Control charts can be useful for identifying that a specific cause exists, but they may not identify what that cause is. The cause might be an intervention, but it could be another factor independent of the intervention.

Qualitative Analysis

Qualitative interviews for the case study were chosen as an appropriate research technique because of their capacity for generating rich, detailed information. Interviews and focus groups can provide a thorough understanding of the issues from varied perspectives. Therefore, interviews and focus group are also subject to wide variations in interviewer/observer bias and interpretation, which creates analytic challenges. These challenges can be addressed by triangulating these data with the narrative from the quarterly reports (extracted from the Lewin database), the Project Officer's observations (entered into the POST database), and by using a well-structured coding scheme for data analysis.

We developed codes around the theoretical constructs depicted in the conceptual framework that are grounded in current literature as key components to implementation of these types of interventions. Because the codes in our plan tightly align with the data collection, the coding scheme was developed *after* the initial interview and focus group protocols have been completed. The coding scheme is documented in a codebook that specifies the code name, definition, examples, and hierarchy. Coders receive training on the use of the codes to ensure high interrater reliability and quality of data interpretation.

In addition to coding topic areas and the content of response, the coding scheme includes codes for different attributes of the awardee and the informants (see ***Table 1-11***). Attributes are the primary means by which we can compare and contrast across awardees to identify patterns, themes, and commonalities. This same approach can be applied to multiple sites within an awardee for within-case analysis. We use a qualitative data analysis software, QSR NVivo 10.0 (www.qsrinternational.com), to code and synthesize the interview, focus group transcripts, and narrative text from the interviews, and quarterly and POST reports. Additionally, we use NVivo to organize and manage the data over the multiple years of the project. The software also allows us to rapidly and efficiently generate our evaluation quarterly reports to CMMI and produce for CMMI important ad hoc (supplemental) findings as they emerge.

Table 1-11. Sample Awardee and Informant Attributes Codes

Attribute	Code
Program Type	Care coordination Patient navigation HIT Other
Informant Type	Leaders Managers Patient navigator Partners Clients Providers
Target Population	Infants and children Seniors Disabled Immigrants
Location	Urban Rural Suburban

In our case study, we plan to analyze data (1) within each awardee; (2) across all awardees; and (3) in clusters of similar innovations. The within-awardee analysis uses methods to identify and verify conclusions about a single awardee: “the phenomena in a bounded context that make up a single ‘case study,’ whether that case is an individual in a setting, a small group, or a larger unit such as an organization or community" (Miles & Huberman, 1994, p. 79). For this evaluation, the analysis of individual awardees and their multiple sites will produce rich descriptions of each awardee's structures, processes, barriers, and facilitators in implementing their service delivery and payment models. Across-all-awardee analysis will address broad evaluation questions that have the potential to provide cross-cutting insights regardless of the intervention, setting, or population. For example, a cross-cutting question would be whether the presence of an intervention champion resulted in more rapid adoption of the intervention within the organization or setting. The cluster analysis will examine patterns and themes applicable to the program types (clusters) we have identified thus far: care coordination/patient navigation, care coordination/HIT, and unique interventions. By examining programs with similar interventions, we can identify common structures and processes and gather insights about their relationship to workforce, implementation effectiveness, and outcomes.

Qualitative Comparative Analysis

Qualitative comparative analysis (QCA) is a case-oriented approach that examines relationships between conditions (similar to explanatory variables in regression models) and an outcome using set theory, a form of logic that deals with the nature and relations of sets. QCA is a method designed for small N studies (i.e., 10 to 50 cases). It assesses which factors—alone or in combination—identify pathways related to an outcome. QCA uses an analytic device called a truth table to evaluate all combinations of explanatory conditions and to identify the most parsimonious causal models among sample sizes that are too small for traditional regression analysis. Whereas regression analysis seeks to identify "what factor, *holding all other factors constant* at each factor's average, will increase (or decrease) the *likelihood of an outcome*," QCA examines "*what conditions*—alone or in combination with other conditions—are *necessary or sufficient to produce an outcome*" (Rosenbaum and Rubin, 1983). To implement QCA, we will follow a standardized form for compiling measures around the key domains of the conceptual framework presented in Figure 1-2.

1.4 Challenges and Limitations

Although the overarching goals and objectives of the HCIA Community Resource evaluation are focused and well defined, the awardees are implementing a broad array of innovations for impacting the care coordination at the program participant, workforce or program staff, provider practice or organizational, or system levels. The awardee interventions differ greatly in terms of their foci (e.g., chronic conditions), settings (e.g., clinics, community), and target populations, (e.g., youth, newborns), among other factors, which will create variation in the potential short-term and intermediate targeted outcomes. This challenge is compounded by variation across awardees with their implementation of the interventions (e.g., size of program, timing of implementation, fidelity), making the evaluation quite complex. This complexity stems from several factors:

- Some activities have a clear anticipated impact, whereas the impact of others is more diffuse and/or indirect.
- Synergies exist across program activities that add to the complexity of the program and may result in spillover effects.
- Program success is affected by environmental influences and sociodemographic characteristics (e.g., endogenous and exogenous factors) that vary across patient groups, provider practices, organizations, health care systems, and communities.
- Many program activities likely began once an awardee was funded (July 2012) or before, while others have evolved over time and perhaps changed in their focus, making it difficult to retroactively assess how far each has come in effectively addressing organizational and system changes to reach the outcomes of the Triple Aim.
- True comparison samples are often lacking, hard to identify, or difficult to access for data collection, making evaluation difficult.
- Medicaid programs vary widely between states (e.g., in terms of eligibility policies and service reimbursements), Medicaid claims may not be standardized across states, and the claims data may not be available in a timely fashion.

The variation in implementing activities creates both opportunities and challenges for the evaluation team. One challenge will be to identify a sufficient number of programs that are similar enough to be clustered together for a cross-awardee evaluation study (e.g., programs clustered together by their focus area on system- or patient-level changes). However, there should be sufficient variation in the dose and implementation of these approaches to have the power to understand their impact on the targeted health behaviors and outcomes. Given the diversity of the innovations, the limited number focused on changing priority outcomes, and the delays in implementation, we have increasing concerns that changes in outcomes will not be detectable within the next 3 years to a level that will truly inform policy development.

To address these challenges, we have assembled a multidisciplinary team of evaluators with the expertise and experience needed to evaluate each type of intervention in the HCIA Community Resource cohort and provide CMMI with findings for all prioritized outcomes (e.g., the Triple Aim). ***Table 1-12*** provides an overview of some of the other challenges for this evaluation and proposed solutions for each.

Table 1-12. Challenges for HCIA Community Resource Evaluation and Proposed Solutions

Challenges for HCIA Community Resource Evaluation	Proposed Solutions
Awardee-Specific	
Lack of commonality across innovations	Identify areas where commonalities exist and collect measures specific to those clusters or groups. Establish levels of intensity of evaluation such that those with greater commonality are assessed more comprehensively.
Slower initiation of innovation than expected	Thoroughly understand the barriers encountered by awardees during start-up and assess outcomes relative to their completion of milestones.
Limited focus among awardees on the four priority measures	Develop methods to collect more in-depth information from awardees with the potential to impact the four measures (i.e., total cost, admissions, readmissions, and ED use).
Limited ability of some awardees to collect data in a form that is transmittable to RTI	Work with CMMI to identify technical assistance needs of specific awardees; address data quality issues on a case-by-case basis with specific awardees.
Design-Specific	
Timing of evaluation relative to intervention implementation (i.e., evaluation is starting 15 months after project initiation)	Work quickly to catch up on all submitted documentation and conduct in-depth interviews with Project Officers, coding and abstracting all along, to develop a complete picture of their evolution to date. Awardees have experienced delays in intervention implementation and may not have recruited sufficient clients into their programs for them to be included in aspects of the evaluation.
Inconsistency in measures across awardees	Develop standard metrics, measures, and outcomes to be used for each HCIA Community Resource awardee based on the literature; collaborate with other HCIA evaluation team members to develop standardized measures and methods for reporting outcomes to CMMI.
Narrowing down overall breadth of evaluation such that measures of greatest importance are collected	Work with CORs to develop sample reports and data presentations in advance so that measures can be prioritized and those of low priority dropped from the design.
Limited access to potential control groups	Apply a seven-step process for developing comparison groups. Use multiple control groups for Medicare, if possible. Employ run and control charts if control groups are not available.
Limited time period to expect change in priority outcomes	Use retrospective data when possible (e.g., claims analysis) and select awardees for data collection that have achieved goals more quickly (e.g., recruited sufficient numbers for intervention participation).
Limited access to claims data for non-Medicare and non-Medicaid patients	Use awardee self-monitoring data on the number of non-Medicare and non-Medicaid patients served. Infer potential savings from Medicare and Medicaid patients if possible.
Assessing program implementation given the dynamic processes for HCIA	Include the time since implementation as an independent or stratifying variable in evaluation analyses, to assess changes in structures, processes, and outcomes over time, and sustainability of implemented programs.

(continued)

Table 1-12. Challenges for HCIA Community Resource Evaluation and Proposed Solutions (continued)

Challenges for HCIA Community Resource Evaluation	Proposed Solutions
Design-Specific (continued)	
Limited availability of Medicaid claims	Access new Alpha-MAX data through the CCW enclave. Work closely and flexibly with CMMI as the data enclaves are developed and refined. Avoid contacting state Medicaid agencies for data if at all possible. Enter into data reuse agreements where feasible.
Measuring changes in key outcomes	Examine all available data sources and work with CORs to access claims and awardee data as quickly as possible.
Logistic-Specific	
Minimizing burden on Project Officers or awardees	Use existing self-monitoring data whenever possible. Coordinate site visits with Project Officers and awardee liaisons. Carefully weigh benefits of data requests against burdens.
Obtaining data directly from awardees in a timely manner	Work with CORs to proactively address delays on a case-by-case basis.
Reliance on other contractors for specific data variables	Work with CORs to raise concern about data collected through the Lewin database or elsewhere (e.g., elimination of cost study variables that were collected in database but are no longer available and yet are a component of our evaluation design). Adjust evaluation design based on guidance from CMMI.
Narrowing down site visit protocols so data can be collected over a discrete period of time	Work with CORs to prioritize who to interview while on site and the topics of greatest importance to address during the 1–4-day site visits.

COR = contracting officer’s representative; CCW = Chronic Conditions Data Warehouse; CMMI = Centers for Medicare & Medicaid Services; DUA =data use agreement; ED = emergency department; HCIA = Health Care Innovation Awards.

1.5 Summary

In our evaluation of the 24 HCIA Community Resource awardees, RTI will seek to determine whether these initiatives have been able to achieve better care for the individual, better health for populations, or lower costs through improvement of care delivery processes, workforce development, replication, and scaling of new models. Furthermore, we will take into consideration how the administrative, geographic, policy, and organizational context of each might influence this success. As we move forward with gathering data about each initiative, we will be able to better understand not only whether they have been effective in achieving their goals but also under what conditions and for which particular populations these initiatives are more or less successful. These nuanced insights will provide CMMI with results it can use to support the current awardees and to guide future initiatives.

2. CROSS-AWARDEE FINDINGS

The goals of the cross-site or group-level quantitative and qualitative analyses are twofold: to combine similar quantitative data across sites to assess overall trends, and to combine different sources of data to address broader evaluation questions that cannot be examined using any one data source alone.

The results presented in this section are based on the first 12 months of the evaluation for the 24 HCIA Community Resource awardees. Given the timing, some data presented here are incomplete and will be verified with the awardees and updated in subsequent reports. Nearly all of the descriptive information provided is based on our assessment of the awardees during their individualized site visits. For each site visit, two RTI team members visited each awardee between April and August 2014. Before and after the visit, our team reviewed all documentation on the innovation. To best present data across the awardees, however, we plan to code all of the interview data around the evaluation domains presented in Section 2.1. By coding the data across interviews and awardees (which began in September 2014), we are able to present common themes for each evaluation domain and a more complete picture of apparent patterns in the next annual report.

For quantitative data, we provide an overview of the data we currently have available and describe data that we plan to obtain during the remainder of 2014. As described in Section 1, we have been working to obtain patient identifiers from all awardees who are serving beneficiaries of Medicare and/or Medicaid (Section 1.3.3) and will use those identifiers to access claims data as well as link it to other patient-level data we are able to obtain from each awardee (Section 1.3.2). We are also obtaining data directly from the awardees to assess many of the variables we discuss and will be able to present cross-awardee findings for like indicators in future reports. Section 1 provides an overview of our data collection and analysis and the status of analysis for each awardee. We also describe our methods in detail in Section 1. This section focuses on presenting findings from RTI’s site visits, document reviews, follow-up calls, and analysis of quantitative data obtained and cleaned by RTI through September 11, 2014. Data presented in this section are drawn directly from data in each of the awardee sections (Section 3) where the data sources are indicated.

2.1 Summary Description of All 24 HCIA Community Resource Awardees by Evaluation Domain

This section describes all 24 HCIA Community Resource awardees, organized by evaluation domain***.*** These domains are captured in our conceptual framework (***Figure 1-2*** in Section 1) and are essential to assessing the overall effectiveness of each innovation. We follow the same outline in this section that we do in the individual awardee sections presented in Section 3, including innovation components, participant characteristics, implementation process, workforce development, and implementation effectiveness.

2.1.1 Innovation Components

In the first year of the HCIA Community Resource evaluation, we have defined and described the components of each awardee's innovation through an extensive review of awardee documents and qualitative data collected during site visits. Summarizing these components is challenging because the innovations are diverse, have multiple parts that vary in complexity, and may be embedded in programs or initiatives that predate HCIA or operate concurrently with other funding. In classifying the components, we distinguish between aspects of an innovation that are its primary goal or target and aspects that simply enable or support an innovation (i.e., supporting elements presented in awardee sections). This nuance is important: distinguishing what the innovation is from what the innovation does is an essential step in specifying appropriate outcomes and associated measures for each innovation.

We used a taxonomy developed for the HCIA meta-evaluation to make distinctions in the types of components being implemented by each awardee, as shown in ***Table 2-1***. We adopted this taxonomy because it promotes the consistent use of terminology across HCIA evaluations and will enhance comparability of findings. These terms are defined in ***Appendix D.***

Table 2-1. Summary of HCIA Community Resource Awardees' Innovation Components

		Component Type								
Awardee	**Awardee Component Name**	**Care Coordination**	**Medical Home**	**Home Care**	**Workflow/Process Redesign**	**Health IT**	**Decision Support**	**Provider Payment Reform**	**Direct Health/ Dental Care**	**Workforce Training**
Altarum Institute	ImageSmart	—	—	—	•	•	•	—	—	—
	Web Portal and Education Support	—	—	—	—	•	—	—	—	—
Asian Americans for Community Involvement (AACI)	Patient Navigation Training	—	—	—	—	—	—	—	—	•
	Patient Navigation Services	•	—	—	—	—	—	—	—	—

(continued)

Table 2-1. Summary of HCIA Community Resource Awardees' Innovation Components (continued)

Awardee	Awardee Component Name	Component Type: Care Coordination	Medical Home	Home Care	Workflow/Process Redesign	Health IT	Decision Support	Provider Payment Reform	Direct Health/ Dental Care	Workforce Training
Ben Archer Health Center (BAHC)	Preventive Health Services	•	—	—	—	—	—	—	—	—
	Intensive Case Management	•	—	—	—	—	—	—	—	—
Bronx Regional Health Information Organization (Bronx RHIO)	Data Analytics	—	—	—	—	•	—	—	—	—
	Data Analytics Workforce Development	—	—	—	—	—	—	—	—	•
Children's Hospital and Health System (Children's Hospital)	Community Health Navigators	•	—	—	—	—	—	—	—	—
	Nurse Navigators	•	—	—	—	—	—	—	—	—
Curators of the University of Missouri (Curators)	LIGHT2 Suite of Tools	—	—	—	—	•	•	—	—	—
	Data Analytics	—	—	—	—	•	•	—	—	—
	Patient Portal	—	—	—	—	•	•	—	—	—
	Nurse Care Managers	•	—	—	—	—	—	—	—	—
Delta Dental Plan of South Dakota (Delta Dental)	Direct Dental Services	—	—	—	—	—	—	—	•	—
	Oral Health Care Coordination	•	—	—	—	—	—	—	—	—
Eau Claire Cooperative Health Centers (ECCHC)	Micro-Clinics in High Risk Communities	—	—	—	—	—	—	—	•	—
	Community Health Teams	•	—	—	—	—	—	—	—	—
Finity Communications (Finity)	Condition Management LifeTracks	•	—	—	—	•	—	—	—	—
	Everybody Get Healthy Patient Portal	—	—	—	—	•	•	—	—	—

(continued)

Table 2-1. Summary of HCIA Community Resource Awardees' Innovation Components (continued)

		Component Type								
Awardee	**Awardee Component Name**	**Care Coordination**	**Medical Home**	**Home Care**	**Workflow/Process Redesign**	**Health IT**	**Decision Support**	**Provider Payment Reform**	**Direct Health/ Dental Care**	**Workforce Training**
Imaging Advantage	Radiology Outsourcing/Workflow Reengineering and Teleradiology	—	—	—	•	•	—	—	—	—
	Radiology Advisor	—	—	—	—	•	•	—	—	—
	Radiology Dashboards	—	—	—	—	•	•	—	—	—
	RealTime Quality Assurance	—	—	—	—	•	•	—	—	—
Intermountain Health Care Services, Inc. (Intermountain)	Shared Savings Model	—	—	—	—	—	—	•	—	—
	Patient Engagement	—	—	—	—	•	•	—	—	—
	Population Management	—	—	—	—	•	—	—	—	—
Mary's Center for Maternal & Child Care (Mary's Center)	Community Health Workers	•	—	—	—	—	—	—	—	—
	Capital Partners in Care Health Information Exchange	—	—	—	—	•	—	—	—	—
	Shared Savings Model	—	—	—	—	—	—	•	—	—
Michigan Public Health Institute (MPHI)	Community Hubs	•	—	—	—	—	—	—	•	—
	Community Health Workers	•	—	—	—	—	—	•	—	•
Mineral Regional Health Center (Mineral Regional)	Workforce Development	—	—	—	•	—	—	—	—	•
	Community Participation	—	—	—	•	—	—	—	—	—
	Provider-Based Research Network (FRIN)	—	—	—	•	—	—	•	—	—
	Rural Participation in Value-Based Purchasing	—	—	—	—	—	—	•	—	—
	Integrated EHR Systems	—	—	—	—	•	—	—	—	—

(continued)

Table 2-1. Summary of HCIA Community Resource Awardees' Innovation Components (continued)

Awardee	Awardee Component Name	Component Type								
		Care Coordination	**Medical Home**	**Home Care**	**Workflow/Process Redesign**	**Health IT**	**Decision Support**	**Provider Payment Reform**	**Direct Health/ Dental Care**	**Workforce Training**
National Health Care for the Homeless Council (NHCHC)	Community Health Workers (CHWs)	•	•	—	—	—	—	—	•	—
Northeastern University (Northeastern)	Regional Extension Center Model	—	—	—	—	•	—	—	—	•
	Process Improvement Projects	—	—	—	•	—	—	—	—	—
Prosser Public Hospital District (Prosser)	Community Paramedics (CPs)	•	—	•	—	—	—	—	—	—
Regional Emergency Medical Services Authority (REMSA)	Community Paramedics (CPs)	•	—	•	—	—	•[1]	—	—	—
	Ambulance Transport Alternatives (ATA)	•	—	—	•	—	—	—	—	—
	Nurse Health Line (NHL)	•	—	—	•	—	—	—	—	—
South County Community Health Center (South County)	Comprehensive Health Assessment	—	•	—	•	—	—	—	—	•
	Panel Management and Family Practice Care Teams	•	•	—	•	—	—	—	•	•
	Nurse Navigators and Health Coaching	•	—	—	•	—	—	—	—	•
Southeast Mental Health Services (SEMHS)	Community Health Workers (CHWs) Training Program	—	—	—	—	—	—	—	—	•
	Health Navigation Services	•	—	—	—	—	—	—	—	—
University of Chicago (U-Chicago)	HealtheRx via CommRx	—	—	—	—	•	—	—	—	—
	HealtheRx to Participants	—	—	—	—	•	•	—	—	—
	Community Health Information Specialist	•	—	—	—	—	•	—	—	—

(continued)

Table 2-1. Summary of HCIA Community Resource Awardees' Innovation Components (continued)

Awardee	Awardee Component Name	Component Type: Care Coordination	Medical Home	Home Care	Workflow/Process Redesign	Health IT	Decision Support	Provider Payment Reform	Direct Health/ Dental Care	Workforce Training
University of Miami (U-Miami)	Community Health Workers (CHWs)	•	—	—	—	—	—	—	—	—
	Expansion of Dental Services	—	—	—	—	—	—	—	•	—
	Telemedicine	—	—	—	—	•	—	—	•	—
	ED Diversion Clinic	•	—	—	—	—	—	—	—	—
	New Payment Mechanism	—	—	—	—	—	—	•	—	—
Women and Infants Hospital of Rhode Island (W&I)	Peer Support	•	—	—	—	—	—	—	—	—
	Social Work Support	•	—	—	—	—	—	—	—	—
	Clinical Support	•	—	—	—	—	—	—	—	—
	Patient Navigation	•	—	—	—	—	—	—	—	—
YMCA of the USA (Y-USA)	Lifestyle Coaches	—	—	—	—	—	—	—	—	•
	Community-Based Trainings	•	—	—	—	—	—	—	—	—
Total		18	2	2	6	11	6	5	6	7

Source: 2014 Site Visits

[1] For the "evaluate and refer" initiative, CPs help providers decide whether a patient needs emergency medical services.

— Not applicable.

More than two-thirds of awardees (18) have components designed to improve the coordination of care, which involves engaging personnel and resources needed to carry out patient care activities. The innovations involved in care coordination have largely deployed community health workers (CHWs) or patient navigators to provide patients with personalized education, coaching, referrals, and follow-up needed to achieve health care goals. Prosser and REMSA are providing this care coordination by engaging community paramedics in similar functions and also deliver care in the home of patients enrolled in their innovation. Two awardees with care coordination components are establishing medical homes as an integral part of their innovation for particularly vulnerable populations, including the homeless (NHCHC) and low-income patients with chronic disease such as diabetes (South County).[1] Six innovations include the delivery of direct health or dental services in combination with care coordination or as a stand-alone intervention.

Nearly half (11) have health information technology (HIT) components that facilitate the exchange of information among providers and organizations, enhance provider or patient decision making, or support data analytics as part of population management. Several innovations (7) have components whose primary goal is to train a new kind of workforce; these efforts are distinct from most of the other innovations that employ training as part of the implementation process (e.g., training providers to use a portal). These innovations are providing training for the following workforce roles: CHWs (AACI, SEMHS, Y-USA), data analysts (Bronx RHIO, Curators), quality improvement specialists (Mineral Regional), and health systems engineers (Northeastern).

Six innovations have components whose primary objective is to change the workflow and processes of care to increase efficiency, reduce waste and duplication, or improve safety. Six awardees are implementing interventions that include developing tools or strategies for decision support of patients or providers. Two innovations have components not captured by the meta-analysis taxonomy, including health promotion and education (Y-USA) and learning collaboratives (Mineral Regional).

How the diversity of innovations may influence what we are able to evaluate is important to understand. Although a few commonalities exist across many HCIA Community Resource awardees (e.g., care coordination, HIT), their dissimilarities are much more evident. Few innovations target similar enough populations (Section 2.1.2) for outcomes to be comparable across awardees: comparing patient-level outcomes for children from one innovation is irrelevant to the many innovations that serve no children, for example. Also, few awardees focus on the same health conditions (e.g., asthma, diabetes) or types of patients (e.g., Medicaid beneficiaries, infants). These innovations will likely affect different health outcomes (e.g., adults with diabetes or children with asthma), making it difficult to present findings across all awardees or even subsets of awardees. RTI plans to make these comparisons in the final analysis where the data allow us to do so rigorously and effectively.

2.1.2 Participant Characteristics

Like the diverse innovation components, HCIA Community Resource awardees address the needs of a diverse mix of participants ***(Table 2-2).*** While many awardees are enrolling diverse patients, the data presented in this section include only the subgroups that awardees have specified they are targeting. Over time, many awardees have refined their participant pool such that their inclusion criteria for participants in the innovation are more

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[1] Although many innovations are based in or partnered with health care systems that have adopted a medical home model, only these two awardees identify it as a key goal.

precise. Based on the site visits and/or recent reports, only two awardees focus on enrolling participants from specific racial or ethnic groups, including Native Americans (Delta Dental) and Asians and Hispanics (AACI). One-fourth of awardees are specifically targeting participants who are already covered by Medicaid (6).[2] Three awardees target individuals who are 65 years or older and are Medicare beneficiaries.[3] Three awardees target children—for high ED use (Children's Hospital), dental care (Delta Dental), or all disease conditions (U-Miami)—and one targets infants (and their families) who spend 5 or more days in a neonatal intensive care unit (W&I). Eleven awardees deliver innovations at multiple locations that serve populations with similar characteristics, and five focus on providing services to local residents in rural or frontier regions (BAHC, Delta Dental, Mineral Regional, Prosser, SEMHS). In terms of medical history, some awardees focus on reducing ED visits among frequent users (Children's Hospital, MPHI, NHCHC, Prosser), or on those with chronic conditions (BAHC, Delta Dental, Finity, Mary's Center, SEMHS), or other specific health-related criteria (i.e., pregnant women, newborns in neonatal intensive care units, prediabetes).

Table 2-2. Participant Characteristics Targeted by HCIA Community Resource Awardees

	Participant Characteristics											
	Race/ Ethnicity			Payer Source		Age			Geographic Location			
Awardee Name	Native American	Asian	Hispanic	Medicaid	Medicare	Children	Infants	65+ Years	Multisite	Type of Region	Medical Condition/ Criteria	Other Inclusion Criteria
Altarum	—	—	—	—	—	—	—	—	•	Multiple states	—	Health care providers (PCPs, specialists, nurses, PAs, and admin. staff)
AACI	—	•	•	—	—	—	—	—	—	Urban	—	—

(continued)

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[2] A total of 14 HCIA Community Resource awardees are serving Medicaid beneficiaries among their participants (based on the latest information). Those that are listed have explicitly noted this group to be a target population of their innovation.

[3] A total of 17 HCIA Community Resource awardees are serving Medicare beneficiaries but only three have explicitly stated this group to be a priority population for their innovation (based on the latest definition).

Table 2-2. Participant Characteristics Targeted by HCIA Community Resource Awardees (continued)

Awardee Name	Participant Characteristics											
	Race/ Ethnicity			Payer Source		Age			Geographic Location			
	Native American	Asian	Hispanic	Medicaid	Medicare	Children	Infants	65+ Years	Multisite	Type of Region	Medical Condition/ Criteria	Other Inclusion Criteria
BAHC	—	—	—	•	•	—	—	•	—	Rural	Chronic conditions: diabetes, asthma, hypertension	Residents of Dona Ana County, vulnerable seniors, homebound individuals, hard-to-reach county residents
Bronx RHIO	—	—	—	—	—	—	—	—	—	Urban	—	All Bronx residents
Children's Hospital	—	—	—	•	—	•	—	—	—	Local region (urban/ rural mix)	2 or more ED visits in past 6 months	Members of the Children's Health Plan
Curators	—	—	—	—	—	—	—	—	—	Urban/ rural mix (23 counties in central Missouri)	—	Univ. of Missouri Family Medicine or Internal Medicine patients
Delta Dental	•	—	—	—	—	•	—	—	•	Rural (South Dakota Am Indian reservations)	Pregnant women, persons with Diabetes	Native Americans on the Standing Rock Reservation if they meet other inclusion criteria
ECCHC	—	—	—	—	—	—	—	—	•	Local region (urban/ rural mix)	—	Resident of specific zip code area (29203)
Finity	—	—	—	•	—	—	—	—	•	Urban	Focus on pregnant women, diabetes, and hypertension	Health Plan Partner Medicaid managed care plan enrollees

(continued)

Table 2-2. Participant Characteristics Targeted by HCIA Community Resource Awardees (continued)

Awardee Name	Participant Characteristics											
	Race/ Ethnicity			Payer Source		Age			Geographic Location		Medical Condition/ Criteria	Other Inclusion Criteria
	Native American	Asian	Hispanic	Medicaid	Medicare	Children	Infants	65+ Years	Multi-Site	Type of Region		
Imaging Advantage	—	—	—	—	—	—	—	—	•	Multiple states	—	ED providers including physicians, NPs, PAs, and radiology staff
Intermountain	—	—	—	—	—	—	—	—	—	Urban/ rural mix (across Utah)	—	Physicians and patients (adults, high benefit/risk profile, and high cost)
Mary's Center	—	—	—	•	—	—	—	—	—	Urban	Focusing on but not limited to diabetes, hypertension, asthma	Residents of the District of Columbia
Mineral Regional	—	—	—	—	—	—	—	—	•	Rural/ frontier	—	Critical care hospitals
MPHI	—	—	—	•	•	—	—	—	•	Local region (urban/ rural mix)	2 or more chronic conditions, 5 or more ED visits and/or 3 or more hospital admissions	—
NHCHC	—	—	—	—	—	—	—	—	•	Multiple states	High ED users (defined by local sites)	Homeless people
Northeastern	—	—	—	—	—	—	—	—	•	Multiple states	—	Health systems that are a good fit to receive services through a regional extension center

(continued)

Table 2-2. Participant Characteristics Targeted by HCIA Community Resource Awardees (continued)

	Participant Characteristics											
	Race/ Ethnicity			Payer Source		Age			Geographic Location			
Awardee Name	**Native American**	**Asian**	**Hispanic**	**Medicaid**	**Medicare**	**Children**	**Infants**	**65+ Years**	**Multi-Site**	**Type of Region**	**Medical Condition/ Criteria**	**Other Inclusion Criteria**
Prosser	—	—	—	—	—	—	—	—	—	Rural/ frontier	High ED users, readmissions, frequent ambulance calls, chronic illness, individuals receiving specific surgeries	—
REMSA	—	—	—	—	—	—	—	—	—	Local region (urban/ rural mix)	—	Residents of Washoe County
SEMHS	—	—	—	•	—	—	—	—	—	Rural/ frontier	High-risk, high-cost, chronically ill patients	High-risk users residents of Prowers County
South County	—	—	—	—	—	—	—	—	—	Urban	—	Members of San Mateo Health Plan
U-Chicago	—	—	—	—	—	—	—	—	•	Urban	—	Residents of 11 high-poverty zip codes in Chicago's South Side
U-Miami	—	—	—	—	—	•	—	—	—	Urban; School District	—	Students attending the 9 participating schools or immediate family members of students
W&I	—	—	—	—	—	—	•	—	—	Multiple states	Newborns spending 5 or more days in neonatal intensive care unit	Residents of Rhode Island, Connecticut, or Massachusetts
Y-USA	—	—	—	—	•	—	—	•	•	Multiple states	Prediabetes	—

Sources: Applications, 2014 Site Visits

CHP = Child Health Plan; ED = emergency department; NP = nurse practitioners; PA = physician assistant; PCP = primary care provider.

— Not applicable.

2.1.3 Process

The implementation process has been the initial focus of the evaluation. Subsequent quarterly and annual reports will assess the impact of the innovation as data become available. The implementation process is best evaluated through a combination of data variables, including execution of implementation that conforms to operational plans and capacity for implementing the innovation in a timely and effective manner. We focused on the implementation process during awardee site visits, addressing such evaluation questions as the following:

- What is the overall execution of the innovation implementation (e.g., the actual rate of expenditures relative to the projected rate)?
- What accomplishments are specific to hiring or training staff so that the organization can build its capacity to implement the innovation effectively?
- What is the implementation effectiveness, including fidelity, reach, and dose of the innovation thus far?

Execution of Intervention

The essence of the execution of an intervention is the process for how awardees undergo implementation, what delays and barriers they encounter, and what strategies they use to circumvent delays. We operationally define execution as including rate of expenditures, enrollment status, and barriers and facilitators to implementation.

HCIA awardees were asked to have innovations ready for implementation upon award and be able to initiate participant enrollment within 6 months of award. Twelve (50%) were able to begin enrollment by the end of January 2013 or within 6 months after their award. Ten awardees began enrollment within the first year of funding, while the remaining two did not start enrolling until more than a year postaward. Delays in starting enrollment may impact how well they will ultimately be able to enroll the targeted number of participants. In particular, Bronx RHIO launched their project in February 2014, which may hamper their efforts to provide RTI with sufficient data on patients impacted by the innovation by the end of their program in June 2015. Reasons for delays included challenges in establishing subcontracts, hiring and/or training new staff, or setting up health information systems. The rate of enrollment is important to understanding execution because it indirectly indicates how nimble the awardee's organization is in incorporating the innovation into their structures and processes (e.g., posting new job positions, establishing subcontracts with key partners) and how quickly the awardee is able to address these types of challenges.

Another proxy for successful implementation of an intervention is project expenditure rates. Project expenditure rates can signal problems with executing key subcontracts with partners and with hiring and training staff, which can lead to serious (and potentially irreversible) delays in project activities. Serious delays can subsequently affect enrollment targets and ultimately any possible impacts on costs and health outcomes.

As of March 2014, eight awardees were on target with the projected spending rates, and all other awardees were below target. Three awardees were below their target spending projects by more than 40%—Children's Hospital, REMSA, and AACI.

Children's Hospital's expenditure rate is lower than expected due to hiring challenges. Recruiting and hiring staff were more difficult than the awardee anticipated. Early in the program's development, turnover of trained community health navigators (CHNs) was higher than expected, and it was determined that the local market for those with similar skills was robust, requiring Children's Hospital to reassess CHN pay rates. The program manager identified such challenges early on and proposed solutions that have been implemented as quickly as possible, but having fewer CHNs than planned has reduced the spending rate.

REMSA's spending rate was impacted by a delayed start-up and because they received the final award in December 2012 (other awardees typically received their awards in June or July 2012).

AACI's lower spending rate may be a result of its lengthy training program (1 year) for patient navigators, which delayed patient enrollment until October 2013.

2.1.4 Workforce Development

Considering the expected increase in individuals seeking medical care with the passage of the Affordable Care Act, workforce development was a significant part of CMS's HCIA goals. To increase the number of qualified care providers, nearly all HCIA Community Resource awardees hired new staff to fill newly designated roles. In addition, all awardees integrated some type of training into their innovations to educate existing or new staff about new tools and strategies for accomplishing key tasks (e.g., using new HIT tools) or about the function of new roles (e.g., CHWs). We start by summarizing staff hiring accomplished across awardees, followed by details on the role of CHWs or patient navigators across the 18 awardees that have staff working in similar positions. During each site visit, we obtained standard information about the functions of each position so the information could be compared across awardees and ultimately used to assess how the functions may be associated with specific changes in health care outcomes. We conclude this section with a summary of the training that awardees conducted.

Hiring Staff

Projected staffing levels and turnover are measures that can affect an awardee's capacity to reach its enrollment targets or complete key training and educational activities. Suboptimal staffing can indicate poor management, low morale, or an insufficient pool of qualified individuals in the community to make the innovation sustainable. Across awardees, a total of 443.8 full-time equivalent staff (FTEs) have been hired.[4] MPHI has the most FTEs and Prosser has the fewest, which is indicative of their innovations—MPHI's innovation spans several counties and includes numerous CHWs while Prosser's innovation has a smaller, very specific group of targeted participants located within a small, rural/frontier community in Washington State.

According to site visit reports, only two awardees have notable staffing concerns: Prosser and Northeastern. A key staffing challenge for Prosser is that no single staff person works full-time on the project. The lack of a staff member who can devote full attention to program administration and implementation has frustrated some Prosser staff, because they are not sure who to turn to with questions about the project. At Northeastern the issue of student turnover, while a positive factor in allowing more students to be trained, presents a challenge in providing a consistent project team for health systems. Northeastern attempted to address this challenge by including a health system lead, who is a senior-level Northeastern staff member, to oversee the project. This individual will remain on the project to provide consistent advisory support to incoming students and serve as a continuing point of communication for the health systems.

Services Provided by New Staff Positions

For this section of each awardee report, RTI presents standard details on the roles and functions of the new CHWs or those operating in similar roles. Of the 24 HCIA awardees, 18 have employed CHWs or those operating in similar roles to implement their innovation. Below we summarize the shared characteristics across the relevant awardees including the functions of these new employees, the requirements for each role, and the variation in titles. For each of the 18 awardees, we present detailed information in ***Table 2-3*** on the title, minimum qualifications, functions, and continuing education programs of each care coordinator role.

The most commonly used title (10 awardees) to describe the care coordinator position was some variation of community health worker/navigator (e.g., community health worker, patient navigator, health navigator, health care worker). Other titles were based on specific qualifications for the position, such as nurse care managers in the Curators innovation and nurse health educators at BAHC who are required to be registered nurses (RNs). Other position titles were based on required certifications for the role such as community paramedics, medical assistants, and panel manager.

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[4] The Lewin Group, March 2014

The employees in the care coordination roles fill a wide range of functions across awardee sites from instrumental support, outreach, and coordination, to providing direct services. The care coordinators provide the categories of services listed below (some additional descriptions are included to elaborate on these functions):

- health education: provided on an individual and/or group basis,
- informal counseling: individualized goal setting,
- outreach and recruitment,
- direct service delivery: first aid, health screening tests, blood pressure checks,
- medication management,
- patient/community advocacy,
- patient monitoring and follow-up,
- service coordination: assistance with enrollment, appointments, referrals,
- community linkages: coordination of care with health, human, and social service organizations, and
- instrumental support: arranging transportation, child care, translators.

Almost all awardees employing CHWs (17 of 18) reported that they served in a health education function (individual and group settings), followed by service coordination (15), and community linkages (15). A majority of the awardees with care coordinators also reported using informal counseling (14), patient monitoring and follow-up (13), and outreach and recruitment (12).

Variances are also evident in the qualifications for employment of the CHWs as designated by each awardee. The majority of awardees employing CHWs (12 of 18) require only a high school diploma or equivalent; however, two awardees require a bachelor’s level degree (one requires an RN). Four awardees require some level of certification (paramedic, medical assistant) and four others require that the CHWs come from the target population they are serving.

Table 2-3. HCIA Care Coordinator Functions and Training[5]

Awardee	Title	Minimum Qualifications	Functions	Continuing Education
AACI	Patient navigator (PN)	PN certificate	Health education Service coordination Instrumental support Community linkages	None
BAHC (existing care coordinators)	Community health worker/ Promotora	GED/high school diploma	Health education Informal counseling Outreach and recruitment Patient monitoring and follow-up Service coordination Community linkages Instrumental support	None
	Nurse health educator	Registered nurse (RN)	Health education Chronic disease management Administer immunizations	None
Children's Hospital	Community health navigator (CHN)	High school diploma/GED; from target population/ community being served	Outreach and recruitment Community linkages	Monthly ongoing training during CHN meetings No formal training program provided
Curators (some existing care coordinators)	Nurse care manager (NCM)	RN	Health education Informal counseling Direct service delivery Medication management Patient monitoring and follow-up Service coordination Community linkages Instrumental support	Monthly ongoing training during NCM meetings Continuing education seminars Pertinent courses at the university Webinars
Delta Dental	Oral health coordinator	High school diploma[1]	Health education Informal counseling Outreach and recruitment Patient monitoring and follow-up Service coordination Community linkages Instrumental support	None
ECCHC	Community health worker	GED/ high school diploma	Health education Informal counseling Outreach and recruitment Medication pick-up and delivery Patient/community advocacy Patient monitoring and follow-up Service coordination Community linkages Instrumental support Disease management coaching	None

(continued)

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[5] Only includes the 18 awardees for whom staff fill these roles.

Table 2-3. HCIA Care Coordinator Functions and Training (continued)

Awardee	Title	Minimum Qualifications	Functions	Continuing Education
Finity	Peer health mentor	No formal educational requirements, although they are required to be from the community being served	Health education Informal counseling Outreach and recruitment Medication management Service coordination Instrumental support	None
Mary's Center	Community health worker	GED/ high school diploma	Health education Informal counseling Outreach and recruitment Direct services delivery Medication management Patient advocacy Patient monitoring and follow-up Service coordination Community linkages	None
MPHI	Community health worker	Regarding high school completion, vary based on the site; must be from community in which they serve	Health education Informal counseling Outreach and recruitment Medication management Patient/community advocacy Service coordination Community linkages Instrumental support	Yes, trainings are in place
NHCHC	Community health worker	GED/high school diploma CHWs must be from the population they are serving	Health education Informal counseling Outreach and recruitment Patient/community advocacy Patient monitoring and follow-up Service coordination Community linkages Instrumental support	None
Prosser	Community paramedic (CP)	2-year paramedic program CP certification	Health education Informal counseling Patient monitoring and follow-up Service coordination Community linkages	None
REMSA	Community paramedic (CP)	Paramedic licensure	Health education Direct service delivery Medication management Patient monitoring and follow-up Service coordination	Paramedics in general are required to receive continuing education credits, and each community paramedic is trained and licensed.

(continued)

Table 2-3. HCIA Care Coordinator Functions and Training (continued)

Awardee	Title	Minimum Qualifications	Functions	Continuing Education
South County	Community health advocate[2]	High school degree	Service coordination	—
	Health navigator	High school degree Certification in panel management/ health coaching training	Service coordination Community linkages Instrumental support	—
	Medical assistant[2,3]	High school degree Medical assistant certification Certification in panel management/ health coaching training	Direct service delivery Service coordination	—
	Health coach[3]	High school degree Medical assistant certification Certification in panel management/ health coaching training	Informal counseling Patient monitoring and follow-up Medication management	—
	Panel manager[3]	High school degree Medical assistant certification Certification in panel management/ health coaching training	Service coordination	—
	Promotora *(Nuestra Casa)*[4]	High school education Trainings in the community, as required by Nuestra Casa	Health education Instrumental support	—
	Recovery Coach Voices of Recovery *(VOR)*[4]	WRAP (Wellness Recovery Action Plan) recovery coach certification	Informal counseling Direct service delivery	—

(continued)

Table 2-3. HCIA Care Coordinator Functions and Training (continued)

Awardee	Title	Minimum Qualifications	Functions	Continuing Education
SEMHS	Health Navigator	Bachelor's level	Health education Informal counseling Outreach and recruitment Patient monitoring and follow-up Service coordination Community linkages Instrumental support	None
U-Chicago	Community health information specialist (CHIS)	GED/high school diploma	Outreach and recruitment Medication management Community linkages Health education	None
U-Miami	Health care worker	High school diploma or equivalent	Health education Informal counseling Outreach and recruitment Direct service delivery Patient/community advocacy Patient monitoring and follow-up Service coordination Community linkages Instrumental support	None
W&I	Family Resource Specialist	High school diploma/GED Have been a parent of a NICU baby	Health education Informal counseling Outreach and recruitment Patient advocacy Patient monitoring and follow up Service coordination Community linkages Instrumental support	Periodic trainings provided by RIPIN, but no formal established program.
Y-USA	Lifestyle Coach	High school diploma	Health education Informal counseling Outreach and recruitment Patient monitoring and follow-up Instrumental Support	None

[1] Although Delta Dental initially put a high school diploma as the minimum qualifications in the job description, ultimately each tribe had the authority to change that requirement. Each tribe hired OHCs.
[2] Role existed prior to the innovation.
[3] Health coaches and panel managers are the same staff, but they have different titles, depending on their role at hand. Health coaches and panel managers are all certified medical assistants.
[4] Employed by a partner organization, not South County.
— Not applicable.

Training

All awardees included training as part of their innovation to develop the health care workforce or establish new roles. According to site visit reports, the number of individuals trained across awardees ranges from 23 to 1,266 (including duplicate count of individuals).[6]

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[6] The total number of trained individuals documented in this report matches the total in the Lewin Group. According to the Lewin data, the range is 23 to 1,266 including duplicates and the total trained is 8,674 including duplicates. Variation in individual awardee reports is due to inclusion of site-level data.

Types of trainings varied by awardee and included courses such as cultural competency, patient coaching and self-management, health education, peer-to-peer training, quality improvement, HIPAA regulations, and many more topics to support care coordinators, physicians, health IT staff, and other project staff. Many awardees offered ongoing training throughout the innovation rather than just a one-time training event. In total, about 4,200 individuals have been trained as a result of HCIA Community Resource innovations.

2.1.5 Effectiveness

Fidelity

Fidelity is the degree to which an innovation has been implemented with the same program components as planned. Most of the 24 HCIA Community Resource awardees made no changes to their original innovation design or only minor adaptions to account for staffing changes or turnover (ECCHC, U-Miami). Three awardees planned to expand existing programs to new populations and have done so (U-Miami, W&I, Y-USA). Only two had to change aspects of their innovation that may ultimately impact their ability to reach key outcomes.

Children's Hospital planned to include school nurses as part of their innovation and to co-locate CHNs in local EDs or large clinics. They learned that since the enrollees of their innovation have to be members of the Children's Health Plan, their members only account for a small proportion of the students seen by school nurses or the patients visiting an ED or health clinic. For this reason, they found it inefficient to hire or collaborate with local school nurses and to locate CHNs in clinical settings. The primary concern with these changes with regard to the evaluation is that they could limit CHNs' ability to connect people with primary care providers, which is the most likely way for them to impact costs among their targeted population.

SEMHS had to make the most significant change in its innovation when it lost formal connection with the primary care provider in their targeted area. This awardee originally planned to connect patients with primary care to reduce ED visits. The initial plan was to partner with a federally qualified health center in the local area to provide this connection for patients, but that partnership was terminated within the first year of HCIA funding. The health navigators at SEMHS now have no formal primary care provider for referrals, making it more challenging for the awardee to link patients to that type of care. This change is significant for the evaluation because the awardee's ability to impact ED use, and thereby reduce costs, is greatly compromised.

Reach

Reach can be difficult to understand, but is essential to conducting evaluations. Reach is defined as the proportion of the population actually "touched" by the program or innovation in relation to the entire body of the target population. Assessing effectiveness based on what proportion of the target audience is reached depends on examining the potential pool of various subgroups of high users and how they enter the program. To calculate reach, RTI first needs to know the types of patients being targeted and the different counts of patients that might be included in the innovation (i.e., the denominators in a proportional statistic that gives the count of the total possible that could be included in the innovation). Specifying these numbers has been difficult for many awardees. Some awardees target all the patients in a system or health plan at the time of the HCIA application, but many of those patients are no longer a part of that system or plan and, therefore, cannot be counted among those targeted or eligible for the program. This challenge is particularly evident for awardees such as South County and SEMHS, which used their current patient population at the time of the application to establish their targets for "reach." Since that time (in most cases, since 2010), their patient population has shifted due to deaths, moves, or other reasons patients may no longer be receiving services from their organizations. Knowing the universe from which each awardee is recruiting patients is essential to determining the impact of the innovation on the patients as a group.

Reach is further complicated by the types of innovations implemented. While most awardees focus on directly impacting patient-level outcomes, five awardees target integrated health systems, members of health plans, or provider practices to impact how care is delivered and to whom. For these awardees, the impact they have on patient-level outcomes (e.g., cost, ED visits) will be the only way we can assess how well they are able to influence changes in the areas of greatest interest to CMS. Some of these awardees (e.g., Mineral Regional, Intermountain, and perhaps Northeastern) are only able to access provider-level identifiers for analysis of groups of patient-level outcomes. For these awardees, RTI will analyze changes in key outcomes at the provider level in hopes of detecting changes in patient care that are greater among those involved with HCIA when compared with those patients seen by providers not involved in HCIA.

Awardees face challenges measuring patient-level aspects of reach as well. Several awardees planned to focus on including Medicare and/or Medicaid enrollees in their innovation but do not know the total number of beneficiaries that would be eligible for enrollment (i.e., the denominator). Since these numbers are ever-changing (e.g., people move in and out of Medicaid), RTI will need to determine their actual pool of patients as soon as possible to use that number in all of our analyses. Some clear-cut examples of reach include the total number of patients residing in a specific zip code (ECCHC), active patients of a provider or hospital who have been diagnosed with a specific health condition (South County), or patients who have consented to be on a list of eligible participants (SEMHS). More challenging examples of reach are from awardees struggling to determine the population count of patients being seen by participating providers (Mary's Center), residents of a specific area who have been diagnosed with a health condition (Delta Dental) or received certain services (U-Chicago), or unknown counts of a specific population (NHCHC).

In Section 3, we provide details on each type of patient population that awardees include in their innovations. We have already been working with awardees to fine-tune these numbers and ensure that the eligible population is clearly defined and understood. However, this effort has been challenging for some HCIA Community Resource awardees because they do not (1) have the data systems in place to know their total patient-level count, (2) have the internal capacity to either spend time extracting this information from their systems or identify staff who have the skill set needed to conduct the work, or (3) have an understanding of what "denominator data" refers to and what exact count RTI needs for the evaluation.

Dose

Dose is another complex evaluation domain for which it is critical that RTI obtain data. Dose is the extent to which individual patients (i.e., those who have been reached) have been exposed to or "touched" by an innovation. For some innovations, all patients who will be included in the analysis will have received some exposure to the innovation and can, therefore, be compared to similar patients who were not exposed to the innovation (e.g., who reside in the same area but are served by another provider). These innovations (Altarum, Northeastern) are being implemented at the system or organizational level such that outcomes at the patient level should be discernable and comparable to similar patients (see Section 1.3.4).

However, the majority of HCIA Community Resource awardees are implementing innovations targeting patient-level outcomes. Dose will need to be captured for each program component and for each patient such that if a patient receives only one program component at one point in time but other patients receive all program components over a 3-month period, RTI can compare the impact of the greater to the lesser levels of exposure on key outcomes. Dose is typically measured through at least three variables:

- duration—the length of time for which a person is exposed or enrolled in a program (e.g., 30 days);
- frequency—the number of touches or encounters with a patient in the specified period of time (e.g., 2 phone calls over 30 days); and
- intensity (or contact type)—the level of effort spent on interacting with the patient (e.g., phone call, distribution of educational materials, home visit).

A fourth variable sometimes used is to quantify the types of services delivered to each patient. Many awardees have this information at the aggregate level but not necessarily at the patient level. Unfortunately, for many awardees, data that quantify dose are typically not included in electronic medical records or existing systems since they need to capture the extent to which the new service or innovation is provided to each patient. Some awardees have captured dose data through logs or spreadsheets for new staff to track and monitor their interactions with patients. Part of our work with awardees during July and throughout the rest of 2014 is to determine which awardees have measures of dose that RTI can obtain and how that information is defined and operationalized.

Ultimately, RTI plans to present details about dose across the awardees. In most relevant awardee sections, we provide table shells such as ***Table 2-4***; in a few cases, we have data to present for dose. For the 18 awardees providing direct services, we plan to present this information across awardees to compare services across innovations.

Table 2-4. Shell for Number of Patients Receiving Each Type of Health Navigator Service for [specify time period]

Type of Service	Patients Receiving Service (#)
Outreach	—
Case management	—
Individual skills training	—
Group skills training	—
Transportation	—
Nonbillable (scheduling, reminders)	—
Total	—

Source: Patient-level data provided to RTI.
— Data not yet available.

2.2 Key Outcomes of HCIA Community Resource Awardees

RTI is working with all 24 awardees to obtain two types of quantitative data to assess the impact of the innovations on key outcomes. As of September 11, 2014, we received patient identifiers from 20 awardees (including from one health system working for Northeastern’s innovation) and have provided findings based on awardee-specific data from 8 awardees. We describe in Section 1 the types of data we are using and our analytic methods for evaluating these innovations. We also present in Section 1 details on which awardees have had different analyses included in this annual report and the reason for their exclusion, if applicable. The following sections summarize the findings based on initial analyses of claims data and awardee-specific data received and cleaned by September 11, 2014. As more data become available, we will incorporate the analysis findings into our quarterly and annual reports.

2.2.2 Findings from Claims Analyses

The findings from claims analyses are limited to the 9 awardees that had Medicare data available for this report. The reasons for the exclusion of Medicare data from these analyses (as noted in Table 1-8) include the lack of beneficiaries in the target population or the lack of patient identifiers. Similar reasons have delayed the presentation of Medicaid data coupled with the lack of approval to conduct a cross-walk with the Alpha-Max database.

Medicare Claims Analysis

In the awardee sections of this report, we provide Medicare data on the core measures for 9 awardees that (a) serve a significant number (more than 50 patients or more than 5% of enrollees) of Medicare beneficiaries, (b) have been enrolling patients for at least three quarters in 2013, and (c) provided patient identifiers by September 11, 2014:

- Altarum
- BAHC
- Bronx RHIO (baseline data only)
- Curators
- Imaging Advantage
- Northeastern (the Lahey Health Systems innovation)
- Prosser
- REMSA (the Ambulance Transport Alternative [ATA] innovation)
- South County

In subsequent reports, we will provide Medicare data for up to seven additional awardees (for data that meet the above criteria) that are expected to serve significant numbers of Medicare beneficiaries (see Table 1-7 in Section 1.3.3) for the reasons Medicare data will not be presented for other awardees):

- AACI
- Intermountain
- MPHI
- Mineral Regional
- SEMHS
- U-Chicago
- Y-USA

Other awardees are not included in this section because they are focusing either on Medicaid or uninsured patients. The following section presents preliminary findings of the priority measures (defined in Section 1) for Medicare analyses.

Results of Priority Measures Across Awardees

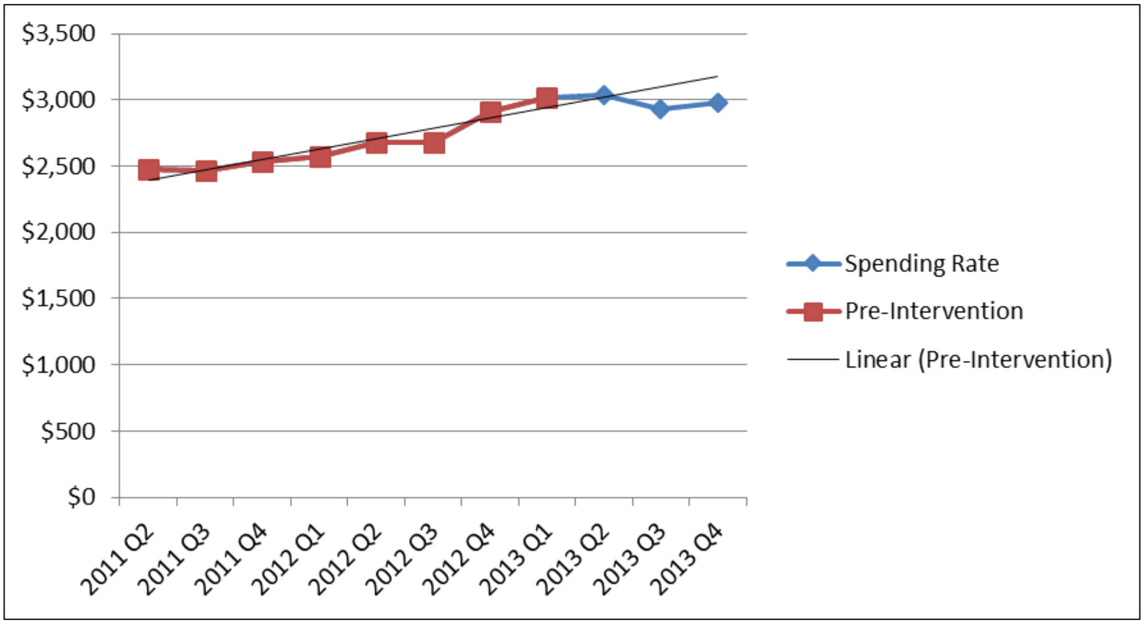
For a variety of reasons, we cannot yet generalize findings from the early Medicare results for the 9 awardees. To help demonstrate these reasons, we show run-sequence charts for quarterly Medicare spending per patient for the awardees ***(Figures 2-1*** through ***2-9).*** Each run-sequence chart shows spending per patient in the 8 quarters before (red) and all quarters after (blue) the awardee began enrolling patients in the innovation. For context, a regression line projects the trend in spending based on the 8 preintervention quarters.

First, there is great variation in spending across the awardees, both in levels and relative to an awardee's trend line. This variation is driven in part by the patients each awardee has targeted—some awardees target patients who have had hospitalizations or many ED visits before or during the innovation launch quarter. For example, the Northeastern/Lahey Health System innovation targets patients who have had hospitalizations for congestive heart failure, the REMSA ATA innovation targets people at risk for ED visits, and the Prosser innovation targets people with high utilization. These patients are high users of the health care system (e.g., multiple ED visits in a short period of time), so awardee spending per patient is higher than for other awardees. Second, for some awardees, the hospitalization or ED visit that triggers enrollment occurs during the enrollment quarter. This timing tends to increase spending during the enrollment quarter, making it appear that the innovation causes an increase in spending in the before-and-after framework of the charts. Third, most awardees have rolling enrollment, with enrollment gradually increasing over time. Thus, in the current charts, some enrollees have only been participating in the innovation for part of the time since enrollment began. We are collecting additional data on enrollment dates and will incorporate these dates in future reports. Fourth, the innovations may not have immediate effects on health care spending or utilization. Many innovations focus on health IT or patient navigation, and their impact may not be immediate because time is needed for providers to incorporate new sources of information and for patient navigation to achieve changes in health care utilization. Finally, some innovations target specific conditions or services (e.g., diabetes or medical imaging services). Although the innovation may have a statistically significant impact on the spending, inpatient admissions, readmissions, or ED visits related to the condition or services, it may not have a statistically detectible impact on the variables at the total spending or utilization level, because the targeted condition or service accounts for only a small share of total spending or utilization. In later reports, we will also provide condition- or service-specific spending and utilization data.

Most of these reasons underscore the importance of developing appropriate comparison groups for each awardee's enrollees. We are in the process of developing the comparison groups. With appropriate comparison groups, we will be able to estimate the change in spending for each enrollee. These saving estimates will allow for comparisons across awardees that cannot be made on the basis of spending levels alone.

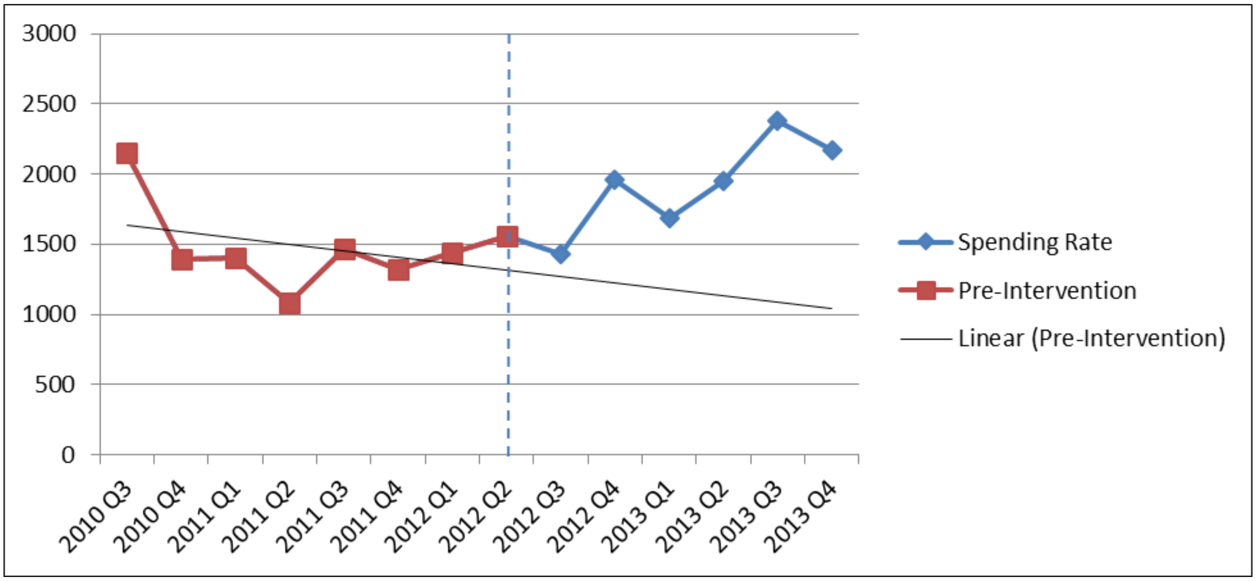
The reasons for declining to compare Medicare spending across awardees also apply to the other core measures. Therefore, we do not summarize these measures here, but show the results in the individual awardee sections.

Figure 2-1. Medicare Spending per Patient: Altarum



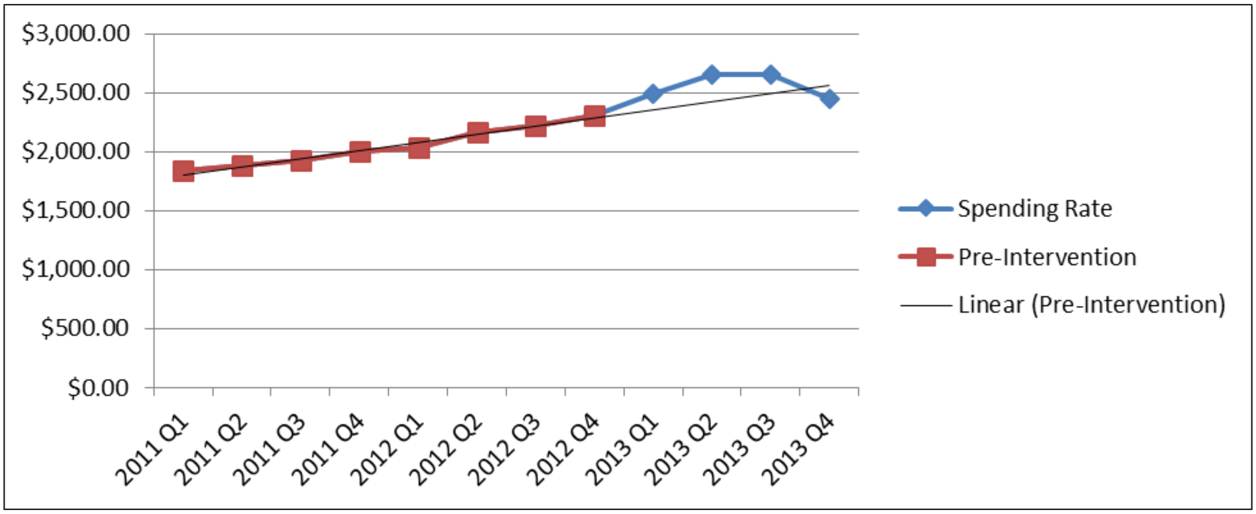
Source: RTI analysis of Chronic Conditions Data Warehouse (CCW) Medicare claims.

Figure 2-2. Medicare Spending per Patient: BAHC



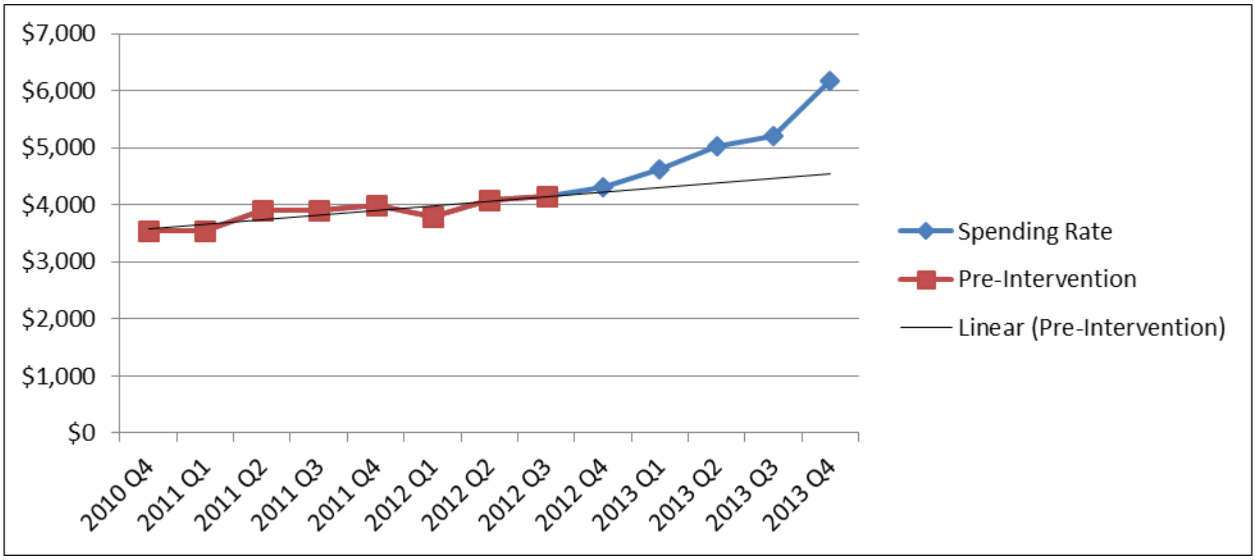
Source: RTI analysis of Chronic Conditions Data Warehouse (CCW) Medicare claims.

Figure 2-3. Medicare Spending per Patient: Curators



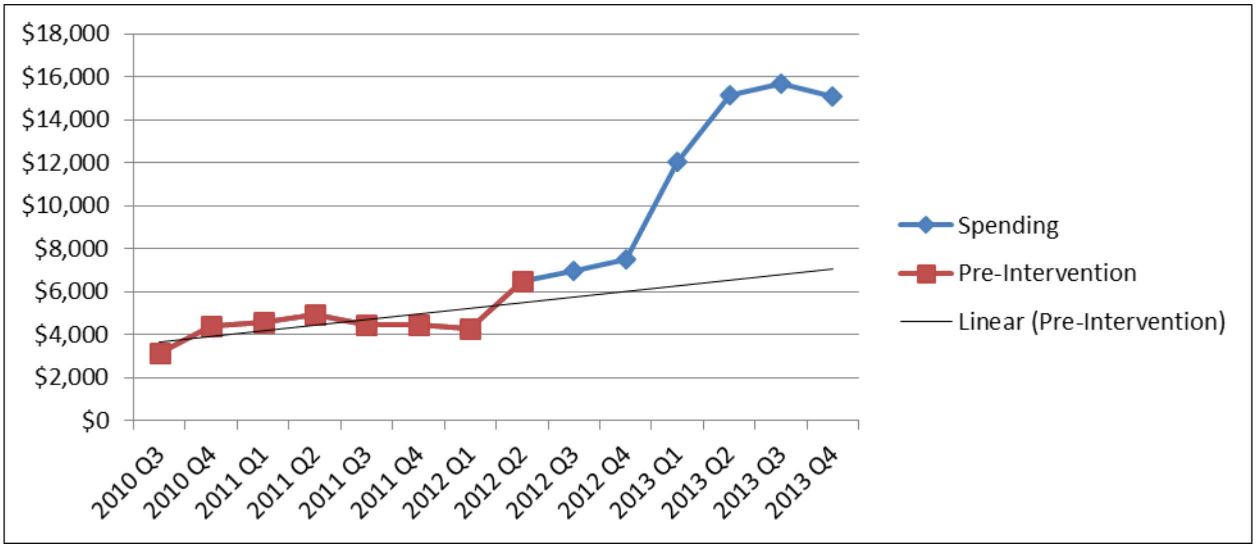
Source: RTI analysis of Chronic Conditions Data Warehouse (CCW) Medicare claims.

Figure 2-4. Medicare Spending per Patient: Imaging Advantage



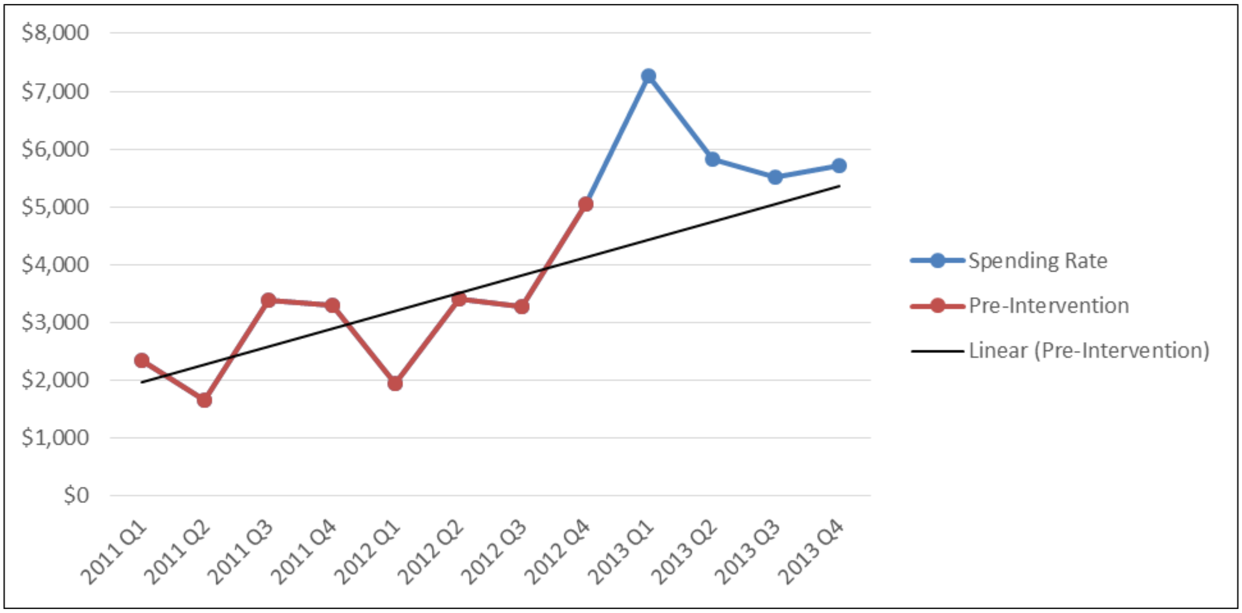
Source: RTI analysis of Chronic Conditions Data Warehouse (CCW) Medicare claims.

Figure 2-5. Medicare Spending per Patient: Northeastern-Lahey Health System



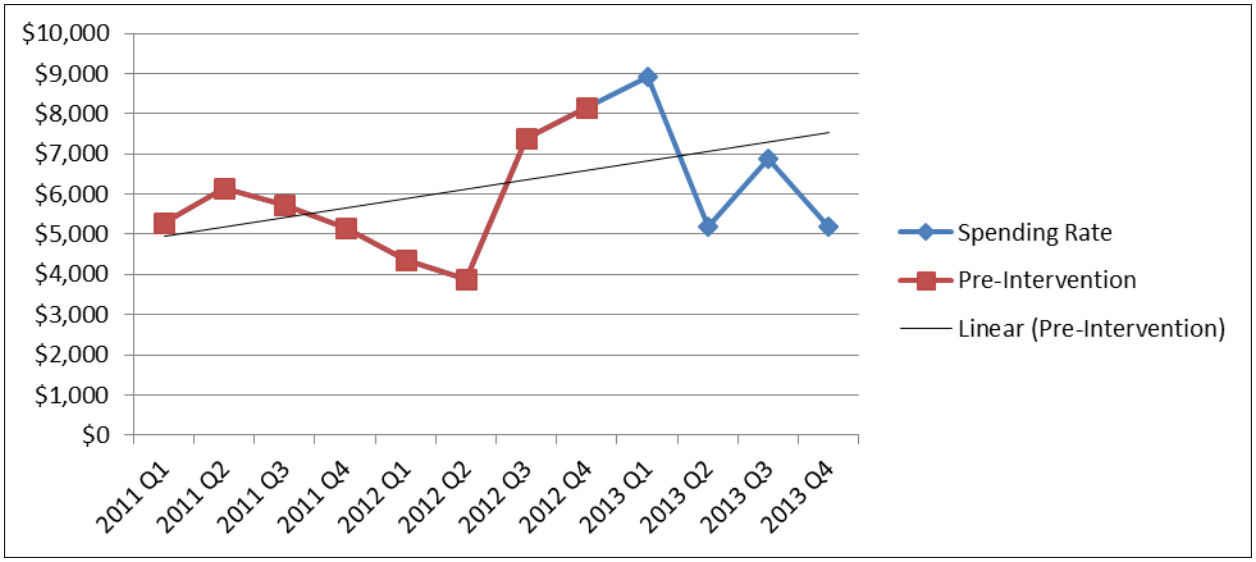
Source: RTI analysis of Chronic Conditions Data Warehouse (CCW) Medicare claims.

Figure 2-6. Medicare Spending per Patient: Prosser: Cohort 3



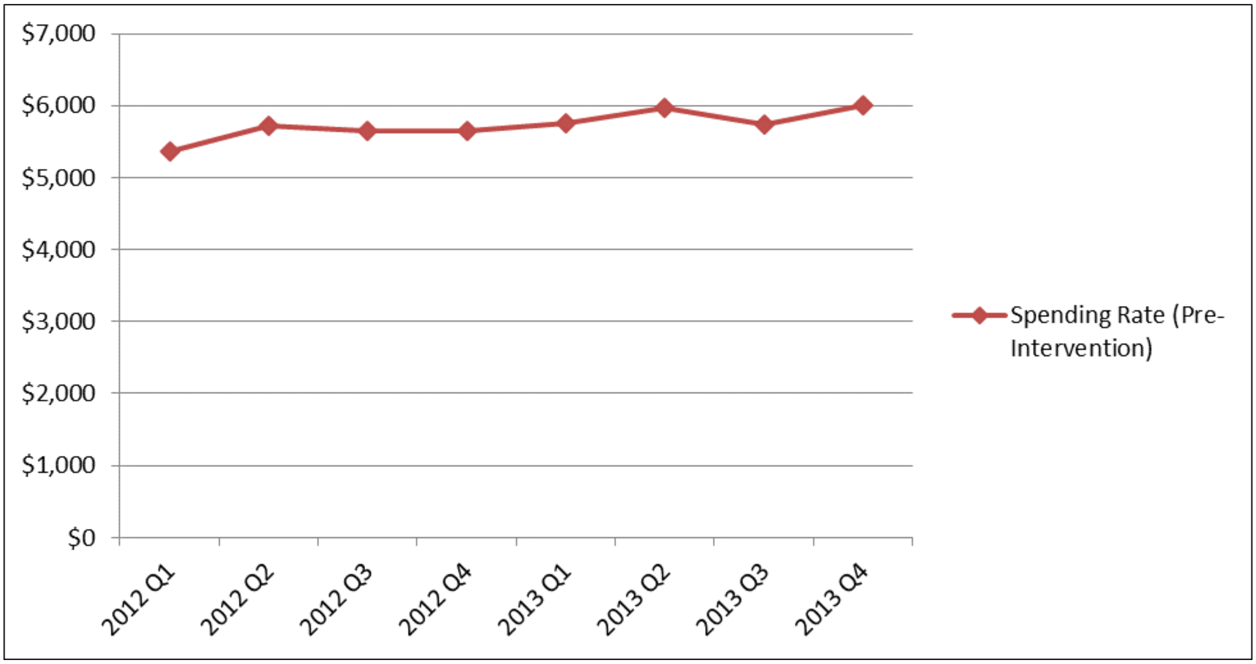
Source: RTI analysis of Chronic Conditions Data Warehouse (CCW) Medicare claims.

Figure 2-7. Medicare Spending per Patient: REMSA— Ambulance Transport Alternatives (ATA) Innovation



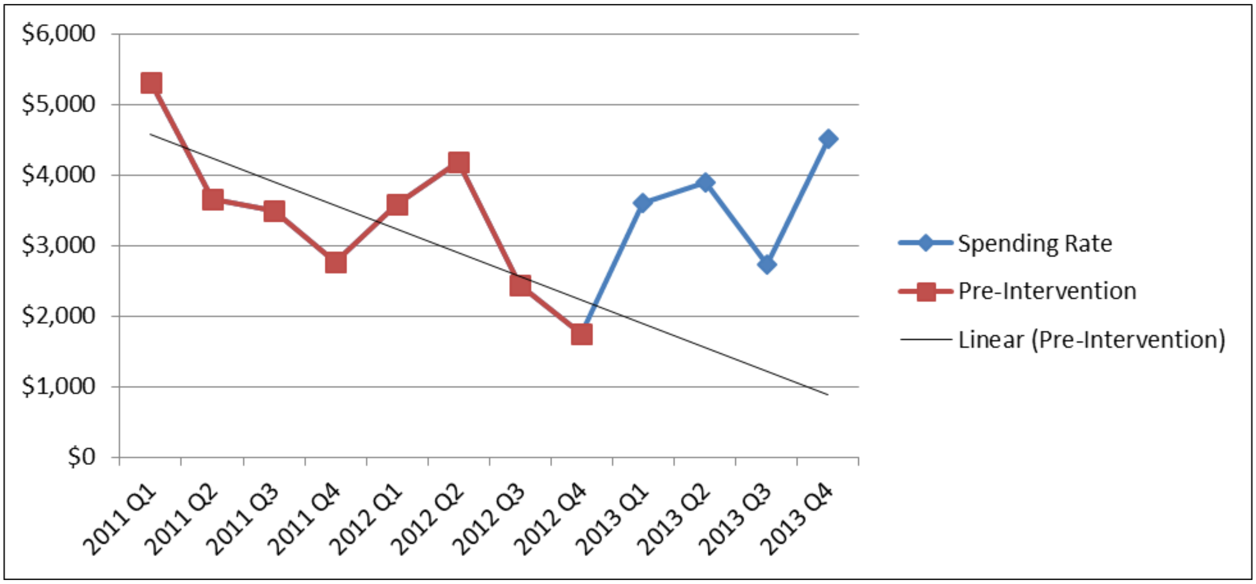
Source: RTI analysis of Chronic Conditions Data Warehouse (CCW) Medicare claims.

Figure 2-8. Medicare Spending per Patient: Bronx RHIO



Source: RTI analysis of Chronic Conditions Data Warehouse (CCW) Medicare claims.

Figure 2-9. Medicare Spending per Patient: South County Community Health Center



Source: RTI analysis of Chronic Conditions Data Warehouse (CCW) Medicare claims.

Medicaid Claims Analysis

As noted in Section 1, Table 1-8, Medicaid data are not available or accessible for analysis for most awardees. Our initial criteria for inclusion of Medicaid results in this report were:

- serving a significant number of Medicaid beneficiaries (22 awardees met this criteria),
- availability of Alpha-MAX Medicaid claims for at least 2 quarters after innovation launch (6 awardees met this criteria), and
- patient identifiers available as of September 11, 2013 (see Table 2-6 for an updated list of awardees that have provided or are in the process of providing patient identifiers).

Although six awardees met the initial criteria for inclusion in the report, delays in receiving crosswalks to link patient identifiers to Alpha-MAX files have postponed access to the Medicaid data. One awardee, Finity, provided separate Medicaid claims data from the managed care patients it serves. We are in the process of analyzing this data using propensity score analysis, and we will report results from this analysis in the next quarterly report.

We expect that all awardees will eventually serve Medicaid patients except for NHCHC, which primarily serves uninsured patients, and Y-USA, which serves only Medicare patients. We will include Medicaid data for the other awardees serving Medicaid beneficiaries in later reports, assuming that an awardee’s state eventually provides the necessary Medicaid files to CMS.

2.2.3 Results of Other Awardee-Specific Data

Descriptive analyses were conducted on the data received from eight awardees by mid-September 2014: Altarum, Curators, Finity, Mary’s Center, MPHI, Prosser, REMSA, and SEMHS. As shown in Tables 1-2 through 1-5 in Chapter 1, four of the eight awardees (i.e., Curators, Finity, Mary’s Center, and MPHI) indicated that they are assessing poor HbA1c control. However, during the request for data from Mary’s Center, we learned that changes in the implementation of the innovation, including the loss of two primary managed care organizations (MCOs) as partners, delayed full implementation. That is, the HIT component to link Medicaid information and providers was not in place as of June 2014, so they do not yet have data for many measures listed in their self-monitoring measurement plan, including poor hemoglobin A1c control. Instead, we received measures of blood glucose collected by CHWs. One of the eight awardees (i.e., Finity) is collecting data on diabetes eye exams and another is collecting data on diabetes foot exams (i.e., MPHI).

Among the cardiovascular-related measures (Table 1-3), three of the eight awardees (i.e., Curators, Mary’s Center, and MPHI) are assessing high blood pressure control, and two of the awardees (i.e., Curators and Finity) are assessing coronary artery disease lipid control. For the asthma measures (Table 1-4), Curators is assessing forced expiratory volume in 1 second (FEV1) and visits to the ED/urgent care for asthma. Mary’s Center is assessing medication management for those with asthma. MPHI is screening for clinical depression, as well as assessing body mass index (BMI) (Table 1-5).

Four of the eight awardees (i.e., Altarum, Prosser, REMSA, and SEMHS) are not assessing any of the measures listed in Tables 1-2 through 1-5. We are continuing to work with the awardees to obtain all available data over time and have been careful not to overburden awardees with our requests. However, this process seems to have led to longer delays than ideal. We will discuss with CMS potential strategies for obtaining the patient-level data requested more quickly from awardees.

Health Outcomes Results

We are in the early stages of analyzing data received from awardees. We are working with awardees to obtain all data requested and to understand the data provided. ***Table 2-5*** shows the number and percentage of patients with three health conditions for Curators, Mary’s Center, and MPHI. As shown in the table, a large percentage of MPHI’s patients have each of the three conditions, demonstrating that the innovation is reaching the chronically ill population targeted. Mary’s Center originally intended to reach larger percentages of chronically ill patients. However, as noted above, the loss of partnerships with two MCOs that were to provide lists of chronically ill patients has complicated the identification of patients in need of the innovation. This difficulty is reflected in their lower percentages of patients with each of the three health conditions.

Table 2-5. Number and Percentage of Patients with Health Condition, by Awardee

Awardee (Total population or denominator)	Asthma		Diabetes		Hypertension	
	Number	%	Number	%	Number	%
Curators (n=9,932)	1,080	10.9	1,540	15.5	4,251	42.8
Mary’s Center (n=1,920)	499	26.0	348	18.1	715	37.2
MPHI (n=3,367)	2,305	68.5	2,413	71.7	2,613	77.6

Source: Patient-level data provided by awardee to RTI.

A larger percentage of patients for each awardee have hypertension as compared to asthma and diabetes. For Curators, the percentage of patients with hypertension is nearly 3 times the percentage with diabetes. This may reflect the greater percentage of Medicare patients (54.7%) participating in Curators’ innovation than in the Mary’s Center or MPHI innovation (0.0% and 14.3%, respectively), as hypertension tends to increase with age and Medicare primarily serves those 65 and older. ***Tables 2-6*** through ***2-8*** provide additional examples for presenting data across awardees over time in annual and quarterly reports, after awardee data are received.

Table 2-6. Shell for the Percentage of Diabetes Patients with Poor Hemoglobin A1c Control (>9.0%) by Awardee Over Time

Awardee	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Curators	—	—	—	—	—	—	—
ECCHC	—	—	—	—	—	—	—
Finity	—	—	—	—	—	—	—
Intermountain	—	—	—	—	—	—	—
NHCHC	—	—	—	—	—	—	—
Mary’s Center	—	—	—	—	—	—	—
MPHI	—	—	—	—	—	—	—
Northeastern	—	—	—	—	—	—	—
South County	—	—	—	—	—	—	—
U-Chicago	—	—	—	—	—	—	—

— Data not yet available.

Table 2-7. Shell for the Percentage of Diabetes Patients Who Receive Hemoglobin A1c and Lipid Profile Assessment by Awardee Over Time

Awardee	Q1	Q2	Q3	Q4	Q5	Q6	Q7
AACI	—	—	—	—	—	—	—
Children’s Hospital	—	—	—	—	—	—	—
Curators	—	—	—	—	—	—	—
Finity	—	—	—	—	—	—	—
MPHI	—	—	—	—	—	—	—
South County	—	—	—	—	—	—	—
U-Miami	—	—	—	—	—	—	—

— Data not yet available.

Table 2-8. Shell for the Percentage of Hypertension Patients with Blood Pressure <140/90 mm Hg by Awardee Over Time

Awardee	Q1	Q2	Q3	Q4	Q5	Q6	Q7
BAHC	—	—	—	—	—	—	—
Curators	—	—	—	—	—	—	—
ECCHC	—	—	—	—	—	—	—
Intermountain	—	—	—	—	—	—	—
NHCHC	—	—	—	—	—	—	—
Mary’s Center	—	—	—	—	—	—	—
South County	—	—	—	—	—	—	—
U-Chicago	—	—	—	—	—	—	—

— Data not yet available.

2.2.4 Conclusions

We have sought in the first year of evaluation to understand and capture in detail the components of the innovations and establish baseline measures with the available claims and awardee-level secondary data. Our descriptive analyses indicate that two-thirds of awardees (18) have innovations that coordinate care by engaging CHW and clinical staff in a range of activities designed to manage chronic conditions and to facilitate access to appropriate types of health care and social support services. Nearly half (11) of awardees have HIT components designed to enhance clinical decision making, information exchange, workflow efficiency, and timeliness. More than a quarter of the innovations (7) focus on training and deploying a workforce in ways that support the goals of practice transformation through greater patient engagement (e.g., CHWs) or use of information and technology.

The execution of the innovations has been mixed, which is consistent with a diverse set of awardees with varying levels of capacity. Half (12) of awardees were delayed in launching their projects (i.e., launching more than 6 months after award), which has subsequently delayed their ability to enroll patients and provide RTI with timely data, as well as shortened the intervention period in which changes in outcomes might be detected. The majority of the awardees have implemented their innovations with few substantive changes. In cases where significant changes in the design or implementation were necessary, loss of key partners or adjustments to innovation components were the primary causes.

At this time we are unable to provide generalized findings on health outcomes, utilization, and expenditure because only 9 awardees had claims data available to present for this report. Our initial analyses indicate a great variation in spending across the awardees, both in levels and relative to an awardee’s trend line. We have provided descriptive analyses using secondary data from 6 awardees in this report but again, we cannot make any generalized findings until additional quarters of data are analyzed. Baseline findings for three awardees with similar measures for asthma, diabetes, and hypertension (Curators, MPHI, and Mary’s Center) highlight differences consistent with the age distribution of the underlying populations (e.g., Curator’s older population has a higher proportion of hypertension than Mary’s Center or MPHI). We will have additional data to provide baseline and trend analyses for more awardees in the subsequent quarterly reports.

3. AWARDEE-LEVEL FINDINGS

- Altarum Institute (Altarum)
- Asian Americans for Community Involvement (AACI)
- Ben Archer Health Center (BAHC)
- Bronx Regional Health Information Organization (Bronx RHIO)
- Children's Hospital and Health System (Children's Hospital)
- Curators of the University of Missouri (Curators)
- Delta Dental Plan of South Dakota (Delta Dental)
- Eau Claire Cooperative Health Centers (ECCHC)
- Finity Communications (Finity)
- Imaging Advantage
- Intermountain Health Care Services, Inc. (Intermountain)
- Mary's Center for Maternal & Child Care (Mary's Center)
- Michigan Public Health Institute (MPHI)
- Mineral Regional Health Center (Mineral Regional)
- National Health Care for the Homeless Council (NHCHC)
- Northeastern University (Northeastern)
- Prosser Public Hospital District (Prosser)
- Regional Emergency Medical Services Authority (REMSA)
- South County Community Health Center (South County)
- Southeast Mental Health Services (SEMHS)
- University of Chicago (U-Chicago)
- University of Miami (U-Miami)
- Women and Infants Hospital of Rhode Island (W&I)
- YMCA of the USA (Y-USA)

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October 2014

Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring

Annual and Site Visit Report
Altarum Institute

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Order HHS-500-T0010

OVERALL EVALUATION SUMMARY

RTI International was selected to lead an independent evaluation of the 24 Health Care Innovation Award (HCIA) awardees categorized as Community Resource Planning, Prevention, and Monitoring (Community Resource). In this role, RTI is conducting an in-depth evaluation of each innovation, as well as a cross-site evaluation that includes similar innovations targeting the same priority outcomes (e.g., emergency department [ED] visits). For each of the 24 awardees, this report presents findings from the first year of the evaluation (beginning September 23, 2013, and including data obtained by RTI as of September 11, 2014). The report is based on multiple data sources, including operational reports, self-monitoring plans, site visits, and quantitative data analysis.

The evaluation methods vary by awardee innovation, based on the type of innovation and availability of data. RTI has reviewed and coded all existing documents from the awardees through December 31, 2013, and incorporated that knowledge into each awardee’s overview. Our review included the awardees’ original applications for funding, original and current operational and self-monitoring plans, and quarterly narrative and monitoring reports. For this annual report, we incorporated activities reported through the awardee’s seventh quarterly report (i.e., through March 31, 2014).

Between April and August 2014, teams of at least two staff from the RTI team visited all 24 awardees for 2 to 4 days, depending on the number of interviews conducted. Teams included a subject matter expert, with training and experience specific to the awardee’s innovation, and a master’s- or bachelor’s-level colleague to take notes. Before each visit, the teams reviewed all available documentation from the awardee to learn about the innovation’s goals, objectives, and status. The purpose of the site visits was to clarify our understanding of the innovation, obtain detailed information on the implementation process, and review awardee-specific data to determine which elements to incorporate into the evaluation. By August 13, 2014, all 24 awardees had been visited and a thorough description of our findings included in each of the 24 awardee sections.

In addition to the site visits, we report quantitative data from two possible sources for several awardees. First, we present findings from claims analysis for awardees in this annual report if they both provided us with patient identifiers and reported enrolling Medicare and/or Medicaid beneficiaries. RTI has obtained patient identifiers from most of the 24 awardees to conduct claims analysis. Second, we present data RTI obtained directly from awardees to quantify their work in addressing health care costs, quality, and patient outcomes. Data from additional awardees will be analyzed and presented in future reports, as data become available and awardees enroll sufficient participants. An update on the availability of Medicare/Medicaid claims and other awardee-specific data, analysis of data available to us and cleaned as of September 11, 2014, a summary of the comparison groups, and a list of draft evaluation measures are included in each awardee section.

1. HCIA COMMUNITY RESOURCE AWARDEE: ALTARUM INSTITUTE

1.1 Introduction

Altarum Institute, a research organization in southeast Michigan, received an award of $8,366,178 beginning on April 30, 2013. The innovation has the following goals:

1. **Reduce costs** by 10% through eliminating unnecessary and inappropriate image studies and associated unnecessary care. Altarum expects net savings of $32 million over 3 years.
2. **Improve care** by providing radiology decision support, access to prior image study reports, patient education, and provider education that promotes use of radiology guidelines and alternative care pathways.
3. **Improve health** by reducing patient radiation exposure, misdiagnosis, and unnecessary treatment and providing patient and provider education.

RTI is conducting an in-depth case study for this innovation. As part of that case study, two RTI team members conducted a site visit in June 2014; before and after the visit, our team reviewed all documentation on the innovation. We are working to obtain data directly from the awardee to assess many of the variables we discuss. This report describes findings from RTI's site visit, document reviews, follow-up calls, and analysis of data obtained and cleaned by RTI through September 11, 2014. We start by describing the innovation's components and the patients targeted by the awardee.

1.1.1 Innovation Components

This intervention includes two main components, both of which use health information technology (health IT): 1) Web portal and mobile versions of ImageSmart—a radiology clinical decision support (CDS) tool, and 2) a Web-based portal that offers access to ImageSmart, supports electronic exchange of existing study results, and provides education materials related to radiology exams. Overall, the intervention seeks to promote the adoption and use of radiology decision support by outpatient providers to improve quality, reduce inappropriate/increase appropriate image study utilization, lower costs, and improve health for over 1 million patients living in southeastern Michigan.

For this innovation, Altarum has partnered with United Physicians (UP), an Independent Practice Association (IPA) of approximately 2,200 providers (***Table 1***). Altarum has taken leadership of technical and analytical roles, while UP leads efforts to recruit providers and provide ongoing support and training for ImageSmart. Altarum is currently in negotiations with other potential partners, including provider organizations (McLaren) and health IT vendors (MedSocket, Allscripts, EPIC).

Table 1. HCIA Partners, Role, and Location

Partner Name	Role in HCIA Project	Location
United Physicians (UP)	Training, CDS tool users	Bingham Farms, MI

Source: Lewin Report.
CDS = clinical decision support; HCIA = Health Care Innovation Award.

To achieve the goals of the innovation, Altarum and UP have

- developed, implemented, and supported Web and mobile versions of ImageSmart;
- assessed the current availability of relevant image study results (images and reports/interpretations) through health information exchange (HIE) services in the southeast Michigan region;
- developed the workforce by training UP providers on the CDS tool and on accessing image study reports and images through an online portal;
- hired, trained, and retained staff needed to develop, implement, and support the range of technological, educational, and analytical components of the intervention; and,
- developed and implemented targeted patient education material on the appropriate use of imaging, which can be accessed online or given to patients in print.

The components of the intervention are described in more detail below.

Component 1: ImageSmart

ImageSmart, a CDS tool, was developed and implemented by Altarum Institute for use by their initial target population: primary care physicians (PCPs) within the UP network. The ImageSmart software is intended to assist PCPs in making more informed decisions regarding image studies by providing an "appropriateness rating" that is based on American College of Radiology (ACR) appropriateness criteria and augmented with local UP practice guidelines.

To generate its recommendations, ImageSmart collects a number of different parameters—patient's age, gender, body area of interest, imaging modality (optional), and clinical presentation scenarios. Then, through a series of clinical algorithms applied to these data, ImageSmart suggests the most appropriate image modalities on a scale of 1 (low/not appropriate) to 9 (high/appropriate). Recommendations are listed highest to lowest and color coded, with less appropriate exams shaded yellow to red and more appropriate shaded green to blue. These recommendations also include indications of radiation exposure (using a visual scale of 1 to 5 radiation icons) and a range of costs per exam type.

Currently, ImageSmart provides clinician users with guidance on selecting appropriate "high-tech" radiology exams for head, neck, breast, abdomen, pelvis, spine, and general lower and upper extremities. Imaging modalities covered include computed tomography, magnetic resonance and imaging. During our June 11–12, 2014, site visit, RTI learned that Altarum is working to expand ImageSmart to include radiology decision support for additional cardiac imaging services including myocardial perfusion imaging and stress echocardiography.

Originally, Altarum intended for ImageSmart to be accessed online through UP's online Organized System of Care (OSC) portal. To improve adoption, Altarum subsequently developed a mobile version of ImageSmart for use on Apple iOS devices (iPads and iPhones). The mobile app version of ImageSmart has seen rapid adoption, with 30% of ImageSmart usage currently occurring on mobile devices (site visit, June 11–12, 2014). However, only UP providers with provider portal access rights are eligible to download and use the mobile version of ImageSmart.

ImageSmart only supports image order decision analysis and recommendations. Moving forward, Altarum is planning to incorporate radiology ordering capabilities into ImageSmart to better support UP provider workflow. The Implementation Progress section below provides more details on planned enhancements to ImageSmart.

Component 2: Web Portal and Educational Support

As part of its innovation, Altarum worked with UP to build on its existing OSC physician portal to offer access to ImageSmart as well as to patient education materials and existing image study results for UP patients.

Initially, ImageSmart was offered as a stand-alone radiology decision support tool for UP providers. Only UP providers with portal access were eligible to use ImageSmart. The Web and mobile versions of the ImageSmart tool function the same way, and the Web portal version is not integrated into any other UP clinical information system or electronic data source.

Altarum developed patient education materials pertaining to appropriate imaging, available through a dedicated patient education Web site or in printable form. Print materials are often provided by a physician or the office staff during an office visit (site visit, June 11–12, 2014). These materials include a description of the image study, its risks and benefits, and a discussion of alternatives. They are intended to be used to support a shared decision-making approach with patients regarding appropriate utilization of image studies.

Prior to the intervention, the UP provider portal (platform is an AT&T portal with the management of IT resources by Covisint) offered UP physicians read-only access to selected clinical information for patients seen by providers in the UP network. As part of the intervention, Altarum worked with UP and the platform to develop a dedicated area of the portal where UP providers could access selected image study result data. This "folder" is a more passive form of CDS, requiring UP providers to access the OSC portal during an office visit and check for existing radiology exam results.

1.1.2 Program Participant Characteristics

The population affected is more than 1 million patients in southeast Michigan seen by the intervention providers, which currently include 160 trained PCPs within UP who have access to the provider portal. The size of the patient population affected should yield a sufficiently large sample to evaluate the effect of Altarum's innovation on key health outcomes, including cost and image study utilization.

Initially, Altarum focused on PCPs as recipients of the decision support and HIE components of the intervention. Patients seen by UP PCPs were secondary targets of the intervention and were to receive image study educational materials.

During the June 2014 site visit, however, RTI learned that specialists were also being targeted for support. Moreover, we also learned that other provider types—nurses and physician assistants—as well as administrative office staff also used ImageSmart and, therefore, were program participants. These other users often act as clinical extenders, inputting parameters into ImageSmart and providing recommendations to clinical staff for action. As such, their involvement in the innovation will be captured by the RTI evaluation at the practice level. ***Table 2*** provides a summary of intervention participants.

Table 2. Participants Planned for Inclusion in Innovation (Denominator Data)

Provider Type	Data Source	Current Count (Data Source)
PCPs within the UP network, with UP portal access	UP/Altarum	Total UP PCP providers with UP portal access: 256
Specialists within the UP OSC network, with portal access	UP/Altarum	Total UP specialist providers with portal access: 295
Southeast Michigan patients seen by UP PCPs and specialists	Claims data	—

Source: RTI site visit June 2014.
CDS = clinical decision support; OSC = Organized System of Care; PCP = primary care physicians; UP = United Physicians.
— Data not yet available.

1.2 Implementation Progress

The extent to which each awardee is able to implement its innovation as planned and reach a sufficient number of participants (either patients or providers) will be critical to assessing the innovation's impact on health, health care cost, and health care quality. ***Table 3*** summarizes measures related to Altarum's implementation process and effectiveness that RTI plans to use in evaluating this awardee.

Table 3. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for Altarum

Key Evaluation Domains	Subdomains	Measures	Data Source
Workforce development	Education and training	Number of UP providers trained on ImageSmart during intervention time frame (UP providers trained/total UP providers)	Physician program database
		Number of office staff trained on ImageSmart during intervention time frame	Training log, HR systems, project management systems
Implementation process	HIT workflow	Rate of ImageSmart uptime (1-[unplanned system downtime/total planned uptime])	CDS availability tracking system and down time reporting
		Number of times individuals access community folder to view images online (proxy for use of HIE to view image reports)	System logs
		Number of provider reviews of image study reports through UP portal during intervention time frame (reports reviewed/total reports available)	CDS (radiology reports are available through the UP portal, but not accessible through CDS)
		Physician action rates by low, marginal, and high utility recommendation	CDS
Implementation effectiveness	Reach	Number/percentage of southeastern Michigan patients accessing image study educational materials though ImageSmart public Web site (total number of educational material page views/total number of patients)	Site tracking/Google analytics data
	Dose	Number of guidelines-based care relative to ACR guidelines	Claims and encounter data

ACR = American College of Radiology; CDS = clinical decision support; HIE = health information exchange; HR = Human Relations; PCP = primary care physicians; UP = United Physicians.

1.2.1 Process

The implementation process has been the initial focus of the evaluation. Subsequent reports will assess the impact of the intervention as data become available. The implementation process is best evaluated through a combination of data variables, including execution of implementation that conforms to operational plans and capacity for implementing the innovation in a timely and effective manner. We focused on the implementation process during the awardee site visit in June 2014, addressing such evaluation questions as the following:

- What is the overall execution of the innovation implementation (e.g., the actual rate of expenditures relative to the projected rate)?
- What accomplishments are specific to hiring or training staff so that the organization can build its capacity to implement the innovation effectively?
- What is the implementation effectiveness, including fidelity, reach, and dose of the innovation thus far?

Execution of Implementation

The rate at which awardees expend funds or enroll providers, compared with projection, provides useful information to assess the innovation's status. If expenditure or enrollment rates are particularly low (because of such issues as length of time to recruit and train new staff or time to implement or adapt existing clinical information systems), these variables help assess the awardee's readiness to implement the innovation at the start and the extent to which they can spend all funding by the end of the project (i.e., can they effectively allocate the funds provided?).

For Altarum, the total cumulative spending rate is 71.1% (Lewin quarter [Q]7 report), which is on target with budget projections. In terms of enrollment, Altarum has no reliable means of tracking direct participants (i.e., patients to whom they provide services, such as image study education). Moreover, their intervention is largely focused on indirect participants: primary care and specialist physicians, nonphysician clinical staff, and office staff operating as part of UP. Providers receive training on how to use ImageSmart and access the Web portal, as well as how to access and provide educational material related to appropriate imaging. Altarum had a slow start in enrolling providers; data reported for Q6 indicated 75 indirect participants. During Q7, the number of indirect participants increased to 196. Participation increased markedly with the introduction of the mobile version of ImageSmart. Despite the increase in the number of indirect participants, Altarum is short of the 380 participants projected. Given that ImageSmart access is currently limited to the 362 providers with UP portal access, achieving projected user levels will not be possible without more portal-enabled providers.

Altarum had a slow start in enrolling providers, resulting in a lower-than-expected adoption of the innovation by providers. Initially, Altarum targeted providers with the highest utilization and costs associated with imaging studies. Through the implementation process, Altarum recognized the significance of recruiting providers who were more likely to be "engaged" than those who had higher image study utilization and costs of care. As a result, Altarum worked with UP to shift the focus of training and support efforts to those providers who were still relatively higher cost and higher users than average, but not as high as the outliers.

During the June 2014 site visit, respondents indicated that adoption and use of ImageSmart had been challenged by physicians and staff who faced competing priorities, which included integrating the stand-alone tool into their workflow, time constraints for the length of an office visit, and general pushback to the adoption of new software.

In the beginning stages of the award, Altarum reported working closely with a number of UP leaders and clinicians to study how ImageSmart affected clinical processes and then to adapt the tool to support better support workflow—interviewing users and testing versions of ImageSmart with them prior to releasing the tool. Once implemented, to improve physician use of ImageSmart, UP began to incentivize a subsample of 20 providers through the award funding. Providers could earn a total of $1,000 for using the tool: $500 for agreeing to participate and $500 after using the tool 15 times. UP has also designated clinical and support staff to market ImageSmart to UP practices and to train staff on using the tool and patient education materials. Their process includes a senior clinician leader from UP who reviews radiology utilization reports with high-using UP providers and discusses ways to achieve more appropriate utilization, including using ImageSmart. Altarum’s and UP’s enthusiasm and willingness to adapt their innovation to the needs of providers and patients was demonstrable during the June 2014 site visit.

Organizational Capacity and Leadership

Altarum had past experience with federal awards, particularly those involving health IT. However, this award represents the first experience adapting, implementing, and supporting a radiology decision support software tool. The partnership with UP has been beneficial, with each organization lending complementary skill sets in accomplishing milestones. While Altarum has led the technical aspects of the project, notably development of the CDS tool and technical support, UP has led recruitment and training efforts by relying on a wide base of PCPs within their network.

Prior to this innovation award, UP had experience implementing clinical information systems, such as electronic health records (EHRs), and using CDS tools (e.g., medication interaction checking) to inform clinician ordering practices. UP had also participated in federal quality improvement and incentive programs as well as those provided by regional payers (e.g., Physician Group Incentive Program).

Altarum’s leadership and project staff are all committed to the success of the innovation. Similarly, UP’s leadership, in particular, clinical leadership, is committed to ensuring ImageSmart evolves to suit user needs and support more appropriate radiology utilization. Some respondents at UP felt their organization was a good fit for this innovation because it reflects more real-world practice dynamics; UP is not the typical academic setting or large delivery system where these types of health IT-enabled interventions are implemented.

During the June 2014 site visit, RTI heard that UP provided in-kind support for various aspects of developing and implementing the innovation. UP noted substantial in-kind contributions, including the ImageSmart incentives ($20,000), use of internal UP financial analysts and billing systems to understand ImageSmart usage and corresponding changes in image utilization, and a range of other IT-related resources. It was clear from the site visit interviews that both Altarum and UP felt substantial ownership of the innovation and expressed the intent to continue to support and develop the tool after HICA ends.

1.2.2 Workforce Development

Training UP providers and staff is critical for achieving innovation objectives. In Q7, Altarum, through UP, trained a total of 54 community-based clinical personnel and 36 nonclinical personnel, which is below their projected targets for training for this implementation phase. Pilot tests of ImageSmart revealed that physicians were unlikely to use the tool frequently; several stated that "there are not enough situations where the tool would be useful; and do not feel there is added value to their decision making" (Q5 progress report). Altarum is responding to the pilot test feedback by enhancing CDS tool features. As part of the evaluation, RTI plans to conduct a survey of providers to see if they perceive added value from the enhanced CDS tool and the impact on their workflow.

Hiring and Retention

As of June 2014, Altarum's innovation was at projection with 10.3 full-time-equivalent (FTE) staff. In Q7, Altarum reported that 10 individuals employed in the innovation were IT technicians/specialists and 13 were management or administrative staff; 1 FTE staff was hired for the innovation during Q7. The staff retention rate for Altarum in Q7 was 84.6%.

During the site visit, RTI learned that Altarum felt that the delay in hiring staff for self-monitoring was a challenge during the first year after the award began. Project staff indicated that hiring an evaluator more quickly and having the evaluator available to assist would have been beneficial.

Training

The innovation has required intensive training because each practice that uses the tool must be trained when the innovation is first adopted and each time the tool is updated. Altarum, through UP, provided two training courses to 94 individuals during Q7: HIE training delivered through discussion and CDS application training delivered in a classroom setting as well as a Webinar. At the site visit, we learned that Altarum recognized the significance of *who* receives the initial training as central to successful adoption; adoption and level of use increased when a practice's physician was trained initially rather than other clinical staff (i.e., nurse practitioner) or administrative staff who subsequently trained the physician. However, we also learned that the majority of CDS tool users are clinical and administrative staff, not physicians. Not surprisingly, Altarum has dedicated a great deal of resources to training and support. Some key examples include the following:

- Key staff at UP provide ongoing training and support (similar to the kind of "detailing" pharmaceutical representatives conduct) and follow up with high-radiology-cost, high-utilization providers to promote tool usage.
- UP promoted tool adoption by associating its use with existing health plan contract requirements to use decision support tools.
- Altarum developed a feature to provide guidance to users when the CDS tool is updated and continually provide technical support via e-mail and phone. Several UP providers and staff we met with during our site visit stressed the timely responsiveness that Altarum and UP provide to users.

1.2.3 Effectiveness

A major aspect of the evaluation will be to assess the effectiveness of the intervention in terms of the extent to which the intervention implemented aligns with what was planned (i.e., fidelity) and whether patients have been exposed to it. Their exposure will be measured through reach (i.e., the extent to which the total number of patients is reached that were targeted) and dose (i.e., the degree to which each patient is exposed to services provided).

Fidelity

Innovation implementation has been more iterative than expected. For example, feedback from providers using the tool and guidance from steering committees led to improvements to the CDS tool throughout implementation. Altarum is planning additional features to more fully and efficiently attract a wider base of PCP and specialist users (e.g., expanding the CDS to include other domains such as cardiac imaging) and further integrating the tool into the radiology ordering process. This enhancement includes supporting two forms of image ordering. The first consists of working with two of the most common UP EHR vendors (Allscripts and EPIC) and a third-party health IT tool developer (MedSocket) to integrate ImageSmart directly into UP providers' EHRs. The second includes adding an order capability directly into the ImageSmart application itself. Altarum would use the Direct protocol for HIE to send radiology orders directly to imaging centers. In addition, UP actively monitors and analyzes radiology utilization. We learned during the site visit that UP had not received $500,000 in incentive payments from BlueCross BlueShield because of missing radiology utilization targets. UP leadership viewed the Altarum innovation in general—and ImageSmart, in particular—as important to meeting corporate radiology utilization objectives over and above those included as part of the innovation.

Reach

Reach is defined as the number of physician practices trained to use the CDS tool among those targeted for training (within the UP OSC). The target number for training is 95 OSC

PCP practices with later training planned for non-OSC PCPs or specialists who expressed interest in the program. As of June 2014, the awardee reported that 90 PCP practices (about 95% of the practices targeted for training) had been trained to use the CDS tool ***(Table 4)***.

Table 4. Practice Enrollment and Training Reach

Quarter	Number of UP PCP Practices Targeted for Training	Cumulative Number of UP PCP Practices Trained[1]	Training Reach per Quarter	Change from Previous Quarter
September 2013	95	39	41.1%	N/A
December 2013	95	58	61.1%	20.0%
March 2014	95	79	83.2%	22.1%
June 2014	95	90	94.7%	11.5%

Source: ImageSmart training data provided to RTI by Altarum; June 2014.
[1] An additional 49 UP physicians who were not in the target population expressed interest and received ImageSmart training.
N/A = not applicable; PCP = primary care physician; UP = United Physicians.

Reach can also be defined as the number of physician practices using the CDS tool versus the number of UP physicians ***(Table 5).***

Table 5. Practice Training and User Reach

Quarter	Cumulative Number of UP PCP Practices Trained	Cumulative Number of UP Physician Practice Users[1]	User Reach per Quarter	Change from Previous Quarter
September 2013	39	8	20.5%	N/A
December 2013	58	12	20.7%	0.2%
March 2014	79	25	31.6%	10.9%
June 2014	90	36	40.0%	8.4%

Source: ImageSmart data provided to RTI by Altarum in July 2014.
[1] UP Physician Practices with at least one user per practice.
N/A = not applicable; UP = United Physicians.

During the site visit, we worked to understand the measures the awardee has been reporting through the implementation process. Although Altarum initially had a tool and process to measure the reach of the patient education materials, the original software used to track Web page hits (Google Analytics) did not allow Altarum to measure reach to actual patients since there is no way to identify patients on the Web. Additionally, although many users reported the usefulness of providing print material to patients, neither UP nor Altarum reported or collected the number of patients provided with material. Altarum is working with UP to address this issue, and we expect to be able to measure reach of the patient education materials in future annual reports.

Dose

Any innovation that involves delivery of direct services to participants, in this case, providers, needs to assess the extent to which those participants have actually been exposed to the new services. This intensity of services (e.g., frequency, duration) provided to participants is combined with outcome data such as from claims analysis to determine whether increasing exposure (or exposure at all) to the innovation is associated with changes in outcomes. For Altarum, dose is measured as the rate of guidelines-based care relative to ACR guidelines. During the site visit, we learned that Altarum is tracking provider use of the CDS tool; however, they cannot assess patient-level effects because of an inability to link individuals from the portal to claims data. Dose may be best measured at the practice level by examining a change in ordering appropriate imaging studies by the ACR utilization guidelines.

1.3 Evaluation Outcomes

RTI will use two types of quantitative data from awardees to assess the impact of the awardee’s innovation on key outcomes. These include claims data for Medicare and/or Medicaid beneficiaries, depending on who the awardee serves, and other administrative or utilization data the awardee is collecting (which we have labeled as “other awardee-specific data” reflecting the variability of the types of data elements available across awardees). We are in the process of finalizing our assessment of all the available data sources and requesting data directly from each awardee. As those data are received and cleaned, we will incorporate the findings into subsequent reports. The following sections present descriptive findings from the quantitative outcome data provided to RTI as of September 11, 2014.

1.3.1 Measures for Evaluation

Following the site visit, the data management and site visit teams met to review each of the measures listed in the awardee’s self-monitoring measurement plan. The measures listed in ***Tables 3*** (above) and ***6*** (below) reflect the measures determined as most relevant for our evaluation of Altarum’s innovation.

Table 6. Outcome Measures Requested from Altarum

Key Evaluation Domains	Subdomains	Measures	Data Source
Clinical effectiveness	General health and wellness	Reductions in patient exposure to radiation resulting from changes in unnecessary imaging	Claims and encounter data
Health care outcomes	Utilization	Changes in imaging utilization rates during intervention timeframe	Claims and encounter data
		Positive impact rate1	Claims and encounter data
	Cost	Spending per patient	Claims data
		Cost savings	Claims and encounter data

[1] Defined as the rate of physicians who initially ordered an imaging study with a low- or marginal-utility American College of Radiology recommendation but ended up selecting an imaging study with a high-utility American College of Radiology recommendation.

1.3.2 Claims Data

As part of a broad assessment of health care innovations, the Center for Medicare & Medicaid Innovation (CMMI) is assessing the impact of its programs, including those funded specifically by HCIA, on four core measures. These measures are:

- health care spending per patient,
- hospital inpatient admissions,
- hospital unplanned readmissions, and
- ED visits.

Collectively, CMMI programs are anticipated to slow the increase in health care spending, reduce hospital admissions and avoidable readmissions, and prevent unnecessary ED visits. We are reporting these measures for all HCIA Community Resource awardees so that the collective impact of the awards can be assessed. As discussed below, some awardees' innovations may not be focused on these measures. Other awardees' innovations target specific conditions (e.g., imaging, diabetes, etc.) and may have significant impacts on spending, admissions, readmissions, and ED visits for the targeted conditions but not have a statistically detectable impact on the measures at the aggregate level because the targeted conditions represent only a small fraction of total spending, inpatient admissions, and ED visits.

The measures are calculated through analysis of Medicare and Medicaid fee-for-service claims. Because of differences between Medicare and Medicaid patients in age, other demographic variables, and disease status, we report the Medicare and Medicaid results separately below. Currently, complete Medicare claims are available through the end of

2013. In principle, Medicaid claims for Altarum are available from the Centers for Medicare & Medicaid Services (CMS) through Q1 2013; however, Altarum may not be able to provide patient identifiers for Medicaid patients. The Altarum innovation was launched on April 30, 2013 (HIE component) and May 22, 2013 (CDS component, i.e., ImageSmart).

- **Health Care Spending per Patient**. For Medicare beneficiaries, health care spending per patient includes Part A and Part B Medicare expenditures for persons enrolled in the Part A and Part B fee-for-service program. The variable focuses on Medicare fee-for-service spending, so Medicare managed care (Part C) services are excluded, as are beneficiary copayments. Medicare Part D prescription spending is also excluded. Spending is reported on a per-person per-quarter basis. If a beneficiary is not enrolled for every month in a quarter, spending (except for hospital inpatient spending) is prorated to a quarterly basis based on the number of days enrolled during the quarter. Because hospital inpatient admissions are both rare and expensive, spending is not prorated for hospital inpatient spending. Prorating is also not performed for beneficiaries who die during a quarter.

  For Medicaid beneficiaries, health care spending per patient is reported for fee-for-service beneficiaries. Beneficiaries are only included in the analysis for spending (and the other measures) during periods when they are enrolled in Medicaid.

- **Hospital Inpatient Admissions**. This variable measures hospitalization, the single most expensive component of health care spending. Patients kept overnight in observation beds are excluded from this measure. Inclusion criteria for the analysis are the same as for spending. Hospital inpatient admissions are not prorated based on the number of days eligible during the quarter. All-cause inpatient admissions are reported. The mean quarterly admission rate per 1,000 patients is reported. For Altarum, it is important to note that inpatient admissions may not be directly correlated or attributable to this innovation, which pertains solely to imaging studies.

- **Hospital Readmissions**. Hospital readmission rates serve a dual purpose in evaluating HCIA impacts. Readmissions add to the costs of a prior hospitalization, and they often reflect a problem in the care provided during the first admission. All-cause readmissions are defined as a follow-up admission to any short-term acute general or long-term care hospital within 30 days of a discharge from another hospital of the same type. We ignore multiple admissions within 1 day of an initial admission because these often represent transfers between hospitals. We define index hospitalizations that begin during the quarter and follow each index admission for 30 days, even when the follow-up period extends beyond the end of the quarter. Inclusion criteria for the analysis are the same as for spending. The readmission rate equals the number of readmissions divided by the number of index hospitalizations during the quarter. Planned readmissions are excluded from the calculation of the numerator. Quarterly mean readmission and ambulatory care sensitive condition (ACSC) readmission rates per 1,000 admissions are reported. For Altarum, it is important to note that hospital readmissions may not be directly correlated or attributable to this innovation, which pertains solely to imaging studies.

- **ED Visits**. ED visits are sometimes viewed as a symptom of the inability of the community's health care system to provide adequate preventive and ambulatory care visits. We report an all-cause ED visit rate that excludes ED visits resulting in an inpatient admission (which presumably represent unavoidable visits) and includes overnight ED visits without an inpatient admission. Inclusion criteria for the analysis are the same as for spending, and ED visits are also subject to the same prorating formula as for spending. The mean quarterly ED visit rate per 1,000 patients is reported. For Altarum it is important to note that ED visits may not be directly correlated or attributable to this innovation, which pertains solely to imaging studies.

Medicare Claims Analysis

The analysis focuses on over 144,000 Medicare Parts A and B beneficiaries who participated in the Altarum innovation during or after its launch in Q2 2013. The analysis uses data from the CMS Chronic Conditions Data Warehouse (CCW). We present the measures for these beneficiaries in the quarters before and after the innovation was launched on April 30, 2013 (the HIE component) and May 22, 2013 (the CDS component).

Spending decreases slightly relative to the trend line in the quarters following innovation launch. Although this decrease may indicate that the innovation may lower spending for Medicare patients, it is premature to test whether postlaunch spending is statistically different than trend values. As shown in ***Table 7,*** the standard deviation for spending is very high, representing the skewed nature of expenditures. The table reports Medicare spending per patient in the eight quarters before and the three quarters during and after the launch date.

Table 7. Medicare Spending per Patient: Altarum

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
1C1CMS330976	Altarum												
	Spending rate	$2,481	$2,463	$2,531	$2,572	$2,682	$2,679	$2,916	$3,013	$3,038	$2,930	$2,981	—
	Std dev	$6,959	$6,848	$7,136	$7,552	$7,664	$7,483	$8,343	$9,081	$8,848	$8,602	$8,662	—
	Unique patients	120,161	123,022	125,737	128,645	131,134	133,831	136,203	139,158	141,289	142,962	144,433	—
Comparison Group													
1C1CMS330976	Altarum												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—

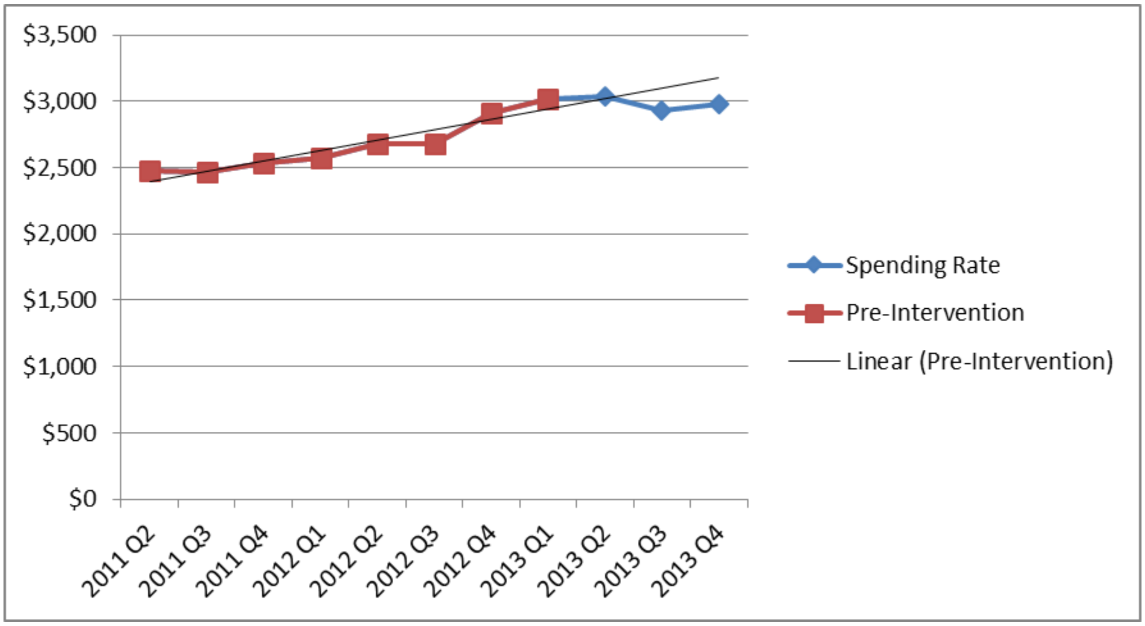
Savings per Patient

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of Chronic Conditions Data Warehouse (CCW) Medicare claims.
Notes: Altarum began enrolling patients on 4/30/2013. I1 is 2013 Q2. Spending rate: total quarter (i.e., quarterized) payments/number of unique patients. Savings per patient: difference in comparison minus the intervention's average spending rates.
— Data not yet available.

Figure 1 plots spending as a function of time. The red line represents values in quarters prior to the innovation's launch date on April 30, 2013, and the blue line represents quarters during and after launch. The graph includes a trend line based on a linear regression of prelaunch values.

Figure 1. Medicare Spending per Patient: Altarum



Similar to spending, inpatient admissions decrease slightly relative to the trend line in the quarters following innovation launch. Without statistical testing and a better-defined comparison group, however, it is premature to conclude that the innovation has caused a decrease in inpatient admissions. Moreover, the Altarum innovation may not be directly related to inpatient admissions so changes in admissions post-innovation should not be attributed directly to the innovation. The all-cause inpatient admissions rate per 1,000 participants is shown in ***Table 8*** and ***Figure 2***.

Table 8. All-cause Inpatient Admissions Rate per 1,000 Enrollees: Altarum

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

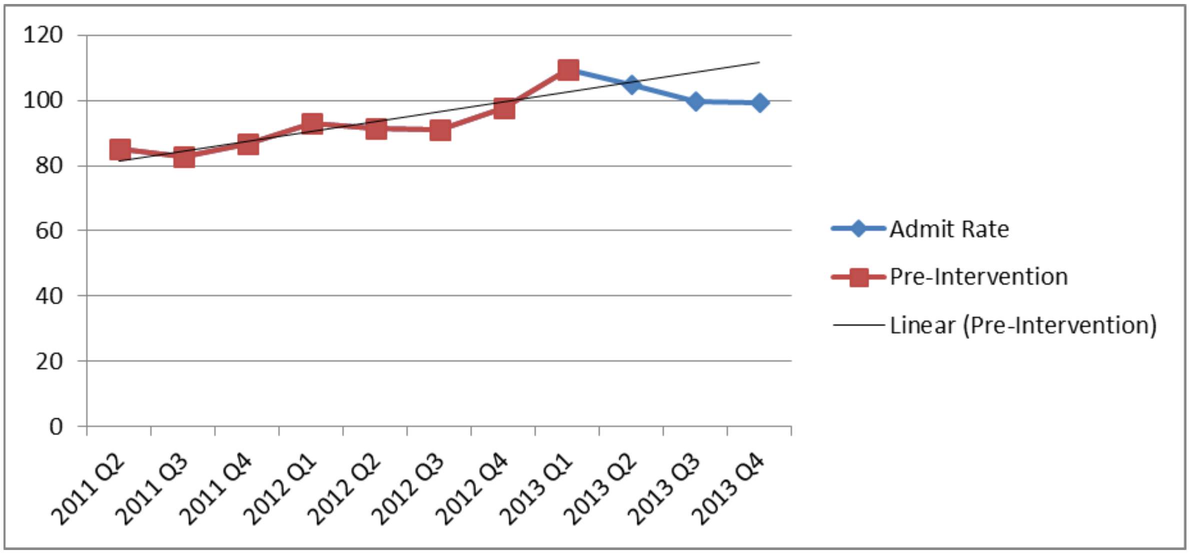
Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
1C1CMS330976	Altarum												
	Admit rate	85	83	87	93	91	91	98	109	105	100	99	—
	Std dev	352	348	357	372	375	370	387	405	402	392	393	—
	N. of patients	120,161	123,022	125,737	128,645	131,134	133,831	136,203	139,158	141,289	142,962	144,433	—
Comparison Group													
1C1CMS330976	Altarum												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of Chronic Conditions Data Warehouse (CCW) Medicare claims.
Note: Altarum began enrolling patients on 4/30/2013. I1 is 2013 Q2. Admit rate: total unquarterized admissions/number of unique patients.
— Data not yet available.

Figure 2. All-cause Inpatient Admissions Rate per 1,000 Enrollees: Altarum



Hospital readmission rates per 1,000 admissions are shown in ***Table 9*** and ***Figure 3***. The hospital readmission rate follows a fairly stable slightly decreasing trend prior to launch. Hospital readmissions decrease slightly in the first two quarters following innovation launch and more dramatically in the third quarter following innovation launch. Without statistical testing and a better-defined comparison group, however, it is premature to conclude that the innovation has caused a decrease in hospital readmissions. Moreover, the Altarum innovation may not be directly related to readmissions so changes in readmissions post-innovation should not be attributed directly to the innovation.

Table 9. Hospital Readmission Rates per 1,000 Admissions: Altarum

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare
Admissions Measure: All cause

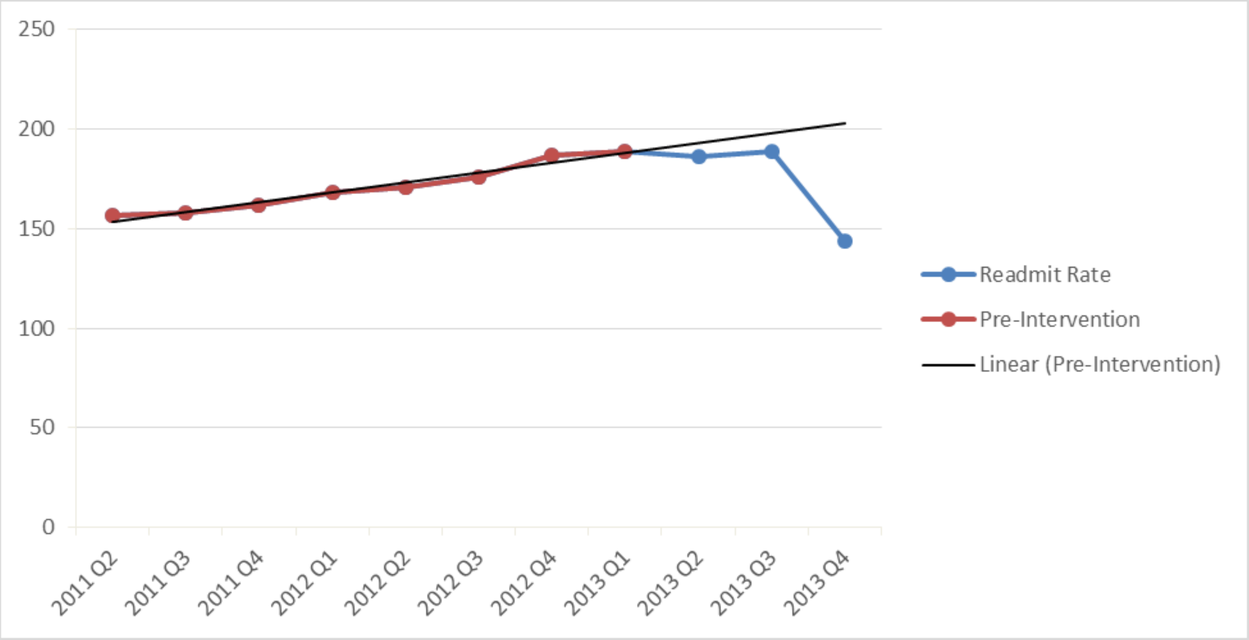
Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
1C1CMS330976	Altarum												
	Readmit rate	157	158	162	168	171	176	187	189	186	189	144	—
	Std dev	364	365	368	374	376	381	390	392	389	391	351	—
	Total admissions	9,503	9,424	10,136	11,130	11,060	11,296	12,297	13,857	13,465	12,858	12,868	—
Comparison Group													
1C1CMS330976	Altarum												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total admissions	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of Chronic Conditions Data Warehouse (CCW) Medicare claims.
Note: Altarum began enrolling patients on 4/30/2013. I1 is 2013 Q2. Readmit rate: sum of all readmissions to eligible hospital within 30 days/all admissions in the quarter. Total admissions: all eligible admissions in the quarter.
— Data not yet available.

Figure 3. Hospital Readmission Rates per 1,000 Admissions: Altarum



ED visits per 1,000 participants are shown in ***Table 10*** and ***Figure 4***. The ED visit rate (***Figure 4***) trends slightly upward and there is no discernable break from the pre-innovation trend after the innovation is launched. Without statistical testing and a better-defined comparison group; however, it is premature to draw conclusions about the innovation's impact on ED visit rates. Moreover, the Altarum innovation may not be directly related to ED visits so changes in ED visit rates post-innovation should not be attributed directly to the innovation. In future reports we will use a comparison group and test whether the ED visit rate is statistically different after the innovation.

Table 10. ED Visits per 1,000 Participants: Altarum

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare
Admissions Measure: All cause

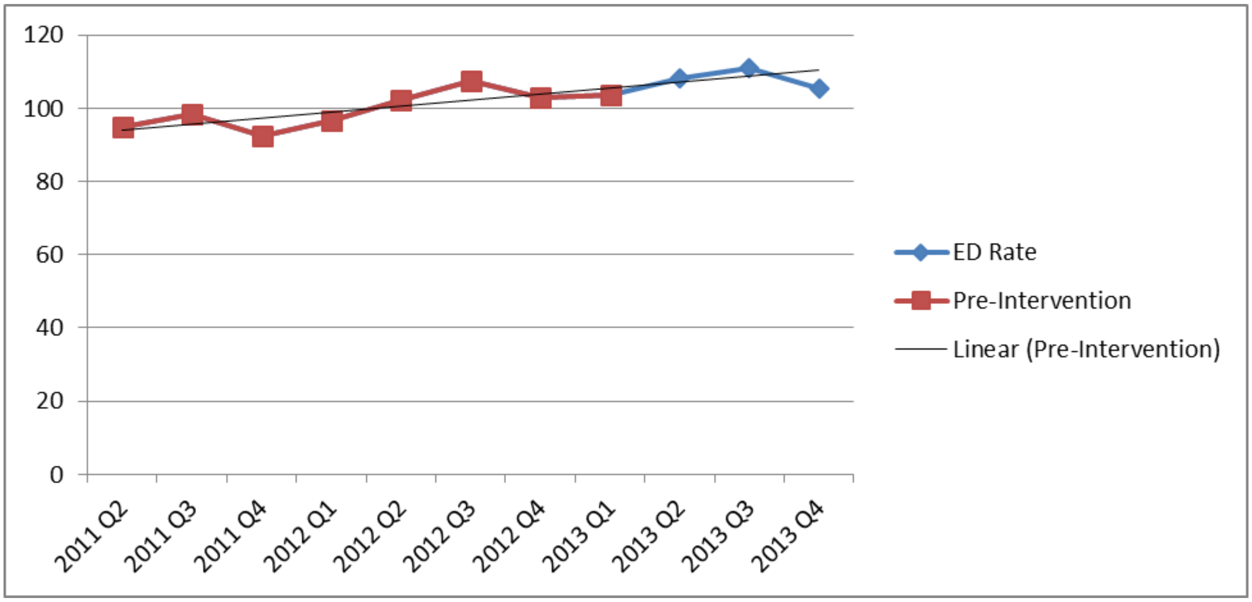
Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
1C1CMS330976	Altarum												
	ED rate	95	98	92	97	102	107	103	104	108	111	105	—
	Std dev	791	782	744	872	760	790	762	832	835	860	809	—
	N. of patients	120,161	123,022	125,737	128,645	131,134	133,831	136,203	139,158	141,289	142,962	144,433	—
Comparison Group													
1C1CMS330976	Altarum												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of Chronic Conditions Data Warehouse (CCW) Medicare claims.
Note: Altarum began enrolling patients on 4/30/2013. I1 is 2013 Q2. ED rate: total quarterized ED visits and observation stays/number of unique patients.
— Data not yet available.

Figure 4. ED Visits per 1,000 Participants: Altarum



Medicaid Claims Analysis

If Altarum can provide Medicaid patient identifiers, the Medicaid data analysis will use data from the CMS Alpha-MAX data files. Currently, Medicaid claims for Altarum are only available in Alpha-MAX through Q1 2013, and claims for that final quarter may not be complete. Because the Altarum innovation was launched on April 30, 2013 and claims for that quarter are not available, we are not presenting measures for Medicaid patients in this report. We will provide Medicaid analyses in subsequent reports if patient identifiers are available. We will report tables and figures similar to those for Medicare. Utilization rates for nonemergency, high-tech imaging services may be low among the nonelderly Medicaid population.

Discussion of Claims Analysis

The four measures provide descriptive data on patients enrolled in Altarum's innovation before, during, and after the launch of the innovation. Although it is necessary to report these measures to support CMS's broader assessment of its full portfolio of innovation projects, the measures may not provide a complete evaluation picture of Altarum's innovation for a number of reasons. First, the innovation was only launched on April 30, 2013. To date, we have evaluated data only for three quarters during and following innovation launch. Although some trend lines appear to be decreasing for the four utilization measures, some fluctuation also occurs prelaunch—so without statistical testing and analyses of the comparison groups, it is premature to make any definitive conclusions regarding the impact of the innovation on spending, inpatient admissions, readmissions, and ED visits. Second, the innovation is focused on high-tech [computed tomography/computed tomography angiography (CT/CTA), magnetic resonance angiogram/magnetic resonance imaging/ magnetic resonance angiogram (MRI/MRA), and magnetic resonance spectroscopy (MRS)] imaging. Although the innovation may have a statistically significant impact on the spending, inpatient admissions, readmissions, or ED visits related to imaging, it may not have a statistically detectable impact on the variables at the total cost or utilization level, because imaging accounts for only a portion of total spending or utilization. In later reports, we will also provide imaging-specific cost and utilization data to better understand the impact of the innovation. Third, the simple trend lines provided in the figures represent trends for patients before launch of the innovation. They do not control for external factors that coincide with the innovation launch and affect the measures for both participating providers and other nonparticipating providers. As described below, we are developing additional comparison groups for Altarum. Fourth, each of the four measures has a high standard deviation, suggesting that it may be difficult to statistically distinguish between innovation effects and random fluctuation. Finally, Altarum does not have direct program participants who are officially enrolled with and receiving services from Altarum. Instead, it has indirect program participants who are receiving treatment from providers who are served by Altarum. Many of the indirect program participants will not need the imaging services that are the focus of the Altarum innovation.

Development of Comparison Groups

For Altarum, we will construct two comparison groups. First, we will examine UP participating providers before and after the innovation is adopted. This step is important because this comparison will help isolate the impact of the innovation on outcomes and control for differences between providers, particularly in analyses that focus on imaging services. In addition to comparing UP providers before and after implementation of the innovation, we are also constructing a comparison group of nonparticipating providers in the UP catchment areas. This group would include UP providers who do not have access to the OSC portal or who have not received training on the OSC portal. This comparison group will control for external, non-innovation factors affecting both participating and nonparticipating providers. We will use propensity score matching to identify nonparticipating UP providers with similar characteristics as participating UP providers. For example, characteristics may include medical specialty, age or years in practice, gender, race, practice type, and patient mix. Results for the comparison groups will be included in later reports.

1.3.3 Other Awardee-Specific Data

In July 2014, following the data review meeting, RTI met with Altarum to request the raw provider-level data that was used to generate each of the measures from data sources other than claims data in ***Tables 3*** and ***6*** for each quarter.

Overview of Data Received

We received most of the requested raw data in July 2014. Altarum sent RTI data on its server uptime and downtime by month, Web analytics by month, the ImageSmart application at the provider-level, and training data by month. Outcome data on the Web portal and educational support component are sparse and, thus, RTI will be discussing with Altarum which measures we can use to evaluate the Web portal and educational support component of the innovation for future reports.

Health Care Indicator Outcomes

We are continuing to work with the data received from Altarum. For this report, we present findings related to ImageSmart utilization below based on the provider-level data provided to RTI in July 2014.

As discussed above in Section 1.1.1., the ImageSmart application generates its recommendations by applying a series of clinical algorithms using parameters the provider inputs. Altarum tracks the imaging modalities requested by the provider (i.e., requested procedures) and the imaging modalities that the ImageSmart application suggests (i.e., attested procedures). ImageSmart provides clinician users with guidance on the following imaging modalities: CT, CTA, MRS, MRI, MRA, X-ray scans, ultrasounds (US), fluoroscopy (FLUOR), mammography (MAM), nuclear imaging (NUC), positron emission tomography – computed tomography (PET-CT), and ultrasound-x-ray (US-XRAY). In addition, the ImageSmart application could also suggest non-imaging modalities (i.e., alternate care). We wanted to be able to show changes in the provider's requested procedure and ImageSmart's suggested procedures; however, the requested procedure is optional on the first screen of ImageSmart.

Table 11a shows the count of attested sessions based upon the modality of the requested procedure. Because selection of a requested procedure is optional for the ImageSmart user, the table includes 112 attested sessions for which no procedure was requested.

Table 11a. Distribution of Attested Sessions by Modality Requested through June 2014

Modality Requested	Attested Sessions
CT	245
CTA	13
MR/MRI/MRA	305
No modality requested	112
Total Sessions	675

Table 11b provides a breakout of procedures that were selected for the 675 attested sessions in Table 11a. Due to software issues, 82 of the sessions are shown as unknown. In those cases, the ImageSmart system recorded these as alternate care when either a procedure or alternate care was selected.

Table 11b. Distribution of Attested Sessions by Procedure Selected through June 2014

Modality	Procedure Selected
CT	215
CTA	14
MR/MRI/MRA	233
XRAY	43
Ultrasound	14
Other	11
Alternate Care	63
Unknown	82
Total Sessions	675

Source: ImageSmart data provided to RTI by Altarum in July 2014
CT = computed tomography, CTA = computed angiography, MR = magnetic resonance scans, MRI = magnetic resonance imaging, MRA = magnetic resonance angiogram.

Table 12 shows a more detailed breakdown of the requested and attested modalities. Of the 218 requested CT exams that were attested, most (82.6%) were attested by the ImageSmart application. About 8% were diverted to MR/MRI/MRA, other modalities (FLUOR, MAM, NUC, PET-CT, US-XRAY) or alternate care. Of the 256 requested MR/MRI/MRA procedures that were attested, 25% of these were diverted to other imaging modalities or alternate care.

Table 12. Overall Number of Requested and Attested Procedures by Modality through June 2014

		Attested Procedure						
Requested Procedure	Total Attested Procedures	CT	CTA	MR/MRI/ MRA	XRAY	US	Other (incl. FLUOR, MAM, NUC, PET-CT, US-XRAY)	Alternate Care1
CT	218	180	0	17	1	4	2	14
CTA	12	10	0	0	0	0	1	1
MR/MRI/MRA	256	10	0	193	8	3	7	35
Total Attested Procedures	486	200	0	210	9	7	10	50

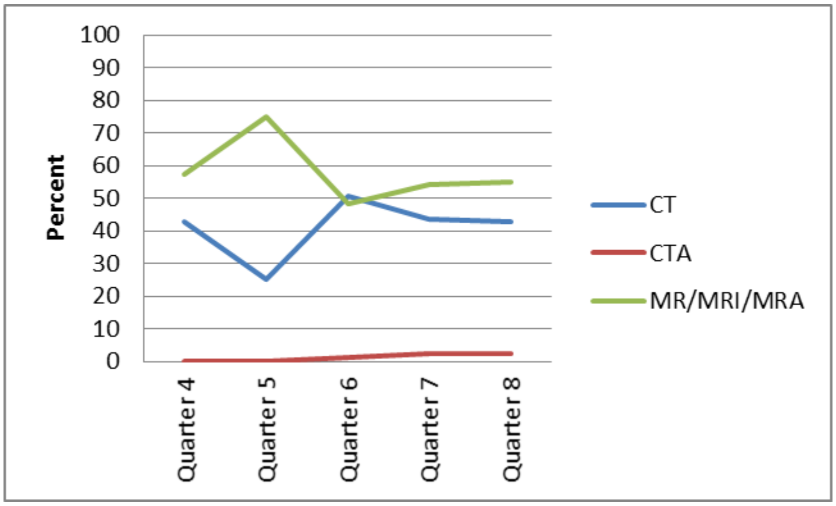
Source: ImageSmart data provided to RTI by Altarum in July 2014.

[1] Alternate care was suggested by the ImageSmart application when the use of an imaging study was inappropriate.

CT = computed tomography, CTA = computed angiography, MR = magnetic resonance scans, MRI = magnetic resonance imaging, MRA = magnetic resonance angiogram, US = ultrasounds, FLUOR = fluoroscopy, MAM = mammography, NUC = nuclear imaging, PET-CT = positron emission tomography – computed tomography, US-XRAY = ultrasound-x-ray.

Table 12 (above) shows a decrease overall in high-score procedures (i.e., CTs and MRIs) but we were also interested in changes from the beginning of the innovation. Thus, we also analyzed the changes in requested and attested procedures over time. As shown in the following graphs (***Figures 5*** and ***6***), requested and attested CTs remained relatively stable since the beginning of the innovation. However, requested MRIs decreased while attested MRIs increased over time.

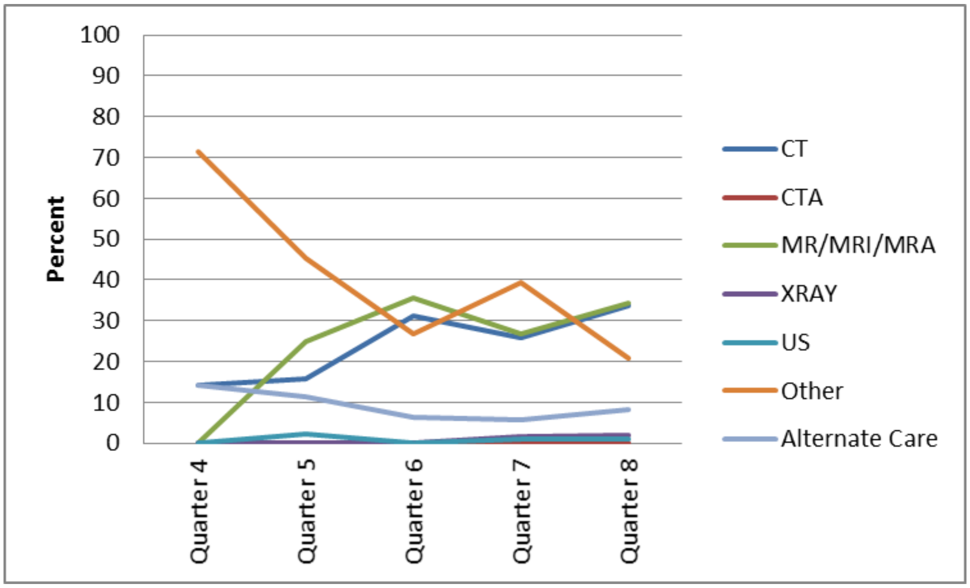
Figure 5. Percentage of Requested Procedures by Modality over Time by ImageSmart Users



Source: ImageSmart data provided to RTI by Altarum in July 2014.

CT = computed tomography, CTA = computed angiography, MR = magnetic resonance scans, MRI = magnetic resonance imaging, MRA = magnetic resonance angiogram.

Figure 6. Percentage of Attested Procedures by Modality over Time by ImageSmart Users



Source: ImageSmart data provided to RTI by Altarum in July 2014.
CT = computed tomography, CTA = computed angiography, MR = magnetic resonance scans, MRI = magnetic resonance imaging, MRA = magnetic resonance angiogram, US = ultrasounds, FLUOR = fluoroscopy, MAM = mammography, NUC = nuclear imaging, PET-CT = positron emission tomography – computed tomography, US-XRAY = ultrasound-x-ray.

Initial analysis of the positive impact rate outcome can be seen in ***Table 13***. This rate is defined as providers who initially chose a procedure with a low or marginal score but the ImageSmart application attested a procedure with a high score option. The numerator for this rate consists of those who requested a procedure with a low or marginal score and attested a procedure with a high score or for whom alternate care was suggested. The denominator for the rate consists of providers who requested and attested a procedure with any score or for whom alternate care was suggested. We found that 21.1% of all trained providers (aggregate Q4 through Q8) requested a low-value option but the ImageSmart application suggested a high-value option based on the provider’s inputs.

Table 13 shows that there has been a decrease in positive impact with half of the low- or marginal-score requested procedures diverted to high-score procedures at the beginning of the innovation to 16.4% in Q6. The trend has been slightly increasing since then, but is still about half in Q8 (23.3) of what it was in Q4 (50.0).

Table 13. Positive Impact Rate over Time among Providers using the ImageSmart application

	Q4	Q5	Q6	Q7	Q8
Positive impact rate (%)	50.0	36.0	16.4	17.5	23.3

Source: ImageSmart data provided to RTI by Altarum in July 2014.
Q= quarter.

In April 2014, Altarum began measuring patient exposure to radiation. ***Table 14*** shows preliminary results of this measure for attested procedures. More than half of adult patients received no exposure to radiation in April and June of 2014. As we continue our analyses, we plan to show changes over time of actual radiation exposure.

Table 14. Number of Patients Exposed to Radiation for Procedures Attested by Providers Using ImageSmart over Time

	April 2014		May 2014		June 2014	
	Number	Percent	Number	Percent	Number	Percent
Adult patients						
0 mSv	43	55.8%	21	38.9%	40	53.3%
0.1 – 1 mSv	1	1.3%	1	1.8%	0	0.0%
1–10 mSv	13	16.9%	17	31.5%	14	18.7%
10–30 mSv	20	26.0%	15	27.8%	21	28.0%
Total	77	100.0%	54	100.0%	75	100.0%
Pediatric patients						
0 mSV	1	25.0%	1	100.0%	0	0.0%
0.3–3 mSv	3	75.0%	0	0.0%	0	0.0%
3–10 mSv	0	0.0%	0	0.0%	1	100.0%
Total	4	100.0%	1	100.0%	1	100.0%

Source: ImageSmart data provided to RTI by Altarum in July 2014.
mSv = millisievert.

Discussion of Other Awardee-Specific Findings

The awardee-specific outcome data analyzed to date demonstrates that the use of the ImageSmart application is showing reductions in CT and MRI procedures. Use of these procedures has also decreased over time. Even though the use of these high-value options has been decreasing, the positive impact rate has also been decreasing over time with a slight increase in Q7 and Q8.

Once we receive additional data over time from Altarum, we can more thoroughly examine changes in health care outcomes. We can also examine the health care outcomes based on dose.

1.4 Overall Program Effectiveness to Date

Overall, the Altarum innovation had a slow start, but has made steady progress. Altarum has developed the CDS tool and patient education materials, and has implemented these components. The combined Altarum and UP team has promoted and trained a number of UP providers, and has been responsive to provider requests for changes in radiology decision support content and functionality. Altarum and UP have also developed a number of processes—the High Tech Steering Committee (HTSC)—to update the range of imaging tests supported by ImageSmart. UP also has a regular review of imaging utilization to help target additional adoption. Respondents during the site visit noted that working with clinician users to ensure ImageSmart integrates with clinical workflow and that the CDS recommendations are comprehensive and correct have both been critical for innovation success to date.

Respondents shared other important lessons from progress to date, including the desire to learn from existing radiology CDS products as part of developing ImageSmart. They also stressed that, ultimately, for ImageSmart to better succeed, it had to be carefully integrated into the EHR. Providers who have a poor experience with the tool will not likely use it again. Finally, in addition to the proposed cost, quality, and health benefits of the innovation, several respondents noted that one key benefit of ImageSmart—perhaps the greatest benefit to UP—is the potential for it to replace the current prior review/pre-authorization process for image studies that regional payers currently require.

At this point in the evaluation, however, the data are inconclusive. The number of provider users of ImageSmart is small—perhaps too small to detect significant effects in changes in utilization, alternate care, and cost. Tracking patient’s exposure to radiation and to radiology educational materials is challenging as well; there are no reliable means to collect these data at this point. Without significant increases in the number of clinician users, increased usage of the ImageSmart tool by these clinicians, and reliable means to track patient’s exposure to radiation and image study education materials, it is uncertain what effects RTI will be able evaluate.

October 2014

Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring

Annual and Site Visit Report

Asian Americans for Community Involvement (AACI)

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OVERALL EVALUATION SUMMARY

RTI International was selected to lead an independent evaluation of the 24 Health Care Innovation Award (HCIA) awardees categorized as Community Resource Planning, Prevention, and Monitoring (Community Resource). In this role, RTI is conducting an in-depth evaluation of each innovation, as well as a cross-site evaluation that includes similar innovations targeting the same priority outcomes (e.g., emergency department [ED] visits). For each of the 24 awardees, this report presents findings from the first year of the evaluation (beginning September 23, 2013) and includes data obtained by RTI through September 11, 2014. The report is based on multiple data sources, including operational reports, self-monitoring plans, site visits, and quantitative data analysis.

The evaluation methods vary by awardee innovation, based on the type of innovation and availability of data. RTI has reviewed and coded all existing documents from the awardees through December 31, 2013, and incorporated that knowledge into each awardee's overview. Our review included the awardees' original applications for funding, original and current operational and self-monitoring plans, and quarterly narrative and monitoring reports. For this annual report, we incorporated activities reported through the awardee's seventh quarterly report (i.e., through March 31, 2014).

Between April and August 2014, teams of at least two staff from the RTI team visited all 24 awardees for 2-4 days, depending on the number of interviews conducted. Teams included a subject matter expert, with training and experience specific to the awardee's innovation, and a master's- or bachelor's-level colleague to take notes. Before each visit, the teams reviewed all available documentation from the awardee to learn about the innovation's goals, objectives, and status. The purpose of the site visits was to clarify our understanding of the innovation, obtain detailed information on the implementation process, and review awardee-specific data to determine which elements to incorporate into the evaluation. By August 13, 2014, all 24 awardees had been visited and a thorough description of our findings included in each of the 24 awardee sections.

In addition to the site visit descriptions, we report quantitative data from two sources for several awardees. First, we present findings from claims analysis for awardees in this report if they both provided us with patient identifiers and reported enrolling participants who are Medicare and/or Medicaid beneficiaries. RTI has obtained patient identifiers from most of the 24 awardees to conduct claims analysis. Second, we present data RTI obtained directly from awardees to quantify their work in addressing health care costs, quality, and patient outcomes. Data from additional awardees will be analyzed and presented in future reports, as data become available and awardees enroll sufficient participants. An update on the availability of Medicare/Medicaid claims and other awardee-specific data, analysis of data available to us and cleaned as of September 11, 2014, a summary of the comparison groups, and a list of draft evaluation measures are included in each awardee section.

1. HCIA COMMUNITY RESOURCE AWARDEE: ASIAN AMERICANS FOR COMMUNITY INVOLVEMENT (AACI)

1.1 Introduction

Asian Americans for Community Involvement (AACI), a federally qualified health center (FQHC) in San Jose, California, received an award of $2,684,545 and began enrolling participants on October 30, 2013, to achieve the following goals:

1. **Reduce costs** by reducing unnecessary ED visits, saving $3,373,602 in gross medical expenditures.
2. **Improve care** by becoming a patient-centered medical home (PCMH) and establishing a patient navigation center (PNC) to improve patient access to health and social services for 5,000 unique beneficiaries across nine primary care and mental/behavioral health services.
3. **Improve health** by improving cancer and diabetes prevention and early treatment, as well as by creating 29 nonclinical health worker jobs and training 165 young adults.

RTI is conducting an in-depth case study for this innovation. As part of that case study, two RTI team members conducted a site visit on July 29–30, and information gathered during the site visit is included in this report. This report also describes findings from document reviews, conference calls, and analysis of data obtained and cleaned by RTI through September 11, 2014. We are working to obtain data directly from the awardee to assess many of the variables we discuss. In the sections that follow, we describe innovation components and target participants, summarize implementation progress, and provide an overview of our planned evaluation approach. We close the report with an assessment of overall program effectiveness.

1.1.1 Innovation Components

AACI’s innovation has two major components: 1) working with community college partners to train Asian and Hispanic young adults as nonclinical health workers and 2) providing support services to AACI patients through the PNC. These major innovation components are supported by health information technology (HIT) elements, including the development of a PNC Portal, a Web application that will facilitate the scheduling and documentation of PNC services; an electronic health record (EHR) upgrade, which will enhance the awardees’ beneficiary tracking and reporting capabilities; and a call center to receive all incoming calls to the FQHC, which is intended to improve customer service and may provide another format through which patient navigators’ services can be provided and tracked. AACI is leveraging its FQHC status (received November 2013) and the PNC innovation to obtain National Committee for Quality Assurance PCMH recognition.

Component 1: Patient Navigator (PN) Training

Workforce development is a primary component of the AACI innovation. AACI's goal is to train young Asian and Hispanic adults in low-income East San Jose communities as PNs who add "concierge-level services" to each patient visit. As part of the innovation, AACI aims to create career pathways and living-wage jobs for young adults who may otherwise have limited employment opportunities. AACI partnered with the Career Ladders Project and four community colleges to train students as PNs (***Table 1***), which involved developing the PN curriculum and establishing a 1-year certificate program at each school. The PN certificate programs at three of the four partnering community colleges include a paid internship. During the site visit, we learned that Cañada College policies preclude them from offering a paid internship.

Table 1. HCIA Partners, Role, and Location

Partner Name	Role in HCIA Project	Location
Career Ladders Project	Training, project management/ administration	Oakland, CA
San Jose City College	Training	San Jose, CA
Cañada College	Training	Redwood City, CA
Evergreen Valley College	Training	San Jose, CA
Skyline College[1]	Training	San Bruno, CA

Source: The Lewin Group, 2012–2014.
[1] Skyline College is not listed as a partner in the Lewin reporting system but was mentioned as a partner in the quarter 7 (Q7) progress report.
HCIA = Health Care Innovation Award.

Each of the partnering community colleges determined where to house the PN certificate program within their institutions (e.g., in Medical Assisting, Emergency Medical Services, Nursing) based on their understanding of the PN role and staff availability. To align certificate program rollout with the HCIA timeline, partnering colleges accelerated curriculum development by bundling existing courses relevant to patient navigation. Career Ladders Project staff have administrative experience with community colleges and health care experience, so they were highly involved in getting the PN certificate programs approved at each community college.

According to AACI's quarter 6 (Q6) progress report, one of the greatest challenges in working with partners to establish PN certificate programs has been defining the role and responsibilities of PNs—"this definition is essential for developing and translating knowledge, skills, and abilities into for-credit curriculum and training in the community colleges." AACI's conceptualization of PNs (i.e., nonclinical workers who assist with nonclinical translation and provide warm handoffs for patients) was not well understood by partners at the start of the innovation. Some professors, college administrators, employers, and students did not understand the PN role or how the PN program differed from related offerings, such as the community health worker certificate. In February 2014, AACI used HCIA funding to support a Bay Area Summit that convened the Career Ladders Project, community college partners, and other stakeholders, including the Health Trust, policymakers, and employers, to clarify the PN role and to discuss policy issues related to the training and employment of nonclinical health workers. As a result of the summit, a working group will be developing PN competencies and making recommendations on curriculum content.

AACI plays a significant role in recruiting students, providing PN-related workshops in tandem with the certificate programs, and establishing internship opportunities for students. Students were recruited from five internal AACI programs, 10 community agencies, and educational partners, through a combination of outreach events and one-on-one outreach based on referrals. In Q7 AACI worked to improve the recruitment rate by increasing the number of in-person visits to local high schools, training centers, adult education schools, and job training organizations. They also established relationships with the counselors, instructors, and teachers at these institutions, which resulted in opportunities to conduct presentations in the classrooms.

To ensure students are a good fit for the program, AACI created a screening process that includes a written application, a short interview, and attendance at a mandatory orientation and introduction meeting. Their ideal candidate is proficient in English, has bilingual skills (e.g., Vietnamese, Mandarin Chinese, Spanish), and is between 18 and 30 years old. Once students complete the application process and are admitted to the PN certificate program at one of the four community colleges, they complete 1 year of courses.

In addition to the required coursework, students must complete 75 internship hours to earn a PN certificate. AACI staff and community college partners coordinate the internships for which students earn both work experience credit and a stipend upon completion. Three cohorts of students have completed or are currently engaged in internships. As of March 2014, 8 students had received the PN certificate and 47 students were completing the PN certificate program.

Component 2: Patient Navigation

PN Role and Functions

AACI did not have PNs on staff prior to the HCIA project. Their goal is to create nonclinical health worker jobs for 29 students who complete the PN certificate program. AACI currently employs four graduates of San Jose City College's PN certificate program—two as full-time PNs and two as PNC cohort mentors. One PN is assigned to AACI's primary care clinic, and the other PN is assigned to AACI's mental health department. PNs are responsible for handing out educational DVDs in patients' primary language, filling out flu shot forms and other intake forms, coordinating appointments, and navigating patients to referral appointments and urgent care visits at the county hospital. One PN has done extensive work on a resource guide, including site visits to local community resources, as well as exploring roles to further incorporate patient navigation into the workflow of mental health/behavioral health. Lastly, PNs are responsible for documenting demographic and encounter data in an electronic log. ACCI PN functions are summarized in ***Table 2***.

To integrate nonclinical health workers (PNs) into clinic workflow, AACI has engaged a practice coach to provide technical expertise on clinic transformation. This will include workflow mapping, roles definition, training needs assessment, and communication plan development. The RTI team did not interview the practice coach during the site visit but briefly discussed this role with the project director and manager.

Table 2. HCIA Care Coordinator Functions and Training

Characteristic Type	AACI PN Role
Title	Patient navigator
Minimum qualifications	PN certificate
Functions	Health education (individual and group) Service coordination (assistance with enrollment, appointments, referrals) Instrumental support (arranging transportation, translators) Community linkages (coordination of care with health, human, and social service organizations)
Established continuing education program	None

Source: Site visit, July 2014.
AACI = Asian Americans for Community Involvement; HCIA = Health Care Innovation Award; PN = patient navigator.

Supporting Elements: Health Information Technology

Web Application

Since July 2012, AACI has worked with a volunteer student organization, the University of California, Berkeley, chapter of Code the Change, to develop and implement a Web application to schedule and deploy PNs. Code the Change connects computer scientists with nonprofits and social enterprises that lack the internal technical capacity to develop the technological components of their program or the budget to recruit and hire highly specialized technical staff. The Berkeley team consists of roughly 10 programmers and 2 project managers. In Q5, the project administrator expanded the Web application development team to include all PNC staff members and new staff from AACI's health clinic to obtain feedback from a wider range of staff who may be using the Web application. Meetings are led by Code the Change.

The planned Web application, PNC Portal, will be a secure Website (www.aacipnc.com) that can be accessed by smart phone or computer using a secure log-in. The system is intended to be simple and user friendly so that clinic staff can create new appointments and PNs can view available appointments. When PNs accept an appointment, they receive an email message with patient contact information and general information necessary to make arrangements with the patient. Code the Change continues to resolve testing issues and the administrator maintains a matrix of ongoing modifications based on staff feedback. In addition, the clinic's data analyst is working to integrate PNC Portal and AACI's EHR system.

EHRs

AACI upgraded its EHR to NextGen version 8.3 in June 2014. The new version complies with federal Meaningful Use Stage 2 standards and new International Classification of Diseases, Tenth Revision (ICD-10) billing codes. Integration between AACI's primary care and mental health clinics allows for more streamlined reporting. PNs already have EHR access and can track beneficiary identifiers and encounters.

Call Center

With HCIA funding, AACI is developing a call center using inContact software to centralize all calls to the FQHC. AACI plans to link call center encounters with its EHR. The call center is intended to improve customer service and to provide another format through which PN services can be provided and tracked (PNs may staff the call center part time).

AACI visited two call centers to develop a better understanding of how the centers are designed and staffed. In September 2013, AACI toured Kaiser Permanente's call center, where they learned about the scripts, protocols, and administration of a high-functioning call center. In March 2014, they toured the Petaluma Health call center, where they learned more about call volume and staffing approaches. AACI plans to adopt Petaluma's call center model in which staff rotate between a care team and the call center to prevent burnout and isolation.

In June 2014 (Q8), AACI purchased a new telephone system as part of call center development. AACI's expanded Moorpark Clinic design includes a dedicated call center space.

1.1.2 Program Participant Characteristics

AACI's innovation aims to train young Asian and Hispanic adults as nonclinical health workers for a PNC. PNC services are available to the approximately 12,500 Asian and Hispanic patients served in ACCI's primary care and mental/behavioral health clinics. AACI aims to provide patient navigation services to a total of 5,000 unique beneficiaries (3,000 primary care patients in Year 2 and 2,000 mental/behavioral health patients in Year 3). As of March 2014, AACI reported that 1,269 patients had received PNC services. During the July site visit, the data manager estimated that 1,700 patients received PNC services. ***Table 3*** is an example shell of the characteristics of all participants enrolled in the innovation. This table will be completed once AACI provides patient-level data about enrolled participants.

Table 3. Shell for Characteristics of All Patients Ever Enrolled in the Innovation

Characteristic	Number of Patients	Percentage of Patients
Age		
18–24 years	—	—
25–44 years	—	—
45–64 years	—	—
65–74 years	—	—
75–84 years	—	—
85+ years	—	—
Missing	—	—
Sex		
Female	—	—
Male	—	—
Missing	—	—

(continued)

Table 3. Shell for Characteristics of All Patients Ever Enrolled in the Innovation (continued)

Characteristic	Number of Patients	Percentage of Patients
Race/ethnicity		
White	—	—
Black	—	—
Hispanic	—	—
Asian	—	—
American Indian or Alaska Native	—	—
Other	—	—
Missing/refused	—	—
Payer Category		
Dual	—	—
Medicaid	—	—
Medicare	—	—
Medicare Advantage	—	—
Missing	—	—

Source: RTI will fill in this table after patient-level data are provided by AACI.
— Data not yet available.

1.2 Implementation Progress

The extent to which each awardee is able to implement its innovation as planned and reach a sufficient number of patients will be critical to assessing impact on the Triple Aim. The following sections describe implementation and effectiveness. ***Table 4*** lists the measures RTI plans to use in assessing each evaluation domain.

Table 4. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for AACI

Key Evaluation Domains	Subdomains	Measure	Data Source
Workforce development	Education and training	Number of young adults trained as PNs during the intervention	Lewin
Implementation effectiveness	Reach	Number and percentage of patients receiving navigation services	HER
	Dose	Number of services provided to each participant	HER
		Types of services provided to each participant Appointment scheduling assistance and reminders Language assistance (nonclinical translation) Help identifying community resources and related applications Transportation assistance Health education (mental/ behavioral health clinic PN)	HER

AACI = Asian Americans for Community Involvement; EHR = electronic health record; PN = patient navigator.

1.2.1 Process

The implementation process has been the initial focus of the evaluation. RTI defines the implementation process as including execution of implementation, organizational capacity, engagement of key staff and partners, and client recruitment and enrollment. The implementation process is best evaluated through a combination of data variables, including execution of implementation that conforms with operational plans, and capacity for implementing the innovation in a timely and effective manner. We focused on the implementation process during the awardee site visit (July 29–30) and addressed the following evaluation questions:

- What is the overall execution of the innovation implementation (e.g., the actual rate of expenditures relative to the projected rate)?
- What accomplishments are specific to hiring or training staff so that the organization can build its capacity to implement the innovation effectively?
- What is the implementation effectiveness, including fidelity, reach, and dose of the innovation thus far?

Execution of Implementation

The rate at which awardees expend funds or enroll patients, compared with projection, provides useful information to assess innovation status. If expenditure or enrollment rates are particularly low (because of such issues as length of time to recruit and train new staff or time to implement a training program and recruit PNs), these variables help assess the awardee's readiness to implement the innovation at the start and the extent to which they can spend all funding and meet their overall goals by the end of the project (e.g., can they effectively allocate the funds provided?). AACI did not start enrolling participants (i.e., providing PN services) until PNs were in place. Time required to establish certificate programs and to recruit and train students in the year-long program resulted in the October 2013 start date for patient enrollment. Regarding spending, for AACI, the total cumulative spending rate for Q7 is 35.73%, which is significantly lower than the expected rate of 58.33% after seven quarters. AACI used Year 1 carry-over funding to expand their innovation at Evergreen Valley College and plans to apply for Year 2 carry-over funding as well. As they ramp up enrollment in Year 3, spending may increase. Enrollment is reported under the Reach section.

Component 1: PN Training

The awardee first partnered with San Jose City College (SJCC) to develop PN training because they are in close proximity AACI's Moorpark clinic site and the county hospital. SJCC experienced turnover in leadership at the start of the innovation, which posed implementation challenges. AACI had to orient new leadership staff to the PNC certificate program and gain their buy-in to proceed with the innovation as planned. During the site visit, AACI mentioned that they had not previously partnered with SJCC, and it may have been better to start with a community college where they had relationships in place. AACI expanded the number of community college partners (a total of four) to increase the number of students in the PN certificate program. As of the site visit, AACI had trained or was in process of training about 100 students (their goal is 165). In addition to the community college courses, AACI holds workshops for students to help connect what they learn in the classroom to the PN role and how to apply their knowledge to real-world scenarios. The graduates that we spoke with during the site visit noted that these workshops were exceptionally useful and provided a better explanation of the PN role than their courses. AACI and their community college partners have not systematically collected satisfaction data from students or tracked students after graduation; therefore, we are unable to assess: student satisfaction with the PN certificate program, and either the employment rate of graduates overall (i.e., with any job) or for a PN role specifically.

Component 2: Patient Navigation

AACI hired four PN certificate program graduates and helped an additional two graduates obtain PN positions at Kaiser Permanente (see ***1.2.2 Workforce Development*** for additional details regarding creation of PN jobs). Site visit interview participants noted that it has taken longer than anticipated for providers to "get used to" the PNs, particularly in the behavioral health departments where some staff members' roles (e.g., case management) seem to overlap with PN duties.

The awardee has not yet reached its goal of creating 29 nonclinical health worker jobs for PN certificate program graduates. At the time of the site visit, AACI was in the process of expanding its primary care and behavioral health clinics, which could potentially support more PNs. AACI outlined long-term plans to create a pool of PNs that could greet patients as they come to the clinic and help with check-in, work part-time in the call center, and accept patient appointments in the PNC Portal.

Supporting Elements: Health Information Technology

AACI has experienced delays in implementing the call center and PNC Portal. During the site visit, AACI indicated that web application was in Beta stage. The awardee's decision to partner with a volunteer student organization to develop PNC Portal impacted the innovation timeline. When Code the Change students had exams or mid-terms, or left for summer break they were unable to work on the Web application. For Year 3, AACI requested funding to hire an external information technology consultant to finish the PNC Portal.

Organizational Capacity and Leadership

Established in 1973, AACI is the largest community-based organization providing health and human services and advocacy for Asian Americans in Santa Clara County. Its mission is to improve the physical and mental health and well-being of the Asian community. Since its inception, it has managed federal, state, and local contracts and grants. One of AACI's main goals is to become a PCMH by consolidating its support services into a PNC that is "linked to clinical and social services inside and outside AACI, in order to provide a seamless network of care" (AACI application). To accomplish this goal, AACI is working to build staff capacity for practice transformation and process redesign. In Q7, AACI convened a series of managers' trainings led by a local leadership coach. They also created a pilot interdepartmental program committee with mental health, clinic, integrated behavioral health, and patient navigation staff. The committee's task is to recommend workflow improvements to enable clinic integration.

1.2.2 Workforce Development

As mentioned previously, training nonclinical health workers is a key process outcome that must be achieved for the project to meet its objectives.

Hiring and Retention

One of AACI's goals is to create 29 nonclinical health worker jobs for the young adults who are trained in the PN program. As of Q7, 8 students from San Jose City College had earned a PN certificate. AACI hired 4 graduates (2 as PNs and 2 as cohort mentors) and helped 2 additional students find PN positions at Kaiser Permanente. The remaining 2 graduates were pursuing additional training in the health care field. As of Q7, a total 6 PN certificate program graduates had obtained jobs (20.69% of AACI's target of 29 positions). It is unclear how many PN positions AACI intends to create within its organization. There is currently no system or standard protocol in place to track students' job or academic placements following graduation. However, AACI is planning to develop and administer an exit survey and to maintain contact with graduates through a Facebook page.

The PN assigned to AACI's primary care clinic was not available for an interview during the site visit. However, according to interviews with other PNC staff and quarterly reports, she speaks English and Mandarin Chinese. Her responsibilities include helping AACI's primary care patients get to and through referral, laboratory, and urgent care visits; providing educational materials in the waiting room; and supporting PNC Portal development. The PN assigned to AACI's mental health department, which consists of nine mental/behavioral health clinics, speaks English and Vietnamese. In addition to the PN certificate program, he completed California's 40-hour domestic advocacy training so he can work with AACI's domestic violence program. Currently, his duties include compiling a community services resource guide for patients, providing direct patient services like nonclinical translation to clients during patient visits, and helping providers connect clients with community resources. At the time of the site visit, he was also planning to start a wellness program for Vietnamese-speaking mental health patients to help transition them from high-level care to low-level care.

AACI also hired two graduates of the PN certificate program to serve as cohort mentors. Each has the technical and leadership skills to help the current students graduate. In addition, they serve as PNC ambassadors with community college staff and at outreach and recruitment events.

In Q6, Kaiser Permanente's Medi-Cal Strategy Team hired two graduating students as PNs. PNC staff helped prepare and coach six students for their interviews, putting together resumes, roleplaying with candidates, and debriefing afterwards. The two students who were hired will work at the Kaiser Permanente Santa Clara site helping Medi-Cal members find needed resources within Kaiser Permanente and out in the community.

Training

Training has been the main focus of AACI's innovation for the first several quarters. As of July 2014, AACI estimated that a total of 100 students at SJCC, Cañada College, and Evergreen Valley College had been trained for its HCIA project, or about 60% of the goal to train 165 young adults.

In February, AACI began recruiting students for the fall semester at SJCC, Evergreen Valley College, Cañada College, and Skyline College. Based on historical yields, the goal is to recruit 20–25 students into each program and graduate 15 students a year later. As of March 2014, they had 22 applicants for SJCC and Evergreen Valley College each.

In Q7, AACI and the program at Cañada College also placed 20 students in health internships. While many of the internships are directly related to health care, some students perform non-PN tasks, such as childcare and administrative work. AACI is working with several organizations (e.g., Gardner Family Health Center, Indian Health Center of Santa Clara County, Santa Clara Valley Medical Center, and Latinas Contra Cancer) to execute a memorandum of understanding to help place students in PN internships and reduce the potential for non-PN internships.

In addition, AACI plans to engage all clinic staff in practice transformation introductory training. The University of California at San Francisco (UCSF) training takes 4 hours and requires scheduling half the clinic staff for morning training and the other half for afternoon training. HCIA funding is used to help cover clinic release time for staff; however, scheduling training for clinical staff has been challenging because of competing priorities, including an EHR upgrade, increased productivity goals, clinic expansion, hiring of new medical staff, New Access Point award of full FQHC status, and PCMH recognition. Providing training for all clinic staff requires lead time for scheduling both UCSF trainers and patient visits.

1.2.3 Effectiveness

A major aspect of the evaluation will be to assess the effectiveness of the intervention in terms of the extent to which the intervention implemented aligns with what was planned (i.e., fidelity) and whether patients have been exposed to it. Their exposure will be measured through reach (i.e., the extent to which the total number of targeted patients were reached) and dose (i.e., the degree to which each patient is exposed to services provided by CHWs).

Fidelity

Overall, AACI has not changed the innovation from what it intended to implement; however, it is behind schedule in reaching targeted patients and implementing the PNC Portal. AACI has been working with a volunteer student organization, Berkeley's Code the Change, to design and develop PNC Portal without using HCIA funding but plans to hire an external information technology consultant to help finalize PNC Portal.

Reach

Reach is the proportion of eligible individuals who participate in a program. AACI aims to reach 5,000 of their 12,500 beneficiaries with the PNC innovation. As of March 2014, AACI reported that 1,269 participants had received some type of PN services. ***Table 5*** summarizes participant reach and the percentage of the total target population reached by the innovation. As of March 2014, AACI had reached about 10% of the target population.

Table 5. Patient Enrollment and Reach for Each Quarter Since Project Launch

Quarter	Target Population (Denominator Identified as Eligible)	Number of Unduplicated Patients Enrolled	Total Reach per Quarter (Column C Divided by B)	Percentage Change from Previous Quarter
December 2013 (Q6)	12,500	549	4.4	0.0
March 2014 (Q7)	12,500	720	5.8	31.2

Source: Lewin, March 2014.

Dose

According to AACI, one PN documented more than 800 encounters in Q6 and more than 900 encounters in Q7. AACI also reported 1,715 in-person visits and phone calls in Q6 and Q7. In March 2014, AACI enhanced its data tracking system by allowing PNs to enter demographic data in one location and to report users and encounters at the time of service. Before then, they had to pull demographic data retrospectively from EHRs. ***Tables 6*** and ***7*** are example shells summarizing services provided participants and the number of participants receiving services.

Table 6. Number of Participants Receiving Specific Services for [time period]

	Number of Services Provided Patients (N=)	
Services Provided to Patients	**Number**	**Percentage**
Appointment scheduling assistance and reminders	—	—
Language assistance (nonclinical translation)	—	—
Assistance with identifying community resources and related applications	—	—
Transportation assistance	—	—
Health education (mental/behavioral health clinic PN)	—	—

Source: Patient-level data to be provided by AACI.
AACI = Asian Americans for Community Involvement; PN = patient navigator.
— Data not yet available.

Table 7. Number of Participants Receiving Specific Contacts through Q7

	Number of Contacts Made (N=)	
Contact Type	**Number**	**Percentage**
In-person visits	—	—
Phone calls	—	—
Total	—	—

Source: Patient-level data to be provided by AACI.
— Data not yet available.

1.3 Evaluation Outcomes

RTI will use two types of quantitative data from awardees to assess the innovation’s impact on key outcomes. These include claims data for Medicare or Medicaid beneficiaries, depending on who the awardee serves, and administrative or utilization data the awardee is collecting (which we have categorized as “other awardee-specific data,” reflecting the variability of the types of data elements available across awardees). We are finalizing our assessment of all available data sources and requesting data directly from each awardee. As those data are received, we will incorporate the findings into our quarterly and annual reports. The following sections present descriptive findings from the quantitative outcome data provided to RTI and cleaned as of September 11, 2014.

1.3.1 Measures for Evaluation

The data management and site visit teams met on August 6, 2014, to review each of the measures listed in the awardee’s self-monitoring measurement plan. During that meeting, the data management team learned that AACI views the HCIA innovation as one component of a larger quality improvement effort. The two PNs currently working for AACI provide services to patients that include nonclinical translation, warm hand-offs to AACI and county hospital providers, and connecting of patients with community resources. Information gathered during the site visit suggests that the measures listed in AACI's self-monitoring measurement plan may have been selected more as a matter of practicality than based on presumed links between PN services and patient outcomes. That is, AACI will be monitoring health indicators listed in ***Table 8*** below as part of PCMH quality reporting. This is concerning because identifying measures that are likely to be affected by the innovation is critical for assessing effectiveness. There are also some uncertainties about the availability and completeness of data, because AACI is in the process of transferring data from PN logs to EHRs. We will discuss this when we meet with AACI to request the raw patient-level data. The outcome measures currently being collected by AACI are listed in ***Table 8***. Given our concerns regarding the selection of measures, we plan to explore whether AACI has other data available that are more directly linked to the innovation.

Table 8. Outcome Measures to Request from AACI

Key Evaluation Domains	Subdomains	Measures	Data Source
Clinical effectiveness	Diabetes	Percentage of patients with diabetes received a hemoglobin A1c and lipid profile assessment	EHR
	Cancer screening	Percentage of members 50–75 years of age who had appropriate screening for colorectal cancer	EHR
		Percentage of members 50–75 years of age who had appropriate screening for breast cancer	EHR
	Patient satisfaction	Experience of patients with physicians and physician office staff	Mailed survey (AACI translated CAHPS® Clinician and Group survey)
Health care outcomes	Utilization	ED visit rate	Claims data
		All-cause admission rate	Claims data
		Readmission rate	Claims data
	Cost	Spending per patient	Claims data
		Cost savings	Claims data

AACI = Asian Americans for Community Involvement; CAHPS = Consumer Assessment of Healthcare Providers and Systems; ED = emergency department; EHR = electronic health record.

1.3.2 Claims Data

As part of a broad assessment of health care innovations, the Center for Medicare & Medicaid Innovation (CMMI) is assessing the impact of its programs, including those funded by HCIAs, on four core measures:

- health care spending per patient,
- hospital inpatient admissions,
- hospital unplanned readmissions, and
- ED visits.

Collectively, CMMI programs are anticipated to slow the increase in health care spending, reduce hospital admissions and readmissions, and prevent unnecessary ED visits. We are reporting these measures for all HCIA Community Resource Planning awardees so that the collective impact of the awards can be assessed. As discussed below, some awardees' innovations may not be focused on these measures. Other innovations target specific conditions (e.g., medical imaging, diabetes); they may significantly affect spending, admissions, readmissions, and ED visits for the targeted conditions, but not have a statistically detectable impact on the measures at the aggregate level because the targeted conditions represent only a small fraction of total spending, inpatient admissions, and ED visits.

The measures are calculated through analysis of Medicare and Medicaid fee-for-service claims. Because of differences between Medicare and Medicaid patients in age, other demographic variables, and disease status, we report Medicare and Medicaid results separately. Currently, complete Medicare claims are available through the end of 2013, and Medicaid claims for AACI are available through the third quarter of 2011. The AACI innovation was launched on October 1, 2013.

- **Health Care Spending per Patient**. For Medicare beneficiaries, health care spending per patient includes Parts A and Part B Medicare expenditures for persons enrolled in the Part A and Part B fee-for-service program. The variable focuses on Medicare fee-for-service spending, so Medicare managed care (Part C) services are excluded, as are beneficiary copayments. Medicare Part D prescription spending is also excluded. Spending is reported on a per-person per-quarter basis. If a beneficiary is not enrolled for every month in a quarter, spending (except for hospital inpatient spending) is prorated to a quarterly basis using the number of days enrolled during the quarter. Because hospital inpatient admissions are both rare and expensive, spending is not prorated for hospital inpatient spending. Prorating is also not performed for beneficiaries who die during a quarter.

For Medicaid beneficiaries, health care spending per patient is reported for fee-for-service beneficiaries. Beneficiaries are only included in the analysis for spending (and the other measures) during periods when they are enrolled in Medicaid.

- **Hospital Inpatient Admissions**. This variable measures hospitalization, the single most expensive component of health care spending. Patients kept overnight in observation beds are excluded from this measure. Inclusion criteria for the analysis are the same as for spending. Hospital inpatient admissions are not prorated based on the number of days eligible during the quarter. All-cause inpatient admissions and ambulatory care sensitive conditions (ACSC) admissions are reported separately, under the assumption that a greater share of ACSC admissions can be prevented by appropriate ambulatory care. The mean quarterly admission rate per 1,000 patients is reported.
- **Hospital Readmissions**. Hospital readmission rates serve a dual purpose in evaluating HCIA impacts. Readmissions add to the costs of a prior hospitalization, and they often reflect a problem in the care provided during the first admission. All-cause readmissions are defined as a follow-up admission to any short-term acute general or long-term care hospital within 30 days of discharge from another hospital of the same type. We ignore multiple admissions within 1 day of an initial admission because these often represent transfers between hospitals. We define index hospitalizations that begin during the quarter and follow each index admission for 30 days, even when the follow-up period extends beyond the end of the quarter. Inclusion criteria for the analysis are the same as for spending. We also calculate ACSC readmissions. ACSC status is defined by the patient’s first hospitalization during the quarter. The readmission rate equals the number of readmissions divided by the number of index hospitalizations during the quarter. Planned readmissions are excluded from the calculation of the numerator. Quarterly mean readmission and ACSC readmission rates per 1,000 admissions are reported.
- **ED Visits**. ED visits are sometimes viewed as a symptom of the inability of the community’s health care system to provide adequate preventive and ambulatory care visits. We report an all-cause ED visit rate that excludes ED visits resulting in an inpatient admission (which presumably represent unavoidable visits) and includes overnight ED visits without an inpatient admission. Inclusion criteria for the analysis are the same as for spending, and ED visits are also subject to the same prorating formula as for spending. The mean quarterly ED visit rate per 1,000 patients is reported.

Medicare Claims Analysis

We expect to include Medicare claims analyses in subsequent reports but do not have enough post-innovation claims to support Medicare analysis at this time. The analysis will focus on Medicare beneficiaries enrolled in the AACI innovation who were enrolled in fee-for-service Medicare Parts A and B between 2010 and 2013. The analysis will use data from the CMS Chronic Conditions Data Warehouse (CCW). Measures will be presented for these beneficiaries in the quarters before and after the innovation was launched on October 1, 2013. ***Appendix A*** shows the claims analyses tables that will be presented for Medicare.

In addition to tables, we will present figures showing each measure as a function of time. Values for quarters prior to the innovation's launch in October 2013 will be shown in one color, and values for quarters during and after launch will be shown in another color. The figures will include a trend line based on a linear regression of prelaunch values.

Medicaid Claims Analysis

The Medicaid data analysis will use data from CMS Alpha-MAX data files. Currently, Medicaid claims for AACI are only available in Alpha-MAX through the third quarter of 2011. Because the innovation was launched in October 2013 and Alpha-MAX claims for that quarter are not available, we are not presenting measures for Medicaid patients in this report. We will provide Medicaid analyses in subsequent reports as more data become available. We will report tables and figures similar to those for Medicare (see ***Appendix A***).

Discussion of Claims Analysis

The claims measures will provide descriptive data on patients enrolled in the AACI innovation before, during, and after its launch. Although it is necessary to report these measures to support CMS's broader assessment of its full portfolio of innovation projects, they may not provide a complete evaluation picture of the innovation for several reasons. First, the AACI innovation focuses on ED visits and prevention and early treatment of diabetes and cancer. Although the innovation may have a statistically significant impact on the spending, inpatient admissions, and readmissions related to diabetes and cancer, it may not have a statistically detectible impact on the variables at the total spending or utilization level, because diabetes and cancer account for only a small share of total spending or utilization. In later reports, we will also provide diabetes- and cancer-specific spending and utilization data. Second, Medicare fee-for-service and Medicaid beneficiaries represent only about two-thirds of the patients served by AACI. Third, the innovation was only launched on October 1, 2013, and the impact of a PN innovation may not be immediate because it takes time for PNs to achieve changes in health care utilization.

Development of Comparison Groups

In addition to comparing Medicare and Medicaid beneficiaries pre- and post-innovation, we are constructing a statistically matched, contemporaneous comparison group of Medicare and Medicaid fee-for-service patients in Santa Clara County who were not enrolled in the innovation. This comparison group will control for external, noninnovation factors affecting both AACI and non-AACI patients. Because AACI collaborates with nearby South County Community Health Center (another HCIA awardee also doing a PN innovation) in neighboring San Mateo, we will exclude South County and other San Mateo County patients from the comparison group.

The comparison group will be constructed using propensity score matching to identify noninnovation patients who are similar to innovation patients. A propensity score will be estimated using a parametric model (e.g., logit) as a function of demographics (gender, age, and ethnicity), health characteristics (number of chronic conditions), and spending during the years prior to program participation. Each program participant will be matched with a comparison group member having the nearest propensity score within a statistical threshold or a set of comparison group members with similar propensity scores.

1.3.3 Other Awardee-Specific Data

RTI is setting up a meeting with AACI to request the raw patient-level and PN-level data that were used to generate each of the measures from data sources other than claims data for each quarter.

Overview of Data Request

RTI met with AACI on September 18, 2014, to request data from AACI and explore whether AACI is collecting other measures that may be more directly linked to the PNC innovation beyond those listed in the self-monitoring measurement plan. During that meeting, AACI indicated that they are collecting other data and that they will provide their full list of measures once finalized as part of their PCMH certification process. Once we receive that list, we will review and identify measures relevant for our evaluation of AACI.

Health Outcomes

Once we receive the data requested from AACI, we will have a better understanding of what type of results we will provide. ***Table 9*** is an example shell of findings we anticipate presenting.

Table 9. Health Outcomes Over Time-Primary Care Patients

Measure	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Diabetes screening							
Among patients receiving PN services, the percentage with diabetes who receive a diabetic lipid and hemoglobin A1c profile within the quarter	—	—	—	—	—	—	—
Colorectal cancer screening							
Among patients receiving PN services, the percentage who receive colorectal cancer screening within the quarter	—	—	—	—	—	—	—

(continued)

Table 9. Health Outcomes Over Time-Primary Care Patients (continued)

Measure	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Mammograms							
Among patients receiving PN services, the percentage who receive mammography within the quarter	—	—	—	—	—	—	—

Source: RTI will fill in this table after patient-level data are provided by AACI.
AACI = Asian Americans for Community Involvement; PN = patient navigator.
— Data not yet available.

Discussion of Other Awardee-Specific Findings

Once we receive data from AACI, we will review, clean, merge, and begin conducting descriptive analyses to fill in the table shells we develop. At that point, we will be in a better position to discuss findings related to the other awardee-specific data.

1.4 Overall Program Effectiveness to Date

In November 2013, AACI was awarded a New Access Point grant from the federal Health Resources and Services Administration. This award enabled AACI's FQHC lookalike health clinic to become a full FQHC. AACI will leverage FQHC status and the PNC innovation to obtain National Committee for Quality Assurance PCMH recognition. The awardee anticipates that these combined efforts will help it increase clinic users, expand clinical services, and improve care. AACI plans to establish PCMHs beyond their Moorpark Clinic location, with PNs as key members of the home health team.

As of March 2014, AACI achieved about 60% (100 students) of their goal to train 165 students as PNs. AACI has also provided, or helped obtain, positions for 6 of the 29 (20.69%) students they aim to create nonclinical health worker jobs for. Several cohorts of students have not finished the PN certificate training, so AACI will likely reach the training goal of 165 students. AACI will need to ramp up its hiring and efforts to facilitate job placements in order to meet its goal for creating nonclinical health worker jobs.

Because of the focus on recruitment and training, AACI was significantly delayed in hiring PNs and did not start enrolling participants until October 2013. As of Q7, 1,269 patients had received PNC services. AACI aims to reach 5,000 of its 12,500 primary care and mental/behavioral health patients with the PNC innovation and has achieved 25.38% of this target. The awardee may need to increase the number of PNs on staff to achieve their reach target.

RTI does not yet have adequate data to assess cost savings and health outcomes of patients. RTI will continue to work with AACI to obtain EHR data, administrative data, and patient identifiers.

APPENDIX A

Table A-1. Baseline and Intervention Trends in Health Care Spending per Patient

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—

Savings per Patient

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Spending rate: total quarter (i.e., quarterized) payments/number of unique patients. Savings per patient: difference in comparison minus the intervention’s average spending rates.
— Data not yet available.

Table A-2. Baseline and Intervention Trends in Admissions per 1,000 Patients

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Admit rate: total unquarterized admissions/number of unique patients.
— Data not yet available.

Table A-3. Baseline and Intervention Trends in Readmissions per 1,000 Admissions

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total admissions	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total Admissions	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Readmit rate: sum of all readmissions to eligible hospital within 30 days/all admissions in the quarter. Total admissions: all eligible admissions in the quarter.
— Data not yet available.

Table A-4. Baseline and Intervention Trends in ED Visits per 1,000 Patients

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: ED rate: total quarterized ED visits and observation stays/number of unique patients.
— Data not yet available.

October 2014

Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring

Annual and Site Visit Report
Ben Archer Health Center

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OVERALL EVALUATION SUMMARY

RTI International was selected to lead an independent evaluation of the 24 Health Care Innovation Award (HCIA) awardees categorized as Community Resource Planning, Prevention, and Monitoring (Community Resource). In this role, RTI is conducting an in-depth evaluation of each innovation, as well as a cross-site evaluation that includes similar innovations targeting the same priority outcomes (e.g., emergency department [ED] visits). For each of the 24 awardees, this report presents findings from the first year of the evaluation (beginning September 23, 2013, and including data obtained by RTI as of September 11, 2014). The report is based on multiple data sources, including operational reports, self-monitoring plans, site visits, and quantitative data analysis.

The evaluation methods vary by awardee innovation, based on the type of innovation and availability of data. RTI has reviewed and coded all existing documents from the awardees through December 31, 2013, and incorporated that knowledge into each awardee’s overview. Our review included the awardees’ original applications for funding, original and current operational and self-monitoring plans, and quarterly narrative and monitoring reports. For this annual report, we incorporated activities reported through the awardee’s seventh quarterly report (i.e., through March 31, 2014).

Between April and August 2014, teams of at least two staff from the RTI team visited all 24 awardees for 2–4 days, depending on the number of interviews conducted. Teams included a subject matter expert, with training and experience specific to the awardee’s innovation, and a master’s- or bachelor’s-level colleague to take notes. Before each visit, the teams reviewed all available documentation from the awardee to learn about the innovation’s goals, objectives, and status. The purpose of the site visits was to clarify our understanding of the innovation, obtain detailed information on the implementation process, and review awardee-specific data to determine which elements to incorporate into the evaluation. By August 13, 2014, all 24 awardees had been visited and a thorough description of our findings included in each of the 24 awardee sections.

In addition to the site visits, we report quantitative data from two possible sources for several awardees. First, we present findings from claims analysis for awardees in this report if they both provided us with patient identifiers and reported enrolling participants who are Medicare and/or Medicaid beneficiaries. RTI has obtained patient identifiers from most of the 24 awardees to conduct claims analysis. Second, we present data RTI obtained directly from awardees to quantify their work in addressing health care costs, quality, and patient outcomes. Data from additional awardees will be analyzed and presented in future reports, as data become available and awardees enroll sufficient participants. An update on the availability of Medicare/Medicaid claims and other awardee-specific data, analysis of data available to us and cleaned as of September 11, 2014, a summary of the comparison groups, and a list of draft evaluation measures are included in each awardee section.

1. HCIA COMMUNITY RESOURCE AWARDEE: BEN ARCHER HEALTH CENTER

1.1 Introduction

Ben Archer Health Center (BAHC), a federally qualified health center (FQHC)/ community health center in rural New Mexico, received an award of $1,270,845 to implement their innovation, which began enrolling patients on September 5, 2012, to achieve the following goals:

1. **Improve care** by providing an innovative home-based health care model that promotes healthy lifestyles and delivers quality health care education to 4,600 enrollees in northern Doña Ana County by 2015.

2. **Improve health** by increasing access to quality health care, promoting disease prevention, and providing immunizations.

3. **Reduce the total cost of care** in northern Doña Ana County by 10% and increase the number of people in the service area who have a primary medical care home to 80% by 2015.

BAHC serves the primarily Hispanic population of northern Doña Ana County, a rural farming community with a population of 15,000. Northern Dona Ana County covers 2,500 square miles and includes the communities of Hatch and Radium Springs and many small communities located on the United States/Mexico border. Hatch, where BAHC is headquartered, has been designated by the U.S. Department of Health and Human Services as a Medically Underserved Area and a Health Professional Shortage Area.

RTI is in the process of conducting an in-depth case study of this innovation. As part of that case study, two RTI team members conducted a site visit in June 2014 and both before and after the visit, our team reviewed all documentation on this innovation. We are actively working now to obtain data directly from the awardee that will help assess many of the variables we discuss in this report section. This report describes findings from the site visit, document reviews, follow-up telephone calls, and analysis of data obtained and cleaned by RTI through September 11, 2014. We start by describing the innovation components in detail and the patients targeted by the awardee.

1.1.1 Innovation Components

The BAHC innovation builds on an existing community health worker (CHW) model to address gaps in health care services provided to the rural population in northern Dona Ana County using the following components:

- CHW services provided to the larger community and focused on health education for receipt of **preventive care services**, including immunization campaigns and participation in community events.

- **intensive case management services** from the CHWs to support effective chronic disease management, including home visits.

BAHC has a long-standing history of working with CHWs to connect individuals with needed medical services throughout the community, and for the innovation, they are focusing their efforts on preventive health services. At the time of initiation of the innovation, BAHC had five CHWs (three CHWs, two promotores [bilingual CHWs]) on staff providing the following services: home visits, health education, chronic disease management, and community outreach. For this innovation, the CHWs/promotores are focused on linking patients with preventive health services and identifying primary medical homes for those without a regular provider. The CHWs and promotores are well connected and respected lay members of the local communities who may or may not have formal background and training in health care. The CHWs and promotores (hereafter referred to as CHWs) are, however, in a position to provide culturally and linguistically appropriate care to the community's residents. They are very knowledgeable of the community and have relied on their historical presence and engagement with the community to actively address its health needs.

This innovation uses both nurse health educators (NHEs) and CHWs for intensive case management as a bridge between patients and medical providers by helping patients navigate the health care system and providing home-based case management (e.g., medication management, home safety assessments), chronic disease prevention and management, and health education. The NHEs works with the primary care clinic to provide intensive case management for the most complex patients, including the elderly who are at home, to extend available primary care resources in the rural communities of northern Dona Ana County. The NHEs and CHWs provide coordination of services for adult and child immunizations and chronic disease management to ensure that patients diagnosed with chronic diseases are referred for further care. NHEs and CHWs both work with providers to individualize treatment of patients using a patient-centered approach. BAHC has used CHWs since 1992 and nurses since 1971 and is using the Health Care Innovation Award (HCIA) funding to expand their roles. ***Table 1*** highlights the key functions of the CHW and NHE role, followed by a detailed description of each role's function.

BAHC has not reported any formal partners for the innovation though they have actively sought referrals from local organizations for eligible patients. Although the BAHC collaborates with other organizations as appropriate, they are the only health care provider in the targeted rural areas. Within BAHC, the program director works with the primary care team (so that they are aware of the program) by attending team meetings and working with providers individually. Additionally, the Southern New Mexico Diabetes Outreach has worked with BAHC over the last several years to identify individuals at risk for diabetes and has established a referral system to the clinics.

Table 1. HCIA CHW and NHE Functions and Training

Characteristic Type	CHW Role	NHE Role
Title	Community health worker/promotora	Nurse health educator
Functions	Health education (individual and group) Informal counseling, individualized goal setting Outreach and recruitment Patient monitoring and follow-up Service coordination Community linkages Instrumental support	Health education Chronic disease management Administer immunizations
Established continuing education program	None	None

Source: Site visit, June 3–4, 2014.
CHW = community health worker; GED = general equivalency diploma; NHE = nurse health educator.

Component 1: Preventive Health Services

The first component of the intervention is focused on providing specific preventive services to the larger community through strategies such as door-to-door immunization campaigns, home health parties (HHPs) specific to providing diabetes education, and outreach at local community events.

Immunization Campaigns

As a way to increase immunization rates, the innovation has included a door-to-door immunization campaign targeted at young children. This event was held on March 24–25, 2014, in the communities of Hatch, Rincon, Salem, Milagro, Rodey, Placitas, and Radium Springs. During the campaign, teams of CHWs, NHEs, and volunteers went door to door throughout the service area to check immunization records and administer vaccines as needed to children. The team evaluated each family for additional educational needs, including disease prevention or other health topics as well as awareness of available services, such as WIC. The team carried all Vaccines for Children (VFC) vaccines and used the state immunization database New Mexico Statewide Immunization Information System (NMSIIS) to query for vaccination history and to document vaccines administered. Bags with health education materials and incentives were provided to the families. Through the door-to-door immunizations campaign, immunizations were provided at no cost to the patient, and the campaign gave home-bound individuals the opportunity to receive vaccinations.

Diabetes Home Health Parties

Diabetes education in the form of HHPs allows CHWs and NHEs to present diabetes information to participants who may include those diagnosed with diabetes, family members of those diagnosed with diabetes, or persons at risk for developing diabetes. Similar to a

Tupperware® party, community members volunteer to host a party in their home for family, friends, and other community members. A promotora facilitates the discussion in the individual's home with flip charts and other materials developed in Spanish. One CHW who described the HHPs as "fun" further stressed that "people learn more when you do it as a group than me just talking to patients, where they listen and don't understand. When we do it as a group, they all have different opinions and participate."

Home Safety Assessments

As a preventive measure, CHWs conduct home safety assessments as part of the home visit to help decrease the number of falls, medication errors, asthma triggers, accidental poisonings, and other injuries that this vulnerable population may be susceptible to.

Component 2: Intensive Case Management

Providing case management to patients in their homes with complex health care needs is a key feature of the BAHC innovation. The NHE works with the primary care clinic to provide intensive case management, including home visits, for people determined to be among those with the greatest needs. For example, the elderly receive extended primary care resources in their homes that they would not otherwise obtain.

Home Visits

Home visits are conducted for those individuals diagnosed with chronic disease, persons at risk of developing diabetes, vulnerable seniors and homebound individuals, young children, and hard-to-reach county residents. Patients recruited for home visits are identified in several ways: door-to-door recruitment, community events, referrals from community agencies, and generation of BAHC disease registry reports. Registry reports are generated from the health center database and ran each week to identify people who may be eligible for a home visit. Eligible people include individuals 18 to 65 diagnosed with diabetes, hypertension, or asthma. Seniors aged 65 and over and children 6 and over are also identified for inclusion in the immunization campaign. Each time a patient is visited, an encounter form is generated with information such as blood pressure checks and ED visits. Drawing on the strengths of the CHWs, the innovation also uses door-to-door recruitment approaches to identify potential clients for the program. CHWs conduct door-to-door campaigns delivering program information and health education materials in the form of flyers written in both English and Spanish. Their knowledge of the community and its residents makes them a key factor in identifying those in most need of program services (e.g., elderly, physically disabled).

The CHW and NHE typically conduct home visits together. If the visit is with a new patient, the NHE conducts a baseline assessment of vital signs such as blood pressure, temperature, and pulse checks and, along with the CHW, provides education on healthier lifestyles if needed. Depending on the needs of the patient, follow-up care is planned as appropriate. If the patient is having trouble managing his/her condition or conditions, home visits may occur as often as 4 or 5 times a week. Patients are also brought or referred to the clinic for in-person visits as needed. For patients in better control of their conditions, fewer visits and less intervention are required. As patient's vitals become more "controlled" and, therefore, patients require less intense contacts and oversight, the CHW can then visit the patient's home without the NHE.

After each visit, the CHW enters patient information into BAHC's electronic health record (EHR) system and the Patient Electronic Care System (PECSYS) disease registry. PECSYS is used to monitor and track outcome improvements for all patients within the innovation. BAHC anticipates providing a minimum of 5,000 case management visits in patient homes during Year 2 of the innovation. The goal for number of case management visits per quarter is 1,250. During quarter (Q) 7, CHWs and NHEs completed 1,361,641 intensive case management visits with the target population.

1.1.2 Program Participant Characteristics

BAHC targets patients diagnosed with a chronic disease, people at risk of developing diabetes, vulnerable seniors, homebound individuals, young children, and hard-to-reach county residents in rural New Mexico. Additional types of patients BAHC hopes to reach include patients over 65 with asthma and newly eligible adult Medicaid patients with diabetes, hypertension, or asthma. Approximately 15,000 individuals live in northern Dona Ana County, and BAHC anticipates serving 4,656 individuals throughout the 3-year innovation period.

We received a patient identifier file from BAHC in May 2014 with 1,019 patients. This reflects about 22% of the projected total number of people BAHC expects to serve by the end of the project. The information provided in ***Table 2***, which provides demographic characteristics of Medicare patients enrolled in the innovation through Q7, is based on the demographic data (e.g., age, payer type) that were included in that file. As shown in the table, a large proportion of patients (70.4%) were between the ages of 65 and 84. All of the patients included in the patient identifier file have either Medicare (68.1%) or Medicare Advantage (31.9%).

Table 2. Characteristics of Medicare Patients Enrolled in the Innovation through Q7

Characteristic	Number of Patients	Percentage of Patients
Age		
<18	2	0.2
18–24	2	0.2
25–44	30	2.9
45–64	173	17.0
65–74	463	45.5
75–84	254	24.9
85+	95	9.3
Missing	0	0.0
Sex[1]		
Female	—	—
Male	—	—
Missing	—	—
Race/ethnicity[2]		
White	—	—
Black	—	—
Hispanic	—	—
Asian	—	—
American Indian or Alaska Native	—	—
Other	—	—
Missing/refused	—	—
Payer Category		
Dual[3]	—	—
Medicaid[3]	—	—
Medicare	694	68.1
Medicare Advantage	325	31.9
Missing	0	0.0

Source: Patient identifier file provided to RTI in May 2014.

[1] Data not provided by awardee.

[2] Consistent with the “Standards for the Classification of Federal Data on Race and Ethnicity” (http://www.whitehouse.gov/omb/fedreg_1997standards/), the table includes a combined race and Hispanic ethnicity category that is co-equal with other the categories of race. This is how the data were provided to RTI by the awardee; therefore, self-identification is not feasible.

[3] Data not yet available.

Table 3 illustrates the patient type planned for inclusion in the innovation. This table will be completed in subsequent annual/quarterly reports using the patient-level data provided by BAHC.

Table 3. Total Patients Planned for Inclusion in Intensive Case Management Innovation (Denominator Data)[1]

Patient Type	Data Source	Current Count (Data Source)[1]
Patients identified as having diabetes (aged 18–75)	EHR and PECSYS	—
Patients identified as having asthma (aged 18–75)	EHR and PECSYS	—
Patients identified as having hypertension (aged 18–75)	EHR and PECSYS	
All patients enrolled in the project over the age of 6 months seen between October 1 and the end of February	EHR and PECSYS	—
Adults aged 65 and over	EHR and PECSYS	—

[1] BAHC uses a registry developed by Aristos called PECSYS. The registry is used to monitor and track outcome improvement for all patients within the project.
EHR = electronic health record; PECSYS = Patient Electronic Care System.
— Data not yet available.

Prevention Services

Immunization Campaign

CHWs and NHEs conduct door-to-door outreach campaigns with the goal of increasing the rates of senior adult and child immunizations. BAHC hopes to reach seniors in the population requiring a flu and/or pneumonia vaccine and school-age children requiring needed vaccinations. The team uses the state immunization database, New Mexico Statewide Immunization Information System (NMSIIS), to query for vaccination history and to document vaccines administered. Lists are then generated to identify individuals for the door-to-door campaign. By 2016, the program hopes to (1) increase the percentage of adults over the age of 65 who have received an annual flu shot to 60% (the rate was 70% as of March 2014), (2) increase the percentage of adults over the age of 65 who have received a pneumococcal vaccination to 60% (the rate was at 50% as of March 2014), and (3) increase the percentage of children by 2 years of age who have appropriate immunizations to 90%. During its March 2014 childhood immunization campaign, the program administered 75 vaccines to 57 children.

Diabetes Home Health Parties

HHPs are an innovative way to provide diabetes education to the community. With the goal of improving diabetes self-management among the rural population in northern Dona Ana County, these "parties" help improve knowledge about diabetes, build skills for diabetes management, and offer social support all within an individual's home. CHWs (or promotores if the household members are bilingual) work with community members to serve as "hosts" for the parties. The host invites family members and others from the community, while the CHWs offer culturally appropriate education and support. The program's goal is to complete

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[1] Data not yet available

10 HHPs each month, in which they are currently on track. During the HHPs, they work with patients to develop self-management goals for their diabetes. The percentage of patients with a documented self-management goal decreased slightly from Q6 (77%) to Q7 (72%).

Home Safety Assessments

As described earlier, home safety assessments are conducted as part of the home visits to help decrease falls, medication errors, accidental poisonings, and other injuries susceptible to this population. Over the course of the project, CHWs and NHEs have completed 2 hours of training in "Home Safety and Poisoning" and 3 hours of training in "Fall Prevention and Home Safety." Since the project's inception, 142 home health assessments have been completed.

Intensive Case Management Services

Home Visits

BAHC reported a total of 1,641 encounters or in-person home visits to 746 patients in Q7. As discussed previously, the CHW and NHE routinely conduct the home visits together. Patients are identified through door-to-door recruitment, community events (e.g., health education fairs, town meetings), community agency referrals, and disease registry reports. BAHC anticipates providing a minimum of 5,000 case management visits during Year 2 of the innovation, with a goal of 1,250 per quarter. BAHC does not track the number of door-to-door recruitment efforts or clients recruited through community agency referrals; therefore, data on these recruitment efforts are not known.

1.2 Implementation Progress

The extent to which each awardee is able to implement its innovation as planned and reach a sufficient number of patients will be critical to assessing its impact on the Triple Aim. The following provides details on first the implementation process and then the effectiveness. ***Table 4*** lists the measures (i.e., explanatory or independent variables) that RTI plans to use to assess the impact on outcomes of the innovation.

1.2.1 Process

The implementation process has been the initial focus of the evaluation. Subsequent reports will assess the impact of the intervention as data become available. The implementation process is best evaluated through a combination of data variables, including execution of implementation that conforms with operational plans, and capacity for implementing the innovation in a timely and effective manner. We focused on the implementation process during the awardee site visit in June 2014, addressing such evaluation questions as the following:

- What is the overall execution of the innovation implementation (e.g., the actual rate of expenditures relative to the projected rate)?

- What accomplishments are specific to hiring or training staff so that the organization can build its capacity to implement the innovation effectively?
- What is the implementation effectiveness, including fidelity, reach, and dose of the innovation thus far?

Table 4. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for Ben Archer Health Center

Key Evaluation Domains	Subdomains	Measures	Data Source
Implementation process	Care coordination	Number of patients with a documented self-management goal	EHR and PECSYS
Implementation effectiveness	Reach	Number/percentage of participants eligible for services	Lewin data
		Number/percentage of participants recruited door-to-door	EHR and PECSYS
		Number/percentage of participants enrolled following an agency referral	EHR and PECSYS
		Number/percentage of participants receiving intensive case management	Awardee reporting, site visit
	Dose	Number of home safety assessments completed	EHR and PECSYS
		Number of case management/home improvement home visits completed	EHR and PECSYS

EHR = electronic health record; PECSYS = Patient Electronic Care System.

Execution of Implementation

Execution is the extent to which the innovation has been implemented according to plan. We use a number of data variables to assess execution, including the extent to which the innovation has encountered delays in implementation, the effectiveness with which the awardee is able to allocate staffing and resources to support the innovation, and the organizational capacity for implementation. Based on site visit findings from June 2014, the implementation process of the project has gone smoothly, both in terms of process and timeliness. BAHC began enrolling patients in early September 2012, one of the first of the 24 HCIA Community Resource awardees to do so.

The rate at which awardees expend funds and enroll patients, compared with projections, provides useful information to assess the innovation’s status. If expenditure or enrollment rates are low (because of an inability to hire staff or lack of information regarding a group of people eligible for enrollment), these variables help assess the awardee’s readiness to implement the innovation at the start and the extent to which BAHC can spend all funding and meet their overall goals by the end of the innovation (e.g., can BAHC effectively use the funds provided?). BAHC's current rate of spending is 57.7%, which is on target with the projected rate reported in Q7. Enrollment and recruitment of patients into the BAHC innovation are discussed in the Reach section of this report.

Organizational Capacity and Leadership

BAHC has been providing primary care services for over four decades. The organization has 10 community health centers that provide medical, dental, and behavioral health to local residents and Spanish-speaking migrant workers. The 10 centers are distributed throughout southern New Mexico, with Hatch, NM, as the main location. With its current infrastructure, it has the necessary resources built in to support increased capacity for the program.

BAHC's leadership seems highly supportive of their innovation, and, overall, staff generally feel empowered and supported. Strong organizational capacity is evident from its long history of using CHWs in the community. Regionally known as the Promotora Model, this model has been used within BAHC for almost 20 years. All CHWs are crossed-trained and certified through the University of New Mexico's "Reaching Out" Curriculum and cross-trained in diabetes, asthma, home safety, parenting, childbirth, family planning, and breast and cervical cancer education.

This project has enabled BAHC to hire additional CHWs to reach more community members as well as to provide more intensive services to those with the highest need, who are among the most likely to use an ED if their health care needs are not addressed and monitored consistently. Implementing a more intensive CHW program has changed clinic physicians' views of CHWs' roles and expectations. Some providers were hesitant at first, wondering why CHWs were interacting with their patients. Over time, physicians saw the CHWs' value as a resource and began to use them as intended: to help manage the needs of complex patients. CHWs are now viewed as a more integrated part of the health care team, serving a necessary and valuable role.

1.2.2 Workforce Development

Integrating CHWs and NHEs into primary care teams is the crux of BAHC's innovation. To have an effect on outcomes, the awardee must hire, train, and retain adequate numbers of staff over time. This section provides an overview of hiring and retention, as well as training that the awardee has conducted in support of the innovation.

Hiring and Retention

Staff involved in the HCIA innovation are six CHWs, two registered nurses (RNs), and two management or administrative staff. The project had 8.5 full-time equivalents (FTEs) and no new hires or staff turnover in Q7. Most of the hires were made in Q1 (three full-time CHWs and one half-time RN), and staffing has stayed at projection as of that time.

Training

During the site visit, we spoke with a number of CHWs about a variety of topics, including training. CHWs participate in annual trainings highlighting such topics as asthma, chronic obstructive pulmonary disease, chronic disease management, smoking cessation, healthy eating, and Medicaid and ED training. The innovation also involves periodic training in a range of topics, including health disparities, healthy homes, and stress management. CHWs attended the Southern New Mexico Promotora conference. The conference involved 6 hours of training covering such topics as women's health, home safety, poison control, goal setting, and documentation. Eight HCIA staff members attended the training. Additionally, CHWs completed an online training on diabetes education and resources. Overall, CHWs reported being satisfied with the ongoing training provided. When asked if they would find any additional training helpful, CHWs suggested training on the cardiovascular system and behavioral health. The CHWs also felt that additional training in mental health/depression issues would be useful because "there are a lot of newly diagnosed patients who suffer from depression" (CHW interviewee, June 3, 2014). Physicians indicated that more medical training would help CHWs integrate even better into the patient-centered medical home team.

1.2.3 Implementation Effectiveness

A major aspect of the evaluation will be to assess the effectiveness of the intervention in terms of the extent to which the intervention implemented aligns with what was planned (i.e., fidelity) and whether patients have been exposed to it. Their exposure will be measured through reach (i.e., the extent to which the total number of patients is reached that were targeted) and dose (i.e., the degree to which each patient is exposed to educational, preventive, or case management services provided by CHWs).

Fidelity

No changes have been reported. BAHC continues to use the Promotora model as planned to provide both preventive and intensive case management services in conjunction with the NHE and clinic-based health care providers.

Reach

BAHC's target population is defined as those living in northern Dona Ana County who are high risk/high opportunity, including Medicare, Medicaid, and Children's Health Insurance Program beneficiaries. For this innovation, the target population total is 4,656 patients. Reach is the extent to which the targeted patient population (4,656) is exposed to the innovation. To date, RTI has received patient identifiers for only 1,019 patients and has no other data yet to determine the total (or cumulative) number of patients served through

March 2014. According to data entered in the Lewin database, BAHC reached 746 patients during Q7 alone, exceeding its goal of reaching 400 individuals during each quarter. From document review and interviews with site visit staff, we learned that staff are involved in a variety of activities to reach the target population. Community events (fairs, public meetings) provide a means for recruiting participants, educating the public about health issues, and raising awareness of the program. According to the awardee application, these events are designed to "reach large numbers of the total population allowing an opportunity to recruit participants that are in need of the proposed services but not accessed through other means." ***Table 5*** shows the reach for each quarter since launch of the BAHC innovation. This table will be updated with patient-level data from BAHC in subsequent annual/quarterly reports.

Table 5. Patient Enrollment and Reach for Each Quarter Since Project Launch[2]

Quarter	Target Population	Number of Unduplicated Patients Enrolled and Receiving Services	Total Reach per Quarter	Percentage Change from Previous Quarter
September 2012	4,656	—	—	—
December 2012	4,656	—	—	—
March 2013	4,656	—	—	—
June 2013	4,656	—	—	—
September 2013	4,656	—	—	—
December 2013	4,656	—	—	—
March 2014	4,656	—	—	—
Total enrolled as of March 2014	—	—	—	—

— Data not yet available.

Dose

Any innovation that involves delivery of direct services to participants needs to assess the extent to which those participants have actually been exposed to the new services. This intensity of services (e.g., frequency, duration) provided to participants is combined with outcome data such as from claims analysis to determine whether increasing exposure (or exposure at all) to the innovation is associated with changes in outcomes.

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[2] Awardees report enrollment numbers each quarter in a data base managed by Lewin. We found that the data in that system do not align with data RTI has received directly from the awardee so we are not reporting data at this time. RTI is working with the awardee to ensure that any reported data is accurate and will provide those data in the next quarterly/annual report.

The dosage of the intervention varies by design. Community outreach efforts range from providing immunizations and general health information (at a health fair, for example) or raising awareness of BAHC's health care services to recruiting people into more intensive case management and providing home visitation services for additional or complicated health care. The assumption is that there is a range of needs in the community, and one way to address them is to start with general outreach like providing general preventive health information. People with specific health care needs can then be linked to health care services as appropriate; those with the most intensive health care needs are referred into a patient-centered medical home or intensive case management program. We plan to separate the intensive case management patients from those with less exposure to the intervention.

Home visits are one way to provide more intensive education or case management to patients. CHWs and NHEs conducted a total of 1,641 encounters or in-person home-based case management visits in Q7. During this time, they reached 746 patients (the goal for the quarter was 1,250). In March 2014, BAHC conducted a 2-day, door-to-door immunization campaign, visiting 556 homes and vaccinating 57 children (75 vaccinations total).[3] ***Table 6*** provides a summary of the services provided and the number of patients receiving services from January through March 2014.

Table 6. Number of Patients Receiving Specific Services for January–March 2014

Services Provided to Patients	Number of Services per Patient
Door-to-door immunization services	75 vaccinations given to 57 children (some received more than one vaccination)
Case management visits	1,641 encounters to 746 patients
Healthy lifestyle events	None conducted in Q7
Home health parties	30 parties held
Home safety assessments	50 assessments conducted

Source: Lewin database

1.3 Evaluation Outcomes

RTI will use two types of quantitative data from awardees to assess the impact of the awardee's innovation on key outcomes. These include claims data for Medicare and/or Medicaid beneficiaries, depending on who the awardee serves, and administrative or utilization data the awardee is collecting (which we have categorized as "other awardee specific data" reflecting the variability of the types of data elements available across awardees). We are in the process of finalizing our assessment of all the available data

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[3] RTI is working with awardee to define the counts. It is not clear at this time who is included in the 1,641 count (e.g., whether home visits for the immunization campaign are included).

sources and requesting data directly from each awardee. As those data are received, we will incorporate the findings into our quarterly/annual reports. The following sections present descriptive findings from the quantitative outcome data provided to RTI (and cleaned) as of September 11, 2014.

1.3.1 Measures for Evaluation

Following the site visit, the data management and site visit teams met to review each of the measures listed in the awardee's self-monitoring measurement plan. The independent or explanatory (***Table 4***) and dependent measures (***Table 7***) listed in the tables both reflect those determined as most relevant for our evaluation of BAHC's innovation.

Table 7. Outcome Measures Request from Ben Archer Health Center

Key Evaluation Domains	Subdomains	Measures	Data Source
Clinical effectiveness	Diabetes	Percentage of patients with diabetes who received an eye screening for diabetic retinal disease	EHR and PECSYS
		Percentage of patients with diabetes who received a foot exam	EHR and PECSYS
	Vaccination	Percentage of patients who received an influenza immunization	EHR and PECSYS
		Percentage of patients who received a pneumococcal vaccination	EHR and PECSYS
Health outcomes	Diabetes	Percentage of patients with diabetes who had hemoglobin A1c > 9.0%	EHR and PECSYS
	Hypertension	Percentage of patients with a diagnosis of hypertension with BP < 140/90 mm Hg	EHR and PECSYS
Health care outcomes	Utilization	ED visit rate	Claims data
		All-cause admission rate	Claims data
		Readmission rate	Claims data
		Asthma: Percentage of patients who had a visit ED/urgent care office	EHR and PECSYS
	Cost	Spending per patient	Claims data
		Cost savings	Claims data

BP = blood pressure; ED = emergency department; EHR = electronic health record; PECSYS = Patient Electronic Care System.

1.3.2 Claims Data

As part of a broad assessment of health care innovations, CMMI is assessing the impact of its programs, including those funded specifically by Health Care Innovation Awards, on four core measures. The four core measures are

- health care spending per patient,
- hospital inpatient admissions,
- hospital unplanned readmissions, and
- ED visits.

Collectively, it is anticipated that CMMI programs will slow the increase in health care spending, reduce hospital admissions, reduce avoidable hospital readmissions, and prevent unnecessary ED visits. We are reporting these measures for all HCIA Community Resource Planning awardees so that the collective impact of the awards can be assessed. As discussed below, some awardees' innovations may not be focused on these measures. Other awardees' innovations target specific conditions (e.g., imaging, diabetes) and may have significant impacts on spending, admissions, readmissions, and ED visits for the targeted conditions but not have a statistically detectable impact on the measures at the aggregate level because the targeted conditions represent only a small fraction of total spending, inpatient admissions, and ED visits.

The measures are calculated through analysis of Medicare and Medicaid fee-for-service claims. Because of differences between Medicare and Medicaid patients in age, other demographic variables, and disease status, we report the Medicare and Medicaid results separately below. Currently, complete Medicare claims are available through the end of 2013. Medicaid claims for BAHC are available from 2010 through the second quarter of 2013, although claims for the final quarter in this data set may not be complete. The BAHC innovation was launched on September 5, 2012.

- **Health Care Spending per Patient.** For Medicare beneficiaries, health care spending per patient includes Part A and Part B Medicare expenditures for persons enrolled in the Part A and Part B fee-for-service program. The variable focuses on Medicare fee-for-service spending, so Medicare managed care (Part C) services are excluded, as are beneficiary copayments. Medicare Part D prescription spending is also excluded. Spending is reported on a per-person per-quarter basis. If a beneficiary is not enrolled for every month in a quarter, spending (except for hospital inpatient spending) is prorated to a quarterly basis based on the number of days enrolled during the quarter. Because hospital inpatient admissions are both rare and expensive, spending is not prorated for hospital inpatient spending. Prorating is also not performed for beneficiaries who die during a quarter.

  For Medicaid beneficiaries, health care spending per patient is reported for fee-for-service beneficiaries. Beneficiaries are only included in the analysis for spending (and the other measures) during periods when they are enrolled in Medicaid.

- **Hospital Inpatient Admissions.** This variable measures hospitalization, the single most expensive component of health care spending. Patients kept overnight in observation beds are excluded from this measure. Inclusion criteria for the analysis are the same as for spending. Hospital inpatient admissions are not prorated based on the number of days eligible during the quarter. All-cause inpatient admissions are reported. The mean quarterly admission rate per 1,000 patients is reported.

- **Hospital Readmissions.** Hospital readmission rates serve a dual purpose in evaluating HCIA impacts. Readmissions add to the costs of a prior hospitalization, and they often reflect a problem in the care provided during the first admission. All-cause readmissions are defined as a follow-up admission to any short-term acute general or long-term care hospital within 30 days of a discharge from another hospital of the same type. We ignore multiple admissions within 1 day of an initial admission because these often represent transfers between hospitals. We define index hospitalizations that begin during the quarter and follow each index admission for 30 days, even when the follow-up period extends beyond the end of the quarter. Inclusion criteria for the analysis are the same as for spending. The readmission rate equals the number of readmissions divided by the number of index hospitalizations during the quarter. Planned readmissions are excluded from the calculation of the numerator. Quarterly mean readmission and ACSC readmission rates per 1,000 admissions are reported.

- **ED Visits.** ED visits are sometimes viewed as a symptom of the inability of the community's health care system to provide adequate preventive and ambulatory care visits. We report an all-cause ED visit rate that excludes ED visits resulting in an inpatient admission (which presumably represent unavoidable visits) and includes overnight ED visits without an inpatient admission. Inclusion criteria for the analysis are the same as for spending, and ED visits are also subject to the same prorating formula as for spending. The mean quarterly ED visit rate per 1,000 patients is reported.

Medicare Claims Analysis

The analysis focuses on Medicare beneficiaries enrolled in the BAHC innovation through March 2014 who were enrolled in fee-for-service Medicare Parts A and B at some point after the innovation was launched. Of the total of 935 Medicare beneficiaries enrolled in the program in 2013, the number enrolled in fee-for-service Medicare Parts A and B ranged from 566 to 594 per quarter. The analysis uses data from the CMS Chronic Conditions Data Warehouse (CCW), via the Virtual Research Data Center. We present the measures for these beneficiaries in the quarters before and after the innovation was launched on September 5, 2012. ***Table 8*** reports Medicare spending per patient in the eight quarters before and the six quarters during and after the launch date.

Table 8. Medicare Spending per Patient: Ben Archer Health Center

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year					
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4	I5	I6
Intervention Group															
1C1CMS331013	Ben Archer Health Center														
	Spending rate	$2,155	$1,390	$1,404	$1,086	$1,462	$1,323	$1,435	$1,555	$1,430	$1,959	$1,682	$1,950	$2,381	$2,169
	Std dev	$6,921	$3,980	$5,134	$3,147	$3,901	$4,109	$4,354	$5,618	$4,679	$9,308	$4,924	$5,512	$7,487	$7,524
	Unique patients	471	482	498	510	516	528	541	546	566	587	579	590	588	594
Comparison Group															
1C1CMS331013	Ben Archer Health Center														
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—	—	—

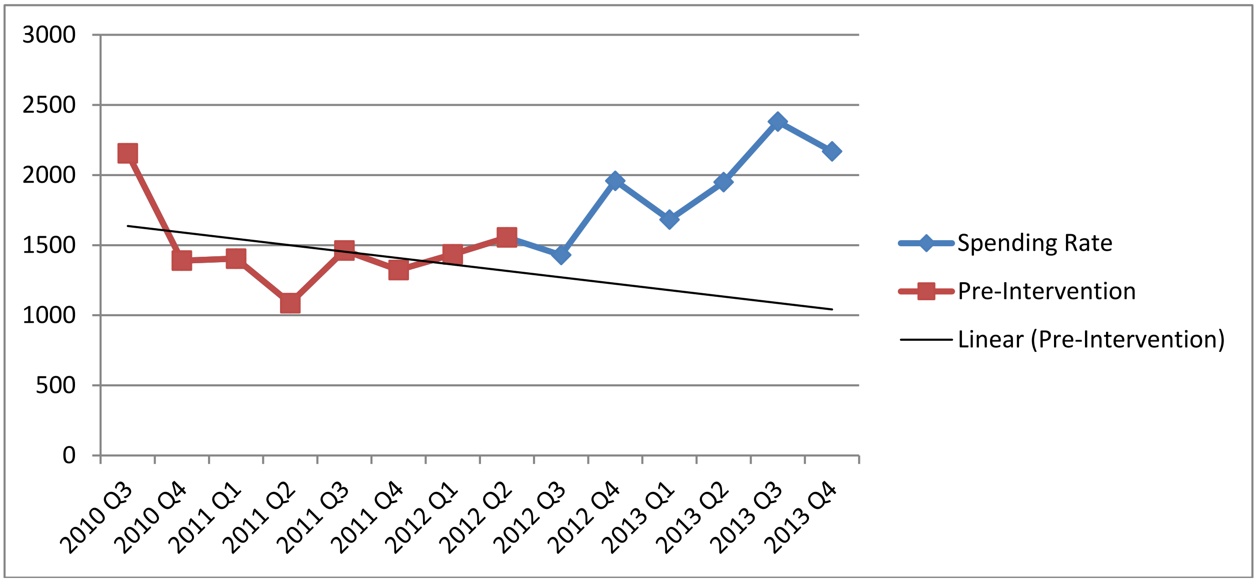
Savings per Patient

Baseline Quarters								First Intervention Year					
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4	I5	I6
—	—	—	—	—	—	—	—	—	—	—	—		

Source: RTI analysis of CCW Medicare claims.
Note: BAHC began enrolling patients on September 5, 2012. I1 is 2012 Q3. Spending rate: total quarter (i.e., quarterized) payments/number of unique patients. Savings per patient: difference in comparison minus the intervention's average spending rates.
— Data not yet available.

Figure 1 plots spending as a function of time. The red line represents values in quarters prior to the innovation's launch date on September 5, 2012, and the blue line represents quarters during and after launch. The graph includes a trend line based on a linear regression of prelaunch values.

Figure 1. Medicare Spending per Patient: Ben Archer Health Center



The trend line for spending slopes down prior to launch, which is somewhat surprising because the population is aging (we analyze the same individuals before and after the innovation was launched) and medical care inflation is generally positive. Although spending is close to the trend line in the first period after launch, it is higher in subsequent periods. We have not yet tested whether postlaunch spending is statistically different than trend values. As shown in ***Table 8***, the standard deviation for spending is very high, representing the skewed nature of expenditures. We will estimate the statistical impact of the innovation in later reports as more data become available.

The all-cause inpatient admissions rate per 1,000 participants is shown in ***Table 9*** and ***Figure 2***.

Table 9. All-Cause Inpatient Admissions Rate per 1,000 Enrollees: Ben Archer Health Center

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare
Admissions Measure: All cause

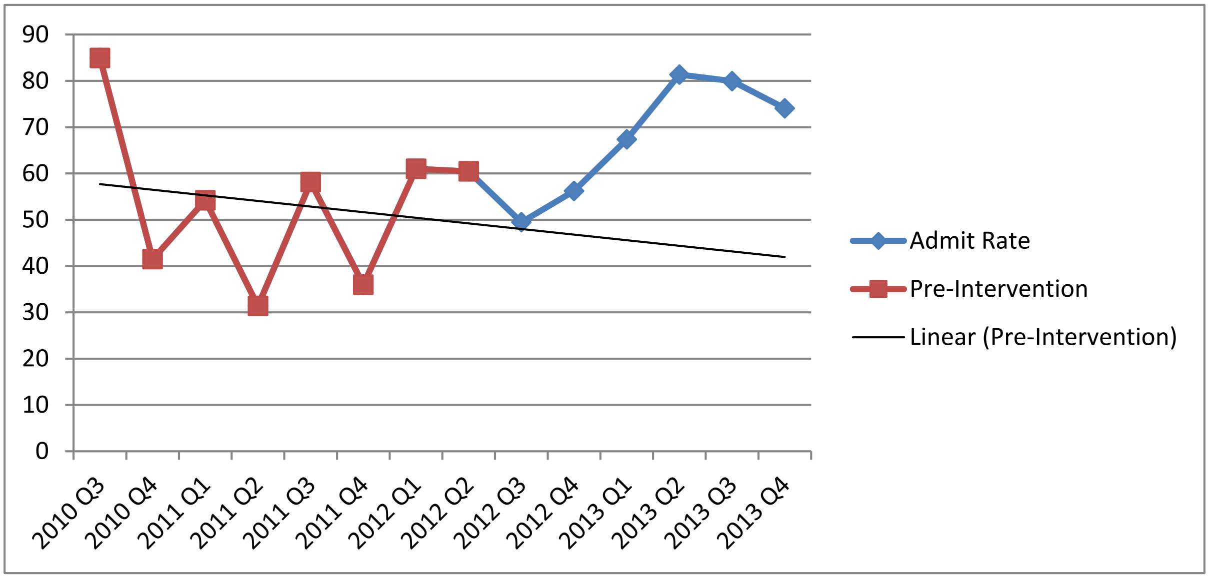
Awardee Number	Description	Baseline Quarters								First Intervention Year					
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4	I5	I6
Intervention Group															
1C1CMS331013	Ben Archer Health Center														
	Admit rate	85	41	54	31	58	36	61	60	49	56	67	81	80	74
	Std dev	414	210	267	215	265	206	269	268	255	328	301	325	363	350
	N. of patients	471	482	498	510	516	528	541	546	566	587	579	590	588	594
Comparison Group															
1C1CMS331013	Ben Archer Health Center														
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year					
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4	I5	I6
—	—	—	—	—	—	—	—	—	—	—	—		

Source: RTI analysis of CCW Medicare claims.
Note: BAHC began enrolling patients on September 5, 2012. I1 is 2012 Q3. Admit rate: total unquarterized admissions/number of unique patients.
— Data not yet available.

Figure 2. All-Cause Inpatient Admissions Rate per 1,000 Enrollees: Ben Archer Health Center



The inpatient admission rate is close to the trend line during the launch quarter before rising above trend in subsequent quarters. Without statistical testing and a better-defined comparison group, it is premature to conclude that the innovation caused the increase; we will examine this question as the evaluation continues.

Hospital readmission rates per 1,000 admissions are shown in ***Table 10*** and ***Figure 3***.

Table 10. Hospital Readmission Rates per 1,000 Admissions: Ben Archer Health Center

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare
Admissions Measure: All cause

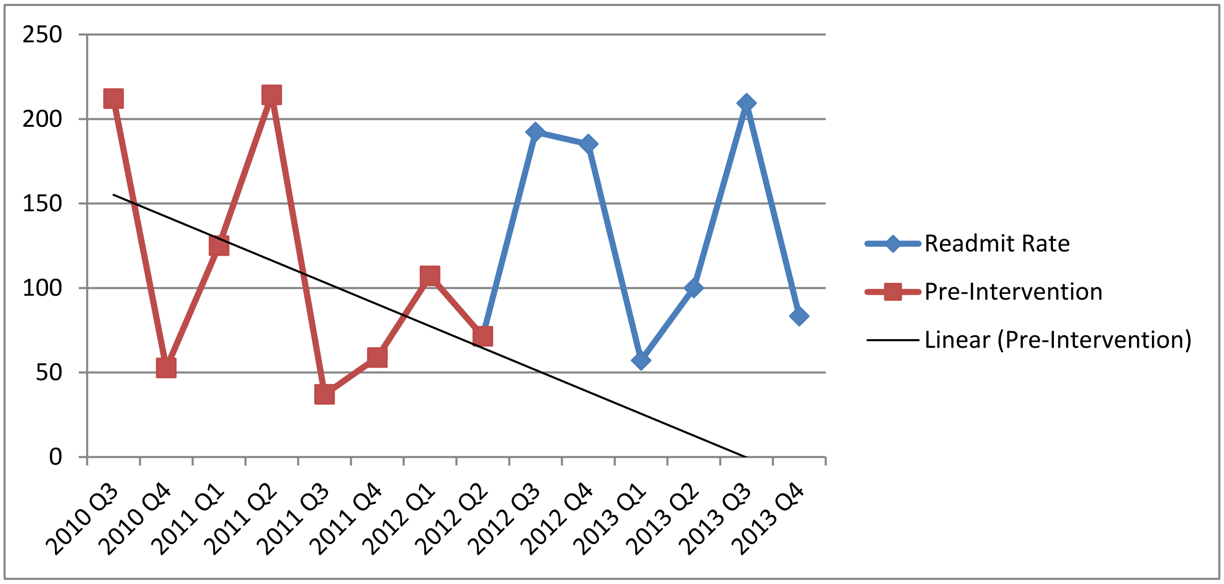
Awardee Number	Description	Baseline Quarters								First Intervention Year					
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4	I5	I6
Intervention Group															
1C1CMS331013	Ben Archer Health Center														
	Readmit rate	212	53	125	214	37	59	107	71	192	185	57	100	209	83
	Std dev	409	223	331	410	189	235	309	258	394	388	232	300	407	276
	Total admissions	33	19	24	14	27	17	28	28	26	27	35	40	43	36
Comparison Group															
1C1CMS331013	Ben Archer Health Center														
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Total admissions	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year					
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4	I5	I6
—	—	—	—	—	—	—	—	—	—	—	—		

Source: RTI analysis of CCW Medicare claims.
Note: BAHC began enrolling patients on September 5, 2012. I1 is 2012 Q3. Readmit rate: sum of all readmissions to eligible hospital within 30 days/all admissions in the quarter. Total admissions: all eligible admissions in the quarter.
— Data not yet available.

Figure 3. **Hospital Readmission Rates per 1,000 Admissions: Ben Archer Health Center**



Readmission rates are highly variable before and after the launch of the innovation, reflecting the relatively small number of hospital admissions for participants during each quarter. With few admissions (the denominator in the readmission rate) and a relatively low underlying percentage of readmissions, the readmission rate exhibits a high variance over time. As with the other variables, we will include statistical tests on the readmission rate in subsequent reports.

ED visits per 1,000 participants are shown in ***Table 11*** and ***Figure 4***.

Table 11. ED Visits per 1,000 Participants: Ben Archer Health Center

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare
Admissions Measure: All cause

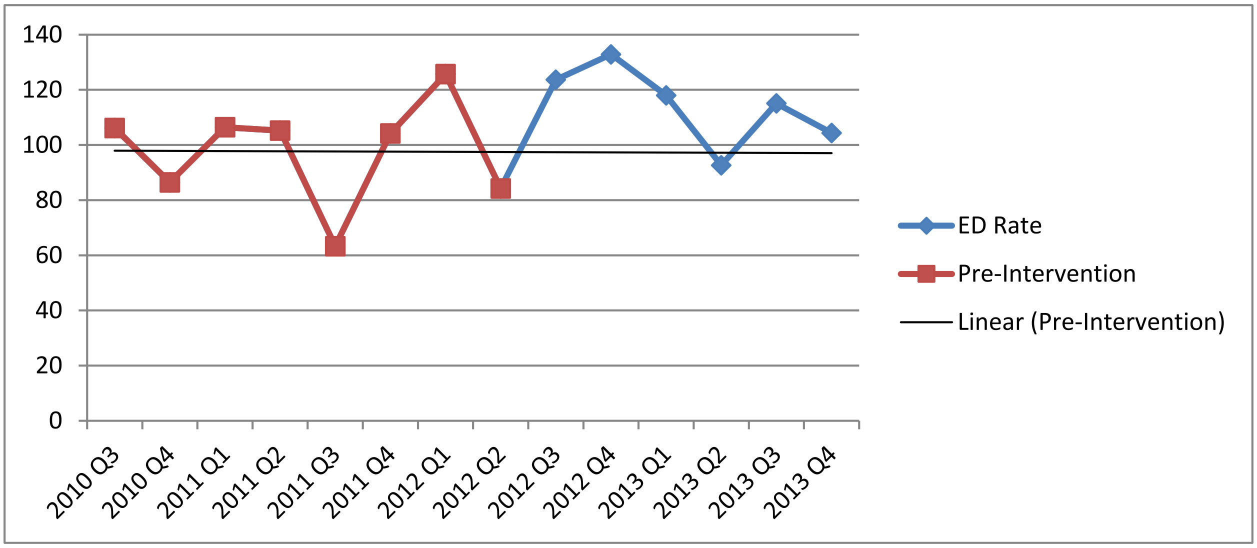
Awardee Number	Description	Baseline Quarters								First Intervention Year					
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**	**I5**	**I6**
Intervention Group															
1C1CMS331013	Ben Archer Health Center														
	ED rate	106	86	106	105	63	104	126	84	124	133	118	93	115	104
	Std dev	525	454	1193	315	807	534	939	556	979	1221	803	901	567	1140
	N. of patients	471	482	498	510	516	528	541	546	566	587	579	590	588	594
Comparison Group															
1C1CMS331013	Ben Archer Health Center														
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year					
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**	**I5**	**I6**
—	—	—	—	—	—	—	—	—	—	—	—		

Source: RTI analysis of CCW Medicare claims.
Note: BAHC began enrolling patients on September 5, 2012. I1 is 2012 Q3. ED rate: total quarterized ED visits and observation stays/number of unique patients.
— Data not yet available.

Figure 4. ED Visits per 1,000 Participants: Ben Archer Health Center



The ED visit rate trend line is virtually flat prior to launch, although the time series exhibits a fair amount of variability. The ED visit rate is above the trend line for five of the six quarters after launch. As with the other variables, we will include statistical tests on the ED visit rate in subsequent reports as more data become available.

Medicaid Claims Analysis

The Medicaid data analysis will use data from the CMS Alpha-MAX data files. Currently, Medicaid claims for BAHC are only available in Alpha-MAX through the second quarter of 2013, and claims for the final quarter may not be complete. Analysis of BAHC Medicaid claims is in process, and we will provide Medicaid analyses in future reports. We will report tables and figures similar to those for Medicare.

Discussion of Claims Analysis

The four measures provide descriptive data on patients enrolled in the BAHC innovation before, during, and after the launch of the innovation. Although it is necessary to report these measures to support CMS's broader assessment of its full portfolio of innovation projects, the measures may not provide a complete evaluation picture of the BAHC innovation. There are a number of reasons for this. First, although the innovation was launched on September 5, 2012, not all patients were enrolled at that time. We are obtaining information on the enrollment dates for patients that will allow us to control for starting dates. Second, the impact of a care management innovation may not be immediate because it takes time for care management to achieve changes in health care utilization. Third, although all BAHC beneficiaries may potentially benefit from the innovation, the benefits may be most pronounced for the more complex patients. The four measures listed above are reported at the aggregate level for all Medicare patients. Fourth, the simple trend lines provided in the figures represent trends for BAHC patients before launch of the innovation. BAHC does not control for external factors that coincide with the innovation launch and affect the measures both for BAHC and for other providers. As described below, we are developing additional comparison groups for BAHC. Finally, each of the four measures has a high standard deviation, suggesting that it may be difficult to statistically distinguish between innovation effects and random fluctuation. This is particularly true for the hospital readmission rate where the underlying number of index hospitalizations (the denominator in the readmission rate) is low and small differences in the number of readmissions (the numerator) can lead to large swings in the readmission rate.

Development of Comparison Groups

In addition to comparing BAHC patients before and after implementation of the innovation, we are constructing a comparison group of Medicare and Medicaid fee-for-service patients in rural New Mexico. This comparison group will control for external, noninnovation factors affecting both BAHC and non-BAHC patients. The comparison area will be limited to rural areas of New Mexico, avoiding the larger metropolitan areas of Albuquerque and Santa Fe. We are using propensity score matching to identify patients with similar characteristics as BAHC patients. Results for the comparison group will be included in later reports.

1.3.3 Other Awardee-Specific Data

Overview of Data Request

RTI met with BAHC on August 6, 2014, to request the raw patient- and CHW-level data used to generate the measures in ***Tables 4*** and ***7*** for each quarter. BAHC provided data to RTI in mid-September 2014.

Health Outcomes

Once we review and query the database from BAHC, we will have a better understanding of what type of results we will provide. ***Tables 12*** and ***13*** are example shells of findings we anticipate presenting.

Table 12. Average Patient Health Outcomes Over Time

Health Indicator	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Diabetes							
Hemoglobin A1c	—	—	—	—	—	—	—
Hypertension	—	—	—	—	—	—	—
Blood pressure	—	—	—	—	—	—	—

— Data not yet available.

Table 13. Percentage of Patients by Measures of Health Outcomes Over Time

Measure	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Diabetes Management							
Percentage of patients with diabetes who had hemoglobin A1c > 9.0%	—	—	—	—	—	—	—
Percentage of diabetes patients who received an eye exam	—	—	—	—	—	—	—
Percentage of diabetes patients who received a foot exam	—	—	—	—	—	—	—
Blood Pressure Management							
Percentage of patients with a diagnosis of hypertension with last blood pressure < 140/90 mm Hg	—	—	—	—	—	—	—
Vaccinations							
Percentage of patients who received an influenza vaccination	—	—	—	—	—	—	—
Percentage of patients who received a pneumonia vaccination	—	—	—	—	—	—	—
Utilization							
Percentage of asthma patients who with an asthma-related ED or urgent care visit in the past 6 months	—	—	—	—	—	—	—

ED = emergency department.
— Data not yet available.

1.3.4 Discussion of Other Awardee-Specific Findings

The table shells above will be updated in subsequent annual/quarterly reports as data become available.

1.4 Overall Program Effectiveness to Date

As a network of 10 community centers, BAHC is the primary source of health and dental care to northern Don Ana County’s 15,000 residents. With this innovation, BAHC hopes to address several health gaps in the community, including access to health services, chronic disease (diabetes, hypertension, and asthma) management and education, and immunizations. BAHC’s history of using CHWs in the community to connect its rural residents to health and medical services has been an invaluable asset for this innovation. CHWs are well respected in the community and highly knowledgeable of local resources, which has facilitated their relationship with providers, so they have become an integral part of the health care team in providing needed services to the community. During the site visit, the team highlighted the importance of teamwork and communication to effectively meet patients' needs. The innovation has strong leadership support and is a priority; BAHC leadership can articulate a clear vision for the program and their involvement. Overall, staff feel well supported and trained to effectively meet the needs of patients.

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October 2014

Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring

Annual and Site Visit Report

Bronx Regional Health Information Organization (Bronx RHIO)

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OVERALL EVALUATION SUMMARY

RTI International was selected to lead an independent evaluation of the 24 Health Care Innovation Award (HCIA) awardees categorized as Community Resource Planning, Prevention, and Monitoring (Community Resource). In this role, RTI is conducting an in-depth evaluation of each innovation, as well as a cross-site evaluation that includes similar innovations targeting the same priority outcomes (e.g., emergency department [ED] visits). For each of the 24 awardees, this report presents findings from the first year of the evaluation (beginning September 23, 2013, and including data obtained by RTI as of September 11, 2014). The report is based on multiple data sources, including operational reports, self-monitoring plans, site visits, and quantitative data analysis.

The evaluation methods vary by awardee innovation, based on the type of innovation and availability of data. RTI has reviewed and coded all existing documents from awardees through December 31, 2013, and incorporated that knowledge into each awardee’s overview. Our review included awardees’ original applications for funding, original and current operational and self-monitoring plans, and quarterly narrative and monitoring reports. For this annual report, we incorporated activities reported through the awardee’s seventh quarterly report (i.e., through March 31, 2014).

Between April and August 2014, teams of at least two staff from the RTI team visited all 24 awardees for 2 to 4 days, depending on the number of interviews conducted. Teams included a subject matter expert, with training and experience specific to the awardee’s innovation, and a master’s- or bachelor’s-level colleague to take notes. Before each visit, the teams reviewed all available documentation from the awardee to learn about the innovation’s goals, objectives, and status. The purpose of the site visits was to clarify our understanding of the innovation, obtain detailed information on the implementation process, and review awardee-specific data to determine which elements to incorporate into the evaluation. By August 13, 2014, all 24 awardees had been visited and a thorough description of our findings included in each of the 24 awardee sections.

In addition to the site visits, we report quantitative data from two possible sources for several awardees. First, we present findings from claims analysis for awardees in this report if they both provided us with patient identifiers and reported enrolling participants who are Medicare and/or Medicaid beneficiaries. RTI has obtained patient identifiers from most of the 24 awardees to conduct claims analysis. Second, we present data RTI obtained directly from awardees to quantify their work in addressing health care costs, quality, and patient outcomes. Data from additional awardees will be analyzed and presented in future reports, as data become available and awardees enroll sufficient participants. An update on the availability of Medicare/Medicaid claims and other awardee-specific data, analysis of data available to us and cleaned as of September 11, 2014, a summary of the comparison groups, and a list of draft evaluation measures are included in each awardee section.

1. HCIA COMMUNITY RESOURCE AWARDEE: BRONX RHIO

1.1 Introduction

Bronx Regional Health Information Organization (Bronx RHIO) received an award of $12,689,157 beginning on July 1, 2012 and launched the Bronx Regional Informatics Center (BRIC) innovation on February 20, 2014. The BRIC innovation goals include the following:

1. **Reduce costs** by improving clinical quality in the member RHIO sites. Bronx RHIO expects net savings of $15 million over 3 years.
2. **Improve care** by providing countywide data that will focus care managers' patient work lists on target patients.
3. **Improve health** by increasing rates of Bronx residents receiving preventive services at the appropriate times related to avoiding preventable admissions, preventing 30-day readmissions, and reducing preventable ED visits.

1.1.1 Innovation Components

This intervention includes two main components: (1) analytics to produce aggregate reporting for RHIO providers, and (2) a trained workforce to conduct analytics to target the care of patients living in the Bronx. The BRIC innovation seeks to use a newly trained workforce of health informatics analysts to provide analytics on the data of the more than 750,000 patients who have consented to have their data accessible in the Bronx RHIO. The reports support of interventions to reduce preventable inpatient admissions and emergency visits for patients with chronic conditions. This support is accomplished through improved efficiency and effectiveness of care coordination.

The innovation is supported by several key partners (***Table 1***) who help the Bronx RHIO implement and evaluate the innovation components. As the program moves towards full implementation, these partnerships are of vital importance to achieving the innovation's following two objectives and related tasks:

- Develop an infrastructure to utilize data from member records to generate information that providers can use in their daily practice to improve patient care and health. Provider end users work with the analysts to develop analytic parameters for report generation and dissemination to identify the key data elements that will be tracked and reported.
- Establish workforce training to enable Bronx RHIO and member providers to integrate analyzed and organized information into their daily practice at member sites.

Table 1. HCIA Partners, Role, and Location

Partner Name	Role in HCIA Project	Location
Research Foundation of the City University of New York/ Bronx Community College	Vocational training services	New York City, NY
Streamline Health	Health IT expertise	New York City, NY
Weill Cornell Medical College's Center for Healthcare Informatics and Policy	Awardee evaluation and monitoring	New York City, NY
OptumInsight	Health IT expertise	San Jose, CA/Eden Prairie, MN

Source: Site visit July 15–16, 2014; Lewin data (Q7).
HCIA = Health Care Innovation Award, IT = information technology.

OptumInsight developed the infrastructure to support analytics. Streamline Health developed the front-end interface to run reports. Bronx Community College (BCC) developed and implemented the training program. The RHIO has partnered with Cornell to evaluate its efforts.

Component 1: Data Analytics

The first component involves development of the BRIC and interface to access it. The RHIO, which has been in existence since 2005, houses information for the 750,000 patients who have consented to have their information shared. The RHIO’s member sites in the Bronx contribute consented patient data in the form of automated data feeds from the electronic health record (EHR) and/or practice management system. The RHIO’s largest partners are Montefiore Medical Center, Bronx Lebanon Hospital, St. Barnabas Health System, Morris Heights federally qualified health center (FQHC), Martin Luther King FQHC, and Visiting Nurse Service of New York (VNSNY). The Bronx Veterans’ Administration (VA) hospital can access data for their patients who receive care outside of the VA system, but does not contribute its own data. After patients consent to have their health information accessed through the RHIO, providers from a member site can review patient records across all Bronx RHIO sites. For example, a provider at Montefiore can look up a patient and see that patient’s visits, orders, and other pertinent health information across participating sites where that patient receives care.

Although the capacity to view consented patients’ EHRs across member sites is extremely helpful when caring for individual patients, this capability relies on providers to know that patients are seeking care in multiple locations and to actively look them up. In addition, the RHIO was not designed to conduct analyses across patients. Thus, the BRIC was developed to provide an infrastructure for analytics and automated notifications. OptumInsight is the partner that supports the BRIC. The BRIC does not include a user interface. To create a mechanism to run reports based on the data in the BRIC, the Bronx RHIO partnered with

Streamline Health, which has a user interface for aggregate reporting called Clinical Looking Glass (CLG).

The BRIC consists of two tools: 1) Bronx Regional Analytic Database (BRAD) and 2) CLG software. Data from consented patients of member sites feed into the BRAD. The BRAD collects the raw data received from various EHRs of member sites and stores the data in tables based on specific patient identifiers and variables (e.g., death, insurance codes, diagnosis codes, etc.). The CLG is the user interface that accesses the BRAD raw data to map to standardized reporting tables. When a member site requests a report for a specific patient population, analysts use CLG to create the reports. The analytic activities that make CLG feasible and accessible to provide reports include the following: managing patient records, linking consented patients to the RHIO, merging medical record transactions, mapping health insurance information, and identifying patients assigned to accountable care organizations (ACOs), health homes, or other population management programs.

The BRIC innovation utilizes analytics to provide custom reports for partners. The clinical partners determine the data they want to see and they are responsible for taking action based on the reports. Some clinical sites use the reports to confirm demographic data. Other sites ask for reports of patients with uncontrolled chronic conditions so that they can follow up. Sites may also use the reports to facilitate their own internal quality improvement programs. In addition to reports, the BRIC supports alerts that can be customized to be real-time or on a regular basis. For example, providers could receive alerts when a patient in their practice presents to the ED. This scenario highlights the importance of analyzing the bank of data in the Bronx RHIO.

Component 2: Workforce Development for Data Analytics

Conducting analyses based on the RHIO and the underlying data quality and review work to support those analyses requires skills and training. Bronx RHIO partnered with BCC to train informatics analysts, a new type of health worker, to conduct analyses on data collected from Bronx RHIO member sites (***Table 2*** outlines the informatics analysts' functions and training). Some of the BCC graduates work at the Bronx RHIO to conduct analyses, while others work at the participating member sites most of their time.

Informatics Analyst Role and Functions

Each informatics analyst is assigned a subset of sites to support. Larger sites have more than one analyst. Prior to developing reports for a given site, the assigned informatics analyst(s), clinical director, and data manager will meet with the site staff to discuss how the site collects and reports data for data transfer purposes. There is not consistency in EHR systems or requests for reports across sites. Thus, the informatics analysts must understand the site's systems and how data are stored to adequately design unique reports. The assigned analyst will document how to run site-specific reports. This partnership between the site and the analysts allows analysts to develop expertise on a site's data feeds and health information technology (HIT) system as well as efficiencies to quickly produce and tailor these reports as data feeds improve or the volume of data increases.

Table 2. Informatics Analysts Functions and Training

Characteristic Type	Bronx RHIO Role
Title	Informatics analyst
Minimal qualifications	IT degree and/or a high school diploma (or GED) BCC graduate At least 2 years of IT work experience in health information management, health care, or IT
Functions	Maintain relationship with site Conduct data quality audits Troubleshoot HIT issues among BRAD database and CLG and SQL software Develop reports for sites Obtain user requirements for reports
Established continuing education program	Weekly meetings with colleagues and supervisor to discuss queries and HIT challenges/solutions

Sources: Site visit, July 15-16, 2014; Bronx Community College Health Information Technology specialist entrance criteria (http://www.bcc.cuny.edu/Continuing-Education/?p=Health-Information-Technology-Specialist).

BCC = Bronx Community College; BRAD=Bronx Regional Analytics Database; HIT = health information technology; IT=information technology.

In addition, the informatics analysts conduct a number of data quality functions: performing quality checks, working with RHIO technical staff to address problems, and working with site technical staff to understand feeds and special projects. Infrastructure activities include developing mapping tables between a site's EHR and the BRAD and identifying business requirements for changes. For example, member sites may change the format or the variable names for the data they are collecting. If the member site does not alert the RHIO of these changes, then the analytics may not be reported accurately. Sites are focused on their own internal operations and may neglect to inform the RHIO of these changes. Thus, these data changes can slow down the process for creating reports. The analysts are now trying to touch base with sites on a weekly basis to address any change management needs in how the sites are reporting data in their EHR systems.

Informatics analysts work with CLG to run reports on a daily basis, but have experienced some initial challenges running queries and reports for member sites. Since CLG is an external program, Bronx RHIO staff cannot view the program code that the software uses to run reports. The repeated delays and unknown error messages from the software led many analysts to use SQL coding to run the reports themselves. Since a vendor representative for CLG software is part of the HIT working group, the analysts worked with her to improve the user interface, and now the software is more intuitive for both the analysts and providers at member sites to use for specific reports.

1.1.2 Program Participant Characteristics

This innovation does not involve direct patient care nor is the awardee responsible for interventions that result from the reports. Thus, defining a program participant is challenging. The target population is drawn from the 750,000 Bronx residents who have consented to have their information accessed by providers through the Bronx RHIO (patient consent is not required for health care facilities to feed data to the RHIO, but information cannot be accessed without patient consent). The Bronx RHIO eventually aims to increase participation in the RHIO to include receiving data from providers who care for as many as possible of all 1.4 million Bronx residents. The RHIO's target population is not limited by disease condition, payer-type (i.e., includes Medicare, Medicaid, Children's Health Insurance Program [CHIP], or private insurance payers) or where they receive their care (i.e., hospitals, patient-centered medical homes, other outpatient providers, health homes, or other case management programs).

Because each of the partner sites defines its own populations of interest and report parameters, defining the patient population for HCIA evaluation purposes is complex. We are currently working with the awardee to more fully understand the reporting and appropriately define program participants. Each site in the RHIO handles obtaining consent differently. Consequently, respondents in the site visit indicated that access to data from the RHIO is greater in some sites than others.

Although the RHIO population is not limited to individuals with specific conditions, the member sites have indicated interest in producing analytic reports for consented patients that are at risk for asthma, hypertension, diabetes, multiple chronic conditions, and other identified high-risk or high-cost clinical conditions.

The majority of the residents in the Bronx are Medicaid (including CHIP) and/or Medicare beneficiaries with low incomes who experience substantial health disparities. According to a 2010 county census, 29% of Bronx individuals live below the poverty line, 25% of residents have no health insurance, and 12.2% of the over-16 population seeking work are unemployed (5.3% nationally and 8.4% city-wide). The target population represents over 75% of the Bronx's $11 billion in annual medical costs. Furthermore, the target population has a high percentage of minorities: 53.5% are Hispanic, 30% are non-Hispanic Black.[1] The size of the population affected should yield a sufficiently large sample size for complex analyses in the impact evaluation. We are working with the awardee to determine the population of patients to use in calculating their outcomes.

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[1] Bronx RHIO application.

Table 3 includes the participants planned for inclusion in the innovation, the related data source, and current count.

Table 3. Patients Planned for Inclusion in Innovation (Denominator Data)

Participant Type	Data Source	Current Count (Data Source)
Patients consented to have information shared with the Bronx RHIO	Bronx RHIO	Approximately 750,000
Consented patients with conditions of interest per member site intervention	BRAD	TBD since awardee is still tracking implementation of these member site interventions

Source: Site visit, July 15–16, 2014; Quarter 7 Lewin Report.
BRAD: Bronx Regional Analytics Database; RHIO = regional health information organization; TBD= to be determined.

The innovation does not involve providing patient care, so there are no direct patients. As indicated earlier, RTI will include in the evaluation only participants who have consented to have their information accessed through the Bronx RHIO and have received services at one of the participating health care facilities. If a patient does not consent to have his/her information accessed, the Bronx RHIO cannot conduct analytics and share this patient information with providers across the participating health care sites. As of quarter (Q) 7, the awardee does not report any participants, or individuals appearing in reports, in the innovation, because the BRAD was still being refined and data issues addressed. The awardee is projected to have 150 participants in Q7 and 200 participants by Q8. Preliminary information collected during the site visit suggests that they have exceeded this goal, but we are working with the site to more fully understand their reporting.

The numbers of participants are predicated on the reports the sites request. The implementation analysts do not determine what reports should be run or what data should appear in them. The sites determine those items; however, the RHIO staff make recommendations and the Bronx RHIO reported that most sites use the same basic template for these reports. Each site has a different focus for reporting. Thus, the participant projections may change over time. During the site visit, we learned that some sites are very specific in their report requests while others are more general. Some sites seek clinical information in reporting and others seek demographic information. In addition, reports can be one-time or ongoing. This variation in reporting makes identifying target participant numbers challenging.

The Bronx RHIO has had approximately 750,000 consented participants to date. During the site visit, we learned that the process for consenting patients was not consistent across sites. At one of the sites where the consent process is not incorporated into the administrative or clinical workflow, the awardee is hiring a community health advocate to work with the site and its patients in an effort to increase the number of consents at sites who are receiving reports. This addition would improve the robustness of reporting.

1.2 Implementation Progress

The extent to which each awardee is able to implement their innovation as planned and reach a sufficient number of patients is critical to assessing their impact on improving health and health care and reducing cost. The fact that this awardee has just begun to launch their innovation is a major concern for the evaluation because they will need to quickly impact outcomes in order to achieve their goals by June 2015. Although the Bronx RHIO has a high number of consented patients within the RHIO, reports have been run on only a small fraction of the total number of patients. Thus, at this point, it is unclear whether Bronx RHIO will have enough participant data from reports to obtain sufficient sample sizes to demonstrate any impacts on key outcomes. The following section provides details on first the implementation process and then the effectiveness; ***Table 4*** lists the measures RTI plans to use in assessing each.

Table 4. Explanatory Measures Influencing Innovation Outcomes (Independent Variables) for Bronx RHIO

Key Evaluation Domains	Subdomains	Measures	Data Source
Workforce development	Education and training	Number of informatics analysts trained	Bronx RHIO training completion records
Implementation process	HIT workflow	Number of reports requested and generated for providers using BRIC	BRIC
Implementation effectiveness	Reach	Number/percentage of unique participants who have consented to share health information with Bronx RHIO	BRAD
		Number/percentage of consented unique participants whose data are analyzed from one of the participating intervention sites/TBD based on the particulars of the individual sites	BRAD

BRAD: Bronx Regional Analytics Database; BRIC: Bronx Regional Informatics Center; HIT = health information technology; RHIO = regional health information organization; TBD= to be determined.

1.2.1 Process

The implementation process has been the initial focus of the evaluation. RTI defines implementation process as including execution of implementation, organizational capacity, engaging key staff and partners, and client recruitment and enrollment. The implementation process is best evaluated through a combination of data variables, including execution of implementation that conforms to operational plans, and capacity for implementing the innovation in a timely and effective manner. We focused on the implementation process during the awardee site visits (July 15-16) and asked such evaluation questions as:

- What is the overall execution of the innovation implementation (e.g., what is the actual rate of expenditures relative to the projected rate)? What are the lessons learned?
- What accomplishments are specific to hiring or training staff so that the organization can build its capacity to implement the innovation effectively?
- How closely has the innovation followed its original implementation plan and timeline? If there are changes, why were they made?

Execution of Implementation

Component 1: Analytics

According to the informatics analysts and HIT working group, cleaning the data feeds is time consuming and requires iterative data quality checks. Several interviewees reported that the time required to prepare the data for reporting was one of the main reasons for the innovation's delay.

Although the project goals have remained consistent since inception, the timeline for accomplishing those goals has been significantly delayed because of issues in standardizing data across sites and data quality issues. Each participating site has a different EHR. Existing standards provide guidance about how data are stored and transmitted, but they have some leeway for interpretation. Thus, each site may transmit data to the RHIO slightly differently. The same piece of data, such as a diagnosis code, may be sent to a different place or in a different format across systems—thus, the data could appear differently in the RHIO. These differences are not of concern when an individual patient record is viewed because the user can see the field name and the content. However, when reports are generated containing data across sites, consistency is important.

When the Bronx RHIO was first started, the management team decided to allow participating sites to submit data to the RHIO with minimal standardization across all sites and data types. During the site visit, the leadership team reported that this decision was made to encourage participation in the RHIO. The result is that important information has been reported in different ways. Once the BRIC was developed with a focus on aggregate reporting, the implications of the previous decision not to standardize data feeds came to light. The team worked to identify inconsistencies and develop mapping tables to address them. The BRIC team spent time to address these issues before going live, which delayed implementation. Then as the first reports were developed, additional data quality and consistency issues arose, which also had to be addressed, and delayed implementation of further reports.

The rate at which awardees expend funds or enroll patients, compared to projection, provides useful information to assess the innovation's status. The Bronx RHIO spend rate for Year 2 is 32%, which is below their projections. The low expenditure and low enrollment rates illustrate the awardee's lack of readiness to implement the innovation at the start and the extent to which they can spend all funding by the end of the project. Because of the delays in data quality review and analytic reporting, corresponding delays have occurred in enrollment and in the overall low expenditure rate, which have impacted overall project implementation.

Component 2: Workforce Development

The Bronx RHIO collaboration with BCC appears to be working as planned. The two organizations reported regularly working together to identify reporting needs of the sites and training needs of the participants. The data quality issues mentioned previously make training challenging. When the data are not trustworthy or difficult to parse, utility of real-time training of reporting through CLG is limited. The site responded by having a person from CLG and a person from the Bronx RHIO teach the training course together.

The BCC reported maintaining strong ties with alumni of their training program and with the employers who employ graduates. BCC staff leverage these ties to recruit future students, disseminate job opportunities, and obtain course feedback to inform curriculum changes.

In terms of enrollment, although Bronx RHIO has no direct participants (i.e., no patients to whom they provide direct care), the extent to which they are able to identify and incorporate these indirect participants into their reporting can serve as a proxy indicator of how well they are integrating patients into the BRIC. The awardee will be reporting indirect participants as those patients served by the participating sites.

Organizational Capacity and Leadership

The RTI team assessed a high level of support for the innovation at all levels of the innovation.[2] Leadership and governance infrastructure appeared to be clearly defined on paper and articulated during the site visit interviews. The Bronx RHIO, initiated in 2005, is the primary lead for the multisite innovation. According to the organizational chart for BRIC, the innovation is overseen by a board of directors, who also works closely with six board committees, which all have a primary function, and the audit & legal advisory board. The six board committees consist of the following focus areas: clinical, executive, finance, technical, health information management (HIM), and patient rights. Under the board of directors is the designated primary leader of the innovation, the Bronx RHIO executive director, who is based within the Bronx RHIO headquarters and is a seasoned leader in health information exchange. The executive director of the innovation is supported by a medical compliance officer, finance and consultants, administrative assistant, and the BRIC project manager.

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[2] Site visit on July 15-16, 2014.

The BRIC project manager oversees the data manager and clinical director, who work closely with the informatics analysts; in turn, they work on a biweekly to daily basis with the participating sites and their specific data feeds. The BRIC project manager is supported by the HIT consulting team that developed the BRAD and an implementation and support manager.

The Bronx RHIO outsources its chief information officer (CIO) and IT functions to an outside firm—for the operations of the RHIO, not necessarily the innovation itself. According to the Bronx RHIO project manager, "The CIO and her team were involved with the details of BRIC development from the very first day of working to develop the BRAD and have been consistently engaged in creating the data model, validating data, and identifying and resolving issues. The CIO and team members from her staff participated directly in two to three meetings per week with Optum and the RHIO on BRAD development and were directly involved in every single data quality issue identified as we moved this process forward."

The implementation partners collaborate through committees that have primary responsibility for developing and implementing key components of the innovation. Feedback from all working groups informs subsequent revisions or redesigns of the key components. This feedback and collaboration among HIT partners was critical to the BRIC innovation because the Bronx RHIO has not had experience in conducting this particular type of analytic model. The RHIO committees helped the analysts and IT team create a data quality system to test how the CLG software received and conducted analytics for the various data feeds. The process of troubleshooting some challenges with the patient identifying information during implementation led to subsequent delays in reporting and enrollment.

Furthermore, various interviewees indicated that the workforce development partner, BCC, is committed, involved, and accountable for training the workforce to implement the innovation. For example, the BCC integrates the health IT leads into teaching some of the CLG courses so that health IT leads can continually improve the software. The Bronx RHIO continues to cover the tuition costs for analysts who attend courses at the BCC. This financial support illustrates the RHIO's commitment to train the analysts in the curriculum that tests the analytic tools in the actual training class to strengthen these tools for the innovation. Despite a delayed launch of almost 2 years, the innovation appears to have capable leadership; the various committees seemed to include the right stakeholders and to be working well.

1.2.2 Workforce Development

One of the three goals of Bronx RHIO's innovation is to train health care workers in analytics and practice design skill to rapidly implement this program, which aims to improve health by increasing rates of Bronx residents receiving preventive services at appropriate times. The workforce development partner, BCC, provides tailored health informatics courses to the Bronx RHIO informatics analysts, who are full-time employees of Bronx RHIO. This section provides an overview of the hiring and retention, as well as training the awardee has conducted in support of the innovation.

Hiring and Retention

As of June 2014, 23 staff members worked on the Bronx RHIO innovation. The 23 staff represent 19.6 full-time-equivalent (FTE) staff which includes: IT technicians/specialists (7); management or administrative staff (4); physician (1); nurse (1); patient advocate (1); pharmacist (1); and other types of health workers (8) that include analysts and educators. Even though 6 FTE staff were hired for the innovation during Q7, the innovation is 6 FTE below their projection for Q7 (22.2 FTE). The RHIO hiring has not met its staffing projections; this lag may be due to the timing of training or the lack of available work since many sites are launching their interventions, which require analysts to track and produce analytic-based reports. RTI will continue to monitor the hiring of FTE because the lack of staff will likely continue to impact implementation. As of July 2014, the awardee hired a community health advocate to be placed in a partnering site to educate patients about the Bronx RHIO with the aim of increasing the number of participants consented to date.

Training

Project leadership and the BCC are highly committed and involved for the training and workforce development for this intervention. Over the course of the innovation, the BCC conducted five training courses for the informatics analysts as well as the analysts at the VA Hospital to prepare them to implement this health innovation effectively. Training more informatics analysts and management or administrative staff will increase the likelihood of achieving innovation objectives specific to launching the intervention and collecting and reporting data with the BRAD and CLG tools. In Q7, Bronx RHIO trained 27 health analysts at the RHIO and individual sites. The intervention has invested in more than 7,301 training hours across 206 trainees (who may have attended more than one training course). In Q8, the program will use baseline data from the first four pilot sites to inform the four new sites. Bronx RHIO will likely enhance the current health IT systems based on the pilot testing feedback from the pilot practices. The informatics analysts explained how training with BRIC-affiliated instructors was used to facilitate data quality review, CLG software enhancement, and other implementation activities (e.g., revisions to the CLG software and testing of queries for analytic-reports). Training at the BCC appeared to provide a collaborative learning environment where feedback was appreciated and implemented to improve the BRIC innovation and various HIT components.

Informatics analysts lead topical weekly training sessions and described them during the site visit. During these informal gatherings, the analysts present a previously run query in either CLG or SQL for a participating site and illustrate their current challenges and questions. As a team, the analysts address the issue and document best practices in a developing data manual that analysts currently already reference.

The informatics analysts had difficulty using the CLG software initially. However, the vendor that designed the CLG software (Streamline Health) provided clear feedback and documentation of error messages, so the software is now more intuitive and user friendly. The analysts also work closely with the data manager to determine how to run site-specific reports. Because of the various EHR systems and data feeds, some analysts prefer to use SQL coding for their reports. Informatics analysts received training in both SQL coding and CLG, and many stated that they feel more confident working with sites to develop their reports. After they learned that the reports depend on the quality of the data, the analysts now spend more time up front with sites to understand their data feeds and what analytics are feasible. One analyst reported that the sites are also learning from the analysts how to improve their data collection and reporting. RTI will continue to gather data from the awardee on how the partnership between the analyst and member may improve data reporting and analytics over time.

1.2.3 Effectiveness

The innovation's effectiveness can be measured through the execution of an implementation as planned (fidelity) with the intended number of participants (reach) and the extent to which participants are exposed to the intervention (dose). After our site visit, the RTI team determined that the awardee had a detailed implementation plan that included staff assignments, milestones, and documentation, especially related to a variety of committees facilitating the decision-making processes.

Fidelity

The innovation's goals have remained consistent since the project's inception. Because of the delayed innovation launch, it may be difficult to show outcome improvement during the course of HCIA funding.

Several issues prevented the innovation from being implemented as planned. The data quality and integrity issues took longer to address than anticipated. The data quality review process delayed implementation because prior to the innovation, the Bronx RHIO accepted data in various formats to encourage participation among area providers. After the RHIO realized the time required to standardize data from the various sites, the RHIO had to conduct thorough data quality reviews and work more closely with sites to collect data variables for specific reports. Even where standards existed, they were interpreted differently across providers. Although the lack of consistency is not a problem when records are viewed records individually, inconsistencies in format and structure present significant challenges for aggregate reporting.

Due to the inconsistencies across sites in consent processes and obtaining consent from more patients, the innovation added a new role—the community advocate. This individual was not part of the initial implementation plan; thus, the addition of the role illustrates how the awardee is trying to address the challenge of incorporating the RHIO consent into a site's workflow. RTI will monitor the status of this new role to determine if it affects the fidelity of the innovation.

RHIOs are community resources with data contributed by multiple sites. These sites typically have other HIT initiatives occurring at the same time; thus, when the sites change their format for data collection and reporting, the sites often forget to inform the RHIO of these data format changes. These slight changes in the data format without the RHIO's knowledge can lead to inaccurate analytics and reporting. If an informatics analyst is available onsite, that person can work with the RHIO to ameliorate the impact of data format changes. Otherwise, the site makes data format changes and the RHIO technical staff and informatics analysts troubleshoot after the fact. Prior to the BRIC implementation, these data issues for interoperability were unknown. The BRIC has identified data issues at member sites and improve data quality within and among sites.

Reach

Reports typically focus on a given condition. By generating reports and sending them to participating providers, the innovation reaches the member site's population of interest. RTI will monitor the status of these activities to determine on the number of patients "reached" relative to their target population. We will report the reach measure in ***Table 5*** as data become available.

Table 5. Patient Enrollment and Reach for Each Quarter Since Project Launch

A	B	C	D	E
Quarter (End Date)	**Target Population (Denominator Designated by Organizational Leadership)**	**Number of Unduplicated Patients Captured in a Report**	**Total Reach per Quarter (=C/B)**	**Percent Change from Previous Quarter**
March 2014	—	—	—	—
June 2014	—	—	—	—
July 2014	—	—	—	—

Source: Patient-level data to be provided to RTI.
— Data not yet available.

1.3 Evaluation Outcomes

Awardees have two possible types of quantitative data that RTI will use in assessing the impact of the awardee's innovation on key outcomes. These include claims data for Medicare or Medicaid beneficiaries, depending on who the awardee serves, and administrative or utilization data the awardee is collecting (which we have categorized as "other awardee-specific data," reflecting the variability of the types of data elements available across awardees). We are finalizing our assessment of all available data sources and requesting data directly from each awardee. As those data are received, we will incorporate the findings into subsequent reports. The following sections present descriptive findings from the quantitative outcome data available to RTI as of September 11, 2014.

1.3.1 Measures for Evaluation

The measures listed in ***Tables 4*** and ***6*** reflect those determined as most relevant for our evaluation of Bronx RHIO's innovation.

Table 6. Outcome Measures for Bronx RHIO

Key Evaluation Domains	Subdomains	Measures	Data Source
Clinical effectiveness	Diabetes	Percentage of patients with diabetes received a hemoglobin A1c and lipid profile assessment	BRAD
Health outcomes	Diabetes	Percentage of patients with diabetes who had hemoglobin A1c > 9.0 %	BRAD
		Percentage of patients with diabetes who had LDL-C < 100 mg/dL	BRAD
Health care outcomes	Utilization	ED visit rate	BRAD; Claims
		All-cause admission rate	BRAD; Claims
		Readmission rate	BRAD; Claims
		Percent of patients who have had a visit to an ED/urgent care office	BRAD; Claims
	Cost	Spending per patient	Claims data
		Cost savings	Claims data

ED = emergency department; BRAD = Bronx RHIO Analytic Database.

1.3.2 Claims Data

As part of a broad assessment of health care innovations, the Center for Medicare & Medicaid Innovation (CMMI) is assessing the impact of its programs, including those funded specifically by HCIA, on four core measures. The four core measures are

- health care spending per patient,
- hospital inpatient admissions,
- hospital unplanned readmissions, and
- ED visits.

Collectively, CMMI programs are anticipated to slow the increase in health care spending, reduce hospital admissions, reduce avoidable hospital readmissions, and prevent unnecessary ED visits. We are reporting these measures for all HCIA Community Resource awardees so that the collective impact of the awards can be assessed. As discussed below, some awardees' innovations may not be focused on these measures. Other awardees' innovations target specific conditions (e.g., imaging, diabetes, etc.) and may have significant impacts on spending, admissions, readmissions, and ED visits for the targeted conditions but not have a statistically detectable impact on the measures at the aggregate level because the targeted conditions represent only a small fraction of total spending, inpatient admissions, and ED visits.

The measures are calculated through analysis of Medicare and Medicaid fee-for-service claims. Because of differences between Medicare and Medicaid patients in age, other demographic variables, and disease status, we report the Medicare and Medicaid results separately below. Currently, complete Medicare claims are available through the end of 2013. Medicaid claims for Bronx RHIO are will be available through Q2 2013, although claims for the final quarter may not be complete. The Bronx RHIO innovation began enrolling patients on February 20, 2014; therefore, in this report, data are presented for baseline quarters only.

- **Health Care Spending per Patient**. For Medicare beneficiaries, health care spending per patient includes Part A and Part B Medicare expenditures for persons enrolled in the Part A and Part B fee-for-service program. The variable focuses on Medicare fee-for-service spending, so Medicare managed care (Part C) services are excluded, as are beneficiary copayments. Medicare Part D prescription spending is also excluded. Spending is reported on a per-person per-quarter basis. If a beneficiary is not enrolled for every month in a quarter, spending (except for hospital inpatient spending) is prorated to a quarterly basis based on the number of days enrolled during the quarter. Because hospital inpatient admissions are both rare and expensive, spending is not prorated for hospital inpatient spending. Prorating is also not performed for beneficiaries who die during a quarter.

  For Medicaid beneficiaries, health care spending per patient is reported for fee-for-service beneficiaries. Beneficiaries are only included in the analysis for spending (and the other measures) during periods when they are enrolled in Medicaid.

- **Hospital Inpatient Admissions**. This variable measures hospitalization, the single most expensive component of health care spending. Patients kept overnight in observation beds are excluded from this measure. Inclusion criteria for the analysis are the same as for spending. Hospital inpatient admissions are not prorated based on the number of days eligible during the quarter. All-cause inpatient admissions and ACSC admissions are reported separately, under the assumption that a greater share of ACSC admissions can be prevented by appropriate ambulatory care. The mean quarterly admission rate per 1,000 patients is reported.

- **Hospital Readmissions**. Hospital readmission rates serve a dual purpose in evaluating HCIA impacts. Readmissions add to the costs of a prior hospitalization, and they often reflect a problem in the care provided during the first admission. All-cause readmissions are defined as a follow-up admission to any short-term acute general or long-term care hospital within 30 days of a discharge from another hospital of the same type. We ignore multiple admissions within 1 day of an initial admission because these often represent transfers between hospitals. We define index hospitalizations that begin during the quarter and follow each index admission for 30 days, even when the follow-up period extends beyond the end of the quarter. Inclusion criteria for the analysis are the same as for total spending. We also calculate readmissions for persons with ACSC. The person's ACSC status is defined by the first hospitalization during the quarter. The readmission rate equals the number of readmissions divided by the number of index hospitalizations during the quarter. Planned readmissions are excluded from the calculation of the numerator. Quarterly mean readmission and ACSC readmission rates per 1,000 admissions are reported.

- **ED Visits.** ED visits are sometimes viewed as a symptom of the inability of the community's health care system to provide adequate preventive and ambulatory care visits. We report an all-cause ED visit rate that excludes ED visits resulting in an inpatient admission (that presumably represent unavoidable visits) and includes overnight ED visits without an inpatient admission. Inclusion criteria for the analysis are the same as for spending, and ED visits are also subject to the same prorating formula as for spending. The mean quarterly ED visit rate per 1,000 patients is reported.

Medicare Claims Analysis

Out of 507,526 individuals who consented to share their identifying information by September 2013, 79,626 Medicare beneficiaries were identifiable in the CMS Chronic Conditions Data Warehouse (CCW). The analysis focuses on 35,908 Medicare beneficiaries enrolled in fee-for-service Medicare Parts A and B who have been consented. In the tables that follow, these beneficiaries are listed as the "Intervention Group" because they were eligible to be included in reports and receive interventions after the innovation was launched. It is not yet clear how many of these beneficiaries will actually be included in reports and receive intervention services.

We present the measures for these beneficiaries in the baseline quarters before the innovation was launched on February 20, 2014. Analyses on the innovations will be presented in later reports.

Table 7 reports Medicare spending per patient in the 8 quarters before the launch date.

Table 7. Baseline and Intervention Trends in Health Care Spending per Patient

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters							
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**
Intervention Group									
1C1CMS331065	Bronx RHIO								
	Admit rate	$5,361	$5,727	$5,654	$5,642	$5,765	$5,972	$5,733	$6,003
	Std dev	$15,347	$16,019	$16,045	$15,784	$16,102	$16,827	$15,797	$16,255
	Unique patients	34,257	34,390	34,820	35,257	34,965	35,333	35,609	35,908
Comparison Group									
1C1CMS331065	Bronx RHIO								
	Spending rate	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—

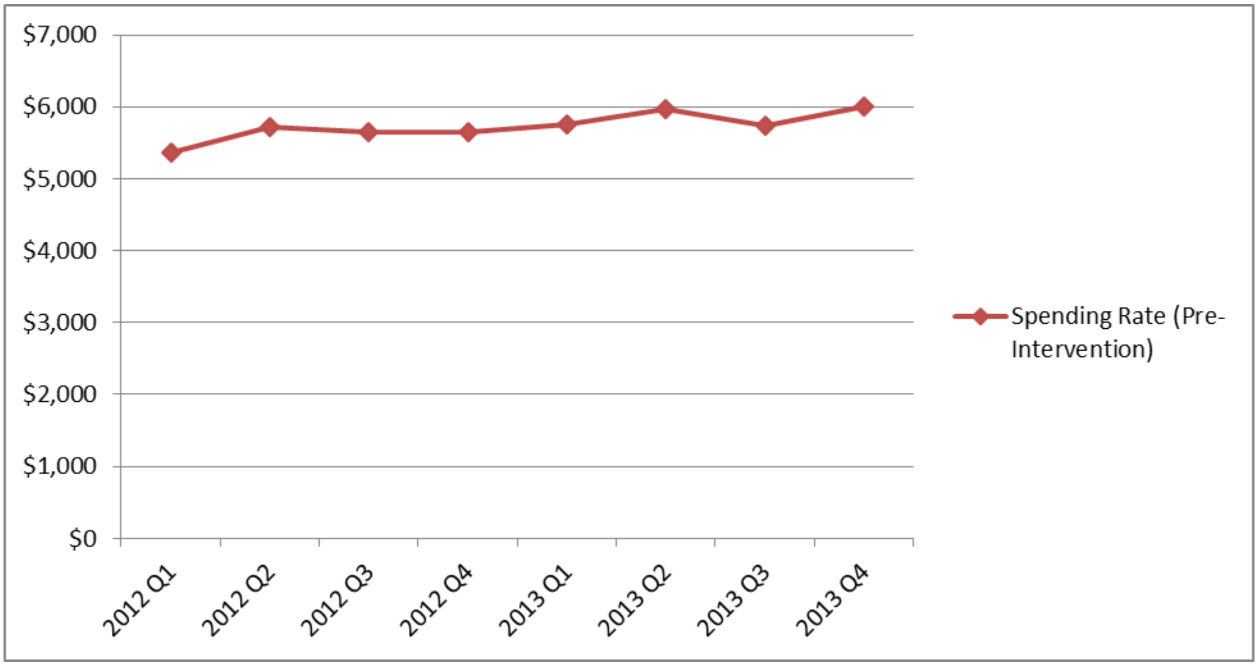
Savings per Patient

Baseline Quarters							
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**
—	—	—	—	—	—	—	—

Source: RTI analysis of Chronic Conditions Data Warehouse (CCW) Medicare claims.
Note: Spending rate: total quarter (i.e., quarterized) payments/number of unique patients. Savings per patient: difference in comparison minus the intervention’s average spending rates.
— Data not yet available.

Figure 1 plots spending as a function of time. The red line represents values in quarters prior to the innovation's launch date.

Figure 1. Medicare Spending per Patient: Bronx RHIO



Spending increases by $642 between Q1 2012 and Q4 2013. This increase may possibly reflect the aging of the sample population (because we analyze roughly the same individuals across time) and general medical care inflation. In later reports as more data become available, we will estimate spending after launch and compare impact of the innovation to the baseline data.

The all-cause inpatient admissions rate per 1,000 participants is shown in ***Table 8*** and ***Figure 2***.

Table 8. Baseline Trends in Admissions per 1,000 Patients

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare
Admissions Measure: All cause

Awardee Number	Description	Baseline Quarters B1	B2	B3	B4	B5	B6	B7	B8
Intervention Group									
1C1CMS331065	Bronx RHIO								
	Admit rate	175	178	173	171	176	180	177	177
	Std dev	525	544	534	522	525	532	533	542
	Unique patients	34,257	34,390	34,820	35,257	34,965	35,333	35,609	35,908
Comparison Group									
1C1CMS331065	Bronx RHIO								
	Admit rate	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—

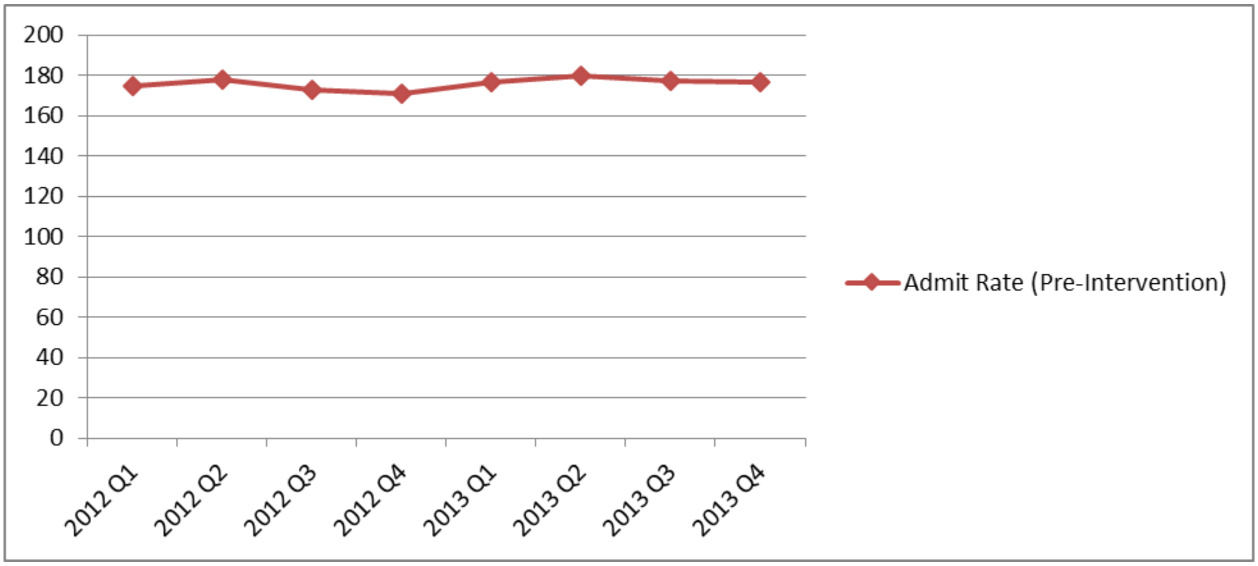
Intervention—Comparison Rate

Baseline Quarters B1	B2	B3	B4	B5	B6	B7	B8
—	—	—	—	—	—	—	—

Source: RTI analysis of Chronic Conditions Data Warehouse (CCW) Medicare claims.
Note: Admit rate: total unquarterized admissions/number of unique patients.
— Data not yet available.

The inpatient admission rate (***Figure 2***) appears to be constant through the baseline period.

Figure 2. All-cause Inpatient Admissions Rate per 1,000 Enrollees: Bronx RHIO



The all-cause inpatient readmissions rate per 1,000 participants is shown in ***Table 9*** and ***Figure 3***.

Table 9. Baseline Trends in Readmissions per 1,000 Admissions

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare
Admissions Measure: All cause

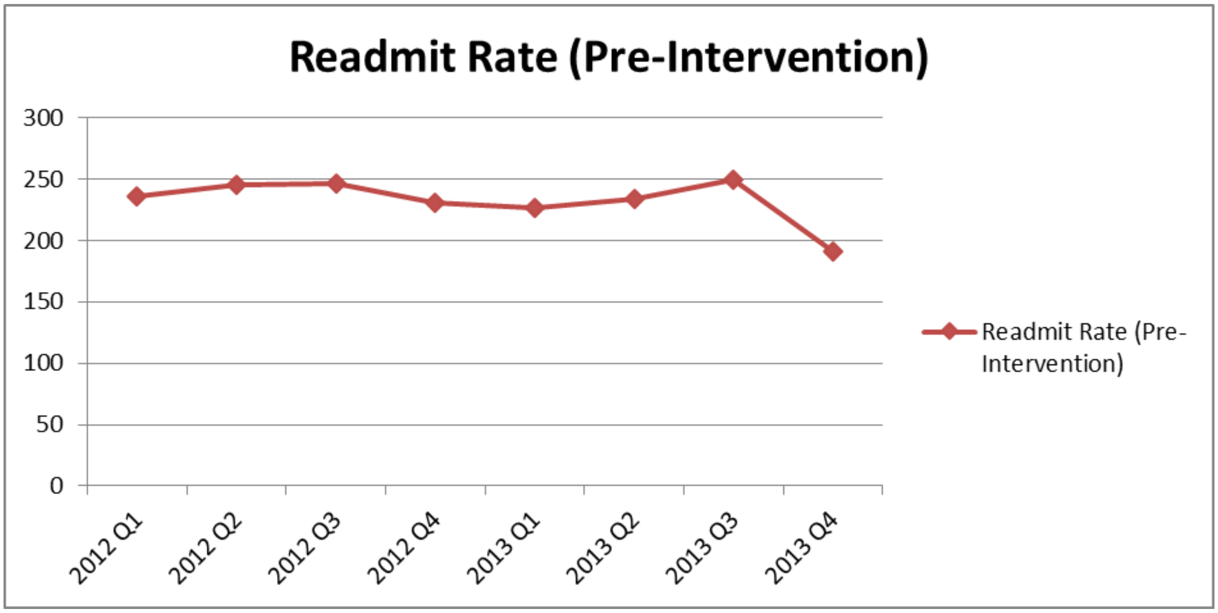
Awardee Number	Description	Baseline Quarters							
		B1	B2	B3	B4	B5	B6	B7	B8
Intervention Group									
1C1CMS331065	Bronx RHIO								
	Readmit rate	236	245	247	231	226	233	250	192
	Std dev	425	430	431	421	419	423	433	394
	Total admissions	5,372	5,373	5,300	5,335	5,455	5,602	5,573	5,554
Comparison Group									
1C1CMS331065	Bronx RHIO								
	Readmit rate	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—
	Total admissions	—	—	—	—	—	—	—	—
Intervention—Comparison Rate		—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters							
B1	B2	B3	B4	B5	B6	B7	B8
—	—	—	—	—	—	—	—

Source: RTI analysis of Chronic Conditions Data Warehouse (CCW) Medicare claims.
Note: Readmit rate: sum of all readmissions to eligible hospital within 30 days/all admissions in the quarter. Total admissions: all eligible admissions in the quarter.
— Data not yet available.

Figure 3. Hospital Readmission Rates per 1,000 Admissions: Bronx RHIO



ED visits per 1,000 participants are shown in ***Table 10*** and ***Figure 4***. These are stable throughout the baseline period.

Table 10. Baseline Trends in ED Visits per 1,000 Patients

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

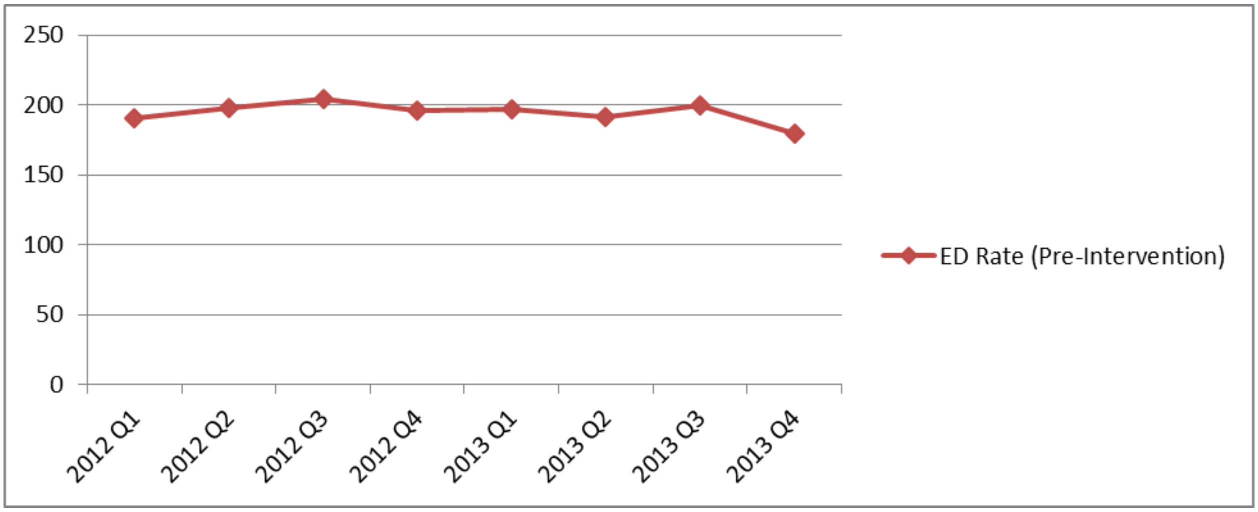
Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
1C1CMS331065	Bronx RHIO												
	ED rate	191	198	205	196	197	191	200	180	—	—	—	—
	Std dev	1,312	1,129	1,151	1,146	1,148	1,222	1,284	1,245	—	—	—	—
	Unique patients	34,257	34,390	34,820	35,257	34,965	35,333	35,609	35,908	—	—	—	—
Comparison Group													
1C1CMS331065	Bronx RHIO												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of Chronic Conditions Data Warehouse (CCW) Medicare claims.
Note: ED rate: total quarterized ED visits and observation stays/number of unique patients.
— Data not yet available.

Figure 4. ED Visits per 1,000 Participants: Bronx RHIO



Medicaid Claims Analysis

The Medicaid data analysis will use data from the CMS Alpha-MAX data files. Currently, Medicaid claims for Bronx RHIO are only available in Alpha-MAX through Q2 2013. Because, the Bronx RHIO innovation did not launch until February 20, 2014, we do not present measures for Medicaid patients in this report. We will provide Medicaid analyses in subsequent reports as more data become available. We will report tables and figures similar to those for Medicare.

Discussion of Claims Analysis

The claims measures provide descriptive data on patients enrolled in the Bronx RHIO innovation before, during, and after the launch of the innovation. Although these measures must be reported to support CMS's broader assessment of its full portfolio of innovation projects, they may not provide a complete evaluation picture of the Bronx RHIO innovation for a number of reasons. First, the impact of an HIT innovation may not be immediate because it takes time for providers to incorporate new sources of information and for patient management to achieve changes in health care utilization. Second, some of the Bronx RHIO initiatives may focus on specific diseases or services. Although the innovation may have a statistically significant impact on the spending, inpatient admissions, readmissions, or ED visits related to the types of disease or service targeted, it may not have a statistically detectible impact on the variables at the total spending or utilization level, because the disease or service accounts for only a small share of total spending or utilization. In later reports, we will also provide disease- or service-specific spending and utilization data for the largest Bronx RHIO initiatives. Finally, Medicare fee-for-service and Medicaid beneficiaries may not account for all patients served by Bronx RHIO.

Development of Comparison Groups

In addition to comparing Bronx RHIO patients before and after implementation of the innovation, we will construct a comparison group of Medicare and Medicaid fee-for-service patients in the Bronx. We have identified four groups of interest, depending on data availability:

A. Medicare and Medicaid beneficiaries in the Bronx who have consented for use of their patient data and who have received a targeted intervention

B. Medicare and Medicaid beneficiaries in the Bronx who have consented for use of their patient data and who have not received a targeted intervention

C. Medicare and Medicaid beneficiaries in the Bronx who have not consented for use of their patient data

D. Medicare and Medicaid beneficiaries in other boroughs of New York City

Group A is our treatment group. A versus B would be the standard comparison group, provided we are able to identify with the help of the awardee those in group B. Groups A and B represent the intention-to-treat group; these could be compared to either groups C or D. The benefit of using groups B or C is that these groups allow us to control for external, non-innovation factors affecting Bronx RHIO patients. For all groups, propensity score matching will be performed to identify patients with similar observable characteristics, such as age, chronic conditions, insurance type/status, and gender as Bronx RHIO patients. Results for the comparison group will be included in later reports.

1.3.3 Other Awardee-Specific Data

Overview of Data Request

Prior to the site visit, Bronx RHIO submitted a large number of data files for the more than 500,000 consented patients within the RHIO. Although these data may ultimately be useful, the HCIA innovation is unlikely to impact the whole population of patients within the RHIO. Therefore, we are working with Bronx RHIO to get patient-level data on the subset of patients included in one or more of the BRIC reports generated as part of the innovation.

Health Outcomes Results

Once we have completed the data review meeting and meet with the data person to clarify the data received and request additional data, we will have a better understanding of what type of results we will provide. ***Table 11*** is an example shell of findings we anticipate presenting.

Table 11. Percentage of Patients by Measures of Health Outcomes Over Time

Health Indicator	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Diabetes							
Percentage of patients 18–75 years of age with diabetes (type 1 or type 2) who had hemoglobin A1c > 9.0 %	—	—	—	—	—	—	—
Percentage of patients 18–75 years of age with diabetes (type 1 or type 2) who had LDL-C<100 mg/dL	—	—	—	—	—	—	—

Source: Patient-level data to be provided to RTI.
Q = quarter.
— Data not yet available.

Discussion of Other Awardee-Specific Findings

We will present findings based on other awardee data after we receive patient-level data on the subset of patients included in one or more of the BRIC reports generated.

1.4 Overall Program Effectiveness Assessment

The Bronx RHIO’s delayed launch has impacted ability to evaluate its success. Even though the Bronx RHIO may eventually make some progress, the long start-up time will limit their ability to achieve their initial goals for analytics during the remaining period of the award. The workforce development piece appears to have been implemented as planned. Much of the impact of that component is predicated on conducting analytics, which has been challenging. The awardee spent significant time and effort addressing data quality issues and continues to do so. Continuing to focus on data quality on a regular basis is paramount to the innovation’s success. As of mid-2013, the awardee has incorporated planning and data quality and cleaning work into its systems and processes.

One of the challenges of the Bronx RHIO is similar to health information exchange efforts in general. The RHIO decided at the outset to allow sites flexibility in submissions to improve uptake. The data arrive in the RHIO from member sites through automated data feeds. When the sites use the data, they determine what they would like and work with the RHIO staff to obtain it. Thus, the RHIO has very little control over the data and which aspects are used.

The awardee is also focused on expanding their reach. For instance, Bronx RHIO continues to bring new provider members into the RHIO and implement feeds from more provider members in the Bronx borough because they want to allow access to patient data among all health care providers and facilities. The key stakeholders, particularly the informatics analysts and providers, are supportive of expanding the integration of data analytics among their consented patient population.

Although the goals of the innovation have remained consistent, the awardee has made changes from their initial implementation plan based on the data issues described above. These changes impact the fidelity of the innovation. We learned that the data issues took up so much team time that it may have impacted the planning and relationship-building aspects of report building with sites.

The combination of data quality issues and allotting insufficient time to address synthesizing the data is the main reason for the delay in this project. Now that some initial reports are being run, additional data issues are being identified and resolved as they occur. The site also has incorporated data quality processes into new feed planning as of mid-2013 to improve data quality going forward. Additional time will be needed to determine the impact of this innovation due to the delayed launch to address these issues.

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October 2014

Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring

Annual and Site Visit Report

Children's Hospital and Health System

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OVERALL EVALUATION SUMMARY

RTI International was selected to lead an independent evaluation of the 24 Health Care Innovation Award (HCIA) awardees categorized as Community Resource Planning, Prevention, and Monitoring (Community Resource). In this role, RTI is conducting an in-depth evaluation of each innovation, as well as a cross-site evaluation that includes similar innovations targeting the same priority outcomes (e.g., emergency department [ED] visits). For each of the 24 awardees, this report presents findings from the first year of the evaluation (beginning September 23, 2013, and including data obtained by RTI as of September 11, 2014). The report is based on multiple data sources, including operational reports, self-monitoring plans, site visits, and quantitative data analysis.

The evaluation methods vary by awardee innovation, based on the type of innovation and availability of data. RTI has reviewed and coded all existing documents from the awardees through December 31, 2013, and incorporated that knowledge into each awardee's overview. Our review included the awardees' original applications for funding, original and current operational and self-monitoring plans, and quarterly narrative and monitoring reports. For this annual report, we incorporated activities reported through the awardee's seventh quarterly report (i.e., through March 31, 2014).

Between April and August 2014, teams of at least two staff from the RTI team visited all 24 awardees for 2 to 4 days, depending on the number of interviews conducted. Teams included a subject matter expert, with training and experience specific to the awardee's innovation, and a master's- or bachelor's-level colleague to take notes. Before each visit, the teams reviewed all available documentation from the awardee to learn about the innovation's goals, objectives, and status. The purpose of the site visits was to clarify our understanding of the innovation, obtain detailed information on the implementation process, and review awardee-specific data to determine which elements to incorporate into the evaluation. By August 13, 2014, all 24 awardees have been visited and a thorough description of our findings included in each of the 24 awardee sections.

In addition to the site visits, we report quantitative data from two possible sources for several awardees. First, we present findings from claims analysis for awardees in this annual report if they both provided us with patient identifiers and reported enrolling participants who are Medicare and/or Medicaid beneficiaries. RTI has obtained patient identifiers from most of the 24 awardees to conduct claims analysis. Second, we present data RTI obtained directly from awardees to quantify their work in addressing health care costs, quality, and patient outcomes. Data from additional awardees will be analyzed and presented in future reports, as data become available and awardees enroll sufficient participants. An update on the availability of Medicare/Medicaid claims and other awardee-specific data, analysis of data available to us as of September 11, 2014, a summary of the comparison groups, and a list of draft evaluation measures are included in each awardee section.

1. HCIA COMMUNITY RESOURCE AWARDEE: CHILDREN'S HOSPITAL AND HEALTH SYSTEM, INC. (CHILDREN'S HOSPITAL)

1.1 Introduction

Children's Hospital and Health System (Children's Hospital), Inc., an integrated health system in Milwaukee, Wisconsin, received an award of $2,796,255 and began enrolling patients in November 2012. Children's Hospital includes a nonprofit health maintenance organization (HMO) called the Children's Community Health Plan (CCHP); the plan includes members who range in age from newborn to 64 years, and more than two-thirds of members are younger than 18 years. CCHP created an Advanced Wrap Network[1] Model that includes provision of support services from community health navigators (CHNs) and nurse navigators (NNs) to CCHP members who meet specific criteria. The Children's Hospital innovation, called Care Links, plans to achieve the following goals:

1. **Reduce costs** by decreasing annual nonemergency and primary care treatable ED visits by a total of 2,030 for CCHP members (for a cost savings of $406,000).
2. **Improve care** by educating and empowering members to navigate the health care system; facilitating appointment-keeping; providing education and resource referral; and improving Healthcare Effectiveness Data and Information Set (HEDIS) benchmarks for diabetes (HbA1c and low-density lipoproteins), asthma, lead testing, childhood immunizations, and connecting of members to primary health care.
3. **Improve health** by promoting preventative care, modifying member behavior through participation in the Care Links program, and improving associated health outcomes.

RTI is in the process of conducting an in-depth case study for this innovation. As part of that case study, two RTI team members conducted a site visit in July 2014, and both before and after the visit, our team reviewed all documentation on this innovation. We are actively working now to obtain data directly from the awardee that will help assess many of the variables we discuss in this report section. This report describes findings from the site visit, document reviews, follow-up telephone calls, and analysis of data obtained and cleaned by RTI through September 11, 2014. We start by describing the innovation components in detail and the patients targeted by the awardee.

1.1.1 Innovation Components

The Children's Hospital innovation, Care Links, is a relatively simple innovation with two program components (i.e., CHNs and NNs) that provide support services to members of the

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[1] In the Quarter (Q) 7 awardee report, this name had been changed to Care Links.

CCHP who are high risk for ED use. Through Care Links, the initial program included CHNs or NNs providing care to different types of patients who have used the ED at least twice in the prior 6 months. The intervention has been revised somewhat over time and includes the following revised objectives:

- Provide outreach services to members in the seven-county southeastern Wisconsin region, targeting members who
    - have had two visits to the ED within 6 months (focus of CHNs) (i.e., are on the "2+ list") or
    - are diagnosed with asthma *and* have had one asthma-related ED visit or one asthma-related inpatient admission (focus of NNs).
- Reduce avoidable ED visits by 2,030 visits in Year 1, resulting in a $406,000 reduction in ED costs in Year 1.
- Decrease asthma-related inpatient admissions for members diagnosed with asthma by 30 visits in Year 1, resulting in a $119,000 reduction in inpatient asthma costs in Year 1.

Component 1: Community Health Navigators (CHNs)

CHNs are lay workers who represent the communities they serve and often have family lives not unlike the members they serve. In this way, they are able to relate to the stress the family is under and are also aware of different community resources the family can access. Children's Hospital has nine CHNs on staff (eight full-time equivalents who are employees of CCHP, two of whom are bilingual in Spanish) who are assigned to different zip codes or areas of the Milwaukee region. One CHN works and resides in the Racine area, while two others share a full-time position in the Walworth area. Each of these CHNs is colocated in offices that include other community programs of the Children's Hospital and Healthcare System or county government services (e.g., child protective services). The remaining six CHNs are now housed in the main offices for CCHP and cover the remaining areas of Milwaukee. The north side of Milwaukee is the area with the highest poverty level and use of the ED, so a high proportion of the members who are on the 2+ list reside in these areas. The south side is an area with a high proportion of Hispanic members who receive services from the two bilingual CHNs.

CHNs initially worked in a variety of settings to support high ED users, including EDs of other hospitals and high-volume clinics. Children's Hospital encountered several barriers in placing the CHNs in these locations. First, the awardee learned that the clinics and EDs were reluctant to incorporate the CHNs into their care process because their services are only available to CCHP members, who represent a small portion of the clinics' and EDs' clientele. As noted by one respondent during our site visit, it is "hard for any clinic to change their workflow for less than half their patients." For this reason, the CHNs were ultimately removed from the clinics, including one local federally qualified health center. The EDs of other hospitals were reluctant to incorporate the CHNs into their patient care process for the same reason. The CHNs also learned that families who were in the ED were much more likely to refuse follow-up contact than they were if they were contacted after the event and asked to participate. For these reasons, the CHNs began to work from other locations. Ultimately, it was too difficult to manage and supervise their work from the different locations, so most of them have been moved into the main office so the program manager can work with them directly each day.

The CHN program is set up to provide three home visits to members who agree to participate. Children's Hospital uses the following process to engage members in the program:

1. CHNs call members on their individually assigned list (these lists can include nearly 500 members) to explain the program and offer to come visit the home (at this point, the member declines to participate or agrees to an initial home visit; in many cases, reaching the member is the biggest hurdle given the often transient nature of the target population's lives).

2. The CHN visits the home the first time, assesses members' social needs, and coordinates services such as primary health care and other community resources as needed. Barriers at this point in the process include that members are not at home at the agreed-upon appointment times or they do not answer the door. The awardee developed a door hangar for the CHN to leave on the handle in situations where they have appointments but are not able to contact the member. The hangar also notifies the member that they can receive a $5 gift card from Wal-Mart if they reply.

3. During the home visit, any number of services can be offered and referrals made. Examples of services include providing information on housing and jobs; connecting members with food banks; and referring members to medical services such as for vision, dental, or primary care.[2] The CHN works to identify the most critical needs at the time in hopes that providing this support helps improve the member's health in the long term. Before they leave, CHNs typically make their second appointment for the follow-up home visit.

4. They then visit the home a second and third time to provide additional support to the member (visits typically occur 2 to 3 weeks apart). A primary goal during these visits is to educate members on assessing their child's health (or their own) to know when an ED visit is required and describing available resources in the area to meet their family's needs.

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[2] CHNs interviewed during the site visit indicated that the most frequent requests are for dental care, transportation, housing assistance, job searches, and vision care.

They also follow up to see if members obtained services, and they provide health education and tools for members to manage chronic conditions, particularly asthma. In addition, CHNs provide outreach and education services about the appropriate places to receive care. This includes facilitating making appointments for a primary care visit. The CCHP is part of a larger health system, but the CHNs do not interact with providers in the clinics or departments from the hospital or system. ***Table 1*** provides an overview of the CHN functions and training specific to the CCHP innovation.

Table 1. CHN Functions and Training

Characteristic Type	CHN Role
Title	Community health navigators
Minimal qualifications	High school diploma/GED; from target population/community being served
Functions	Outreach and recruitment (25–50% time/week) Community linkages (25–50% time/week)
Established continuing education program	Monthly ongoing training during CHN meetings No formal training program provided

Source: Site visit, July 21–22, 2014.
CHN = community health navigator; GED = general equivalency diploma.

Three major changes recently occurred for the CHN program because of lessons learned in implementation: 1) relocation of the Milwaukee-based CHNs to the main CCHP office (explained above), 2) increase in pay for CHNs, and 3) creation of a new position called the Care Management Outreach Coordinator (CMOC). When the CHN role was first established in CCHP, there were few positions to compare it to, so the salary was set at what proved to be a rate below the local market value. With this low pay, the turnover of CHNs was relatively high, so the program manager worked to have their pay level increased, which was accomplished this year.

Another recent change that occurred this year is the creation of the CMOC positions. The awardee learned that the ability of a CHN to "sell" the program to members on the phone was critical to enrolling them into the program. They tracked enrollment data over time and realized several CHNs had consistently higher levels of success on the phone (in gaining access to the home) than others. The program manager sought approval to create a new, supervisory position that meant the CMOC would recruit patients into the program and the CHNs would continue to conduct the home visits. Two existing CHNs were promoted to this position, and a third one was hired in April 2014. Respondents during the site visit spoke positively about this change and felt it helped reach more members.

Component 2: Nurse Navigators (NNs)

NNs were intended to help with follow-up and coordination for complex asthma patients. Their job includes reviewing admission data or retrospective data claims, assessing patient needs, providing health education, and identifying a primary health care home. When NNs feel that CHN services are needed for additional coordination services, they appoint one for follow-up. The NN program has experienced barriers primarily in hiring and retaining staff. The first NN left in December 2013 for a higher paying position providing direct patient care. Her position was recently filled (June 2014) and her replacement had not begun to make home visits as of our July site visit. Respondents shared that the NN position has not worked out as they had hoped, and it seems unlikely that this program component will affect any outcomes during the remaining time of program implementation (through June 2015).

Another nurse position that was discussed in the awardee's application was using school nurses to improve care coordination for children (who are CCHP members) with asthma, but this component was never implemented. Children's Hospital has had difficulty establishing linkages with both internal and external entities to facilitate care coordination of their members. The primary reason for this challenge is that the awardee is a health plan, not a direct service provider, and their CHNs can only provide services to CCHP members. Since CCHP is one of several Medicaid HMO plans available to eligible participants, the proportion of clients served by a clinic or hospital and covered by their plan is relatively small. They have attempted to colocate their CHNs in hospital EDs for 4 hours/day for 4 days/week, but this arrangement did not succeed because many of the patients in the ED were not covered by the health plan or were not willing to participate in the program. The awardee also attempted to have CHN services available at large clinics, such as the local federally qualified health center, but that too was challenging because many of their center's patients are not members of the health plan. The same situation was true for school nurses in that only a small proportion of students are covered by that plan. Ultimately, the awardee has focused on reaching out to their members directly and providing navigation services in members' homes.

The awardee has not involved any organizational key partners or subcontractors under the HCIA Community Resource program. Individual clinicians are not included as organizational key partners/subcontractors. RTI verified during the July site visit that no partners should be listed in subsequent reports. Though the awardee attempted to have their CHNs colocated at partner agencies (e.g., clinics, EDs), these arrangements were not sustainable.

An important contextual factor to understand about CCHP is that in 2013 their membership dramatically increased because United Health no longer covered the Medicaid population in the southeastern region of Wisconsin.[3] Their membership was approximately 40,000 before

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[3] In 2013, the state of Wisconsin's Medicaid capitation rates decreased significantly, resulting in one major health insurer, United Health, dropping their members' coverage. This change meant that there were fewer plans available from which eligible participants could choose, thereby increasing the CCHP membership dramatically.

this change and is now approximately 135,000[4] members. We address this issue further when we discuss organizational capacity (Section 1.2); it has had a major impact on every aspect of the innovation.

1.1.2 Program Participant Characteristics

CCHP now serves approximately 135,000 members, a more than three-fold increase since their application for HCIA funding. Their members include Medicaid-eligible children and adults in seven southeastern Wisconsin counties. Because Wisconsin is one of the states that elected to not expand Medicaid coverage, approximately 10% of the parents of Medicaid-eligible children are no longer included in the program. The demographic characteristics of the CCHP members included in Care Links will be outlined in ***Table 2*** once we receive data from Children's Hospital.

Table 2. Characteristics of All Patients Enrolled in the Innovation

Characteristic	Number of Patients	Percentage of Patients
Age		
Infant	—	—
Child	—	—
Adolescent	—	—
Adults (18+)	—	—
Missing	—	—
Sex		
Female	—	—
Male	—	—
Missing	—	—
Race/ethnicity		
White	—	—
Black	—	—
Hispanic	—	—
Asian or Pacific Islander	—	—
American Indian or Alaska Native	—	—
Other	—	—
Missing/refused	—	—

Source: Data to be provided by Children's Hospital to RTI.
— Data not yet available.

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[4] CMS Project Officer estimates this total to be 125,000; however, the awardee provided 135,000 as the total during our June 2014 site visit. RTI is working to verify their participant count.

Potential Care Links participants (i.e., CCHP members who have had two or more ED visits in the prior 6 months) are identified through a monthly report (or the 2+ list) generated from electronic health records data. Many of the members included on this 2+ list each month are only one household member who is covered by CCHP. When the 2+ list is generated, any members in the same household who received services during the same time period are also listed. CCHP defines this entire list (the member who used the ED two or more times + family members) as those they served during that time. Their rationale for this definition is that when a CHN visits that home, they are "serving" anyone in the home who needs assistance. Data on enrolled members are available through their record system called CareWebQI. The awardee had initially hoped to use the state's health information exchange as a source for identifying members who have had two or more ED visits, but that data system is not proving to be as inclusive or accessible as they had hoped.

The members included on the 2+ list is one area that has been greatly affected by the growth in CCHP membership. Before the growth, the 2+ list once had approximately 2,000 to 3,000 members on each monthly list, but now the list includes approximately 7,000 per month. From the 2+ list, the awardee deletes any cases that were due to accidents, injuries, or acute conditions and then stratifies the remaining members by the zip code of their residence. The list of potential members to provide services is still very overwhelming (approximately 2,500 each month) and far exceeds what the awardee planned in their application. Through a prioritization process, the awardee identifies members in greatest need of CHN support in a given month based on the following criteria:

1. family total of ER visits in the last 6 months (i.e., if a family as a unit has a higher number of ER visits)
2. predictive risk score[5]
3. total medical cost
4. pharmacy cost

The report also gives an indication of whether the member was on the list previously and the member's previous outcomes. If the member has never received a call, he/she would be prioritized higher than someone who had previously declined enrollment.

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[5] Verisk, an analytics company, is contracted with Children's Hospital and conducts predictive risk modeling with a tool called Medical Intelligence. CCHP sends all of their paid claims each month to Verisk, and Verisk provides utilization metrics and risk scores for each person in their population in an attempt to assess future costs and prioritize the patient for enrollment in the Care Links program.

Finally, CCHP has begun to use the new CMOCs to systematically prioritize members to contact in a given month. If an individual or family has previously declined enrollment, CCHP will often turn those cases over to one of the CMOCs for call-back because they tend to be more skilled in engaging families. Once the monthly list is generated, it is dispersed between the CHNs based on their geographic location, and the CHNs or CMOCs call each person on the list to discuss the program with them and encourage them to enroll. ***Table 3*** provides a breakdown of the patient groups RTI will need to keep track of in assessing the reach of the innovation (i.e., denominator data) as of May 2014. We are working with the awardee to obtain more current information.

Table 3. Total Patients Planned for Inclusion in CHN Innovation (Denominator Data)

Patient Type	Data Source	Current Count
Total number of members who have been served as part of the innovation	CareWebQI	—
Number of members on the 2+ list minus those who were never contacted due to limited resources	CareWebQI	—

Source: The awardee gave us a dataset for these numbers in May 2014 that had discrepancies in the counts. RTI is working with the awardee to address issues and will present these data in future reports.
CHN = community health navigator.
— Data not yet available.

1.2 Implementation Progress

The extent to which each awardee is able to implement its innovation as planned and reach a sufficient number of patients will be critical to assessing its impact on reducing costs and improving health and health care. As part of our evaluation, we are assessing a set of process measures listed in ***Table 4*** that will inform the degree to which Children's Hospital has implemented the Care Links innovation. This section provides details and data on the implementation process and then the effectiveness of the innovation.

Table 4. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for Children's Hospital

Key Evaluation Domain	Subdomains	Measure	Data Source
Implementation effectiveness	Reach	Number/percentage of members who agreed to participate in Care Links	CareWebQI
		Number/percentage of members on the 2+ list/month	CareWebQI
	Dose	Number of completed visits per member	CareWebQI
		Number and types of services provided by CHNs	CareWebQI

CHN = community health navigator.

1.2.1 Process

The implementation process has been the initial focus of the evaluation. Subsequent reports will assess the impact of the intervention as data become available. The implementation process is best evaluated through a combination of data variables, including execution of implementation that conforms with operational plans, and capacity for implementing the innovation in a timely and effective manner. We focused on the implementation process during the awardee site visit in July 2014. The evaluation questions included the following:

- What is the overall execution of the innovation implementation (e.g., what is the actual rate of expenditures relative to the projected rate?)? What is the rate of enrollment relative to projection? What are the lessons learned?
- What accomplishments are specific to hiring or training staff so that the organization can build its capacity to implement the innovation effectively?
- What is the implementation effectiveness, including fidelity, reach, and dose of the innovation thus far?

Execution of Implementation

In preparing the application for HCIA, the awardee staff brainstormed ways in which they could have a "high touch" program that would help address high costs of care for their members. Maternity care is the highest cost covered by CCHP, and a similar program to Care Links exists to help maternity patients navigate the system and receive the best care during their pregnancy. The next highest cost of care is for ED visits, so they decided to implement the program by hiring and training navigators who represent their families and can provide support to members in finding resources and care to avoid ED visits.

The program manager was a team member during the application process and was able to launch the program and begin enrollment within 4 months after the award (starting in November 2012). From Quarter (Q) 2 through Q7, the number of indirect unique participants served by the innovation has steadily increased. The health navigation team served 2,471 unduplicated individuals in Q7, with a total of 10,244[6] served as of June 30, 2014 (and with a final disposition) since program inception. Members served include the person on the 2+ list plus family members in the household who are also CCHP members. This number is high when compared with the members who are actually enrolled in the program and receive at least one phone call or those who receive any home visits (see Table 6). Barriers to conducting home visits have been recruiting members into the program so they agree to the visit and convincing members that a visit would help support their health needs. CHNs shared that once they are able to get into the homes, the members are very appreciative of their time and efforts, but accessing the home is very challenging. When a member agrees to a home visit, the CHNs need to be concerned about their safety in visiting some local areas and travel together if necessary. The creation of the role of CMOC was primarily to increase the number of people recruited into the program, more closely monitor CHN visits in the community, and provide more direct supervision and mentoring of the CHNs making visits.

Recruiting and hiring staff have been more difficult than the awardee anticipated. Early in the program's development, turnover of trained CHNs was higher than expected, and it was determined that the local market for those with similar skills was robust, requiring Children's Hospital to reassess their pay for their CHNs. The program manager identified challenges like these early on and proposed solutions that have been implemented as quickly as possible, but having fewer CHNs than planned has reduced the awardee's capacity to reach more members. The two NN positions have been particularly difficult to fill, and the awardee recently began advertising for two part-time positions to fill one full-time equivalent job in hopes of finding more candidates.

The rate at which awardees expend funds or enroll patients, compared with projection, provides useful information to assess the innovation's status. If expenditure or enrollment rates are particularly low (because of such issues as length of time to recruit and train new staff or time to implement or adapt electronic health records for the program), these variables help assess the awardee's readiness to implement the innovation at the start and the extent to which they can spend all funding by the end of the project (i.e., can they effectively allocate the funds provided?). Largely because they have had fewer staff than planned, Children's Hospital is below the projected spend rate by more than 40% with a

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[6] Number self-reported by awardee separately to CMS and RTI.

total cumulative expenditure rate of 31.1%. Children's Hospital received approval for carryover funds in March 2014 to use unspent funds to hire additional CHNs. Enrollment is addressed in the Implementation Effectiveness Section.

Organizational Capacity and Leadership

Children's Hospital has been undergoing extreme growth after the removal of one of the Medicaid HMOs from the local market. Members covered by Medicaid who were members of the HMO that closed (United Health) then had to select a new HMO, and CCHP grew to more than three times its prior membership (from about 40,000 to 135,000). This growth has required Children's Hospital to hire new staff across the organization and allocate other resources such as space and equipment. A major impact on Care Links is that CCHP initially estimated they would reduce ED visits by as much as 7% during the course of the innovation but that was with a much smaller population base. Once their population expanded by such a large degree, they had to adjust their estimated ED cost savings to $460,000 total, primarily because the HCIA innovation did not grow with their membership.

The impact of the growth of the CCHP membership on program implementation cannot be overstated. When the application for HCIA was submitted, the CCHP patient population was very different from what it is today. The estimated size of the program was much smaller with far fewer members to be served by the innovation than the size of the program today. The growth has affected the allocation of space (because so many new employees have been hired to meet the needs of the growing membership), affected the number of potential members to serve each month, and affected the attention management can give the program considering the current context.

1.2.2 Workforce Development

Hiring and Retention

Hiring and retention of CHNs and NNs to help patients manage access and use of the health care system are critical to the success of this innovation. The awardee currently has nine CHNs and one NN on staff, with plans to hire additional CHNs. The NN position was envisioned as someone with more experience in the community to provide health education and answer the families' questions, but the first person who filled that position wanted to be involved in providing clinical care, so she/he left for another position. Since that time (December 2013), CCHP has advertised the position but had difficult filling the two NN positions they hoped to use for the innovation. They were able to fill one position and the new employee began work in June 2014. After four quarters (Q3 through Q6) without a prospective second NN, the awardee decided to make the position part time to increase the chances of finding a suitable NN. The second position was filled in Q7, but that person had just given her resignation notice before we visited the site.

During the site visit, Children's Hospital shared a number of lessons learned regarding staffing during the implementation process. The placement of the CHNs in the EDs and clinics was not feasible because none had the space or the interest to house a CHN on a part-time basis because this program would only be offered to CCHP members. Having staff in remote offices became a huge management challenge for the program manager, and some of the CHNs needed closer supervision. The team quickly realized that more structure was needed. Without an office phone, the remote phone numbers were not recognizable and not trustworthy to the patients they intended to reach. The CHNs have now transitioned well in the Children's Hospital office, and there are plans to expand the office space for their use.

Training

When the innovation was starting, the newly hired CHNs were required to attend a 10-week training sponsored by the Area Health Education Center. The CHNs who are still at CCHP noted that this training was too long and did not provide them with enough field experience to prepare for home visits. Since that time, CHNs have attended community events (sponsored by other agencies) as they are available to help address such issues as safety during home visits and effective use of time once in the home. In addition to these events, the CHNs meet at least weekly as a group with the program manager to discuss challenges they have encountered and resolutions.

New CHNs, as they have been hired, have received no formal training. They are oriented to the program and shadow another, experienced CHN, but the exposure they get during this process is highly dependent on the willingness of the CHN who is being shadowed to include them. In addition, Children's Hospital has no protocols in place for how CHNs should handle different situations they may encounter in the field. Because the program is modeled after an existing program in California, the CHNs use a number of standard questionnaires and forms instead of protocols to assess members and track their ongoing contacts. Though safety has been a concern and the awardee has established some strategies to address it, issues such as how to deal with drug abuse or intoxicated people, domestic violence, or different types of health issues that may be raised have not been systematically addressed so that CHNs feel prepared when entering a home.

1.2.3 Implementation Effectiveness

A major aspect of the evaluation will be to assess the effectiveness of the intervention in terms of the extent to which it is implemented as planned (fidelity) and patients have been exposed to the innovation. Their exposure will be measured through reach (i.e., the extent to which the total number of patients is reached that were targeted) and dose (i.e., the degree to which each patient is exposed to services provided).

Fidelity

The awardee has implemented the program mostly as they intended, although they have had to make adjustments to accommodate the growth and challenges with staffing previously described.

Reach

Reach is the proportion of patients who are eligible for the program relative to those exposed to the innovation. For Care Links, reach is the extent to which eligible patients are contacted through the first phone call. In the previous report, we noted the program's challenge in reaching members by telephone. An additional issue discovered during the site visit is the limited capacity of CCHP to address the needs of all the people who are on the 2+ list each month. During Q6, the awardee reported establishing a CMOC position, which has helped maximize coordination efforts and increase reach numbers. We will complete ***Table 5*** once we receive data from the awardee.

Table 5. Recruitment and Enrollment for Patients Since Program Initiation

Participant Status	#	%
Unable to locate	—	—
Declined services	—	—
Successful completion of the program (i.e., 3 home visits complete)	—	—
Initiated in program but lost to follow-up (<3 visits)	—	—
Total	—	—

Source: Data to be provided by awardee to RTI.
— Data not yet available.

Dose

During the site visit, we learned how Children's Hospital is tracking patient exposure to CHNs. Dose is the extent to which a person is exposed to a program or intervention (e.g., frequency and duration of contact). For Care Links, members who can be located are first exposed to the program by a phone call from the CHN or CMOC that invites them to participate in the program. At that point, the member can decline to participate or agree to an initial home visit. Once they agree to a home visit, they are enrollees of the CHN program and will then be followed for three home visits. A barrier to follow-up is that patients move and cannot be located, lose interest in the program, or have other issues arise that take priority over their participation. Only 5% of the participants in Q7 completed all three home visits, while 9% in Q7 agreed to a home visit and had zero, one, or two completed by the CHNs (i.e., now counted as lost to follow-up).[7] RTI worked with the awardee during the site visit to review the data and requested that they begin reporting counts by the number of visits so that those who complete even one visit are considered enrollees in our analysis. Once we receive dose data over time, we can complete ***Table 6.***

Table 6. Dose Received Over Time

Number of Visits Received	Q1	Q2	Q3	Q4	Q5	Q6	Q7
1 visit	—	—	—	—	—	—	—
2 visits	—	—	—	—	—	—	—
3 visits	—	—	—	—	—	—	—

Source: Patient-level data to be provided to RTI.

1.3 Evaluation Outcomes

RTI will use two types of quantitative data from awardees to assess the impact of their innovations on key outcomes. These include claims data for Medicare and/or Medicaid beneficiaries, depending on who the awardee serves, and administrative or utilization data the awardee is collecting (which we have categorized as "other awardee-specific data" reflecting the variability of the types of data elements available across awardees). We are in the process of finalizing our assessment of all the available data sources and requesting data directly from each awardee. As those data are received, we will incorporate the findings into our quarterly/annual reports. The following sections present descriptive findings from the quantitative outcome data provided to RTI and cleaned as of September 11, 2014.

1.3.1 Measures for Evaluation

On August 6, following the site visit, the data management and site visit teams met to review each of the measures listed in the awardee's self-monitoring measurement plan. The measures listed in ***Tables 4*** (above) and ***7*** (below) reflect the measures determined as most relevant for our evaluation of the Children's Hospital innovation.

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[7] Q7 data reported in this section were provided to RTI during our site visit and reviewed together in person.

Table 7. Outcome Measures Requested from Children's Hospital

Key Evaluation Domains	Subdomains	Measure	Data Source
Health process indicators	Asthma	Dispensed a prescription for either an inhaled corticosteroid or acceptable alternative medication to patients with persistent asthma (HEDIS)	Claims data/medical record review
Health care outcomes	Utilization	ED visit rate	Claims data
		Percentage of ED visits considered "nonurgent" or "primary care treatable"	Claims data
		All-cause admission rate	Claims data
		Admission rate for members with asthma	Claims data
		Readmission rate	Claims data
		Percentage of children who had 6 well-child visits with a PCP during their first 15 months of life (HEDIS)	Claims data/medical record review
		Percentage of children 3–6 years of age who received one or more well-child visits (HEDIS)	Claims data/medical record review
		Percentage of children who had at least 1 primary care visit completed each year (HEDIS)	Claims data/medical record review
	Cost	Spending per patient	Claims data
		Cost savings	Claims data/enrollment data
		ED costs	Claims data/enrollment data
		Inpatient asthma costs	Claims data/enrollment data

ED = emergency department; HEDIS = Healthcare Effectiveness Data and Information Set; PCP = primary care provider.

1.3.2 Claims Data

As part of a broad assessment of health care innovations, the Center for Medicare & Medicaid Innovation (CMMI) is assessing the impact of its programs, including those funded specifically by HCIAs, on four core measures. The four core measures are

- health care spending per patient,
- hospital inpatient admissions,

- hospital unplanned readmissions, and
- ED visits.

Collectively, it is anticipated that CMMI programs will slow the increase in health care spending, reduce hospital admissions, reduce avoidable hospital readmissions, and prevent unnecessary ED visits. We are reporting these measures for all HCIA Community Resource Planning awardees so that the collective impact of the awards can be assessed.

As discussed below, some awardees' innovations may not be focused on these measures. Other awardees' innovations target specific conditions (e.g., imaging, diabetes) and may have significant impacts on spending, admissions, readmissions, and ED visits for the targeted conditions but not have a statistically detectable impact on the measures at the aggregate level because the targeted conditions represent only a small fraction of total spending, inpatient admissions, and ED visits.

The measures are calculated through analysis of Medicare and Medicaid fee-for-service claims. Because of differences between Medicare and Medicaid patients in age, other demographic variables, and disease status, we report the Medicare and Medicaid results separately below. Currently, complete Medicare claims are available through the end of 2013. Medicaid claims for Children's Hospital, however, are only available through the second quarter of 2011. Children's Hospital's innovation was launched in November 2012.

- **Health Care Spending per Patient.** For Medicare beneficiaries, health care spending per patient includes Part A and Part B Medicare expenditures for persons enrolled in the Part A and Part B fee-for-service program. The variable focuses on Medicare fee-for-service spending, so Medicare managed care (Part C) services are excluded, as are beneficiary copayments. Medicare Part D prescription spending is also excluded. Spending is reported on a per-person per-quarter basis. If a beneficiary is not enrolled for every month in a quarter, spending (except for hospital inpatient spending) is prorated to a quarterly basis based on the number of days enrolled during the quarter. Because hospital inpatient admissions are both rare and expensive, spending is not prorated for hospital inpatient spending. Prorating is also not performed for beneficiaries who die during a quarter.

  For Medicaid beneficiaries, health care spending per patient is reported for fee-for-service beneficiaries. Beneficiaries are only included in the analysis for spending (and the other measures) during periods when they are enrolled in Medicaid.

- **Hospital Inpatient Admissions.** This variable measures hospitalization, the single most expensive component of health care spending. Patients kept overnight in observation beds are excluded from this measure. Inclusion criteria for the analysis are the same as for spending. Hospital inpatient admissions are not prorated based on the number of days eligible during the quarter. All-cause inpatient admissions and ACSC admissions are reported separately, under the assumption that a greater share of ACSC admissions can be prevented by appropriate ambulatory care. The mean quarterly admission rate per 1,000 patients is reported.

- **Hospital Readmissions.** Hospital readmission rates serve a dual purpose in evaluating HCIA impacts. Readmissions add to the costs of a prior hospitalization, and they often reflect a problem in the care provided during the first admission. All-cause readmissions are defined as a follow-up admission to any short-term acute general or long-term care hospital within 30 days of a discharge from another hospital of the same type. We ignore multiple admissions within 1 day of an initial admission because these often represent transfers between hospitals. We define index hospitalizations that begin during the quarter and follow each index admission for 30 days, even when the follow-up period extends beyond the end of the quarter. Inclusion criteria for the analysis are the same as for spending. We also calculate readmissions for persons with Ambulatory Care Sensitive Condition (ACSC). The person's ACSC status is defined by their first hospitalization during the quarter. The readmission rate equals the number of readmissions divided by the number of index hospitalizations during the quarter. Planned readmissions are excluded from the calculation of the numerator. Quarterly mean readmission and ACSC readmission rates per 1,000 admissions are reported.

- **ED Visits.** ED visits are sometimes viewed as a symptom of the inability of the community's health care system to provide adequate preventive and ambulatory care visits. We report an all-cause ED visit rate that excludes ED visits resulting in an inpatient admission (which presumably represent unavoidable visits) and includes overnight ED visits without an inpatient admission. Inclusion criteria for the analysis are the same as for spending, and ED visits are also subject to the same prorating formula as for spending. The mean quarterly ED visit rate per 1,000 patients is reported.

Medicare Claims Analysis

Children's Hospital focuses on Medicaid managed care patients and does not currently serve Medicare patients, so Medicare data are not applicable.

Medicaid Claims Analysis

The Medicaid data analysis will use data from the Centers for Medicare & Medicaid Services (CMS) Alpha-MAX data files. Currently, Medicaid claims for Children's Hospital are only available in Alpha-MAX through the second quarter of 2011. Because Children's Hospital's innovation was launched in November 2012 and Alpha-Max claims are not yet available, we are not presenting measures for Medicaid patients in this report. We will provide Medicaid analyses in subsequent reports as more data become available. Children's Hospital, however, only includes CCHP Medicaid managed care recipients, and Medicaid Alpha-MAX data do not always include Medicaid managed care enrollees. If managed care claims are not available in Alpha-MAX, Medicaid data will need to come from Children's Hospital directly.

Appendix A shows the claims analyses tables that we plan to present for Medicaid. In addition to the tabular format, we will present figures showing each measure as a function of time. Values in quarters prior to the innovation's launch in November 2012 will be shown in one color, and values for quarters during and after launch will be shown in another color. The figures will include a trend line based on a linear regression of prelaunch values.

Discussion of Claims Analysis

The claims measures will provide descriptive data on patients enrolled in both the CHN and the NN components of Children's Hospital's innovation before, during, and after the launch of the innovation. Although it is necessary to report these measures to support CMS's broader assessment of its full portfolio of innovation projects, the measures may not provide a complete evaluation picture of the Children's Hospital innovation. There are a number of reasons for this. First, the innovation was only launched in November 2012. The impact of a navigator-based innovation may not be immediate because it takes time for patients to change behavior and manage their conditions to achieve changes in health care utilization. Second, the innovation mainly focuses on avoidable ED visits and asthma care. Although the innovation may have a statistically significant impact on the ED visits, attaining certain HEDIS benchmarks, or admissions and readmissions related to asthma, it may not have a statistically detectible impact on the variables at the total spending or utilization level, because avoidable ED visits and asthma admissions and readmissions account for only a small share of total spending or utilization. In later reports, we will also provide asthma-specific spending and utilization data. Lastly, Children's Hospital received a significant number of new members during this time that would be considered eligible for navigation services. Because of limited resources, however, they are not able to reach all eligible members.

Development of Comparison Groups

In addition to comparing Children's Hospital's innovation participants before and after implementation of the innovation, we are constructing comparison groups of CCHP members who are eligible but are not participating in the innovation components. We will want to make sure those eligible but not participating have not been contacted and declined to participate, because that could lead to issues of selection bias. We will likely have one comparison group for the entire innovation. Comparison groups will control for external, noninnovation factors affecting both innovation participants and nonparticipants. We will use propensity score matching to identify patients with similar characteristics, such as age, chronic conditions, and gender that are not currently participating in the innovation but are eligible to participate. Results for the comparison group will be included in later reports.

1.3.3 Other Awardee-Specific Data

Overview of Data Received

RTI met with Children's Hospital on September 18, 2014, to request the raw patient-level data used to calculate the measures in ***Tables 4*** and ***7***. We anticipate receiving data by early November 2014.

Health Outcomes

Once we receive the raw patient-level data from Children's Hospital, we will link it to the patient identifiers to better understand the results we can provide. The following table shells (***Tables 8*** and ***9***) reflect examples of findings we anticipate presenting.

Table 8. Health Outcomes Over Time

Measure	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Asthma							
Dispensed a prescription for either an inhaled corticosteroid or acceptable alternative medication to patients with persistent asthma (HEDIS)	—	—	—	—	—	—	—
Children's Health Care							
6 well-child visits in the first 15 months of life (HEDIS)	—	—	—	—	—	—	—
Well-child visits in the third, fourth, fifth, and sixth years of life (HEDIS)	—	—	—	—	—	—	—
General Wellness							
At least 1 primary care visit completed each year (HEDIS)	—	—	—	—	—	—	—

Source: Patient-level data to be provided to RTI.
HEDIS = Healthcare Effectiveness Data and Information Set.

Table 9. Health Outcomes by Dose

Measure	Low Dose (1 Visit)	Medium Dose (2 Visits)	High Dose (3+ Visits)
Asthma			
Dispensed a prescription for either an inhaled corticosteroid or acceptable alternative medication to patients with persistent asthma (HEDIS)	—	—	—

(continued)

Table 9. Health Outcomes by Dose (continued)

Measure	Low Dose (1 Visit)	Medium Dose (2 Visits)	High Dose (3+ Visits)
Children's Health Care			
6 well-child visits in the first 15 months of life (HEDIS)	—	—	—
Well child visits in the third, fourth, fifth, and sixth years of life (HEDIS)	—	—	—
General Wellness			
At least 1 primary care visit completed each year (HEDIS)	—	—	—

Source: Patient-level data to be provided to RTI.
HEDIS = Healthcare Effectiveness Data and Information Set.

Discussion of Other Awardee-Specific Findings

Once we receive data from Children's Hospital, we will review, clean, merge, and begin conducting descriptive analyses to fill in the table shells above. At that point, we will be in a better position to discuss findings related to the other awardee-specific data.

1.4 Overall Program Effectiveness to Date

Children's Hospital is implementing a relatively simple innovation where CHNs provide outreach to members (and their families) who have recently had a high use of ED services (i.e., 2 or more visits in past 6 months). The awardee has many lessons learned from implementation, including that placing CHNs in external locations (e.g., EDs of other hospitals, high-volume clinics) is not an efficient use of their time nor does it access a large enough number of potential enrollees. They have been challenged by identifying external and/or internal partners to facilitate patient enrollment because their members represent only a small proportion of patients served by a provider or hospital, and, within the health system, the health plan is not a clinical partner in the delivery of care, so there are few examples of how they can best interact with Children's Hospital providers to enhance care coordination of their members.

The awardee has also experienced challenges in implementing the roles involving NNs primarily because of difficulty recruiting a person to fill the positions full time. Not having some type of clinical oversight of the CHNs is likely to limit their ability to identify comorbidities or other issues affecting health (though indirectly related to ED visits) and to know how to systematically assess the health risks of the members they visit. Although the awardee does have staff on hand who are passionate about their work on this program, the CHNs would benefit from more standardized trainings that include building their knowledge about the health risks of their target populations and the issues to look for when visiting a home. Without standard trainings to date, the quality and comprehensiveness of CHN interactions with enrollees is unknown and not systematically assessed, making it hard to know whether they are directly affecting enrollees' health behaviors.

A challenge in evaluating this innovation will be in determining how the awardee counts these enrollees and identifies those members who receive direct services from the CHNs. As previously described, people "served" by the program include anyone living in the home of the person who appears on the 2+ list. Although it is true that the CHNs are visiting the home and may provide support to someone other than the patient, the likelihood that the interaction will affect health outcomes for those other than the patient is very small. It is also challenging because the CHNs report that most of the requests from their enrolled members are for support that will not result in measurable change of key health outcomes (e.g., assisting a family in accessing a food bank, finding a dentist who will accept Medicaid patients). The services the CHNs provide are certainly important and are key issues that the families need addressed to ultimately improve their care, but Children's Hospital will require more time to demonstrate the downstream impact of this kind of support.

As previously noted, the growth of CCHP members has been tremendous and caused unanticipated changes to and increases in staffing. Their HCIA innovation has a huge deficit in capacity relative to the current membership numbers. For this reason, the CHNs are not able to contact more than half of the eligible members each month, meaning that their impact on key health outcomes will be more difficult to detect than anticipated. This growth and the fact that the CHNs are able to reach so few of the members make it difficult for senior management to know how best to assess the return on investment of this innovation, making the sustainability of the program questionable. The awardee does seem to have a good data system with high-quality data that will support RTI's work to assess their impact over time.

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APPENDIX A

Table A-1. Baseline and Intervention Trends in Health Care Spending per Patient

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—

Savings per Patient

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Spending rate: total quarter (i.e., quarterized) payments/number of unique patients. Savings per patient: difference in comparison minus the intervention's average spending rates.
— Data not yet available.

Table A-2. Baseline and Intervention Trends in Admissions per 1,000 Patients

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Admit rate: total unquarterized admissions/number of unique patients.
— Data not yet available.

Table A-3. Baseline and Intervention Trends in Readmissions per 1,000 Admissions

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total admissions	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total Admissions	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Readmit rate: sum of all readmissions to eligible hospital within 30 days/all admissions in the quarter. Total admissions: all eligible admissions in the quarter.
— Data not yet available.

Table A-4. Baseline and Intervention Trends in ED Visits per 1,000 Patients

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: ED rate: total quarterized ED visits and observation stays/number of unique patients.
— Data not yet available.

October 2014

Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring

Annual and Site Visit Report

The Curators of the University of Missouri

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OVERALL EVALUATION SUMMARY

RTI International was selected to lead an independent evaluation of the 24 Health Care Innovation Award (HCIA) awardees categorized as Community Resource Planning, Prevention, and Monitoring (Community Resource). In this role, RTI is conducting an in-depth evaluation of each innovation, as well as a cross-site evaluation that includes similar innovations targeting the same priority outcomes (e.g., emergency department [ED] visits). For each of the 24 awardees, this report presents findings from the first year of the evaluation (beginning September 23, 2013, and including data obtained by RTI as of September 11, 2014). The report is based on multiple data sources, including operational reports, self-monitoring plans, site visits, and quantitative data analysis.

The evaluation methods vary by awardee innovation, based on the type of innovation and availability of data. RTI has reviewed and coded all existing documents from the awardees through December 31, 2013, and incorporated that knowledge into each awardee's overview. Our review included the awardees' original applications for funding, original and current operational and self-monitoring plans, and quarterly narrative and monitoring reports. For this annual report, we incorporated activities reported through the awardee's seventh quarterly report (i.e., through March 31, 2014).

Between April and August 2014, teams of at least two staff from the RTI team visited all 24 awardees for 2 to 4 days, depending on the number of interviews conducted. Teams included a subject matter expert, with training and experience specific to the awardee's innovation, and a master's- or bachelor's-level colleague to take notes. Before each visit, the teams reviewed all available documentation from the awardee to learn about the innovation's goals, objectives, and status. The purpose of the site visits was to clarify our understanding of the innovation, obtain detailed information on the implementation process, and review awardee-specific data to determine which elements to incorporate into the evaluation. By August 13, 2014, all 24 awardees had been visited and a thorough description of our findings included in each of the 24 awardee sections.

In addition to the site visits, we report quantitative data from two possible sources for several awardees. First, we present findings from claims analysis for awardees in this report if they both provided us with patient identifiers and reported enrolling participants who are Medicare and/or Medicaid beneficiaries. RTI has obtained patient identifiers from most of the 24 awardees to conduct claims analysis. Second, we present data RTI obtained directly from awardees to quantify their work in addressing health care costs, quality, and patient outcomes. Data from additional awardees will be analyzed and presented in future reports, as data become available and awardees enroll sufficient participants. An update on the availability of Medicare/Medicaid claims and other awardee-specific data, analysis of data available to us and cleaned as of September 11, 2014, a summary of the comparison groups, and a list of draft evaluation measures are included in each awardee section.

1. HCIA COMMUNITY RESOURCE AWARDEE: THE CURATORS OF THE UNIVERSITY OF MISSOURI (CURATORS)

1.1 Introduction

The Curators of the University of Missouri (Curators) is an integrated health system in Columbia, Missouri. Curators was awarded $13,265,444 to support Leveraging Information Technology to Guide High Tech, High Touch Care (LIGHT^2). The innovation encompasses health information technology (health IT) implementation for providers and patients, analytics conducted by health information analysts (HIAs), and the use of nurse case managers (NCMs) to facilitate care coordination. Curators began enrolling patients into its innovation in February 2013[1] to achieve the following goals:

1. **Improve health status** through improved coordination processes to manage chronic disease and provide preventive care services.
2. **Improve health care delivery** from the patient perspective through improved coordination and patient engagement.
3. **Reduce health care costs by a net savings of** $17.7 million over the 3 years of the project.

RTI is in the process of conducting an in-depth case study for this innovation. As part of that case study, two RTI team members conducted a site visit in May 2014, and both before and after the visit, our team reviewed all documentation on this innovation. We are actively working now to obtain data directly from the awardee that will help assess many of the variables we discuss in this report section. This report describes findings from the site visit, document reviews, follow-up telephone calls, and analysis of data obtained and cleaned by RTI through September 11, 2014. We start by describing the innovation components in detail and the patients targeted by the awardee.

1.1.1 Innovation Components

The innovation combines four components that use health information technology (health IT) to guide care coordination efforts:

- **development of the LIGHT^2 suite of tools** to aggregate electronic health record (EHR) data from the target population so that population-based metrics and custom reports can be generated and displayed
- **analytics conducted by HIAs** that support aggregate metrics and custom reports
- a **Web-based patient portal** that offers access to educational materials, allows patients to request prescription refills, and provides patients a mechanism to communicate with providers and NCMs

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[1] Source: Lewin database

- **care coordination provided by the NCMs** that is guided by the LIGHT^2 tools.

Prior to the innovation, Curators had some of the components in place to varying degrees. The LIGHT^2 innovation built on the existing relationship with Cerner, a health information technology company (see ***Table 1***) to provide additional functionality to support aggregate-level reporting on metrics and custom reporting. The partnership created the Tiger Institute, which includes a datamart[2] of Curator patient data and enhanced reporting. Curators had a Cerner EHR system in place, which allowed providers and NCMs to look up individual patient information but had limited aggregate reporting capabilities and did not support customizing reports. Thus, there was not a mechanism for providers to view the health status of their patient population as a whole.

Table 1. HCIA Partner, Role, and Location

Partner Name	Role in HCIA Innovation	Location
Cerner Corporation	Project management, administration, health IT support	North Kansas City, MO

Source: Site visit, May 5–6, 2014 and Lewin Report.
HCIA = Health Care Innovation Award; IT = information technology.

Prior to innovation inception, there were five NCMs in some of the Curators family medicine and internal medicine clinics, but not all of them. The NCMs and providers had access to the EHR prior to the inception of LIGHT^2 but not to displays of aggregate metrics or custom reports. The patient portal and HIAs were not in place prior to the innovation.

To achieve the goals of the innovation, Curators has completed the following objectives to date:

- Developed, implemented, and supported the LIGHT^2 suite of tools;
- Developed the workforce by training NCMs, providers, and HIAs about the tools and how to use them;
- Identified population-level metrics for the LIGHT^2 tools;
- Developed a care coordination protocol and risk stratification reporting to support the protocol;
- Obtained buy-in from stakeholders throughout the organization;
- Identified and provided targeted patient education material through the patient portal.

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[2] A datamart is a subset of the overall data warehouse (in this case, elements in the EHR) that is dedicated to LIGHT^2 innovation.

Component 1: LIGHT^2 Suite of Tools

The LIGHT^2 suite of tools was not in place prior to the innovation. Prior to the innovation, there was no standardized way for Curators to evaluate performance on key metrics. Similarly, providers were not able to mine the data in the EHR to get an overall picture of their patient population. For example, if an internal medicine provider wanted to develop a report of diabetic patients in his or her patient panel with poor glucose control who had not come in for a visit in the past 3 months, it would not have been possible in an automated fashion. Rather, it would require manual chart review, a manual tracking process or development of a custom report through a lengthy change/control process with Cerner. . There also was not a standardized set of metrics that were used to monitor and evaluate population-based performance. During the site visit, RTI learned that to obtain aggregate reporting, the organization and its providers would have to go through Cerner, the EHR vendor. Cerner had a process in place to request reporting, but they charged for each report, which required organizational approvals at many levels.

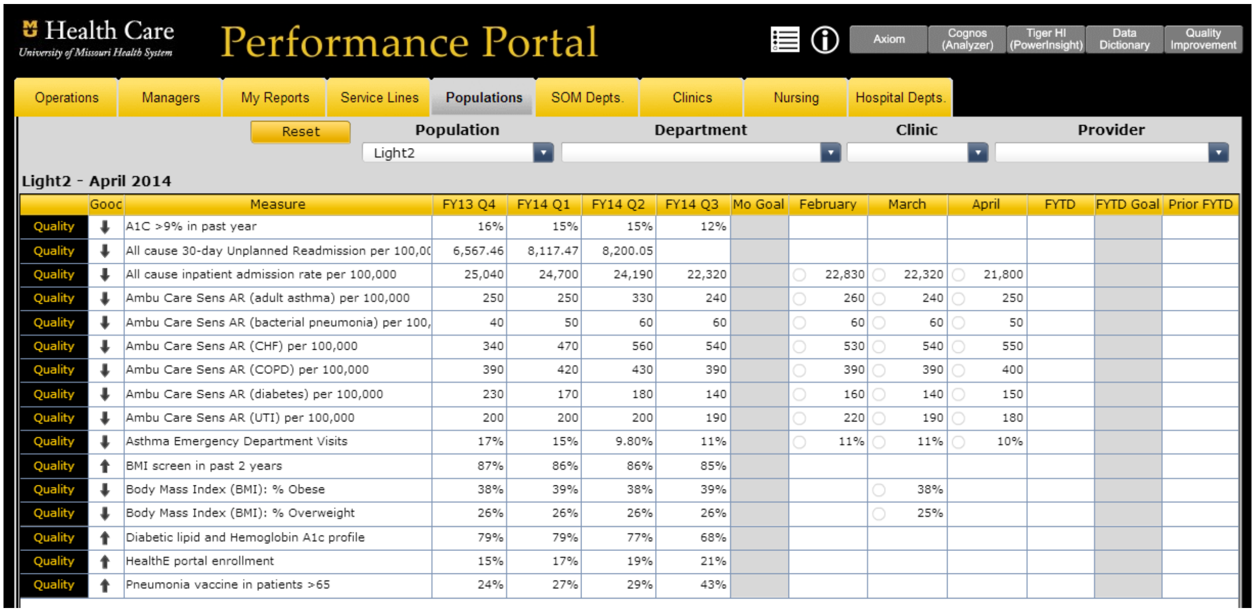
The LIGHT^2 suite of tools includes two sets of tools that are either provider- or NCM- facing and explained in detail below. The provider-facing component involves aggregate metrics of the target population displayed in a dashboard, which is available on the Curators internal portal. This allows organizational leaders, department leaders, clinic leaders, and individual providers to track performance on key metrics. The NCM-facing component allows NCMs to view the individual patients assigned to them and provides them a place to document care coordination activities.

Provider-Facing LIGHT^2 Tools

The provider-facing tools are viewed through a dashboard on the organizational intranet through which organizational leaders and providers can view target population performance on key metrics. The information in this dashboard is used by organizational leadership to guide quality improvement efforts and to identify changes to be made in their own practice. The information can also be used to identify necessary workflow, educational, or other clinical changes.

Provider-facing LIGHT^2 tools are available to everyone in the organization with access to the internal portal. ***Figure 1*** is a screenshot of the aggregate-level display that can be viewed by Curators employees.

Figure 1. Screenshot of Aggregate Metrics Provided by the LIGHT² Tools[3]



Population: Light2

Light2 - April 2014

	Gooc	Measure	FY13 Q4	FY14 Q1	FY14 Q2	FY14 Q3	Mo Goal	February	March	April	FYTD	FYTD Goal	Prior FYTD
Quality	↓	A1C >9% in past year	16%	15%	15%	12%							
Quality	↓	All cause 30-day Unplanned Readmission per 100,0(	6,567.46	8,117.47	8,200.05								
Quality	↓	All cause inpatient admission rate per 100,000	25,040	24,700	24,190	22,320		○ 22,830	○ 22,320	○ 21,800			
Quality	↓	Ambu Care Sens AR (adult asthma) per 100,000	250	250	330	240		○ 260	○ 240	○ 250			
Quality	↓	Ambu Care Sens AR (bacterial pneumonia) per 100,	40	50	60	60		○ 60	○ 60	○ 50			
Quality	↓	Ambu Care Sens AR (CHF) per 100,000	340	470	560	540		○ 530	○ 540	○ 550			
Quality	↓	Ambu Care Sens AR (COPD) per 100,000	390	420	430	390		○ 390	○ 390	○ 400			
Quality	↓	Ambu Care Sens AR (diabetes) per 100,000	230	170	180	140		○ 160	○ 140	○ 150			
Quality	↓	Ambu Care Sens AR (UTI) per 100,000	200	200	200	190		○ 220	○ 190	○ 180			
Quality	↓	Asthma Emergency Department Visits	17%	15%	9.80%	11%		○ 11%	○ 11%	○ 10%			
Quality	↑	BMI screen in past 2 years	87%	86%	86%	85%							
Quality	↓	Body Mass Index (BMI): % Obese	38%	39%	38%	39%			○ 38%				
Quality	↓	Body Mass Index (BMI): % Overweight	26%	26%	26%	26%			○ 25%				
Quality	↑	Diabetic lipid and Hemoglobin A1c profile	79%	79%	77%	68%							
Quality	↑	HealthE portal enrollment	15%	17%	19%	21%							
Quality	↑	Pneumonia vaccine in patients >65	24%	27%	29%	43%							

The dashboard has fields for the measure being tracked, the results for previous quarters, and the results for the current quarter broken down by month. The dashboard can be viewed at the aggregate level for the entire population in the innovation, at the department level, clinic level, or individual provider level. For each metric, the user can click on the individual cell to obtain information about the patients who make up the metric. Based on the dashboard, organizational leaders or providers may ask the HIAs to develop custom reports to identify areas for follow-up. For example, if the percentage of patients aged 18 through 75 years with type 1 or type 2 diabetes mellitus who had a most recent hemoglobin A1c (HbA1c) greater than 9% in a given clinic is high, the clinic leadership can ask the HIA to run a report of those patients in their clinic so that the NCMs can follow up with those patients individually. Prior to the tools, this type of targeted reporting was not available.

NCM-Specific LIGHT² Tools

The NCMs have access to the provider-facing tools and use them to obtain aggregate measures of their patient populations. Because NCMs may be assigned to more than one provider within a clinic, they have customized reporting so that they can view their entire patient panels. Prior to the innovation, NCMs used manual processes to track and monitor their work. During our site visit, NCMs who were in place prior to the innovation reported manually cross-matching the daily clinic schedule with their patient panels and maintaining their own tracking methods on spreadsheets. The five NCMs who were in place prior to the

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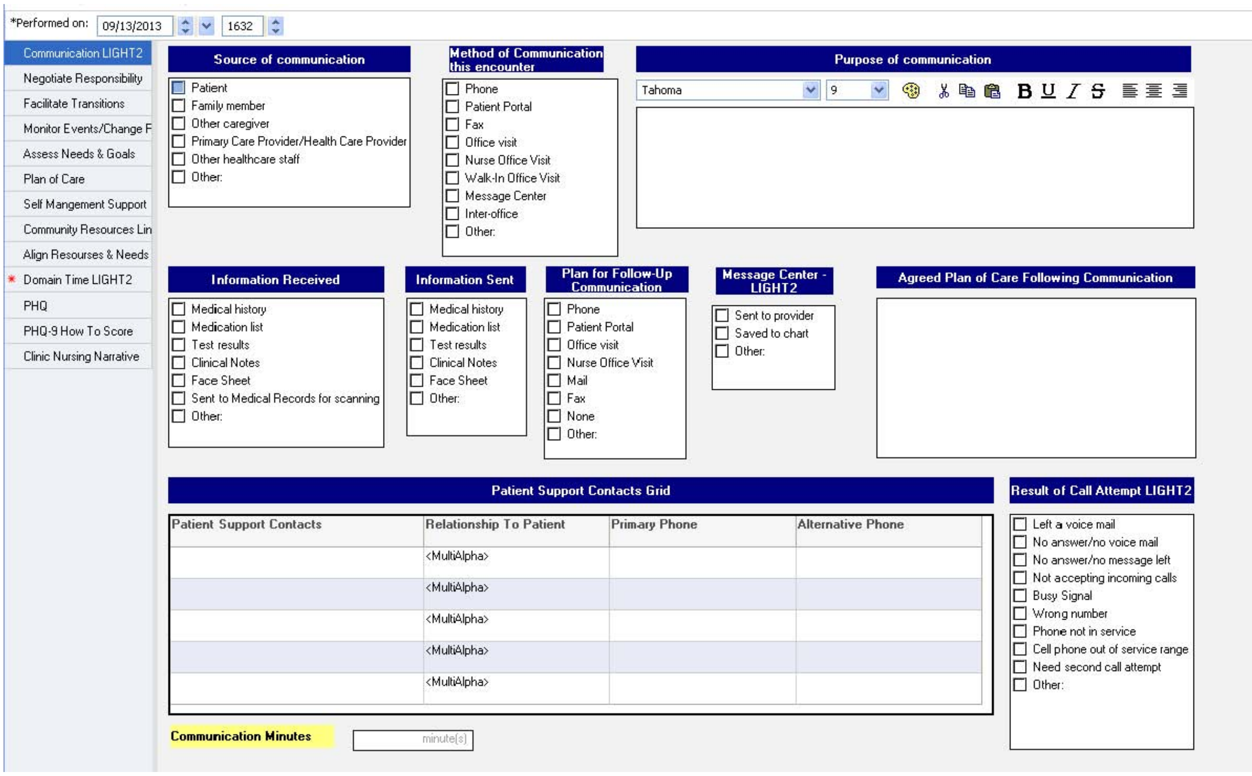
[3] Accessible to all Curators employees with access to the internal portal.

innovation shared their manual tracking lists and needs for reporting with the Cerner team to inform tool development.

The LIGHT^2 tools have allowed for more efficiency in daily operations and quality improvement projects. In daily operations, the tools interface with the EHR so that the NCM can identify the innovation's patients assigned to the clinic that day and review necessary preventive care and chronic condition care activities required. By viewing the metrics of the population as a whole and identifying the most complex patients, NCMs can appropriately direct their efforts to facilitate provision of preventive services and care coordination. The NCMs use the tools to inform their work so that they can preschedule necessary testing and start the administrative process for physician referrals and orders, if necessary. For example, if a healthy patient who is due for a colonoscopy is scheduled to come in on a given day, the NCM can communicate a physician's order to the gastrointestinal (GI) department to schedule a colonoscopy. Other activities for which they use tools in monitoring their patient panels include helping patients set up routine visits with their physicians, ensuring patients stay current with preventive care and chronic disease care guidelines, and helping them with other resource needs in the community. ***Figure 2*** is a screenshot denoting the LIGHT^2 tools NCMs use to track their work.

Figure 2. Screenshot of NCM-Facing Tool



*Performed on: 09/13/2013 1632

Source of communication
☐ Patient
☐ Family member
☐ Other caregiver
☐ Primary Care Provider/Health Care Provider
☐ Other healthcare staff
☐ Other:

Method of Communication this encounter
☐ Phone
☐ Patient Portal
☐ Fax
☐ Office visit
☐ Nurse Office Visit
☐ Walk-In Office Visit
☐ Message Center
☐ Inter-office
☐ Other:

Purpose of communication

Information Received
☐ Medical history
☐ Medication list
☐ Test results
☐ Clinical Notes
☐ Face Sheet
☐ Sent to Medical Records for scanning
☐ Other:

Information Sent
☐ Medical history
☐ Medication list
☐ Test results
☐ Clinical Notes
☐ Face Sheet
☐ Other:

Plan for Follow-Up Communication
☐ Phone
☐ Patient Portal
☐ Office visit
☐ Nurse Office Visit
☐ Mail
☐ Fax
☐ None
☐ Other:

Message Center - LIGHT2
☐ Sent to provider
☐ Saved to chart
☐ Other:

Agreed Plan of Care Following Communication

Patient Support Contacts Grid

Patient Support Contacts	Relationship To Patient	Primary Phone	Alternative Phone
	<MultiAlpha>		
	<MultiAlpha>		
	<MultiAlpha>		
	<MultiAlpha>		
	<MultiAlpha>		

Communication Minutes minute(s)

Result of Call Attempt LIGHT2
☐ Left a voice mail
☐ No answer/no voice mail
☐ No answer/no message left
☐ Not accepting incoming calls
☐ Busy Signal
☐ Wrong number
☐ Phone not in service
☐ Cell phone out of service range
☐ Need second call attempt
☐ Other:

Based on the results of the metrics in the provider-facing tools, the NCM may develop a list of patients who need follow-up care for their disease condition. This tool also tracks NCM activities, such as communication with the patient, test results, and any follow-up needed. In addition, if the NCM needs to send a note to the provider, she can do so automatically through the tool.

Component 2: Data Analytics

A key component to Curators' innovation is the HIA. This is a new role for Curators. Prior to the HCIA, Curators had no way to conduct aggregated analyses of EHR data and believed that a way to improve care coordination would be to more systematically analyze data for providers to use in tracking and monitoring care. Development of the LIGHT^2 suite of tools addressed the tool infrastructure. The Tiger Institute provided the infrastructure that includes the datamart in which the aggregate data from the EHR are housed and the user-interface, which is what the organizational leader, provider, or NCM would view when using the tools. The HIA serves as a bridge between the Cerner EHR team, which provides the infrastructure, and the users who use the tool.

HIAs are located in the main Curators hospital and not the clinics. However, they do visit the clinics and attend stakeholder meetings to understand user needs. They conduct analytics that underpin the tools. One important piece that the HIAs addressed is attribution of patients. For the LIGHT^2 tools to be accurate, each patient must be correctly tagged to his or her primary care provider. If the attribution of patients to primary care providers was incorrect, providers would not trust the data because they would not have confidence that their patients and only their patients would be included in the reports. Thus, developing algorithms to appropriately tag patients to the appropriate provider was a challenge that the HIAs addressed. Another important piece of the HIA work is risk stratification of patients. The HIAs developed a system to stratify patients into risk tiers based on their complexity. HIAs worked with NCMs, providers, and Cerner to identify available data elements that could be used to stratify patients, select the most appropriate ones, and run the data. This stratification system categorizes patients into risk tiers based on their social and clinical status. These reports are run regularly because patients may change tiers as their health and social status changes.

Custom reports and queries are also generated by the HIAs. Based on the dashboard reports, an organizational leader, provider, or NCM may wish to delve into a particular topic further or conduct a quality improvement project. They would work with the HIA to discuss the purpose of the report, discuss available data elements, and develop a report. Reports may be ongoing or one-time occurrences depending on the needs of the user.

The HIAs are not clinical but have experience in computer science, health information management, and related fields. They run the reports and track performance metrics for the HCIA innovation and other quality improvement activities, and Curators anticipates that the

HIAs will be involved in tracking metrics going forward as well. ***Table 2*** provides detail about the position.

Table 2. HIA Role

Characteristic Type	HIA Role
Title	Health information analyst
Minimal qualifications	Bachelor's degree
Functions	Identify provider data needs with NCMs Analytics in support of: Tiering of patients Reporting for NCMs Scheduled reporting to CMS Institutional Review Board (IRB) Analysis of claims data
Established continuing education program	None specifically identified

Source: Site visit, May 5–6, 2014.

CMS = Centers for Medicare & Medicaid Services; HIA = health information analyst; IRB = Institutional Review Board; NCM = nurse case manager.

Component 3: Patient Portal

Curators worked with Cerner to develop a Web-based patient portal to serve patients throughout the network. The portal is available to anyone who is a patient in the Curators network and is not confined to those who are part of the innovation. The most commonly used functions by patients are in updating their demographic information, scheduling screenings, viewing lab results, requesting prescription refills, and communicating with NCMs or other office staff. The portal also has educational materials patients can reference. These are part of the product provided by Cerner.

Component 4: Nurse Case Managers

NCMs are registered nurses (RNs) who are assigned to providers within the internal medicine or family medicine clinics at Curators. They are housed in the offices themselves. Some of the clinics had NCMs prior to the innovation and others did not. There were five NCMs in place before the innovation. Consequently, HCIA funding supports the new NCMs but not the ones who were already in place. Curators used the job description and functions of existing NCMs to recruit and hire them. Recruiting took place both internally within Curators and externally in the local community through Human Resources.

The NCMs each have a panel of approximately 500 patients based on their provider assignments. The risk stratification system developed by the HIAs helps the NCMs manage their patient panels. Prior to having the LIGHT^2 tools and automated risk stratification system, NCMs kept track of complicated patients through their own lists. Now, they use the tools to identify the patients needing the most attention and to track the work accomplished with each patient. For the more complicated patients, NCMs help with coordination, follow-up, and medical management. For less complicated patients, NCMs are less involved and help ensure that preventive medicine guidelines such as routine screenings are followed.

Services Provided by NCMs

The NCMs fulfill the functions listed in ***Table 3***. Each day, they review the patients scheduled to be seen for the day and work with the physician to ensure that screenings, orders, and other coordination activities are fulfilled. During the clinic visit, the NCMs meet with patients to introduce themselves (if they have not yet met) and explain that they are part of the team and what they are doing. For patients who are newly diagnosed with a disease such as diabetes, the NCMs provide patient education about relevant topics such as medication adherence and monitoring blood sugar. When patients are complicated and have many diseases, they help coordinate their care across providers, reconcile medications, and provide education. They also facilitate referrals to social services as needed. The NCMs maintain a list of local services and share that information with each other to facilitate referrals.

Table 3. NCM Role

Characteristic Type	NCM Role
Title	Nurse care manager
Minimal qualifications	Registered Nurse (RN)
Functions	Health education Informal counseling, individualized goal setting Direct service delivery Medication management Patient monitoring and follow-up Service coordination Community linkages Instrumental support Assessment of preventive services needed and coordination with the physician
Established continuing education program	Monthly ongoing training during NCM meetings Continuing education seminars Pertinent courses at the university Webinars

Source: Site visit, May 5–6, 2014
NCM = nurse care manager; RN = registered nurse.

There are two ways in which NCM services differ across clinics. One is due to clinic location and the other is due to clinic experience with NCMs prior to the innovation. Because the clinics are located throughout the region with diversity in their patient mix (e.g., wide socioeconomic and demographic variation), some of the NCMs are more involved with social services than others. During the site visit, we learned that practices with previous experiences with NCMs were more easily able to incorporate them into their clinic workflow than practices that did not have care coordinators in place. There was no formal kickoff with roles and responsibilities outlined when the NCMs joined the clinics. Furthermore, the clinics had no guidance or training about how to incorporate the NCMs into clinic workflow. NCMs who joined clinics without a history of NCMs said they educated the clinic providers and staff about their role on an informal basis. NCMs offer support services to ensure patients receive adequate and timely care for their diagnosed conditions and appropriate preventive care services.

1.1.2 Program Participant Characteristics

The innovation's target population is adult patients with a primary care provider in the University of Missouri Family and Community Medicine or General Internal Medicine Department. All disease conditions are included. Clinics are located in both the urban and suburban settings of 23 counties in central Missouri. The demographic characteristics and payer mix are outlined in ***Table 4***. Eligible patients are those with a documented visit with a Curators internal medicine or family practice provider in the 2 years prior to implementation. The HIAs worked with Cerner to query the EHR to initially identify the patient population. Because there were some inconsistencies in attributing patients to the correct clinic, the HIAs refined the queries to address attribution challenges and improve accuracy.

Once the target population was identified, they were enrolled by the NCMs assigned to each clinic. The NCMs managed recruitment in 2013 by discussing the project with patients during their regularly scheduled visits. Patients who enrolled prior to July 1, 2013, are considered "charter members" and total 9,932 patients. Enrollment did not continue after this time. During the site visit, Curators indicated that they froze recruitment so that they could track the innovation's impact over time. Patients will remain enrolled in the innovation until they move out of the service area or are deceased. The number of patients who remained enrolled as of Quarter 7 (Q7) is 9,387 (i.e., 193 patients are deceased and 352 have likely moved out of the service area). ***Table 5*** provides the demographic characteristics of all patients ever enrolled in the innovation. As shown in the table, a majority (68.2%) were between 25 and 74 years of age at enrollment and more than half (60.1%) are female. Most patients (85.8%) are White, and about 12% are black, Hispanic, Asian, or American Indian or Alaska Native. More than half (61.6%) of patients are covered by Medicare or Medicare Advantage, about one-fifth (18.1%) are covered by Medicaid, while another one-fifth (17.5%) are dually eligible patients.

Table 4. Characteristics of All Patients Ever Enrolled in the Innovation through Q7

Characteristic	Number of Patients (n=9932)	Percentage of Patients
Age		
18–24	467	4.7
25–44	1,749	17.6
45–64	2,119	21.3
65–74	2,903	29.2
75–84	1,759	17.7
85+	934	9.4
Missing	1	0.1
Sex		
Female	5,966	60.1
Male	3,966	40.0
Missing	0	0.0
Race/ethnicity[1]		
White	8,523	85.8
Black	1,092	11.0
Hispanic	35	0.4
Asian	87	0.9
American Indian or Alaska Native	35	0.4
Other	113	1.1
Missing/refused	47	0.5
Payer Category		
Dual	1,739	17.5
Medicaid	1,798	18.1
Medicare	5,433	54.7
Medicare Advantage	687	6.9
Missing	275	2.8

Source: Patient-level data provided to RTI by Curators in July 2014.

[1] Consistent with the "Standards for the Classification of Federal Data on Race and Ethnicity" (http://www.whitehouse.gov/omb/fedreg_1997standards/), the table includes a combined race and Hispanic ethnicity category that is co-equal with the other categories of race. This is how the data were provided to RTI by the awardee; therefore, self-identification is not feasible.

The HIAs conducted analyses to stratify patients into tiers based on health status. This analysis was based on coding and utilization information for each patient that was housed in the EHR. There are four tiers that range from 1 (patients with no chronic conditions who require only preventive services) to 4 (medically complex patients with high utilization).

Patients may move between tiers as their health status changes. The NCMs use the tiers to guide their work, reserving more of their time for patients in Tiers 3 and 4.

The number of patients by their most recently assigned risk tier is provided in ***Table 5***. As shown in the table, most patients (72.8%) are categorized in the healthier, less complex risk tier (i.e., Tiers 1 and 2). About one-fifth (20.4%) of patients were on the more complex side of the scale. Future reports will examine changes in health outcomes (e.g., blood pressure control among those with hypertension) over time based on risk tier at baseline. We will also assess whether differences in health measures at baseline between risk Tiers 1 and 2 versus 3 and 4 decrease over time, which would indicate the innovation is having an effect on patient health.

Table 5. Patients Planned for Inclusion in Innovation (Denominator Data)

Risk Tier	Number of Patients[1] (n=9932)
Tier 1—Healthy patients without a chronic condition	2,548
Tier 2—Patients with a stable chronic condition (low utilization)	4,687
Tier 3—Patients that have at least one hospital admission or multiple outpatient visits to ambulatory care (moderate utilization)	1,357
Tier 4—Most complex patient cases (high utilization)	673
Missing/unknown	667

Source: Patient-level data provided to RTI by Curators in July 2014.

[1] Tiers can change over time. The data provided in the table are based on the most recent stratification for each patient. We will update the number of patients in each risk tier by quarter in subsequent reports.

1.2 Implementation Progress

The extent to which each awardee is able to implement its innovation as planned and reach a sufficient number of patients will be critical to assessing its impact on reducing costs and improving health and health care. As part of our evaluation we are assessing a set of process measures listed in ***Table 6*** that will inform how well Curators has implemented the LIGHT[2] innovation. The paragraphs following the table provide details and data on the implementation process and then the effectiveness of the innovation.

1.2.1 Process

The implementation process has been the initial focus of the evaluation. The implementation process is best evaluated through a combination of data variables, including execution of implementation that conforms to operational plans and capacity for implementing the innovation in a timely and effective manner. We focused on the implementation process during the awardee site visit in May 2014. Evaluation questions included the following:

- What is the overall execution of the innovation implementation (e.g., the actual rate of expenditures relative to the projected rate)?
- What accomplishments are specific to hiring or training staff so that the organization can build its capacity to implement the innovation effectively?
- What is the implementation effectiveness, including fidelity, reach, and dose of the innovation thus far?

Table 6. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for Curators

Key Evaluation Domains	Subdomains	Measures	Data Source
Implementation effectiveness	Reach	Number/percentage of physicians who were aware of and participated in the innovation	Provider Survey
		Number/percentage of patients who enrolled in the patient portal	LIGHT^2 system
	Dose	Number of patient contacts by risk tier	LIGHT^2 system

Execution of Implementation

This innovation is complex, involving many sites and components. During the site visit, the project director emphasized the importance of careful planning, oversight, and stakeholder engagement to facilitate Curators meeting its objectives. The project director obtained organizational support to develop a number of taskforces and committees that were involved from the planning stages. The teams included an Operations Team to address project logistics, an Analytics Coordinating Committee to address reporting, a High Touch Team to address care coordination, and an Advisory Board to provide institutional oversight. These meetings served several purposes, including obtaining stakeholder buy-in, understanding reporting needs, selecting key metrics for the dashboard, and identifying topics for training new and existing staff. Those interviewed in the site visit noted that the meetings have been well attended and that participants have been engaged in the discussions.

During implementation, the focus of the meetings was on innovation implementation. Now that the components are in place, the meeting foci have turned to evaluation, sustainability, and lessons learned. These stakeholder engagement meetings also provide a forum to identify and prioritize updates and changes.

LIGHT^2 Tool Implementation

We learned that all components of LIGHT^2 tools have been implemented and were implemented at once. Cerner was responsible for implementation and attended the meetings above to obtain user requirements. The site considers the technology stable and only anticipates minor changes to the system going forward to meet user needs as they arise. Currently, the site is working on enhancing the datamart to include more data elements. This will allow more flexibility and robustness in reporting in the future. In addition, the site is working on obtaining claims and pharmacy data so that they can tie those to its own utilization data.

Data Analytics

Data analytics are set up with expertise from HIAs. As mentioned earlier, this is a new role at Curators. As such, there was some confusion at the start about the HIAs' role and how they differed from Cerner employees. Part of this confusion may be because the NCMs and providers are located in the clinic, while the HIAs are located with the project director at the medical school. The HIAs attend meetings with NCMs, providers, and organizational leaders who use the dashboard so that they can learn about user needs. However, the NCMs, providers, and organizational leaders with whom we spoke did not appear to fully understand the HIA role or the promise of analytics. The HIA staff are in place, though there was turnover just before the site visit, the outcome of which remains to be seen. There will be some ramp-up time for the new HIAs as they go through a training period and that may affect reporting. In addition, the new HIAs will have to spend time building relationships with NCMs and organizational leaders who use reports developed through the innovation The project director and the HIA with whom we spoke during the site visit indicated that the fact that the HIA was a term position contributed to the high turnover. As the HIAs found more permanent positions, they left to pursue them. The remaining HIA is a physician and a doctoral student who will be charged with training and mentoring the new HIAs.

Patient Portal

The Web-based patient portal has been implemented and the system is in production. This implementation was managed by Cerner. This was a standard Cerner product that interfaces with the Cerner EHR. The site reported limited customization. There is not a consistent process across Curators for signing patients up for the portal. Even within clinics that are participating in the innovation, stakeholders reported that there has not been a concerted effort to recruit patients into signing up and participating in the portal. In addition, Curators has not done wide-scale marketing of the portal internally or externally.

Nurse Care Managers

The NCMs are in place at the clinics. The innovation resulted in nominal changes to the clinic workflow where NCMs were already in place. During the site visit, the NCMs in those clinics reported that their workflows were improved because of the LIGHT^2 tools improving efficiency and reducing manual processes. The clinics where NCMs were new had some growing pains associated with implementation. During the site visit, NCMs in those clinics indicated that a kick-off meeting facilitated by the project director or nurse researcher on the implementation team would have ameliorated some of those issues. Those NCMs indicated that they still had trouble integrating their services into the clinic workflow. This means they sometimes miss opportunities to reach patients while they are in the clinic and have to follow up by phone or other means.

Organizational Capacity and Leadership

The Curators of the University of Missouri is the governing body of the university, and this innovation is operationalized through the partnership between the University of Missouri and Cerner. Curators has outsourced their health IT functions to Cerner. The only IT functions Curators handles itself are non-health-related IT systems such as Human Resources systems. In 2009, the University and Cerner formed a public-private partnership called the Tiger Institute for Health Innovation, which is dedicated to creating a national model of better health care and reduced costs. The Tiger Institute/Cerner implemented the LIGHT^2 health information technology (HIT) component, and they continue to provide all HIT-related services.

LIGHT^2 has clearly designated leadership with the experience, skills, and authority to make decisions. The project director has managed many grants and has gained extensive organizational leadership experience during his lengthy tenure at Curators. This institutional knowledge was instrumental in him garnering organizational support to hold the stakeholder meetings described above. However, he is not a clinician, so there are co-investigators with clinical expertise, such as a nurse researcher. Team members are familiar with federal awards and their oversight.

The innovation was complex and involved a great deal of planning. The project director developed a core team with the co-investigators and Cerner partners to plan the project and considered aspects such as incorporating feedback from various stakeholders, providing stakeholders the time to meet with the leadership team in single disciplinary groups and multidisciplinary groups, planning for evaluation, and incorporating technical and clinical input. At the time of the site visit, all components of the innovation had been launched.

1.2.2 Workforce Development

As cited earlier, recruiting and training NCMs is critical to the success of the innovation. The HIAs are also key to the innovation's success. Although patient care is not funded by HCIA, provider engagement and utility are key components of success as well.

Hiring and Retention

Hiring and retaining staff is a key component of the innovation. In Q7, the innovation team was fully staffed (2.15 FTE above projection). These numbers do not reflect HIA turnover that occurred between Q7 and the site visit. Initial training of existing staff is also complete. New staff will be trained as part of their orientation.

Curators recently hired a project coordinator who will assist the project director in day-to-day management and reporting. There has been little turnover in the NCMs. However, as mentioned earlier, the HIAs have experienced turnover. Two of the HIAs had given notice right before the site visit, and one has agreed to stay on in a consulting role, so the impact of the turnover has not fully been realized. We will monitor the innovation for any impact on reporting. The turnover rate and lessons learned were addressed during site visit interviews, and Curators is using this turnover as an opportunity to hire people better suited to the position as it evolves. Initially the HIAs were hired based solely on their technical skills, and now that the project has been implemented, the learning has been that communication, understanding of the health system, and ability to easily interact with the NCMs are additional critical skills. Early in the innovation, Curators was more focused on seeking technical skills and not people skills; now when they interview people, they focus on both technical and soft skills. Because these are term positions, they have had some difficulty finding longer term hires. This has not been true of the NCMs who are more easily able to transition to other nursing or care coordinator positions in the organization.

Training

Curators cited training as one of its major activities. With 133 providers across multiple sites using LIGHT^2, training is necessary to ensure consistent system use and compliance across sites and among all staff. As of Q7, they have conducted training for 807 trainees for a total of 3,032 cumulative hours. Topics included system use and optimization, clinical topics associated with chronic disease and complex conditions, electronic medical record training and support, LIGHT^2 training, and new hire training. Below we provide details regarding training provided to the LIGHT^2 staff as relayed to RTI during the site visit and in the Q7 reporting.

Use of LIGHT^2 Tools Training for all Staff

Training about how to use the LIGHT^2 tools was developed and conducted by a collaborative team that includes the University of Missouri Center for Education Development and Cerner employees. The team tried to standardize and use existing systems to integrate training and not add burden to the users as much as possible. An initial training was conducted in a classroom setting on laptops for all LIGHT2 staff including providers, NCMs, and HIAs. As a result of numerous NCM workflow changes, an additional half-day in-person training was conducted on June 18, 2013. The purpose of this training was to review the concepts, how to use the system, what the alerts look like, how the scheduling works, and other details for using the system effectively. This training was well received and useful for helping the NCMs and providers use the LIGHT^2 tools efficiently. Direct one-on-one trainings were offered as needed, and the team traveled to each clinic to meet with the providers and NCMs individually to answer questions and address concerns. The feedback from the NCMs during the site visit was that it was not a difficult system to learn and that there is a helpdesk and specialized support if needed. The health IT staff attend monthly meetings and involve the staff in discussions regarding use of the systems and any changes or updates that might be necessary. The NCMs felt that their opinions were valued and really taken into consideration in the development and use of the LIGHT^2 tools.

Care Coordination Training for the NCMs

The NCM training was created based on the AHRQ Care Coordination Framework[4] and other literature regarding care coordination. Furthermore, a Blackboard Website is used among all the NCMs that includes all of the documents and comprehensive care coordinator training. The Blackboard message boards provide a way for the NCMs who are distributed across sites to communicate about the trainings and how they are applied in the clinical setting. Respondents cited that the Blackboard message boards have been efficient for the NCM team and supervisors because everyone receives the same content information and learns the major conceptual areas of negotiation, education, using teach-back, motivational interviewing, and community services. It was stated that the Blackboard Website was also for new staff to easily access training and resources online. Additionally, supervisors encourage the NCMs to write their success stories on an online discussion board to share their experiences and bring relevance to their work.

During the site visit, the NCMs indicated that much of their training and information updates are provided on an ongoing basis during monthly NCM meetings, which is organized by the two NCM supervisors. Furthermore, it was stated that being in a university setting allows access to numerous beneficial courses, grand rounds, continuing education seminars, and webinars conducted by varying associations.

HIA Training

The HIA position was completely new to Curators and evolved as the innovation progressed. Although the HIAs received LIGHT^2 training and organizational orientation, they did not receive formal specialized training. One of the lessons learned discussed by the HIA team manager was that there must be adequate onboarding training for the HIA staff so that they are able to accomplish their tasks and maintain their motivation. Training for new HIA staff will be conducted by the HIA team manager and one of the departing HIAs who has agreed to remain as a consultant to the team for a short period of time for training and technical assistance. Training documents have also been developed by the manager and the departing experienced HIAs as training and reference tools.

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[4] Source: http://www.ahrq.gov/professionals/prevention-chronic-care/improve/coordination/atlas2014/chapter3.html

1.2.3 Implementation Effectiveness

A major aspect of the evaluation will be to assess the effectiveness of the intervention in terms of the extent to which the intervention implemented aligns with what was planned (i.e., fidelity) and whether patients have been exposed to it. Their exposure will be measured through reach (i.e., the extent to which the total number of patients is reached that were targeted) and dose (i.e., the degree to which each patient is exposed to services provided).

Fidelity

Originally, NCMs were to contact patients in all tiers of the risk stratification model at least once per year, with patients in Tiers 3 and 4 receiving more services. Based on workflow analyses and feedback from the NCMs and providers, we understand that patients in Tiers 1 and 2 will no longer have required contacts by the NCMs unless there is a need as outlined through the NCM-facing tool. This means that NCMs will contact patients in Tiers 1 and 2 only if the tools indicate a need for a preventive service such as a colonoscopy and not on a regular basis. During the site visits, the NCMs indicated that they were pleased with this change because it would free up their time to focus on the more complicated patients.

The NCM roles and functions have remained the same. However, the NCMs who were in clinics without previous experience with a care coordinator had to spend time conducting educational activities for the providers and staff and had to determine how to fit their services in the clinic workflow. This took NCM time away from coordination activities in the beginning.

The HIA function was a brand new role that has shifted from a primarily analytical role to a role requiring more health knowledge and communication skills. Because the NCMs, providers, and organizational leadership turn to the HIAs for reporting, this may affect reporting going forward. This is because the incoming HIAs will have to learn the reporting processes, terminology, systems, and roles and responsibilities of various stakeholders. During the site visit, we asked the remaining HIA if transition plans were in place, and he indicated that he was working with the departing HIAs to develop documentation to facilitate new hires.

Reach

In their application for funding, Curators estimated that they would reach 10,000 Medicare and Medicaid beneficiaries. As previously described, they enrolled 9,932 patients for a discrete period of time into the innovation. Enrollment in Curators' innovation began when an NCM discussed the LIGHT^2 innovation with the target patient and that patient agreed to join. Curators defines a participant as a patient who has had a "clinical event" with a LIGHT^2 NCM. Examples of clinical events include phone messages, letters, clinic notes, and screenings.

Patient-level data provided to RTI by Curators in July 2014 indicate that a total of 9,932 patients have participated in the innovation. ***Table 7*** provides the overall target population, the number of unduplicated patients by quarter, the percentage of the target population reached each quarter, and the percentage of change from one quarter to the next. During Q4, Curators reached nearly 100% of its target population. The number of patients has decreased by less than 5% over time because of patients dying or moving out of the area.

Table 7. Patient Enrollment and Reach for Each Quarter Since Project Launch

Quarter	Target Population (Denominator Identified as Eligible)	Number of Unduplicated Patients Enrolled	Total Reach per Quarter	Percentage Change from Previous Quarter
March 2013 (Q3)	9,932	6,087	61.4	0.0
June 2013 (Q4)	9,932	9,852	99.3	37.9
September 2013 (Q5)	9,932	9,546	96.3	−3.1
December 2013 (Q6)	9,932	9,498	95.8	−0.5
March 2014 (Q7)	9,932	9,387	94.7	−1.1

Source: Patient-level data provided to RTI by Curators in July 2014.

Patient engagement can also be defined through portal use. ***Table 8*** provides the number of patients registered for the patient portal by quarter, as well as the reach and change in reach over time. Overall, 12.2% of the target population had signed up for the patient portal by March 2014. Staff indicated that marketing the portal was less of a focus than building rapport and explaining the NCM function.

Table 8. Participant Enrollment in the Patient Portal for Each Quarter Since Project Launch

Quarter	Target Population (Denominator Identified as Eligible)	Number of Unduplicated Patients Registered for Health Portal	Total Reach per Quarter	Percentage Change from Previous Quarter
March 2013 (Q3)	9,932	245	2.5	0.0
June 2013 (Q4)	9,932	22	0.1	−2.4
September 2013 (Q5)	9,932	23	0.1	0.0
December 2013 (Q6)	9,932	443	4.5	4.4
March 2014 (Q7)	9,932	492	5.0	0.5

Source: Patient-level data provided to RTI by Curators in July 2014.

To affect clinical activities, physicians must also be reached. Physician reach can be assessed through physician use of the LIGHT^2 tools and meetings with the NCM to review the patient data. During the site visit, we learned that physician use of the dashboard was variable, partially because physicians are not as focused on population health as the NCMs or administration. Physicians interviewed expressed appreciation for the utility of tools for NCMs and indicated that they rely on the NCMs to bring issues to their attention. We will work with the site to determine if Cerner can provide view counts or similar analytics to assess use to report in future quarterly reports. In addition, we will also use the Provider Survey to capture use and perceived benefits of the innovation and help us understand how the innovation has changed their practices.

Dose

Dose assesses the extent to which participants have been exposed to new services. This intensity of services (e.g., frequency, duration) provided to participants is combined with outcome data to determine whether increasing exposure (or exposure at all) to the innovation is associated with changes in outcomes. Three of the four components of the innovation are relevant for all enrolled patients: LIGHT^2 system, HIA reporting, and the Web-based portal. NCM services are available for all enrolled patients but are stratified by risk tier.

Table 9 provides a list of NCM services and the number and percentage of patients who received each type of service over time, for all patients receiving at least one of the listed services, as well as for those in Tiers 1 and 2 and those in Tiers 3 and 4. It should be noted that the risk tier data provided by Curators to date seems to be based on the most recent determination (i.e., risk tier can change over time). Once we receive the data over time as requested from Curators, we will revise this table to reflect risk tier at baseline.

Table 9. Number of Patients Receiving Specific NCM Services through Q7

	Number of Services Provided Across Patients					
	All Patients (N=9,932)		Tiers 1 and 2 (n=7,235)		Tiers 3 and 4 (n=2,030)	
Services	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Assess needs and goals	4,960	49.9	3,140	43.4	1,654	81.5
Communication	2,531	25.5	1,484	20.5	991	45.8
Community resources link	5,119	51.5	3,185	44.0	1,715	84.5
Facilitate transitions	2,311	23.3	938	13.0	1,246	61.4
Plan of care	3,388	34.1	2,178	30.1	1,152	56.8
Self-management support	2,611	26.3	1,607	22.2	971	47.8
Total[5]	5,345	54.8	3,388	72.9	1,731	85.3

Source: Patient-level data provided to RTI by Curators July 2014.
NCM = nurse care manager.

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[5] Patients receiving at least one of the listed services.

Overall, 54.8% of patients enrolled received at least one of the NCM services listed in the table. About one-half of all patients (49.9%) received an assessment of their needs and goals. Slightly more than one-half (51.5%) were provided with links to resources available in the community. This pattern was similar for patients in Tiers 1 and 2 and for patients in Tiers 3 and 4, with the majority of patients receiving an assessment of their needs and goals and/or links to community resources. In all instances, a greater percentage of patients in Tiers 3 and 4 (85.3%) received services provided by NCMs than did patients in Tiers 1 and 2 (72.9%), as would be expected given the greater health complexity among those in Tiers 3 and 4.

1.3 Evaluation Outcomes

RTI will use two types of quantitative data from awardees to assess the impact of the awardee's innovation on key outcomes. These include claims data for Medicare and/or Medicaid beneficiaries, depending on who the awardee serves, and other administrative or utilization data the awardee is collecting (which we have labeled as "other awardee-specific data," reflecting the variability of the types of data elements available across awardees). We are in the process of finalizing our assessment of all the available data sources and requesting data directly from each awardee. As those data are received (and cleaned), we will incorporate the findings into our quarterly/annual reports. The following sections present descriptive findings from the quantitative outcome data provided to RTI as of July 11, 2014.

1.3.1 Measures for Evaluation

Following the site visit, the data management and site visit teams met to review each of the measures listed in the awardee's self-monitoring measurement plan (i.e., data review meeting). The measures listed in ***Tables 6*** (above) and ***10*** (below) reflect those determined as most relevant for our evaluation of Curators' innovation outcomes.

Table 10. Outcome Measures Requested from Curators

Key Evaluation Domains	Subdomains	Measures	Data Source
Clinical effectiveness	Cardiovascular disease	Percentage of patients with CAD seen who were prescribed aspirin or clopidogrel	EHR
	Chronic obstructive pulmonary disease (COPD)	Percentage of patients with COPD who were prescribed an inhaled bronchodilator	EHR
		Percentage of patients with a diagnosis of COPD who had spirometry results documented	EHR
	Diabetes	Percentage of patients with diabetes received a hemoglobin A1c and lipid profile assessment	EHR

(continued)

Table 10. Outcome Measures Requested from Curators (continued)

Key Evaluation Domains	Subdomains	Measures	Data Source
Health outcomes	Asthma	Percentage of patients with asthma who have FEV1 ≥ 80%	EHR
	Cardiovascular disease	Percentage of patients with CAD who have a LDL-C result <100 mg/dL	EHR
	Diabetes	Percentage of patients with diabetes who had LDL-C < 100 mg/dL	EHR
	Hypertension	Percentage of patients with a diagnosis of hypertension with BP < 140/90 mm Hg	EHR
	Mortality	Percentage of patients enrolled in the initiative who died	Claims data
Health care outcomes	Utilization	ED visit rate	Claims data
		All-cause admission rate	Claims data
		Readmission rate	Claims data
	Cost	Spending per patient	Claims data
		Cost savings	Claims data

BP = blood pressure; CAD = coronary artery disease; COPD = chronic obstructive pulmonary disease; ED = emergency department; EHR = electronic health record; FEV1 = forced expiratory volume in 1 second; LDL-C = low-density lipoprotein cholesterol; NCM = nurse care manager.

1.3.2 Claims Data

As part of a broad assessment of health care innovations, Center for Medicare & Medicaid Innovation (CMMI) is assessing the impact of its programs, including those funded specifically by HCIAs, on four core measures. The four core measures are

- health care spending per patient,
- hospital inpatient admissions,
- hospital unplanned readmissions, and
- ED visits.

Collectively, it is anticipated that CMMI programs will slow the increase in health care spending, reduce hospital admissions, reduce avoidable hospital readmissions, and prevent unnecessary ED visits. We are reporting these measures for all HCIA Community Resource Planning awardees so that the collective impact of the awards can be assessed. As discussed below, some awardees' innovations may not be focused on these measures. Other awardees' innovations target specific conditions (e.g., imaging, diabetes) and may have significant impacts on spending, admissions, readmissions, and ED visits for the targeted conditions but not have a statistically detectable impact on the measures at the aggregate level because the targeted conditions represent only a small fraction of total spending, inpatient admissions, and ED visits.

The measures are calculated through analysis of Medicare and Medicaid fee-for-service claims. Because of differences between Medicare and Medicaid patients in age, other demographic variables, and disease status, we report the Medicare and Medicaid results separately below. Currently, complete Medicare claims are available through the end of 2013. Medicaid claims for Curators are available through the first quarter of 2013, although claims for the final quarter may not be complete. The Curators innovation was launched on February 18, 2013 (Source: Lewin database).

- **Health Care Spending per Patient**. For Medicare beneficiaries, health care spending per patient includes Part A and Part B Medicare expenditures for persons enrolled in the Part A and Part B fee-for-service program. The variable focuses on Medicare fee-for-service spending, so Medicare managed care (Part C) services are excluded, as are beneficiary copayments. Medicare Part D prescription spending is also excluded. Spending is reported on a per-person per-quarter basis. If a beneficiary is not enrolled for every month in a quarter, spending (except for hospital inpatient spending) is prorated to a quarterly basis based on the number of days enrolled during the quarter. Because hospital inpatient admissions are both rare and expensive, spending is not prorated for hospital inpatient spending. Prorating is also not performed for beneficiaries who die during a quarter.

  For Medicaid beneficiaries, health care spending per patient is reported for fee-for-service beneficiaries. Beneficiaries are only included in the analysis for spending (and the other measures) during periods when they are enrolled in Medicaid.

- **Hospital Inpatient Admissions**. This variable measures hospitalization, the single most expensive component of health care spending. Patients kept overnight in observation beds are excluded from this measure. Inclusion criteria for the analysis are the same as for spending. Hospital inpatient admissions are not prorated based on the number of days eligible during the quarter. All-cause inpatient admissions are reported. The mean quarterly admission rate per 1,000 patients is reported.

- **Hospital Readmissions**. Hospital readmission rates serve a dual purpose in evaluating HCIA impacts. Readmissions add to the costs of a prior hospitalization, and they often reflect a problem in the care provided during the first admission. All-cause readmissions are defined as a follow-up admission to any short-term acute general or long-term care hospital within 30 days of a discharge from another hospital of the same type. We ignore multiple admissions within 1 day of an initial admission because these often represent transfers between hospitals. We define index hospitalizations that begin during the quarter and follow each index admission for 30 days, even when the follow-up period extends beyond the end of the quarter. Inclusion criteria for the analysis are the same as for spending. The readmission rate equals the number of readmissions divided by the number of index hospitalizations during the quarter. Planned readmissions are excluded from the calculation of the numerator. Quarterly mean readmission and ambulatory care- specific conditions (ACSC) readmission rates per 1,000 admissions are reported.

- **ED Visits**. ED visits are sometimes viewed as a symptom of the inability of the community's health care system to provide adequate preventive and ambulatory care visits. We report an all-cause ED visit rate that excludes ED visits resulting in an inpatient admission (which presumably represent unavoidable visits) and includes overnight ED visits without an inpatient admission. Inclusion criteria for the analysis are the same as for spending, and ED visits are also subject to the same prorating formula as for spending. The mean quarterly ED visit rate per 1,000 patients is reported.

Medicare Claims Analysis

The analysis focuses on 6,740 Medicare beneficiaries enrolled in the Curators innovation through March 2014 who were enrolled in fee-for-service Medicare Part A and B during 2013. The analysis uses data from the CMS Chronic Conditions Warehouse (CCW). We present the measures for these beneficiaries in the quarters before and after the innovation was launched on February 18, 2013.

Table 11 reports Medicare spending per patient in the eight quarters before and the four quarters during and after the launch date.

Table 11. Medicare Spending per Patient: Curators

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
1C1CMS331001	Curators												
	Spending rate	$1,834	$1,881	$1,930	$1,998	$2,032	$2,169	$2,215	$2,309	$2,491	$2,657	$2,652	$2,447
	Std dev	$6,495	$6,433	$6,418	$6,099	$7,036	$7,718	$6,896	$7,916	$7,930	$8,805	$9,256	$7,924
	Unique patients	5,692	5,804	5,935	6,079	6,214	6,340	6,501	6,609	6,729	6,719	6,735	6,740
Comparison Group													
1C1CMS331001	Curators												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—

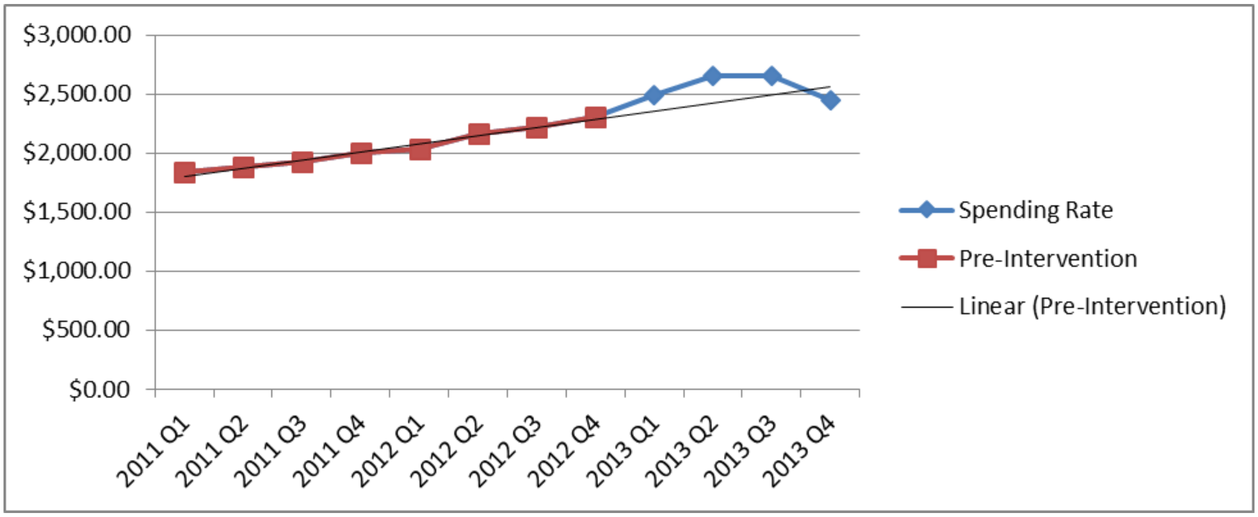
Savings per Patient

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Curators began enrolling patients on 2/18/2013 (Source: Lewin database). I1 is 2013 Q1. Spending rate: total quarter quarterized payments/number of unique patients. Savings per patient: difference in comparison minus intervention average spending rates.
— Data not yet available.

Figure 3 plots spending as a function of time. The red line represents values in quarters prior to the innovation's launch date on February 18, 2013, and the blue line represents quarters during and after launch. The graph includes a trend line based on a linear regression of prelaunch values.

Figure 3. Medicare Spending per Patient: Curators



The trend line for spending increases due to aging of the sample population (because we analyze the same individuals before and after the innovation was launched) and general medical care inflation. Although spending is higher than the trend line for the first three quarters during and after launch, the 2013 Q4 value is slightly below the trend line, and it is premature to test whether postlaunch spending is statistically different than trend values. As shown in Table 11, the standard deviation for spending is very high, representing the skewed nature of expenditures.

The all-cause inpatient admissions rate per 1,000 participants is shown in ***Table 12*** and ***Figure 4***.

Table 12. All-Cause Inpatient Admissions Rate per 1,000 Enrollees: Curators

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare
Admissions Measure: All cause

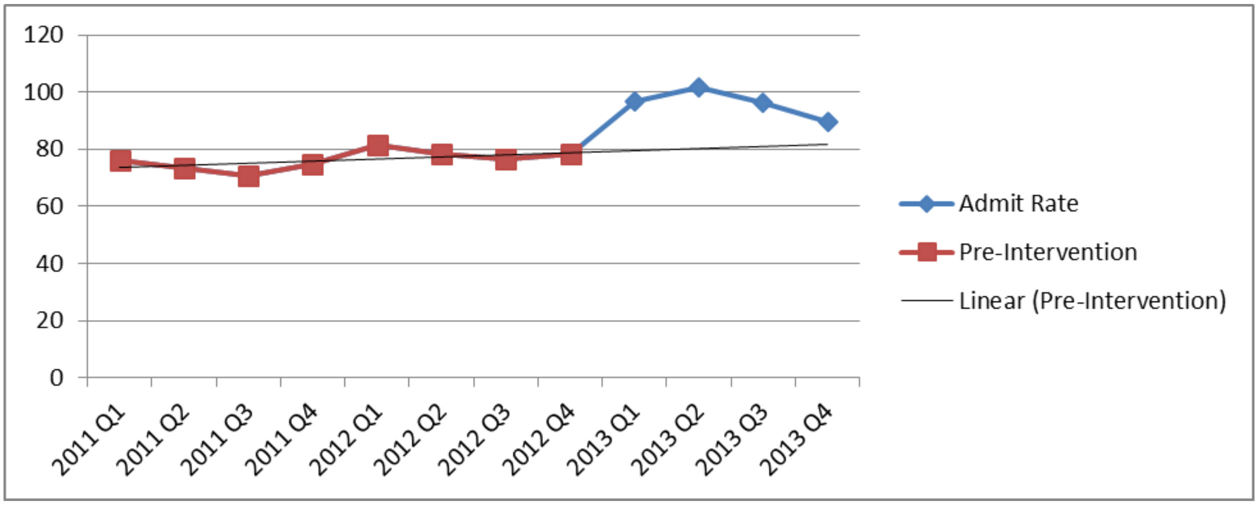
Awardee Number	Description	Baseline Quarters B1	B2	B3	B4	B5	B6	B7	B8	First Intervention Year I1	I2	I3	I4
Intervention Group													
1C1CMS331001	Curators												
	Admit rate	76	74	71	75	81	78	76	79	97	102	96	89
	Std dev	333	338	338	345	365	339	339	359	387	403	387	373
	N. of patients	5,692	5,804	5,935	6,079	6,214	6,340	6,501	6,609	6,729	6,719	6,735	6,740
Comparison Group													
1C1CMS331001	Curators												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters B1	B2	B3	B4	B5	B6	B7	B8	First Intervention Year I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Curators began enrolling patients on 2/18/2013 (Source: Lewin database). I1 is 2013 Q1. Admit rate: total unquarterized admissions/unique patients.
— Data not yet available.

Figure 4. All-Cause Inpatient Admissions Rate per 1,000 Enrollees: Curators



The inpatient admission rate (Figure 4) increases in the launch and following quarter before falling in the next two quarters; the rate remains above the overall time trend. Without statistical testing and a better-defined comparison group, it is premature to conclude that the innovation caused the increase; we will examine this question as the evaluation continues.

Hospital readmission rates per 1,000 admissions are shown in ***Table 13*** and ***Figure 5***.

Table 13. Hospital Readmission Rates per 1,000 Admissions: Curators

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare
Admissions Measure: All cause

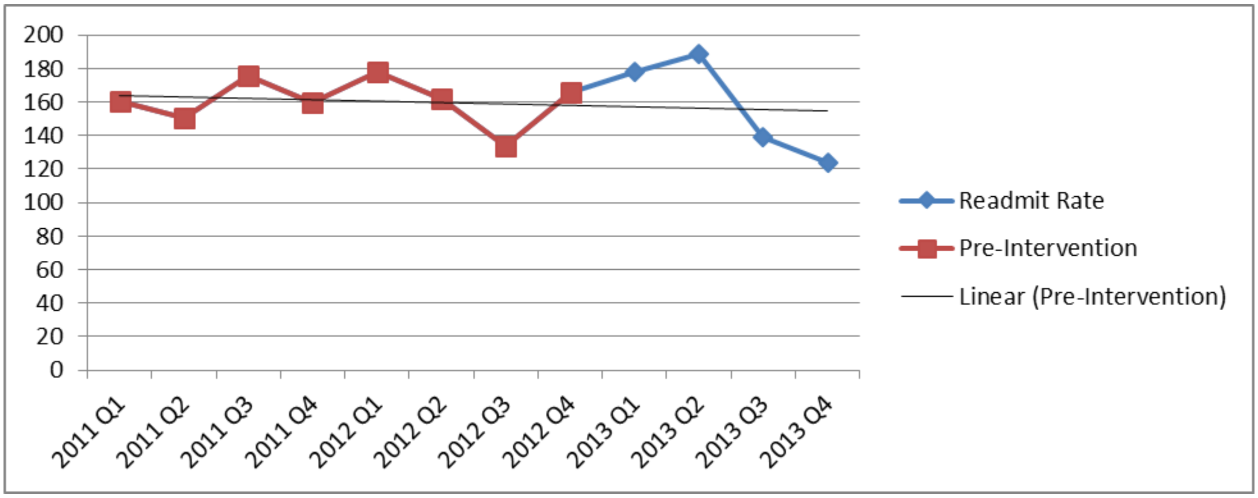
Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
1C1CMS331001	Curators												
	Readmit rate	161	150	176	160	178	162	133	166	178	188	139	124
	Std dev	367	357	381	366	382	368	340	372	383	391	346	330
	Total admissions	361	353	353	382	433	420	412	428	561	563	539	516
Comparison Group													
1C1CMS331001	Curators												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total admissions	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Curators began enrolling patients on 2/18/2013 (Source: Lewin database). I1 is 2013 Q1. Readmit rate: Sum all readmits to eligible hospital within 30 days/all admissions in quarter. Total admissions: All eligible admissions in quarter.
— Data not yet available.

Figure 5. Hospital Readmission Rates per 1,000 Admissions: Curators



Readmission rates (Figure 5) trend downwards prior to the innovation's launch, although the quarterly rate has been somewhat variable. The readmission rate is above the trend line in the first two quarters during and after launch and below the trend line in the third and fourth quarters after launch. As with the other variables, we will include statistical tests on the readmission rate in subsequent reports as more data become available.

ED visits per 1,000 participants are shown in ***Table 14*** and ***Figure 6***.

Table 14. ED Visits per 1,000 Participants: Curators

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

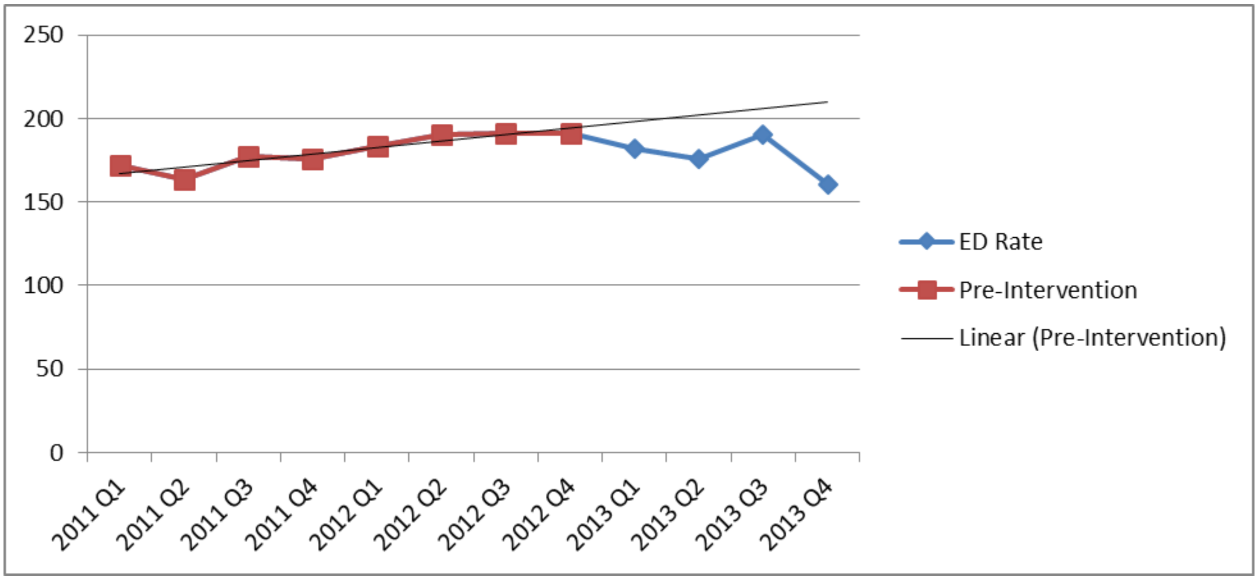
Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
1C1CMS331001	Curators												
	ED rate	172	164	177	176	184	190	191	192	182	176	190	161
	Std dev	1,030	937	915	910	1,015	1,079	1,049	1,035	1,183	1,073	1,198	1,182
	N. of patients	5,692	5,804	5,935	6,079	6,214	6,340	6,501	6,609	6,729	6,719	6,735	6,740
Comparison Group													
1C1CMS331001	Curators												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Curators began enrolling patients on 2/18/2013 (Source: Lewin database). I1 is 2013 Q1. ED rate: total quarterized ED visits and observation stays/unique patients.
— Data not yet available.

Figure 6. ED Visits per 1,000 Participants: Curators



The ED visit rate (Figure 6) follows a fairly stable increasing trend prior to launch. The rate has been below the trend line in the first four postlaunch quarters. As with the other variables, we will include statistical tests on the ED visit rate in subsequent reports as more data become available.

Medicaid Claims Analysis

The Medicaid data analysis will use data from the CMS Alpha-MAX data files. Currently, Medicaid claims for Curators are only available in Alpha-MAX through the first quarter of 2013, and claims for that final quarter may not be complete. Because the Curators innovation was launched on February 18, 2013 (Source: Lewin database), and claims for that quarter are not complete, we are not presenting measures for Medicaid patients in this report. We will provide Medicaid analyses in subsequent reports as more data become available. We will report tables and figures similar to those for Medicare.

Discussion of Claims Analysis

The four measures provide descriptive data on patients enrolled in the Curators innovation before, during, and after the launch of the innovation. Although it is necessary to report these measures to support CMS's broader assessment of its full portfolio of innovation projects, the measures may not provide a complete evaluation picture of the Curators innovation. There are a number of reasons for this. First, the innovation was only launched on February 18, 2013. The impact of an HIT and NCM innovation may not be immediate because it takes time for providers to incorporate new sources of information and for patient management to achieve changes in health care utilization. Second, although all Curators beneficiaries may potentially benefit from the LIGHT^2 innovation, the benefits may be most pronounced for the more complex Tier 3 and Tier 4 patients. The four measures listed above are reported at the aggregate level for all Medicare patients. Third, the simple trend lines provided in the figures represent trends for Curators patients before launch of the innovation. They do not control for external factors that coincide with the innovation launch and affect the measures both for Curators and for other providers. As described below, we are developing additional comparison groups for Curators. Finally, each of the four measures has a high standard deviation, suggesting that it may be difficult to statistically distinguish between innovation effects and random fluctuation.

Development of Comparison Groups

In addition to comparing Curators patients before and after implementation of the innovation, we are constructing a comparison group of Medicare and Medicaid fee-for-service patients in Missouri. This comparison group will control for external, noninnovation factors affecting both Curators and non-Curators patients. The comparison area will be limited to central Missouri, avoiding the larger metropolitan areas of Kansas City and St. Louis. We are using propensity score matching to identify patients with similar characteristics as Curators patients. Results for the comparison group will be included in later reports.

1.3.3 Other Awardee-Specific Data

In mid-June 2014, following the data review meeting, RTI met with Curators to request the raw patient-level and NCM-level data that were used to generate each of the measures from data sources other than claims data in ***Tables 6*** and ***14*** for each quarter.

Overview of Data Received

We received the initial raw data in early July 2014. We did receive each of the variables we requested. However, we did not receive the variables over time for the same patients. More specifically, we asked for each health-related measure (e.g., FEV1, LDL-C, HbA1c, blood pressure, FEV1/FVC) each time it was provided for each patient over time with date of each measurement. However, we received only the most recent value for each. We followed up with Curators to request the historical data and received it in August 2014.

Health Outcomes

Table 15 shows the number and percentage of patients by health condition (based on data received in July 2014). The largest majority of patients (42.8%) have hypertension. About 20% of patients have asthma or COPD (2.8% have both asthma and COPD). About one-fourth of patients (24.5%) have more than one of the five conditions. As would be expected with a useful risk stratification algorithm, there were greater percentages of patients within Tiers 3 and 4 with each of the health conditions as compared with those in Tiers 1 and 2.

Nearly one-half of patients in Tiers 3 and 4 (45.7%) have more than one of the health conditions.

Table 15. Number and Percentage of Patients by Health Condition Overall and by Risk Tier

	All Patients (N=9,932)		Risk Tiers 1 and 2 (n=7,235)		Risk Tiers 3 and 4 (n=2,030)	
Health Condition	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Asthma	1,080	10.87	639	8.8	363	17.9
Diabetes	1,540	15.51	944	13.1	596	29.4
Hypertension	4,251	42.80	3,022	41.8	1,229	60.5
Coronary artery disease	1,212	12.20	641	8.9	430	21.2
COPD	1,025	10.32	537	7.4	388	19.1
Multiple conditions	2,437	24.54	1,443	19.9	928	45.7

Source: Patient-level data provided to RTI by Curators July 2014.[6]

It is important to note that the risk tier provided by Curators in their July 2014 data upload includes only the most recent risk tier assigned to patients. Once we receive the historical data from Curators, we will update this table to reflect the risk tier at or close to enrollment.

Table 16 will show the percentage of patients in each of the four tiers over time. Because all patients were enrolled prior to July 1, 2013, the percentage of those in the higher tiers will go down over time reflecting effectiveness of the innovation. This table will be updated in subsequent reports.

Table 16. Run Chart Showing the Percentage of Patients by Risk Tier over Time

Risk Tier	Q3	Q4	Q5	Q6	Q7
1	—	—	—	—	—
2	—	—	—	—	—
3	—	—	—	—	—
4	—	—	—	—	—

— Data not yet available.

Table 17 will show the average test results for each health condition across patients by quarter. The effectiveness of the innovation should be reflected in reductions in the mean values over time.

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[6] Note that Curators provided RTI with additional data in August 2014. RTI is continuing to work to clean, assess, and rectify errors in those data before they are reported.

Table 17. Average Health Indicators over Time among Patients with Each Health Condition

Health Indicator	Q3	Q4	Q5	Q6	Q7
Asthma					
FEV1	—	—	—	—	—
Diabetes					
LDL-C	—	—	—	—	—
Hemoglobin A1c	—	—	—	—	—
COPD					
FEV1/FVC	—	—	—	—	—

Source: Patient-level data provided to RTI by Curators July 2014.
COPD = chronic obstructive pulmonary disease; FEV1 = forced expiratory volume in 1 second; FVC = forced vital capacity; LDL-C = low-density lipoprotein cholesterol.
— Data not yet available.

Table 18 will be converted to a series of run charts showing the percentage of patients reflecting each health measure over time.

Table 18. Percentage of Patients by Health Indicator by Risk Tier over Time

	Tiers 1 and 2					Tiers 3 and 4				
Measure	**Q3**	**Q4**	**Q5**	**Q6**	**Q7**	**Q3**	**Q4**	**Q5**	**Q6**	**Q7**
Asthma										
Percentage of patients with asthma who have FEV1≥ 80% predicted/personal best over time	—	—	—	—	—	—	—	—	—	—
Diabetes										
Percentage of patients 18–75 years of age with diabetes (type 1 and type 2) whose most recent LDL-C test is <100 mg/dL during the measurement year	—	—	—	—	—	—	—	—	—	—
Percentage of adult patients with diabetes aged 18–75 years who received a hemoglobin A1c and lipid profile assessment during the measurement year	—	—	—	—	—	—	—	—	—	—
COPD										
Percentage of patients aged 18 years or older with a diagnosis of COPD and who have an FEV1/FVC<70% and have symptoms who were prescribed an inhaled bronchodilator	—	—	—	—	—	—	—	—	—	—

Source: Patient-level data provided to RTI by Curators July 2014.
COPD = chronic obstructive pulmonary disease; FEV1 = forced expiratory volume in 1 second; FVC = forced vital capacity; LDL-C = low-density lipoprotein cholesterol.
— Data not yet available.

Discussion of Other Awardee-Specific Findings

The awardee-specific outcome data analyzed to date demonstrates that the risk algorithm used for categorizing patients by tiers is effective in identifying patients in most need of the services provided by NCMs. Patients categorized into risk Tiers 3 and 4 are more likely to suffer from asthma, diabetes, hypertension, coronary artery disease, and/or COPD. A greater percentage of these patients are also more likely to have more than one of these conditions, as compared with those in risk Tiers 1 and 2. As reflected in Table 15, these patients are also more likely to need and receive one or more of the services provided by the NCMs.

Once we receive additional data over time from Curators, we can examine longitudinal changes in the health indicators by risk tier. We can also examine whether those who received a greater number of services (i.e., greater dose) over time were more likely to experience improvements in health than those who received fewer services, both within risk tier or across risk tiers (i.e., controlling for risk tier).

1.4 Overall Program Effectiveness to Date

This complex innovation, which includes health IT implementations for providers and for patients, care coordination, and analytics, has made steady progress. The components of the innovation are in place. As time goes on, RTI will be better able to track the cohort's progress over time and determine if the goals are being met.

Strengths of the innovation to date include organizational support, a methodical approach to stakeholder engagement, and building on a preexisting partnership with Cerner. Areas of improvement include offering training, providing clarity of the new roles, and integrating health IT use into workflows.

Organizationally, Curators has provided support, oversight, and leadership for the innovation. This support includes the partnership with Cerner, making staff available for meetings and for training and providing resources to the project director as needed. There have been a number of stakeholder team meetings that are designed to share information and gather input. During our site visits, respondents expressed appreciation for the opportunity to provide input into how the LIGHT^2 system was designed and implemented.

Curators has conducted quite a bit of training throughout implementation. NCMs said that they were pleased with the training they received and the topics. However, additional training could be useful in such areas as explaining the new roles to clinic staff. Within the NCM and HIA groups, there appeared to be an understanding of their roles and what they were supposed to do. However, when the NCMs were first placed into new clinics, clinic staff and providers were not familiar with what their roles and responsibilities would be. Similarly, during the site visit, NCMs did not appear to understand the HIA role in the same way the HIAs or project leadership did. This role confusion could affect effectiveness of the innovation.

Integrating health IT use into workflows is another area of opportunity. During the site visit, physicians expressed that they did not typically use the LIGHT^2 tools themselves but relied on the NCMs to alert them to anything that needed their attention. Physicians typically used the EHR for patient information and not necessarily the tools to change clinical practice. Similarly, signing patients up for the portal and encouraging them to use it was not a standard part of clinic workflow. If portal signups were part of the clinic workflow, then perhaps portal enrollment and use would increase.

Curators has made efforts to facilitate assessing the impact of the innovation. The tools to track NCM contacts and work and freezing the cohort as of July 1, 2013, will help track exposure by patient. At this point in the evaluation, data are inconclusive, because there has not been enough time to track the impact of exposure. We will continue to track their progress as they move forward with their innovation and evaluation plans.

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October 2014

Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring

Annual and Site Visit Report
Delta Dental Plan of South Dakota

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OVERALL EVALUATION SUMMARY

RTI International was selected to lead an independent evaluation of the 24 Health Care Innovation Award (HCIA) awardees categorized as Community Resource Planning, Prevention, and Monitoring (Community Resource). In this role, RTI is conducting an in-depth evaluation of each innovation, as well as a cross-site evaluation that includes similar innovations targeting the same priority outcomes (e.g., emergency department [ED] visits). For each of the 24 awardees, this report presents findings from the first year of the evaluation (beginning September 23, 2013, and including data obtained by RTI as of September 11, 2014). The report is based on multiple data sources, including operational reports, self-monitoring plans, site visits, and quantitative data analysis.

The evaluation methods vary by awardee innovation, based on the type of innovation and availability of data. RTI has reviewed and coded all existing documents from the awardees through December 31, 2013, and incorporated that knowledge into each awardee's overview. Our review included the awardees' original applications for funding, original and current operational and self-monitoring plans, and quarterly narrative and monitoring reports. For this annual report, we incorporated activities reported through the awardee's seventh quarterly report (i.e., through March 31, 2014).

Between April and August 2014, teams of at least two staff from the RTI team visited all 24 awardees for 2 to 4 days, depending on the number of interviews conducted. Teams included a subject matter expert, with training and experience specific to the awardee's innovation, and a master's- or bachelor's-level colleague to take notes. Before each visit, the teams reviewed all available documentation from the awardee to learn about the innovation's goals, objectives, and status. The purpose of the site visits was to clarify our understanding of the innovation, obtain detailed information on the implementation process, and review awardee-specific data to determine which elements to incorporate into the evaluation. By August 13, 2014, all 24 awardees had been visited and a thorough description of our findings included in each of the 24 awardee sections.

In addition to the site visits, we report quantitative data from two possible sources for several awardees. First, we present findings from claims analysis for awardees in this report if they both provided us with patient identifiers and reported enrolling participants who are Medicare and/or Medicaid beneficiaries. RTI has obtained patient identifiers from most of the 24 awardees to conduct claims analysis. Second, we present data RTI obtained directly from awardees to quantify their work in addressing health care costs, quality, and patient outcomes. Data from additional awardees will be analyzed and presented in future reports, as data become available and awardees enroll sufficient participants. An update on the availability of Medicare/Medicaid claims and other awardee-specific data, analysis of data available to us and cleaned as of September 11, 2014, a summary of the comparison groups, and a list of draft evaluation measures are included in each awardee section.

1. HCIA COMMUNITY RESOURCE AWARDEE: DELTA DENTAL PLAN OF SOUTH DAKOTA

1.1 Introduction

Located in Pierre, South Dakota, Delta Dental Plan of South Dakota received a total award of $3,364,528 and launched the innovation on January 7, 2013. Their innovation, Circle of Smiles: Improving Oral Health in Indian Country, primarily targets oral/dental health and has the following goals:

1. **Reduce costs** by improving oral health care through preventive interventions.
2. **Improve oral health care and general oral health** among American Indian people with diabetes, pregnant women, and children under age 9 on South Dakota reservations.

RTI is in the process of conducting an in-depth case study for this innovation. As part of that case study, two RTI team members conducted a site visit in July 2014, and both before and after the visit, our team reviewed all documentation on this innovation. We are obtaining data directly from the awardee that will help assess many of the variables we discuss in this report section. This report describes findings from the site visit, document reviews, follow-up telephone calls, and analysis of data obtained by RTI through September 11, 2014. We start by describing the innovation components in detail and the patients targeted by the awardee.

1.1.1 Innovation Components

The Delta Dental innovation includes two program components: direct dental services to patients through dental hygienists and care coordination through oral health coordinators (OHCs). Delta Dental's innovation has the following aims:

- Provide and expand the target population's access to basic oral health prevention and education.
- Increase the dental workforce by hiring and educating new providers.
- Retain and train new lay community health representatives to link participants to dental prevention services, provide oral health education, and coordinate participants' care.

Component 1: Direct Dental Services

The Circle of Smiles dental hygienists provide participants with basic oral health services, such as dental sealants, prophylaxis (e.g., cleanings), and fluoride varnishes, at "clinics" organized on each of the nine reservations across the state of South Dakota. Each reservation is assigned a number of dental hygienists based on the population. For example, Pine Ridge is the largest reservation and has three dental hygienists; smaller reservations are assigned fewer staff.

To enroll children in the program, dental hygienists and OHCs set up clinics at locations throughout the communities such as schools; Head Start; Women, Infants and Children (WIC) offices; or other community spaces. At the clinics, dental hygienists provide dental sealants, prophylaxis, and fluoride varnishes as needed for each child. Dental hygienists carry all of the equipment needed to provide dental services in their vehicles (including chairs and other mobile dental equipment). At each site, hygienists and OHCs set up mobile dental equipment in the spaces offered, which have ranged from broom closets to classrooms. Before services can be provided to children, their legal guardian must fill out and sign a registration form.

According to South Dakota policy, dental hygienists are not allowed to “diagnose” cavities; however, they can tell parents if there are “problem areas” and refer them for restorative services when necessary. If significant decay is evident, children are referred to surgery to take care of all dental work at one time. For the Western South Dakota reservations, Delta Dental partnered with Black Hills Pediatric Dentistry in Rapid City, SD, to provide surgical work for children when necessary. Because of the success of the relationship, a similar arrangement was started with Children’s Dental Center in Sioux Falls for eastern South Dakota. If surgical work is needed, the legal guardian must complete and submit a separate surgical registration packet.

Component 2: Oral Health Care Coordination

OHCs are responsible for multiple functions (***Table 1***). They primarily link participants with community resources related to receiving follow-up restorative dental services (i.e., care transitions). OHCs are present at most clinics and assist the dental hygienists as needed and provide health education to children. OHCs are members of the communities they serve and are hired directly by the tribes.

OHCs ensure that children who receive referrals for restorative care actually get those services. OHCs described a time- and labor-intensive follow-up process that involves not only making multiple phone calls, but also going to people’s houses, helping them access transportation, and even in a few cases, helping a noncustodial relative obtain custody so that the child can receive dental services.

Delta Dental has partnered with 18 organizations to implement the innovation, including providing training or other support to dental hygienists and OHCs (***Table 2***). Delta Dental has partnered with each of the nine tribes in South Dakota. Those partnerships facilitate the hiring of OHCs. Delta Dental approached each tribe and the Great Plains Tribal Chairmen’s Health Board prior to being awarded the cooperative agreement to seek buy-in and interest from each tribe. After receiving the Centers for Medicare & Medicaid Services (CMS) award, Delta Dental approached each tribe again about participating in the innovation project.

Table 1. HCIA Care Coordinator Functions and Training

Characteristic Type	Delta Dental HN Role
Title	Oral health coordinator
Minimal qualifications	High school diploma[1]
Functions	Health education Informal counseling Outreach and recruitment Patient monitoring and follow-up Service coordination Community linkages Instrumental support
Established continuing education program	None

[1] Although Delta Dental initially put a high school diploma as the minimum qualifications in the job description, ultimately each tribe had the authority to change that requirement. Each tribe hired OHCs. Program staff could not determine whether each tribe met that requirement.
HCIA = Health Care Innovation Award; HN = Health Navigator; OHC = oral health coordinator.

Table 2. HCIA Partners, Role, and Location

Partner Name	Role in HCIA Innovation	Location
Great Plains Tribal Chairmen's Health Board	Training	Rapid City, SD
Maricopa County Community College District (Rio Salado College)	Training	Tempe, AZ
Crow Creek Sioux Tribe	OHCs[1]	Fort Thompson, SD
Cheyenne River Sioux Tribe	OHCs	Eagle Butte, SD
Standing Rock Sioux Tribe	OHCs	Fort Yates, ND
Yankton Sioux Tribe	OHCs	Wagner, SD
Sisseton-Whapeton Oyate	OHCs	Sisseton, SD
Lower Brule Sioux Tribe	OHCs	Lower Brule, SD
Rosebud Sioux Tribe	OHCs	Rosebud, SD
Oglala Sioux Tribe	OHCs	Pine Ridge, SD
Flandreau Santee Sioux Tribe	OHCs	Flandreau, SD
Children's Dental Center	Care coordination	Sioux Falls, SD
Indian Health Service	Advisory board	Aberdeen, SD
South Dakota Dental Association	Advisory board	Pierre, SD
Children's Dental Center	Direct Services	Sioux Falls, SD
BPro, Inc.	Health IT	Pierre, SD
Medicaid-CHIP State Dental Association	Project management/ administration, health IT	Sandwich, MA
Black Hills Pediatric Dentistry	Direct services	Rapid City, SD

Source: The Lewin Group, 2012–2014.
[1] Through a subcontract with Delta Dental, each tribe hires the OHCs.
HCIA = Health Care Innovation Award; IT = information technology; OHC = oral health coordinator.

Program staff described challenges experienced working with the Indian Health Service (IHS). Delta Dental's main contact at IHS, the area dental consultant, retired in June 2014. She has been replaced by a pediatric dentist working for the Sisseton IHS. The 11 IHS clinics in South Dakota, or service units, operate independently, and not all service units have allowed Delta Dental to come into their clinics. Program staff indicated that a few IHS staff expressed concern that allowing Delta Dental staff in the clinics and communities would take away their work (even though Delta Dental program staff explained that they would be supplementing IHS staff so that together they could serve more patients because IHS service units are often understaffed).

In addition, when service units agreed to participate, program staff found it challenging and time consuming to credential volunteer dentists and dental hygienists to work alongside IHS staff at their service units. The credentialing process is not centrally managed; service units often have separate protocols. Program staff described the credentialing process as a major barrier to implementing their program and bringing added restorative capacity to the reservations.

1.1.2 Program Participant Characteristics

The direct population for the innovation includes South Dakota American Indian children under age 9, pregnant women, and people with diabetes[1] (***Table 3***). The target population also includes American Indians living on the Standing Rock Reservation, which extends into both North and South Dakota, if they meet the other inclusion criteria (e.g., American Indian children under age 9, pregnant women). The innovation targets American Indians on all nine reservations in South Dakota. During the site visit, we went to the largest reservation, Pine Ridge.

Table 3. Patients Planned for Inclusion in Delta Dental Innovation (Denominator Data)

Patient Type	Data Source	Current Count (Data Source)
Children aged 0 to 9	State Medicaid records	—
People with diabetes	State Medicaid records	—
Pregnant women	State Medicaid records	—

— Data not yet available.

According to Delta Dental, they continue to try to recruit adults into the innovation even though they have encountered barriers in working with IHS (e.g., resistance from IHS staff, low enrollment of adults at some IHS clinics). Initially, Delta Dental staff planned to work

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[1] As of Quarter (Q) 7, the awardee continues to report all of these groups as part of their target population. RTI verified the target population during our July site visit.

with 11 IHS clinic sites; since experiencing challenges, they have dropped 4 of the original clinics and reduced services at 1. Delta Dental staff may drop an additional 2 clinics, if enrollment numbers are low at time of the next visit from Delta Dental hygienists and OHCs. Of the remaining 4 clinics, Delta Dental program staff primarily serve there during the summer months to reach children who are on summer vacation. As a result of these difficulties in reaching adults, the awardee, in collaboration with Center for Medicare & Medicaid Innovation (CMMI), decided to focus this pilot on children, but will continue to provide services to adults, as feasible.

As of March 2014, Delta Dental had enrolled a total of 4,679 unique direct participants, which exceeds their projection of 4,200 by 479 participants. Based on Q7 Lewin data, the majority of participants are children 1 to 11 years old (92.4%); 0.9% are infants, 0.6% are 12 to 18 years, 0.4% are 19 to 25 years, 4.4% are 26 to 64 years, 0.9% are 65 to 74 years, and 0.2% are 75 years and older. Of participants, 51.7% are female and 48.2% are male. Delta Dental reports that the race/ethnicity of the majority of their participants (88.2%) is Native American; 6.7% are white, 3.7% are unknown, 0.7% are black or African American, and 0.7% are two or more races/ethnicities. The majority of participants are enrolled in Medicaid (76.0%), 22.1% are uninsured, 1.8% have private insurance, and 0.1% have TRICARE.

The awardee is having greater success enrolling children in the program than adults, particularly those with diabetes. Children are typically enrolled through clinics at locations such as schools, Head Start, WIC offices, or other community spaces. Delta Dental has experienced the most success with this population; program staff commented that having captive audiences at physical locations such as schools and daycare centers facilitates enrollment into the program. Dental hygienists also set up open clinics in community spaces but typically see fewer children at these open clinics than when they visit schools or Head Starts. Program staff described the difficulty of finding pregnant women and people with diabetes because there is often not a physical location where participants can be identified. Delta Dental tried to reach out to pregnant women by visiting prenatal clinics on the reservations, but not all women receive prenatal care, which is a significant barrier to recruitment.

1.2 Implementation Progress

The extent to which each awardee is able to implement its innovation as planned and reach a sufficient number of patients will be critical to assessing its impact on the Triple Aim. The following section provides details on first the implementation process and then the effectiveness, with a table that provides the list of measures RTI plans to use in assessing each (see ***Table 4***).

Table 4. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for Delta Dental

Key Evaluation Domains	Subdomains	Measures	Data Source
Workforce development	Recruitment and retention	Number of dental health professionals	Lewin
	Education and training	Number of training for OHCs	Lewin
Implementation effectiveness	Reach	Number of Medicaid enrolled AIC ages 0-9 living in/on a SD Reservation County who received at least one diagnostic or preventive dental service	Claims data

AIC = amount in controversy; OHC = oral health coordinator; SD = South Dakota.

1.2.1 Process

The implementation process has been the initial focus of the evaluation. Subsequent reports will assess the impact of the intervention as data become available. The implementation process is best evaluated through a combination of data variables, including execution of implementation that conforms with operational plans, and capacity for implementing the innovation in a timely and effective manner. We focused on the implementation process during the awardee site visit, asking such evaluation questions as the following:

- What is the overall execution of the innovation implementation (e.g., the actual rate of expenditures relative to the projected rate)?
- What accomplishments are specific to hiring or training staff so that the organization can build its capacity to implement the innovation effectively?
- What is the implementation effectiveness, including fidelity, reach, and dose of the innovation thus far?

Execution of Implementation

The Circle of Smiles innovation has been implemented as planned for the most part. Delta Dental staff, in collaboration with a representative from IHS and the South Dakota Dental Association, drew upon the community health representative model IHS and tribes employ. Delta Dental and its partners considered that having a community health representative focused solely on oral health would benefit the community and would supplement preventive care provided by hygienists. After crafting this model, Delta Dental staff approached tribal leadership (usually tribal health council representatives) to present the model and asked whether they would support such a program should it be funded. Through the presentations and follow-up meetings, Delta Dental staff gained buy-in for the model. Once funded, Delta Dental staff approached the same individuals (or their representatives) to obtain a tribal council resolution supporting the program and worked with tribal health representatives to establish subcontracts for hiring OHCs. Delta Dental staff managed to accomplish this within the first project year. They also hired a project manager and seven hygienists at the outset of the innovation. Because hygienists were hired directly by Delta Dental (rather than through a longer subcontracting process), hygienists began their work before OHCs began working and initially had some of the OHCs' responsibilities (e.g., patient follow-up) until the OHCs joined the innovation.

As part of the their work, hygienists and OHCs contact sites, such as schools, Head Start, WIC offices, or other community spaces, to schedule clinics. Working with children requires parental consent, so they also collaborate with site staff (e.g., principals, Head Start directors) to send out the parental permission forms prior to the visit. Having parents return the permission forms in a timely fashion initially proved challenging, but since the inception of the program, hygienists and OHCs have collaborated with sites to have the permission forms included in the school or Head Start registration packets, which has increased the number of returned forms substantially, according to program staff. At each site, hygienists and OHCs set up mobile dental equipment in the spaces offered, which have ranged from broom closets to classrooms. Children getting cleanings also receive oral health education from the OHC while they wait in line and from the hygienist while they are in the chair, and when parents are present, the OHC provides parents with oral health education. At the completion of the cleaning, the hygienist completes a brief form summarizing the status of the child's oral health. All patients are referred to a dentist for an exam and, if needed, restorative care. When health concerns arise, the form indicates that the child needs to be seen by a dentist soon. The hygienist or OHC records this information on paper, which the hygienist later enters into Delta Dental's electronic medical record system and Patient Tracker. (The hygienist cannot enter the record electronically in real time because most sites do not have Internet access.)

After the clinic, OHCs also review the information in their Patient Tracker to determine which children require follow-up for restorative care. Following up with children's parents or guardians can be an extensive process. OHCs call the parents or guardians to ask whether they have scheduled dental appointments, go to the home to talk with the parents or guardians, facilitate children getting physicals prior to a surgery, and sometimes arrange transportation. When parents or guardians are unresponsive to phone calls, OHCs may rely on kinship networks to reach the parent or guardian (e.g., call a grandmother and ask her to tell the parents the OHC would like to reach them). In more extreme cases, OHCs have had to identify the custodial parent or guardian or help a guardian obtain legal custody of the child because the pediatric dentist cannot see children without the consent of the legal guardian. In a few instances, it has taken *over a year* from initial diagnosis from the hygienist to when the child actually receives care from a pediatric dentist because the OHC has needed to do extensive follow-up. The OHCs document all follow-up interactions in the Patient Tracker system.

For people with diabetes and pregnant women, the innovation has had setbacks in reaching these populations for several reasons: 1) the partnership with IHS has not resulted in as many referrals as planned, 2) referred patients with diabetes often do not show up to appointments consistently, 3) program staff could not identify single locations that serve women and that would become partners for this innovation, and 4) stigma associated with being a young pregnant woman prevents many pregnant women from seeking prenatal services. Program staff are striving to overcome these challenges by offering patients with diabetes a chance to receive a $20 incentive for completing a survey after a dental cleaning; ideally, this incentive will reduce the no-show rate of patients with diabetes. Program staff continue to work with IHS to receive more referrals for patients with diabetes and pregnant women, but this effort will require longer-term collaboration. Also, the challenges with having IHS staff refer patients tend to be localized to a few facilities, known as service units. In those service units, IHS staff do not support the Circle of Smiles program, and several program staff explained that staff in those service units perceive the Circle of Smiles innovation as competition. In other service units with supportive staff, the Circle of Smiles innovation seems to be reaching patients with diabetes, but because the IHS data do not currently identify the service units, staff cannot determine the number of patients with certainty.

Identifying pregnant women has proved challenging as well. Program staff tried outreach to multiple venues but noted that many pregnant women in the communities they serve do not seek prenatal care. Because of challenges with reaching this population, program staff have made this population less of a priority for the remainder of the innovation, but will continue to involve them when feasible.

Organizational Capacity and Leadership

Delta Dental has had a long-term commitment to and has supported programs for improving access to oral health care to low-income individuals in South Dakota. Prior to the HCIA, Delta Dental staff participated in the South Dakota Oral Health Coalition, a group comprising the state dental association, tribal leadership, IHS representatives, and other state and federal representation. Over the last 10 years, the Coalition has discussed how to meet the needs of the underserved native population. Through the Coalition, Delta Dental established relationships with partners who have been essential for the Circle of Smiles innovation. In addition to their involvement in the Coalition, Delta Dental has partnered with the South Dakota Dental Association on a Health Resources and Services Administration project, involving outreach to medical health providers on reimbursement for providing fluoride varnishes. This project gave them experience in educating the medical health workforce.

In terms of direct services, since 2004, Delta Dental has maintained a mobile dental program, which provides restorative and preventive oral health care to underserved children. The program has reached over 25,000 children, but Delta Dental staff recognized that the need for oral health care in South Dakota has remained high, while the dentist workforce remained inadequate to serve South Dakota. However, program staff noted that they can more easily identify and hire hygienists, and the Circle of Smiles innovation enabled them to expand their hygienist workforce. Hiring hygienists to provide direct care as part of the innovation worked in this context because a South Dakota law that allows hygienists to provide preventive care without the direct supervision of a dentist for up to 13 months.

Although Delta Dental had existing relationships and experience, the Circle of Smiles innovation represented a distinctly new programmatic approach. It had a much broader scope and set of partners than Delta Dental had worked with previously. The innovation required gaining buy-in and tribal resolutions from all nine tribal nations and necessitated strategies for integrating and aligning the services and staff offered by Circle of Smiles with IHS clinical work. However, prior to applying for the HCIA, Delta Dental staff contacted representatives (e.g., tribal council, health council) from all tribes and gained preliminary support from them.

Multiple leaders comprise the Circle of Smiles innovation; innovation leaders include Delta Dental's CEO, tribal leadership (e.g., health chairs, tribal council members), and representatives of partner organizations (e.g., Executive Director of the South Dakota Dental Association). Program staff noted that levels of support for the Circle of Smiles innovation varies among these leaders.

Within Delta Dental, organizational leadership has supported the Circle of Smiles innovation by showing public support, encouraging leaders in partner organizations to attend meetings, and participating in high-level meetings. One program staff member noted that a call from the Delta Dental chief executive officer (CEO) increases the likelihood that leaders from partner organizations will attend meetings. The CEO asked Delta Dental Board members to testify before the state legislature about the importance of state law allowing hygienists to provide preventive oral health care without direct supervision of dentists; this effort led to a compromise that permitted Circle of Smiles hygienists to continue seeing patients without a dentist exam within 13 months. (The legislature has created a taskforce to consider the future of this law beyond 2016 when it ceases to have an effect or "sunsets.") Although the CEO is not directly involved in day-to-day activities, he maintains strong support for the innovation.

Although Delta Dental initially had support from the Aberdeen Area IHS dental consultant, this individual retired and was replaced by a pediatric dentist from the Sisseton IHS. In general, however, IHS leaders have not supported the effort; one IHS leader told Delta Dental staff that the innovation would burden IHS staff. IHS dental clinic staff identified Delta Dental staff as threats to their jobs and competition, rather than as support.

Moreover, Delta Dental and the South Dakota Dental Association recruited approximately 70 dentists to volunteer in the IHS clinics, but the credentialing process proved so arduous (as described above) that dentists could not complete the process easily. Consequently, no dentists could volunteer, which was frustrating for Delta Dental, the South Dakota Dental Association, and the potential volunteers.

Active support among tribal leadership varies across the nine tribes. Although Circle of Smiles program staff gained buy-in and worked with all tribal leaders or their representatives to get a resolution in support of the innovation, sustained engagement has differed. Some tribal leaders continue to meet with Circle of Smiles program staff, whereas others are less engaged (e.g., only review reports on oral health services provided to the tribe Circle of Smiles shares).

The South Dakota Dental Association Executive Director has played and continues to play a key role in the innovation. In particular, he collaborated with Delta Dental staff to design the innovation and ensured that restorative care complemented the preventive care offered in the Circle of Smiles. The Executive Director marshalled Dental Association membership, including 16 dentists, 2 dental students, and over 30 dental assistants and hygienists, to volunteer at a “Dental Days” event in Rosebud, South Dakota. (Initially, he and Delta Dental staff had hoped that members would volunteer regularly in IHS clinics to increase access to restorative care; however, because of complicated credentialing requirements in each IHS facility, this effort proved unfeasible.)

1.2.2 Workforce Development

Hiring and Retention

Delta Dental hired the 2 program management staff, 7 dental hygienists, and 1 OHC liaison but subcontracts with the tribes for the OHC positions (14 OHCs are in place; 1 position was unfilled at the time of the site visit). They established this structure hoping that tribes would see the value in having an OHC and would sustain the position beyond the funding period. One OHC left the project in Q7 in part because that OHC’s interests did not align with the work demands; the tribe responsible for hiring this individual is currently reviewing applicants.

Hygienists have state dental certification; prior to the innovation, most of the hygienists worked in private-practice settings. OHCs must be a member of the community they are serving as part of their job requirements. Delta Dental originally recommended that OHCs must have a high school degree; however, because the tribes directly hire OHCs through their own internal processes, program staff could not confirm if that requirement was met. The OHC liaison has been in place for approximately 1 year. Program management recognized that they needed support in orienting new OHCs, providing more consistent oversight of existing OHCs, bringing together OHCs for peer-to-peer learning, and covering the caseload when an OHC leaves her job. As a result, they developed the OHC liaison position, which requires a college degree. The OHC liaison has also completed the Community Dental Health Coordinator certificate program.

Training

Delta Dental provides three annual in-person trainings in Pierre to all program staff. These trainings include refresher lessons on cultural competency and motivational interviewing, as well as any other topic that program management identifies (e.g., tobacco cessation). Program staff also learn innovation-specific information, such as how to use the Patient Tracker system. In addition to the annual trainings, program management staff lead weekly calls with the dental hygienists and OHCs. The calls alternate between regional calls with both hygienists and OHCs from each region and hygienist and OHC calls for all those in each position. These calls not only allow program management to provide updates, but also serve as opportunities for peer-to-peer learning and problem solving. When new staff are hired, they undergo an orientation to the innovation that provides an overview of the innovation, training in Patient Tracker systems, shadowing an experienced hygienist and OHC, and oversight by the OHC liaison (for OHCs only).

For the innovation, Delta Dental encouraged all the OHCs to pursue Community Health Dental Coordinator certification (an American Dental Association certified course) through an Arizona community college’s online training program. The Community Health Dental Coordinator certificate consists of three main components: 1) community health worker modules, 2) dental health modules (e.g., information on fluoride varnishes, dietary counseling), and 3) modules integrating community and dental health work. This certification program, one program staff member estimated, takes approximately 6 months to complete.

Initially, Delta Dental required OHCs to obtain this certification. However, Delta Dental staff encountered several challenges with this requirement. Program management envisioned the certificate program as a training, but in reality, the certificate is a formal college series of courses. Completing online courses proved difficult for most OHCs; some of whom had been out of school for more than 20 years (thus, they were out of practice at writing essays and doing formal schoolwork). Also, most OHCs had difficulty keeping up with their weekly lessons and doing their work in the community. Many fell behind, and the community college required them to re-enroll, which created administrative challenges for program management.

As a result of these difficulties, Delta Dental now allows coordinators to opt out of certification. OHCs are required to complete the dental health modules so that they can provide dental health education to the patients they serve. Ten coordinators completed the certification and two are pursuing certification; the remainder have decided not to complete the certification program.

1.2.3 Implementation Effectiveness

Effectiveness can be evaluated in several ways. Fidelity involves the extent to which the innovation is being implemented as planned. Reach is the extent to which the target population is being served by the innovation. Dose is the appropriateness of the reach. Below, we discuss how Delta Dental is addressing these aspects of effectiveness.

Fidelity

At the time of the July 2014 site visit, Delta Dental had implemented nearly all program components as planned. Although there have been some changes as the program has been implemented, the core components remain unchanged.

Reach

Reach is the extent to which the targeted population is exposed to the innovation. Enrollment status is an indicator of how effectively the awardee is reaching its intended target population. As of March 2014, Delta Dental enrolled a total of 4,679 unique direct participants, which exceeds their projection of 4,200 by 479 participants. The awardee has experienced great success at reaching children; however, they have experienced significant challenges reaching people with diabetes and pregnant women. During the site visit, the awardee discussed that one challenge is actually finding the target population. The awardee has successfully identified and enrolled children into the program through organizations that serve children (e.g., schools, Head Starts, WIC offices). Although they have attempted to identify organizations at which to recruit adults (e.g., prenatal clinics), they have had much less success with this strategy for pregnant women and people with diabetes. One barrier specific to serving pregnant women is that many women do not receive prenatal care and, therefore, are simply not at prenatal clinics. Once we receive patient-level data from Delta Dental, ***Table 5*** will include the reach for each quarter since the launch of the innovation.

Table 5. Patient Enrollment and Reach for Each Quarter Since Project Launch

Column A	B	C	D	E
Quarter	**Target Population (Denominator of Children Aged 0–9)**	**Number of Unduplicated Patients Served**	**Total Reach per Quarter (Column C Divided by B)**	**Percentage Change from Previous Quarter**
January 2013	—	—	—	—
March 2013	—	—	—	—
June 2013	—	—	—	—
September 2013	—	—	—	—
December 2013	—	—	—	—
March 2014	—	—	—	—
June 2014	—	—	—	—
Total enrolled as of _____	—	—	—	—

Source: Patient-level data to be provided to RTI.
— Data not yet available.

Dose

The definition for dose differs by target population (i.e., children, people with diabetes, and pregnant women). For children, Delta Dental is hoping to ensure that all infants visit a dentist before their first birthday; children aged 1 to 9 should receive one dental prophylaxis annually. Children aged 6 to 9 should receive necessary sealants and fluoride varnishes once per year. People with diabetes and pregnant women should receive care coordination services and periodontal cleanings as needed. Services received depend on individual needs.

Delta Dental determined dose based on a number of factors: input from the South Dakota Dental Association, American Dental Association guidelines, and their knowledge of what services can be feasibly provided in the field with which frequency.

Table 6 summarizes the services provided and the number of patients receiving services during their enrollment in the Delta Dental innovation. ***Table 7*** summarizes the number of contacts patients receive.

Table 6. Number of Patients Receiving Specific Services from January 2013 to June 2014

Services Provided to Patients[1]	Number of Patients	Number of Services Provided
Fluoride varnish applied	4,679	5,737
Cleanings provided	4,679	5,089
Oral health instruction	4,679	5,693
Sealants placed[2]	4,679	7,262
Patients referred to OHCs for care coordination	4,679	2,204
Total	—	—

Source: Site visit, July 2014

[1] All clinical services counts (cleanings, fluoride varnish, sealants, oral health instruction) are cumulative. Of the 4,679 unique patients, some received services at multiple visits.

[2] Sealants are counted per tooth; one visit could have multiple sealants placed.

OHC = oral health coordinator.

— Data not yet available.

Table 7. Number of Patient Contacts from January 2013 to June 2014

Contact Type	Number of Contacts
Clinical patient encounters[1]	6,889
Care coordination contacts[2]	4,572
Educational session contacts[3]	5,268
Total	17,289

Source: Site visit, July, 2014

[1] Although the patients with diabetes are counted in the unique patients and clinical encounters, they are not counted in the clinical services numbers. The reason for this is because the services provided in IHS facilities are marked as unbillable and not counted in the clinical services report provided in the Open Dental practice management system.

[2] The numbers for care coordination and education session contacts come from Delta Dental's patient tracker system. The care coordination numbers are a count of all phone and in-person contacts added into the patient tracker system by an OHC or a hygienist.

[3] The education session numbers are a cumulative count of attendees at group education sessions reported in patient tracker by OHCs and hygienists. The attendees to education sessions do not necessarily overlap with any of the clinical or care coordination patients, but instead are a count of people reached through education of groups at health fairs, parent meetings, school classrooms, etc.

1.3 Evaluation Outcomes

Awardees have two possible types of quantitative data that RTI will use in assessing the impact of the awardee's innovation on key outcomes. These include claims data for Medicare and/or Medicaid beneficiaries, depending on who the awardee serves, and administrative or utilization data the awardee is collecting (which we have categorized as "other awardee-specific data" reflecting the variability of the types of data elements available across awardees). We are finalizing our assessment of all the available data sources and requesting data directly from each awardee. As those data are received, we will incorporate the findings into our quarterly/annual reports. The following sections present descriptive findings from the quantitative outcome data provided to RTI as of September 11, 2014.

1.3.1 Measures for Evaluation

Following the site visit, the data management and site visit teams met to review each of the measures listed in the awardee's self-monitoring measurement plan. The measures listed in ***Table 9*** reflect an initial assessment of the measures determined as most relevant for our evaluation of Delta Dental's innovation.

Table 9. Outcome Measures to Use for Delta Dental Evaluation

Key Evaluation Domains	Subdomains	Measures	Data Source
Clinical effectiveness	Oral health care	Percentage (number) of infants having a preventive dental visit before their first birthday	Claims data
		Percentage (number) of children ages 2–9 with a dental sealant on a primary tooth	Claims data
		Percentage (number) of children age 6-9 with dental sealants	Claims data
		Percentage (number) of children ages 2–9 with a dental sealant on a primary tooth	Claims data
		Percentage (number) of children under age 10 receiving fluoride varnish treatment	Claims data
		Percentage of Medicaid enrolled AIC ages 0–9 living on SD Reservation counties with Medicaid dental claim associated with use of OR	Claims data
Health care outcomes	Utilization	ED visit rate	Claims data
		All-cause admission rate	Claims data
		Readmission rate	Claims data
	Cost	Spending per patient	Claims data
		Cost savings	Claims data

AIC = amount in controversy; ED = emergency department; OHC = oral health coordinator; OR = operating room; SD = South Dakota.

1.3.2 Claims Data

As part of a broad assessment of health care innovations, CMMI is assessing the impact of its programs, including those funded specifically by HCIA, on four core measures. The four core measures are

- health care spending per patient,
- hospital inpatient admissions,
- hospital unplanned readmissions, and
- ED visits.

Collectively, CMMI programs are anticipated to slow the increase in health care spending, reduce hospital admissions, reduce avoidable hospital readmissions, and prevent unnecessary ED visits. We are reporting these measures for all HCIA Community Resource awardees so that the collective impact of the awards can be assessed. As discussed below, some awardees' innovations may not be focused on these measures. Other awardees' innovations target specific conditions (e.g., imaging, diabetes, etc.) and may have significant impacts on spending, admissions, readmissions, and ED visits for the targeted conditions but not have a statistically detectable impact on the measures at the aggregate level because the targeted conditions represent only a small fraction of total spending, inpatient admissions, and ED visits.

The measures are calculated through analysis of Medicare and Medicaid fee-for-service claims. Because of differences between Medicare and Medicaid patients in age, other demographic variables, and disease status, we report the Medicare and Medicaid results separately below. Currently, complete Medicare claims are available through the end of 2013. Medicaid claims for Delta Dental are available through Q2 2013, although claims for the final quarter may not be complete. The Delta Dental innovation was launched on January 7, 2013.

- **Health Care Spending per Patient.** For Medicare beneficiaries, health care spending per patient includes Part A and Part B Medicare expenditures for persons enrolled in the Part A and Part B fee-for-service program. The variable focuses on Medicare fee-for-service spending, so Medicare managed care (Part C) services are excluded, as are beneficiary copayments. Medicare Part D prescription spending is also excluded. Spending is reported on a per-person per-quarter basis. If a beneficiary is not enrolled for every month in a quarter, spending (except for hospital inpatient spending) is prorated to a quarterly basis based on the number of days enrolled during the quarter. Because hospital inpatient admissions are both rare and expensive, spending is not prorated for hospital inpatient spending. Prorating is also not performed for beneficiaries who die during a quarter.

  For Medicaid beneficiaries, health care spending per patient is reported for fee-for-service beneficiaries. Beneficiaries are only included in the analysis for spending (and the other measures) during periods when they are enrolled in Medicaid.

- **Hospital Inpatient Admissions.** This variable measures hospitalization, the single most expensive component of health care spending. Patients kept overnight in observation beds are excluded from this measure. Inclusion criteria for the analysis are the same as for spending. Hospital inpatient admissions are not prorated based on the number of days eligible during the quarter. All-cause inpatient admissions are reported. The mean quarterly admission rate per 1,000 patients is reported.

- **Hospital Readmissions.** Hospital readmission rates serve a dual purpose in evaluating HCIA impacts. Readmissions add to the costs of a prior hospitalization, and they often reflect a problem in the care provided during the first admission. All-cause admissions are defined as a follow-up admission to any short-term acute general or long-term care hospital within 30 days of a discharge from another hospital of the same type. We ignore multiple admissions within 1 day of an initial admission because these often represent transfers between hospitals. We define index hospitalizations that begin during the quarter and follow each index admission for 30 days, even when the follow-up period extends beyond the end of the quarter. Inclusion criteria for the analysis are the same as for spending. The readmission rate equals the number of readmissions divided by the number of index hospitalizations during the quarter. Planned readmissions are excluded from the calculation of the numerator. Quarterly mean readmission rates per 1,000 admissions are reported.

- **ED Visits.** ED visits are sometimes viewed as a symptom of the inability of the community's health care system to provide adequate preventive and ambulatory care visits. We report an all-cause ED visit rate that excludes ED visits resulting in an inpatient admission (which presumably represent unavoidable visits) and includes overnight ED visits without an inpatient admission. Inclusion criteria for the analysis are the same as for spending, and ED visits are also subject to the same prorating formula as for spending. The mean quarterly ED visit rate per 1,000 patients is reported.

Medicare Claims Analysis

Delta Dental is not serving Medicare patients; therefore, we will not conduct Medicare claims analysis for this awardee.

Medicaid Claims Analysis

The Medicaid data analysis will use data from the CMS Alpha-MAX data files. Currently, Medicaid claims for Delta Dental are available in Alpha-MAX through Q2 2013, and claims for that final quarter may not be complete. We are in the process of analyzing Medicaid claims for Delta Dental, and Medicaid analyses will be provided in subsequent reports as more data become available. Measures are presented for these beneficiaries in the quarters before and after the innovation was launched on January 7, 2013. Appendix A presents tables shells for how the data will be shown in future reports.

Discussion of Claims Analysis

The claims measures provide descriptive data on patients enrolled in the Delta Dental innovation before, during, and after the launch of the innovation. Although these measures must be reported to support CMS's broader assessment of its full portfolio of innovation projects, they may not provide a complete evaluation picture of the Delta Dental innovation for a number of reasons. First, the innovation was launched on January 7, 2013, and we currently have data only through Q2 2013. The impact of the innovation on the four measures may not be immediate, and some enrollees did not begin care until later in 2013 or 2014. We are collecting information on patient enrollment dates and will account for this information in later reports. Second, the Delta Dental innovation focuses on dental services. Although the innovation may have a statistically significant impact on spending related to dental services, it may not have a statistically detectable impact on total spending, because dental services account for only a small share of total spending or utilization. In later reports, we will also provide dental-specific spending data. Third, dental services may not have much of an impact on hospitalization, readmissions, or ED visits.

Development of Comparison Groups

In addition to comparing Delta Dental patients before and after implementation of the innovation, we are constructing a comparison group of Medicaid fee-for-service patients in South Dakota. This comparison group will control for external, non-innovation factors affecting both Delta Dental and non-Delta Dental patients. The comparison group will include Medicaid fee-for-service patients living on an Indian reservation in South Dakota who have not participated in the Delta Dental innovation but meet the inclusion criteria (i.e., American Indian children under age 9, pregnant women, people with diabetes). We are using propensity score matching to identify patients with similar characteristics as Delta Dental patients. Matching will be based on demographics (gender, age, and ethnicity), health characteristics (number of chronic conditions) and spending during the years prior to program participation. Results for the comparison group will be included in later reports.

1.3.3 Other Awardee-Specific Data

After the site visit was conducted on July 22-23, 2014, the data management and site visit teams met to review each of the measures listed in the awardee's self-monitoring measurement plan.

Overview of Data Requested and Received

As shown in Table 9, the outcome measures are all based on claims data. RTI will use the patient identifiers provided by Delta Dental to identify claims for analysis. Thus, we will not be requesting any awardee-specific data from Delta Dental.

1.4 Overall Program Effectiveness to Date

Overall, the Circles of Smiles innovation brought much-needed services to underserved children in South Dakota. As shown in the previous tables, the innovation has served significant numbers of children in their schools and daycare centers and in any community location that will provide space for a clinic. OHCs have worked to ensure that children who receive referrals for restorative care actually get those services. OHCs described a time- and labor-intensive follow-up process that involves not only making multiple phone calls, but also going to people's houses, helping them access transportation, and even in a few cases, helping a noncustodial relative obtain custody so that the guardian could take the child to a pediatric dentist for services. OHCs noted that their success depended on being a member of the community. Because OHCs know the families in their community (and families know them), being a community member enabled them to reach parents and guardians in ways outsiders could not. Parents and guardians are more likely to answer the phone or door for an OHC from their community than for someone outside the community because community members tend to distrust outsiders. In addition to achieving this community outreach, hygienists and OHCs described situations in which their oral health care, collaboration, and follow-up may have saved children's lives or prevented much more serious infections.

Circle of Smiles has not, however, reached as many patients with diabetes and pregnant women as program staff initially planned. Although Circle of Smiles is trying new strategies for reaching patients with diabetes and working with IHS to identify new recruitment strategies, they have deprioritized the pregnant women population for the remainder of the innovation and have opted to focus on children. In spite of the setbacks with two of the intended populations, the success with the child populations suggests that this innovation has proved effective in this underserved population. Initial estimates of total cost of care for children have shown an average reduction in costs, but program staff are still exploring this surprising result, because they anticipated an increase in costs because more children are receiving care than before the innovation.

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APPENDIX A

Table A-1. Baseline and Intervention Trends in Health Care Spending per Patient

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—

Savings per Patient

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Spending rate: total quarter (i.e., quarterized) payments/number of unique patients. Savings per patient: difference in comparison minus the intervention's average spending rates.
— Data not yet available.

Table A-2. Baseline and Intervention Trends in Admissions per 1,000 Patients

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Admit rate: total unquarterized admissions/number of unique patients.
— Data not yet available.

Table A-3. Baseline and Intervention Trends in Readmissions per 1,000 Admissions

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total admissions	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total Admissions	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Readmit rate: sum of all readmissions to eligible hospital within 30 days/all admissions in the quarter. Total admissions: all eligible admissions in the quarter.
— Data not yet available.

Table A-4. Baseline and Intervention Trends in ED Visits per 1,000 Patients

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: ED rate: total quarterized ED visits and observation stays/number of unique patients.
— Data not yet available.

October 2014

Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring

Annual and Site Visit Report

Eau Claire Cooperative Health Centers, Inc.

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OVERALL EVALUATION SUMMARY

RTI International was selected to lead an independent evaluation of the 24 Health Care Innovation Award (HCIA) awardees categorized as Community Resource Planning, Prevention, and Monitoring (Community Resource). In this role, RTI is conducting an in-depth evaluation of each innovation, as well as a cross-site evaluation that includes similar innovations targeting the same priority outcomes (e.g., emergency department [ED] visits). For each of the 24 awardees, this report presents findings from the first year of the evaluation (beginning September 23, 2013, and including data obtained by RTI as of September 11, 2014). The report is based on multiple data sources, including operational reports, self-monitoring plans, site visits, and quantitative data analysis.

The evaluation methods vary by awardee innovation, based on the type of innovation and availability of data. RTI has reviewed and coded all existing documents from the awardees through December 31, 2013, and incorporated that knowledge into each awardee’s overview. Our review included the awardees’ original applications for funding, original and current operational and self-monitoring plans, and quarterly narrative and monitoring reports. For this annual report, we incorporated activities reported through the awardee’s seventh quarterly report (i.e., through March 31, 2014).

Between April and August 2014, teams of at least two staff from the RTI team visited all 24 awardees for 2 to 4 days, depending on the number of interviews conducted. Teams included a subject matter expert, with training and experience specific to the awardee’s innovation, and a master’s- or bachelor’s-level colleague to take notes. Before each visit, the teams reviewed all available documentation from the awardee to learn about the innovation’s goals, objectives, and status. The purpose of the site visits was to clarify our understanding of the innovation, obtain detailed information on the implementation process, and review awardee-specific data to determine which elements to incorporate into the evaluation. By August 13, 2014, all 24 awardees had been visited and a thorough description of our findings included in each of the 24 awardee sections.

In addition to the site visits, we report quantitative data from two possible sources for several awardees. First, we present findings from claims analysis for awardees in this report if they both provided us with patient identifiers and reported enrolling participants who are Medicare and/or Medicaid beneficiaries. RTI has obtained patient identifiers from most of the 24 awardees to conduct claims analysis. Second, we present data RTI obtained directly from awardees to quantify their work in addressing health care costs, quality, and patient outcomes. Data from additional awardees will be analyzed and presented in future reports, as data become available and awardees enroll sufficient participants. An update on the availability of Medicare/Medicaid claims and other awardee-specific data, analysis of data available to us and cleaned as of September 11, 2014, a summary of the comparison groups, and a list of evaluation measures are included in each awardee section.

1. HCIA COMMUNITY RESOURCE AWARDEE: EAU CLAIRE COOPERATIVE HEALTH CENTERS, INC.

1.1 Introduction

Eau Claire Cooperative Health Centers, Inc. (ECCHC), a federally qualified health center (FQHC) in Columbia, South Carolina, received a Centers for Medicare & Medicaid Services (CMS) award of $2,330,000 and began enrolling patients into its Innovations Health program on December 1, 2012. The program has the following goals:

1. **Provide access to comprehensive primary care** leading to a permanent and secure medical home (either ECCHC or another primary care provider).
2. **Improve personal health** and health literacy in the target community.
3. **Reduce costs** through appropriate prenatal care for pregnant women and reductions in inappropriate emergency room (ER) use by 20% in 3 years.

RTI is in the process of conducting an in-depth case study for ECCHC's Innovations Health program. As part of that case study, two RTI team members visited the site April 30–May 2, 2014; both before and after the visit, the team reviewed all documentation on this innovation. This report describes findings from the site visit, document reviews, follow-up telephone calls, and analysis of data obtained by RTI and cleaned through September 11, 2014. We are actively working now to obtain data directly from the awardee, which will help RTI to assess many of the variables we discuss in this report. In the next section, we detail the innovation components and the patients targeted by the awardee.

1.1.1 Innovation Components

ECCHC's Innovations Health is a moderately complex, multisite intervention that utilizes a community health team approach to affect multiple parameters of lifestyle and disease conditions, including cardiovascular disease, diabetes, high cholesterol, health risk behaviors, low birth weight, depression, obesity, pregnancy/delivery-related conditions, smoking, hypertension, and premature births. The innovation has three primary components:

- establishing micro-clinics that are located within neighborhoods so that high ED users have better access to care,
- hiring and maintaining community health teams with five professionals to provide home-and clinic-based primary care services and self-management education, and
- recruiting and enrolling high-risk patients who have the greatest need for services (i.e., frequent ED users).

Innovations Health has the following objectives:

- Improve self-management for patients with chronic conditions.
- Decrease in low birth weight infant care and improved health outcomes in general.
- Reduce use of high-cost health care services, including ED visits and hospitalizations.

ECCHC is partnering with two managed care organizations (MCOs), a local hospital system, and two state agencies to implement the HCIA innovation (***Table 1***). Two MCOs, Blue Choice and Select Health, have partnered with ECCHC to reimburse the home visits of community health workers (CHWs) to the Innovations Health patients who are their beneficiaries. Select Health also partnered with ECCHC to share 20% of the savings for reduced ED visits and 10% of the low birth weight hospitalization cost savings with the program. Palmetto Health comprises five hospitals that serve 70% of the residents of Richland County and includes Palmetto Health Richland and Palmetto Health Baptist in Columbia, which serve the targeted Eau Claire community. These two hospitals provide specialty care for Innovations Health patients and refer uninsured frequent users of their ED (currently defined as three ED visits within a 12-month period) to Innovations Health.

Table 1. HCIA Partners, Role, and Location

Partner Name	Role in HCIA Project	Location
BlueChoice Health Plan of South Carolina Medicaid (MCO)	Sharing of ED and hospital utilization data for cost savings	Columbia, SC
Select Health Managed Care Organization (MCO)	Sharing of ED and hospital utilization data for cost savings	Charleston, SC
Palmetto Health Richland and Palmetto Health Baptist Hospitals	Patient referral for specialty care through Palmetto Cares Referral of uninsured patients to Innovations Health	Columbia, SC
Midlands Technical College and the South Carolina Department of Health and Environmental Control	Workforce development (community health workers)	Columbia, SC

Source: Site Visit, April 30–May 2, 2014.
ED = emergency department; HCIA = Health Care Innovation Award.

Component 1: Establishing Micro-clinics in High-Risk Neighborhoods

ECCHC has a 30-year history of working in the Eau Claire community that has 40 neighborhoods and has built an extensive multidisciplinary primary care network that includes 35 providers (e.g., adult medicine, pediatrics, OB/GYN, behavioral health and pharmacy (application). For the Innovations Health program, three neighborhoods within the targeted 29203 zip code area were identified as "hot spots" for their high ED utilization rates, poverty, limited access to primary care, and overall health disparities (e.g., neighborhoods of concentrated health disparity). ECCHC established three new micro-clinics (e.g., small clinics) that are located in those neighborhoods. The micro-clinics operate independently of ECCHC's traditional clinic infrastructure. Located in close geographic proximity to one another (e.g., within 1 mile), the three micro-clinics—identified as Eau Claire, Greenview, and Ridgewood—provide primary care services to the enrolled community residents. ECCHC's ultimate goal is to integrate patients into primary care homes (including ECCHC's traditional clinics or other primary care providers).

Establishing the new micro-clinics involved several credentialing processes that delayed the start-up of the program. The credentialing processes (e.g., Medicare for each micro-clinic and each provider at the clinics, Medicaid, Clinical Laboratory Improvement Amendments [CLIA] laboratory license, and 25 private insurers) involved several steps that had to be completed sequentially and not concurrently. A single process could take from 30 to as many as 90 days to execute. Additionally, the Health Resources and Services Administration (HRSA) required a change of scope for each site (90+ days) and credentialing requests for new sites and personnel, which can take up to 6 months causing a delay in project initiation. As a result, ECCHC secured the leases on the first and second micro-clinics (i.e., Eau Claire and Greenwood) in quarter (Q) 4 2012. ECCHC was unable to enroll and serve participants at these locations until March 2013. ECCHC addressed the credentialing issues and was able to operate all three micro-clinics by July 2013. However, the loss of two nurse practitioners at the Ridgewood and Eau Claire micro-clinics in the following 2 months seriously curtailed implementation of the innovation. The Ridgewood clinic reopened in mid-December 2013. The Eau Claire micro-clinic currently provides services in a very limited capacity.

Component 2: Establishing Community Health Teams

A five-member community health team—which consists of a nurse practitioner (NP), registered nurse (RN), a CHW, and more recently, a certified medical assistant (CMA) and patient service representative (PSR)—staffs each micro-clinic. Working under ECCHC's medical director, the NP is the licensed independent clinical provider and designated leader of the community health team. As such, the NP directly supervises the RN and oversees the day-to-day activity of other team members [e.g., reading and signing off on the CHW's entries in the electronic health record (EHR)].

New to ECCHC and critical to Innovations Health's community health team approach are the nine CHWs who are the key communication link among the patients, the staff at the micro-clinics, and other service providers. Full-time employees with ECCHC, the CHWs are formal, fully integrated members of the community health team and routinely participate in meetings about patients' health care (e.g., huddles, monthly team meetings).

During Q7 that ended March 2014, ECCHC leadership determined the need for a CMA and a PSR at each site. The goal of the CMAs is to assist the NPs in the office, which allows greater flexibility for the RNs to provide services (e.g., home visits) in the community. CMAs have administrative (e.g., ordering medical and lab supplies) and clinical tasks such as assisting the NP with referrals, reminding patients of follow-up visits and referrals, conducting intakes, and drawing blood for lab tests. Also, the addition of the PSR to the community health team allows the CHW to spend more time on recruitment and follow-up home visits with existing patients. The PSRs perform several administrative tasks to support the community health team (e.g., entering information in the EHR). ***Table 2*** lists the roles of the team members as currently defined and shared with the RTI team during the site visit. The community health team provides several core services for patients enrolled in the Innovations Health program: comprehensive primary care, referral for specialty care, medication management and delivery, care coordination, and disease-specific education and coaching (i.e., caring for feet, taking blood pressure). Providing home-and clinic-based primary care services is a key element of the Innovations Health model.

Table 2. Roles of the Community Health Team

Position	Current Role/Function
Nurse practitioner	Is the team leader Diagnoses the patient with assistance from the CMA (clinic visit) Creates care plans Assigns patient for follow-up with RN or CHW Reviews, at the end of the day, RN's and CHW's entries in EHR and sign off
Registered nurse	Completes comprehensive patient history Completes physical assessment of patient (home visit) Takes patient health history Draws initial lab work Schedules clinic visit with NP Schedules specialty appointments Handles issues related to medication adherence among other items
Community health worker	Enrolls patients (home or clinic visits) Gets patient information Schedules appointment with the RN for initial assessment (home visit) Follows up with patient about provider visits and referrals

(continued)

Table 2. Roles of the Community Health Team (continued)

Position	Current Role/Function
Certified medical assistant	Checks patients in and out Verifies insurance Uses the EHR to track patient status Records patient's complaint/symptom, quick history, current medications, and health status (BP, weight, temperature, pulse) Arranges referrals to specialists and notifies the patient
Patient service representative	Manages the overall patient flow in the clinic Collects and tracks demographic information Assists with scheduling clinic visits Verifies clinic appointment with the patient the day before the appointment Contacts CHW if unable to reach

BP = blood pressure; CHW = community health worker; CMA = certified medical assistant; EHR = electronic health record; NP = nurse practitioner; RN = registered nurse.

Initial Comprehensive Health Assessment

As described by ECCHC staff during the site visit, the initial comprehensive assessment for all newly enrolled patients involves four encounters (e.g., home and clinic visits, phone calls) with members of the community health team. The CHW completes an initial home visit with the new recruit. Using a laptop with a wireless card to access ECCHC's secured network servers and password-protected EHR system, the CHW submits the necessary demographic information in the medical form template to enroll the patient in Innovations Health (i.e., creating an EHR). The CHW submits the patient electronic signature (e.g., consent to release of information) or obtains a physical signature that she can later scan and submit to the EHR system. For the second encounter, the PSR initiates a follow-up phone call to complete enrollment of the patient (e.g., collect additional demographic information, health information). For the third encounter, the RN, accompanied by the CHW, completes the initial assessment (e.g., health history, baseline physical, lab work) in the patient's home, which provides the information that the NP needs to complete the diagnosis and care plan. For example, the NP needs more than one blood pressure reading to diagnose a patient as hypertensive. The RN then puts the patient on the NP's schedule. Finally, the NP completes the physical assessment in the clinic, which is the fourth encounter in the initial comprehensive clinical assessment process. Staff estimated having approximately five to seven encounters with patients to complete the initial assessment phase and development of the care plan by the NP.

Follow-up Health Encounters

Next, stabilized patients are followed once every quarter, which depends on the patient's needs based on the NP's assessment. A high proportion of Innovations Health patients are hypertensive, overweight [high body mass index (BMI)], or diabetic. For example, hypertensive patients are seen once a month for blood pressure checks; however, patients with uncontrolled blood pressures or those who received new medications may come in each week. Also, the NP conducts foot checks for diabetic patients every quarter. In addition to follow-up clinic visits, the NP will ask the RN to follow up with patients in the home as needed. Team members chart all medical encounters in the EHR (e.g., by checking the appropriate boxes in the various form templates—intake, self-care education, and medication pick-up and delivery); a note field is attached to each checkbox. The CHWs document social issues and any related action in the notes field. Face-to-face encounters by the NP, RN, and CHW are billable. ECCHC submits the EHR form to the MCOs who reimburse ECCHC for the CHW visits. As of Q7, Innovations Health had provided a cumulative total of 12,578 direct program patient encounters, which includes the 3,204 encounters that occurred in Q7 (2,901 in-person visits, 303 telephone-based services).

Specialty Care

Referral for specialty care (e.g., prenatal, OB-GYN, cardiology) is another key service provided for patients enrolled in ECCHC's Innovations Health. The NP inserts a note in the EHR that the patient requires a clinical follow-up; some patients may need two to three referral appointments. As the RTI team learned during the site visit, the CMA for each micro-clinic has the primary responsibility to schedule clinical referrals during the time when she is not doing home visits with the RN. According to a CMA, getting one referral to a specialist for uninsured patients can take up to a month if the patient is not signed up for Richland Care. This countywide community health initiative provides access to health care services for Richland County residents who do not have health insurance [e.g., ineligible for Medicare, Medicaid, or Veteran's Administrations (VA benefits] and cannot afford care (http://www.palmettohealth.org/body.cfm?id=132).

Health care services include laboratory fees, diagnostic procedures (e.g., CT scans, MRIs), education (e.g., diet, exercise, stress management), and specialty care. Specialists' fees are reduced and patients pay a $20 copay. (However, the specialists often take insured patients first, according to Health Innovations staff. According to ECCHC's Innovations Health team, the program also has an agreement with the Palmetto Care under the Healthy Outcomes Plan (HOP), which was created by the South Carolina Department of Health and Human Services. Rather than expanding Medicaid, the state of South Carolina provided incentives for hospitals to reduce ED utilization and readmissions (e.g., having the potential to lose up to 5% of its disproportionate share funds for Medicaid patients if they did not). Palmetto Care targets Richland County residents who have a chronic condition or ambulatory-sensitive condition, seek care in the ED, and have the highest number of ED visits at Palmetto Health Richland and Palmetto Health Baptist Hospitals.

ECCHC negotiated an agreement in December 2013 to enroll uninsured patients into Palmetto Care with a commitment from Palmetto Health Richland Hospital to fund specialty care, laboratory fees, diagnostic procedures, and pharmaceuticals. As a result, Innovations Health has been able to obtain access to low-cost specialty care for more than 30 patients. Palmetto Health Baptist Hospital offers a similar referral resource for the Innovations Health program, except it is free for Palmetto Health Baptist patients. Since Innovations Health moved its focus from prenatal support for pregnant teens to pregnancy prevention (around June 2013 according to the fourth quarterly progress report), ECCHC partners with the school-based initiative funded through New Morning Foundation, which provides family planning services to uninsured teens (including 60 Innovations Health patients who attend a local high school).

Medications

Providing needed medications is essential for the high-risk disparate population served through the Innovations Health program. The CHWs coordinate the delivery of prescribed medications for Innovations Health patients, which are distributed by ECCHC’s pharmacy. Each CHW is assigned a 2-month rotation to pick up medications, sign in the medications, and secure them in a locked cabinet at the micro-clinic. Then the CHWs call the patients; if the patients cannot pick up their medication, the CHWs deliver it. The CHWs will also deliver medications to the home if their attempts to reach patients by phone are unsuccessful. Many patients in this disadvantaged population have prepaid cell phones and exhaust their available minutes quickly. If the medications are not delivered to the patient within 2 weeks, the CHWs return the medicine to the pharmacy. However, some patients see more than one provider (e.g., ECCHC internal medicine as well as the Innovations Health). In those cases, the pharmacy will not automatically put the medications in the Innovations Health bin for the CHWs to pick up; rather, a different process of coordination and delivery is required. During Q7, ECCHC provided approximately $17,000 in 340b medication assistance, which would cost approximately $42,500 if purchased through retail pharmacies (Q7 narrative report).

Transportation

According to the Innovations Health staff, their patients’ greatest need is assistance with transportation. Public transportation via Central Midlands Regional Transit Authority is available. However, the bus stop may be a mile or more from the micro-clinic or the patient's home. Innovations Health staff have worked with the transit system to have the buses stop closer to the micro-clinics. Although public transportation is not cheap (costing $3.00 or less for each one-way trip), it is less expensive than a taxi. An AmeriCorps Vista volunteer worked with the regional transit authority to obtain 1-day bus tokens, which were purchased at bulk price using approved Year 1 HCIA carryover funds. The tokens are distributed equally to the micro-clinics (approximately 30 passes at each site). The NP sends a flag via the EHR to inform the CHW that the patient needs a bus pass. The CHWs provide the token for regular transit or the Dial-A-Ride Transit service, which are minibuses that transport the certified disabled. The Columbia Police Department, which has a member on Innovations Health's Advisory Board, also provides transportation through their Assisting Columbia's Elderly program that serves seniors who need help. Finally, the CHWs also transport patients to the office and specialty appointments. Working on designated days in the week, the CHW also refer patients to patient assistance programs (e.g., medication, smoking cessation) and social services resources [e.g., getting help with paying rent or utilities, obtaining Supplemental Nutrition Assistance Program (SNAP) benefits, etc.]

Self-Management Skills

Another program objective is to improve the self-management skills of Innovations Health patients with chronic conditions. During their second visit with the enrolled patient, the CHWs complete the Patient Action Model (PAM) by Insignia Health LLC, which is a 13-item questionnaire that measures patients' readiness to handle their own health (i.e., knowledge, skills, and confidence to do self-management). The CHWs read the questions, mark patients' responses on a hard copy, and then enter the PAM score in the EHR after the home visit. First, they calculate a raw score by totaling the value assigned to each response (e.g., strongly agree = 4) and then convert the raw score into an activation score that ranges from 0% for a score of 13 (e.g., all answers were strongly disagree) to 100% for a score of 52 (if all answers were strongly agree). The activation levels are: 1) may not believe that the patient's role is important (score of 47.0 or lower); 2) lacks confidence and knowledge to take action (score of 47.1 to 55.1); 3) is beginning to take action (score of 55.2 to 67.0); and, 4) has difficulty maintaining behaviors over time (score 67.1 or above). The CHWs are supposed to do a follow-up PAM at a nonspecified time to demonstrate change in activation over time. Coaching on disease-specific self-management (e.g., diabetes, hypertension) is the primary role of the CHWs. However, the NPs sign off on every note and encounter—during the site visit the providers (NP, RN) identify the need for a set curriculum or talking points for the CHWs to deliver (e.g., writing an "order" for specific education or coaching that is incorporated into the EHR). This process assures that all CHWs give the same information to patients and minimizes variability in the information they give to patients (unlike the current situation). After the coaching session, the CHWs document in the EHR that they provided education. Currently, the CHWs document self-management education in the EHR as part of the health knowledge assessment.

The CHW's qualifications and functions are summarized in ***Table 3***. During the site visit, the RTI team met with the CHWs as a group and their respective community health teams (Ridgewood and Greenview micro-clinics). All seven CHWs that participated in the group interview had college degrees (one had a master's degree) and experience in community-based advocacy, directing community-based programs, teaching, or pastoral care.

Table 3. HCIA Care Coordinator Functions and Training

Characteristic Type	Care Coordination Role/Functions
Title	Community health worker
Minimal qualifications	GED/high school diploma
Functions	Health education (individual and group) Informal counseling, individualized goal setting Outreach and recruitment Medication pick-up and delivery Patient/community advocacy Patient monitoring and follow-up Service coordination Community linkages Instrumental support Disease management coaching
Established continuing education program	None

Component 3: Enrolling Frequent ED Users

The Innovations Health program is designed to seek and serve patients with the greatest need (e.g., high-risk, underserved patients who had three or more ED visits within 12 months). The focus of the intervention is adults, children, and pregnant women with chronic diseases, including hypertension, diabetes, and asthma who live in the 29203 zip code area and who do not have a primary care provider (e.g., are frequent users of EDs). According to ECCHC application, residents in this targeted area generate, on average, more than 130,000 annual ED visits; in 2008, 1% of the population accounted for 20.2% of the total health care expenditures. Original data from Palmetto Health Richland and Palmetto Health Baptist Hospitals identified 1,500 patients who had at least four ED visits.

Recruitment and enrollment are the responsibilities of the CHWs who are assigned to specific public housing units within the targeted 29203 zip code area, where they focus their enrollment efforts through a collaborative relationship with the housing managers. As stated in their application, ECCHC originally envisioned a collaborative relationship with the local hospitals—Palmetto Health Richland and Palmetto Health Baptist—that was short-circuited by the state's Healthy Outcomes Plan, its alternative to expanding Medicaid. As a result, the hospitals are only referring the uninsured patients to ECCHC, which means they will not be sharing costs savings or ED and hospital utilization data. Each quarter, the local EDs provide a list of the repeat users who are uninsured. The CHWs then reach out to individuals on the list. Losing the expected volume of hospital referrals and the community's lack of trust were initial challenges to the CHWs' recruitment efforts.

The CHWs implement targeted community outreach (e.g., neighborhood associations, community-based organizations, social services agencies), use various communication channels (i.e., tailored brochures, radio programs), and participate in community events (e.g., health fairs, festivals) to increase awareness about Innovations Health and identify high-need patients. As the RTI team learned during the site visit, the CHWs have established name and face recognition and trust with community residents and a collaborative relationship with the community-based organizations that work with the residents within the 29203 zip code. Often, residents in the Eau Claire community learned about the Innovations Health program from enrolled patients who shared information with their neighbors and family members. Additionally, other community organizations make referrals. For example, Richland County First Steps, which provides parent education to pregnant women and parents of children up to age 3, refer patients when they see issues in the home. The community agencies know that Innovations Health will see all patients, not just the insured. Therefore, agencies refer the uninsured patients.

1.1.2 Program Participant Characteristics

The target population for this innovation is the 46,000 residents who live in the 29203 zip code area, which is the Eau Claire section of Columbia and Richland County), more than 30% of whom live below the federal poverty level..

RTI received a patient identifier file from Eau Claire in July 2014 with 1,619 unique patient identifiers. The information provided in ***Table 4*** is based on the demographic data (i.e., age, gender, race/ethnicity) that were included in that file. As shown in the table, a large proportion of patients (59.9%) were between the ages of 25 and 64, two-thirds were female (63.5%), and more than 90% were black. Payer type was not included in the patient identifier file. We have asked Eau Claire to include this information in the awardee-specific patient-level data requested.

Table 4. Characteristics of All Patients Enrolled in the Innovation through Q8

Characteristic	Number of Patients	Percentage of Patients
Age		
0–18	373	23.0
19–24	128	7.9
25–44	398	24.6
45–64	571	35.3
65–74	99	6.1
75–84	32	2.0
85+	18	1.1
Missing	0	0.0
Sex		
Female	1,028	63.5
Male	591	36.5
Missing	0	0.0
Race/ethnicity		
White	32	2.0
Black	1,491	92.1
Hispanic	64	4.0
Asian	5	0.3
American Indian or Alaskan Native	11	0.7
Native Hawaiian or Other Pacific Islander	2	0.1
Other	4	0.2
Missing/refused	10	0.6
Payer category		
Medicare	—	—
Medicaid	—	—
Dual eligible	—	—
Other	—	—
Missing	—	—

Source: Patient identifier file provided to RTI in July 2014
Q = quarter.
— Data not available.

1.2 Implementation Progress

The extent to which each awardee is able to implement its innovation as planned and reach a sufficient number of patients is critical to assessing the impact on the Triple Aim. The following section provides details on the implementation process and effectiveness. ***Table 5*** lists the explanatory measures RTI plans to request from Eau Claire to assess the impact on outcomes of the innovation.

Table 5. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for ECCHC

Key Evaluation Domains	Subdomains	Measures	Data Source
Implementation process	Care coordination	Medication delivery and coaching for people with asthma	EHR
Implementation effectiveness	Reach	Number/percentage of participants receiving services	EHR
	Dose	Number of RN home visits per patient per year	EHR
		Number of RN micro-clinic visits per patient per year	EHR
		Number of NP home visits per patient per year	EHR
		Number of NP micro-clinic visits per patient per year	EHR
		Number of CHW home visits per patient per year	EHR
		Number of CHW micro-clinic visits per patient per year	EHR
		Number of disease-specific coaching sessions with CHWs per patient	EHR

CHW = community health worker; ECCHC = Eau Claire Cooperative Health Centers; EHR = electronic health record; NP = nurse practitioner; RN = registered nurse.

1.2.1 Process

The implementation process has been the initial focus of the evaluation. RTI defines implementation process as including execution of implementation, organizational capacity, engaging key staff and partners, and client recruitment and enrollment. The implementation process is best evaluated through a combination of data variables, including execution of implementation that conforms to operational plans, and capacity for implementing the innovation in a timely and effective manner. We focused on the implementation process during the awardee site visit (April 30–May 2), asking such evaluation questions as:

- What is the overall execution of the innovation implementation (e.g., the actual rate of expenditures relative to the projected rate)?
- What accomplishments are specific to hiring or training staff so that the organization can build its capacity to implement the innovation effectively?

- What is the implementation effectiveness, including fidelity, reach, and dose of the innovation thus far?

Execution of Implementation

During the site visit, we learned that ECCHC is implementing a number of changes to its Innovations Health program during Q7 (e.g., adding two team members, changing roles of team members). The changes will mitigate infrastructure and ongoing staffing issues (e.g., shortage of NPs, NPs' expectations for their role, conflicts between job function and professional practice guidelines). First, ECCHC has already expanded the original three-member community health team to add a CMA and PSR to increase efficiencies (i.e., allowing the RN to work independently, decreasing administrative load of CHWs). As the RTI site visit team learned, the plan is also to hire a licensed medical social worker (LMSW) to replace the project coordinator who left the project in Q7. The LMSW will supervise the CHWs and serve as the liaison between the CHWs and clinical staff, bridging the clinical (NP, RN, CMA) and nonclinical (CHW, PSR) components of the community health team. We learned that the project manager had assumed the responsibilities of the project coordinator. Members of the Advisory Council were aware of the project coordinator's departure since she is a resident of the community; however, ECCHC leadership had not communicated the proposed changes to the Advisory Council. Also, the plan is to designate a lead CHW to mentor and support the CHWs. The anticipated benefits of these changes are that 1) the NPs will have more time for clinical assessments and care plans, which are important given the shortage of staff, 2) the CHWs will have more structure and guidance related to implementing care plans and nonclinical services, and 3) the more experienced CHWs will be able to mentor and support one another. Overall, the members perceive that the changes have improved patient attendance, reduced the administrative load of the CHW, and relieved overtaxed clinical staff.

Also, the RTI site visit team learned that ECCHC plans to establish a shared leadership model that bridges the community health teams to ECCHC's clinical management infrastructure. As originally implemented, the Innovations Health's micro-clinics operated independently of the other ECCHC clinic staff and infrastructure (e.g., with their own clinic space, phone lines, communications and tracking systems, and staff). Under the proposed changes, the ECCHC's regional nurse manager will support and provide guidance to the Innovations Health's NP. ECCHC management staff (e.g., regional nurse manager, lead provider, office manager) will begin to meet monthly with each community health team. Previously, only the medical director who supervises the NPs held monthly meetings with the NPs. His lack of availability was an issue (e.g., he responded up to 2 days later when he was sought for emergencies that required hospitalization). The plan is to identify preceptors for Innovations Health clinical staff, which are in place at ECCHC's traditional sites (e.g., for nursing in the ECCHC's internal medicine clinic), but not for the Innovations Health's micro-clinics. Lacking that institutional support, the leaders of the Innovations Health micro-clinics previously relied on each other for back-up.

As expected, patient recruitment, enrollment, and services—key implementation processes for the Innovations Health program—have been negatively impacted by the staffing challenges. Overall, cumulative enrollment of patients in Innovations Health by the end of Q7 was 1,420 patients, which was below the projected target of 2,133 (a difference of 713 patients or 66.6%). Since Q5, Innovations Health has consistently not met its projected enrollment (down by approximately 30% each quarter). One objective for the program is to ensure that participants enrolled in Innovations Health receive key patient services (e.g. comprehensive patient histories, self-care coaching, and medication management) as planned. Even with the expanded team and redefined roles to maximize efficiencies (e.g., NPs doing clinic visits only, RN doing home visits), the frequency of services that enrolled patients receive (e.g., home visits, clinic visits) has been impacted. In Q7, ECCHC reported that the number of NP and RN visits decreased (progress report). ECCHC plans to explore other factors, besides understaffing, that contributed to the decrease (e.g., improved self-management and health status of enrolled patients require fewer visits, new patients with fewer chronic health conditions and need for clinical follow-up). Understaffing of the micro-clinics also negatively impacted recruitment efforts. We learned during the site visit that CHWs recruit participants only from their assigned housing development: word-of-mouth referrals from other Innovations Health patients are the most frequent source.

Finally, the ultimate goal of the Innovations Health program is to assure that its patients have a permanent medical home. It was clear from the site visit that Innovations Health refers its patients to external specialists and other providers for services as well as to ECCHC's clinics (e.g., pediatrics, internal medicine, behavioral health); however, they may remain enrolled with Innovations Health. During the interviews, team members stated that patients view the micro-clinic as their medical home and do not see a need to transfer elsewhere. Also, ECCHC's traditional clinics (e.g., internal medicine) are booked for months ahead and cannot quickly respond to new patients; the internal medicine clinic occasionally refers patients to Innovations Health micro-clinics. The understanding of the RTI team, based on the site visit, is that ECCHC is not systematically tracking (e.g., in the EHR) the assignment of Innovations Health patients to a permanent medical home. However, ECCHC reported in its Q7 progress report that it has "successfully integrated the Innovations Health model" into its larger four-county network. Specifically, the Innovations Health program has" incorporated 14 distinct sites with seven practice disciplines into serving Innovations' patients." ECCHC's process and measure for tracking assignment to a medical home requires further clarification.

Organizational Capacity and Leadership

As RTI learned during the site visit, ECCHC leadership seems highly supportive of the Innovations Health program. However, ECCHC's clinical hierarchy has little to no involvement in the Innovations Health program (e.g., mostly monthly meetings with the medical director, no involvement by the director of nursing, and no oversight by the regional nurse manager until Q7 when RTI made the site visit). Even though Innovations Health staff—who are all new ECCHC employees—appear to feel empowered and supported, organizational capacity seems to be an ongoing issue for ECCHC, which had not previously utilized the CHW care coordination model.

Essentially, the community health team approach is the foundation of the Innovations Health program. Led by an NP, members of the community health team make home visits to disparate areas, provide health and wellness education, and provide primary care services with referrals to traditional ECCHC clinics (e.g., pediatrics, internal medical) as well as specialists. The loss of two NPs highlighted the crucial leadership of the NPs and essential skills needed for that role. The lesson learned, as shared with the RTI site visit team, is the need for more experienced seasoned clinical staff in that leadership role (e.g., at least 10 years of outpatient clinical experience) and highly organized and adaptable individuals—who can make independent assessments and handle the challenges faced in the micro-clinics. Respondents' perspective was that new (early career) NPs lack the necessary skills to operate independently and became easily frustrated by the clinical and nonclinical challenges of caring for high-risk patients from neighborhoods with concentrated health disparity. Another lesson learned was the need for a nonclinical specialist to bridge the clinical/nonclinical link between NP who signs off in the EHR for CHWs whom the project coordinator supervised. ECCHC's MCO partners, particularly Select Health, have implemented their own CHW initiative and can potentially share lessons learned and promising practices with Innovations Health.

ECCHC has strong community linkages with other community organizations (e.g., housing, transportation, and the police department) that provide necessary support services for its program participants. Even so, ECCHC did not organize a community Advisory Council until Q 5 and it met for the first time in July 2013. The plan is for the Council to meet quarterly.

1.2.2 Workforce Development

The awardee's ability to effectively recruit, hire, train, and retain members of the community health team to deliver the model is one of the key outcomes for the project to achieve its objectives.

Hiring and Retention

Over the 3-year period, ECCHC's Innovations Health program will create an estimated 22 health care-related jobs, including positions for 9 CHWs, 3 RNs, 3 NPs, 2 PSRs, a project director, an administrative assistant, and 3 CMAs. (The first employee was hired in September 2012.) As of March 2014, Innovations Health has 20.68 total full-time equivalent (FTE) staff. In Q7, ECCHC reported having 9 CHWs, 5 management or administrative staff, and 3 aides/assistants/direct-care workers, 2 NPs, and 2 RNs. A total of 2.8 FTE Innovation staff was hired during Q7. As of the site visit, ECCHC had replaced one of the two NP vacancies.

Training

Through Q7, ECCHC reported that 118 attendees—including those who participated in multiple sessions (i.e., duplicate counts)—received training as part of the workforce development to prepare them to implement Innovation Health effectively. Training totaled 4,352 hours from July 2012 through March 2014. ECCHC offered several training courses to Innovations Health staff. Through a collaborative agreement between Midlands Technical College and the South Carolina Department of Health and Environmental Control (DHEC), all NPs and CHWs participated in the Minnesota Model Training, a 62-hour nationally-recognized training course designed for CHWs. The training focused on patient enrollment, insurance verification, coding procedures, patient scheduling, care plans, medication tracking, prescription assistance programs, EHRs, and patient referrals.

The CHWs also completed Better Choices Better Health (as it is known in South Carolina), a chronic disease self-management program originally developed by Stanford University in 1996. Conducted by DHEC, this train-the trainer course prepares the CHW to teach Innovations Health patients how to eat healthy foods and live a healthier life. The course meets 2.5 hours per week for 6 weeks. During the site visit, CHWs expressed that the Better Choices Better Health training was beneficial. However, it was hard to integrate and apply what they learned in training into their practice, especially in the beginning because they were not seeing patients right away. The CHWs also completed 12 days of supplemental training in motivational interviewing, teamwork, conflict management, health care finance, uniform data system and Healthcare Effectiveness Data and Information Set (HEDIS) measures, and Triple Aim (health care issues and opportunities-global and local and clinical processes-ECCHC clinical training) (based on Lewin data).

Also, the CHWs were supposed to confer with a PSR who would train them to use the EHR; however, that portion of training did not happen. Instead, the CHWs received a manual and practiced using the EHR with one another. When they were asked how trainings could be improved, some noted that new CHWs should have the opportunity to shadow a current

CHW for a week or two. Shadowing would help the new CHW become more familiar with their roles and responsibilities. No separate training was provided for staff who supervise the CHWs.

1.2.3 Effectiveness

A major aspect of the evaluation is to assess the effectiveness of the intervention in terms of the extent to which it is implemented as planned (i.e., fidelity) and patients have been exposed to the innovation. Their exposure will be measured through reach (e.g., the number of targeted population that were enrolled in the innovation) and dose (e.g., the degree to which each enrolled patient is exposed to services).

Fidelity

Although the core components of the Innovations Health program remain the same, ECCHC is not implementing it as originally planned due to staffing shortage and other staffing issues. As previously stated, ECCHC has initiated several changes to address the issues (e.g., adding two additional members, changing roles and responsibilities of team members to increase efficiency, integrating the independent micro-clinics into the larger ECCHC clinical management infrastructure). For example, the RN now operates more independently (doing intake in patients' homes to gather medical history and complete the physical assessment). The consensus viewpoint was that pairing the RN with an NP in the clinic setting (the original model) underutilized the RN's skills and was very inefficient. Expanding the team, redefining roles, and changing workflow allow the providers (NP, RN) to see more patients. ECCHC's regional nurse manager (charge nurse), lead provider, and office manager will participate in the regular monthly meetings of each community health team to discuss issues at each micro-site. Proposed, but not completed, is the plan to hire an LMSW to supervise the CHWs and oversee the nonclinical issues of the Innovations Health patients and designate a lead CHW to mentor the other CHWs and take issues to the LMSW and NP. As the RTI team learned, the needs of the residents in this concentrated health disparity area often push staff beyond their skill set (e.g., CHWs handling difficult social issues such as dementia patients living alone). The changes in the model are designed to address those staffing issues so that Innovations Health staff can operate within their level of experience, training, and qualifications and meet quality and practice standards.

Finally, Innovations Health is not reaching the projected number of patients. As previously detailed, Innovations Health is managing the current enrollment, but the staff noted that it is sometimes a struggle. The RTI team learned that ECCHC is not systematically tracking the transfer of patients to a permanent medical home, which is a key outcome for Innovations Health. Even if the Innovations Health team refers a patient to a ECCHC traditional clinic (e.g., internal medicine), the patient remains enrolled in Innovations Health since ECCHC traditional clinics do not have CHWs to provide the needed support that is the hallmark of the Innovations Health program, which is a temporary patient-centered medical home.

Reach

Reach is the proportion of the targeted population that is eligible to participate in the innovation relative to those who are actually enrolled. For Eau Claire, the target population is the 46,000 residents who reside in the 29203 zip code area. ***Table 6*** shows the reach for each quarter since launch of the Innovations Health program. Based on the patient identifier data file provided in July 2014, a total of 1,619 unique patients were enrolled. Overall, ECCHC has reached 3.5% of the target population.

Table 6. Patient Enrollment and Reach for Each Quarter Since Project Launch

Quarter	Target Population[1] (denominator)	Number of Unduplicated Patients Enrolled[2]	Total Reach per Quarter	Percent Change from Previous Quarter
Q2 (December 2012)	46,000	118	0.3	--
Q3 (March 2013)	46,000	397	0.9	0.6
Q4 (June 2013	46,000	392	0.9	0.0
Q5 (September 2013)	46,000	314	0.7	-0.2
Q6 (December 2013)	46,000	90	0.2	-0.5
Q7 (March 2014)	46,000	138	0.3	0.1
Q8 (June 2014)	46,000	170	0.4	0.1

[1] Number of individuals that reside in zip code 29203 (the target area), which is the Eau Claire section of Columbia, SC, in Richland County (application).
[2] Patient identifier file provided to RTI in July 2014.
Q = quarter.

Dose

We learned during the site visit that all enrolled participants get three initial visits with members of the community health team (e.g., CHW only, RN, and CHW in the home or in the clinic, and the NP's assessment during a clinic visit) under the revised implementation model. Although the number of follow-up visits depends on the participant's diagnosis (and willingness to continue participating), the usual schedule is every 2-3 months for stabilized patients, which could be longer given the staffing shortage. Because the innovation was short of one nurse practitioner in Q7, ECCHC continued its emphasis on consolidating roles among staff in order to serve enrollees in the three micro-clinics by the NPs and RNs (two of each). During the site visit, the CHWs shared that they are limited to assigned blocks of times during which they can schedule participants. Although the implementation process has changed, how data are collected seems constant. The CHWs provide and document the number of disease-specific coaching sessions in the participants' EHR. ECCHC also tracks the number of NP clinic visits since they are a billable service. In Q7, ECCHC noted that clinic visits were reported as home visits in EHR. ***Table 7*** summarizes the services provided to patients and the number of encounters.

Table 7. Number of Patients Receiving Specific Services and Contacts: January–March 2014[1]

Services Provided to Patients	Number of Encounters
Disease-specific coaching sessions	1,059[2]
In-person visits	2,901[1]
CHW home visits	1,078[3]
Phone calls	303[1]
Total	3,204[1]

[1] Lewin data, Q7 report.
[2] Self-Monitoring Plan, Q7 (1.668 sessions per patient x 635 patients).
[3] Self-Monitoring Plan, Q7 (1.691visits per patient x 635 patients).
CHW = community health worker.

1.3 Evaluation Outcomes

Awardees have two types of quantitative data that RTI will use in assessing the impact of the awardee's innovation on key outcomes. These include claims data for Medicare and/or Medicaid beneficiaries, depending on who the awardee serves, and administrative or utilization data the awardee is collecting (which we have categorized as "other awardee-specific data" reflecting the variability of the types of data elements available across awardees). We are in the process of finalizing our assessment of all the available data sources and requesting data directly from each awardee. Analyses will be provided in subsequent reports as more data become available. The following sections present descriptive findings from the quantitative outcome data provided to RTI as of September 11, 2014.

1.3.1 Measures for Evaluation

Following the site visit, the data management and site visit teams met to review each of the measures listed in the awardee's self-monitoring measurement plan. The measures listed in ***Tables 5*** and **8** reflect the measures determined as most relevant for our evaluation of ECCHC's Innovations Health program.

Table 8. Outcome Measures Requested from ECCHC

Key Evaluation Domains	Subdomains	Measures	Data Source
Clinical effectiveness	Diabetes	Percentage of patients with diabetes who received a foot exam	EHR
	Vaccination	Percentage of patients who received an influenza immunization	EHR
		Percentage of patients who received a pneumococcal vaccination	EHR
	Mental health	Percentage of patients screened for clinical depression using PHQ9	EHR
	Patient satisfaction	Patient Activation Measure (PAM) 13 item measure	Self-report data
		FQHC patient satisfaction survey	Self-report data
	Weight management	Percentage of patients who are overweight (BMI 25.0-29.9) or obese (BMI >30)	EHR
Health outcomes	Diabetes	Percentage of patients with diabetes who had hemoglobin A1c > 9.0 %	EHR
	Hypertension	Percentage of patients with a diagnosis of hypertension with BP < 140/90 mm Hg	EHR
	Cardiovascular disease	Percentage of patients with CAD who have a LDL-C result <100 mg/dL	EHR
Health care outcomes	Utilization	ED visit rate	Claims data
		All-cause admission rate	Claims data
		Neonatal intensive care admission rate	EHR and hospital systems
		Readmission rate	Claims data
	Cost	Spending per patient	Claims data
		Cost savings	Claims data
		Cost of inappropriate ED visits for all program participants	EHR/hospital data; claims data

BMI = body mass index; BP= blood pressure; CAD = coronary artery disease; ED = emergency department; EHR = electronic health record; FQHC = federally qualified health center; LDL-C = low-density lipoprotein cholesterol; PQ9 = Patient Health Questionnaire 9.

1.3.2 Claims Data

As part of a broad assessment of health care innovations, the Center for Medicare & Medicaid Innovation (CMMI) is assessing the impact of its programs, including those funded specifically by HCIA, on four core measures. The four core measures are

- health care spending per patient,

- hospital inpatient admissions,
- hospital unplanned readmissions, and
- ED visits.

Collectively, CMMI programs are anticipated to slow the increase in health care spending, reduce hospital admissions, reduce avoidable hospital readmissions, and prevent unnecessary ED visits. We are reporting these measures for all HCIA Community Resource awardees so that the collective impact of the awards can be assessed. As discussed below, some awardees' innovations may not be focused on these measures. Other awardees' innovations target specific conditions (e.g., imaging, diabetes, etc.) and may have significant impacts on spending, admissions, readmissions, and ED visits for the targeted conditions. However, the innovations may not have a statistically detectable impact on the measures at the aggregate level because the targeted conditions represent only a small fraction of total spending, inpatient admissions, and ED visits.

The measures are calculated through analysis of Medicare and Medicaid fee-for-service claims. Because of differences between Medicare and Medicaid patients in age, other demographic variables, and disease status, we report the Medicare and Medicaid results separately below. Currently, complete Medicare claims are available through the end of 2013. Medicaid claims for ECCHC are available through Q3 2012. The Innovations Health program was launched on December 1, 2012.

- **Health Care Spending per Patient**. For Medicare beneficiaries, health care spending per patient includes Part A and Part B Medicare expenditures for persons enrolled in the Part A and Part B fee-for-service program. The variable focuses on Medicare fee-for-service spending, so Medicare managed care (Part C) services are excluded, as are beneficiary copayments. Medicare Part D prescription spending is also excluded. Spending is reported on a per-person per-quarter basis. If a beneficiary is not enrolled for every month in a quarter, spending (except for hospital inpatient spending) is prorated to a quarterly basis based on the number of days enrolled during the quarter. Because hospital inpatient admissions are both rare and expensive, spending is not prorated for hospital inpatient spending. Prorating is also not performed for beneficiaries who die during a quarter. For Medicaid beneficiaries, health care spending per patient is reported for fee-for-service beneficiaries. Beneficiaries are only included in the analysis for spending (and the other measures) during periods when they are enrolled in Medicaid.

- **Hospital Inpatient Admissions**. This variable measures hospitalization, the single most expensive component of health care spending. Patients kept overnight in observation beds are excluded from this measure. Inclusion criteria for the analysis are the same as for spending. Hospital inpatient admissions are not prorated based on the number of days eligible during the quarter. All-cause inpatient admissions and ACSC admissions are reported separately, under the assumption that a greater share of ACSC admissions can be prevented by appropriate ambulatory care. The mean quarterly admission rate per 1,000 patients is reported.

- **Hospital Readmissions**. Hospital readmission rates serve a dual purpose in evaluating HCIA impacts. Readmissions add to the costs of a prior hospitalization and they often reflect a problem in the care provided during the first admission. All-cause readmissions are defined as a follow-up admission to any short-term acute general or long-term care hospital within 30 days of a discharge from another hospital of the same type. We ignore multiple admissions within 1 day of an initial admission because these often represent transfers between hospitals. We define index hospitalizations that begin during the quarter and follow each index admission for 30 days, even when the follow-up period extends beyond the end of the quarter. Inclusion criteria for the analysis are the same as for spending. We also calculate readmissions for persons with ACSC. The person's ACSC status is defined by the patient's first hospitalization during the quarter. The readmission rate equals the number of readmissions divided by the number of index hospitalizations during the quarter. Planned readmissions are excluded from the calculation of the numerator. Quarterly mean readmission and ACSC readmission rates per 1,000 admissions are reported.

- **ED Visits.** ED visits are sometimes viewed as a symptom of the inability of the community's health care system to provide adequate preventive and ambulatory care visits. We report an all-cause ED visit rate that excludes ED visits resulting in an inpatient admission (which presumably represent unavoidable visits) and include overnight ED visits without an inpatient admission. Inclusion criteria for the analysis are the same as for spending, and ED visits are also subject to the same prorating formula as for spending. The mean quarterly ED visit rate per 1,000 patients is reported.

Medicare Claims Analysis

We do not expect to include Medicare claims analyses because only 12 of the patients (1.9%) enrolled in ECCHC's innovation are enrolled in Medicare fee-for-service.

Medicaid Claims Analysis

The Medicaid data analysis will use data from the CMS Alpha-MAX data files. Currently, Medicaid claims for ECCHC are only available in Alpha-MAX through Q3 2012. Because the ECCHC innovation was launched on December 1, 2012 and claims are not yet available, we are not presenting measures for Medicaid patients in this report. We will provide Medicaid analyses in subsequent reports as more data become available. ECCHC's innovation, however, only includes 85 Medicaid recipients (13.4%). The vast majority of participants are uninsured (408, 64.3%).

Appendix A shows the claims analyses tables that we plan to present for Medicaid. In addition to the tabular format, we will present figures showing each measure as a function of time. Values in quarters prior to the innovation's launch in November 2012 will be shown in one color and values for quarters during and after launch will be shown in another color. The figures will include a trend line based on a linear regression of prelaunch values.

Discussion of Claims Analysis

The claims measures will provide descriptive data on patients enrolled in ECCHC's Innovations Health before, during, and after the program's launch. Although it is necessary to report these measures to support CMS's broader assessment of its full portfolio of innovation projects, the measures may not provide a complete evaluation picture of the ECCHC's Innovations Health for a number of reasons. First, Medicaid beneficiaries only represent 13.4% of the patients served. Therefore, we will likely have a small sample size, and results for this group may not be representative of results for patients without Medicaid coverage. Additionally, ECCHC's innovation was only launched in December 2012. The impact of their innovation may not be immediate because time is needed for patients to change behavior and care utilization patterns.

Development of Comparison Groups

In addition to comparing ECCHC's patients before and after implementation of the innovation, we are constructing a comparison group of Medicaid fee-for-service patients in surrounding zip codes. ECCHC also serves two other zip codes that are not included in the innovation that have similar demographic composition (i.e., a predominantly minority and uninsured population) that could potentially be used to draw a comparison group from. This comparison group will control for external, non-innovation factors affecting both patients participating in ECCHC's innovation and those that are not participating. We are using propensity score matching to identify patients with similar characteristics, such as age, chronic conditions, and gender in the surrounding areas to ECCHC's patients enrolled in the innovation. Results for the comparison group will be included in later reports.

1.3.3 Other Awardee-Specific Data

Overview of Data Requested and Received

In late June 2014, RTI met with ECCHC to request the raw patient-level data that was used to generate each of the measures in ***Table 9*** for each quarter. At that time, ECCHC's data person was no longer affiliated with this award and ECCHC indicated it had to train someone new to be able to access their data. ECCHC was scheduled to receive technical assistance (TA) from the CMS TA contractor on how to access and retrieve data from the current systems during the week of July 21. We met again with ECCHC on October 13, 2014, to request the data raw patient-level data again, and are hopeful that they will be able to provide the data within 3 weeks of that meeting.

Health Outcomes

Once we receive the raw patient-level data requested from ECCHC, we will have a better understanding of what type of results we will provide. We will ultimately convert these three measures into a series of run charts for each measure with three lines per chart—one for each dose level. The following table shells reflect examples of findings we anticipate presenting.

Table 9. Health Indicators and Outcomes over Time

Measure	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Diabetes							
HbA1c poor control (HbA1c > 9.0%)	—	—	—	—	—	—	—
Foot exam	—	—	—	—	—	—	—
Heart health							
Blood pressure control for those with hypertension (BP < 140/90 mm/Hg)	—	—	—	—	—	—	—
Patients with CAD who have a LDL-C result <100 mg/dL	—	—	—	—	—	—	—
Patients who have a LDL-C result >=100 mg/dL and have a documented plan of care to achieve LDL-C <100mg/dL, including at a minimum the prescription of a statin	—	—	—	—	—	—	—
Mental health							
Screening for clinical depression using PHQ9	—	—	—	—	—	—	—
General health							
Influenza immunization	—	—	—	—	—	—	—
Pneumonia vaccine for older adults	—	—	—	—	—	—	—
Weight screening completed using BMI	—	—	—	—	—	—	—

Source: Patient-level data to be provided to RTI.

BMI = body mass index; BP= blood pressure; CAD = coronary artery disease; ED = emergency department; EHR = electronic health record; FQHC = federally qualified health center; LDL-C = low-density lipoprotein cholesterol; PQ9 = Patient Health Questionnaire 9; Q = quarter.

— Data not available.

Discussion of Other Awardee-specific Findings

Once we receive data from ECCHC, we will review, clean, merge, and begin conducting descriptive analyses to fill in the table shells above. At that point, we will be able to discuss findings related to the other awardee-specific data.

1.4 Overall Program Effectiveness to Date

An independently operated organizational unit within a large FQHC that serves four South Carolina counties, the ECCHC's Innovations Health program located micro-clinics in three neighborhoods within in the target community (i.e., the 29203 zip code area within Richland County). Each of the three micro-clinics has the same staffing model, a community health team that includes an NP (the team lead), RN, CHW, CMA, and PSR. Each team has daily meetings, referred to as "huddles," to review patient charts for the day to identify participants' needs and any issues with care coordination. Interviews during the site visit (April 30–May 2, 2014) revealed a high level of commitment to the Innovations Health program among ECCHC's leadership. However, the leadership's priority and focus was to address the ongoing staffing shortage and related infrastructure and practice issues that caused two NPs to resign. As a corrective response to these issues, ECCHC was integrating the micro-clinics into the overall FQHC management infrastructure (e.g., oversight and support by ECCHC's regional nurse manager), restructuring the community health team to include a CMA, and hiring an LMSW to supervise the CHWs and bridge the clinical and nonclinical components of the community health team. The ongoing infrastructure and staffing issues have negatively impacted Innovations Health's overall effectiveness. Reach is 3% as of Q7 (1,420 enrolled patients from the 46,000 target population). The projected enrollment by Q7 was 2,133. The two fully-staffed community health teams are managing the current enrollment, but the staff noted that it is sometimes a struggle. ECCHC noted that the number of NP and RN visits decreased in Q7 (progress report) although they are still enrolling new patients. New enrollees are receiving, at minimum, the three encounters associated with the initial comprehensive assessment (e.g., a CHW home visit, an RN/CHW home visit, and a clinic visit with the NP).

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APPENDIX A

Table A-1. Baseline and Intervention Trends in Health Care Spending per Patient

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—

Savings per Patient

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Spending rate: total quarter (i.e., quarterized) payments/number of unique patients. Savings per patient: difference in comparison minus the intervention’s average spending rates.
— Data not yet available.

Table A-2. Baseline and Intervention Trends in Admissions per 1,000 Patients

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare
Admissions Measure: All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Admit rate: total unquarterized admissions/number of unique patients.
— Data not yet available.

Table A-3. Baseline and Intervention Trends in Readmissions per 1,000 Admissions

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total admissions	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total Admissions	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.

Note: Readmit rate: sum of all readmissions to eligible hospital within 30 days/all admissions in the quarter. Total admissions: all eligible admissions in the quarter.

— Data not yet available.

Table A-4. Baseline and Intervention Trends in ED Visits per 1,000 Patients

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: ED rate: total quarterized ED visits and observation stays/number of unique patients.
— Data not yet available.

October 2014

Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring

Annual and Site Visit Report

Finity Communications

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OVERALL EVALUATION SUMMARY

RTI International was selected to lead an independent evaluation of the 24 Health Care Innovation Award (HCIA) awardees categorized as Community Resource Planning, Prevention, and Monitoring (Community Resource). In this role, RTI is conducting an in-depth evaluation of each innovation, as well as a cross-site evaluation that includes similar innovations targeting the same priority outcomes (e.g., emergency department [ED] visits). For each of the 24 awardees, this report presents findings from the first year of the evaluation (beginning September 23, 2013, and including data obtained by RTI as of September 11, 2014). The report is based on multiple data sources, including operational reports, self-monitoring plans, site visits, and quantitative data analysis.

The evaluation methods vary by awardee innovation, based on the type of innovation and availability of data. RTI has reviewed and coded all existing documents from the awardees through December 31, 2013, and incorporated that knowledge into each awardee's overview. Our review included the awardees' original applications for funding, original and current operational and self-monitoring plans, and quarterly narrative and monitoring reports. For this annual report, we incorporated activities reported through the awardee's seventh quarterly report (i.e., through March 31, 2014).

Between April and August 2014, teams of at least two staff from the RTI team visited all 24 awardees for 2 to 4 days, depending on the number of interviews conducted. Teams included a subject matter expert, with training and experience specific to the awardee's innovation, and a master's- or bachelor's-level colleague to take notes. Before each visit, the teams reviewed all available documentation from the awardee to learn about the innovation's goals, objectives, and status. The purpose of the site visits was to clarify our understanding of the innovation, obtain detailed information on the implementation process, and review awardee-specific data to determine which elements to incorporate into the evaluation. By August 13, 2014, all 24 awardees had been visited and a thorough description of our findings included in each of the 24 awardee sections.

In addition to the site visits, we report quantitative data from two possible sources for several awardees. First, we present findings from claims analysis for awardees in this report if they both provided us with patient identifiers and reported enrolling participants who are Medicare and/or Medicaid beneficiaries. RTI has obtained patient identifiers from most of the 24 awardees to conduct claims analysis. Second, we present data RTI obtained directly from awardees to quantify their work in addressing health care costs, quality, and patient outcomes. Data from additional awardees will be analyzed and presented in future reports, as data become available and awardees enroll sufficient participants. An update on the availability of Medicare/Medicaid claims and other awardee-specific data, analysis of data available to us and cleaned as of September 11, 2014, a summary of the comparison groups, and a list of draft evaluation measures are included in each awardee section.

1. HCIA COMMUNITY RESOURCE AWARDEE: FINITY COMMUNICATIONS (FINITY)

1.1 Introduction

Finity Communications, Inc., a technology vendor in Portland, Oregon, received an award of $4,967,962 that launched on November 15, 2012, to achieve the following specific goals:

1. **Reduce total cost of care** by $8,744,407.
2. **Improve care** by implementing a closed-loop disease management program that will result in a reduction of emergency department (ED) services by an average of 0.1% off the baseline for disease management program participants.
3. **Improve health** by improving targeted health outcomes by an average of 0.1% off the baseline for disease management program participants.

During our site visit to Finity in May 2014, Finity noted a few additional goals that, to date, have not been incorporated into its operational plans or progress reports. These other goals are 1) improving general wellness through increased preventive screenings, primary care visits, and medication adherence; 2) reducing other utilization costs such as inpatient admissions and per-member per-month costs in addition to reducing ED services; and 3) developing a sustainable program that would continue and be expanded after the award concludes.

RTI is conducting an in-depth case study for this innovation. As part of that case study, two RTI team members conducted a site visit in May 2014; before and after the visit, our team reviewed all documentation on the innovation. We are working to obtain data directly from the awardee to assess many of the variables we discuss. This report describes findings from RTI’s site visit, document reviews, follow-up calls, and analysis of data obtained and cleaned by RTI through September 11, 2014. We start by describing the innovation’s components and the patients targeted by the awardee.

1.1.1 Innovation Components

Finity’s innovation is relatively complex. As we learned during our May 2014 site visit, their core innovation is closed-loop tracking of health behaviors by aggregating and analyzing data from multiple sources, including information systems and claims data, and continuous tailoring of interventions based on disease management programs offered through their Medicaid Managed Care partner, Health Partners Plans (HPP). Finity aggregates and links HPP disease management data and, based on member claims, experience, and program encounters, tailors the innovation to the needs of the member to improve participation and change behaviors. Finity’s analytic partner, SCIO Health Analytics, specifically helps analyze the claims data provided by HPP to monitor utilization rates and calculate cost savings periodically. Changes in overall program direction are based on feedback from both SCIO's analysis of participants' claims and Finity's analysis of innovation encounters. All of Finity's partners for the innovation are presented in ***Table 1***.

Some disease management programs being tracked and analyzed as part of this innovation were in place prior to this award (e.g., Baby Partners, medication management), while others are completely new (e.g., Web-based educational portal, diabetes and heart health incentive programs). The closed-loop tracking of health behaviors, however, is applied to some of HPP's existing disease management programs as well as the programs that were added as part of this award. The current innovation is best understood through the closed-loop tracking and feedback of two main components: 1) condition management programs, or LifeTracks, which provides education, financial incentives, and access to peer health mentors to encourage participants to better manage their conditions and care, and 2) a general wellness program that promotes health and wellness among HPP members by using a Web-based educational portal and other initiatives, such as the Step-Up Challenge and Dance Now!, a mobile app that encourages exercise through dance. The innovation has the following overall objectives:

- Create and deploy a technology platform called EveryBODY Get Healthy that includes beneficiary health profiles and a health communications delivery platform to implement targeted mobile, online, or paper-based disease management tools that provide outreach, wellness information, support services, and alerts to support successful behavior change.
- Hire, train, and deploy peer health mentors to support participant behavior change.
- Deploy the wellness, health consumerism, and disease management programs and evolve the wellness and disease management programs based on ongoing metrics and reports.

Table 1. HCIA Partners, Role, and Location

Partner Name	Role in HCIA Project	Location
Health Partners Plan (HPP)	Provides participants, enrollment/outreach, project management/ administration, payer expertise, and oversees peer health mentors,	Philadelphia, PA
SCIO Health Analytics	Conducts health analytics	Farmington, CT
Duke Integrative Medicine	Develops peer health mentor training	Durham, NC

Source: Site Visit May 21-22, 2014.
HCIA = Health Care Innovation Award; HPP = Health Partners Plans.

Component One: Condition Management LifeTracks

Finity's innovation is organized as a set of interrelated programs (e.g., wellness, condition management) and is supported through various technologies (i.e., front-end Web portal and e-mail/text/automated messages facing patients, and back-end tracking and analytics that support closed-loop tracking and innovation tailoring). The first component of the innovation, LifeTracks, both builds on existing disease management programs operating at HPP, such as Baby Partners, and provides additional condition management programs for HPP members for diabetes and heart health.

Once enrolled in LifeTracks, participants receive support communications frequently through a variety of mediums (e.g., e-mail, text, phone). Participants elect which mode they primarily prefer to receive communications, although Finity is constantly monitoring the most effective medium to reach participants and adjusts outreach and contact accordingly. Participating in LifeTracks includes access to the online Web-based portal, EveryBODY Get Healthy, which provides general health and wellness education and information regarding a participant's specific health condition(s) (e.g., pregnancy if enrolled in Baby Partners).

LifeTracks participants for these three conditions may also participate in the incentive portion of the condition management program. The incentives are in the form of a reloadable incentive card that can be used to purchase, for example, healthy foods. For Baby Partners, an incentive of $25 is awarded for a prenatal visit, $25 for a dental visit, and $25 for a postpartum visit. An additional $25 is awarded if the first three goals are completed, for a total incentive of $100 per participant. The LifeTracks program incentives for participants with diabetes include $25 for completing a low-density lipoprotein (LDL) test, $25 for an HbA1c assessment, $25 for monthly contact with a peer health mentor, and $25 for a checkup with their provider, for a total incentive of $100. Heart health participants may receive up to $100 in incentives as well: $20 for an LDL test, $20 for primary care visit, $20 to improve blood pressure, $20 for medication adherence, and $20 for monthly contact with a peer health mentor.

Members are only officially enrolled in one LifeTrack for the incentive component of the innovation. If they have multiple comorbidities, members and disease management staff determine which condition takes precedence. For example, if a woman is both pregnant and diabetic, she would likely formally participate in the Baby Partners LifeTrack. Although she would be eligible for incentives only through Baby Partners, she would still receive information and educational content related to diabetes through the Web portal.

During the site visit, we learned that Finity plans to expand LifeTracks to include asthma, tobacco cessation, and weight loss. These programs are currently under review by the Pennsylvania Department of Public Welfare (DPW). Although these new LifeTracks programs will include specific educational and peer health resources, they will not include an incentive component.

Peer Health Mentor Role and Functions

The peer health mentors are an integral part of Finity's innovation. Finity currently utilizes three peer health mentors, contracted through HPP. Only two were currently active as of the site visit because one was on extended medical leave. The peer health mentor position has no formal educational requirements, such as completion of high school or a bachelor's degree, but the mentors must live in the local community. They were required to complete a formal training program. All three are also bilingual, although this also does not appear to have been a formal requirement. The peer health mentors, while currently funded by the award, were all previous HPP employees. They are supervised by current HPP disease management staff and are physically located at HPP.

The peer health mentors' role is to get people engaged and sustain their involvement in the various LifeTracks programs. Overall, the peer health mentors fulfill the functions provided in ***Table 2***. Part of their role, especially in the beginning of the innovation, was to enroll eligible participants in LifeTracks. Now that the innovation is under way, they spend most of their time interacting and engaging with current LifeTracks participants. One of the peer health mentors exclusively engages with Baby Partners participants and eligible Baby Partners members, while the others work with the diabetes and heart health participants as well as engage with members more generally. New participants are assigned either to the mentor who works with Baby Partners if they are eligible for that program or one of the other two peer health mentors, depending on current availability and case load. There is, however, a central hotline so all LifeTracks participants always have a real-time support option. The hotline serves as another channel for supporting participants. Although the peer health mentors noted that they would like to meet with members face to face, so far most communication has been via the phone. The specific number of calls and communication vary by participant because some members are more high risk and require more follow-up contact with their peer health mentor. In addition, some LifeTracks incentives for diabetes and heart health are based on frequent contact with the peer health mentor.

Table 2. HCIA Care Coordinator Functions and Training

Characteristic Type	Peer Health Mentor Role
Title	Peer health mentor
Minimal qualifications	No formal educational requirements, although they are required to be from the community being served
Functions	Health education (individual and group) Informal counselling, individualized goal setting Outreach and recruitment Medication management Service coordination Instrumental support
Established continuing education program	None

Source: Site visit, May 2014.
HCIA = Health Care Innovation Award.

Finity and HPP leadership both noted that the peer health mentors are critical to the innovation. They demonstrated that contact with the mentors was four times more successful at enrolling and engaging members than any other mode of communication, including text message, e-mail, online, and communication with existing HPP disease management staff. Finity and HPP both hope to add more peer health mentors in the future, although this is likely not feasible under this award.

Component Two: EveryBODY Gets Health Patient Portal

In addition, HPP members, including those that participate in LifeTracks, may also enroll in the general wellness components of the innovation. At first, general wellness programs offered to HPP members were the central component of the innovation. However, Finity has since shifted focus to expand the condition-specific management programs through LifeTracks because they believe these programs will achieve more significant cost savings longer term. Based on initial claims analyses, Finity leadership felt it would be too difficult to ascribe general wellness components to any changes in utilization and cost. Although there were high levels of member satisfaction and completion rates with many of the wellness components, it would be difficult to demonstrate cost savings and improved health and care because the innovation was not tracking outcomes such as weight loss, improved blood pressure, and other health indicators. Finity does, however, monitor preventive screening rates, which they believe may be attributable to general wellness activities. Therefore, the main focus is on the condition management programs, although the general wellness programs are still an active component of the overall innovation.

The first aspect of the general wellness component of the innovation is access to the online Web-based portal, EveryBODY Get Healthy, which provides general health and wellness education (https://www.everybodygethealthy.com/hpp/login/). The content is from Finity's database, which has been in development since Finity's inception in 2004. They license all content so they can use it as desired throughout the portal. The Finity medical team reviews all information in the portal annually. In addition, for this award, HPP's chief medical officer reviewed all content to ensure it was appropriate for members and that it aligned with HPP's current educational efforts.

In addition, the general wellness components include the Step-Up Challenge, which encourages taking 10,000 steps a day, and Dance Now!, a mobile application that promotes exercise through dancing. Furthermore, the general wellness components include many other types of healthy activities and challenges. Although no specific incentives are tied to general wellness participation, members who participate in any of the challenges or enroll in the member portal are eligible for raffles and wellness activity drawings, which select one winner per month. Winners receive items such as gift cards for use to purchase healthy foods.

Finity also tracks and analyzes all disease management encounters from HPP staff in addition to contact with peer health mentors. Given HPP has a robust disease management program, these encounters may include outreach regarding medication management programs, other care management programs currently not included in this innovation such as asthma, and weight management programs for adults and children.

Future Program Component: Health Alerts

Finally, Finity's innovation will also include health alerts via text messages. Although not yet implemented, Finity proposes that health alert messages include reminders to members for activities such as obtaining preventive screenings, visiting their providers, and taking their medications. They will be available for both LifeTracks and general wellness participants. The Pennsylvania DPW is currently reviewing these reminders, a state requirement for any contact with Medicaid recipients.

1.1.2 Program Participant Characteristics

Overall, the population affected is approximately 166,370 low-income Medicaid beneficiaries located in the greater Philadelphia area who are enrolled in HPP's Medicaid managed care plan. Although all HPP Medicaid members are eligible for the general wellness component of the innovation, the condition management portion of the innovation currently targets three specific conditions (see ***Table 3***). The first is the Baby Partners LifeTrack, which is available for all pregnant women enrolled in HPP. The number of eligible members changes at any given point in time. The goal, however, is to enroll at least 10,445 pregnant mothers in the incentive component overall. They do not specifically target high-risk pregnant women; rather they try to enroll all pregnant members. High-risk women may have more contact with peer health mentors, but participation is not limited in any way. The same is now true for the diabetes and heart health condition management programs. The heart health program is aimed at members with hypertension. The innovation initially targeted members with the highest risk for hypertension. During the site visit, however, Finity noted it was planning to expand these programs so they are available for all participants with these conditions, given they needed to increase enrollment. Finity is targeting 1,935 HPP members with diabetes for the incentive component of the diabetes LifeTrack and 1,201 HPP members with hypertension for the incentive component of the heart health LifeTrack.

Given that condition management participants may also participate in the general wellness aspects of the innovation, eligible participants may not be mutually exclusive among all innovation components. Because participants can enroll in both a LifeTrack and general wellness initiatives, we should note that these denominators are not mutually exclusive because we want to capture reach as a percentage of all targeted participants for a specific program regardless if they are eligible for multiple programs.

Table 3. Participants Planned for Inclusion in Innovation (Denominator Data) as of July 2014

Patient Type	Data Source	Current Count (Data Source)
Number of targeted participants for Baby Partners incentive component	Finity self-reported data	10,445
Number of targeted participants for diabetes incentive component	Finity self-reported data	1,935
Number of targeted participants for heart health incentive component	Finity self-reported data	1,201
Total targeted HPP members for general wellness activities	Finity self-reported data	All HPP members

Source: Patient-level data provided to RTI by Finity in July 2014.
HPP = Health Partners Plans.

Enrollment Process

HPP identifies eligible members for the program using a range of data. For example, they use claims data; Medicaid enrollment data; referrals; and, if applicable, Healthcare Effectiveness Data and Information Set (HEDIS) criteria to identify high-risk pregnant women, diabetic members, and members with cardiovascular disease. Once eligible members have been identified, outreach for enrollment includes direct mailings, automated calls, text messages, and direct phone calls from peer health mentors. Enrollment can occur on the phone during the initial outreach. Flyers included in the mailings direct patients on how to enroll via the Web-based portal or direct patients to call the peer mentor hotline. As discussed, calls from peer health mentors are noted as the most effective method for enrolling patients.

To that end, Finity is providing three full-time call center representatives from their own staff to contact eligible members, especially for the diabetes and heart health programs.

Participant Demographics

As presented in ***Table 4***, for Baby Partners, the majority of women are ages 25 to 44 (41%) although 35% are between ages 18 and 24. With regard to race, 40% are black, 20% are white, and 20% are Hispanic. For the other two disease management programs, the majority of participants are female (81% and 76%), ages 45 to 64 (87% and 94%), and black (75% and 79%). For these programs, we have data only through quarter (Q)5. All participants are HPP Medicaid managed care recipients.

Table 4. Characteristics of Participants

	Baby Partners Q1–Q7		Diabetes Q1–Q51		Heart Health Q1–Q51	
	Number of Participants	Percentage of Baby Partner Participants	Number of Participants	Percentage of Diabetes Participants	Number of Participants	Percentage of Heart Health Participants
Age						
< 18	108	1.8	0	0.0	0	0.0
18–24	2,063	34.8	2	2.7	0	0.0
25–44	2,416	40.7	6	8.0	0	0.0
45–64	2	0.0	65	86.7	32	94.1
65–74	0	0.0	1	1.3	0	0.0
75–84	0	0.0	0	0.0	0	0.0
85+	0	0.0	0	0.0	0	0.0
Missing	1,341	22.6	1	1.3	2	5.9
Sex						
Female	5,930	100.0	61	81.3	26	76.5
Male	0	0.0	14	18.7	8	23.5
Missing	0	0.0	0	0.0	0	0.0
Race/ethnicity						
White	1,148	19.4	11	14.7	2	5.9
Black	2,364	39.9	56	74.7	27	79.4

(continued)

Table 4. Characteristics of Participants (continued)

	Baby Partners Q1–Q7		Diabetes Q1–Q51		Heart Health Q1–Q51	
	Number of Participants	**Percentage of Baby Partner Participants**	**Number of Participants**	**Percentage of Diabetes Participants**	**Number of Participants**	**Percentage of Heart Health Participants**
Race/ethnicity						
Hispanic	1,199	20.2	8	10.7	4	11.8
Asian	141	2.4	0	0.0	0	0.0
American Indian or Alaska Native	5	0.0	0	0.0	0	0.0
Other	0	0.0	0	0.0	0	0.0
Missing/ refused	1,073	18.1	0	0.0	1	2.9
Total	**5,930**		**75**		**34**	

Source: Patient-level data provided to RTI by Finity in July 2014.
[1] Most recent data provided by Finity to RTI. Q = quarter.

1.2 Implementation Progress

The extent to which each awardee is able to implement its innovation as planned and reach a sufficient number of patients will be critical to assessing its impact on the Triple Aim. The following section provides details on first the implementation process and then the effectiveness and includes a table that provides the list of measures RTI plans to use in assessing each evaluation domain (***Table 5***).

Table 5. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for Finity

Measures by Key Evaluation Domains	Evaluation Subdomain	Measure	Data Source
Implementation effectiveness	Reach	Number/percentage of patients enrolled in Baby Partners incentive component	Data provided to RTI by Finity
		Number/percentage of patients enrolled in diabetes incentive component	Data provided to RTI by Finity
		Number/percentage of patients enrolled in heart health incentive component	Data provided to RTI by Finity
		Number/percentage of patients enrolled in Step-Up Challenge	Data provided to RTI by Finity

(continued)

Table 5. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for Finity (continued)

Measures by Key Evaluation Domains	Evaluation Subdomain	Measure	Data Source
Implementation effectiveness (continued)	Dose	Baby Partners: incentive received by specific activity completed (e.g., prenatal visit, postnatal visit, or dental visit)	Data provided to RTI by Finity
		Diabetes: incentive received by specific activity completed (e.g., LDL test, HbA1c test, peer mentor contact)	Data provided to RTI by Finity
		Heart health: incentive received by specific activity completed (e.g., LDL test, PCP visit, improve blood pressure)	Data provided to RTI by Finity

LDL = low-density lipoprotein; PCP = primary care provider.

1.2.1 Process

The implementation process has been the initial focus of the evaluation. RTI defines implementation process as including execution of implementation, organizational capacity, key staff and partner engagement, and client recruitment and enrollment. The implementation process is best evaluated through a combination of data variables, including execution of implementation that conforms with operational plans and capacity for implementing the innovation in a timely and effective manner. We focused on the implementation process during the awardee site visits (May 21–21) and asked such evaluation questions as the following:

- What is the overall execution of the innovation implementation (e.g., the actual rate of expenditures relative to the projected rate)?
- What accomplishments are specific to hiring or training staff so that the organization can build its capacity to implement the innovation effectively?
- What is the implementation effectiveness, including fidelity, reach, and dose of the innovation thus far?

Execution of Implementation

The rate at which awardees expend funds or enroll patients, compared with projection, provides useful information to assess the innovation’s status. If expenditure or enrollment rates are particularly low (because of such issues as length of time to recruit eligible participants or hire and train the peer health mentors), these variables help assess the awardee’s readiness to implement the innovation at the start and the extent to which they can spend all funding and meet their overall goals by the end of the project (e.g., can they effectively allocate the funds provided?). Using the most updated Lewin numbers, as of March 2014 (Q7), the awardee had spent about 65% of its Year 2 budget, which is on target with their Centers for Medicare & Medicaid Services (CMS)-approved plan. Finity and their partners, however, noted that they have had to provide additional in-kind resources to ensure the success of the innovation. For example, Finity has made its own call center staff available to conduct outreach and enroll potential participants. This common sentiment was echoed by HPP who had provided more staff time than originally supported by award funding, given the overall organizational commitment to make the innovation successful. Other partners, including SCIO Health Analytics and Duke University, also commented on providing in-kind staff support to ensure the success of the innovation.

Overall, Finity and its partners were able to launch the innovation quickly. Finity's closed-loop monitoring platform and Web-based portal were already developed, and Finity had a clear roadmap of how implementation needed to proceed. One of the biggest challenges Finity faced, however, was working with the state of Pennsylvania's DPW to approve all outreach to Medicaid beneficiaries. Finity did not anticipate that state review and approvals would require substantial time and resources. They spent significant time with DPW staff explaining their innovation, including the closed-looped feedback process and intervention tailoring based on member behaviors. The state was initially hesitant to approve outreach via mobile technologies such as text messaging. Although Finity and HPP were ultimately able to get text messages approved by the state, the approval process slowed the execution of the innovation. For future initiatives, Finity suggested including state officials very early in the process to ensure timely and efficient reviews and to ensure consistent understanding across stakeholders throughout implementation.

Although enrollment into LifeTracks for diabetes and heart health has been slower than expected (discussed in more detail below), Finity is on track regarding overall participants, which includes general wellness and LifeTracks programs. At first Finity reported all encounters with HPP Medicaid members (e.g., telephone calls, e-mails, direct mailings) as indirect participants. We learned during the site visit, however, that now some participants are considered direct participants if Finity is able to track the participant's activities. For example, Finity can track when participants have contact with the peer health mentor, logged into the Web portal, ordered the Step-Up challenge kit, earned an incentive, or used the incentive card to purchase healthy food. All of these individuals for whom Finity has activity data would now count as direct participants. Indirect participants now include only those engaged in some peripheral disease management activities, such as receiving direct mailings from HPP. This change in definition explains why Finity had no direct participants until July 2013 (Q5), and the most recent Lewin data from March (Q7) reports Finity having

33,358 unique direct participants overall since project inception with 5,310 occurring in Q7. Finity reported 12,329 indirect participants for Q7.

Organizational Capacity and Leadership

HCIA is the first federal award that Finity has won. Staff members working on this project have no prior experience managing a government-funded project. Although staff members were familiar with the technology and implementing the innovation itself, they were not experienced with managing federal awards and the associated budgetary and reporting requirements. Finity is a private company that started working in health care by building the infrastructure for consumer-direct health plan components such as health saving accounts and health reimbursement accounts. They operate mostly in the commercial space engaging with private insurance companies and employers directly. They provide employee benefit communication products related to the administration of health benefits, health and wellness services, consumer-directed health plans, and retirement benefits. This is their first time working with Medicaid. So although Finity was experienced in implementing the innovation components, they have had to adjust their timeline and expectations given the different requirements of working with a Medicaid payer under a federal contract.

Regarding Finity's partners, leadership at Finity noted that they selected HPP as the health plan partner because HPP had the organizational capacity and leadership to implement the innovation. They had an existing, robust disease management program that could be adapted and developed given the short award time frame. HPP is also very service-oriented and has an organizational culture that encourages innovation. They were already engaging in inventive programs with their current members and were willing to be innovative with Finity's approaches to member outreach (e.g., text messages, Web portal) as well as adding additional disease management staff (i.e., peer health mentors). Finity also noted the importance of partnering with HPP because it had the capacity to supervise and oversee the peer health mentors. HPP is the smallest health plan in the state and is self-described as "scrappy, competitive, and determined" to succeed. HPP believed that partnering with Finity and implementing this innovation would put them ahead of other local plans.

Finity and SCIO Health Analytics had worked together before this award. Leadership at both organizations noted that they work well together and have a positive relationship. Although SCIO has vast experience with claims data, Medicaid was also new to them. They have had to work closely with HPP and their Health Economics Group to ensure consistency throughout the project.

In addition, the leadership at Finity and all of its associated partners are committed to the success of this innovation both during the award period and in the future. The implementation process has had clear, capable, and committed leadership across all levels and partners. Engagement was high because most of the leaders understood the innovation well and could articulate their direct involvement.

1.2.2 Workforce Development

Recruiting and training peer health mentors to engage participants is an important part of the innovation with the potential to affect outcomes. During the May 2014 site visit, we learned that peer health mentors are a critical aspect of the innovation in enrolling and supporting members.

Hiring and Retention

As of May 2014, the innovation supports three peer health mentors, although one was out on medical leave. All three were hired internally from HPP. Of the two we spoke with, one peer health mentor was in member relations working in customer service before the award and the other worked in the customer call center. As discussed, one peer health mentor is assigned to work exclusively with Baby Partners participants, while the other two mentors work with diabetes and heart health LifeTracks participants and more generally with other wellness program participants. The number of patient interactions per day varies by mentor. For Baby Partners, the number can be as high as 20 to 30 different members a day, whereas the other peer health mentor noted it is more in the range of 5 to 10 members a day.

Although the number of peer health mentors has met projections and is fully operational at this point, during the site visit Finity and HPP both noted the importance of the peer health mentors and their desire to hire additional mentors. Even though it does not appear that more hiring will be feasible under this award, Finity and HPP both noted that the peer health mentors were critical to the innovation’s success. HPP leadership hoped to sustain the peer health mentor position postaward, if feasible. In addition, HPP noted it has disease management staff members who may contact members for other initiatives. Other staff members hired for this award include a project manager at Finity dedicated to this innovation and five information technology specialists.

Training

Finity worked with Duke Integrative Medicine to create distance-learning content and software for the peer health mentors to use. Duke based the curriculum on its integrative health coaching and interactive health coaching programs, although it is a customized program specifically aimed at peer health mentors. Duke was primarily responsible for creating the content, while Finity created an online platform for the peer health mentors to receive the training. Duke has used some online components in training programs prior to this award, although Duke had never created an exclusively online training program prior to the peer health mentor training.

The peer health mentor training program was designed to last 9 weeks, but actually took much longer to complete. It is an asynchronous program so the peer health mentors could complete it on their own schedules. The program included watching videos, reading online content, and journaling. Each week of the designed program actually took the mentors from 2 to 4 weeks to complete, mainly because the mentors were also working full time during the training, and the training was designed as a full-time program. Although the peer health mentors were glad the schedule was flexible and they were able to complete it on their own time, they wished it was more interactive. They suggested having in-person or Web-based sessions to break up the training. In addition, they suggested adding chat rooms to make the training platform more user friendly.

Topics covered during the training included how to speak with participants, sympathy versus empathy, types of listening, and how to be an active listener. They suggested that future iterations should include conflict resolution skills and trainings more specifically related to their role. For example, they received some basic medical information but could have used more training related to pregnancy, diabetes, and heart health. No more formal training is planned for the peer health mentors through this innovation. The peer health mentors noted, however, that they receive the same trainings as the rest of the disease management department at HPP, so they do attend additional trainings even if it is not reported in the Lewin data as part of this specific innovation.

Directors from both the Health and Wellness Program at Finity and the Disease Management Department at HPP also completed the training. They, however, attended both an in-person component at Duke and completed the online version. This level of training was important because HPP Disease Management staff supervised mentors. In addition, Finity would like to have HPP call center staff who conduct outreach with HPP members complete the peer health mentor training as well and is exploring this possibility.

1.2.3 Effectiveness

Effective implementation (also known as "implementation success") is the presence of the innovation delivered as intended (fidelity) to a substantial proportion of the targeted population (reach) in amounts associated with effectiveness (dose). During our site visit in May 2014, we determined the innovation to have moderately successful implementation. Overall, nearly all services are being provided as intended. It is, however, difficult to assess proper dose for some of the programs (i.e., wellness), although dose can be assessed for some of the LifeTracks programs. In addition, enrollment numbers for some of the specific condition management LifeTracks programs are low. Implementation effectiveness affects the evaluation, because it directly relates to the innovation's ability to be successful (i.e., to lower costs or improve health outcomes). If innovation implementation is inconsistent or has not reached intended participants, we would not expect the innovation to reach its intended goals. More details concerning fidelity, reach, and dose are discussed below.

Fidelity

A key component of Finity's innovation is its closed-loop technology platform, which provides timely updates to adapt the innovation. Each month, Finity tracks the success of various outreach methods and adjusts the outreach and contact methods based on these reports. In addition, Finity has constantly added new programs and targeted new high-risk conditions as necessary and has engaged in continuous quality improvement of the innovation since the beginning. For example, strategies to accomplish the innovation's goals from Finity's operational plan include 1) customizing and deploying the Web portal; 2) creating, deploying, and evolving the peer health mentor program; 3) creating, deploying, and evolving the member engagement program; and 4) deploying and evolving the wellness and disease management programs based on ongoing metrics and reports. All of these strategies include constant evolution and feedback, which is how implementation has proceeded. The innovation has evolved to include more of a condition management focus, because Finity expects to achieve significant cost savings in that area and expand to include more LifeTracks. Therefore, fidelity is an important construct in evaluating this innovation. We will likely assess fidelity using qualitative methods as opposed to a quantitative measure included in the statistical analyses.

Reach

As of Q7, 5,930 women were enrolled in the Baby Partners incentive component of LifeTracks (see ***Table 6***). As of Q5, the most recent data provided to RTI by Finity, for diabetes, only 75 of targeted 1,935 members with diabetes were enrolled in the incentive component, and for heart health, only 34 of the 1,201 targeted members with hypertension were enrolled in the incentive component (see ***Tables 7*** and ***8***). As of July 2014, participants engaging in the Step-up Challenge via the Web portal include 619 members. The number of participants reported by Finity in the Lewin reports is higher because Finity is reporting both indirect encounters (e.g., e-mail, flyer in the mail) and direct encounters (e.g., contact with peer health mentors), while RTI is presenting only the number of direct participants in the incentive programs. Given that the LifeTracks condition management program targets higher cost conditions, we expect enrollment in these programs to be the most likely to affect utilization and, by extension, costs of care.

Enrollment in the incentive programs will significantly affect the evaluation. We need a sufficient number of participants to quantitatively determine the impact of the diabetes and heart health incentive programs on utilization and outcomes. During our site visit, however, Finity noted it would expand its outreach efforts to include all members with diabetes and/or cardiovascular disease (beyond those with the highest risk) as well as adding more staff to outreach to enroll members in these incentive programs because Finity believes direct contact with the participants is the most effective way to enroll them in the incentive programs. They anticipate enrollment numbers of direct participants to increase in the following quarters. Therefore, our current analysis focuses on Baby Partners participants—it is a more mature program with higher enrollment. It is the only condition-specific program that has been in place since the start of the award.

Table 6. Total Enrollment and Reach for Each Quarter for Baby Partners Incentive Program, Since Project Launch through Quarter 7

Quarter1	Target Baby Partners Population	Number of Unduplicated Patients Enrolled and Receiving Incentives	Total Reach per Quarter	Percentage Change from Previous Quarter
September 2012 (Q1)	10,445	204	2.0	—
December 2012 (Q2)	10,445	655	6.3	4.3
March 2013 (Q3)	10,445	1,010	9.7	3.4
June 2013 (Q4)	10,445	1,076	10.3	0.6
September 2013 (Q5)	10,445	1,219	11.7	1.4
December 2013 (Q6)	10,445	779	7.5	−4.2
March 2014 (Q7)	10,445	862	8.3	0.8
Missing date of enrollment	N/A	125	N/A	N/A
Total enrolled as of March 31, 2014 (Q7)	10,445	5,930	55.6	N/A

HPP = Health Partners Plans; N/A = not applicable.
Source: Patient-level data provided to RTI by Finity in July 2014
[1] When available, date is based on recorded enrollment date. When unavailable, date is based on receipt of first incentive.

Table 7. Total Enrollment and Reach for Each Quarter for Diabetes Incentive Program, Since Project Launch through Quarter 5

Quarter[1]	Target HPP Members with Diabetes	Number of Unduplicated Patients Enrolled and Receiving Incentives	Total Reach per Quarter	Percentage Change from Previous Quarter
September 2012 (Q1)	1,935	0	0.0	—
December 2012 (Q2)	1,935	0	0.0	0.0
March 2013 (Q3)	1,935	0	0.0	0.0
June 2013 (Q4)	1,935	0	0.0	0.0
September 2013 (Q5)	1,935	75	3.9	3.9
Total enrolled as of September 30, 2013 (Q5)	1,935	75	3.9	N/A

HPP = Health Partners Plans; N/A = not applicable.
Source: Patient-level data provided to RTI by Finity in July 2014.
[1] Date of enrollment considered the first data a patient received an incentive.

Table 8. Total Enrollment and Reach for Each Quarter for Heart Health Incentive Program, Since Project Launch through Quarter 5

Quarter[1]	Target HPP Members with Hypertension	Number of Unduplicated Patients Enrolled and Receiving Incentives	Total Reach per Quarter	Percentage Change from Previous Quarter
September 2012 (Q1)	1,201	0	0.0	0.0
December 2012 (Q2)	1,201	0	0.0	0.0
March 2013 (Q3)	1,201	0	0.0	0.0
June 2013 (Q4)	1,201	0	0.0	0.0
September 2013 (Q5)	1,201	34	2.8	2.8
Total enrolled as of September 30, 2013 (Q5)	1,201	34	2.8	N/A

HPP = Health Partners Plans; N/A = not applicable.
Source: Patient-level data provided to RTI by Finity in July 2014.
[1] Date of enrollment considered the first data a patient received an incentive.

Dose

There is no standard or target dose for the entire innovation, given that the number and type of encounters varies by condition and wellness program and by participants in those programs. However, dose is a relevant construct in the evaluation of the condition-specific LifeTracks incentive programs, whose components tied to incentives constitute specific dosages. Baby Partners, for example, requires a prenatal, postnatal, and dental visit to achieve the full incentive, while Heart Health requires an LDL test, a primary care visit, improved blood pressure (although it is unclear how this is assessed), medication adherence (which appears to be assessed as filling relevant prescriptions), and monthly contact with a peer health mentor. Finally, the diabetes incentive program requires completing an LDL test, an HbA1c test, monthly contact with a peer health mentor, and a visit with their provider. Therefore, for these programs RTI proposes examining dose as the type or total amount of incentive received for the various requirements. Data on dose for the incentive component of the Baby Partners LifeTrack are presented in ***Table 9***. For the other two programs, enrollment is still low; therefore, far fewer incentives have been rewarded (***Table 10*** and ***Table 11***).

For some of the other wellness initiatives, however, there is no established dose. Although Finity tracks other types of activities such as use of the Web-based portal, flyers, and attendance at health fairs, there are no prescribed doses. In addition, many programs (e.g., Dance Now! Step-Up Challenge) can be customized to fit best into the participant's lifestyle. Measurement of dose will affect the evaluation because we will be able to shape more specific evaluation measures and questions, for example, if participation in certain condition management or general wellness programs leads to better health outcomes and lower costs.

Table 9. Number and Type of Baby Partner Incentives Rewarded Through Q7

Incentive Activities	Number of Incentives Provided
Prenatal visit	3,424
Dental visit	2,827
Postpartum visit	2,478
Bonus received for all activities completed	255

Source: Patient-level data provided to RTI by Finity in July 2014.

Table 10. Number and Type of Diabetes Incentives Rewarded Through Q5

Incentive Activities	Number of Incentives Provided
LDL test	42
HbA1c assessment	40
Provider visit	54
Monthly contact with peer health mentor	0

Source: Patient-level data provided to RTI by Finity in July 2014.

Table 11. Number and Type of Heart Health Incentives Rewarded Through Q5

Incentive Activities	Number of Incentives Provided
LDL test	13
Primary care visit	28
Improved blood pressure	0
Medication adherence	0
Monthly contact with peer health mentor	0

Source: Patient-level data provided to RTI by Finity in July 2014.

1.3 Evaluation Outcomes

RTI will use two types of quantitative data from awardees to assess the impact of the awardee's innovation on key outcomes. These include claims data for Medicare and/or Medicaid beneficiaries, depending on who the awardee serves, and other administrative or utilization data the awardee is collecting (which we have labeled as "'other awardee-specific data" reflecting the variability of the types of data elements available across awardees). We are in the process of finalizing our assessment of all the available data sources and requesting data directly from each awardee. As those data are received, we will incorporate the findings into our subsequent reports. The following sections present descriptive findings from the quantitative outcome data provided to RTI and cleaned as of September 11, 2014.

1.3.1 Measures for Evaluation

Following the site visit, the data management and site visit teams met to review each of the measures listed in the awardee's self-monitoring measurement plan (i.e., data review meeting). The measures listed in ***Tables 5*** (above) and ***12*** (below) reflect those determined as most relevant for our evaluation of Finity's innovation outcomes.

Table 12. Outcome Measures Requested from Finity

Key Evaluation Domains	Subdomains	Measure	Data Source
Clinical effectiveness	Cancer screening	Percentage of targeted members who received appropriate screening for: Colorectal cancer Breast cancer Cervical cancer	Claims data
	Cardiovascular disease	Percentage of targeted members with CHF or CAD who received beta blocker therapy	Claims data
		Percentage of targeted members with a diagnosis of CAD who were prescribed ACE inhibitor or ARB therapy	Claims data

(continued)

Table 12. Outcome Measures Requested from Finity (continued)

Key Evaluation Domains	Subdomains	Measure	Data Source
Clinical effectiveness (continued)	Diabetes	Percentage of targeted members with at least 1 urine protein screenings	Claims data
		Percentage of targeted members receiving a glucose test	Claims data
		Percentage of targeted members with diabetes received a hemoglobin A1c and lipid profile assessment	Claims data
		Percentage of targeted members with diabetes who received an eye screening for diabetic retinal disease	Claims data
	General health and wellness	Number/percentage with primary care visits	Claims data
	Maternity care	Average number of office visits	Claims data
		Average number of ultrasounds received	Claims data
		Percentage receiving a glucose test	Claims data
		Percentage of targeted members who received an influenza immunization	Claims data
		Percentage completing a postpartum visit	Claims data
Health care outcomes	Utilization	ED visit rate	Claims data
		ED visit rate due to specific reasons such as pregnancy or diabetes	Claims data
		All-cause admission rate	Claims data
		Admission rates due to:	Claims data
		Readmission rate	Claims data
		ACSC inpatient admission rate	Claims data
	Cost	Sum of total inpatient/hospitalization costs + ED visit costs + specialty care visit costs	Aggregation and validation of data from multiple internal and external/partner sources
		Spending per patient	Claims data
		Cost savings	Claims data

ACSC = ambulatory care-sensitive condition; ACE = angiotensin converting enzyme; ARB = angiotensin receptor blockers; CHF: congestive heart failure; CAD = coronary artery disease; ED = emergency department.

1.3.2 Claims Data

As part of a broad assessment of health care innovations, the Center for Medicare & Medicaid Innovation (CMMI) is assessing the impact of its programs, including those funded specifically by HCIA, on four core measures. The four core measures are

- health care spending per patient,
- hospital inpatient admissions,
- hospital unplanned readmissions, and
- ED visits.

Collectively, CMMI programs are anticipated to slow the increase in health care spending, reduce hospital admissions, reduce avoidable hospital readmissions, and prevent unnecessary ED visits. We are reporting these measures for all HCIA Community Resource awardees so that the collective impact of the awards can be assessed. As discussed below, some awardees' innovations may not be focused on these measures. Other awardees' innovations target specific conditions (e.g., imaging, diabetes, etc.) and may have significant impacts on spending, admissions, readmissions, and ED visits for the targeted conditions but not have a statistically detectable impact on the measures at the aggregate level because the targeted conditions represent only a small fraction of total spending, inpatient admissions, and ED visits.

The measures are calculated through analysis of Medicare and Medicaid fee-for-service claims. Because of differences between Medicare and Medicaid patients in age, other demographic variables, and disease status, we report the Medicare and Medicaid results separately below. Currently, complete Medicare claims are available through the end of 2013. Medicaid claims for Finity are available through Q1 2013, although claims for the final quarter may not be complete. The Finity innovation was launched on November 15, 2012.

- **Health Care Spending per Patient**. For Medicare beneficiaries, health care spending per patient includes Part A and Part B Medicare expenditures for persons enrolled in the Part A and Part B fee-for-service program. The variable focuses on Medicare fee-for-service spending, so Medicare managed care (Part C) services are excluded, as are beneficiary copayments. Medicare Part D prescription spending is also excluded. Spending is reported on a per person per quarter basis. If a beneficiary is not enrolled for every month in a quarter, spending (except for hospital inpatient spending) is prorated to a quarterly basis based on the number of days enrolled during the quarter. Because hospital inpatient admissions are both rare and expensive, spending is not prorated for hospital inpatient spending. Prorating is also not performed for beneficiaries who die during a quarter.

For Medicaid beneficiaries, health care spending per patient is reported for fee-for-service beneficiaries. Beneficiaries are only included in the analysis for spending (and the other measures) during periods when they are enrolled in Medicaid.

- **Hospital Inpatient Admissions.** This variable measures hospitalization, the single most expensive component of health care spending. Patients kept overnight in observation beds are excluded from this measure. Inclusion criteria for the analysis are the same as for spending. Hospital inpatient admissions are not prorated based on the number of days eligible during the quarter. All-cause inpatient admissions are reported. The mean quarterly admission rate per 1,000 patients is reported.

- **Hospital Readmissions**. Hospital readmission rate serve a dual purpose in evaluating HCIA impacts. Readmissions add to the costs of a prior hospitalization, and they often reflect a problem in the care provided during the first admission. All-cause admissions are defined as a follow-up admission to any short-term acute general or long-term care hospital within 30 days of a discharge from another hospital of the same type. We ignore multiple admissions within one day of an initial admission because these often represent transfers between hospitals. We define index hospitalizations that begin during the quarter and follow each index admission for 30 days, even when the follow-up period extends beyond the end of the quarter. Inclusion criteria for the analysis are the same as for spending. The readmission rate equals the number of readmissions divided by the number of index hospitalizations during the quarter. Planned readmissions are excluded from the calculation of the numerator. Quarterly mean readmission rates per 1,000 admissions are reported.

- **ED Visits**. ED visits are sometimes viewed as a symptom of the inability of the community's health care system to provide adequate preventive and ambulatory care visits. We report an all-cause ED visit rate that excludes ED visits resulting in an inpatient admission (which presumably represent unavoidable visits) and includes overnight ED visits without an inpatient admission. Inclusion criteria for the analysis are the same as for spending, and ED visits are also subject to the same prorating formula as for spending. The mean quarterly ED visit rate per 1,000 patients is reported.

Medicare Claims Analysis

The Finity innovation focuses on Medicaid patients. Therefore, we do not expect to perform Medicare analyses.

Medicaid Claims Analysis

The Medicaid data analysis will use data from the CMS Alpha-MAX data files as well as data provided directly by Finity. The Alpha-MAX data are not currently available in the Chronic Conditions Data Warehouse (CCW). Finity has provided data on the Baby Partners LifeTrack, and we are in the process of comparing spending and utilization for participants and nonparticipants in the program. Results of this analysis will be presented in subsequent reports. The diabetes and heart health LifeTracks do not yet have sufficient enrollment for analysis. Appendix A shows the claims analyses tables that will be presented for Medicaid.

In addition to the tabular format, we will present figures showing each measure as a function of time. Values in quarters prior to the innovation's launch on November 15, 2012 will be shown in one color, and values for quarters during and after launch will be shown in another color. The figures will include a trend line based on a linear regression of prelaunch values.

Discussion of Claims Analysis

The claims measures will provide descriptive data on patients enrolled in the Finity innovation before, during, and after the launch of the innovation. Although it is necessary to report these measures to support CMS's broader assessment of its full portfolio of innovation projects, the measures may not provide a complete evaluation picture of the Finity innovation for a number of reasons. First, the innovation was only launched on November 15, 2012. The impact of a disease management innovation may not be immediately evident in the data because it takes time for disease management to produce reductions in health service use. Second, the Finity innovation is especially focused on new mothers and patients with diabetes and/or heart disease. Although the innovation may have a statistically significant impact on the spending, inpatient admissions, readmissions, or ED visits related to these conditions, it may not have a statistically detectible impact on the variables at the total spending or utilization level, because the conditions account for only a small share of total spending or utilization. In later reports, we will also provide condition-specific spending and utilization data. Finity has also noted that the cost savings for participants in the Baby Partners LifeTrack may be driven by healthier outcomes of the babies. Therefore, when analyzing this intervention, we will examine spending and utilization for mothers and their babies.

Development of Comparison Groups

In addition to comparing Finity patients before and after implementation of the innovation, we plan to construct comparison groups for specific components of the Finity innovation. We assume that we will have enough participants in the diabetes and heart health LifeTracks to be able to compare participants with nonparticipants. If the sample size remains low, our analyses will be underpowered. We suggest the following comparisons groups for Finity's multicomponent innovation:

- **Baby Partners LifeTrack:** This condition has the highest current enrollment. We will compare participating mothers (and their babies) with nonparticipating mothers of similar characteristics using propensity score matching.
- **Diabetes LifeTrack:** Relatively few patients were enrolled in this program based on the most recent enrollment numbers. Finity asked for a 6-month delay before it shares data to increase recruitment efforts. Provided that enough participants are enrolled in the diabetes program, it may be possible to conduct a difference-in-

difference estimation using intention to treat (all those invited to participate rather than just those who took up the intervention) against a comparable sample with similar characteristics. This strategy would be advantageous for two reasons: 1) we will increase the number of observations available, and 2) we will capture the effects of implementing this program on a larger scale, thus taking into account those who would be targeted but would not participate.

- **Heart Health LifeTrack:** This is another new program with a potential target sample of over 1,200 HPP members. As of the most recent data, relatively few patients are actively enrolled. As with the diabetes program, difference-in-difference estimation may be possible.
- **Step-Up Challenge/Other Wellness Initiatives:** These programs are aimed at increasing general health and wellness and specifically for the Step-Up Challenge to encourage walking and reduce obesity. Thus far, although more than 600 people have signed up for the Step-Up Challenge, it is unclear how many are using the Web-based portal for general wellness and education. This could also be an intention-to treat analysis. The advantage of Finity's innovation is that the recruitment pool is confined within HPP members, which allows for identification of a comparison group not participating in the Step-Up Challenge.

1.3.3 Other Awardee-Specific Data

In mid-June 2014, following the data review meeting, RTI met with Finity to request the raw patient-level data that was used to generate each of the measures from data sources other than claims data in ***Tables 5*** and ***12*** for each quarter.

Overview of Data Received

We received the initial raw data in early July 2014. Although we received many of the variables requested, we have received claims data so far only for Baby Partners participants. In addition, we received enrollment and incentives data for diabetes and heart health incentive program participants only through September 2013 (Q5). We are working with Finity to receive more recent enrollment and incentive data for diabetes and heart health incentive programs as well as receive claims data for all of the participants so we can examine the care management outcomes related to general wellness, diabetes, and heart health. In addition, we have not received dates of services for the care management outcomes related to Baby Partners; rather, we have only received raw counts regarding the number of services received. We have followed up with Finity to request these data. Finity indicated it will provide the additional data as soon as is possible. These data will be presented in subsequent reports.

Health Outcomes

We are continuing to work with the data received from Finity. Most of the tables presented in the Finity awardee section thus far are based on the raw patient-level data Finity provided to RTI in July 2014. As discussed above, once we receive the additional data requested, we will update the table shells below in subsequent reports.

Table 13 demonstrates that the majority of Baby Partners participants are completing at least 1 office visit during pregnancy (mean 9.48) and obtaining at least 1 ultrasound (mean 8.24). On average, participants are completing about 9 office visits and receiving 8 ultrasounds. However, less than half (44.6%) of women are completing an office visit specifically indicated as a postpartum visit and slightly more than half (57%) are attending any office visit within 30 days after birth.

Table 13. Health Indicators among Baby Partners Participants With Claims Data Available, as of March 2014

Health Indicator	Number of Participants with Any Visits/Services	Percent of Participants with Any Visits/ Services	Mean Number	Range
Baby Partner Participants N= 1,941				
Office visit during pregnancy[1]	1,877	96.7	9.48	0 to 35
Ultrasounds received	1,802	92.8	8.24[3]	0 to 56
Glucose test received	45	2.3	0.03	0 to 4
Flu vaccine received	485	25.0	0.26	0 to 3
Postpartum visits				
Postpartum office visit[2]	866	44.6	0.47	0 to 4

Source: Patient-level data provided to RTI by Finity in July 2014.

[1] Office visit during pregnancy defined by CPT code 99201-99205 99211-99215.

[2] Postpartum office visit defined by CPT code 59430.

[3] This is based on data provided by Finity; median number is 6 ultrasounds during 9 months prior to delivery and 3 months postdelivery.

Once we have data over time, we can complete the following table showing average health indicators over time. As mentioned, currently we can only see total counts, not the data in which the services/visits occurred. ***Table 14*** will be converted to a series of run charts showing the percentage of patients reflecting each health measure over time.

Table 14. Percentage of Patients with Clinical Effectiveness Outcomes over Time among Baby Partner Participants

Health Indicator	Q2	Q3	Q4	Q5	Q6	Q7
Office visit during pregnancy	—	—	—	—	—	—
Ultrasounds received	—	—	—	—	—	—
Glucose test received	—	—	—	—	—	—
Flu vaccine received	—	—	—	—	—	—
Postpartum visits						
Postpartum office visit	—	—	—	—	—	—
Office visit within 30 days after birth	—	—	—	—	—	—
Office visit within 90 days after birth	—	—	—	—	—	—

Source: Patient-level data to be provided to RTI by Finity.
— Data not yet available.

In addition, we do not yet have detailed claims data for the general wellness, diabetes, or heart health incentive programs. Once we have this data, we can complete ***Tables 15*** and **16**. The tables will be converted to a series of run charts showing the percentage of patients reflecting each health measure over time.

Table 15. Percentage of Patients with Clinical Effectiveness Outcomes Completed among Targeted Participants for General Wellness, Diabetes, Hypertension

Health Indicator	Number of Participants Completed	Percent of Participants Completed
Participants General Wellness N=		
PCP visits	—	—
Preventive screening received by targeted members	—	—
Colorectal cancer	—	—
Breast cancer	—	—
Cervical cancer	—	—
Targeted Participants with Diabetes N=		
Urine protein screening	—	—
Hemoglobin A1c assessment	—	—
LDL-C assessment	—	—
Eye screening	—	—
Congestive Heart Failure (CHF) Participants N=		
Percentage of targeted members with CHF who were prescribed beta blocker therapy	—	—

(continued)

Table 15. Percentage of Patients with Clinical Effectiveness Outcomes Completed among Targeted Participants for General Wellness, Diabetes, Hypertension (continued)

Health Indicator	Number of Participants Completed	Percent of Participants Completed
Coronary Artery Disease (CAD) Participants N=		
Percentage of targeted members with CAD who received beta blocker therapy	—	—
Percentage of targeted members with CAD who were prescribed ACE inhibitors or ARB therapy	—	—
Percentage of targeted members with CAD who had a lipid test	—	—

Source: Patient-level data to be provided to RTI by Finity.
CHF: congestive heart failure; CAD = coronary artery disease; ACE = angiotensin converting enzyme; ARB = angiotensin receptor blockers; n = number; PCP = primary care provider.
— Data not yet available.

Table 16. Percentage of Patients with Clinical Effectiveness Outcomes over Time among Patients with each Health Condition

Health Indicator	Q2	Q3	Q4	Q5	Q6	Q7
Targeted Participants General Wellness N=						
PCP visits	—	—	—	—	—	—
Preventative screening received by targeted members	—	—	—	—	—	—
Colorectal cancer	—	—	—	—	—	—
Breast cancer	—	—	—	—	—	—
Cervical cancer	—	—	—	—	—	—
Targeted Participants with Diabetes N=						
Urine protein screening	—	—	—	—	—	—
Hemoglobin A1c assessment	—	—	—	—	—	—
LDL-C assessment	—	—	—	—	—	—
Eye screening	—	—	—	—	—	—
Congestive Heart Failure (CHF) Participants N=						
Percentage of targeted members with CHF who were prescribed beta blocker therapy	—	—	—	—	—	—

(continued)

Table 16. Percentage of Patients with Clinical Effectiveness Outcomes over Time among Patients with each Health Condition (continued)

Health Indicator	Q2	Q3	Q4	Q5	Q6	Q7
Coronary Artery Disease (CAD) Participants N=						
Percentage of targeted members with CAD who received beta blocker therapy	—	—	—	—	—	—
Percentage of targeted members with CAD who were prescribed ACE inhibitors or ARB therapy	—	—	—	—	—	—
Percentage of targeted members with CAD who had a lipid test	—	—	—	—	—	—

Source: Patient-level data to be provided to RTI by Finity.
CHF: congestive heart failure; CAD = coronary artery disease; ACE = angiotensin converting enzyme; ARB = angiotensin receptor blockers; n = number; PCP = primary care provider.
— Data not yet available.

Discussion of Other Awardee-Specific Findings

As discussed, the majority of Baby Partners participants are completing at least one office during pregnancy and obtaining at least one ultrasound. This finding is not surprising because participants receive an incentive to attend a prenatal appointment as part of the incentive component of Baby Partners. Interestingly, however, participants also receive an incentive to complete a postpartum visit as part of Baby Partners, but fewer women have completed one. The data provided by Finity do not include office visits for the baby. Perhaps one reason is that women are prioritizing provider visits for the baby over their own postpartum visit. We will work with Finity to determine if we are able to obtain additional claims data to explore this hypothesis further.

1.4 Overall Program Effectiveness Assessment

Overall the innovation has been successful at engaging HPP members and enrolling them both in the condition management LifeTracks and the general wellness components of the innovation. Finity has been able to leverage successfully many of the existing disease management programs operating at HPP in implementing this innovation. For example, Baby Partners had existed before Finity launched this innovation in 2012 and offered incentives to pregnant mothers. HPP was not tracking encounters, however, nor were they measuring outcomes of the program. Finity was able to provide HPP with their closed-loop technology and ability to measure and track participation and outcomes. Because Baby Partners has been in existence the longest, it has experienced the highest rates of enrollment, while the diabetes and heart health LifeTracks are still gaining momentum. For Baby Partners, Finity is able to enroll into the program over 70% of those reached. Pregnancy, however, is a temporary condition compared with diabetes and heart disease, which are chronic conditions. Staff members have noted that this difference may be affecting enrollment into these LifeTracks.

Potential health outcomes extend to those beyond the activities that are directly incentivized. Finity and HPP noted well-baby check-ups are increasing following participation in Baby Partners, even though check-ups are not directly tied to incentives as part of any program. Finity and all partners noted the importance of this program and its sustainability not only at HPP but also ensuring it is financially viable for other payers. Going forward, Finity hopes to work with other public payers to implement similar programs.

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APPENDIX A

Table A-1. Baseline and Intervention Trends in Health Care Spending per Patient

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—

Savings per Patient

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Spending rate: total quarter (i.e., quarterized) payments/number of unique patients. Savings per patient: difference in comparison minus the intervention’s average spending rates.
— Data not yet available.

Table A-2. Baseline and Intervention Trends in Admissions per 1,000 Patients

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Admit rate: total unquarterized admissions/number of unique patients.
— Data not yet available.

Table A-3. Baseline and Intervention Trends in Readmissions per 1,000 Admissions

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare
Admissions Measure: All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total admissions	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total Admissions	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Readmit rate: sum of all readmissions to eligible hospital within 30 days/all admissions in the quarter. Total admissions: all eligible admissions in the quarter.
— Data not yet available.

Table A-4. Baseline and Intervention Trends in ED Visits per 1,000 Patients

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: ED rate: total quarterized ED visits and observation stays/number of unique patients.
— Data not yet available.

October 2014

Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring

Annual and Site Visit Report
Imaging Advantage, LLC

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OVERALL EVALUATION SUMMARY

RTI International was selected to lead an independent evaluation of the 24 Health Care Innovation Award (HCIA) awardees categorized as Community Resource Planning, Prevention, and Monitoring (Community Resource). In this role, RTI is conducting an in-depth evaluation of each innovation, as well as a cross-site evaluation that includes similar innovations targeting the same priority outcomes (e.g., emergency department [ED] visits). For each of the 24 awardees, this report presents findings from the first year of the evaluation (beginning September 23, 2013, and including data obtained by RTI as of September 11, 2014). The report is based on multiple data sources, including operational reports, self-monitoring plans, site visits, and quantitative data analysis.

The evaluation methods vary by awardee innovation, based on the type of innovation and availability of data. RTI has reviewed and coded all existing documents from the awardees through December 31, 2013, and incorporated that knowledge into each awardee's overview. Our review included the awardees' original applications for funding, original and current operational and self-monitoring plans, and quarterly narrative and monitoring reports. For this annual report, we incorporated activities reported through the awardee's seventh quarterly report (i.e., through March 31, 2014).

Between April and August 2014, teams of at least two staff from the RTI team visited all 24 awardees for 2-4 days, depending on the number of interviews conducted. Teams included a subject matter expert, with training and experience specific to the awardee's innovation, and a master's- or bachelor's-level colleague to take notes. Before each visit, the teams reviewed all available documentation from the awardee to learn about the innovation's goals, objectives, and status. The purpose of the site visits was to clarify our understanding of the innovation, obtain detailed information on the implementation process, and review awardee-specific data to determine which elements to incorporate into the evaluation. By August 13, 2014, all 24 awardees had been visited and a thorough description of our findings included in each of the 24 awardee sections.

In addition to the site visits, we report quantitative data from two possible sources for several awardees. First, we present findings from claims analysis for awardees in this report if they both provided us with patient identifiers and reported enrolling participants who are Medicare and/or Medicaid beneficiaries. RTI has obtained patient identifiers from most of the 24 awardees to conduct claims analysis. Second, we present data RTI obtained directly from awardees to quantify their work in addressing health care costs, quality, and patient outcomes. Data from additional awardees will be analyzed and presented in future reports, as data become available and awardees enroll sufficient participants. An update on the availability of Medicare/Medicaid claims and other awardee-specific data, analysis of data available to us and cleaned as of September 11, 2014, a summary of the comparison groups, and a list of draft evaluation measures are included in each awardee section.

1. HCIA COMMUNITY RESOURCE AWARDEE: IMAGING ADVANTAGE, LLC

1.1 Introduction

Imaging Advantage, a for-profit provider of hospital-based and telemedicine solutions for medical imaging located in Chicago, Illinois, received an award of $5,977,805 and began roll-out in partner hospitals in October 2012, to achieve the following goals:

1. **Reduce the cost of care** by reducing or eliminating duplicative or clinically unnecessary radiology exams and decreasing final report turnaround time.
2. **Improve care** by implementing a comprehensive total quality management program that applies a double-blind reading of high-difficulty radiology exams.
3. **Improve health** by reducing patient exposure to radiation.

RTI is conducting an in-depth case study for this innovation. As part of that case study, two RTI team members conducted a site visit in May 2014; before and after the visit, our team reviewed all documentation on the innovation. We are working to obtain data directly from the awardee to assess many of the variables we discuss. This report describes findings from RTI's site visit, document reviews, follow-up calls, and analysis of data obtained and cleaned by RTI through September 11, 2014. We start by describing the innovation's components and the patients targeted by the awardee.

1.1.1 Innovation Components

IA's innovation is complex, and consists of four main components: radiology outsourcing and workflow reengineering and teleradiology services (RO); Radiology Advisor (RA), a radiology clinical decision support tool; radiology dashboards/reports (RD); and RealTime imaging quality assurance (QA). These components use different means—changes in provider workflow, optimization of radiology staff availability and access, radiology decision support, and access to radiology utilization data—to target improving appropriate use of radiology services as well as reviews of image studies.

The innovation aims to meet the following objectives:

- Reduce final report turnaround time, regarded as a significant factor in hospital efficiency and cost control, at Vanguard Health Chicago (now Tenet Health).
- Eliminate subpar wet or preliminary readings in Tenet Health EDs, including readings by nonradiologists.
- Develop and deploy Radiology Advisor, a proprietary front-end decision support tool for referring physicians, to reduce or eliminate duplicative or clinically unnecessary radiology exams.

- Implement a comprehensive total quality management program, including Imaging Advantage's proprietary RealTime QA® program, which applies double-blind readings to high-difficulty radiology exams before the patient is treated.

Imaging Advantage is working with two organizational partners, Tenet Health and MedCPU, as well as an advisory board and consultants to develop and implement the innovation (see ***Table 1***). Tenet Health, a for-profit hospital system, operates the four hospitals where Imaging Advantage is implementing the innovation: West Suburban Medical Center, Westlake Hospital, Weiss Memorial Hospital, and MacNeal Hospital. MedCPU developed Radiology Advisor. The advisory board of stakeholders from multiple organizations includes providers and radiologists from Imaging Advantage and MedCPU, and a consultant, Dr. Steve Smith, a radiologist in the Chicago market.

Table 1. HCIA Partners, Role, and Location

Partner Name	Role in HCIA Project	Location
MedCPU	Decision support tool (Radiology Advisor) development and implementation	Israel
Tenet Health (formerly Vanguard Health Chicago)	Clinical sites for development and implementation	Chicago, IL
Advisory board of stakeholders from multiple organizations	Advisory board and consultant involved in the development and refinement of clinical algorithms for use in Radiology Advisor	Varies

Sources: Lewin 2012–2014, May 7–8 site visit.
HCIA = Health Care Innovation Award.

The four main components of Imaging Advantage's innovation are described below.

Component 1: Radiology Outsourcing/Workflow Reengineering and Teleradiology

Imaging Advantage currently holds the contract with Tenet Health to provide all radiology services in their Chicago-area hospitals. Three on-site radiology groups were previously employed by the hospitals: a primary group at MacNeal (the largest of the four hospitals), and two smaller groups at two other hospitals. Under the former on-site radiology groups, ED providers at Tenet hospitals read their own plain films after hours when radiologists were not on duty. A Tenet radiologist performed the final reading of the film and final interpretation immediately the following morning.

Imaging Advantage replaced the on-site radiology services, and now operates in all four Tenet hospitals in the innovation; the new workflow is intended to eliminate subpar wet or preliminary readings in EDs. Currently, Imaging Advantage employs radiologists on site at the four hospitals, as well as teleradiologists who sit in control centers in Phoenix and Detroit or work remotely from home. The reengineered workflow differs by the time of day. In the Chicago market, teleradiology services are primarily used after hours (after 5 p.m. and before 8 a.m.); each evening, the system automatically switches from sending exams to on-site radiologists to teleradiologists. In addition, teleradiologists can be accessed by Tenet providers when daytime image study volume exceeds on-site radiologist capacity.

The reengineered workflow is also intended to decrease turnaround times. Clinical support representatives (CSRs) triage and expedite readings to ensure images move through the system according to expected/required turnaround times. At the control centers in Phoenix and Detroit, a team of seven CSRs monitor the flow of exams and interpretation by Imaging Advantage radiologists 24 hours per day, 7 days per week. CSRs receive and parse orders, and ensure exams are read; they monitor for emergent cases, such as stroke victims, that should be prioritized for review.

CSRs also manage the administrative work for which radiologists were previously responsible. For example, if an exam is received without necessary information, CSRs follow up with the appropriate person to obtain the information.

Component 2: Radiology Advisor

Radiology Advisor is a proprietary radiology clinical decision support tool for referring ED providers, developed by MedCPU. The purpose of the tool is to decrease inappropriate imaging studies by providing ED providers with alerts, reminders, and recommendations about indicated imaging studies, based on American College of Radiology appropriateness criteria. As of RIT's site visit on May 7-8, 2014, Radiology Advisor included the following algorithms:

- nontraumatic headache
- chest-pulmonary embolism
- nontraumatic abdomen
- traumatic extremities
- nontraumatic extremities

The Radiology Advisor software has two main functions:

1. Acquire and read all clinical information in the electronic health record (EHR) and assess compliance with appropriateness criteria for imaging studies based on programmed clinical algorithms.
2. Provide real-time clinical decision support to ED providers, when warranted, in the form of a pop-up "smart button."

Function 1: Acquire and read clinical information in the EHR and assess compliance with appropriateness criteria

Radiology Advisor runs on top of any Microsoft-based EHR system; the software is not integrated into EHRs. Radiology Advisor acquires and reads data from multiple clinical information systems, including EHRs, radiology information systems (RISs), picture archiving and communication systems (PACS), order entry, dictation, laboratory, pharmacy, and other ancillary systems. The software is capable of reading and interpreting both structured data and free text (i.e., narrative notes) from these systems, using a proprietary natural language processing technology. Radiology Advisor evaluates the data in real time. For example, each time a physician enters new information into the EHR, Radiology Advisor automatically acquires and reads the new data, and adjusts alerts and recommendations accordingly. When Radiology Advisor detects a potential deviation from the standard of care, it communicates that information to the physician.

Function 2: Provide real-time clinical decision support to ED providers

ED providers view a small window that sits on top of their EHR screen: a Radiology Advisor smart button that changes color based on provider interactions with the system relative to image ordering. The color changes from green, to yellow, to red when the tool identifies a contraindication for an image study being ordered. It also prompts providers to enter more information to help provide recommendations for more appropriate image studies.

From the user perspective (i.e., ED providers), Radiology Advisor does not interfere with their workflow, unless it "pops up" with a suggestion or reminder about certain appropriateness criteria. When prompted to provide additional documentation to explain why an order is indicated, physicians may also ignore the tool and proceed with the order. Physicians do not receive any notifications unless Radiology Advisor detects a potential deviation from the appropriateness criteria. As an optional tool, Radiology Advisor has no "hard stop" that providers must act on (e.g., order justification) before ordering an exam. Providers can order the exams they want, even if Radiology Advisor informs them that the order is not indicated or another type of imaging study (i.e., MRI or ultrasound) is more appropriate.

Component 3: Radiology Dashboards and Daily Reports

Radiology dashboards are reports that display segmental turnaround times, exam volume, seasonal trending, and duplicate exams ordered by ED providers in the past 24 hours. Appropriateness criteria are assessed through a standardized list of key performance indicators developed by Imaging Advantage and delivered through daily reports. The dashboards are online, hospital-specific, and intended to be given to medical directors daily. They can be tailored to display information each medical director prefers in the format each desires.

If ED providers order imaging studies that do not meet the appropriateness criteria, the medical record number for each case is displayed with the metric in the daily reports delivered to the appropriate medical director. Medical directors are expected to use that information to give feedback to their ED providers about more appropriate ordering practices.

Component 4: RealTime QA

The newest and final component of the Imaging Advantage innovation focuses on QA for image study readings. For a percentage of high-risk imaging studies, the previously described reengineered workflow is slightly modified. If a high-risk exam is ordered, the request for reviews is routed to two separate radiologists. The radiologists each complete a blinded review of the film. If their findings agree, the interpretation report is generated and passed on to the referring physician. If they do not agree, the two radiologists discuss their interpretations. If there is still no agreement, the exam is routed to a third radiologist who conducts a blinded review.

1.1.2 Program Participant Characteristics

Table 2 lists the program participant groups targeted by this innovation. The primary targets of the Imaging Advantage innovation are ED providers in the Tenet Health System. Imaging Advantage received support from Vanguard National to move forward with the innovation after receiving the award. Imaging Advantage sought local buy-in from the four hospitals in Tenet by starting with high-level administrators, such as chief medical officers and other administrators.

Radiology staff in the Tenet Health System are a target of the innovation's other three components. We were not able to meet with directors of imaging services or radiology staff during the May site visit, and these types of staff are not reported in the awardee self-monitoring or Lewin reports. Therefore, our ability to characterize and assess their involvement in these program components—and the impact on both direct and indirect evaluation measures—is limited for this annual report.

Patients receiving imaging studies in the four Tenet hospital EDs are the secondary target population of the innovation. Enrollment numbers are driven entirely by volume and patient flow in each ED. As of May 2014, Imaging Advantage had uploaded patient identifiers for 50,296 unique patients affected by at least one component of the innovation.

Table 2. Program Participants Planned for Inclusion in Innovation (Denominator Data)

Program Participant Type	Data Source	Current Count (Data Source)
ED providers	List of ED providers provided by Imaging Advantage	126 (as of May 7–8 site visit)
ED providers by hospital	List of ED providers provided by Imaging Advantage	—
Radiology staff—TBD	Imaging directors, staff radiologists	—
Patients receiving an imaging study in any of 4 Tenet hospitals in Chicago EDs	Patient identifiers provided by Imaging Advantage	50,296

Source: Site visit May 7–8, 2014.
ED = emergency department; TBD = to be determined.
— Data not yet available.

1.2 Implementation Progress

The extent to which each awardee is able to implement their innovation as planned and reach a sufficient number of participants (either patients or providers) will be critical to assessing the innovation's impact on health, health care cost, and quality. ***Table 3*** summarizes the measures related to Imaging Advantage's implementation process and effectiveness that RTI plans to use in evaluating this awardee.

Table 3. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for Imaging Advantage

Key Evaluation Domains	Subdomains	Measures	Data Source
Implementation process	HIT workflow	Emergent final report turnaround time	Hospital information system, RIS
		Inpatient final report turnaround time	Hospital information system, RIS
		Outpatient final report turnaround time	Hospital information system, RIS
		System availability (uptime/downtime)	Imaging Advantage/MedCPU
		System usage (total usage/total radiology orders)	Imaging Advantage/MedCPU
Implementation effectiveness	Reach	Number/percentage of patients who required imaging	Hospital information system, RIS
	Dose	Modality utilization	Hospital information system, RIS

CMS = Center for Medicare & Medicaid Services; RIS = radiology information system.

1.2.1 Process

The implementation process has been the initial focus of the evaluation. RTI defines this process as including execution of implementation, organizational capacity, engagement of key staff and partners, and recruitment and enrollment. The implementation process is best evaluated through a combination of variables, including execution of implementation that conforms to operational plans, and capacity for implementing the innovation in a timely and effective manner. We focused on the implementation process during the awardee site visit in May 2014 and addressed such evaluation questions as the following:

- What is the overall execution of the innovation implementation (e.g., the actual rate of expenditures relative to the projected rate)?
- What accomplishments are specific to hiring or training staff so that the organization can build its capacity to implement the innovation effectively?
- What is the implementation effectiveness, including fidelity, reach, and dose of the innovation thus far?

Execution of Implementation

The rate at which awardees expend funds or enroll participants, compared to projection, provides useful information to assess the innovation’s status. If expenditure or enrollment rates are particularly low, these variables help assess the awardee’s readiness to implement the innovation at the start and the extent to which they can spend all funding and meet their overall goals by the end of the project. Using the most updated Lewin numbers, as of March 2014 (quarter 7 [Q7]), Imaging Advantage had spent about 75% of its Year 2 budget, which is on target with their Center for Medicare & Medicaid Services (CMS)-approved plan.

RTI visited Imaging Advantage and its four hospital sites from May 7 to 8, 2014. The innovation includes four components, which the awardee has adapted or developed and then implemented incrementally over the first 2 years of the award. We discuss implementation progress below for each component.

During the site visit, RTI came to understand that reengineering (Component 1) included replacing the current radiology services vendor used in Tenet hospitals with Imaging Advantage, and then implementing Imaging Advantage’s process for receiving, reviewing, and reporting on image studies. Central to this model was the use of CSRs to triage the image study reviews and reports and the use of teleradiology. To implement the reengineering-related components of the innovation, Imaging Advantage needed to hire, credential, and train new radiologists and to hire and train CSRs to work in Imaging Advantage facilities. We received some information about this process during our site visit. In general, though, discussions with ED medical directors in the four Tenet hospitals we visited indicated that Imaging Advantage's roll-out of radiology services had been smooth, and that ED providers were generally satisfied with the services (***Table 4***).

Table 4. Roll-Out Schedule for Component 1: Radiology Outsourcing and Workflow Reengineering

Hospital	Teleradiology "Go-Live" Date
West Suburban Medical Center	October 28, 2012
Westlake Hospital	November 28, 2012
MacNeal Hospital	January 31, 2013
Weiss Memorial Hospital	June 30, 2013

Source: Lewin 2012–2014; Site visit May 7–8, 2014.

After radiology outsourcing and workflow reengineering, Imaging Advantage partnered with MedCPU to develop, pilot test, and implement Radiology Advisor (Component 2) separately for each of the four hospitals. Imaging Advantage and MedCPU took an iterative approach to the development of Radiology Advisor. In partnership with an expert panel consisting of the Tenet clinical council, radiologists, and ED providers, Imaging Advantage developed clinical algorithms for a subset of imaging studies/modalities based on American College of Radiology appropriateness criteria. MedCPU then programmed those algorithms into their existing platform to create the Radiology Advisor tool. One ED's medical director (West Suburban Hospital) has been involved in Radiology Advisor development from the beginning of the award.

Imaging Advantage started with a base set of radiology decision support algorithms to detect unnecessary and possibly inappropriate image studies and, working with MedCPU, added new algorithms as they were developed. The development of the initial version took approximately 16 months, with continuous updates since initial implementation at West Suburban Hospital. Imaging Advantage anticipated releasing the remaining nine algorithms by the end of June 2014. As part of developing and testing new algorithms, Imaging Advantage also developed key performance indicators related to each algorithm.

After a complex development process, implementation of the tool involves "turning it on" for ED providers. MedCPU staff receive a list of providers who are authorized to have access to Radiology Advisor and they establish permissions. The roll-out schedule for Radiology Advisor is listed in ***Table 5***.

Table 5. Roll-Out Schedule for Component 2: Radiology Advisor Tool

Hospital	Radiology Advisor "Go-Live" Date
West Suburban Medical Center	November 25, 2013
Westlake Hospital	February 4, 2014
Weiss Memorial Hospital	February 25, 2014
MacNeal Hospital	March 25, 2014

Source: Lewin 2012–2014; Site visit May 7–8.

During implementation of Radiology Advisor, MedCPU provided on-site training and support to providers. Online training (streaming video) was available to all ED providers as well. In addition, part of the implementation process involved rapid feedback and adjustments to the Radiology Advisor software and algorithms based on ED provider comments.

Implementation at Tenet hospitals was straightforward and unobtrusive. As a stand-alone application that operates as an adjunct to an EHR system, the Radiology Advisor tool simply appeared as a small dialog box on provider EHR screens on the day of implementation.

The level of engagement of the medical directors of each ED varied. For example, the medical director who had been involved in the project since development of the algorithms (West Suburban) was more engaged than other medical directors who were either new to their position (Westlake, MacNeal) or whose hospitals had just recently deployed Radiology Advisor (MacNeal). Interviews with key Imaging Advantage and Tenet staff indicated that involving more ED providers earlier and more regularly in Radiology Advisor development, training, and implementation would have likely produced greater initial adoption and acceptance of this tool.

Implementation information related to the radiology dashboard and RealTime QA (Components 3 and 4) of Imaging Advantage's innovation were limited. RTI was not able to determine how the roll-out of these components occurred. Anecdotes from ED medical directors indicated that they had access to the dashboard tool, for example, but had not used it much given its recent introduction into the hospital or their newness to the ED medical director role.

During the visit, RTI learned of turnover in the position responsible for the RealTime QA component, which was the component implemented most recently. The position has recently been filled and the component has made significant progress since that time.

Organizational Capacity and Leadership

Imaging Advantage is an experienced provider of outsourced radiology services. The innovation's leaders all had substantial experience in radiology, including clinical radiology practice, radiology technicians, and teleradiology. With the exception of Radiology Advisor, innovation components had been developed and deployed in other settings prior to the award. This is the first time Imaging Advantage led development and implementation of a radiology decision support tool, however. Imaging Advantage selected MedCPU as the development partner for Radiology Advisor given its experience developing similar decision support tools and its proprietary natural language processing platform.

MedCPU had significant experience developing clinical decision support tools prior to the award; their proprietary natural language processing technology and decision support platform served as the basis for Radiology Advisor. Similar to Imaging Advantage, this award was the first time MedCPU developed a radiology-specific decision support tool.

Finally, Tenet hospitals had experience with outsourced radiology services as well as with some clinical decision support functionality (medication interaction checking) through their EHR system prior to the innovation, but no experience with radiology decision support.

During the May 2014 site visit, it was apparent that leadership at Imaging Advantage and MedCPU were committed to the success of the innovation, and had the requisite skills and authority to marshal resources and make decisions. At the four Tenet hospitals (the implementation sites), we saw a range in levels of engagement regarding the second component of the innovation, Radiology Advisor. We spoke with the medical directors of four EDs. One ED medical director (at West Suburban) had been very involved in the planning and design of the innovation and was very engaged. Two medical directors (Westlake and MacNeal) were new to their position and less familiar with the overall innovation. Another medical director (Weiss) was out of the country for the roll-out at his hospital and was less familiar with the project. All ED medical directors, in principle, supported the innovation, particularly Radiology Advisor. It was notable that ED medical directors largely viewed the innovation as primarily consisting of the Radiology Advisor tool. The reengineered radiology workflow and RealTime QA components of the intervention were only discussed by the ED directors when prompted by RTI. The final component of the innovation—dashboards—was referred to by one of the ED medical directors, and seemed to be reviewed consistently, but was not viewed as an important innovation component. The other three ED directors were new to the dashboard and had little to no experience using it at the time of our visit. As RTI develops the provider survey component of our evaluation, we plan to include a range of clinical staff—ED medical directors, imaging directors, ED providers, and radiologists—in our survey of Imaging Advantage participants.

Leaders at Imaging Advantage, MedCPU, and Tenet hospitals noted that they work well together and have a positive relationship.

1.2.2 Workforce Development

Hiring and Retention

As of March 2014, Imaging Advantage's innovation project had 24 full-time equivalents (FTEs), which is at projection. Since the project's inception, Imaging Advantage had hired

13 new staff. As of March 2014, 16 staff were clinical support staff, 10 were IT technicians/specialists, 7 were management or administrative staff, and 1 was a health educator/health coach. Overall retention has been good; there was no turnover in Q7.

Training

Because Imaging Advantage has reengineered workflow processes and implemented a QA system, in addition to the decision support tool, all staff need to be aware of the changes and how to use the new systems. Imaging Advantage has conducted trainings for radiologists and hospital technologists, assessed existing workflow, implemented clinical and imaging protocols, and developed decision support algorithms and processes. Their training modalities include in-person discussion, online training, and hands-on training. Examples of training sessions include operating final-reads teleradiology (clinical support staff), introduction to the CMS initiative for physicians and hospital executives, operating front-end decision support tools, and total quality management.

Imaging Advantage did not appear to have a continuing education program in place or planned for Tenet providers. For Radiology Advisor, MedCPU sends out a support person to troubleshoot with providers every few weeks. They have an ongoing, planned presence, but the intervention does not appear to include refresher trainings or reinforcing skills. Notably, Radiology Advisor requires very little training to use. New algorithms, when developed, are added to Radiology Advisor, but it is unclear to what extent the new algorithms are communicated to intervention participants. Some medical directors and providers indicated that they receive a notification that new algorithms are being implemented; others did not remember being advised when new algorithms were implemented, but reported that they knew because Radiology Advisor would prompt them with new content they had not previously seen.

1.2.3 Effectiveness

A major aspect of the evaluation will be to assess the effectiveness of the intervention in terms of the extent to which the intervention implemented aligns with what was planned (i.e., fidelity) and whether patients have been exposed to it. Exposure will be measured through reach (i.e., the extent to which the total number of providers and their patients are reached that were targeted) and dose (i.e., the degree to which each provider is exposed to the innovation).

Fidelity

At the time of the May 2014 site visit, all four program components were implemented and being provided to ED staff. Some components, such as dashboards and RealTime QA, were new to program participants at the time of our visit, given their recent introduction to the program or the Tenet provider’s recent engagement with the innovation. We were not able to evaluate the extent to which other participants—namely imaging directors and radiologists—experienced the radiology outsourcing, workflow reengineering, dashboard, and RealTime QA components of the intervention.

Reach

Reach is the extent to which the targeted population is exposed to the innovation. Enrollment status is an indicator of how effectively the awardee is reaching its intended target population. Imaging Advantage targets ED providers with the Radiology Advisor clinical decision making tool. All providers (126 at the time of the site visit) are exposed to Radiology Advisor, as well as to the radiology outsourcing and RealTime QA components of the intervention. When a hospital "Go-Live" is implemented, Radiology Advisor is pushed to all providers through their IT department.

RTI was not able to determine the extent to which other non-ED staff, including Tenet radiology staff, were exposed to various components of the innovation. As noted, we did not interview imaging directors or radiologists, both of whom are potential users or recipients of three innovation components (outsourced radiology, dashboards, and RealTime QA).

As of March 2014, 50,296 patients had received an order for an imaging study at one of the four hospitals.[1] However, it is unclear the extent to which components of the innovation are reaching these patients. It is important to note that not all patients receive the same type of image study, and some patients may receive no image study at all. The component of the innovation that directly affects the number of patients receiving imaging studies is the Radiology Advisor component. Measuring reach for patients that is attributable to the innovation is a challenge. Developing an evaluation measure (explanatory variable) that captures reach to patients will be important moving forward.

Tables 6, 7, and ***8*** outline how RTI will measure reach for each of the three program participant groups.

Dose

Tracking and reporting of exposure to the innovation is necessary to measure effectiveness. We have defined dose for providers as exposure to the innovation (i.e., Radiology Advisor pushed to EHRs). As of March 2014, all 126 ED providers were exposed to the innovation. We currently do not have data on the percentage of ED providers who actively use the prompts. MedCPU collects data to measure how many times providers interact with prompts or ignore them; Imaging Advantage did not have access to those data as of our visit, but planned to request access from MedCPU, which RTI will be able to access for our evaluation.

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[1] Patient identifier data received from Imaging Advantage in May 2014.

Table 6. Program Participant Reach for Each Quarter Since Project Launch: ED Providers

Column A	B	C	D	E
Quarter	Target Population (Denominator = All ED Providers)	Number of ED Providers Using Radiology Advisor	Total Reach per Quarter (Column C Divided by B)	Percentage Change from Previous Quarter
December 2012	—	—	—	—
March 2013	—	—	—	—
June 2013	—	—	—	—
September 2013	—	—	—	—
December 2013	—	—	—	—
March 2014	126	126	100%	—

Source: National Provider Identifiers (NPIs) provided by Imaging Advantage in August 2014.
ED = emergency department.
— Data not yet available.

Table 7. Program Participant Reach for Each Quarter Since Project Launch: Radiology

Column A	B	C	D	E
Quarter	Target Population (Denominator = All Radiology Staff)	Number of Radiology Staff	Total Reach per Quarter (Column C Divided by B)	Percentage Change from Previous Quarter
December 2012	—	—	—	—
March 2013	—	—	—	—
June 2013	—	—	—	—
September 2013	—	—	—	—
December 2013	—	—	—	—
March 2014	—	—	—	—

Source: Patient-level data to be provided to RTI.
— Data not yet available.

Table 8. Program Participant Reach for Each Quarter Since Project Launch: ED Patients Receiving an Imaging Study

Column A	B	C	D	E
Quarter	Target Population (Denominator = All ED Patients Receiving an Imaging Study)	Number of ED Patients Receiving an Imaging Study	Total Reach per Quarter (Column C Divided by B)	Percentage Change from Previous Quarter
December 2012	—	—	—	—
March 2013	—	—	—	—
June 2013	—	—	—	—
September 2013	—	—	—	—
December 2013	—	—	—	—
March 2014	—	—	—	—

Source: Patient-level data to be provided to RTI.
ED = emergency department.
— Data not yet available.

1.3 Evaluation Outcomes

RTI will use two types of quantitative data from awardees to assess the impact of the awardee’s innovation on key outcomes. These data include claims data for Medicare and/or Medicaid beneficiaries, depending on who the awardee serves, and administrative or utilization data the awardee is collecting (which we have categorized as “other awardee-specific data,” reflecting variability of the types of data elements available across awardees). We are in the process of finalizing our assessment of all the available data sources and requesting data directly from each awardee. As those data are received, we will incorporate the findings into our quarterly/annual reports. The following sections present descriptive findings from the quantitative outcome data available to RTI (and cleaned) as of September 11, 2014.

1.3.1 Measures for Evaluation

The measures listed in ***Tables 3*** and ***10*** reflect the measures determined as most relevant for our evaluation of Imaging Advantage’s innovation.

1.3.2 Claims Data

As part of a broad assessment of health care innovations, Center for Medicare & Medicaid Innovation (CMMI) is assessing the impact of its programs, including those funded specifically by Health Care Innovation Awards, on four core measures. The four core measures are

- health care spending per patient,
- hospital inpatient admissions,
- hospital unplanned readmissions, and
- ED visits.

Table 10. Outcome Measures for Imaging Advantage

Key Evaluation Domains	Subdomains	Measures	Data Source
Clinical effectiveness	General health and wellness	Patient radiation dosage	Hospital information system/IA database/hospital EMR
Health care outcomes	Utilization	All-cause admission rate	Claims
		Readmission rate	Claims
		CT exam with and without contrast	Hospital information system/IA database
		Percentage reduction of duplicate CT exam orders	Hospital information system/IA database
		Percentage reduction of duplicate MRI exam orders	Hospital information system/IA database
		Percentage reduction of CT radiology technician errors	Hospital information system/IA database
		Percentage reduction of MRI radiology technician errors	Hospital information system/IA database
		Percentage reduction of incorrect CT exam orders	Hospital information system/IA database
		Percentage reduction of incorrect MRI exam orders	Hospital information system/IA database
	Cost	Spending per patient	Claims data
		Cost savings	Claims data

CT = computerized tomography; EMR = electronic medical record; IA = Imaging Advantage; MRI = magnetic resonance imaging.

Collectively, it is anticipated that CMMI programs will slow the increase in health care spending, reduce hospital admissions, reduce avoidable hospital readmissions, and prevent unnecessary ED visits. We are reporting these measures for all HCIA Community Resource Planning awardees so that the collective impact of the awards can be assessed. As discussed below, some awardees' innovations may not be focused on these measures. Other awardees' innovations target specific conditions (e.g., imaging, diabetes) and may have significant impacts on spending, admissions, readmissions, and ED visits for the targeted conditions but not have a statistically detectable impact on the measures at the aggregate level because the targeted conditions represent only a small fraction of total spending, inpatient admissions, and ED visits.

The measures are calculated through analysis of Medicare and Medicaid fee-for-service claims. Because of differences between Medicare and Medicaid patients in age, other demographic variables, and disease status, we report the Medicare and Medicaid results separately below. Currently, complete Medicare claims are available through the end of 2013. Medicaid claims for Imaging Advantage are available through the third quarter of 2012. The Imaging Advantage innovation was launched on October 28, 2012. The following provides a description of how each variable is defined.

- **Health Care Spending per Patient**. Health care spending is defined differently for Medicare and Medicaid beneficiaries. For Medicare beneficiaries, health care spending per patient includes Part A and Part B Medicare expenditures for persons enrolled in the Part A and Part B fee-for-service program. The variable focuses on Medicare fee-for-service spending, so Medicare managed care (Part C) services are excluded, as are beneficiary copayments. Medicare Part D prescription spending is also excluded. Spending is reported on a per-person per-quarter basis. If a beneficiary is not enrolled for every month in a quarter, spending (except for hospital inpatient spending) is prorated to a quarterly basis based on the number of days enrolled during the quarter. Because hospital inpatient admissions are both rare and expensive, spending is not prorated for hospital inpatient spending. Prorating is also not performed for beneficiaries who die during a quarter. For Medicaid beneficiaries, health care spending per patient is reported for fee-for-service beneficiaries. Beneficiaries are only included in the analysis for spending (and the other measures) during periods when they are enrolled in Medicaid.

- **Hospital Inpatient Admissions**. This variable measures hospitalization, the single most expensive component of health care spending. Patients kept overnight in observation beds are excluded from this measure. Inclusion criteria for the analysis are the same as for spending. Hospital inpatient admissions are not prorated based on the number of days eligible during the quarter. All-cause inpatient admissions are reported. The mean quarterly admission rate per 1,000 patients is reported.

- **Hospital Readmissions**. Hospital readmission rates serve a dual purpose in evaluating HCIA impacts. Readmissions add to the costs of a prior hospitalization, and they often reflect a problem in the care provided during the first admission. All-cause readmissions are defined as a follow-up admission to any short-term acute general or long-term care hospital within 30 days of a discharge from another hospital of the same type. We ignore multiple admissions within one day of an initial admission because these often represent transfers between hospitals. We define index hospitalizations that begin during the quarter and follow each index admission for 30 days, even when the follow-up period extends beyond the end of the quarter. Inclusion criteria for the analysis are the same as for spending. The readmission rate equals the number of readmissions divided by the number of index hospitalizations during the quarter. Planned readmissions are excluded from the calculation of the numerator. Quarterly mean readmission and Ambulatory Care-Sensitive Conditions (ACSC) readmission rates per 1,000 admissions are reported.

- **ED Visits**. ED visits are sometimes viewed as a symptom of the inability of the community's health care system to provide adequate preventive and ambulatory care visits. We report an all-cause ED visit rate that excludes ED visits resulting in an inpatient admission (which presumably represent unavoidable visits) and includes overnight ED visits without an inpatient admission. Inclusion criteria for the analysis are the same as for spending, and ED visits are also subject to the same prorating formula as for spending. The mean quarterly ED visit rate per 1,000 patients is reported.

Medicare Claims Analysis

The analysis focuses on 7,433 Medicare beneficiaries enrolled in the Imaging Advantage innovation through March 2014 who were enrolled in fee-for-service Medicare Parts A and B at some point during or after the launch quarter. The analysis uses data from the CMS Chronic Conditions Data Warehouse (CCW). We present the measures for these beneficiaries in the quarters before and after the innovation was launched on October 28, 2012.

Table 11 reports Medicare spending per patient in the eight quarters before and the five quarters during and after the launch date.

Table 11. Medicare Spending per Patient: Imaging Advantage

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year				
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4	I5
Intervention Group														
1C1CMS331 066	Imaging Advantage													
	Spending rate	$3,543	$3,553	$3,905	$3,899	$3,986	$3,792	$4,087	$4,151	$4,300	$4,613	$5,022	$5,204	$6,167
	Std dev	$8,539	$9,837	$10,350	$10,321	$10,434	$9,598	$10,586	$10,196	$10,758	$12,675	$13,277	$13,128	$14,323
	Unique patients	5,770	5,888	6,021	6,187	6,340	6,481	6,640	6,824	6,976	7,009	7,124	7,289	7,433
Comparison Group														
1C1CMS331 066	Imaging Advantage													
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—	—

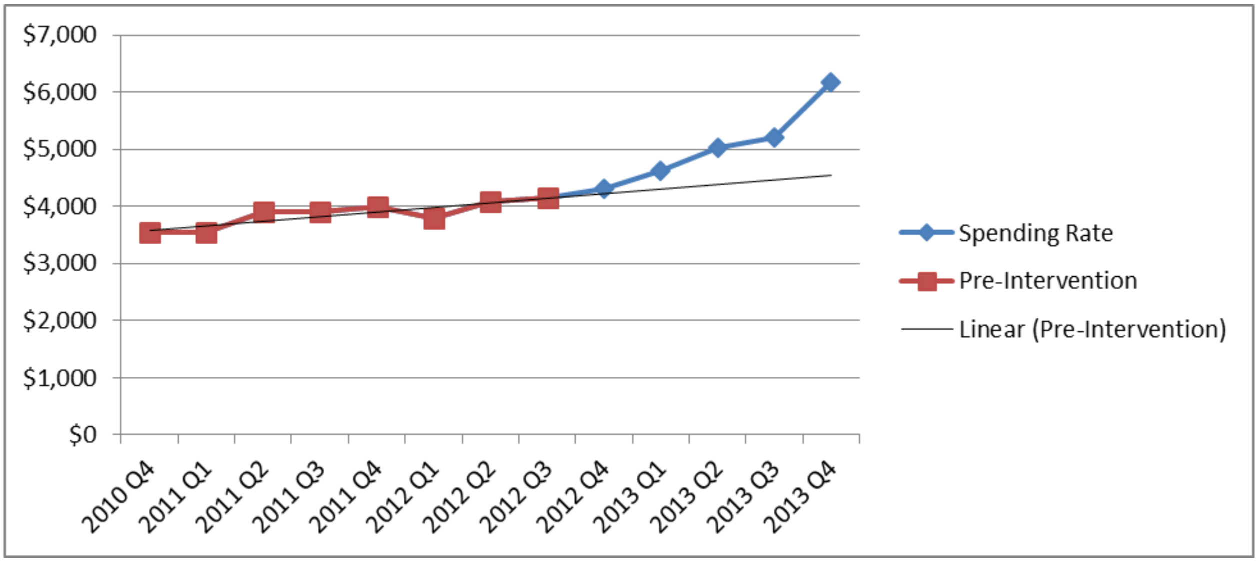
Savings per Patient

Baseline Quarters								First Intervention Year				
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4	I5
—	—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Imaging Advantage began enrolling patients on 10/28/2012. I1 is 2012 Q4. Spending rate: total quarter (i.e., quarterized) payments/number of unique patients. Savings per patient: difference in comparison minus the intervention's average spending rates.
— Data not yet available

Figure 1 plots spending as a function of time. The red line represents values in quarters prior to the innovation's launch date on October 28, 2012, and the blue line represents quarters during and after launch. The graph includes a trend line based on a linear regression of prelaunch values.

Figure 1. Medicare Spending per Patient: Imaging Advantage



The trend line for spending increases, which may be the result of aging of the sample population, given that we analyze the same individuals before and after the innovation was launched, and general medical care inflation. Although spending does appear higher than the expected trend line for all five quarters postlaunch, it is premature to test whether postlaunch spending is statistically different than expected trend values. As shown in ***Table 11***, the standard deviation for spending is very high, representing the skewed nature of expenditures.

The all-cause inpatient admissions rate per 1,000 participants is shown in ***Table 12*** and ***Figure 2***.

Table 12. All-Cause Inpatient Admissions Rate per 1,000 Enrollees: Imaging Advantage

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

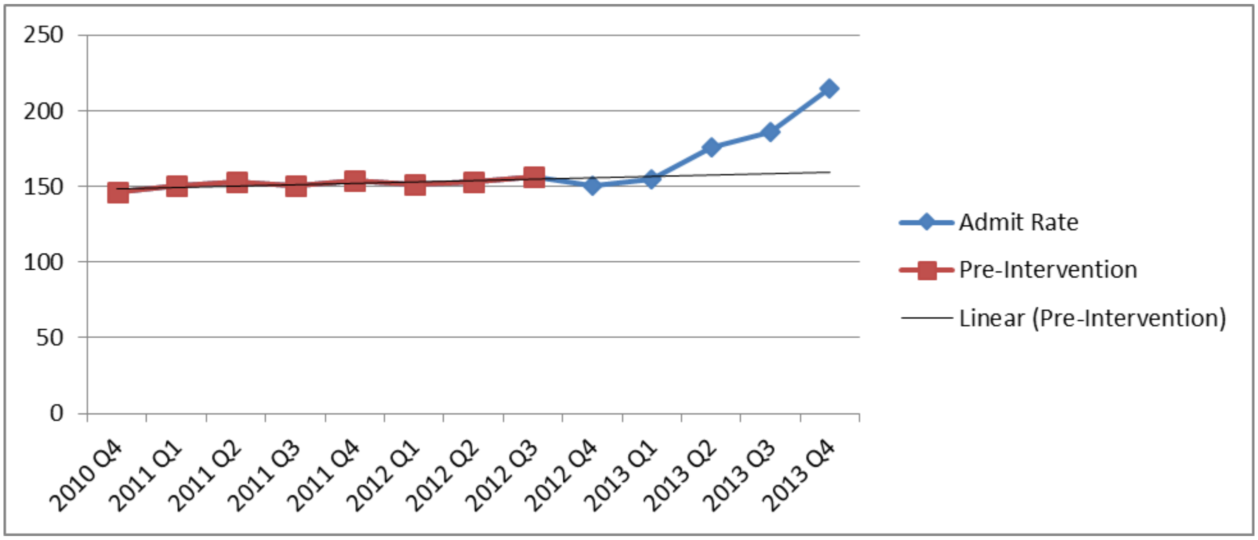
Awardee Number	Description	Baseline Quarters								First Intervention Year				
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**	**I5**
Intervention Group														
1C1CMS331066	Imaging Advantage													
	Admit rate	146	151	153	151	153	152	153	156	150	155	175	186	215
	Std dev	521	519	525	535	548	530	521	549	510	520	572	624	637
	N. of patients	5,770	5,888	6,021	6,187	6,340	6,481	6,640	6,824	6,976	7,009	7,124	7,289	7,433
Comparison Group														
1C1CMS331066	Imaging Advantage													
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year				
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**	**I5**
—	—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Imaging Advantage began enrolling patients on 10/28/2012. I1 is 2012 Q4. Admit rate: total unquarterized admissions/number of unique patients.
— Data not yet available.

Figure 2. All-Cause Inpatient Admissions Rate per 1,000 Enrollees: Imaging Advantage



The inpatient admissions rate follows a fairly stable trend prior to launch. The inpatient admission rate increases in the quarters following innovation launch, with the biggest increase in Q4 and Q5 postlaunch. Without statistical testing and a better-defined comparison group, however, it is premature to conclude that the innovation caused the increase; we will examine this question as the evaluation continues.

Hospital readmission rates per 1,000 admissions are shown in ***Table 13*** and ***Figure 3***.

Table 13. Hospital Readmission Rates per 1,000 Admissions: Imaging Advantage

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare
Admissions Measure: All cause

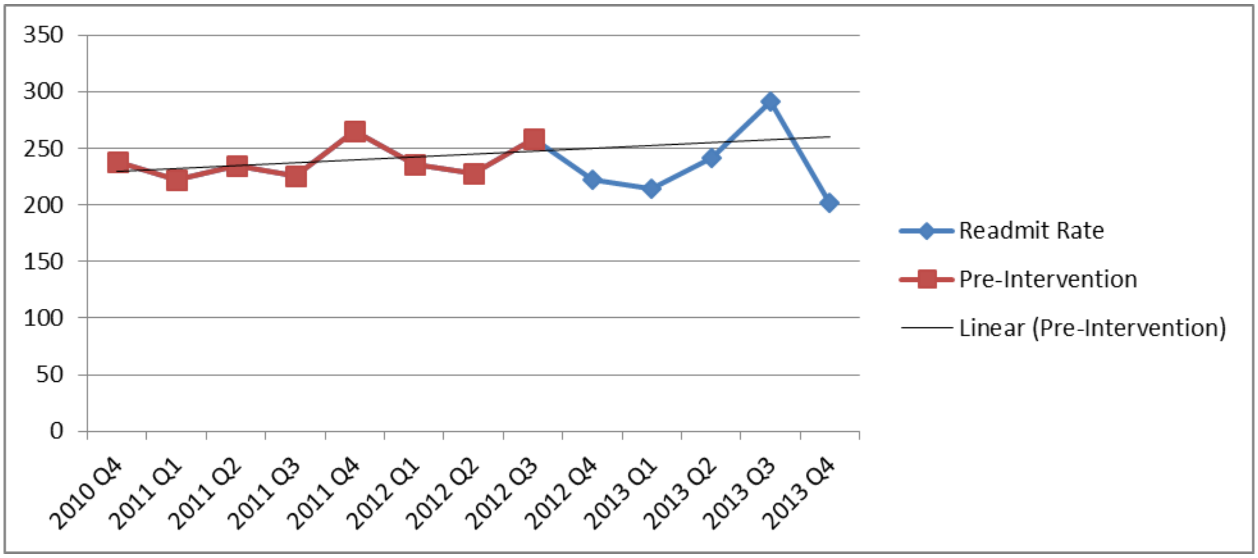
Awardee Number	Description	Baseline Quarters								First Intervention Year				
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4	I5
Intervention Group														
1C1CMS331066	Imaging Advantage													
	Readmit rate	238	222	234	226	265	236	228	258	222	214	241	291	202
	Std dev	426	416	424	418	441	425	419	438	415	410	428	454	402
	Total admissions	745	778	789	802	850	872	878	921	916	958	1,094	1,178	1,400
Comparison Group														
1C1CMS331066	Imaging Advantage													
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—	—
	Total admissions	—	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year				
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4	I5
—	—	—	—	—	—	—	—	—	—	—	—	—

Source: Imaging Advantage began enrolling patients on 10/28/2012. I1 is 2012 Q4. RTI analysis of CCW Medicare claims.
Note: Readmit rate: sum of all readmissions to eligible hospital within 30 days/all admissions in the quarter. Total admissions: all eligible admissions in the quarter.
— Data not yet available.

Figure 3. Hospital Readmission Rates per 1,000 Admissions: Imaging Advantage



The hospital readmission rate is variable prior to innovation launch. Similar variability occurs postlaunch as well. Although the rates in the first three quarters postlaunch are below the expected trend line, the readmission rate in Q4 increases above the expected trend line before decreasing again in Q5. These fluctuations may be due to external factors not related to innovation implementation. Without statistical testing and a better-defined comparison group, however, it is premature to conclude that the innovation has affected hospital readmission rates; we will examine this question as the evaluation continues.

ED visits per 1,000 participants are shown in ***Table 14*** and ***Figure 4***.

Table 14. ED Visits per 1,000 Participants: Imaging Advantage

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare
Admissions Measure: All cause

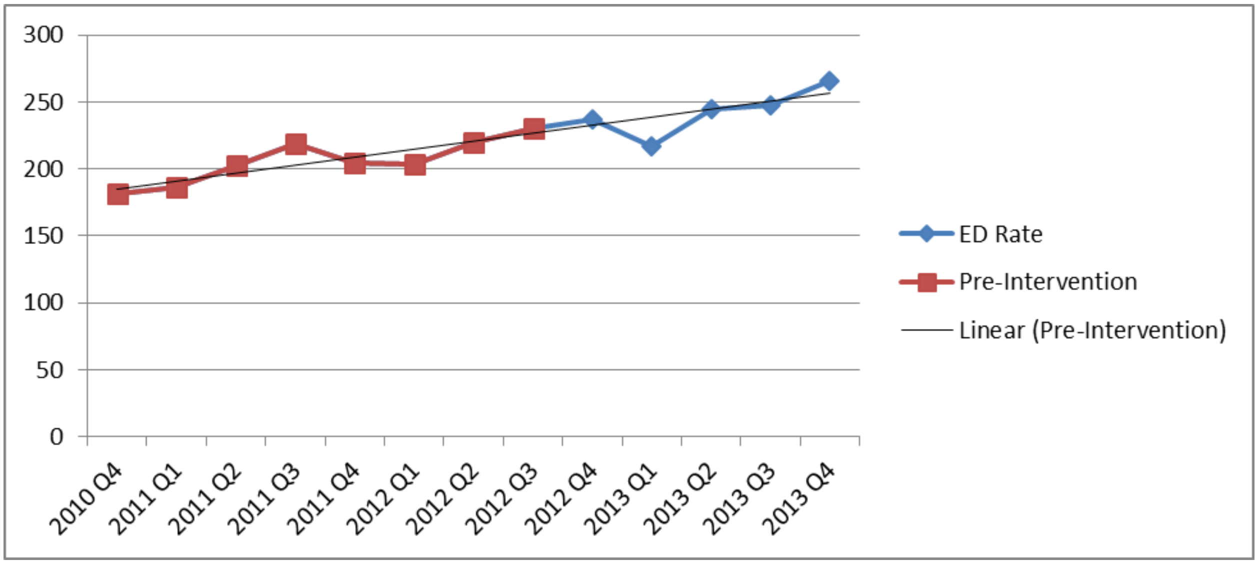
Awardee Number	Description	Baseline Quarters								First Intervention Year				
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4	I5
Intervention Group														
1C1CMS331066	Imaging Advantage													
	ED rate	182	186	203	218	204	204	220	231	237	217	245	247	266
	Std dev	1,444	1,446	1,694	1,669	1,385	1,407	1,694	1,723	1,790	1,627	1,582	1,594	1,591
	N. of patients	6,274	6,364	6,536	6,682	6,807	6,746	6,907	7,079	7,148	7,212	7,337	7,510	7,617
Comparison Group														
1C1CMS331066	Imaging Advantage													
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year				
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4	I5
—	—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Imaging Advantage began enrolling patients on 10/28/2012. I1 is 2012 Q4. ED rate: total quarterized ED visits and observation stays/number of unique patients.
— Data not yet available.

Figure 4. ED Visits per 1,000 Participants: Imaging Advantage



The ED visit rate (***Figure 4)*** follows a fairly stable increasing trend prior to launch. The ED visit rate decreases slightly in the second quarter following innovation launch before returning to near the trend line in Qs 3, 4, and 5 postlaunch. Overall the trend line is consistent with what would be expected based on preintervention data. Without statistical testing and a better-defined comparison group, however, it is premature to conclude that the innovation has affected ED visit rates; we will examine this question as the evaluation continues.

Medicaid Claims Analysis

The Medicaid data analysis will use data from the CMS Alpha-MAX data files. Currently, Medicaid claims for Imaging Advantage are only available in Alpha-MAX through the third quarter of 2012. Because the Imaging Advantage innovation was launched on October 28, 2012, and claims for that quarter are not available, we are not presenting measures for Medicaid patients in this report. We will provide Medicaid analyses in subsequent reports as more data become available. We will report tables and figures similar to those for Medicare.

Discussion of Claims Analysis

The four measures provide descriptive data on patients enrolled in Imaging Advantage's innovation before, during, and after the launch of the innovation. Although it is necessary to report these measures to support CMS's broader assessment of its full portfolio of innovation projects, the measures may not provide a complete evaluation picture of Imaging Advantage's innovation. There are a number of reasons for this. First, the innovation was only launched on October 28, 2012. To date, we have only evaluated five quarters following innovation launch. The impact of an innovation focused on provider behavior regarding imaging and workflow may not be immediate because it takes time for providers to incorporate new sources of information. Second, the innovation is focused on imaging. Although the innovation may have a statistically significant impact on the spending, inpatient admissions, readmissions, or ED visits related to imaging, it may not have a statistically detectable impact on the variables at the total cost or utilization level, because imaging accounts for only a portion of total spending or utilization. In later reports, we will also provide imaging-specific cost and utilization data to better understand the impact of the innovation. Third, the simple trend lines provided in the figures represent trends for patients before launch of the innovation. They do not control for external factors that coincide with the innovation launch and affect the measures for both participating providers and other nonparticipating providers. As described below, we are developing additional comparison groups for Imaging Advantage. Fourth, each of the four measures has a high standard deviation, suggesting that it may be difficult to statistically distinguish between innovation effects and random fluctuation. Finally, Imaging Advantage does not have direct program participants who are officially enrolled with and receiving services from Imaging Advantage. Instead, it has indirect program participants who are receiving treatment from providers who are served by Imaging Advantage. Many of the indirect program participants will not need the imaging services that are the focus of the Imaging Advantage innovation.

Development of Comparison Groups

For Imaging Advantage, we will construct multiple comparison groups based on the innovation’s primary target, providers. First, we will examine participating providers before and after the innovation is adopted. We will separately examine participating ED providers and participating radiology staff at Tenet Health System before and after the innovation is adopted. This is important because this comparison will help isolate the impact of the innovation on outcomes among each group of providers and control for differences between individual ED providers and radiology staff. In addition to comparing ED providers and radiology staff separately before and after implementation of the innovation, we are also constructing two comparison groups of nonparticipating ED providers and radiology staff in the Tenet catchment areas, respectively. These comparison groups will control for external, noninnovation factors affecting both participating ED providers and Radiology staff and nonparticipating ED providers and radiology staff. We will use propensity score matching to identify one comparison group of nonparticipating ED providers with similar characteristics as participating ED providers at Tenet and a second comparison group of nonparticipating radiology staff with similar characteristics as participating radiology staff at Tenet. For example, characteristics may include medical specialty, medical training, age or years in practice, gender, race, practice type, and patient mix. Results for the comparison groups will be included in later reports.

1.3.3 Other Awardee-Specific Data

Overview of Data Request

RTI met with Imaging Advantage on June 30, 2014, to request the nonclaims data used to generate the measures in ***Tables 15*** and ***16***. During that meeting, Imaging Advantage noted that many of the measures we are requesting are part of their dashboard system and that it may be possible for them to provide us with access to the data directly. We are continuing to explore this possibility. It also seems that some of the measures we have requested are not currently available. For instance, Imaging Advantage is still in the process of creating a means by which to measure actual patient radiation dosage, rather than an estimate of that dosage. With or without direct access to the data, we hope to receive the data requested by late August 2014.

Health Outcomes Results

After we receive the data requested from Imaging Advantage, we will have a better understanding of what type of results we will provide. The following table shells reflect examples of findings we anticipate presenting.

Table 15. Average Patient Radiation Dosage over Time

Health Indicator	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Patient radiation dosage	—	—	—	—	—	—	—

Source: Patient-level data to be provided to RTI.
— Data not yet available.

Table 16. Percentage Reduction in Incorrect Orders, Technician Errors, and Duplicate Exams over Time

Measure	Q1	Q2	Q3	Q4	Q5	Q6	Q7
CT Exams							
Percentage reduction of duplicate CT exam orders	—	—	—	—	—	—	—
Percentage reduction of incorrect CT exam orders	—	—	—	—	—	—	—
Percentage reduction of CT radiology technician errors	—	—	—	—	—	—	—

(continued)

Table 16. Percentage Reduction in Incorrect Orders, Technician Errors, and Duplicate Exams over Time (continued)

Measure	Q1	Q2	Q3	Q4	Q5	Q6	Q7
MRI Exams							
Percentage reduction of duplicate MRI exam orders	—	—	—	—	—	—	—
Percentage reduction of MRI radiology technician errors	—	—	—	—	—	—	—
Percentage reduction of incorrect MRI exam orders	—	—	—	—	—	—	—

Source: Patient-level data to be provided to RTI.
CT = computerized tomography; MRI = magnetic resonance imaging.
— Data not yet available.

Discussion of Other Awardee-Specific Findings

After we receive data from Imaging Advantage, we will begin filling in the table shells above and begin additional analyses to report findings in future reports.

1.4 Overall Program Effectiveness Assessment

Overall, Imaging Advantage's implementation of their innovation is mostly successful. All components of the innovation have been developed and implemented, with some components (e.g., radiology outsourcing and workflow reengineering) enjoying more uniform adoption and usage than others (e.g., Radiology Advisor).

Leaders across Imaging Advantage and its partners are committed to the further implementation and success of this innovation. RTI found that innovation leaders had clear plans for developing Radiology Advisor, for instance, and were held accountable for executing the plans. The Imaging Advantage innovation included a multidisciplinary team with experience implementing various components of the innovation, notably outsourced radiology services, workflow reengineering, and teleradiology. RTI considers the innovation components to be moderately to highly complex. The awardee's experience implementing similar workflows, coupled with its knowledge of radiology modalities, processes, and guidelines, have all been important to their success.

During the May 2014 site visit, we found that most respondents view Radiology Advisor as the core component of the innovation. This electronic clinical decision support tool is a stand-alone plug-in application that appears as a separate window on the ED provider's EHR system screens. Radiology Advisor is relatively simple to implement and is intended to be unobtrusive. As a result, this innovation component "reaches" all ED providers who use the Tenet EHR system.

However, subjective provider acceptance of Radiology Advisor could be improved. During the site visit, some ED provider staff mentioned challenges with integrating Radiology Advisor into their workflow. Imaging Advantage and MedCPU were working to improve provider acceptance of this innovation component by engaging them more in the development process.

At this time, we are unable to assess implementation effectiveness for RealTime QA, which was recently developed and implemented by Imaging Advantage.

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October 2014

Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring

Annual and Site Visit Report
Intermountain Healthcare, Inc.

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OVERALL EVALUATION SUMMARY

RTI International was selected to lead an independent evaluation of the 24 Health Care Innovation Award (HCIA) awardees categorized as Community Resource Planning, Prevention, and Monitoring (Community Resource). In this role, RTI is conducting an in-depth evaluation of each innovation, as well as a cross-site evaluation that includes similar innovations targeting the same priority outcomes (e.g., emergency department visits). For each of the 24 awardees, this report presents findings from the first year of the evaluation (beginning September 23, 2013, and including data obtained by RTI as of September 11, 2014). The report is based on multiple data sources, including operational reports, self-monitoring plans, site visits, and quantitative data analysis.

The evaluation methods vary by awardee innovation, based on the type of innovation and availability of data. RTI has reviewed and coded all existing documents from the awardees through December 31, 2013, and incorporated that knowledge into each awardee's overview. Our review included the awardees' original applications for funding, original and current operational and self-monitoring plans, and quarterly narrative and monitoring reports. For this annual report, we incorporated activities reported through the awardee's seventh quarterly report (i.e., through March 31, 2014).

Between April and August 2014, teams of at least two staff from the RTI team visited all 24 awardees for 2 to 4 days, depending on the number of interviews conducted. Teams included a subject matter expert, with training and experience specific to the awardee's innovation, and a master's- or bachelor's-level colleague to take notes. Before each visit, the teams reviewed all available documentation from the awardee to learn about the innovation's goals, objectives, and status. The purpose of the site visits was to clarify our understanding of the innovation, obtain detailed information on the implementation process, and review awardee-specific data to determine which elements to incorporate into the evaluation. By August 13, 2014, all 24 awardees had been visited. This report includes thorough descriptions from the 21 site visits completed by September 11, 2014.

In addition to the site visits, we report quantitative data from two possible sources for several awardees. First, we present findings from claims analysis for awardees in this annual report if they both provided us with patient identifiers and reported enrolling participants who receive Medicare and/or Medicaid. RTI has obtained patient identifiers from most of the 24 awardees to conduct claims analysis. Second, we present data RTI obtained directly from awardees to quantify their work in addressing health care costs, quality, and patient outcomes. Data from additional awardees will be analyzed and presented in future reports, as data become available and awardees enroll sufficient participants. An update on the availability of Medicare/Medicaid claims and other awardee-specific data, analysis of data available to us as of September 11, 2014, a summary of the comparison groups, and a list of draft evaluation measures are included in each awardee section.

1. HCIA COMMUNITY RESOURCE AWARDEE: INTERMOUNTAIN HEALTHCARE, INC.

1.1 Introduction

Intermountain Healthcare, Inc. is a nonprofit integrated health care system headquartered in Salt Lake City, Utah. As an integrated health care system, it encompasses 22 hospitals, more than 150 clinics, and the SelectHealth plan that insures about 750,000 people across the state (about one-third of the state's population). Awarded $9,724,142 (and began enrolling in June 2013) to develop and pilot its unique "disruptive innovation," Intermountain seeks to implement multiple tools that will achieve the following goals within the context of its version of an accountable care organization, the shared accountable organization (SAO):

1. **Improve care** by implementing a shared decision-making model that engages Intermountain patients in a dialog with their physicians to better manage their chronic illnesses. A key aspect of innovation is shared decision making and patient activation/engagement using the Archimedes IndiGO tool.

2. **Improve health** through population management (e.g., "hotspotting") by first identifying and then targeting interventions to high-risk or high-cost patient populations.

3. **Reduce the cost of care** through a shared savings model (SSM) for both employed and affiliated physicians. Intermountain estimates that its innovation will achieve a potential cost savings of $1.7 million in Year 1 and $37 million by the end of the award period.

RTI is conducting a case study for this innovation. As part of that case study, two RTI team members conducted a site visit in June 2014; before and after the visit, our team reviewed all documentation on the innovation. We are working to obtain data directly from the awardee to assess many of the variables we discuss. This report describes findings from RTI's site visit, document reviews, follow-up calls, and analysis of data obtained by RTI through July 11, 2014. We start by describing the innovation's components and the patients targeted by the awardee.

1.1.1 Innovation Components

The Intermountain innovation is part of a broader organization-wide transformation of how care is paid for and delivered through a strategic initiative launched nearly 3 years ago known as an SAO. The primary goal of the SAO is to optimize utilization (the right care at the right time) while reducing waste, improving efficiency, and ultimately bending the cost curve. The SAO initiative covers a multitude of interventions to achieve this goal, but the

Health Care Innovation Award (HCIA) focuses on three interventions designed to accelerate the SAO:

1. **The SSM**, a physician compensation plan that replaces traditional fee for service (FFS) with a risk-adjusted global budget that compensates care at 85% FFS and 15% performance based.
2. **Population management** (hotspotting) to identify high-cost/high-utilizing patients using advanced analytics and then using this evidence to develop interventions to address the needs of these patients.
3. **Patient engagement** via the IndiGO tool and tracking of patient-centered measures of care.

These three distinct but complementary components are part of the SAO initiative and support one or more of its three aims: (1) alignment of financial incentives to pay for quality at the lowest necessary cost, (2) patient engagement, and (3) evidence-based care. First, for physicians to assume greater financial risk for outcomes of care (the SSM), the SAO must first identify its highest-cost patients and intervene to ensure that they receive appropriate, evidence-based care (population management). Second, the SAO must activate patients who could benefit from lifestyle changes that may ultimately keep them from ever becoming high-cost patients (IndiGO and patient-centered measures).

For the innovation, Intermountain contracted with Archimedes, Inc., to implement and refine the IndiGO tool into the Intermountain system (***Table 1***).

Table 1. HCIA Partners, Roles, and Locations

Partner Name	Role in HCIA Project	Location
Archimedes, Inc.	Technology vendor for the IndiGO product used for patient activation and population management	San Francisco, CA

Source: The Lewin Group, 7th quarterly report, June 7, 2014.
HCIA = Health Care Innovation Award.

Component 1: Shared Savings Model (SSM)

The SSM, a cornerstone of Intermountain's SAO strategy, is a physician compensation plan that is 85% FFS and 15% performance based. Physicians have a risk-adjusted global budget, which they use to manage the care of their patients to meet specific financial and quality targets. Providers are incentivized to meet these targets because they receive a share of the savings they produce by meeting them. The physician's share of the savings (one-third) is returned to his or her global budget. Payments are distributed on a quarterly basis, so the risk is manageable, and discussion of targets can be an ongoing part of managing the practice population. At this stage of implementation, physicians have not been asked to assume the downside risk (going over budget), although Intermountain understands that some mechanism must eventually be put in place to manage this risk. Over time, Intermountain's goal is to cover 75%–80% of patient care under the SSM and slow the rate of insurance premium growth.

The global budget model, in the view of key informants, offers advantages over the traditional capitated payment model. In the capitated model, the primary care physician (PCP) is a gatekeeper, and this role can generate silos and conflicts between primary care and specialty care. Greater accountability under an SSM means making quality and financial performance transparent to all, and the current physician contracts are being amended to allow for this new level of disclosure. According to informants, physicians are willing to share their data because they have a vested interest in seeing how others are doing compared with themselves.

The major task in the SSM work early on was identifying and selecting the appropriate quality metrics, weights, and targets. Physicians report many types of measures for various incentive plans, so a major goal was to harmonize to the extent possible the measures for the SSM. Out of the initial 263 quality measures identified, 31 were selected for incentive payments. The selection process garnered the input of various physician groups and used specific selection criteria (e.g., feasibility, evidence based) to guide the work. A practice-level dashboard provides physicians with the feedback on cost and quality impacts.

In October 2013, Intermountain launched the SSM beta as a shadow payment system of $28 million with 383 physicians spanning all specialties that cared for a relatively lower-risk population of more than 7,000 Intermountain employees in SelectHealth. At full launch (sometime in summer 2014), the SSM will expand to 1,700 physicians with a budget of $1 billion.

Component 2: Patient Engagement

IndiGO Tool

The IndiGO tool uses statistical algorithms to calculate the potential reduction in risk if patients engage in specific treatments or behaviors. Unlike risk calculators that base algorithms on population risk, IndiGO uses the patient's own family and medical history, laboratory results, behaviors, and so forth (up to 150 different variables) to calculate individualized risk. The tool is beneficial for adult patients aged 18–85 for whom a change in behavior will result in significant clinical improvement. In other words, it is a preventive tool and not intended for sick patients who may already be doing all they can to manage their condition or who will gain little or no benefit from additional treatment. An IndiGO benefit score of 8 or greater indicates use of the tool. We learned in documents provided to RTI during a site visit in June 2014 that some patients who could potentially benefit from the tool (up to as many as half in some medical groups) could be missed because the tool is available only to patients with an assigned PCP. Although PCPs are imputed for most patients, there are some exceptions. If a patient does not have an assigned PCP, he or she most likely does not visit the doctor enough to have a set PCP or receives only a fraction of his or her care within the system and his or her PCP does not practice at an Intermountain primary care clinic. In these cases, the patient is not likely to have enough data to accurately calculate IndiGO score.

The primary disease conditions and modifiable risk factors targeted by the tool are cardiac/ cardiovascular diseases (acute myocardial infarction), stroke, diabetes, obesity, sedentary behavior, smoking, hypertension, and chronic obstructive pulmonary disease. The tool also includes screenings for breast and colon cancer. The innovation has enhanced the tool by creating and deploying a new depression module. Intermountain analytics have indicated that depression is comorbid with many of the targeted chronic diseases. In future evaluation activities, RTI will look into methods that were used to validate the IndiGO tool.

An IndiGO encounter is called a “view” and is initiated when the physician clicks the IndiGO icon in the patient’s electronic medical record (EMR) and can begin up to 30 minutes before the appointment through 90 minutes after the appointment. Capturing the use of the tool *during an appointment* is an important element of tracking because the tool is meant to be used in a face-to-face visit. A physician or nurse may check a patient’s IndiGO status for other reasons outside of the appointment time frame, but these encounters with the system would have no bearing on patient activation. Thus, an “eligible visit” is one in which the physician has an opportunity to have a conversation with the patient in one or more of the following procedure categories:

- Office visits
- Consultations (e.g., nutritional)
- Preventive care
- Special service (e.g., tobacco cessation, depression screening)
- Psychiatry
- Physical medication/rehabilitation
- Confirmatory consultations (for patients with complex health care needs)

During the visit, the physician is able to visually demonstrate to the patients the reduction in risk from specific adverse events (e.g., stroke, heart attack, death) over a specified time period if they change a behavior (e.g., lose weight, adhere to their medication plan). The current mechanisms for tracking the tool's use cannot assess whether physicians are actually using the tool during the appointment to engage the patient in conversation.

IndiGO is integrated into the workflow of a practice in one of two ways. The first way is for the physician to routinely check the IndiGO portion of the EMR to determine whether the patient is eligible and then proceed with the consultation. The second way is for a designated practice staff member to run reports of those patients on the clinic schedule (the patient watch list) who are IndiGO eligible and to inform the physician before seeing the patient. Other workflow integration strategies will likely emerge as more clinics use the tool over a longer period.

The IndiGO tool is currently being delivered at 70 clinics owned by Intermountain across Utah (site visit, June 2014) over an 8-month phased rollout that began in June 2013. The rollout began with a small set of pilot clinics (three) and will eventually expand to all Intermountain primary care clinics across the state by Year 3 of the innovation.

Patient-Centered Outcomes

This component of the innovation aims to harmonize the disparate patient-centered measures currently used throughout the Intermountain system using the Patient Reported Outcomes Measurement Information System and the patient health questionnaire. These validated, self-reported measures and tools capture a patient's physical, mental, and social wellbeing and are widely used in health services research and clinical trials. The innovation supports the integration of these measures into the EMR and patient portal, My Health, as a means of tracking the patient's experience with care. Intermountain encourages all patients through various media (including television ads) to visit the My Health portal and provide their feedback. Ideally, providers would use these measures in much the same way as they would use clinical measures and tailor their treatment accordingly. The launch of these measures is slated for June 30, 2014.

Component 3: Population Management

Population management (hotspotting) involves using data analytics to identify high-cost/high-utilizing patients. The algorithms themselves are complex ranking methodologies that take into account costs and clinical outcomes over a number of years, IndiGO scores, and other risk scores. Patients whose costs are in the top 10% highest-cost population in 2 of the last 3 years, live within 30 miles of the clinic, and are older than 18 years are targeted for population management.

The hotspotting analytics committee (HAC) sets priorities, conducts analyses, and reports results to an executive committee. The scope of the HAC encompasses, identifies and disseminates, new methods of statistical analysis through education, literature reviews, and collaborations. The nine members of the HAC represent key stakeholder entities responsible for health care transformation efforts within Intermountain—the clinical programs and services, the SAO, and the SelectHealth plan.

The executive committee of the HAC uses the results of the analytics to recommend specific population management interventions (not funded by HCIA). The first of these interventions is the personalized care clinic (PCC)—an outpatient clinic located at one of the Intermountain hospitals. Patients receive a full range of medical and psychosocial care for a short period (3–6 months) until they can be returned to their PCP. The second intervention is the Community Care Management program, in which patients receive additional care and oversight within their primary care or specialty practice.

1.1.2 Program Participant Characteristics

The participants for each of the three components of the Intermountain innovation are distinct but have some degree of overlap. In our evaluation, we plan to distinguish the program's participants by component to the extent possible, as depicted in ***Table 2***. To determine whether exposure to one or more of these components results in better care and better health, we proposed in our evaluation plan to examine the increase in the number of condition-specific assessments for beneficiaries with diabetes, cardiovascular disease, and depression. Additionally, we proposed to examine improvements in health outcomes related to these assessments. The program participants of the SSM and IndiGO include both physicians and patients. The participants of the population management component would include only patients because only selected clinics have launched population management objectives.

Table 2. Participants Planned for Inclusion in Innovation (Denominator Data)

Participant Type	Data Source	Count
Adult patients in SSM practices	Intermountain	Data not available
Physicians targeted for the SSM	Intermountain	1,700
Clinics targeted for IndiGO	Intermountain	83
Eligible patients with high-benefit/risk profile	Intermountain	1,723 [1]
High-cost patients	Intermountain	1,600 [2]

Source: Intermountain site visit, June 2014.

[1] Eligible patients are identified over time; this number reflects eligible patients identified from October 2013 to May 2014.

[2] High-cost patients are those who are in the top 10% highest-cost population in 2 of the last 3 years (including the last 12 months), live within 30 miles of the clinic, meet payer requirements, and are older than age 18.

SSM = shared savings model.

Of the 379,366 patients indirectly served by one or more of Intermountain's innovations, the majority (74%) are privately insured (quarter 7 [Q7], Lewin Report). Of the 96,940 patients publicly insured, 4.2% are covered by Medicaid, 12.7% by Medicare FFS, 8.3% by Medicare Advantage, and less than 1% are dually eligible. Intermountain patients are predominantly white (85%), and more than half (65%) are aged 25–64 years. Pending a business associate agreement (BAA) with Intermountain, RTI will present demographic data (in the table shell shown as ***Table 3***) independent of those in the self-monitoring plan in future reports.

Table 3. Characteristics of All Patients Ever Enrolled in the Innovation

Characteristic	Number of Patients	Percentage of Patients
Age		
18–24	—	—
25–44	—	—
45–64	—	—
65–74	—	—
75–84	—	—
85+	—	—
Missing	—	—
Sex		
Female	—	—
Male	—	—
Missing	—	—

(continued)

Table 3. Characteristics of All Patients Ever Enrolled in the Innovation (continued)

Characteristic	Number of Patients	Percentage of Patients
Race/ethnicity		
White	—	—
Black	—	—
Hispanic	—	—
Asian	—	—
American Indian or Alaska Native	—	—
Other	—	—
Missing/refused	—	—
Payer Category		
Dually eligible	—	—
Medicaid	—	—
Medicare	—	—
Medicare Advantage	—	—

Source: Patient-level data to be provided to RTI.
— Data not yet available.

1.2 Implementation Progress

The extent to which each awardee is able to implement its innovation as planned and reach a sufficient number of patients/providers will be critical to assessing its impact on improving health and health care and reducing costs. ***Table 4*** provides the list of measures RTI plans to use in assessing the factors known to impact implementation success.

Table 4. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for Intermountain

Key Evaluation Domains	Subdomains	Measures	Data Sources
Workforce development	Provider satisfaction	Provider satisfaction with the IndiGO tool	Provider survey
Implementation effectiveness	Reach	Number/percentage of providers/physician practices participating in the SSM	EDW
		Number/percentage of physician practices using IndiGO.	EDW

(continued)

Table 4. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for Intermountain (continued)

Key Evaluation Domains	Subdomains	Measures	Data Sources
Implementation effectiveness (continued)	Reach (continued)	Number/percentage of eligible patients viewed in IndiGO during appointment	EDW
		Number/percentage of hotspotted patients seen at the personalized care clinic	EDW
		Number/percentage of hotspotted patients receiving Community Care Management.	EDW

EDW = electronic data warehouse; SSM = shared savings model.

1.2.1 Process

The implementation process has been the initial focus of the evaluation. Subsequent reports will assess the impact of the intervention as data become available. The implementation process is best evaluated through a combination of data variables, including execution of implementation that conforms to operational plans, and capacity for implementing the innovation effectively and on time. We focused on the implementation process during the awardee site visit in June 2014, asking such evaluation questions as:

- What is the overall execution of the innovation implementation (e.g., what is the actual rate of expenditures relative to the projected rate)? What are the lessons learned?
- What accomplishments are specific to hiring or training staff so that the organization can build its capacity to implement the innovation effectively?
- To what degree are providers using IndiGO and finding utility in it for patient engagement?
- How are the data analytics that support population management being used to address the needs of high-cost/high-utilizing patients?

The following sections present some of our initial insights based on what we learned during the site visit. We will build on these insights in subsequent reports with additional data from Intermountain (both qualitative and quantitative) as they become available.

Execution of Implementation

As Utah’s largest health care provider and private insurer, Intermountain has extensive capabilities for mounting large and complex innovations and strong quality improvement culture with considerable resources devoted to collecting and using data to track performance. The overall execution of the Intermountain innovation has been moderately successful in terms of fidelity. The three components (the SSM, patient engagement, and population management) have remained largely unchanged in scope and design.

The relatively high level of fidelity to the original scope and design is notable given the complexity of each innovation component. It speaks to a well-developed planning process with documented procedures, timelines, milestones, and clear staff assignments led by experienced leaders with the skills and authority to carry out their responsibilities. The innovation's team works through a defined governance structure consisting of many committees and workgroups that allow the team to interface with key decision makers throughout the organization. The innovation enjoys strong leadership support, although other aspects of the SAO initiative compete for resources and priority. Moreover, in this data-driven organization, the expectations of leaders for *quantifiable* results are high.

The launch of both the SSM and IndiGO were delayed by a lack of sufficient IT support, implementation of a new EMR, and an onerous compliance process. The implementation of a new EMR required the need to outsource work to collect patient-reported measures. Consequently, the SSM shadow payment phase, which should have launched in Q2 of 2012 (Q7 operation plan), was launched in Q4 2013 (November 2013). The IndiGO tool, which was scheduled to launch in Q4 2012, started in Q2 2013. The patient-centered measures initiative, which had no official launch date, has also encountered implementation delays due to software and IT support issues. Although the various components are now largely under way, the number of patients to be reached (more than 300,000) within the award period will be highly challenging. In the following sections, we discuss in more detail the reasons for the delays and efforts to address them.

The delays to date mean that the cumulative spend rate after 7 quarters is approximately 35% of Year 2 funding (Q7 Lewin). The forecast spend rate after 8 quarters is expected to be below the projected rate (10%–20%) for this phase of the project. Intermountain made a carry-forward request because of contract issues that will affect Year 2 spending.

Organizational Capacity and Leadership

Intermountain, an integrated health care system, consists of 22 hospitals in 9 urban centers; the Intermountain Medical Group of 185 clinics with more than 1,300 affiliated physicians and contracts with more than 1,000 unaffiliated physicians; the SelectHealth plan, which offers a variety of commercial health insurance products to employers, as well as Medicaid, Medicare Advantage, and Children's Health Insurance Program. Collectively, the Intermountain system provides 50%–60% of the medical care in Utah and insures approximately 25% of the state's population of 2.5 million (site visit, June 2014).

Intermountain has a long history of using health IT and health informatics to provide and optimize patient care spanning more than 4 decades, beginning with the introduction of the nation's first EMR system in the early 1970s. Intermountain's innovation builds on this history with relatively advanced analytic capacity, allowing it to tackle complex health care problems. Supporting the transition to the SAO is an upgrade of the current data infrastructure, known as the electronic data warehouse (EDW), through a Web-based reporting platform (funded in part by the innovation award). The platform integrates the six "data marts" that make up the EDW: (1) claims-based cost-of-care data; (2) claims-based quality measures; (3) clinical data; (4) patient experience data; (5) risk stratification data; and (6) admission, discharge, and transfer data. The integration of these datasets will provide Intermountain with detailed reporting on quality, cost, and service at the patient, condition, procedure, and population levels.

As an integrated health care system, Intermountain is in a unique position to experiment with and scale up innovation. The organization has a strong culture of quality improvement and innovation, and pilots are an expected part of delivering health care. In the 1990s, Intermountain initiated an organization-wide initiative to further leverage its analytic capacity to generate practice-based evidence for process improvement and cost containment. Those efforts have yielded a highly complex structure for systematic assessment of every clinical service line and detailed protocols that are continually assessed for safety, efficacy, efficiency, and cost. Consequently, clinical sites and staff are accustomed to participating in various initiatives and understand that this is part of how the system improves over time. The innovation sits within the Institute for Health Care Delivery Research, which employs 19 analysts to support the organization's data-driven approaches to managing care and controlling costs.

The highest levels of the Intermountain organization are heavily invested in planning and monitoring the SAO initiative, which involves 20 teams, engaging a total of 10 full-time equivalent staff spanning all levels of the organization. Those leading the HCIA innovation are part of a coordinated team that meets regularly. The implementation process has clearly defined leaders, with leads for each of the three complementary innovations that have been consistent since inception. At the clinic implementation level, for IndiGO, it has been helpful to have a champion. Participation in pilots is optional, and this is one approach to expanding IndiGO implementation.

The intense level of leadership engagement for the innovations comes with high expectations for results. The delays in implementation of IndiGO and slow adoption are a concern for the innovation's team. Without quantifiable evidence that the tool is having its intended impact, leadership is unlikely to dedicate resources to sustain the tool after award.

Such a position is perfectly in line with the organization's data-driven culture; interventions that do not demonstrate their value are not disseminated or sustained.

The breadth and depth of the SAO initiative is taxing organizational capacity; one member of the innovation team described the pace of change as "choking." Within the next 18 months, Intermountain must have all its physician practice contracts in place, so the SAO and all its components (including those covered by the innovation award) are fully operational by 2016. The SAO has also required an upgrade of the legacy EMR system to a new Cerner-based system, which has consumed a large share of IT capacity. Consequently, the IT support for the patient-reported measures component of the innovation was greatly reduced, requiring a contract with an outside vendor to complete the work. Intermountain's compliance infrastructure has also not been able to keep up with the accelerated pace of change and has created serious lags in implementation. Approval for the IndiGO tool alone took 8 months.

1.2.2 Workforce Development

Hiring and Retention

The Salt Lake City area is home to two universities—the University of Utah and Brigham Young University—with strong informatics programs that produce a well-educated workforce for the high-tech and health care sectors. Nonetheless, challenges exist when recruiting analytic staff. The innovation's leaders are working with the human resources department to conduct a market analysis to justify recalibrating salaries for these positions. Offering more competitive salaries will likely resolve this issue. There has also been turnover among implementation support staff at the clinic level. Existing staff are filling in for the short term, but for a longer-term solution, they are exploring the possibility of funding temporary staff to address the existing gaps.

Since project inception, Intermountain has hired 9.3 new staff and reassigned 11.8 Intermountain staff, for a total of 21.5 innovation staff, including administrators, IT technicians, medical staff, and behavioral health workers. Clinical staff receive no financial compensation for participation in HCIA-funded activities. No new staff were hired, and 1 staff member left in Q7.

Training

The two trainings conducted during Q7 included a physician payment model report handbook training (related to the SSM) and an IndiGO training for community-based clinical personnel (22) and nonclinical personnel (99) for a cumulative total of 344 trainees from July 2012 to March 2014. Feedback on the IndiGO training was that it was more intensive than necessary. Going forward, more attention is being focused on raising awareness of the IndiGO tool and its dedicated help desk, which operates during normal business hours. The help desk will provide information and support to clinic staff on an ad hoc basis.

1.2.3 Effectiveness

Fidelity

Important aspects of fidelity for this innovation are the degree to which Intermountain is able to implement the various components as planned. With the exception of the IndiGO tool, the Intermountain innovation is wholly a work in progress; no preexisting intervention informs the work. Thus, capturing the changes and adaptations to the components is a key focus of the evaluation, and those captured in the site visit are discussed here.

The SSM has been largely executed as planned with one major deviation. Prosoft, the software selected to carry out the physician compensation analytics, was no longer available when the innovation launched and had to be replaced. The launch of the SSM beta (pilots) with the shadow payments was on schedule but was extended by several months to summer 2014 so that physicians could become more comfortable with the arrangement. Innovation team members believe that once the payments become "more real," engagement and support will deepen. Spread across more than 300 physicians, $28 million amounts to only a few thousand dollars in savings per quarter. When the SSM formally launches, it will scale to 1,700 physicians with a budget of $1 billion.

An obvious concern for physicians is a reduction in compensation, so a key challenge has been reducing utilization without diminishing compensation. In theory, the SSM asks the physician not only to share in the savings but also the risk. So a practice that goes over the physician's budget would have that amount taken out of his or her compensation for the next quarter. Currently, the plan's beta implementation does not call for the physician to assume the downside risk, and it is not entirely clear to the SSM developers that it will be needed in the short term. However, sustaining the SSM over the long term requires some mechanism to manage the downside risk.

The IndiGO rollout has encountered more implementation challenges to fidelity. It was implemented along with other elements of the SAO initiative that were competing priorities. Tool glitches, difficulty securing IT support, and a slow compliance approval process all created unanticipated delays in the launch date. The tool undergoes regular updates with new features and enhancements, but these are adaptive refinements that are a planned part of the innovation.

Even with the experience of the pilot studies to guide the implementation, the leaders of the IndiGO project have had to devise new ways to market the tool because physicians are “bombarded” with tools and other care transformation initiatives. The team actively seeks other opportunities to present the tool to groups of providers to supplement the clinic-by-clinic outreach as the team is available.

The use of IndiGO appears to be adaptable to local practice workflow. Originally envisioned as a provider-initiated tool, the experience to date suggests that other clinical and administrative staff use the tool as well as part of team-based care. One unexpected issue was the deidentification of any IndiGO printouts per compliance requirements. Practically speaking, this means that the staff must take extra care in ensuring that any IndiGO forms distributed to the patient indeed belong to that patient. The benefit scores themselves are not computed at Intermountain but by Archimedes, which owns the algorithms, so this vendor receives the deidentified data, but the data must be reidentified once they return to Intermountain. Again, these additional steps were not anticipated at the onset of the project.

Aside from delays stemming from the compliance approval process and securing a new software vendor, the implementation of patient-centered measures remains in scope and design as planned. However, the application of these measures to their intended purposes (improving the patient experience) remains to be explored.

The data analytics component of the innovation, which facilitates population management, has also been implemented without any major deviation from the implementation plan. The analytics work is by its nature highly iterative. The algorithms are based on the unique attributes of the population and data structure, and no ready-made set of tools or methods exists to facilitate this work. The governance structure in place to guide this component also has sufficient breadth of expertise to recommend continuous refinement. In discussions with the staff managing the PCC (where hotspotted patients are referred), we learned that many of their patients were middle-aged women with substance use problems. Because the total population of hotspotted patients represents a broader demographic, the high uptake by this particular subset of the high-risk population was unexpected. We discussed two possible explanations with the team. A genuine selection bias may be occurring because it appears that men are less receptive to the intervention when it is offered to them. Another possible explanation is the hotspotting list that the staff use to select patients could be structured in a way that is also generating a bias. We will continue to examine these issues with the available data.

Reach

Indirectly, the various facets of the innovation have “touched” the care of 379,366 patients (Q7 Lewin), which is 29% more than the projected 270,011 for Q7. Of primary interest for the evaluation are the 64,690 Medicaid and Medicare beneficiaries within this patient population. Because there is no combined innovation, the evaluation will measure to the extent possible provider/physician practice “reach” and patient “reach” for each of the three components.

SSM Reach

Since its beta launch in November 2014, the SSM has operated as a shadow payment system. The estimated 22.5% of providers presented in ***Table 5*** participated in the beta and are scheduled to go live in June/July 2014. Because of the complexity of the plans with SelectHealth and the newness of the SSM, the population selected for SSM beta was a purposively lower-risk population of Intermountain employees. The state of Utah has fully capitated Medicaid and Medicare Advantage, which will assume an even greater proportion of the SelectHealth plan payer mix. Consequently, the urgency to integrate these populations into the SSM is high, and Intermountain will begin to do so in summer 2014.

Table 5. Number and Percentage of Providers Participating in the SSM as of June 2014

Month	Number of Targeted Providers	Number of Providers in the SSM	Percent of Providers Participating (Reach)
Total	1,700	383	22.5

Source: Site visit, June 2014.
SSM = shared savings model.

IndiGO Reach

In Q7, Intermountain reported 83 clinics and 275 clinicians participating in an HCIA-funded activity. These include both practices that have received training for IndiGO and those that have formally “activated.” ***Table 6a*** shows a sharp increase in the number of activated practices beginning in December 2013 and steady increases since then. Overall use remains low, however, with the highest level of physician practice reach at only 6%. Physicians have competing priorities and are using other population risk calculators, and workflow must be tailored to the practice, which involves a trial-and-error period (site visit, June 2014). A physician champion can enhance adoption, but those individuals emerge only after the tool has been in place for a sufficient period to prove its value. In addition, licensed social workers who have their own provider ID and are using IndiGO for the depression module are not currently reported in the system. The Intermountain analysts are working to address this issue, so we can more fully assess provider reach.

Table 6a. Number and Percentage of Physician Practices Participating in IndiGO

Month	Number of Activated Physician Practices	Number of Physician Practices with IndiGO Views	Percentage of Physician Practices with IndiGO Views (Reach)
June 2013	9	0	—
July 2013	9	0	—
August 2013	9	5	5.6
September 2013	9	4	4.4
October 2013	16	8	0.5
November 2013	19	8	4.2
December 2013	40	17	4.3
January 2014	50	19	3.8
February 2014	59	15	2.5
March 2014	60	13	2.2
April 2014	60	10	1.7
May 2014	60	13	2.2

Source: Site visit, June 2014.
— Data not yet available.

IndiGO "reach" at the patient level captures the extent to which eligible patients (those with an IndiGO benefit score of 8 or greater) receive one IndiGO encounter within a 12-month period (***Table 6b***). More than one encounter within 6–12 months is not generally indicated. The number of eligible patients has grown steadily since August 2013 to more than 24,000; however, the percentage with views remains low—less than 2%. The low level of patient "reach" is consistent with low physician practice "reach."

Table 6b. IndiGO Patient Utilization and Reach for Each Month since Launch

Month	Number of Eligible Patients (Score =>8)	Number of Patients Viewed in IndiGO During Appointment	Percentage of Eligible Patients Viewed (Reach)
June 2013	0	0	0
July 2013	0	0	0
August 2013	526	18	3.4
September 2013	523	37	7.1
October 2013	819	82	10.0

(continued)

Table 6b. IndiGO Patient Utilization and Reach for Each Month since Launch (continued)

Month	Number of Eligible Patients (Score =>8)	Number of Patients Viewed in IndiGO During Appointment	Percentage of Eligible Patients Viewed (Reach)
November 2013	1,260	63	5.0
December 2013	2,123	53	2.5
January 2014	3,070	62	2.0
February 2014	2,969	38	1.3
March 2014	3,405	29	0.9
April 2014	3,668	23	0.6
May 2014	5,768	40	0.7
Total	—	**445**	—

Source: Site visit, June 2014.
— Data not reported.

Population Management

As of June 2014, 1,200 patients were targeted and 400 were referred to Community Care Management (site visit, 2014). We do not have data at this time to allow us to calculate the number and percentage of patients who have received these service interventions. The staff of the PCC indicated that more than 200 patients had been seen there since February 2014. One potential issue affecting reach is the complexity of these cases. Ideally, the PCC is a short-term arrangement (3–6 months), and once patients are stabilized, they are referred back to their PCP. However, some patients are staying on longer than planned, which means fewer new patients can be accommodated.

Dose

The indicated "dose" of the tool is annually, based on the early experiences with the tool. Patients who have had an IndiGO view within the past year are excluded from additional views because the quality of the conversations and insights do not appear to improve with additional exposure to the tool. Therefore, we do not consider dose a relevant construct for the evaluation of this innovation.

1.3 Evaluation Outcomes

There are two possible types of quantitative data that RTI will use in assessing the impact of the awardee's innovation on key outcomes. These include claims data for Medicare and/or Medicaid beneficiaries and other administrative or utilization data that the awardee is collecting. (We have labeled these as "other awardee-specific data.") We are in the process of finalizing our assessment of all the available data sources and requesting data directly from each awardee. As those data are received, we will incorporate the findings into our quarterly/annual reports. The following sections present descriptive findings from the quantitative outcome data provided to RTI as of July 11, 2014.

1.3.1 Measures for Evaluation

After the site visit, the data management and site visit teams met to review each of the measures listed in the awardee's self-monitoring measurement plan (i.e., data review meeting). The measures listed in ***Tables 4*** and ***7*** reflect the measures determined as most relevant for our evaluation of Intermountain's innovation.

Table 7. Outcome Measures Requested from Intermountain

Key Evaluation Domains	Subdomains	Measures	Data Sources
Clinical effectiveness	Cardiovascular disease[1]	Percentage of cardiovascular patients with CAD who have a LDL-C result <100 mg/dL	CV registry
		Percentage of patients with CAD who were prescribed beta-blocker therapy	CV registry
		Percentage of patients who had a left ventricular ejection fraction assessment	CV registry
	Diabetes	Percentage of patients with diabetes who received a HbA1c and lipid profile assessment	Diabetes registry
	Mental health	Number of patients screened for clinical depression using PHQ-9	Depression registry
		Percentage of patients with major depression who remained on an antidepressant medication treatment.	Depression registry
	Weight management	Percentage of patients who are overweight (BMI 25.0–29.9) or obese (BMI >30)	HELP[2]—EMR
Health outcomes	Cardiovascular disease*	Percentage of patients with CAD with a BP <130/80 mm Hg and LDL- C <100 mg/dL	Claims/lab/CV registry/EMR
		Percentage of patients with CAD who have an LDL-C result <100 mg/dL	Claims/lab/CV registry/EMR
	Diabetes	Percentage of patients with diabetes who had HbA1c >9.0%	Diabetes registry
	Hypertension	Percentage of patients with a diagnosis of hypertension with BP <140/90 mm Hg	Claims/lab

(continued)

Table 7. Outcome Measures Requested from Intermountain (continued)

Key Evaluation Domains	Subdomains	Measures	Data Sources
Health care outcomes	Utilization	ED visit rate	HELP[1]—EMR
		All-cause admission rate	Claims
		Admission rates due to diabetes, hypertension, and cardiovascular disease	Claims
		Readmission rate	Claims
		ED visit rate—diabetes	HELP[1]—EMR
	Cost	Spending per patient	Claims
		Cost savings	Claims

[1] Includes patients aged 18–75 who were discharged alive for acute myocardial infarction, coronary artery bypass graft, or percutaneous coronary interventions, or who had a diagnosis of ischemic vascular disease.

BMI = body mass index; BP = blood pressure; CAD = coronary artery disease; CV = cardiovascular; ED = emergency department; EMR = electronic medical record; HbA1c = glycated hemoglobin; LDL-C = low-density lipoprotein cholesterol; PHQ-9 = patient health questionnaire.

1.3.2 Claims Data

As part of a broad assessment of health care innovations, the Center for Medicare & Medicaid Innovation (CMMI) is assessing the impact of its programs, including those funded specifically by HCIAs, on four core measures. The four core measures are as follows:

- health care spending per patient,
- hospital inpatient admissions,
- hospital unplanned readmissions, and
- ED visits.

Collectively, CMMI programs are anticipated to slow the increase in health care spending, reduce hospital admissions, reduce avoidable hospital readmissions, and prevent unnecessary ED visits. We are reporting these measures for all HCIA Community Resource Planning awardees so that the collective impact of the awards can be assessed. Intermountain's innovation targets specific conditions (e.g., heart disease, diabetes, depression) and may have significant impacts on spending, admissions, readmissions, and ED visits for the targeted conditions but not have a statistically detectable impact on the measures at the aggregate level because the targeted conditions represent only a small fraction of total spending, inpatient admissions, and ED visits.

The measures are calculated through analysis of Medicare and Medicaid FFS claims. Currently, complete Medicare claims are available through the end of 2013. Medicaid claims for Utah, however, are only available through the second quarter of 2011. The Intermountain innovation has three components, which launched on different dates. The claims analysis will include the patient engagement component via the IndiGO tool, which began enrolling patients in June 2013; the SSM, which began enrolling physician practices in November 2013; and the patients who are identified and receiving follow-on care as part of the population management component (hotspotting).

- **Health Care Spending per Patient.** For Medicare beneficiaries, health care spending per patient includes Part A and Part B Medicare expenditures for persons enrolled in the Part A and Part B FFS program. The variable focuses on Medicare FFS spending, so Medicare managed care (Part C) services are excluded, as are beneficiary copayments. Medicare Part D prescription spending is also excluded. Spending is reported on a per-person per-quarter basis. If a beneficiary is not enrolled for every month in a quarter, spending (except for hospital inpatient spending) is prorated to a quarterly basis based on the number of days enrolled during the quarter. Because hospital inpatient admissions are both rare and expensive, spending is not prorated for hospital inpatient spending. Prorating is also not performed for beneficiaries who die during a quarter.

  For Medicaid beneficiaries, health care spending per patient is reported for FFS beneficiaries. Beneficiaries are only included in the analysis for spending (and the other measures) during periods when they are enrolled in Medicaid.

- **Hospital Inpatient Admissions.** This variable measures hospitalization, the single most expensive component of health care spending. Patients kept overnight in observation beds are excluded from this measure. Inclusion criteria for the analysis are the same as for spending. Hospital inpatient admissions are not prorated based on the number of days eligible during the quarter. All-cause inpatient admissions and ACSC admissions are reported separately, under the assumption that a greater share of ACSC admissions can be prevented by appropriate ambulatory care. The mean quarterly admission rate per 1,000 patients is reported.

- **Hospital Readmissions.** Hospital readmission rates serve a dual purpose in evaluating innovation impacts. Readmissions add to the costs of a prior hospitalization, and they often reflect a problem in the care provided during the first admission. All-cause readmissions are defined as a follow-up admission to any short-term acute general or long-term care hospital within 30 days of a discharge from another hospital of the same type. We ignore multiple admissions within one day of an initial admission because these often represent transfers between hospitals. We define index hospitalizations that begin during the quarter and follow each index admission for 30 days, even when the follow-up period extends beyond the end of the quarter. Inclusion criteria for the analysis are the same as for spending. We also calculate readmissions for persons with ACSC. The person's ACSC status is defined by his or her first hospitalization during the quarter. The readmission rate equals the number of readmissions divided by the number of index hospitalizations during the quarter. Planned readmissions are excluded from the calculation of the numerator.

Quarterly mean readmission and ACSC readmission rates per 1,000 admissions are reported.

- **ED Visits.** ED visits are sometimes viewed as a symptom of the inability of the community's health care system to provide adequate preventive and ambulatory care visits. We report an all-cause ED visit rate that excludes ED visits resulting in an inpatient admission (which presumably represent unavoidable visits) and includes overnight ED visits without an inpatient admission. Inclusion criteria for the analysis are the same as for spending, and ED visits are also subject to the same prorating formula as for spending. The mean quarterly ED visit rate per 1,000 patients is reported.

Medicare Claims Analysis

We expect to include Medicare claims analyses in subsequent reports, but we do not have patient identifiers to support Medicare analysis at this time. The primary focus of the claims analysis will be on patients participating in the IndiGO component of Intermountain's innovation, although we will also explore the feasibility of analyzing Medicare claims for patients in the SSM practices and the patients who were identified through the population management (hotspotting) component.

The analysis will include Medicare beneficiaries enrolled across Intermountain's innovations who were enrolled in FFS Medicare Parts A and B at some point between 2010 and 2013. We will confirm the exact number of Medicare beneficiaries enrolled once we receive patient identifiers from Intermountain. The analysis will use data from the Centers for Medicare & Medicaid Services (CMS) Chronic Conditions Data Warehouse. Measures will be presented for these beneficiaries in the quarters before and after the innovation was launched in June 2013 for IndiGO and November 2013 for the SSM, as well as January 2014 for population management. ***Appendix A*** shows the claims analyses tables that will be presented for Medicare.

In addition to the tabular format, we will present figures showing each measure as a function of time. Values in quarters before the innovation's launch on June 2013 for IndiGO and November 2013 for the SSM will be shown in one color, and values for quarters during and after launch will be shown in another color. The figures will include a trend line based on a linear regression of prelaunch values.

Medicaid Claims Analysis

The Medicaid data analysis will use data from the CMS Alpha-Medicaid Analytic eXtract (MAX) data files. Currently, Medicaid claims for Intermountain are only available in Alpha-MAX through the second quarter of 2011. Because we do not have patient identifiers, and Intermountain Healthcare's innovation was launched on June 2013 for IndiGO, November 2013 for the SSM, and January 2014 for hotspotting, we do not yet have claims data for

Medicaid enrollees in the innovation. Thus, we are not presenting measures for Medicaid patients in this report. We will provide Medicaid analyses in subsequent reports as more data become available. We will report tables and figures similar to those for Medicare (see ***Appendix A***).

Discussion of Claims Analysis

The claims measures will provide descriptive data on patients enrolled in Intermountain Healthcare's innovation before, during, and after its launch. Although it is necessary to report these measures to support CMS's broader assessment of its full portfolio of innovation projects, the measures may not provide a complete evaluation picture of the innovation. There are a number of reasons for this. First, the innovation was only launched in June 2013 for IndiGO, November 2013 for the SSM, and January 2014 for population management (hotspotting). The impact of the IndiGO initiative to try to engage high-risk patients in specific treatments or change behavior may not be immediate because it takes time for providers to incorporate new sources of information and for patient management to achieve changes in health care utilization. In addition, although the SSM incentivizes providers to better manage the care of their patients through financial and quality targets, the impact of the alternative payment model may be long term. Moreover, the period covered by claims analysis for the SSM beginning in November 2013 through summer 2014 was a shadow payment system in which no real compensation was provided, so we do not expect to see any tangible impact until real compensation begins. Second, Intermountain is a highly innovative delivery system, and the simple trend lines provided do not control for external factors that coincide with the innovation launch and affect the measures both for patients included in the innovation and those included in the control groups. Finally, according to the most recent data, Medicare FFS beneficiaries represent only 12.7% of the patients served by Intermountain, and Medicaid beneficiaries represent only 4.2%.

Development of Comparison Groups

In addition to comparing patients served before and after implementation of the innovation, we are constructing relevant control groups of Medicare and Medicaid FFS patients also served by Intermountain but not participating in the innovations. For the SSM, we propose examining the claims data for patients receiving care in one of the practices that joined the SSM versus those that did not. Because these results will likely be presented at the practice level, we will use propensity score matching to create a control group that has similar characteristics to those practices that are participating, such as size, specialty, and patient mix.

The IndiGO component of the innovation targets patients with a benefit score of 8 or greater, which on average is about 15% of the clinics' volume. Intermountain is in the process of making a business case for how long the intervention should last and what form it should take. We believe the testable hypothesis is whether targeting patient care based on risk benefits calculated through a software algorithm leads to more efficient allocation of resources compared with standard care (i.e., a doctor's judgment). With this in mind, our goal is to evaluate health care utilization for all IndiGO-eligible patients (those with a score of 8 or higher) who did not receive an IndiGO view compared with those who did before and after the intervention period. We are using propensity score matching to identify patients with similar characteristics, such as risk score, chronic conditions, age, and gender. For this analysis, Intermountain will need to provide IndiGO scores linked to patient identifiers. Results for the comparison group will be included in later reports.

1.3.3 Other Awardee-Specific Data

Intermountain has requested that RTI enter into a BAA with it before providing any patient-level data to RTI. During the site visit in June 2014, Intermountain noted that the BAA process could take a few more months. Once the BAA is in place, we will meet with Intermountain to request the raw patient-level and practice-level data that were used to generate each of the measures in ***Tables 4*** and **7** for each quarter.

Overview of Data Requested

As of mid-October 2014, we have not yet received any patient identifiers because of the pending BAA (noted previously). Once the BAA is in place, Intermountain has agreed to submit Social Security numbers (SSNs) or names, addresses, sexes, and dates of birth (for patients for whom SSNs are not available) for both Medicare and Medicaid participants.

Health Outcomes

Once we receive data from Intermountain, we will have a better understanding of what type of results we will provide. The following table shells reflect examples of findings we anticipate presenting. ***Table 8*** will be converted to a series of run charts showing the percentage of patients reflecting each health measure over time. These data will be presented separately by component exposure (the SSM, IndiGO, and population management).

Table 8. Health Indicators and Outcomes over Time

Measure	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Diabetes							
Percentage of patients who receive a lipid profile and HbA1c assessment	—	—	—	—	—	—	—
HbA1c poor control (HbA1c >9.0%)	—	—	—	—	—	—	—
Heart health							
Percentage of cardiovascular patients who receive LDL-C screening	—	—	—	—	—	—	—
Percentage of coronary artery disease patients on beta-blocker therapy	—	—	—	—	—	—	—
Percentage of congestive heart failure patients who receive a left ventricular ejection fraction assessment	—	—	—	—	—	—	—
Total control: BP <130/80 mm Hg, LDL-C <100 mg/dL	—	—	—	—	—	—	—
Controlling high BP (< 140/90 mm Hg)	—	—	—	—	—	—	—
Percentage of coronary artery disease patients with lipid control (i.e., patients who have a documented plan of care to achieve LDL-C <100 mg/dL, including at a minimum the prescription of a statin)	—	—	—	—	—	—	—
Mental health							
Percentage of patients who receive antidepressant medication management (i.e., treated with antidepressant medication and remained on an antidepressant medication treatment)	—	—	—	—	—	—	—
PHQ-9 <10	—	—	—	—	—	—	—
Weight management							
Weight screening completed using BMI	—	—	—	—	—	—	—
Overweight: 25<BMI<30 Obesity: BMI >30	—	—	—	—	—	—	—

Source: Patient-level data to be provided to RTI.
BP = blood pressure; BMI = body mass index; HbA1c = glycated hemoglobin; LDL-C = low-density lipoprotein cholesterol; PHQ-9 = patient health questionnaire; Q = quarter.
— Data not yet available.

Similar to ***Table 8***, ***Table 9*** will be converted into a series of run charts showing the percentage of patients reflecting each health measure over time for each innovation component. ***Tables 10*** and ***11*** will reflect similar information.

Table 9. Health Indicators and Outcomes over Time by Innovation Component—Patients in SSM Practices

Measure	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Diabetes							
Percentage of patients who receive a lipid profile and HbA1c assessment	—	—	—	—	—	—	—
HbA1c poor control (HbA1c >9.0%)	—	—	—	—	—	—	—
Heart health							
Percentage of cardiovascular patients who receive LDL-C screening	—	—	—	—	—	—	—
Percentage of coronary artery disease patients on beta-blocker therapy	—	—	—	—	—	—	—
Percentage of congestive heart failure patients who receive a left ventricular ejection fraction assessment	—	—	—	—	—	—	—
Total control: BP <130/80 mm Hg, LDL-C <100 mg/dL	—	—	—	—	—	—	—
Controlling high BP (<140/90 mm Hg)	—	—	—	—	—	—	—
Percentage of coronary artery disease patients with lipid control (i.e., patients who have a documented plan of care to achieve LDL-C <100 mg/dL, including at a minimum the prescription of a statin)	—	—	—	—	—	—	—
Mental health							
Percentage of patients who receive antidepressant medication management (i.e., treated with antidepressant medication and remained on an antidepressant medication treatment)	—	—	—	—	—	—	—
PHQ-9 <10	—	—	—	—	—	—	—
Weight management							
Weight screening completed using BMI	—	—	—	—	—	—	—
Overweight: 25<BMI<30 Obesity: BMI >30	—	—	—	—	—	—	—

Source: Patient-level data to be provided to RTI.
BMI = body mass index; BP = blood pressure; HbA1c = glycated hemoglobin; LDL-C = low-density lipoprotein cholesterol; PHQ-9 = patient health questionnaire; Q = quarter; SSM = shared savings model.
— Data not yet available.

Table 10. Health Indicators and Outcomes over Time by Innovation Component—Patients in IndiGO

Measure	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Diabetes							
Percentage of patients who receive a lipid profile and HbA1c assessment	—	—	—	—	—	—	—
HbA1c poor control (HbA1c >9.0%)	—	—	—	—	—	—	—
Heart health							
Percentage of cardiovascular patients who receive LDL-C screening	—	—	—	—	—	—	—
Percentage of coronary artery disease patients on beta-blocker therapy	—	—	—	—	—	—	—
Percentage of congestive heart failure patients who receive a left ventricular ejection fraction assessment	—	—	—	—	—	—	—
Total control: BP <130/80 mm Hg, LDL-C <100 mg/dL	—	—	—	—	—	—	—
Controlling high BP (<140/90 mm Hg)	—	—	—	—	—	—	—
Percentage of coronary artery disease patients with lipid control (i.e., patients who have a documented plan of care to achieve LDL-C <100 mg/dL, including at a minimum the prescription of a statin)	—	—	—	—	—	—	—
Mental health							
Percentage of patients who receive antidepressant medication management (i.e., treated with antidepressant medication and remained on an antidepressant medication treatment)	—	—	—	—	—	—	—
PHQ-9 <10	—	—	—	—	—	—	—
Weight management							
Weight screening completed using BMI	—	—	—	—	—	—	—
Overweight: 25<BMI<30 Obesity: BMI >30	—	—	—	—	—	—	—

Source: Patient-level data to be provided to RTI.
BMI = body mass index; BP = blood pressure; HbA1c = glycated hemoglobin; LDL-C = low-density lipoprotein cholesterol; PHQ-9 = patient health questionnaire; Q = quarter.
— Data not yet available.

Table 11. Health Indicators and Outcomes over Time by Innovation Component—Patients in Population Management

Measure	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Diabetes							
Percentage of patients who receive a lipid profile and HbA1c assessment	—	—	—	—	—	—	—
HbA1c poor control (HbA1c >9.0%)	—	—	—	—	—	—	—
Heart health							
Percentage of cardiovascular patients who receive LDL-C screening	—	—	—	—	—	—	—
Percentage of coronary artery disease patients on beta-blocker therapy	—	—	—	—	—	—	—
Percentage of congestive heart failure patients who receive a left ventricular ejection fraction assessment	—	—	—	—	—	—	—
Total control: BP <130/80 mm Hg, LDL-C <100 mg/dL	—	—	—	—	—	—	—
Controlling high BP (<140/90 mm Hg)	—	—	—	—	—	—	—
Percentage of coronary artery disease patients with lipid control (i.e., patients who have a documented plan of care to achieve LDL-C <100 mg/dL, including at a minimum the prescription of a statin)	—	—	—	—	—	—	—
Mental health							
Percentage of patients who receive antidepressant medication management (i.e., treated with antidepressant medication and remained on an antidepressant medication treatment)	—	—	—	—	—	—	—
PHQ-9 <10	—	—	—	—	—	—	—
Weight management							
Weight screening completed using BMI	—	—	—	—	—	—	—
Overweight: 25<BMI<30 Obesity: BMI >30	—	—	—	—	—	—	—

Source: Patient-level data to be provided to RTI.
BMI = body mass index; BP = blood pressure; HbA1c = glycated hemoglobin; LDL-C = low-density lipoprotein cholesterol; PHQ-9 = patient health questionnaire; Q = quarter.
— Data not yet available.

Discussion of Other Awardee-Specific Findings

Once we receive data from Intermountain, we will review, clean, merge, and begin conducting descriptive analyses to fill in the table shells. At that point, we will be in a better position to discuss findings related to the other awardee-specific data.

1.4 Overall Program Effectiveness to Date

Overall, the implementation of the Intermountain innovation has been moderately successful, but we have no data at this time by which to assess the impact of the innovation on health care utilization, health outcomes, or cost. The IndiGO tool and the population management (hotspotting) have been fully launched; the SSM and the patient-centered measures had not been fully launched at the time of the June 2014 site visit but were anticipated to start within a month or two of the visit. The scope and scale of the SAO initiative has taxed Intermountain capacity; particularly, the unanticipated change to a new Cerner EMR system has consumed most of the organization’s IT capacity. As a result, all of the components have either had to wait longer than anticipated to receive IT support or contract with an outside vendor to complete the work. Obtaining approval from compliance officers has been lengthy and difficult and has created unanticipated delays in the timeline.

The innovation also receives a high level of leadership support and engagement but accordingly expects to see tangible evidence of success before fully committing to one or more of the innovation components. At this point, the innovation component that may be most vulnerable is the IndiGO tool. The delays in rollout have negatively affected the tool’s reach to clinical sites, and it will be difficult to translate any statistically detectable impact on health outcomes unless the number of patients exposed to the tool increases sharply. A number of early adopters have eagerly embraced the tool, but as with most new technologies, some degree of coaching and championing is required to promote adoption and maintenance.

The impact of the innovation on the beneficiary population in particular may not be detectable in claims for several quarters to come because the one component that has the greatest potential for beneficiary reach—the SSM—was still in the shadow payment phase as of June 2014.

APPENDIX A

Table A-1. Baseline and Intervention Trends in Health Care Spending per Patient

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—

Savings per Patient

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Spending rate: total quarter (i.e., quarterized) payments/number of unique patients. Savings per patient: difference in comparison minus the intervention’s average spending rates.
— Data not yet available.

Table A-2. Baseline and Intervention Trends in Admissions per 1,000 Patients

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

Awardee Number	**Description**	**Baseline Quarters**								**First Intervention Year**			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								**First Intervention Year**			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Admit rate: total unquarterized admissions/number of unique patients.
— Data not yet available.

Table A-3. Baseline and Intervention Trends in Readmissions per 1,000 Admissions

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total admissions	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total Admissions	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Readmit rate: sum of all readmissions to eligible hospital within 30 days/all admissions in the quarter. Total admissions: all eligible admissions in the quarter.
— Data not yet available.

Table A-4. Baseline and Intervention Trends in ED Visits per 1,000 Patients

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: ED rate: total quarterized ED visits and observation stays/number of unique patients.
— Data not yet available.

October 2014

Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring

Annual and Site Visit Report
Mary's Center for Maternal and Child Care

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OVERALL EVALUATION SUMMARY

RTI International was selected to lead an independent evaluation of the 24 Health Care Innovation Award (HCIA) awardees categorized as Community Resource Planning, Prevention, and Monitoring (Community Resource). In this role, RTI is conducting an in-depth evaluation of each innovation, as well as a cross-site evaluation that includes similar innovations targeting the same priority outcomes (e.g., emergency department [ED] visits). For each of the 24 awardees, this report presents findings from the first year of the evaluation (beginning September 23, 2013, and including data obtained by RTI as of September 11, 2014). The report is based on multiple data sources, including operational reports, self-monitoring plans, site visits, and quantitative data analysis.

The evaluation methods vary by awardee innovation, based on the type of innovation and availability of data. RTI has reviewed and coded all existing documents from the awardees through December 31, 2013, and incorporated that knowledge into each awardee's overview. Our review included the awardees' original applications for funding, original and current operational and self-monitoring plans, and quarterly narrative and monitoring reports. For this annual report, we incorporated activities reported through the awardee's seventh quarterly report (i.e., through March 31, 2014).

Between April and August 2014, teams of at least two staff from the RTI team visited all 24 awardees for 2 to 4 days, depending on the number of interviews conducted. Teams included a subject matter expert, with training and experience specific to the awardee's innovation, and a master's- or bachelor's-level colleague to take notes. Before each visit, the teams reviewed all available documentation from the awardee to learn about the innovation's goals, objectives, and status. The purpose of the site visits was to clarify our understanding of the innovation, obtain detailed information on the implementation process, and review awardee-specific data to determine which elements to incorporate into the evaluation. By August 13, 2014, all 24 awardees had been visited and a thorough description of our findings included in each of the 24 awardee sections.

In addition to the site visits, we report quantitative data from two possible sources for several awardees. First, we present findings from claims analysis for awardees in this report if they both provided us with patient identifiers and reported enrolling participants who are Medicare and/or Medicaid beneficiaries. RTI has obtained patient identifiers from most of the 24 awardees to conduct claims analysis. Second, we present data RTI obtained directly from awardees to quantify their work in addressing health care costs, quality, and patient outcomes. Data from additional awardees will be analyzed and presented in future reports, as data become available and awardees enroll sufficient participants. An update on the availability of Medicare/Medicaid claims and other awardee-specific data, analysis of data available to us and cleaned as of September 11, 2014, a summary of the comparison groups, and a list of draft evaluation measures are included in each awardee section.

1. HCIA COMMUNITY RESOURCE AWARDEE: MARY'S CENTER FOR MATERNAL AND CHILD CARE

1.1 Introduction

Mary's Center for Maternal and Child Care is a federally qualified health center (FQHC) in Washington, DC, that provides health care, social services, and family literacy programs, and is the fiduciary agent (awarded $14,991,005, began enrolling in March 2013) to establish the Capital Clinical Integrated Network (CCIN). CCIN is a new entity, still acquiring 501(c)(3) status, that uses community health workers (CHWs) and a combination of high-touch and high-tech strategies to improve access to and coordination of primary care. CCIN has the following goals:

1. **Reduce costs** related to hospitalization, emergency department (ED) use, prescription use, primary care visits, and specialty visits by $17,712,000.
2. **Improve care** by increasing patient enrollment in primary care with timely, coordinated access to relevant health care information.
3. **Improve health** by increasing appropriate medication use among patients with asthma, by decreasing glycated hemoglobin (HbA1c) above 9 among patients with diabetes, and by reducing blood pressure below 140/90 among patients with hypertension.

RTI is conducting an in-depth case study for this innovation. As part of that case study, two RTI team members conducted a site visit in May 2014; before and after the visit, our team reviewed all documentation on the innovation. We are working to obtain data directly from the awardee to assess many of the variables we discuss. This report describes findings from RTI's site visit, document reviews, follow-up calls, and analysis of data obtained and cleaned by RTI through September 11, 2014. We start by describing the innovation's components and the patients targeted by the awardee.

1.1.1 Innovation Components

The CCIN innovation has three components: (1) training CHWs and implementing a behavior change innovation with eligible participants; (2) developing a health information technology (HIT) Hub (i.e., Capital Partners in Care) to electronically link Medicaid, safety net providers, and CCIN in the District of Columbia; and (3) developing a shared savings model that will be sustainable after the Centers for Medicare & Medicaid Services (CMS) Health Care Innovation Award (HCIA) funding ends. The innovation has the following objectives and relies on the partners presented in ***Table 1***:

- Recruit, train, and retain CHWs who can work with primary care providers (PCPs) to ensure that the patient receives the right care at the right time.
- Develop and execute an effective patient outreach strategy.

- Develop a case management system, known as SyntraNet, to track and monitor patients over time to maintain details on the services and care provided to each.

- Develop a fully functional, user-friendly HUB.

- Establish a fully functional governance structure for the HUB that fairly and fully represents the needs of HUB subscribers.

Table 1. HCIA Partners, Roles, and Locations

Partner Name	Role in HCIA Project	Location
Thrasys, Inc.	Health information technology vendor	San Francisco, CA
Mary's Center for Maternal and Child Care	Fiduciary agent, medical provider, and HUB partner that helped create and is a close partner to CCIN	Washington, DC
District of Columbia Department of Health Care Finance	District Medicaid/Medicare agency/claims data provider	Washington, DC
Unity Health Care	Partner medical provider, HUB partner	Washington, DC
AmeriHealth DC	District Medicaid MCO, HUB partner	Washington, DC
Trusted Health Plan	District Medicaid MCO, HUB partner	Washington, DC
La Clinica del Pueblo	Care partner, partner on the technology committee	Washington, DC
So Others Might Eat	Care partner, partner on the technology committee	Washington, DC
Bread for the City	Care partner, partner on the technology committee	Washington, DC
Providence Hospital and Physician Enterprise	Care partner, partner on the technology committee	Washington, DC
DC Primary Care Association	HUB implementation and governance	Washington, DC
Street Calls	Transportation partner	Washington, DC
MTM, Inc.	Transportation partner	Washington, DC
Battle's Transportation	Transportation partner	Washington, DC

Source: Site visit conducted May 2014.
CCIN = Capital Clinical Integrated Network; HCIA = Health Care Innovation Award; MCO = managed care organization.

Component 1: CHWs

The goal of the CHW program is to actively connect persistently ill persons on Medicaid with primary care and to use a home health approach to implement behavioral health change, increase access to health care, and reduce inappropriate use of the ED. CCIN's CHW program is a behavior change innovation that uses CHWs to work with enrolled participants for a 3-month period. During this 3-month period, CHWs guide participants through a series of up to six home visits on goal setting (e.g., what does the participant realistically want to achieve in the 90 days) and creating care plans, individualized health education, direct service delivery (blood pressure checks, glucose testing), monitoring and follow-up, medication management, patient advocacy, and assistance with service coordination. CHWs also facilitate any needed community linkages (with health or social service organizations). The goal of this program is to connect persons in the District of Columbia who are on Medicaid and who overuse the ED with a primary medical home and to help them understand appropriate times to visit the ED (vs. their PCP).

Because of changes in the original model to be explained later in this report, CHWs spend more than 50% of their time on participant recruitment. CHWs have attempted to recruit 12,927 patients into the program, with 1,920 (15%) of those becoming participants.

After recruitment, CHWs will schedule home visits to assess the participants' health, conduct basic blood pressure and glucose testing, document the participants' medication so the registered nurse (RN) supervisor can reconcile the medications, assess the home environment, and determine how often and where the participant seeks medical attention. Realistic goals are set for the 3-month period, and CHWs attempt to conduct biweekly in-home visits. If possible, CHWs also try to accompany participants to a medical visit to support them in engaging with the health care provider and advocating for themselves and their health care. ***Table 2*** displays the characteristics and functions of CCIN's CHWs.

The participant's period of enrollment in the CCIN program is typically 90 days when at least one of the following conditions is met: (1) six successful home visits, (2) three successful home visits, or (3) two successful home visits and the completion of a goal.

Table 2. CCIN CHW Functions and Training

Characteristic Type	CCIN CHW Role
Title	CHW
Minimal qualifications	GED/high school diploma
Functions	Health education Individualized goal setting Outreach and recruitment Direct services delivery (blood pressure checks, HbA1c) Medication management/reconciliation Patient advocacy Patient monitoring and follow-up Service coordination (appointment, referrals) Community linkages (coordination of care with health, human, and social service organizations)
Established continuing education program	None

CCIN = Capital Clinical Integrated Network; CHW = community health worker; GED = General Educational Development; HbA1c = glycated hemoglobin.

Care Coordination System: SyntraNet

CCIN CHWs document their work in SyntraNet, a care coordination platform developed by CCIN with the contractor Thrasys to document the unique type of home visits that these CHWs conduct. SyntraNet was developed to reflect the specialized care and support that the CHWs provided and to adequately document the work that was happening. SyntraNet is specific and unique because the workflow for this model is new. Most of the existing care coordination applications are based on electronic medical records (EMRs), which involve the clinician or user interacting with patients and providing care at a hospital or clinic. SyntraNet involves a different approach: CHWs who work in patients' homes to try and connect them with clinical care.

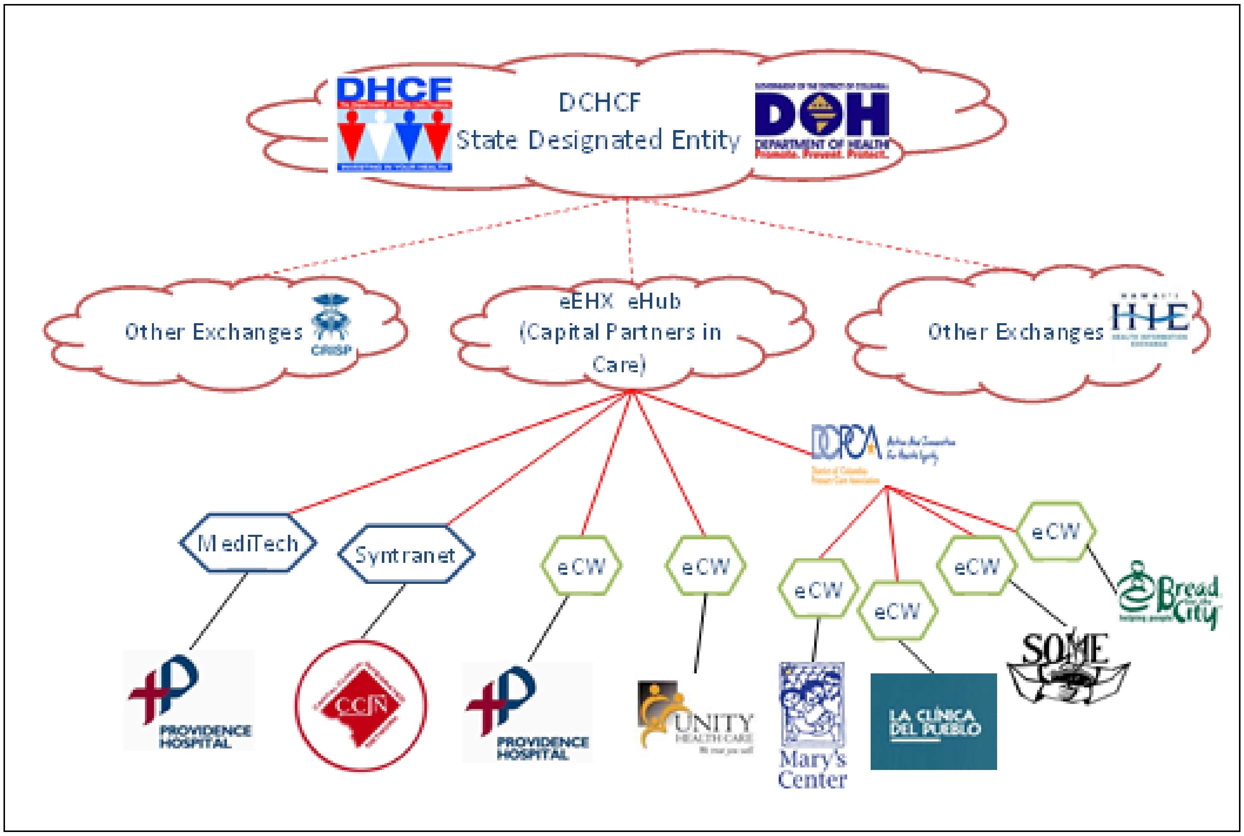
To develop SyntraNet from the ground up, the CCIN HIT staff worked with CHWs/RN supervisors and outcome-measurement staff to customize the application to make it as useful as possible. CHWs can use SyntraNet's electronic connectivity feature to chart for participants while conducting home visits. The mobile part of the SyntraNet application is a Website that allows scheduling and appointment reminders and includes participants' address information to help eliminate the paper process. The SyntraNet application integrates with the calendar and is specifically designed with a file device containing contacts, appointments, a calendar, and links to a map of patients' addresses. Each CHW is given a cell phone, a laptop, and a jet pack (a mobile hot spot device), so the system can be used in the field. Because the system is Web based, no information resides on any of the devices, and all of the information is virtual, so Health Insurance Portability and Accountability Act (HIPAA) risk is minimized.

An additional benefit of SyntraNet is the ability to see the CHWs' productivity and perform quality improvement. By using the mobile devices to determine how much time is spent on each activity during a home visit, ways to improve performance and efficiency can be built into trainings and one-on-one discussions with supervisors.

Component 2: Capital Partners in Care Health Information Exchange

CCIN also leads the development of the health information exchange (HIE) Hub for itself and its partners (also known as subscribers) so that patient information can be shared seamlessly across organizations. This HUB, known as Capital Partners in Care, will link EMRs from subscriber clinics and hospitals with each other and with SyntraNet, so patient information can be exchanged using a single-login Web portal. The current subscribers to the Capital Partners in Care are CCIN, Providence Hospital and Physician Enterprise, Unity Health Care, Mary's Center for Maternal and Child Care, La Clinica del Pueblo, So Others Might Eat, and Bread for the City. Other than CCIN (which uses SyntraNet) and Providence Hospital and Physician Enterprise (which uses MEDITECH), all of the other subscribers use eClinicalWorks (eCW) as their EMR platform. ***Figure 1***, developed by CCIN, shows the vision of the Capital Partners in Care system.

Figure 1. Capital Partners in Care Vision



Source: Mary's Center Quarter 5 Progress Report.

One of the partners, a vice president at Providence Hospital and Physician Enterprise, was instrumental in negotiating a deal with eCW (the EMR vendor for most of the subscribers) for a reasonable fee to provide a single-login screen interface for an unlimited population. With this accomplishment, HUB use will not change a health care provider's current workflow. Providers will sign in to the EMR, and all of the linked information (if a patient is enrolled in CCIN or has visited another clinic/hospital) is on the record, so they do not have to go anywhere else. Physicians will be able to see any laboratory results on the right-hand side and can bring those into the EMR. Clinics get credit for making sure the tests are done, so they do not have to rerun any of them. This information sharing can save money and improve efficiencies.

The system has already gone live with Providence Hospital and Physician Enterprise, Unity Health Care, and Mary's Center for Maternal and Child Care. During the site visit, we were told that the anticipated go-live date for the remaining clinics (La Clinica del Pueblo, So Others Might Eat, and Bread for the City) was scheduled for the end of May, and CCIN anticipated having the governance structure for the system in place by mid-June. As depicted in ***Figure 1***, CCIN and its subscribers hope to eventually link the Capital Partners in Care system with other exchanges (such as Maryland's Chesapeake Regional Information System for our Patients) to ensure the completeness of the information.

To maintain patients' privacy, HIPAA-sensitive "roles" have been created within the Capital Partners in Care system, which will determine the level of information one can see. For example, a CHW may not have access to all of a participant's medical information but will have access to information relevant to his or her tasks, whereas a physician or nurse practitioner will have access to all home visit information and all medical information.

Partners/Ad Hoc Technology Committee

The Capital Partners in Care HUB system was developed by an outside vendor with input from all of the subscribers who are also on the ad hoc technology committee. The ad hoc technology committee, led by CCIN, has been bringing subscribers and partners to the table since the beginning of the grant. The majority of the ad hoc technology committee members approved each decision regarding the development and implementation of this HUB, including the governance, which was anticipated to take effect in mid-June 2014.

Governance of the Capital Partners in Care System

The District of Columbia Primary Care Association (DCPCA) will lead the HUB governance as a subcontractor to CCIN. DCPCA will support the HUB operation, to which each partner (CCIN is one) will contribute monetarily. DCPCA will ensure that all partners have policies in place so patients are able to opt out of the exchange. DCPCA will also oversee the everyday duties of maintaining the exchange.

Component 3: Shared Savings Model

CCIN is developing strategies to allow it to sustain this model after the CMS funding period ends. To do this, CCIN has proposed a split cost-saving model: Any costs not covered by the grant for CCIN or the managed care organizations (MCOs) would come off the top, then the rest of the savings would be split 50/50 based on quality, cost, and savings. The current model involves only the shared savings component with the payers (MCOs in the District of Columbia). During the grant development phase, this shared savings model was discussed and hashed out with the MCOs that were at the table, but as described later in this report, neither of those MCOs (AmeriHealth DC or Unity Health Care) were operating in DC after the grant award. Of the two current existing MCOs, Chartered Health Plan and Trusted Health Plan, Trusted has agreed to confer with CCIN and discuss the possibility of partnering.

The premise of this shared savings model is that the CHWs at CCIN are offering a behavioral health intervention to Medicaid patients in the community whose care costs the MCOs a lot of money by not eating healthy, not exercising, not managing their chronic disease (including medication), or overusing the ED when it would be more appropriate to see their PCP. If the CHW intervention succeeds in achieving its goals, the MCOs will see a difference in the cost of utilization in the next 12–15 months (because of a delay in claims). This decrease in utilization cost would leave a pool of money that would have previously had to be paid out but can now be considered savings. Those savings would cover any costs for the intervention not covered by the award (or costs assumed by the MCOs). The rest of that pool of money would be split between CCIN and the MCO. Within this complex model, CCIN would have to meet certain indicators, and the calculation would be adjusted if CCIN did not meet them.

In expanding this model to the providers (clinics, hospitals), CCIN and the District of Columbia Department of Health Care Finance (DHCF) are considering sharing the distribution component with providers, potentially rewarding them on performance and quality. However, it is difficult for clinics and health centers to commit to something like this when they do not know what their future financial situation will look like. CCIN's partners know that this is the right thing to do for their Medicaid community, and this is where health care is going in the future, but with an entity that is already low on funds, it is difficult to invest in the future.

1.1.2 Program Participant Characteristics

The CCIN CHW program targets high-cost and high-service-utilizing fee-for-service Medicaid recipients (and those with Alliance, a safety net health care that is unique to the District of Columbia for persons who do not qualify for federal insurance). Participants are prioritized based on their diagnosis codes (chronic illnesses: diabetes, asthma, hypertension) and on their total cost of care.

Table 3 provides the demographic characteristics of all patients ever enrolled in the innovation. As shown in the table, the largest percentage of patients (40.3%) are between the ages of 45 and 64, and about one-fourth (23.8%) are children. More than half (62.5%) are female. Of those with non-missing race/ethnicity, most (84.7%) are black. Mary's Center is targeting those with Medicaid, which is reflected in the table.

Table 3. Characteristics of All Patients Ever Enrolled in the Innovation through Quarter 8

Characteristic	Number of Patients	Percentage of Patients
Age		
0–18	456	23.8
19–24	110	5.7
25–44	498	25.9
45–64	774	40.3
65–74	58	3.0

(continued)

Table 3. Characteristics of All Patients Ever Enrolled in the Innovation through Quarter 8 (continued)

Characteristic	Number of Patients	Percentage of Patients
Age (continued)		
75–84	4	0.2
85+	20	1.1
Missing	0	0
Sex		
Female	1,199	62.5
Male	687	35.8
Missing	34	1.7
Race/ethnicity		
White	6	0.3
Black	986	51.3
Hispanic	165	8.6
Asian	0	0
American Indian or Alaska Native	5	0.3
Other	2	0.1
Missing/refused	756	39.4
Payer category		
Medicaid	1,857	96.7
Missing	63	3.3

Source: Patient-level data provided to RTI by Mary's Center.

Table 4 specifies the denominators RTI will use to calculate measures for reporting in subsequent reports. The number of patients recruited (i.e., contacted by a CHW for potential enrollment) is nearly 13,000. Mary's Center has enrolled approximately 15% of those recruited (e.g., those who agreed to participate in the intervention). Among those enrolled as of Q8, about 25% have asthma, about 18% have diabetes, and about 37% have hypertension.

Table 4. Patients Planned for Inclusion in Innovation (Denominator Data)

Patient Type	Data Source	Current Count
Patients recruited	Data provided to RTI in July 2014	12,927
Patients enrolled	Data provided to RTI in July 2014	1,920
Patients enrolled with asthma	Data provided to RTI in July 2014	499
Patients enrolled with diabetes	Data provided to RTI in July 2014	348
Patients enrolled with hypertension	Data provided to RTI in July 2014	715

Source: Patient-level data provided to RTI by Mary's Center.

CCIN is having significant issues with client enrollment because of factors that will be detailed later in this report. Because of these issues, the actual number of participants is 36% of what was originally anticipated at the time of grant award.[1] To make up for this discrepancy, CHWs have recently focused a significant amount of time on recruiting participants. In addition to the small number of names that they receive from MCOs, CHWs spend time in clinics providing information about the program, hanging door knockers, and using word of mouth to recruit friends and family of current participants. We will complete ***Table 5*** once we request and receive the relevant data.

Table 5. Patients Planned for Inclusion in the Innovation (Denominator Data)

Patient Type	Data Source	Current Count (Data Source)
Participants identified by MCOs and information sent to CCIN	MCO records, SyntraNet data	—
Participants identified by clinics/providers	SyntraNet data	—
Participants identified in a clinic by a CHW	SyntraNet data	—
Participants identified by cold calls/door knockers/word of mouth	SyntraNet data	—

Source: Patient-level data provided to RTI by Mary's Center.
CCIN = Capital Clinical Integrated Network; CHW = community health worker; MCO = managed care organization.
— Data not yet available.

1.2 Implementation Progress

The extent to which each awardee is able to implement its innovation as planned and reach a sufficient number of patients will be critical to assessing its impact on reducing cost and improving participants' health and health care. The following section first provides details on the implementation process, then on its effectiveness, and ***Table 6*** provides the list of measures RTI plans to use in assessing each.

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[1] Lewin database, Q7, March 2014.

Table 6. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for Mary's Center/CCIN

Key Evaluation Domains	Subdomains	Measures	Data Source
Implementation process	Care coordination	Number of care plans completed among participants	SyntraNet
		Rate of technology use (BP/glucometer devices)	SyntraNet
	Patient characteristics	Primary diagnosis (asthma, diabetes, hypertension, or none of the three)	Patient self-report
TaImplementation effectiveness	Reach	Number/percentage of persons recruited who are enrolled	EMR/outcomes manager
	Dose	Number of primary care provider and specialist visits per participant	SyntraNet
		Number and types of CHW contacts per participant	SyntraNet

BP = blood pressure; CCIN = Capital Clinical Integrated Network; CHW = community health worker; EMR = electronic medical record.

1.2.1 Process

The implementation process has been the initial focus of the evaluation. RTI defines *implementation process* as including execution of implementation, organizational capacity, key staff and partner engagement, and client recruitment and enrollment. The implementation process is best evaluated through a combination of data variables, including execution of implementation that conforms with operational plans and capacity for implementing the innovation efficiently and on time. We focused on the implementation process during the awardee site visits (May 6–8) and asked such evaluation questions as

- What is the overall execution of the innovation implementation (e.g., the actual rate of expenditures relative to the projected rate)?
- What accomplishments are specific to hiring or training staff so that the organization can build its capacity to implement the innovation effectively?
- What is the implementation effectiveness, including fidelity, reach, and dose of the innovation thus far?

Execution of Implementation

Because of three major issues (discussed in the Fidelity section), CCIN took longer than expected to get its innovation off the ground. Nearly all the components of the innovation are in place. CCIN is fully staffed to meet the current number of clients and referrals; the HIT Hub was anticipated to go live in July 2014, delayed from the original operational date in Q6, and the CCIN case management system, SyntraNet, is in place and operating well after many months of development.

Enrolling and recruiting participants into CCIN's CHW innovation (discussed in more detail in the Reach section of this report) has been very difficult to execute as planned. CCIN lost its source of patient referrals, the original MCO partners, just as the innovation was launching and spent much of the subsequent 18 months seeking health plan partners to replace those sources. Although CCIN made some inroads with new partners, the current number and type of referrals—patients who are largely unreachable—have resulted in an inordinate amount of recruitment effort for very low enrollment reward.

The sustainability component of the CCIN innovation, the shared savings model, has not yet been implemented, and it is unclear whether the infrastructure exists to make this model feasible.

Organizational Capacity and Leadership

CCIN is a new entity, currently in the process of obtaining 501(c)(3) status, developed with the funding received by Mary's Center for Maternal and Child Care, which acted as the fiduciary agent. Mary's Center, a FQHC in Washington, DC, intentionally created CCIN not so it would seem as though Mary's Center was trying to take control of the CHWs or the Capital Partners in Care HUB, but so Mary's Center would be seen as a partner on equal footing with the other hospitals, clinics, and FQHCs that were partnering. CCIN has its own organizational identity, which includes completely separate office space and discrete logo and branding.

CCIN has clearly designated leadership with the experience, skills, and authority to make decisions. CCIN is unique because, since this entity was created with the CMS funding, this innovation is the only work being done by it, and there are no competing priorities from other funders or projects. Staff members on this project have significant experience in health care, grants management, the CHW model, and navigating the political minefield that is the District of Columbia.

One management challenge experienced in the beginning was a lack of decisiveness regarding decision making. Decisions were made "by committee" and thus did not occur with the speed that was needed in this fast-paced, short–time frame innovation. CCIN recognized the issues with this type of leadership and has since developed clear lines of management and supervision and improved the organizational workflow.

The partnerships and networks that live outside of CCIN are complex and unique. The governance of the HIE HUB falling outside of CCIN to a subcontractor was a strategic move by the organization to engage a partner that had experienced setbacks because of changes in the beginning of the grant and to show the other subscriber partners that CCIN/Mary's Center was not trying to run the program or claim dominance over the other partners.

The shared savings model (discussed in ***Section 1.2***) is also a complex issue. There needs to be an influx of capital to make a model like this work; without such an influx, it cannot be initiated or sustained in the view of one partner. Just before the award, the District of Columbia dissolved its MCO contract with Unity Health Care and Chartered Health Plan—the partners that had been originally on board for the innovation. The loss of these partners was a significant setback (described in fuller detail in the Fidelity section) for the CCIN leadership team because it has required them to build alliances with new MCOs that have their own priorities and whose goals do not align with those of the innovation. In some respects, CCIN services are viewed as duplicative or in competition with those of an MCO because these organizations also "manage" care and have case managers who are responsible for that function. CCIN will have to demonstrate its value added (the capacity to reach and successfully intervene with patients who require the most complex and costly treatment) to engage these MCO partners in a shared savings plan.

1.2.2 Workforce Development

CCIN uses CHWs to help Medicaid recipients secure a medical home or become more connected to their existing medical home. During the site visit, RTI determined that the members of CCIN's management team had carefully and thoughtfully selected the CHW and HIT staff and that overall, the entire staff was engaged in solving problems and addressing the challenges that arose. Adequate training for CHWs is also important to ensure that they are providing appropriate care while implementing the intervention.

Hiring and Retention

CCIN most recently reported having a total of 39 staff, 24 of whom were CHWs. Hiring and retaining CHWs is an important and sometimes difficult issue. Traditionally, CHWs are from the community that they serve and are lay people with varying degrees of education. However, with a unique innovation like CCIN, it is important to find CHWs who are willing to go above and beyond (work more hours, work nontraditional hours), have a high level of professionalism (CCIN CHWs work with HIPAA-protected data), and are able to understand and use technology (the SyntraNet care coordination system).

The first round of CHWs hired came directly out of a training program at the Public Health Institute (PHI). CCIN had been interested in hiring the whole class, but because of the excellent extensive training, some of the CHWs found other employment before the grant was fully initiated. The next round of CHWs hired had a significant amount of experience in home visiting and completing specified tasks. However, this innovation calls for CHWs who will go beyond the traditional home visit role to implement the behavior change model. After an initial round of CHW turnover during the early part of the protocol, the management team revised the hiring protocol so that current CHWs interview each prospective hire. These current CHWs provide the interviewee a perspective from someone who is doing the work and who possesses unique skills and competencies required for the position; current CHWs can also assess the personality and attitude of the interviewee and determine whether he or she would be capable in the field.

Training

CCIN leadership at all levels considers training new CHWs to be a high priority and have dedicated resources (time, finances, equipment, physical space) to support a rigorous training program. The original CHWs hired at the beginning of the project went through a 10-month training program through a grant provided by the department of labor at PHI. All of the CHWs who went through the intensive training program are still with CCIN. Subsequent CHW new hire training is not as long but is also developed by PHI. The topics covered are detailed in ***Table 7***. To date, all 24 CHWs have completed this entire program. One supervisor summarized CCIN's training philosophy as "the better you are at addressing training [for the CHWs], the better you are at retention."

Trainings for CHWs and other staff also included use of SyntraNet. Each iteration of this new and highly customized system has required an additional round of training for all staff members who rely on it.

Table 7. CCIN CHW New Hire Training Topics

Definition of a CHW	CHW Self-Care
Role of a CHW	Building Trusting Relationships
Cultural Competency and Diversity	Boundaries
Confidentiality	Patient Engagement
Stress and Time Management	Population-Based Training
Medicaid in the District of Columbia	Medical Landscape in the City
Socioeconomic Factors	Health Disparities
How to Check and Sort Medications	How to Take Vital Signs
HIPAA	Health Behavior Change (theory/practice)
Recruitment Strategies	Home Visiting Strategies
Diabetes	Hypertension
Asthma	CCIN Clinical Practice Policies
Neighborhood Resource Asset Mapping	Motivational Interviewing
CCIN Referral and Documentation	Microsoft Outlook

CCIN = Capital Clinical Integrated Network; CHW = community health worker; HIPAA = Health Insurance Portability and Accountability Act.

1.2.3 Effectiveness

A major aspect of the evaluation will be to assess the effectiveness of the intervention in terms of the extent to which the intervention implemented aligns with what was planned (i.e., fidelity) and whether patients have been exposed to it. Their exposure will be measured through reach (i.e., the extent to which the total number of patients is reached that were targeted) and dose (i.e., the degree to which each patient is exposed to services provided).

Fidelity

Although many of this program's components remain unchanged, CCIN experienced a number of unanticipated obstacles during the first year of implementation that required adaptation of its design and plans. Each obstacle has affected the timeline of the innovation and the ability to reach milestones.

After submitting the grant application, when the anticipated MCO partners—Unity Health Care and Chartered Health Plan—were already engaged and on board with the proposed model, what was described as a "total meltdown" of the Medicaid situation in the District of Columbia occurred. After grant award, CCIN had to work to engage and obtain buy-in from the two new MCOs that were responsible for the DC Medicaid population—Trusted Health Plan and AmeriHealth DC. CCIN has neither anticipated nor budgeted for the need to market the program and actively recruit participants into it because it had agreed to the free flow of participants from the original MCO partners. CCIN had to develop new methods and strategies to recruit participants into the program. CCIN is struggling to find participants for the program because it needs the list of high-utilizing patients from the MCOs to perform outreach. One of the MCOs has provided a list of patients, but because they are considered the most unreachable, CCIN needs to spend more time than anticipated on determining where they are, whether they are still alive, whether they are Medicaid eligible, and so forth. This model requires many participants to achieve the cost savings, and the current MCOs are not willing to provide the extensive information on potential participants that was anticipated during the planning of this intervention. Strategies to help this issue have involved relationship building with the new MCOs, developing a stronger collaboration with DHCF to access fee-for-service Medicaid beneficiaries and acquire claims data for all eligible beneficiaries, and finding alternative methods of identifying participants for enrollment.

Because the grant award is approximately half of what was requested in the proposal, CCIN had to significantly change its initial CHW model design. The initial application called for partnering FQHCs, clinics, and stakeholders to have at least one new CHW position located in and employed by the partner organizations. A reduction in the requested award amount resulted in centralizing the CHWs within CCIN, then expanding the role of CCIN in recruiting and managing these positions. Understandably, the level of engagement and enthusiasm for the innovation among the partnering FQHCs, clinics, and hospitals was negatively affected, although most remain committed to the innovation and actively participate in governance activities. Centralizing the CHWs at CCIN was less costly to the grant and easier to manage but hindered the integration of CHWs with the medical care team. As one CCIN employee said, having workers physically in the clinics is a reminder of the program, but without them stationed there, it is "out of sight, out of mind."

On the HIT side of the innovation, the third obstacle that diverted this innovation from its original course was the determination that the system that was going to be used for the

HUB (the DC Regional Health Information Organization [RHIO]) was not sustainable. It was decided early in the grant award that CCIN needed to develop a new HIE from the ground up. The DC RHIO was developed in 2008, and although it was progressive for its time, it would have needed a lot of upgrades to make it compatible with current systems, and these upgrades would have been more expensive than developing a new system. This decision was difficult for CCIN, and it took a lot of relationship building to bring DCPCA back to the table as a stakeholder and partner. As previously mentioned, DCPCA will be handling the governance of the Capital Partners in Care Hub (as agreed upon by the ad hoc technology committee), and this show of trust and commitment to an ongoing relationship has helped CCIN reengage DCPCA as an important partner.

Reach

During the inception of the innovation, the partnering MCOs, Unity Health Care and AmeriHealth DC, agreed to provide patient information to CCIN so that it would be able to target a large population meeting the eligibility criteria. When the former lost its Medicaid MCO contract and Chartered Health Plan acquired the latter, those arrangements were effectively dissolved. Consequently, CCIN had to lead the recruitment of participants and add an additional layer to the CHWs' work. Although the population targeted by this innovation is sufficiently large, CCIN is experiencing difficulty identifying specific individuals to recruit and enroll in the program.

CCIN has employed many strategies to increase enrollment numbers. CHWs have been trained on motivational interviewing and one-on-one personal engagement techniques, and they are working with different clinics and providing information about the program and encouraging referrals. Letters have been sent to all partners, and community outreach has been performed in a different location. CCIN has done a lot of work on messaging and marketing this intervention and has even worked toward testing this intervention as a quasi–opt-out model, instead of the current opt-in model. One of the new MCOs, Chartered Health Plan, remains involved but has not been able to provide CCIN with the number or type of client referrals originally envisioned. The second MCO, Trusted Health Plan, has provided lists of its most "unreachable" patients. Providence Hospital and Physician Enterprise, Unity Health Care, Mary's Center, and the other specialized health care entities provide some referrals but not enough to replace the number anticipated from the Medicaid MCOs. A pilot project with DHCF currently in development would target 5,000 high-cost/high-service-utilizing fee-for-service Medicaid beneficiaries.

Table 8 shows the number of patients enrolled among those recruited by quarter through Q8. At the end of Q3 (March 2013), more than half (66%) of those recruited were enrolled. The number of patients recruited over time has increased; however, the percentage of those recruited who were enrolled each quarter has decreased over time. Overall, 15% of all patients recruited were enrolled.

Table 8. Percentage of Patients Ever Enrolled by Quarter

Quarter	Number of Unique Patients Recruited	Number of Unique Patients Enrolled	Total Reach (%)	Percent Change from Previous Quarter
March 2013	424	280	66.0	—
June 2013	1,165	293	25.2	–61.9
September 2013	2,111	294	13.9	–44.6
December 2013	2,652	314	11.8	–15.0
March 2014	2,500	334	13.4	12.8
June 2014	4,065	404	9.9	–25.6
Date missing[1]	10	1	—	—
Total as of June 30, 2014	**12,927**	**1,920**	**14.9**	—

Source: Patient-level data provided to RTI by Mary's Center.
[1] RTI will work with Mary's Center to get recruitment and enrollment dates for these patients.
— Data not yet available.

Dose

Any innovation that involves delivering direct services to participants needs to assess the extent to which those participants have actually been exposed to the new services. This intensity of services (e.g., frequency, duration) that participants receive is combined with outcome data (e.g., from claims analysis) to determine whether increasing exposure (or exposure at all) to the innovation is associated with changes in outcomes.

CCIN has developed three different sets of criteria, at least one of which needs to be met at the end of the 90 days, to determine a successful graduation from the program. These criteria (from most to least optimal) are (1) six successful home visits, (2) three successful home visits, or (3) two successful home visits plus meeting a goal. CCIN has also developed milestone measures, and as SyntraNet data become available to RTI, we will investigate CCIN's 30-60-90–day intervention milestone measures to determine whether an optimal dose can be determined for the CHW intervention.

For the providers, RTI will assess the number of encounters with the HUB to determine the degree to which it is using this component of the innovation to monitor patients enrolled in CCIN and their overall satisfaction and experiences with the HIE.

Table 9 provides the total number and the average number of services provided to patients who completed the program (i.e., discharged) and for those who have ever been enrolled in the program (i.e., discharged or currently enrolled) through June 2014. As shown in the table, CHWs conducted more than 3,000 home visits across those who have completed the program, which is an average of 3 home visits per patient. Thus, some patients are completing the program with fewer than 6 home visits. Among those who have ever been enrolled in the program (including those currently enrolled), CHWs conducted nearly 4,000 home visits, an average of about 2 home visits per patient. About half of patients ever enrolled are currently enrolled, so this is in line with what one might expect given the average number of home visits among those who have completed the program.

With regard to phone calls, CHWs conducted more than 8,000 phone calls in which they spoke to the patient, which is an average of about 8 phone calls per patient. Across all patients ever enrolled (including those who have completed the program), CHWs have conducted more than 12,000 phone calls in which contact was made with the patient. This is an average of about 7 calls per patient. It is important to keep in mind that the patients who have completed the program are a subset of those who have ever been enrolled. Therefore, it is not necessarily appropriate to compare the two groups.

Table 9. Number of Patients Receiving Phone Calls and Home Visits through June 2014

	Patients Who Have Completed the Program (N=1,009)		Patients Who Have Completed the Program or Are Currently Enrolled (N=1,920)	
Services Provided to Patients	**Total Number of Services Received**	**Average Number of Services Received Per Patient**	**Total Number of Services Received**	**Average Number of Services Received Per Patient**
Home visits	3,197	3.2	3,894	2.0
Phone calls answered	8,337	8.3	12,564	6.5
Total	**11,534**	**11.4**	**16,458**	**8.6**

Source: Patient-level data provided to RTI by Mary's Center.

Table 10 shows the effort undertaken by the CHWs to try to enroll patients into the program. Overall, CHWs made more than 35,000 phone calls to patients who never enrolled in the program. In less than one-fifth (17.9%) of those attempts, the CHW made contact with someone in the home (who may or may not have been the patient).

Table 10. CHW Efforts to Reach Potential Enrollees by Phone through June 2014

Disposition	Number	Percentage
Call answered	6,598	17.9
Message left	10,648	28.9
Rings but no answer	8,409	22.8
Phone disconnected	8,649	23.5
Wrong number	2,068	5.6
Status of call missing	451	1.3
Total	**36,823**	**—**

Source: Patient-level data provided to RTI by Mary's Center.
CHW = community health worker.
— Data not yet available.

Table 11 shows the number of patients who received each type of service (beyond the home visits and phone calls in ***Table 10***) for those who completed the program (i.e., discharged) and for those who have ever been enrolled in the program (i.e., discharged or currently enrolled) through June 2014. As shown in ***Table 11***, few patients had an ED visit or were diverted from going to the ED as part of the innovation. More than 600 patients had a televisit, and more than 200 had a doctor's visit (PCP or specialist). A small number of patients received transportation assistance as part of the innovation.

Table 11. Number of Patients Receiving Other Services through June 2014

Services Provided to Patients	Number of Services Received by Patients Who Completed the Program	Number of Services Received by Ever Enrolled Patients
ED diversion	1	3
ED visit	2	2
PCP appointment with CHW	138	185
Specialty appointment with CHW	24	52
Televisit	477	606
Transportation	19	19
Other agency/professional contact	236	274
Other contact	362	630
Total	1,259	1,771

Source: Patient-level data provided to RTI by Mary's Center.
CHW = community health worker; ED = emergency department; PCP = primary care provider.

1.3 Evaluation Outcomes

RTI will use two types of quantitative data to assess the impact of the awardee's innovation on key outcomes. These include claims data for Medicare and/or Medicaid beneficiaries, depending on who the awardee serves, and other administrative or utilization data the awardee is collecting (which we have labeled as "other awardee-specific data," reflecting the variability of the types of data elements available across awardees). We are in the process of finalizing our assessment of all the available data sources and requesting data directly from each awardee. As those data are received, we will incorporate the findings into our quarterly/annual reports. The following sections present descriptive findings from the quantitative outcome data provided to RTI as of September 11, 2014.

1.3.1 Measures for Evaluation

After the site visit, the data management and site visit teams met to review each of the measures listed in the awardee's self-monitoring measurement plan (i.e., data review meeting). The measures listed in ***Tables 6*** and ***12*** reflect those determined as most relevant for our evaluation of Mary's Center's innovation outcomes.

Table 12. Outcome Measures Received from Mary's Center

Key Evaluation Domains	Subdomains	Measures	Data Sources
Clinical effectiveness	Asthma	Percentage of patients with asthma who were dispensed appropriate medications	EMR
	Diabetes	Percentage of patients who had their blood glucose measured by a CHW	CHW
	Hypertension	Percentage of patients who had their BP measured by a CHW	CHW
	Patient satisfaction	Percentage of patients indicating satisfaction with the services provided by the CHWs	Surveys administered by CHWs
Health outcomes	Hypertension	Percentage of patients with a diagnosis of hypertension with BP <140/90 mm Hg	EMR
Health care outcomes	Utilization	ED visit rate	Claims data
		All-cause admission rate	Claims data
		Readmission rate	Claims data
		Percentage of participants who have been to a primary care provider during enrollment	SyntraNet
	Cost	Spending per patient	Claims data
		Cost savings	Claims data

BP = blood pressure; CHW = community health worker; ED = emergency department; EMR = electronic medical record.

1.3.2 Claims Data

As part of a broad assessment of health care innovations, the Center for Medicare & Medicaid Innovation (CMMI) is assessing the impact of its programs, including those funded specifically by HCIAs, on four core measures. The four core measures are as follows:

- health care spending per patient,
- hospital inpatient admissions,
- hospital unplanned readmissions, and
- ED visits.

Collectively, CMMI programs are anticipated to slow the increase in health care spending, reduce hospital admissions, reduce avoidable hospital readmissions, and prevent unnecessary ED visits. We are reporting these measures for all HCIA Community Resource awardees so that the collective impact of the awards can be assessed. Discussed as follows, some awardees' innovations may not be focused on these measures. Other awardees' innovations target specific conditions (e.g., imaging, diabetes) and may have significant impacts on spending, admissions, readmissions, and ED visits for the targeted conditions but not have a statistically detectable impact on the measures at the aggregate level because the targeted conditions represent only a small fraction of total spending, inpatient admissions, and ED visits.

The measures are calculated through analysis of Medicare and Medicaid fee-for-service claims. Because of differences between Medicare and Medicaid patients in age, other demographic variables, and disease status, we report the Medicare and Medicaid results separately as follows. Currently, complete Medicare claims are available through the end of 2013. Medicaid claims for CCIN are available through the third quarter of 2011. The CCIN innovation was launched on February 6, 2013.[2]

- **Health Care Spending per Patient.** For Medicare beneficiaries, health care spending per patient includes Part A and Part B Medicare expenditures for persons enrolled in the Part A and Part B fee-for-service program. The variable focuses on Medicare fee-for-service spending, so Medicare managed care (Part C) services are excluded, as are beneficiary copayments. Medicare Part D prescription spending is also excluded. Spending is reported on a per-person per-quarter basis. If a beneficiary is not enrolled for every month in a quarter, spending (except for hospital inpatient spending) is prorated to a quarterly basis based on the number of days enrolled during the quarter. Because hospital inpatient admissions are both rare and expensive, spending is not prorated for hospital inpatient spending. Prorating is also not performed for beneficiaries who die during a quarter.

  For Medicaid beneficiaries, health care spending per patient is reported for fee-for-service beneficiaries. Beneficiaries are only included in the analysis for spending (and the other measures) during periods when they are enrolled in Medicaid.

- **Hospital Inpatient Admissions.** This variable measures hospitalization, the single most expensive component of health care spending. Patients kept overnight in observation beds are excluded from this measure. Inclusion criteria for the analysis are the same as for spending. Hospital inpatient admissions are not prorated based on the number of days eligible during the quarter. All-cause inpatient admissions and ACSC admissions are reported separately, under the assumption that a greater share of ACSC admissions can be prevented by appropriate ambulatory care. The mean quarterly admission rate per 1,000 patients is reported.

- **Hospital Readmissions.** Hospital readmission rates serve a dual purpose in evaluating HCIA impacts. Readmissions add to the costs of a prior hospitalization, and they often reflect a problem in the care provided during the first admission. All-cause readmissions are defined as a follow-up admission to any short-term acute

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[2] Q3, narrative progress report.

general or long-term care hospital within 30 days of a discharge from another hospital of the same type. We ignore multiple admissions within one day of an initial admission because these often represent transfers between hospitals. We define index hospitalizations that begin during the quarter and follow each index admission for 30 days, even when the follow-up period extends beyond the end of the quarter. Inclusion criteria for the analysis are the same as for spending. We also calculate readmissions for persons with ACSC. The person's ACSC status is defined by his or her first hospitalization during the quarter. The readmission rate equals the number of readmissions divided by the number of index hospitalizations during the quarter. Planned readmissions are excluded from the calculation of the numerator. Quarterly mean readmission and ACSC readmission rates per 1,000 admissions are reported.

- **ED Visits.** ED visits are sometimes viewed as a symptom of the inability of the community's health care system to provide adequate preventive and ambulatory care visits. We report an all-cause ED visit rate that excludes ED visits resulting in an inpatient admission (which presumably represent unavoidable visits) and includes overnight ED visits without an inpatient admission. Inclusion criteria for the analysis are the same as for spending, and ED visits are also subject to the same prorating formula as for spending. The mean quarterly ED visit rate per 1,000 patients is reported.

Medicare Claims Analysis

The CCIN innovation focuses on Medicaid managed care patients and does not currently serve Medicare patients, so Medicare data are not applicable.

Medicaid Claims Analysis

The Medicaid data analysis will use data from the CMS Alpha-Medicaid Analytic eXtract (MAX) data files. Currently, Medicaid claims for CCIN are only available in Alpha-MAX through the third quarter of 2011. Because the CCIN innovation was launched on February 6, 2013, and Alpha-MAX claims are not yet available, we are not presenting measures for Medicaid patients in this report. We will provide Medicaid analyses in subsequent reports as more data become available. The CCIN innovation is focusing on Medicaid managed care patients, and Medicaid Alpha-MAX data do not always include Medicaid managed care enrollees. If managed care claims are not available in Alpha-MAX, Medicaid data will need to come from the MCOs, either directly or through CCIN. Because access to MCO data has been a problem for CCIN, we need further discussions to determine whether the relevant data will be available.

Appendix A shows the claims analyses tables that we plan to present for Medicaid. In addition to the tabular format, we will present figures showing each measure as a function of time. Values in quarters before the innovation's launch on February 6, 2013, will be shown in one color, and values for quarters during and after launch will be shown in another color. The figures will include a trend line based on a linear regression of prelaunch values.

Discussion of Claims Analysis

The claims measures will provide descriptive data on patients enrolled in the CCIN innovation before, during, and after the launch of the innovation. Although it is necessary to report these measures to support CMS's broader assessment of its full portfolio of innovation projects, the measures may not provide a complete evaluation picture of the CCIN innovation. There are several reasons for this. First, the impact of a CHW and HIT innovation may not be immediate because it takes time for CHWs to achieve changes in health care utilization and for providers to incorporate new sources of information. Second, CCIN may focus on specific diseases or conditions. Although the innovation may have a statistically significant impact on the spending, inpatient admissions, readmissions, or ED visits related to these diseases or conditions, it may not have a statistically detectible impact on the variables at the total spending or utilization level, because diseases or conditions account for only a small share of total spending or utilization. In later reports, we will also provide targeted disease- or condition-specific spending and utilization data. Finally, it may be difficult to distinguish changes resulting from CCIN from coinciding changes in Medicaid managed care contracts.

Development of Comparison Groups

In addition to comparing CCIN patients before and after implementation of the innovation, we are constructing a comparison group of Medicaid managed care patients in the District of Columbia. This comparison group will control for external, noninnovation factors affecting both CCIN and non-CCIN patients. We will use propensity score matching to identify patients with similar characteristics as CCIN patients. Changeover in Medicaid MCO contracts may hinder our ability to identify Medicaid MCO patients before the innovation, however. Results for the comparison group will be included in later reports.

1.3.3 Other Awardee-Specific Data

In mid-June 2014, after the data review meeting, RTI met with Mary's Center to request the raw patient-level and CHW-level data that were used to generate each of the measures from data sources other than claims data in ***Tables 6*** and ***12*** for each quarter.

Overview of Data Requested and Received

During the meeting to request the raw patient-level and CHW-level data, we learned that without the Hub in place and with the loss of two of the primary MCOs as partners, some of the measures listed in the Mary's Center self-monitoring measurement plan are not available. For instance, one of the dose measures we are interested in, number of provider encounters with the Hub, was not available because the Hub had not yet been in place. Measures based on MCO claims and EHR data are also not available because of the changes in those partnerships. More specifically, health outcomes including HbA1c, poor control, and utilization of medical transportation are not available. The only health outcome measure currently available is blood pressure as measured by the CHW during the home visits. A couple of measures are not available because the CHWs have not administered the data collection instruments. These measures include the assessment of substance abuse among participants and the patient health questionnaire (PHQ-9).

However, we did receive the available raw patient-level and CHW-level data in early July 2014. There have been a number of follow-up communications with Mary's Center to request additional information about variable codes and values. For instance, the race/ethnicity variable included eight 5-digit codes, and a status variable had 3 values (enrolled, discharged, and withdrawn), the meanings of which were not readily evident. After several e-mails, we set up a meeting on August 5 to get some clarity on aspects of the data that were still unclear. This meeting was very useful and allowed us to move forward with the descriptive analyses more quickly.

Health Outcomes

We are continuing to work with the data received from Mary's Center. Most of the tables presented in Mary's Center's awardee section thus far are based on the raw patient-level data provided to RTI in July 2014. The tables presented as follows are based on our initial analyses of the outcome data provided.

Table 13 shows the number and percentage of patients who have each of the three health conditions being tracked by Mary's Center. More than one-third (37.2%) of patients ever enrolled in the innovation have hypertension, about one-fourth (26%) have asthma, and less than one-fifth (18.1%) have diabetes. A small percentage of patients (2.34%) has all three conditions. A relatively large percentage (39.1%) of patients has none of the three conditions.

Table 13. Number and Percentage of Patients Ever Enrolled by Health Condition[1]

	All Patients Ever Enrolled (N=1,920)	
Health Condition	**Number**	**Percentage**
Asthma	499	26.0
Diabetes	348	18.1
Hypertension	715	37.2
2 conditions	303	15.7
All 3 conditions	45	2.3
None	751	39.1

Source: Patient-level data provided to RTI by Mary's Center.

[1] Some people have more than one condition, so the total will exceed 100%.

With regard to health outcome changes over time, ***Table 14*** provides the percentage of participants with diagnosed hypertension (n=715) who had an average blood pressure below 140/90 mm Hg, by CHW visit number. As shown in the table, the percentage of those whose average blood pressure was below 140/90 mm Hg increased across the series of home visits.

Table 14. Percentage of Participants with a Diagnosis of Hypertension with Blood Pressure <140/90 mm Hg by Visit

	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5	Visit 6	Visit 7
Percentage of participants with blood pressure below 140/90 mm Hg (number of participants assessed)	47.5 (594)	57.1 (443)	57.7 (340)	58.4 (245)	60.1 (143)	57.6 (66)	66.7 (9)

Source: Patient-level data provided to RTI by Mary's Center.

For the next quarterly report, we will report blood pressure by quarter. Patients are enrolled in the program on a rolling basis, can be enrolled in the program for multiple quarters, and do not receive a blood pressure reading each quarter they are enrolled. If we were to include the average or median blood pressure of anyone who was enrolled in each quarter, any potential effects may be washed out because some patients are likely near the end of their enrollment, and other patients are likely at the beginning of their enrollment. RTI will consult internal experts to determine the best way to present the data by quarter for the next quarterly report.

Discussion of Other Awardee-Specific Findings

Mary's Center had initially intended to focus on patients with hypertension, diabetes, and asthma. However, as the data show, a large proportion of patients who have ever been enrolled in the innovation have none of the three health conditions. Based on the data available to us, we found a slight increase in the percentage of participants with blood pressure below 140/90 mm Hg by home visit. This increase may suggest that the innovation is having a slight impact on hypertension.

1.4 Overall Program Effectiveness Assessment

CCIN has fully launched and executed two of its three components. The CHW component initiated mostly as planned with some difficulties in hiring and retaining a few of the early CHW recruits. The personnel issues appear to have been largely addressed, and the innovation is fully staffed, operational, and supported by a strong infrastructure for training and engaging staff in problem solving. The delayed launch of the Hub until June/July 2014 has hampered the innovation overall because it represents one of the primary incentives for joining CCIN as a subscriber. The third component, the shared savings model, has not been fully designed or planned, and it remains unclear whether it can be executed within the project timeline.

Overall, the success of the CCIN implementation has been limited to date because both the fidelity and reach of the innovation have been compromised. The loss of key MCO partners was a serious setback that entailed a complete redesign of the outreach and recruitment approach. Nonetheless, the innovation has dedicated leaders; committed, experienced staff; and a strong data and HIT infrastructure that have allowed it to be resilient and adaptive in the face of these setbacks. If in the last year of award, CCIN is able to secure a lasting partnership with DHCF and attract subscribers to the Hub, then some measure of sustainability may be possible, even if the overall impact on costs and outcomes falls short of expectations.

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APPENDIX A

Table A-1. Baseline and Intervention Trends in Health Care Spending per Patient

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—

Savings per Patient

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Spending rate: total quarter (i.e., quarterized) payments/number of unique patients. Savings per patient: difference in comparison minus the intervention's average spending rates.
— Data not yet available.

Table A-2. Baseline and Intervention Trends in Admissions per 1,000 Patients

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Admit rate: total unquarterized admissions/number of unique patients.
— Data not yet available.

Table A-3. Baseline and Intervention Trends in Readmissions per 1,000 Admissions

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total admissions	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total Admissions	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Readmit rate: sum of all readmissions to eligible hospital within 30 days/all admissions in the quarter. Total admissions: all eligible admissions in the quarter.
— Data not yet available.

Table A-4. Baseline and Intervention Trends in ED Visits per 1,000 Patients

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: ED rate: total quarterized ED visits and observation stays/number of unique patients.
— Data not yet available.

October 2014

Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring

Annual and Site Visit Report
Michigan Public Health Institute (MPHI)

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OVERALL EVALUATION SUMMARY

RTI International was selected to lead an independent evaluation of the 24 Health Care Innovation Award (HCIA) awardees categorized as Community Resource Planning, Prevention, and Monitoring (Community Resource). In this role, RTI is conducting an in-depth evaluation of each innovation, as well as a cross-site evaluation that includes similar innovations targeting the same priority outcomes (e.g., emergency department [ED] visits). For each of the 24 awardees, this report presents findings from the first year of the evaluation (beginning September 23, 2013, and including data obtained and cleaned by RTI as of September 11, 2014). The report is based on multiple data sources, including operational reports, self-monitoring plans, site visits, and quantitative data analysis.

The evaluation methods vary by awardee innovation, based on the type of innovation and availability of data. RTI has reviewed and coded all existing documents from the awardees through December 31, 2013, and incorporated that knowledge into each awardee's overview. Our review included the awardees' original applications for funding, original and current operational and self-monitoring plans, and quarterly narrative and monitoring reports. For this annual report, we incorporated activities reported through the awardee's seventh quarterly report (i.e., through March 31, 2014).

Between April and August 2014, teams of at least two staff from the RTI team visited all 24 awardees for 2–4 days, depending on the number of interviews conducted. Teams included a subject matter expert, with training and experience specific to the awardee's innovation, and a master's- or bachelor's-level colleague to take notes. Before each visit, the teams reviewed all available documentation from the awardee to learn about the innovation's goals, objectives, and status. The purpose of the site visits was to clarify our understanding of the innovation, obtain detailed information on the implementation process, and review awardee-specific data to determine which elements to incorporate into the evaluation. By August 13, 2014, all 24 awardees had been visited and a thorough description of our findings included in each of the 24 awardee sections.

In addition to the site visits, we report quantitative data from two possible sources for several awardees. First, we present findings from claims analysis for awardees in this report if they both provided us with patient identifiers and reported enrolling participants who are Medicare and/or Medicaid beneficiaries. RTI has obtained patient identifiers from most of the 24 awardees to conduct claims analysis. Second, we present data RTI obtained directly from awardees to quantify their work in addressing health care costs, quality, and patient outcomes. Data from additional awardees will be analyzed and presented in future reports, as data become available and awardees enroll sufficient participants. An update on the availability of Medicare/Medicaid claims and other awardee-specific data, analysis of data available to us and cleaned as of September 11, 2014, a summary of the comparison groups, and a list of draft evaluation measures are included in each awardee section.

1. HCIA COMMUNITY RESOURCE AWARDEE: MICHIGAN PUBLIC HEALTH INSTITUTE (MPHI)

1.1 Introduction

The nonprofit MPHI is located in Okemos, Michigan. Awarded a total of $14,145,784, MPHI launched the Michigan Pathways to Better Health (Pathways) project in January 2013 to achieve the following goals:

1. **Reduce** by 2% over 1 year ($17,498,641 over 3 years) Pathways enrollees' health care costs through the community hub,[1] and community health worker (CHW) coordination of care, reducing emergency department (ED) visits and hospitalizations.
2. **Improve** by 5% over 1 year Pathways enrollees' use of appropriate and lower-cost health and human services through hub and CHW chronic disease management.
3. **Improve** by 5% over 1 year Pathways enrollees' chronic disease indicators through hub and CHW coordination of health and human services.

RTI is conducting an in-depth case study for this innovation. As part of that case study, two RTI team members conducted a site visit in April 2014; before and after the visit, our team reviewed all documentation on the innovation. We are working to obtain data directly from the awardee to assess many of the variables we discuss. This report describes findings from RTI's site visit, document reviews, follow-up calls, and analysis of data obtained and cleaned by RTI through September 11, 2014. We start by describing the innovation's components and the patients targeted by the awardee.

1.1.1 Innovation Components

The Pathways innovation is based on an established program, the Community Health Access Project (CHAP), developed to improve high-risk pregnant teenagers' birth outcomes. As adapted for use with participants with chronic conditions in the Michigan communities of Saginaw, Muskegon, and Ingham, the innovation includes implementing the Pathways innovation through two program components, including establishing a community hub and training CHWs and clinical supervisors to assist participants with social and health needs. The awardee is also involved in exploring changes to payment models as a supporting effort to sustain the efforts of this program beyond Health Care Innovation Award (HCIA) funding. The innovation overall has the following objectives and relies on the main partners presented in ***Table 1***:

- Implement the Pathways community hub model in the site communities in the three counties, with supporting networks of collaborating community agencies and outreach to Pathways enrollees and the community.

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[1] Defined as a community organization that has the infrastructure to coordinate delivery and connect at-risk individuals to health and social services while avoiding duplication of services.

- Deploy well-trained care coordination teams of CHWs and clinical supervisors with access to networks of community health and human services providers.
- Change care delivery and the coordination of health and human services by establishing a community hub in the site communities.
- Create a robust centralized data capability, and network the site communities.
- Implement monitoring systems and rapid-cycle improvement.
- Develop and implement a payment model to sustain the Pathways community hub model in the site communities.

Table 1. HCIA Partners, Roles, and Locations

Partner Name	Role in HCIA Project	Location
Michigan Department of Community Health	Co-director Project design Technical assistance Integration with other practice transformation initiatives	Lansing, MI
Muskegon Community Health Project	Lead agency Project management/administration, health IT, data collection, deployment of CHWs, care navigation	Muskegon, MI
Saginaw County Community Mental Health Authority	Lead agency and community hub Project management/administration, health IT, data collection, deployment of CHWs, care navigation	Saginaw, MI
Ingham County Health Department	Lead agency Project management/administration, health IT, data collection, deployment of CHWs, care navigation	Lansing, MI

Source: The Lewin Group, 2012–2013. Confirmed at the April 21–25, 2014, site visit.
CHW = community health worker; HCIA = Health Care Innovation Award; IT = information technology.

Component 1: Community Hubs

The model for the Michigan Pathways to Better Health (hereafter referred to as Pathways innovation) is based on the established CHAP program that was developed in Ohio to improve birth outcomes among high-risk pregnant teenagers.[2] The model was designed by Drs. Mark and Sarah Redding with the goal of tracking positive, measurable changes as CHWs help participants navigate the system to address specific health and social problems. The idea behind the model is that participants may not be able to address health needs until basic social needs, such as housing and food, are met. Although tested in a number of different communities, the model had seldom been used among adults with chronic

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[2] http://chap-ohio.net/press/wp-content/uploads/2010/09/PathwaysManual1.pdf

conditions. MPHI worked closely with the Reddings to ensure fidelity to the CHAP model. Each community in Michigan, however, adapted the model as originally designed so it would work in their respective sites. More details are discussed as follows.

Pathways Roles and Responsibilities

MPHI worked with partners in Saginaw, Muskegon, and Ingham to implement Pathways (see ***Table 2*** for the roles the lead agencies played). The original model calls for creating a community hub, or backbone organization, which is a neutral, community organization that helps connect potential participants to CHWs to assist them with their health and social needs. Once an eligible participant is identified, the referral is sent to the community hub, which assigns that referral to a care coordination agency (CCA). The CCA, in turn, assigns the referral to a specific CHW because the CHWs are employed by the CCAs. The hub acts as a neutral entity that does not favor any specific CCA or employ any CHWs directly. Neutrality of the hub is an important feature of the model because it ensures that every CCA is treated fairly, referrals are equally distributed, and “turf wars” are minimized.

Table 2. Roles by Community Site

Site	Lead Agency	Community Hub	Sample of CCAs
Saginaw	Saginaw County Community Mental Health Authority	Saginaw County Community Mental Health Authority	Health Delivery, Inc. St. Mary’s Center of HOPE Covenant HealthCare/VNSS Saginaw County Department of Public Health
Muskegon	Muskegon Community Health Project	County of Muskegon	Muskegon Community Health Project Every Woman’s Place Senior Resources West Michigan Therapy Community enCompass Disability Connection
Ingham	Ingham County Health Department	Ingham Health Plan	Tri-County Office on Aging Volunteers of America NorthWest Initiative Capital Area Community Services National Council on Alcoholism Lansing Regional Area

Source: Data collected during site visit.
CCA = care coordination agency; VNSS = visiting nurse special services.

The original model does not call for a lead agency, but the Michigan Pathways innovation required the establishment of a lead agency in each community, in addition to a community hub, that had the capacity to handle the fiduciary responsibilities associated with implementing the innovation. In Saginaw, the Saginaw County Community Mental Health

Authority is both the lead agency and the hub. In Muskegon and in Ingham, however, there are separate hubs and lead agencies. In Muskegon, the Muskegon Community Health Project is the lead agency, whereas the community hub is the County of Muskegon. In Ingham, the Ingham County Health Department is the lead agency, whereas the Ingham Health Plan is the community hub. In both Muskegon and Ingham, the lead agency also serves as a CCA employing CHWs.

Component 2: Community Health Workers

In addition to the lead agencies that are CCAs, the remaining CCAs are either (1) community social service agencies, which may specialize in a specific population such as substance abuse, domestic violence, or the elderly; (2) hospitals; (3) federally qualified health centers or clinics (FQHCs); or (4) the county health department. The majority of CCAs are community social service agencies. The CCAs hire and employ the CHWs. Many of the CCAs did not have any CHWs at their organizations before the Pathways innovation, although this varies by CCA and site. In some sites, CHWs had more experience working in the community and with participants, whereas in other sites, they recruited new CHWs with limited experience. Many of the CCAs hired CHWs from within their own organization, and others hired new CHWs from their respective communities. Some sites noted that CHWs were required to have a high school degree, but it does not appear to be a formal requirement instituted across all sites. See ***Table 3*** for a list of CHW functions and training.

Table 3. HCIA CHW Functions and Training

Characteristic Type	Pathways CHW Role
Title	CHW
Minimal qualifications	Regarding high school completion, may vary based on the site/CCA; must be from community in which they serve
Functions	Health education (individual) Informal counseling, individualized goal setting Outreach and recruitment Medication management Patient/community advocacy Service coordination Community linkages Instrumental support
Established continuing education program	Yes, trainings are in place

Source: Data collected during site visit.
CCA = care coordination agency; CHW = community health worker; HCIA = Health Care Innovation Award.

CHWs are supervised by clinical supervisors who are located either within the individual CCAs as they are in Saginaw or within the lead agency as they are in Muskegon and Ingham. The clinical supervisors must be either registered nurses (bachelor of science in nursing preferred) or social workers (master of social work preferred) with at least 5 years of experience in a community-based health care or social services setting. The clinical supervisors help oversee the CHWs and the clinical- and health care–associated aspects of the Pathways innovation.

Pathway Services

Once a CHW has received a referral, the CHW works with the individual to complete the adult checklist. The checklist is an inventory of potential social and health needs a participant may have. The goal is to understand the individual's current health and social needs to prioritize and initiate certain "pathways." For example, a participant may require a primary care visit, need utility assistance, and have diabetes. Therefore, the CHW may initiate a primary care referral pathway, a utility assistance pathway, and a health education pathway that includes providing some educational resources and material on diabetes. Each pathway has a final step that marks the completion of the pathway; in some cases, the participant may be able to complete the pathway that day (i.e., education) or the participant may require months to complete it (i.e., utility assistance). In some cases, the CHW may close a pathway that the participant cannot complete successfully. The total number and frequency of contacts with participants vary based on the pathways opened, which depend on the individuals' needs and chronic conditions. ***Table 4*** presents the total number of successfully completed pathways for Pathways participants.

Table 4. Common Pathways and Total Number of Times Successfully Completed

Pathway Name	Total Number Completed[1]
Medical referral	7,302
Social services referral	7,109
Medication assessment	1,568
Education	1,274
Health insurance	586
Medical home	495

Source: Patient-level Michigan Public Health Institute (MPHI) Pathways data provided to RTI in July 2014.

[1] Includes all pathways noted as successfully completed in the MiPathways data provided to RTI by MPHI in July 2014, including pathways completed multiple times by the same patient.

Supporting Effort: Developing a Sustainable Model

Another key component of this innovation is developing a sustainable model for the future. All stakeholders noted the importance of the innovation and were committed to having it succeed once the award period had ended. All of the sites are approaching and working with Medicaid managed care organizations or other payers to understand their potential interest in financing the program, given the innovation's potential to lower costs associated with ED utilization and hospital admissions. Also to this end, MPHI is continuing to work with the Reddings to develop a "pay for deliverable" model in which payment could be tied to CHW or CCA performance, which could include the number or type of pathways completed. The sites noted that this type of compensation would be challenging to implement because many of the CCAs are community nonprofit agencies that could not bear the financial risk. In addition, some of the local health departments may not be able to participate, given that they are unionized. Therefore, MPHI is working to first create a "virtual test" with "virtual dollars" that could give everyone in the system an example of what they would be paid under this method. Once the virtual test is complete, MPHI will revisit this plan to understand its impact on sustainability of the innovation.

1.1.2 Program Participant Characteristics

Program participants are adults aged 18 years or older who are either enrolled in or eligible for Medicare or Medicaid and live in Saginaw, Muskegon, or Ingham Counties or selected adjacent counties. Participants must also have two or more chronic conditions. Pathways targets high users of ED and hospital inpatient services, although MPHI does not limit enrollment to these "frequent fliers." All sites currently target participants with five or more ED visits and/or three or more hospital inpatient admissions. Initially, the program targeted anyone who was eligible for Pathways, but the innovation has since tried to focus on reaching the highest users of ED services given the potential for higher cost savings. As of July 14, 2014, a total of 3,367 participants were considered enrolled in the Pathways innovation (i.e., had signed a release of information [ROI] and had completed the adult checklist). As presented in ***Table 5***, about three-quarters (74.8%) are aged 25–64, and more than 60% (61.9%) are female. More than half (55.9%) are white, and nearly one-third (31.4%) are black. As would be expected based on eligibility criteria, approximately 42.4% receive Medicaid; 17% receive Medicare, including Medicare Advantage; and 20% are dually eligible.

Table 5. Characteristics of All Participants Enrolled through July 2014[1]

Characteristic	Number of Participants	Percentage of Participants
Age		
18–24	116	3.5
25–44	847	25.2
45–64	1,670	49.6
65–74	414	12.3
75–84	206	6.1
85+	111	3.2
Missing	3	0.0

(continued)

Table 5. Characteristics of All Participants Enrolled through July 2014[1] (continued)

Characteristic	Number of Participants	Percentage of Participants
Sex		
Female	2,085	61.9
Male	1,282	38.1
Missing	0	0.0
Race/ethnicity		
White	1,883	55.9
Black	1,056	31.4
Hispanic	182	5.4
Asian	25	0.7
American Indian or Alaska Native	26	0.8
Multiracial	52	1.5
Other	29	0.9
Missing/refused	114	3.4
Insurance Type		
Medicaid[2]	1,428	42.4
Medicare	481	14.3
Medicare Advantage	92	2.7
Dual eligible	672	20.0
Missing[3]	694	20.6

Source: Patient-level Michigan Public Health Institute Pathways data provided to RTI in July 2014.

[1] Count considers only clients with a nonmissing record indicating the release of information was signed and a nonmissing record indicating an adult checklist was complete.

[2] Includes county (i.e., Medicaid expansion).

[3] Missing also includes participants who indicated that they did not have Medicaid, Medicare, or Medicare Advantage and thus could include participants with other sources of insurance (e.g., private).

Staff for the Pathways innovation identify eligible participants through a variety of different mechanisms, including referrals from providers at local clinics, practices, community service agencies, and hospitals. For example, several of the CHWs are located within FQHCs and, therefore, are readily able to accept referrals from providers such as primary care physicians, nurses, and case managers. In this case, the CHW would contact the community hub with the referral, and the participant would most likely be assigned directly to that CHW so they could begin working together at the point of contact. Other CHWs are located within hospitals and can meet with patients upon discharge from an inpatient stay or an ED visit. During our site visit, we heard that in Muskegon, Pathways receives a list of the highest users of the ED and those with frequent hospitalizations to target enrollment in the program, although MPHI post-site visit indicated that all sites receive a similar list of high utilizers. Sites are also working with ambulance services, paramedics, and emergency medical technicians to get referrals on their most frequent users of services. Initially, CHWs also spent time recruiting participants at health fairs and other community events, although based on our site visit, CHWs generally have full caseloads and now spend the majority of their time working with participants as opposed to recruiting new ones. Also, many of the participants reached through health fairs and community outreach were not the highest users of care.

Table 6 displays the number of clients referred to the Pathways innovation and the target number of participants in person years identified by MPHI in its operational plan. In quarter 7 (Q7), MPHI identified more than 11,000 Medicare beneficiaries alone across the three communities with five or more ED visits, three or more hospitalizations, or total health care costs for 2012 greater than $31,500 (i.e., one standard deviation from the mean annual costs for Medicare beneficiaries across the three communities) who are not currently enrolled in Pathways that they could be serving. MPHI plans to conduct outreach to enroll more beneficiaries from this list in the respective communities. In addition, MPHI noted that it is developing a risk assessment tool to attribute risk scores to current Pathways participants based on the participants' initial adult checklist. This tool will also help sites target and recruit individuals who are high users of ED and inpatient admissions.

The total number of clients referred is also important to understand because RTI will examine reach as the number of participants enrolled based on those referred because MPHI's identified targeted numbers for inclusion are in person years and, thus, cannot be compared with a unique person count.

Table 6. Participants Planned for Inclusion in Innovation (Denominator Data)

Participant Type	Data Source	Current Count
Total number referred to Pathways	MPHI Pathways data	5,301 participants
Total number (in person years) targeted for inclusion by MPHI	MPHI analysis of potential cost savings outlined in operational plan	13,311 person years

Source: Patient-level MPHI Pathways data provided to RTI in July 2014.
MPHI = Michigan Public Health Institute.

1.2 Implementation Progress

The extent to which each awardee is able to implement its innovation as planned and reach a sufficient number of patients will be critical to assessing the awardee's impact on key outcomes (e.g., cost). The following discussion provides details on the implementation process, then on the effectiveness, and ***Table 7*** provides the list of measures RTI plans to use in assessing each awardee.

Table 7. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for MPHI

Measures by Key Evaluation Domains	Evaluation Subdomain	Measure	Data Source
Implementation effectiveness	Reach	Number/percentage of clients enrolled (i.e., ROI) based on clients referred	MiPathways data
		Number/percentage of clients considered active (i.e., ROI + adult checklist) based on clients referred	MiPathways data
	Dose	Number and type(s) of pathways per participant	MiPathways data
		Number/percentage of clients participating (i.e., ROI + adult checklist + initiating at least 1 pathway)	MiPathways data

MPHI = Michigan Public Health Institute; ROI = release of information.

1.2.1 Process

The implementation process has been the initial focus of the evaluation. RTI defines "implementation process" as including execution of implementation, organizational capacity, key staff and partner engagement, and client recruitment and enrollment. The implementation process is best evaluated through a combination of data variables, including execution of implementation that conforms with operational plans and capacity for implementing the innovation in a timely and effective manner. We focused on the implementation process during the awardee site visits. We visited MPHI the week of April 21, 2014, and asked evaluation questions such as the following:

- What is the overall execution of the innovation implementation (e.g., the actual rate of expenditures relative to the projected rate)?
- What accomplishments are specific to hiring or training staff so that the organization can build its capacity to implement the innovation effectively?
- What is the implementation effectiveness, including fidelity, reach, and dose of the innovation thus far?

Execution of Implementation

The rate at which awardees expend funds or enroll patients, compared with projection, provides useful information to assess the innovation's status. If expenditure or enrollment rates are particularly low (because of technology issues or issues related to hiring staff), these variables help assess the awardees' readiness to implement the innovation at the start and the extent to which they can spend all funding and meet their overall goals by the end of the project (e.g., can they effectively allocate the funds provided?). Overall, it took

MPHI slightly longer than expected to get its innovation off the ground. Using the most updated Lewin numbers, as of March 2014 (Q7), the awardee had spent about 33% of the overall funding. In the first three quarters of Year 2, it has spent 52.4% of its Year 2 budget.

Although the awardee was able to enroll some participants early in Q2, enrollment has just now begun to pick up. Some early challenges centered on the use of an electronic database developed by Care Coordination Solutions that was ill equipped to handle the data collected from participants by CHWs as part of this innovation. Sites noted that the first system was riddled with problems and was an initial barrier in enrolling participants. CHWs were unable to save the data they had entered, and many of the fields lacked date stamps, so it was difficult to determine when a pathway was initiated and completed. It was not user friendly for the front-end user, the CHW, or the back-end analytics team. MPHI had to abandon this system and decided to design and implement its own in-house data system, MiPathways. This new system was rolled out in January 2014. Although staff have been trained on the new system, some CHWs are still hesitant to use it because they are afraid to lose information they entered, although this has not happened with the new system. Some CHWs are not proficient in entering data into the tablets or feel that the system gets in the way of participant interaction, so they still use paper forms and enter the data later. Some sites have appointed lead CHWs who are more comfortable with the new system and data entry to assist CHWs who are less familiar. Overall, however, MPHI has addressed most of the issues regarding data collection and entry.

Other challenges noted included gaining trust in and support for the Pathways innovation in the respective communities. In some communities like Muskegon and Saginaw, lack of trust and support appears to be less of an issue, but in Ingham, many of the CHWs noted that they lacked provider support and buy-in for the Pathways innovation. Although program staff are trying to engage providers in the community more effectively, during the site visit, CHWs suggested engaging primary care providers earlier in the implementation process in future initiatives.

Organizational Capacity and Leadership

MPHI has experience with both federal and state awards. Staff working on this innovation have prior experience managing and implementing other initiatives of this scale. MPHI has in place the workforce, including the leadership, organizational relationships (to the health department and to local organizations), and information technology (IT) capacity, to develop, coordinate, and evaluate the intervention. Leadership support for the project is high at MPHI and at the lead agencies, as demonstrated by participation in the site visit interviews. The leadership of the sites also believed the project was worthwhile and important to continue once the award had ended. The leadership was also critical in getting all relevant stakeholders within each community to participate in the innovation. Much of the success of involving key stakeholders in the respective communities depended on strong leadership at the lead agency.

In addition, the Michigan Department of Community Health (MDCH), a key partner in this innovation, has the necessary experience and leadership to assist with this innovation because it is currently working on other Centers for Medicare & Medicaid Services (CMS) initiatives such as the Multi-Payer Advanced Primary Care Practice Demonstration and the State Innovation Models. MDCH has provided necessary expertise regarding linking social and health services within the community and has provided trainings for both CHWs and clinical supervisors. One of MDCH's senior staff also serves as the Pathways innovation co–principal investigator. Although they are not paid directly for many of their contributions to this effort, all MDCH staff noted the importance of this innovation and the potential benefits it brings to Michigan residents.

Based on the site visit, organizational capacity to adopt and implement the Pathways innovation appears to be, with few exceptions, also high across the three sites. Within lead agencies and organizations serving as the hubs, relevant aspects of capacity include fiscal resources, workforce, physical infrastructure, organizational relationships, and organizational culture, all of which appear to be adequate to high across the sites. During our site visit, MPHI noted that it considered these factors in selecting lead agencies and community hubs. The lead agencies needed the capacity and ability to sustain this innovation long term as well as the ability to handle the financial responsibility of the award. The community hubs needed to be neutral (i.e., not employ any CHWs directly) and to be able to garner community support.

There are some variations, however, across sites. For example, the Muskegon and Saginaw initiatives each have a community-based office where the CHWs congregate and work, which appears to foster staff cohesion and morale, which is different from the other site. Also in Muskegon, the link of the lead agency to the regional hospital provides access to resources and health care data. In addition, the agencies hiring CHWs across all three sites had different capacities to participate in the intervention. Some smaller nonprofits did not have experience supervising CHWs and monitoring performance; this may also be the case in some of the clinic and primary care sites. Some of these variations in organizational capacity may contribute to differences in effectiveness across the three sites, although examining differences is not a primary focus of the evaluation. Given the overall high level of organizational capacity and leadership support across the organizations, we do not expect this construct to be a limiting feature in overall implementation effectiveness.

1.2.2 Workforce Development

Recruiting and training CHWs to help participants navigate the system to manage health and social needs is an important part of the innovation.

Hiring and Retention

As of the site visit in April, Pathways supports approximately 60 CHWs across the three implementation sites: 15 at Saginaw, 25 at Muskegon, and 20 at Ingham. In addition, there are approximately two full-time equivalent (FTE) clinical supervisors per site. The number of staff has met or exceeded projections and is fully operational at this point. During Q7, Muskegon noted that three CHWs (two FTEs) left the project, but seven CHWs (five FTEs) were added. In addition, Ingham added two full-time CHWs. Overall, communities noted that turnover among staff is low, although several of the CHWs left because the award is scheduled to end, and they were interested in more permanent employment.

The CHWs are supposed to be recruited from the local community because they should be knowledgeable about the neighborhoods they are serving. Pathways leadership strived to obtain racial, ethnic, gender, and age diversity among CHWs. The original model includes providing health benefits for full-time CHWs as part of their employment. Although ideal, this stipulation is difficult for some of the communities to implement because in the beginning, many of the communities had hired CHWs on a part-time basis. In addition, Ingham County is unionized, which presented a number of challenges. MPHI noted that this requirement has affected the site’s ability and speed with which it was able to hire CHWs. Overall, across all three sites, it is slightly below projection of FTEs.

In Saginaw and Muskegon, most clinical supervisors are from the local health care systems, either the hospital or FQHC. In Ingham, the clinical supervisors are from the community health department. Clinical supervisors vary in the number and type of CHWs they supervise. In some cases, an FTE clinical supervisor oversees 10 CHWs, whereas in other sites, it is closer to 18 CHWs. Clinical supervisors noted challenges with trying to oversee CHWs located in other agencies, where the CHW may report to someone located at that agency as well as the clinical supervisor. There has been some confusion with responsibilities in cases where CHWs report to multiple people.

Training

Because of the lack of licensing and variability in backgrounds of the CHWs, training is necessary to facilitate the success of the innovation. CHWs must attend a 1-week training provided by MPHI that covers core competencies, including sessions on the role and responsibilities of a CHW, home safety, listening skills, social justice and equity, and medical information. Initially, the CHWs felt that the training focused too heavily on anatomy and disease information, so the training has been revised to include less medical detail. After the 1-week training, sites require additional trainings for CHWs tailored to the population, needs, and circumstances of the communities served. Trainings offered by one intervention site may be available to CHWs from other intervention sites. Although there is slight variation between sites, the majority of sites provided additional trainings related to, for example, Medicare and Medicaid, the Affordable Care Act, Social Security benefits and resources, safety tips specific to the respective community, details on how to perform a home visit, motivational interviewing, mental health first aid, social justice training, and specific disease-related education. In Q7, MPHI provided software training on the new MiPathways administrative database to hub managers/staff, clinical supervisors, and CHWs. The trainings used a standardized user guide and training manual, developed by MPHI for the MiPathways database. The user guide provides step-by-step instructions on topics such as managing hub tasks, entering clinical data and notes, tracking encounters, recording data, running reports, and accessing education resources on chronic conditions.

MPHI also sponsored trainings for clinical supervisors on conducting medication assessments, collecting clinical data, and explaining roles and responsibilities for clinical supervisors. This quarter, MPHI also sponsored trainings on motivational interview techniques, 5 A’s tobacco cessation, legal issues associated with housing, community mental health services, mental health crisis intervention services, and home visiting safety. In addition, Muskegon noted that it held its own data entry day to help CHWs feel more comfortable using the new MiPathways database. Also in Q7, Saginaw developed a list of CHW trainings that all new hires will undergo after the 1-week MPHI training. As of Q7, at least 25 additional trainings were conducted.

Across the sites, CHWs who received the trainings had positive opinions about them. Clinical supervisors and CCAs were also positive about the training the CHWs received. Trainings appeared to be occurring frequently and were based on expressed needs. Project administrators report actively seeking opportunities for CHWs to learn about community resources and gain skills needed to effectively recruit and work with clients.

Workforce development may affect the evaluation, because trainings may help increase workforce competency and lead to more effective implementation of the innovation. For example, a better-trained workforce may affect the number and type of pathways that participants receive and may affect how the model is implemented in various sites. In addition, trainings may help combat staff burnout and increase specific competencies and skills related to implementing the innovation, which may also affect health outcomes.

1.2.3 Implementation Effectiveness

Effective implementation (also known as “implementation success”) is the presence of the innovation delivered as intended (fidelity) to a substantial proportion of the targeted population (reach) in doses associated with effectiveness (dosage). During our site visit in April 2014, we determined the innovation to have moderately successful implementation. Overall, services are being provided to the intended recipients, despite significant adaptations to the original Pathways model. In addition, enrollment numbers are not as high as originally predicted. Significant numbers of eligible participants in the respective communities are not being served by this innovation. Implementation effectiveness affects the evaluation, because it relates directly to the innovation’s ability to be successful (i.e., to lower costs or improve health outcomes). If innovation implementation is inconsistent or has not reached intended participants, we would not expect the innovation to reach its intended goals. More details concerning fidelity, reach, and dose are discussed as follows.

Fidelity

As discussed, this innovation is based on the Pathways model developed by Drs. Mark and Sarah Redding through their work with the CHAP in Ohio. Communities adapted the original model to fit their local context. The first major adaptation was to include a lead agency at each of the three sites. In the original model, the community hub not only served as the data entity, but also handled all the finances and project management. The hubs contracted with CCAs to hire and train CHWs. Michigan, however, required a lead agency because the administration of the award and finances was more complex than what the leadership felt that organizations selected as the community hubs could administrate.

In addition, because the Pathways model in Michigan focuses on participants with chronic conditions, not high-risk pregnancy, CCAs include community social service agencies as well as local hospitals and FQHCs. Pathways also includes different types of pathways (e.g., education for chronic conditions, medication assessment) to make it most relevant for participants with chronic conditions. The original Pathways model is also constantly evolving. Currently, the developers are working on a certification process for community hubs, in which one of the Michigan sites is participating. In addition, the Reddings' model now suggests paying the CCAs based on CHW performance. Although this was not an original component of the model, it is currently included as a critical element. As discussed, MPHI is working to try to incorporate a cost-reimbursement variant into the model, based on participant services received, but it is challenging for many of the sites and the CCAs to implement.

Overall, leadership at MPHI noted that the target population, number of sites, and size of the innovation required some variations from the original model. Although fidelity to the model is desirable, it is not always achievable because the model is constantly evolving. In addition, it is difficult for the communities to adapt quickly and accordingly with every suggested change. Because the innovation was based on an evidence-based model and adaptations and changes to the model are occurring, we believe fidelity is an important consideration for the evaluation, but we may not be able to formally measure it as a factor. Fidelity may affect implementation effectiveness. If the model was not implemented as originally intended, it may not produce the same results as it has previously among high-risk pregnancy participants.

Reach

There are two ways to examine reach for MPHI. The first way is to examine enrollment in Pathways. This includes participants having signed an ROI. According to MPHI Pathways data provided to RTI, a total of 3,950 clients had signed an ROI. The second way to measure reach is to examine the number of participants considered active in the innovation. This definition requires participants to have signed an ROI in addition to completing the mandatory adult checklist. According to MPHI Pathways data provided to RTI, 3,367 clients met that definition as of July 14, 2014. There are some differences in enrollment and participants considered active among the three sites (see ***Table 8***). Differences are likely because Muskegon operates within a single health system, Mercy Health, a part of Trinity Health. The organizational structure at Muskegon allows for access to system-wide electronic health records. The clinical supervisors are able to use real-time clinical data to locate and verify high users of the ED. During our site visit, CHWs at Muskegon noted they were able to work with nurse care managers at the primary care offices and at the hospital more easily because they are under a single health system with access to information in the electronic health records.

MPHI noted that it is considering adjusting the enrollment targets to take into account the number of active participants, the client's risk status, and the CHW's optimal caseload. These revised targets will be included in future reports as they become available.

Table 8. MPHI Enrolled and Active Participants

	Saginaw	Muskegon	Ingham	Total
Number enrolled: Total ROI signed	1,044	1,702	1,204	3,950
Number active: ROI + adult checklist	939	1,364	1,064	3,367
Difference in participants: ROI signed but no adult checklist	105	338	140	583

Source: Patient-level MPHI Pathways data provided to RTI in July 2014.
MPHI = Michigan Public Health Institute; ROI = release of information.

Enrollment has also varied over time. As discussed, MPHI had a number of early challenges that affected the execution of the innovation. Initially, the CHWs noted they were confused about whom they should target for enrollment. Although all participants have Medicare and/or Medicaid and two chronic conditions, CHWs were not systematically targeting the highest ED and hospital in-patient users. Efforts have seemed to shift to focus on high users. These efforts to target high users will affect the evaluation; it should lead to not only decreases in ED use and in-patient hospital admissions, but also should affect the total cost-of-care measures.

Given that we were interested in determining the number of clients referred who not only enroll, but are also considered active, we present reach several ways. ***Table 9*** presents enrollment and reach by quarter as a percentage of referred clients, whereas ***Table 10*** presents the number of participants considered active and reach by quarter as a percentage of referred clients. We do not present reach as a percentage of set targets by MPHI given that their targets are in person years, which is not comparable to the actual number of enrolled or active participants.

Table 9. Participant Enrollment as Signed ROI Only by Quarter since Project Launch

Quarter	Total Clients Referred	Number of Participants Enrolled (ROI Only)	Total Reach per Quarter (%)	Percentage Change from Previous Quarter
Cumulative through January 2013 (i.e., launch)	36	6	16.7	0.0
Cumulative through March 2013 (Q3)	428	167	39.0	22.3
Cumulative through June 2013 (Q4)	1,331	749	56.3	17.3
Cumulative through September 2013 (Q5)	2,115	1,231	58.2	1.9
Cumulative through December 2013 (Q6)	2,856	1,832	64.1	5.9
Cumulative through March 2014 (Q7)	4,006	2,750	68.6	4.5
Cumulative through June 2014 (Q8)	5,147	3,578	69.5	0.9
Total as of July 2014	5,301	3,950[1]	74.5	5.0

Source: Patient-level Michigan Public Health Institute Pathways data provided to RTI in July 2014.

[1] Missing ROI signed dates for 272 patients. They are included in total enrollment but not designed by quarter.

Q = quarter; ROI = release of information.

Table 10. Participants Considered Active and Reach by Quarter since Project Launch Based on Clients Referred

Quarter	Total Clients Referred	Number of Active Participants (ROI + Adult Checklist)[1]	Total Reach per Quarter (%)	Percentage Change from Previous Quarter
Cumulative through January 2013 (i.e., launch)	36	2	5.6	0.0
Cumulative through March 2013 (Q3)	428	132	30.8	25.2
Cumulative through June 2013 (Q4)	1,331	712	53.5	22.7
Cumulative through September 2013 (Q5)	2,115	1,181	55.8	2.3
Cumulative through December 2013 (Q6)	2,856	1,708	59.8	4.0
Cumulative through March 2014 (Q7)	4,006	2,550	63.7	3.9
Cumulative through June 2014 (Q8)	5,147	3,275	63.6	–0.1
Total as of July 2014	5,301	3,367	63.5	–0.1

Source: Patient-level Michigan Public Health Institute Pathways data provided to RTI in July 2014.

[1] If the date ROI was signed or date of adult checklist was missing, then the first date that a pathway was initiated was used.

Q = quarter; ROI = release of information.

Dose

There is no standard or target dose for the entire innovation, given that the number, type, and duration of the specific pathways vary by participant. However, dose is a relevant construct in the evaluation of MPHI. After the site visit at MPHI, we determined that dose would be best assessed as both the number and type of pathways participants are initiating and completing, including the relevance or appropriateness of the pathways. For example, using MiPathways administrative data, we determined that 3,278 (actual number) participants are being served (e.g., completed an ROI, initial adult checklist, and at least one pathway) compared with those who are considered active (***Table 11***). Dose can also be examined by average number of pathways per participant. We examined the total, type, and average number of pathways per participant (***Table 12***). Given that all pathways are not intended to be the same and the completion of certain pathways may result in improved patient outcomes, we will continue to refine our measures of dose as data become available.

Table 11. Number of Participants Receiving Services by Quarter

Quarter	Number of Active Participants (ROI + Adult Checklist)[1]	Number of Participants Initiating at Least 1 Pathway	Percentage of Participants Enrolled Receiving Services
Cumulative through January 2013 (i.e., launch)	2	2	100.0
Cumulative through March 2013 (Q3)	132	136[2]	103.0
Cumulative through June 2013 (Q4)	712	645	90.6
Cumulative through September 2013 (Q5)	1,181	1,071	90.7
Cumulative through December 2013 (Q6)	1,708	1,568	91.8
Cumulative through March 2014 (Q7)	2,550	2,382	93.4
Cumulative through June 2014 (Q8)	3,275	3,167	96.7
Total as of July 2014	3,367	3,278	97.4

Source: Patient-level MPHI Pathways data provided to RTI in July 2014.

[1] If the date ROI was signed or date of adult checklist was missing, then the first date that a pathway was initiated was used.

[2] Some participants noted initiating a pathway but had not yet completed an adult checklist.

Q = quarter; ROI = release of information.

Table 12. Common Pathways, Total Number of Times Completed and Average Number per Participant

Pathway Name	Total Number Completed[1]	Total Number Completed (No Duplicate Participants[2])	Average Number Completed Per Participant
Medical referral	7,302	1,581	4.6
Social service referral	7,109	2,233	3.2
Medication assessment	1,568	1,401	1.1
Education	1,274	609	2.1
Health insurance	586	546	1.1
Medical home	495	436	1.1
Medication management	178	167	1.1
Family planning	25	23	1.1
Pregnancy	23	23	1.00
Postpartum	13	13	1.00
Total Number Completed	**18,573**	**7,032**	N/A

Source: Patient-level Michigan Public Health Institute Pathways data provided to RTI in July 2014.

[1] Individuals may have completed some pathways multiple times.

[2] Counts only one completed pathway per participant.

N/A = not applicable.

Measurement of dose will affect the evaluation, because we will be able to determine whether those who complete all relevant pathways have improved outcomes. In addition, we can determine whether completion of certain pathways (e.g., medication assessment) leads to better health outcomes and lower costs.

1.3 Evaluation Outcomes

Awardees have two possible types of quantitative data that RTI will use in assessing the impact of the awardee's innovation on key outcomes. These include claims data for Medicare and/or Medicaid beneficiaries, depending on who the awardee serves, and other administrative or utilization data the awardee is collecting (which we have labeled as "other awardee-specific data," reflecting the variability of the types of data elements available across awardees). We are in the process of finalizing our assessment of all the available data sources and requesting data directly from each awardee. As those data are received, we will incorporate the findings into our quarterly/annual reports. The following sections present descriptive findings from the quantitative outcome data provided to and cleaned by RTI as of September 11, 2014.

1.3.1 Measures for Evaluation

After the site visit, the data management and site visit teams met to review each of the measures listed in the awardee's self-monitoring measurement plan (i.e., data review meeting). The measures listed in ***Tables 7*** and ***13*** reflect the measures determined as most relevant for our evaluation of MPHI's innovation outcomes.

Table 13. Outcome Measures Requested from MPHI

Key Evaluation Domains	Subdomains	Measures	Data Sources
Clinical effectiveness	Diabetes	Percentage of patients with diabetes who received a hemoglobin A1c and lipid profile assessment	MiPathways Data
	Hypertension	Percentage of patients who received blood pressure screening	MiPathways Data
	Weight management	Percentage of patients who are overweight (BMI 25.0–29.9) or obese (BMI >30)	MiPathways Data
Health outcomes	Diabetes	Percentage of patients with diabetes who had hemoglobin A1c >9.0%	MiPathways Data
		Percentage of patients with diabetes who had LDL-C <100 mg/dL	MiPathways Data
	Hypertension	Percentage of patients with a diagnosis of hypertension with blood pressure <140/90 mm Hg	MiPathways Data

(continued)

Table 13. Outcome Measures Requested from MPHI (continued)

Key Evaluation Domains	Subdomains	Measures	Data Sources
Health care outcomes	Utilization	ED visit rate	Claims data
		All-cause admission rate	Claims data
		Readmission rate	Claims data
		ACSC inpatient admission rate	Claims data
	Cost	Sum of total inpatient/hospitalization costs + ED visit costs + specialty care visit costs	Aggregation and validation of data from multiple internal and external/partner sources
		Spending per patient	Claims data
		Cost savings	Claims data

ACSC = ambulatory care sensitive condition; BMI = body mass index; ED = emergency department; LDL-C = low-density lipoprotein cholesterol; MPHI = Michigan Public Health Institute.

1.3.2 Claims Data

As part of a broad assessment of health care innovations, the Center for Medicare & Medicaid Innovation (CMMI) is assessing the impact of its programs, including those funded specifically by HCIAs, on four core measures. The four core measures are

- health care spending per patient,
- hospital inpatient admissions,
- hospital unplanned readmissions, and
- ED visits.

Collectively, it is anticipated that CMMI programs will slow the increase in health care spending, reduce hospital admissions, reduce avoidable hospital readmissions, and prevent unnecessary ED visits. We are reporting these measures for all HCIA Community Resource Planning awardees so that the collective impact of the awards can be assessed. Discussed as follows, some awardees' innovations may not be focused on these measures. Other awardees' innovations target specific conditions (e.g., imaging, diabetes) and may have significant impacts on spending, admissions, readmissions, and ED visits for the targeted conditions but not have a statistically detectable impact on the measures at the aggregate level because the targeted conditions represent only a small fraction of total spending, inpatient admissions, and ED visits.

The measures are calculated through analysis of Medicare and Medicaid fee-for-service claims. Because of differences between Medicare and Medicaid patients in age, other demographic variables, and disease status, we report the Medicare and Medicaid results separately as follows. Currently, complete Medicare claims are available through the end of 2013. Medicaid claims for MPHI are available through the first quarter of 2013, although claims for the final quarter may not be complete. The MPHI innovation was launched on January 1, 2013.

- **Health Care Spending per Patient**. For Medicare beneficiaries, health care spending per patient includes Part A and Part B Medicare expenditures for persons enrolled in the Part A and Part B fee-for-service program. The variable focuses on Medicare fee-for-service spending, so Medicare managed care (Part C) services are excluded, as are beneficiary copayments. Medicare Part D prescription spending is also excluded. Spending is reported on a per-person per-quarter basis. If a beneficiary is not enrolled for every month in a quarter, spending (except for hospital inpatient spending) is prorated to a quarterly basis based on the number of days enrolled during the quarter. Because hospital inpatient admissions are both rare and expensive, spending is not prorated for hospital inpatient spending. Prorating is also not performed for beneficiaries who die during a quarter.

  For Medicaid beneficiaries, health care spending per patient is reported for fee-for-service beneficiaries. Beneficiaries are only included in the analysis for spending (and the other measures) during periods when they are enrolled in Medicaid.

- **Hospital Inpatient Admissions**. This variable measures hospitalization, the single most expensive component of health care spending. Patients kept overnight in observation beds are excluded from this measure. Inclusion criteria for the analysis are the same as for spending. Hospital inpatient admissions are not prorated based on the number of days eligible during the quarter. All-cause inpatient admissions are reported. The mean quarterly admission rate per 1,000 patients is reported.

- **Hospital Readmissions**. Hospital readmission rates serve a dual purpose in evaluating HCIA impacts. Readmissions add to the costs of a prior hospitalization, and they often reflect a problem in the care provided during the first admission. All-cause readmissions are defined as a follow-up admission to any short-term acute general or long-term care hospital within 30 days of a discharge from another hospital of the same type. We ignore multiple admissions within 1 day of an initial admission because these often represent transfers between hospitals. We define index hospitalizations that begin during the quarter and follow each index admission for 30 days, even when the follow-up period extends beyond the end of the quarter. Inclusion criteria for the analysis are the same as for spending. The readmission rate equals the number of readmissions divided by the number of index hospitalizations during the quarter. Planned readmissions are excluded from the calculation of the numerator. Quarterly mean readmission and ambulatory care sensitive condition readmission rates per 1,000 admissions are reported.

- **ED Visits**. ED visits are sometimes viewed as a symptom of the inability of the community’s health care system to provide adequate preventive and ambulatory care visits. We report an all-cause ED visit rate that excludes ED visits resulting in an inpatient admission (which presumably represent unavoidable visits) and includes overnight ED visits without an inpatient admission. Inclusion criteria for the analysis are the same as for spending, and ED visits are also subject to the same prorating formula as for spending. The mean quarterly ED visit rate per 1,000 patients is reported.

Medicare Claims Analysis

Appendix A shows the claims analyses tables that we plan to present for Medicare. In addition to the tabular format, we will present figures showing each measure as a function of time. Values in quarters prior to the innovation's launch in January 2013 will be shown in one color, and values for quarters during and after launch will be shown in another color. The figures will include a trend line based on a linear regression of prelaunch values.

Medicaid Claims Analysis

The Medicaid data analysis will use data from the CMS Alpha-Medicaid Analytic eXtract (MAX) data files. Currently, Medicaid claims for MPHI are only available in Alpha-MAX through the first quarter of 2013, and claims for that final quarter may not be complete. We will report tables and figures similar to those for Medicare.

Discussion of Claims Analysis

The four measures provide descriptive data on patients enrolled in the MPHI innovation before, during, and after its launch. Although it is necessary to report these measures to support CMS's broader assessment of its full portfolio of innovation projects, the measures may not provide a complete evaluation picture of the MPHI innovation. There are a number of reasons for this. First, the innovation was only launched on January 1, 2013. The impact of a community hub and CHW innovation may not be immediate because it takes time for providers to incorporate new sources of information and for patient management to achieve changes in health care utilization. Second, although all MPHI beneficiaries may potentially benefit from the Pathways innovation, the benefits (at least in terms of the four core measures) may be most pronounced for patients with health care–related pathways and a greater number of chronic conditions. We will attempt to incorporate these factors in future analyses.

Development of Comparison Groups

In addition to comparing Medicare and Medicaid beneficiaries pre- and postinnovation, we will also construct a statistically matched, contemporaneous comparison group of individuals located in the same three counties (Saginaw, Muskegon, and Ingham) where the intervention was conducted but who were not enrolled in the innovation. The rationale for using a comparison group of individuals in the same geographic areas as the intervention counties is twofold: (1) we want to minimize variation in sociodemographic and community characteristics that may influence service use and expenditures, and (2) we learned in the site visit that a number of other counties in the region have other similar types of programs in the region; thus, it would be best to select a comparison group within the same county. County characteristics are shown in ***Table 14***.

Table 14. County Characteristics

County	Population	Density/Sq Mi	Median per Capita Income ($) (% below the Poverty Line)
Saginaw	200,169	259	21,025 (16.9)
Muskegon	172,188	334	17,967 (11.4)
Ingham	280,895	500	21,079 (14.6)

Source: http://www.census.gov/2010census/.

To construct the comparison group, we will use propensity score matching for each Pathways participant. The likelihood of program participation will be estimated using a parametric model (e.g., logit) as a function of demographics (gender, age, and ethnicity), health characteristics (number of chronic conditions), and spending during the years before program participation. Each program participant will be matched with a comparison-group member having the nearest propensity score within a statistical threshold.

Difference-in-differences analysis will be used to profile changes in the outcomes of interest for participants before and after the intervention, and these estimates will be compared with similar before-and-after changes in spending observed in the matched comparison group. This approach implicitly controls for any unmeasured differences between the groups that remain constant over the study period, thereby preventing these unmeasured differences from biasing the estimates of program impact.

Estimates of the effect of treatment on the treated will be obtained by stratifying on an estimate of the likelihood of participation and by matching each treated observation to controls with similar values of the propensity score.

1.3.3 Other Awardee-Specific Data

In early July 2014, after the data review meeting and execution of the business associate agreement requested by MPHI, RTI met with MPHI to request the raw patient- and site-level data that were used to generate each of the measures in ***Tables 7*** and ***13***.

Overview of Data Received

We received the initial raw data in mid-July 2014, including each of the variables we requested. We are still, however, working with MPHI to ensure we understand all the data provided. There are many nuances regarding how the data are structured that we are working with MPHI to understand. As we get further clarification, we will be able to refine the tables presented as follows in subsequent quarterly/annual reports.

Health Indicators

We are continuing to work with the data received from MPHI. Most of the tables presented in the MPHI awardee section thus far are based on the raw patient-level data MPHI provided to RTI in July 2014. As discussed previously, once we receive further clarification and additional data over time, we will create additional tables in subsequent reports.

Table 15 shows the number and percentage of participants by the most common health conditions and by number of health conditions. As a requirement for eligibility, participants must have at least two chronic conditions. The majority of patients had 3–5 chronic conditions (44%), although 25% had 6–8 chronic conditions, and 10% reported more than 10 chronic conditions. Hypertension (78%), depression (76%), arthritis (74%), diabetes (72%), and anxiety (71%) were the most prevalent among participants; a large majority of participants also had hyperlipidemia (70%), asthma (68%), obesity (67%), chronic obstructive pulmonary disease (66%), and/or bipolar disorder (66%). This table indicates that MPHI is serving a chronically ill population with a large number of chronic conditions.

Table 15. Number and Percentage of Active Participants by Type and Number of Health Conditions for Those Enrolled as of July 2014

	All Active Patients[1] (N=3,367)	
	Number	**Percent**
Specific Health Condition		
Hypertension	2,613	78
Depression	2,560	76
Arthritis	2,492	74
Diabetes type II	2,413	72
Anxiety disorder	2,386	71
Hyperlipidemia	2,356	70
Asthma	2,305	68
Obesity	2,240	67
COPD	2,233	66
Bipolar disorder	2,214	66
Other[2]	2,644	79
Number of Health Conditions		
2 Conditions reported	723	21
3–5 Conditions reported	1,476	44
6–8 Conditions Reported	828	25
>=9 Conditions reported	340	10

Source: Patient-level data provided to RTI by MPHI in July 2014.

[1] Based on most recent adult checklist completed.

[2] Other includes (1) conditions included in the checklist that have been mislabeled as "other" (e.g., anxiety, back pain); (2) conditions that may not be considered chronic health conditions (e.g., illiteracy); and (3) other conditions not included in the checklist (e.g., sleep apnea, fibromyalgia).

We also examined the most common types of chronic conditions by three common pathways to see variation in utilization among participants with certain types of chronic conditions. Overall, however, there was very little variation among participants with common chronic conditions. One reason may be because so many participants have multiple conditions. On average, the medical referral pathway was completed approximately 5–6 times per participant, medication assessment was completed once, and education pathway was completed approximately 2 times per participant (***Table 16***).

Table 16. Number and Type of Pathways Completed by Health Condition for Those Enrolled as of July 2014

Specific Health Condition	Pathway					
	Medical Referral		Medication Assessment		Education Pathway	
	Number Times Completed[1]	Mean Times Per Participant[2]	Number Times Completed[1]	Mean Times Per Participant[2]	Number Times Completed[1]	Mean Times Per Participant[2]
Hypertension	4,489	5.5	876	1.1	761	2.3
Depression	3,873	5.2	731	1.1	687	2.3
Arthritis	3,144	5.2	594	1.1	575	2.3
Diabetes type II	3,312	6.1	585	1.2	533	2.4
Anxiety disorder	2,362	5.0	468	1.1	397	2.1
Hyperlipidemia	4,489	5.5	876	1.1	761	2.3
Asthma	1,977	6.0	355	1.1	196	2.0
Obesity	1,942	6.5	311	1.2	288	2.3
COPD	1,364	5.8	263	1.1	223	2.3
Bipolar disorder	1,049	5.1	221	1.2	186	2.2

Source: Patient-level data provided to RTI by Michigan Public Health Institute in July 2014.
[1] Includes total number of times pathway was completed for anyone with that specific condition.
[2] Mean number of times pathway was completed for people with that specific condition.
COPD = chronic obstructive pulmonary disease.

Last, we also examined several health indicators among participants. We examined the total number of times certain tests and assessments have been completed overall and the total number of unique participants receiving a low-density lipoprotein cholesterol (LDL-C) test, a glycated hemoglobin (HbA1c) test, a blood pressure screening, or a body mass index (BMI) assessment. Although 864 LDL-C screenings were completed in total, only 261 participants received at least one test since project launch (i.e., 864 screenings across 261 patients). Similarly with HbA1c, 824 tests were completed, but only 295 participants received at least one test since project launch. However, 1,160 participants had BMI measured at least once, and 1,379 participants had a blood pressure screening at least once since project launch (***Table 17***).

Table 17. Total Number of Clinical Effectiveness Outcomes Completed among Unique Participants as of July 2014

Health Indicator	Total Number Completed	Total Number of Unique Participants
LDL-C screening	864	261
Hemoglobin A1c testing	824	295
Blood pressure screening	1,787	1,379
BMI	1,678	1,160

Source: Patient-level data provided to RTI by Michigan Public Health Institute in July 2014.
BMI = body mass index; LDC-C = low-density lipoprotein cholesterol.

Health Outcomes

In addition, we looked at health outcomes among participants who had received at least one LDL-C screening, HbA1c test, blood pressure test, or BMI assessment (***Table 18***). For example, almost half of those participants receiving a LDL-C assessment were considered in control (49.4%), and almost 66% of those receiving a blood pressure screening were considered in control. For HbA1c testing, however, among those who received an HbA1c test, the vast majority were considered poorly controlled. In addition, more than 55% of those with a measured BMI were considered obese, and almost 23% were considered obese class 3 (BMI > 40).

Table 18. Number and Percentage of Participants Achieving Each Health Outcome among Those Screened as of July 2014

Health Outcome	Number Achieving Health Outcome	Percentage Achieving Health Outcome
LDL-C control: Percentage of adults with diabetes (types 1 and 2) whose most recent LDL-C test is <100 mg/dL during the measurement year	129	49.4
Hemoglobin A1c poor control: Percentage of adults with diabetes whose most recent hemoglobin A1c indicates poor control (>9.0%) during measurement year	231	78.3
Blood pressure control: Percentage of adults who had a diagnosis of hypertension and whose blood pressure was adequately controlled (<140/90 mm Hg) during the measurement year	908	65.8
BMI obese: Percentage of adult patients who classify as obese (>30) during the measurement year	642	55.3
BMI obese class 3: Percentage of adult patients who classify as obese class 3 (>40) during the measurement year	265	22.8

Source: Patient-level data provided to RTI by Michigan Public Health Institute in July 2014.
BMI = body mass index; LDL-C = low-density lipoprotein cholesterol.

In addition, we are able to examine the number of participants achieving the health outcome over time. These results indicate a fairly stable rate regarding the number of participants achieving each health outcome. This is likely a result of including new enrollees over time. Therefore any changes occurring among current participants are diluted by including those participants who just enrolled. We will present change over time data to reflect rolling enrollment in the following reports in addition to continuing to examine screening rates and outcomes over time (***Table 19***).

Table 19. Number and Percentage of Participants Achieving Each Health Outcome over Time[1]

Health Outcome	Q3	Q4	Q5	Q6	Q7	Q8
LDL-C control: <100 mg/dL	18 (40%)	44 (55%)	43 (44%)	69 (47%)	111 (53%)	75 (61%)
HbA1c poor control: >9.0%	29 (85%)	52 (87%)	58 (85%)	118 (74%)	222 (80%)	107 (73%)
Blood pressure control:<140/90 mm Hg	24 (62%)	75 (71%)	82 (56%)	181 (66%)	426 (65%)	294 (64%)
BMI obese: >30	22 (63%)	52 (54%)	91 (67%)	149 (59%)	349 (56%)	220 (54%)
BMI obese class 3: >40	8 (23%)	27 (28%)	40 (29%)	62 (25%)	129 (21%)	104 (25%)

Source: Patient-level data provided to RTI by Michigan Public Health Institute in July 2014.

[1] 365 participants excluded because of missing dates for tests completed, including 127 BMI tests, 160 LDL-C tests, 80 HbA1c tests, and 108 blood pressure tests.

BMI = body mass index; HbA1c = glycated hemoglobin; LDL-C = low-density lipoprotein cholesterol; Q = quarter.

Discussion of Other Awardee-Specific Findings

The awardee-specific outcome data analyzed to date demonstrate that MPHI is reaching a chronically ill population, and participants are taking part in the Pathways innovation as designed (i.e., completing common pathways). Although this does not equate to MPHI reaching the highest utilizers of the ED, they are reaching a chronically ill population. Current results are mixed, however, on the health outcomes. Regarding blood pressure and LDL-C control, of those receiving tests, at least half were in control. For HbA1c, though, the vast majority were in poor control. This assessment, however, is based on a fairly limited amount of participants being tested given the large number of participants indicating that they have diabetes. During the site visit, MPHI noted it is difficult to obtain this type of clinical information for many of the Pathways participants. Thus, these results may vary over time as more data are available.

1.4 Overall Program Effectiveness to Date

Although there have been some initial challenges, MPHI and the three community sites are committed to making this innovation succeed, not only for the duration of this award, but also into the future. Making this innovation successful is a high priority for all the sites involved. Initial barriers to program effectiveness included changing data collection systems mid-award because of challenges with the initial system and securing provider support and trust, especially among primary care providers, in the respective communities. Now that the innovation is under way, however, enrollment is gaining momentum. MPHI and the three community sites have shifted their focus to target the highest users of the ED and hospital inpatient admissions, which they hope will contribute to lower utilization and costs and in turn will help demonstrate the potential return on investment for health plan payers to sustain this initiative in the future.

Another major focus for the innovation in the last year of HCIA funding is developing a sustainable financing model. The structure of the innovation is sufficiently different in each community that one model for all three communities may not be feasible. Muskegon's organizational capacity, which includes the ability to readily identify its highest-cost patients and deploy a CHW to their care, often before the patient leaves the hospital, means it is likely to see quicker and deeper impacts on cost savings than the other sites, although Saginaw and Ingham are working to develop this capacity as well. Muskegon is also part of the local integrated health system, in which incentives are aligned to keep patients out of the hospital and keep costs down. In Saginaw and Ingham, the CHWs do not have readily available information on the highest-cost patients, and although they may be working with the highest *need* participants, they may not be targeting the highest cost patients.

Thus far, anecdotally, CHWs feel that they are making a difference in the participants' lives and helping keep them out of the ED. In addition, this innovation has helped create a number of full- and part-time job opportunities for CHWs in an area of Michigan with high unemployment rates. Overall, the innovation, as it is being executed, has the potential to improve both the care and health of individuals in Saginaw, Muskegon, and Ingham as well as to lower costs.

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APPENDIX A

Table A-1. Baseline and Intervention Trends in Health Care Spending per Patient

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—

Savings per Patient

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Spending rate: total quarter (i.e., quarterized) payments/number of unique patients. Savings per patient: difference in comparison minus the intervention’s average spending rates.
— Data not yet available.

Table A-2. Baseline and Intervention Trends in Admissions per 1,000 Patients

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare
Admissions Measure: All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Admit rate: total unquarterized admissions/number of unique patients.
— Data not yet available.

Table A-3. Baseline and Intervention Trends in Readmissions per 1,000 Admissions

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total admissions	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total Admissions	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.

Note: Readmit rate: sum of all readmissions to eligible hospital within 30 days/all admissions in the quarter. Total admissions: all eligible admissions in the quarter.

— Data not yet available.

Table A-4. Baseline and Intervention Trends in ED Visits per 1,000 Patients

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: ED rate: total quarterized ED visits and observation stays/number of unique patients.
— Data not yet available.

October 2014

Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring

Annual Report

Mineral Regional Health Center

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OVERALL EVALUATION SUMMARY

RTI International was selected to lead an independent evaluation of the 24 Health Care Innovation Award (HCIA) awardees categorized as Community Resource Planning, Prevention, and Monitoring (Community Resource). In this role, RTI is conducting an in-depth evaluation of each innovation, as well as a cross-site evaluation that includes similar innovations targeting the same priority outcomes (e.g., emergency department [ED] visits). For each of the 24 awardees, this report presents findings from the first year of the evaluation (beginning September 23, 2013, and including data obtained by RTI as of September 11, 2014). The report is based on multiple data sources, including operational reports, self-monitoring plans, site visits, and quantitative data analysis.

The evaluation methods vary by awardee innovation, based on the type of innovation and availability of data. RTI has reviewed and coded all existing documents from the awardees through December 31, 2013, and incorporated that knowledge into each awardee's overview. Our review included the awardees' original applications for funding, original and current operational and self-monitoring plans, and quarterly narrative and monitoring reports. For this annual report, we incorporated activities reported through the awardee's seventh quarterly report (i.e., through March 31, 2014).

Between April and August 2014, teams of at least two staff from the RTI team visited all 24 awardees for 2 to 4 days, depending on the number of interviews conducted. Teams included a subject matter expert, with training and experience specific to the awardee's innovation, and a master's- or bachelor's-level colleague to take notes. Before each visit, the teams reviewed all available documentation from the awardee to learn about the innovation's goals, objectives, and status. The purpose of the site visits was to clarify our understanding of the innovation, obtain detailed information on the implementation process, and review awardee-specific data to determine which elements to incorporate into the evaluation. By August 13, 2014, all 24 awardees had been visited and a thorough description of our findings included in each of the 24 awardee sections.

In addition to the site visits, we report quantitative data from two possible sources for several awardees. First, we present findings from claims analysis for awardees in this report if they both provided us with patient identifiers and reported enrolling participants who are Medicare and/or Medicaid beneficiaries. RTI has obtained patient identifiers from most of the 24 awardees to conduct claims analysis. Second, we present data RTI obtained directly from awardees to quantify their work in addressing health care costs, quality, and patient outcomes. Data from additional awardees will be analyzed and presented in future reports, as data become available and awardees enroll sufficient participants. An update on the availability of Medicare/Medicaid claims and other awardee-specific data, analysis of data available to us and cleaned as of September 11, 2014, a summary of the comparison groups, and a list of draft evaluation measures are included in each awardee section.

1. HCIA COMMUNITY RESOURCE AWARDEE: MINERAL REGIONAL HEALTH CENTER

1.1 Introduction

The Mineral Regional Health Center is a nonprofit regional collaborative in Superior, Montana, that serves as the grant convener. The innovation is called the Frontier Medicine Better Health Partnership (FMBHP), and the goal is to standardize the coordination of care across the spectrum of medical services, ensuring that patients receive the right care at the right time by the right provider. Mineral Regional received an award of $10,499,899 and began enrolling critical access hospitals (CAHs) in November 2012, to achieve the following goals:

1. **Reduce cost** by lowering total expenditures by 7% to 15% over 3 years for frontier and rural populations, patients, and communities.
2. **Improve care** and patient satisfaction and experience by 30% over 3 years for frontier and rural populations, patients, and communities.
3. **Improve health** outcomes by 10% over 3 years for frontier and rural populations, patients, and communities.

RTI is conducting an in-depth case study for this innovation. As part of that case study, two RTI team members conducted a site visit on August 11–12, 2014; before and after the visit, our team reviewed all documentation on the innovation. We are working to obtain data directly from the awardee to assess many of the variables we discuss. This report describes findings from RTI's site visit, document reviews, follow-up calls, and analysis of data obtained and cleaned by RTI through September 11, 2014. We start by describing the innovation's components and the patients targeted by the awardee.

1.1.1 Innovation Components

The site visit enabled the study team to gain a better understanding of the FMBHP innovation. Mineral Regional is not working directly with providers or patients as part of the innovation, but rather is helping CAHs implement initiatives by developing better health/better care plans. The innovation has five main components that focus on CAH organizational change: workforce development, community participation, provider-based research network, rural participation in value-based purchasing, and integrated electronic health record (EHR) systems. From our site visit, we learned that the majority of innovation activities have focused on the first three components: workforce development, community engagement, and the provider-based research network. Staff have just begun work on rural value-based purchasing and have only explored integrated EHR systems.

To achieve its goals, FMBHP is working with a multitude of partners in the planning and training of Better Health Improvement Specialists (BHISs), as well as CAHs across the state that are implementing various initiatives to achieve the following objectives (see ***Table 1***):

- Establish and sustain an innovative, evidence-based, community responsive clinical infrastructure of CAHs that deliver better health and health care at a lower cost.

- With the support of regional hospital partners, implement and standardize processes to facilitate coordination of care across the spectrum of medical services, ensuring the "right care, at the right time, by the right provider," such that access is improved and costs are reduced.

- Develop a system and technical resources to train and deploy providers and other members of the workforce to meet identified needs, creating a cadre of rural and frontier providers participating in continuous practice improvement across the spectrum from discovery to innovation by investing in human capital.

Table 1. HCIA Partners, Role, and Location

Partner Name	Role in HCIA Project[1]	Location
iVantage	Training, project management/administration, health IT, data analytics and measures, reporting and compliance	Portland, ME
A-OPTIC	Training, project management/administration	Pikeville, KY
Northwest Montana AHEC	Health education pilot for workforce development, reporting and compliance	Missoula, MT
Bobrow-Williams Group, LLC	Training, project management/administration, creating plan for health care jobs of the future, workforce development/job creation	Augusta, GA
Montana Office of Rural Health	Clinical, training, health IT, community assessments/collaboratives	Bozeman, MT
Mineral Regional Health Center	Training, project management/administration, health IT reporting and compliance	Superior, MT
Lean Healthcare West	Training	Missoula, MT
Health Facilities Planning and Development	Training, support and planning for communities and awardee concerning better health improvement plans	Seattle, WA
HealthLinkNow	Training	Sacramento, CA
Vree Health	Training, health IT, transitional aftercare	Horsham, PA
T.E.S.T., Inc.	Health IT, tele-medicine	Missoula, MT
Cross Tx	Training, health IT, community collaborative online tool	Bozeman, MT
Providence Health Services	Training	Missoula, MT
Community Medical Center	Training	Missoula, MT
University of Montana—Institute on Rural Disabilities	Training	Missoula, MT

(continued)

Table 1. HCIA Partners, Role, and Location (continued)

Partner Name	Role in HCIA Project[1]	Location
Critical Access Hospital Partners		
Barrett Hospital and Healthcare	Clinical, training, health IT, reporting and compliance	Dillon, MT
Beartooth Billings Clinic	Clinical, training, health IT, reporting and compliance	Red Lodge, MT
Broadwater Health Center	Clinical, training, health IT, reporting and compliance	Townsend, MT
Clark Fork Valley Hospital	Clinical, training, health IT, reporting and compliance	Plains, MT
Dahl Memorial Healthcare Association	Clinical, training, health IT, reporting and compliance	Ekalaka, MT
Daniels Memorial Hospital	Clinical, training, health IT, reporting and compliance	Scobey, MT
Fallon Medical Complex Hospital	Clinical, training, health IT, reporting and compliance	Baker, MT
Frances Mahon Deaconess Hospital	Clinical, training, health IT, reporting and compliance	Glasgow, MT
Granite County Medical Center	Clinical, training, health IT, reporting and compliance	Philipsburg, MT
Livingston Health Care	Clinical, training, health IT, reporting and compliance	Livingston, MT
Marias Medical Center	Clinical, training, health IT, reporting and compliance	Shelby, MT
McCone County Health Center	Clinical, training, health IT, reporting and compliance	Circle, MT
Mineral Community Hospital	Clinical, training, health IT, reporting and compliance	Superior, MT
Missouri River Medical Center	Clinical, training, health IT, reporting and compliance	Fort Benton, MT
North Valley Hospital	Clinical, training, health IT, reporting and compliance	Whitefish, MT
Northern Rockies Medical Center	Clinical, training, health IT, reporting and compliance	Cut Bank, MT
Pioneer Medical Center	Clinical, training, health IT, reporting and compliance	Big Timber, MT
Pondera Medical Center	Clinical, training, health IT, reporting and compliance	Conrad, MT
Roosevelt Medical Center	Clinical, training, health IT, reporting and compliance	Culbertson, MT
Rosebud Healthcare	Clinical, training, health IT, reporting and compliance	Forsyth, MT
Roundup Memorial Healthcare	Clinical, training, health IT, reporting and compliance	Roundup, MT
St. John's Lutheran Hospital	Clinical, training, health IT, reporting and compliance	Libby, MT
St. Joseph Medical Center	Clinical, training, health IT, reporting and compliance	Polson, MT
St. Luke Community Healthcare	Clinical, training, health IT, reporting and compliance	Ronan, MT
Stillwater Billings Clinic	Clinical, training, health IT, reporting and compliance	Columbus, MT

Source: Data received during the site visit August 2014.
HCIA = Health Care Innovation Award; IT = information technology.

Component 1: Workforce Development

The first component of the FMBHP focuses on workforce development and the hiring and training of local BHISs at the 25 participating CAHs. Hiring a BHIS is a key component of the innovation because they are the ones charged with spearheading improvement efforts for the innovation in their respective CAH and the greater community. Each hospital is responsible for hiring its own BHIS and has leeway to hire internally from the hospital or externally. The background and qualifications of the BHISs vary because hospitals hire a BHIS based on their specific needs and goals related to the three objectives described above. BHISs participate in structured training courses and become Lean certified. Lean is based on concepts and methods from manufacturing and focuses on continuous quality improvement in the health care setting. Lean methodologies are employed by the BHISs in developing projects that can influence better health and better care for community members. BHISs also receive training on community health needs assessment, cultural competence and health care improvement. BHISs use their acquired knowledge and skills to work on hospital priorities, such as adopting EHRs or lowering readmission rates. BHIS meet together weekly via telephone and participate in a virtual knowledge community where they share their experiences and lessons learned. They also meet face-to-face along with participating CAH leadership and other partners at face-to-face summits organized by FMBHP as another opportunity to network and share their work.

Also included as part of the workforce development component is an initiative to get youth working with local health care systems. FMBHP partnered with the Montana's Area Health Education Center (AHEC) to offer youth programs in an effort to encourage careers in the health services field. Also working with AHEC in Western Montana, FMBHP has developed a job-shadowing pilot program for youth and displaced workers to learn about careers in health care. Lastly, FMBHP has initiatives to encourage veterans returning to Montana to obtain careers in health care.

Component 2: Community Participation

Community participation, the second innovation component, involves CAHs engaging their community partners in identifying specific priorities through a Community Needs Assessment (CNA). The CNA is used to understand current strengths, areas for improvement, outcomes, and processes and identify existing resources and prioritize community-wide initiatives. FMBHP has partnered with the Office of Rural Health to train the BHISs on how to conduct the CNA and prioritize findings with community stakeholders. Findings from the CNA form the basis of the Better Health Improvement Plan (BHIP) that BHISs and their partners develop for each CAH. The plan includes specific goals, tactics, and measurements for monitoring results. They are to be updated yearly. BHISs are charged with implementing the specific initiatives outlined in the BHIP that will enable the CAH to achieve organizational goals outlined in the plan.

In addition, each BHIS creates a collaborative of community partners to work with them on implementing the BHIP using such approaches as Lean. The plan, updated yearly, includes specific goals, tactics, and measurements for monitoring results. BHISs also work with CAH community members to understand the needs of the community beyond the CAH. These community collaboratives, created by the participating CAHs with help from the BHIS, bring together community stakeholders to coordinate resources and discuss needs across the continuum of health and health-related services in their respective communities. For example, the community collaboratives have helped guide the process of identifying resources and appropriate care settings to create standardized transfer protocols, including ED transfers, facility-to-facility transfers, and facility-to-home transfers. BHISs are also involved in other ways to increase community participation and engagement in the health improvement work of the CAHS. In one community, we learned on our site visit, the BHIS work to provide education classes in the community on diabetes self-management, developing newsletters and other media materials for the community on health promotion and applying for funding to support community gardens at local churches.

Component 3: Provider-Based Research Network

The third innovation component is a provider-based research network called the Frontier Rural Innovation Network (FRIN). The FRIN is a national Practiced-Based Research Network (PBRN) that is focused on improving frontier and rural health care health care delivery to meet the Triple Aim of Better Health, Better Healthcare and Better Healthcare Value.[1] As part of the innovation, FMBHP facilitated the establishment of Montana as the northwest regional hub for the FRIN. FRIN brings together providers in rural and frontier areas to collaborate on primary care research initiatives in the community. FRIN provides the opportunity for providers in rural and relatively isolated areas connect and collaborate with each other to carry out practice-based research relevant to their settings.

The FRIN networking platform, called the Knowledge Community, also provides members with access to ongoing research projects and expertise in conducting research, continuing education in research topics, Internal Review Board services, and information about funding opportunities. iVantage, a partner with FMBHP in the innovation, provides technical support to the Knowledge Community. CAHs participating in FMBHP have joined the network to research the feasibility of specific strategies that will increase cost savings such as instituting new medication drug policies, launching an end-of-life registry, and establishing a swing bed program in their hospital. The infrastructure for the network has been established. The network has four regional hubs across 11 states. Additional funding is needed to maintain staff who are coordinating research efforts for the network as well as the ongoing costs for virtual research space.

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[1] According to information received during the site visit, Better Health Improvement Plan, December 2013.

There are three main FRIN projects. The first is a formulary management project that encourages CAHs to develop therapeutic interchange policies. A pharmacist affiliated with the FMBHP innovation is working with the BHISs to serve as champions at each CAH in developing or refining these policies. Much of this work will be disseminated through the FRIN. The second project is to encourage CAHs to participate in the end-of-life registry. Although one has been developed for Montana, most providers are not using it. Therefore, through the FRIN, FMBHP is trying to encourage additional participation. The third project is a swing bed project to encourage using unoccupied beds at the CAH for postacute care. FMBHP has developed a research proposal through the FRIN to examine swing bed use at CAHs.

Component 4: Rural Participation in Value-Based Purchasing

Included in this component are activities related to providing data back to the CAHs on their financial performance and efforts to educate CAH Chief Executive Officers (CEOs) on value-based purchasing. To this end, iVantage is providing CAHs with data on the Hospital Strength Index to be able to benchmark and compare hospital performance. In addition, FMBHP has focused on helping the CEOs understand the data. For example, FMBHP plans to educate the CEOs on best practices for interpreting and understanding the data provided to them. In addition to providing data back to the CAHs, also included as part of this component is engaging the Leadership Advisory Council, which includes all CAH CEOs, in discussions of value-based purchasing and accountable care organizations. Efforts to inform the CAH CEOs on these topics have begun recently.

Component 5: Integrated EHR Systems

This last component originally included trying to implement an integrated EHR system across the CAHs. Given the challenges associated with implementing integrated and interoperable EHRs across different CAHs, this component is now focused more on helping CAHs that do not currently use an EHR adopt and implement a system. In addition, BHISs are helping those that do currently use an EHR to achieve "meaningful use" in order to receive the associated incentives. Also as part of this component, FMBHP brought together local stakeholders involved in data-reporting processes, such as the Montana Healthcare Improvement Consortium (the local Quality Improvement Organization), Montana Hospital Association, HealthShare Montana, Monida Health Network, and Health Technology Services (the Regional Extension Center), to work on decreasing duplication, maximizing available resources, developing data-sharing agreements, identifying data definitions, and creating standardized report formats. The group is now working on completing a detailed crosswalk of all the data being collected and requested from stakeholders across the state.

1.1.2 Program Participant Characteristics

The FMBHP is not working directly with providers or patients as part of the innovation, but rather is helping CAHs implement initiatives by developing better health/better care plans and deploying BHISs. As of May 30, 2014, they have reached their target of enrolling 25 CAHs. The 25 CAHs are located across the state of Montana (***Tables 2*** and ***3***). Overall the CAHs are small with anywhere from 7 to 25 beds. ***Table 3,*** however, will be filled in when we receive data from Mineral Regional.

Table 2. CAHs Planned for Inclusion in Innovation (Denominator Data)

Year	Number Planned for Inclusion
Year 1	10
Year 2	10
Year 3	5
Total	25

Source: Mineral Regional Q7 Progress Report.
CAH = critical access hospital.

Table 3. Characteristics of All 25 Participating CAHs

Characteristic	Number of CAHs	Percentage of CAHs
Size (Number of Beds)		
1–5	—	—
6–10	—	—
11–15	—	—
16–20	—	—
21–25	—	—
Location		
Eastern Montana	—	—
Western Montana	—	—
Central Montana	—	—
Ownership		
Nonprofit	—	—
For profit	—	—
Government	—	—

Source: Mineral data to be provided to RTI.
CAH = critical access hospital.
— Data not yet available.

1.2 Implementation Progress

The extent to which each awardee is able to implement its innovation as planned and reach a sufficient number of patients will be critical to assessing the awardee’s impact. The following discussion provides details on first the implementation process and then the effectiveness, and ***Table 4*** provides the list of measures RTI plans to use in assessing each awardee.

Table 4. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for Mineral Regional

Key Evaluation Domains	Subdomains	Measures	Data Source
Workforce development	Education and training	Number and types of trainings	Lewin data
		Number of staff trained	Lewin data
	Recruitment and retention	Employee retention and turnover	Lewin data
Implementation process	Care coordination	Number of providers who enter notes into EHR systems each month	EHR
		Number of CAHs that use the eRx system	EHR/eRx
		Number of program participants who schedule follow-up care with primary care or specialist visit within 7 days of discharge	EHR/claims
		Number of patients who meet with their primary care providers within 7 days of hospital discharge	EHR/claims
		Number of scheduled patients cancelled in a 30-day period	EHR
Implementation effectiveness	Reach	Number/percentage of participating CAHs	Internal tracking data
	Dose	Number/percentage of CAHs participating in Component 1, workforce development activities, (e.g., completed/updated BHIP, hired a BHIS)	Internal tracking data
		Number/percentage of CAHs participating in Component 2, community participation, (e.g., completed a community needs assessment, established a community collaborative)	Internal tracking data
		Number/percentage of CAHs participating in Component 3, provider-based research network, (e.g., formulary management study, end-of-life registry, swing bed study)	Internal tracking data
		Number and type of Lean projects	Internal tracking data

Source: Measures provided in Mineral Regional Q7 Self-Monitoring Measurement Plan.
BHIP = Better Health Improvement Plan; BHIS = Better Health Improvement Specialist; CAH = critical access hospital; EHR = electronic health record.

1.2.1 Process

The implementation process has been the initial focus of the evaluation. Subsequent reports will assess the impact of the intervention as data become available. The implementation process is best evaluated through a combination of data variables, including execution of implementation that conforms to operational plans, and capacity for implementing the innovation in a timely and effective manner. We focused on the implementation process during the awardee site visit. RTI visited Mineral Regional from August 12–13, 2014. We asked such evaluation questions as the following:

- What is the overall execution of the innovation implementation (e.g., the actual rate of expenditures relative to the projected rate)?
- What accomplishments are specific to hiring or training staff so that the organization can build its capacity to implement the innovation effectively?
- What is the implementation effectiveness, including fidelity, reach, and dose of the innovation thus far?

Execution of Implementation

Using the most updated Lewin numbers, as of March 2014 (Quarter [Q] 7), the expenditure rate for Year 2 is 59%, which is on target relative to their Centers for Medicare & Medicaid Services (CMS)-approved plan. One of the greatest difficulties Mineral Regional has faced is the misuse of grant funding by previous project administration and the fallout from these actions. During a 6- to 8-month period, there was intense media coverage and community investigations, which made it difficult for the FMBHP to keep the implementation of the innovation on track. Many of the CAHs and regional partners were hesitant to get involved during this time, which affected recruitment and partner engagement. Although these issues affected initial execution, FMBHP has since been able to enroll the final 5 CAHs slated for participation on July 1, 2014, by May 30, 2014. Initially, they did not enroll 10 CAHs in the first two quarters as planned, but since then they have enrolled all 25 CAHs intending to participate. They are now at capacity and have reached their goal for CAH participation.

Organizational leadership and innovation partners noted during the site visit that the FMBHP innovation stayed relatively on track, despite challenges with the previous leadership, and was able to maintain momentum in the community due to the hard work and efforts of the FMBHP project team. The FMBHP has built relationships and trust among both FMBHP partners and the leadership at the CAHs. These relationships were evident during our site visit and helped sustain the innovation throughout a challenging time.

During the site visit, FMBHP project staff noted that most of the FMBHP activities to date have been concentrated in Components 1, 2, and 3. They are, however, trying to increase activities related to rural involvement in value-based purchasing (Component 4) by engaging the Leadership Advisory Council on issues related to value-based purchasing and accountable care organizations that may affect CAHs in the future. A face-to-face summit for the participating CAHs is planned for this fall to begin work specifically on rural value-based purchasing. In addition, efforts to create an integrated EHR system across CAHs (Component 5) has also evolved given the challenges associated with creating and implementing integrated and interoperable EHR systems across CAHs. The initiative now focuses on helping FMBHP member CAHs adopt an EHR platform and train providers if they have not already done so. In addition, efforts are underway to bring together relevant stakeholders, including the Montana Healthcare Improvement Consortium, to create a detailed crosswalk of all the data being collected, reported, and requested from the CAHs.

Organizational Capacity and Leadership

The project staff working on the FMBHP innovation is separate from Mineral Regional Health Center staff. Although Mineral Regional is the fiduciary agent of the award, the FMBHP staff function as a separate entity. The FMBHP staff are located across the state and thus do not share a common work space. During the site visit, the FMBHP noted the distance between staff was a challenge, although they keep in close contact through regular conference calls and do travel frequently to hold in person staff meetings and meetings with each of the CAHs. Another organizational challenge is that several of the FMBHP staff are not dedicated to the innovation full time; thus, the staff have had to augment current capacity with several external partners to help provide trainings and support to CAHs.

In general, the FMBHP innovation has a clear leader and delineated roles for project staff and associated partners. Current leadership at FMBHP appeared to be committed to a successful and sustainable innovation. Although we only spoke with 2 of the 25 CAH CEOs, both noted they were committed to implementing the innovation and having it succeed in their respective organizations. The BHISs located at each of the CAHs were engaged in different types of projects and had different educational backgrounds, but both CAHs noted they would participate in the innovation again if given the choice and hoped to keep the BHIS position and other components of the innovation (e.g., community collaboratives) in place once the grant period ended. The two CAH CEOs we spoke with during the visit noted their hospital was committed to having the innovation succeed and be sustainable in the future.

1.2.2 Workforce Development

Recruiting and training BHISs to help CAHs select and implement specific priorities for their community are important parts of the FMBHP innovation.

Hiring and Retention

A key component of this innovation is for each of the 25 CAHs to hire a BHIS. BHISs can be external hires or internal hospital employees. Overall CAHs hired BHISs in one of three ways. They either promoted from within the organization because they thought they had someone who fit the job description, hired a brand new person, or restructured resources so an internal hospital employee was now able to devote time to being the BHIS.

FMBHP did not develop any prescribed requirements for the BHISs, although they did suggest the BHIS have at least a 4-year degree. If they did not have a 4-year degree, they needed to have relevant and substantial work experience. FMBHP staff also suggested the BHIS not be afraid of change and be willing to network and engage local stakeholders because they should serve as the link between the hospital and the community. Given the lack of formal requirements for the position, the current BHISs are diverse and include clinicians such as pharmacists, physical therapists, nurses, industrial engineers, IT specialists, finance, marketing, and public administration personnel, depending on the CAH's needs. As of our site visit in August 2014, 23 of the 25 CAHs had hired a BHIS, with the other two in the process of hiring a BHIS for their respective hospitals.

According to data provided during our site visit, FMBHP has hired five project staff. Current project staff include a project director, a director of workforce development, a lead BHIS, a director of program implementation and outreach, and a chief clinical officer. Although three people were relieved of their positions because of the mishandling of funds, as it relates to this award, there has been minimal turnover. They have had the same project director throughout the duration of the innovation. The BHISs are technically employees of the respective CAHs, even though they are funded by the FMBHP innovation. FMBHP also has a large number of partners (***Table 1***) that help provide trainings, assist with workforce development activities, and analyze data.

Education and Training

The majority of trainings provided are for the BHISs, although many of the trainings are available for other CAH employees or community members to attend. The trainings include topics specifically geared to the BHIS role, such as BHIS orientation, an overview of the Community Health Needs Assessment, how to use the KnowledgeWeb, Lean training, information pertaining to the community collaboratives, and Health Insurance Portability and Accountability Act (HIPAA) training. Trainings also include overviews of other relevant organizations and initiatives in Montana such as overview of the quality improvement organization, Montana Performance Improvement Network, and the Frontier Rural Innovations Network. BHISs also receive additional trainings on skills that may help them in their role such as change management, habits for highly effective people, and personality assessments. Many trainings are provided by FMBHP partners (e.g., Healthlink provided trainings to educate the BHISs on depression screening tools and mental telehealth opportunities. An additional innovation partner, Steve McArther, provided trainings for BHISs on social and emotional intelligence. Overall, BHISs have completed more than 22 trainings.

1.2.3 Effectiveness

Effective implementation (also known as "implementation success") is the presence of the innovation delivered as intended (fidelity) to a substantial proportion of the targeted population (reach) in doses associated with effectiveness (dosage). Given the highly complex innovation and the variety of different Lean projects being implemented in each CAH, it is difficult to determine implementation effectiveness. Although there is no prescribed model per se that each CAH is supposed to implement, we can assess fidelity of innovation implementation compared with how it was originally intended in the awardee's operational plan. We can also examine dose by the number and type of initiatives each CAH implements, because there are a number of key steps CAHs should complete (i.e., develop a BHIP, hire a BHIS). They have also reached all 25 CAHs as intended as part of this innovation.

Fidelity

Given that the innovation is tailored for the needs of the CAH, there is no prescribed evidence-based model to which we could assess fidelity of the innovation. Therefore, based on our current assessment, we believe we will have to assess fidelity qualitatively by comparing current innovation implementation with the operational plan to determine critical changes in execution. For example, the FMBHP originally intended to create an integrated EHR system, which has subsequently evolved into helping CAHs adopt and implement an EHR system, as applicable, and helping to standardize data reporting processes. Although we have not received data yet from the innovation, it also appears some of the data they proposed to collect in the self-monitoring plans are no longer applicable and thus are not being collected. During the site visit, we discussed with FMBHP project staff and partners the ability of future initiatives to implement a similar type of model. This model was developed for use in frontier medicine in states or regions that are rural and are geographically dispersed. Although the overall innovation is complex and nuanced for Montana CAHs, the key components of hiring BHISs and developing a BHIP may be relevant and replicable for other frontier providers. In addition, many of the educational materials and trainings were created for providers specifically practicing in the frontier and likely applicable to other rural and frontier providers facing similar environmental challenges.

Reach

As discussed, the FMBHP innovation has partnered with 25 CAHs as planned. Therefore, they have been successful at reaching their intended participants. ***Table 5*** provides details on the enrollment of the CAHs since project inception.

Table 5. CAH Enrollment and Reach for Each Quarter Since Project Launch

Quarter	Target Population (Denominator identified as eligible)	Number of CAHs Enrolled	Total Reach per Quarter	Percentage Change from Previous Quarter
December 2012 (Q2)	25	5	20%	—
March 2013 (Q3)	25	4	16%	4%
June 2013 (Q4)	25	3	12%	−4%
September 2013 (Q5)	25	7	28%	14%
December 2013 (Q6)	25	1	32%	4%
March 2014 (Q7)	25	5	20%	−12%
Total as of March 2014 (Q7)	25	25	100%	—

Source: Mineral data provided directly to RTI during the site visit in August 2014.
CAH = critical access hospital.
— Data not yet available.

We know that for the claims analysis RTI plans to conduct, Mineral Regional is providing us with unique provider identifiers (not patient identifiers), and we will assess impact of the innovation at the provider and possibly system levels. Although they are not tracking individual patients or patient-level outcomes, as noted during a data review call with RTI and reiterated during our site visit in August, they expect their largest impact to be lowering the utilization of health care services for the 100,000 Medicare beneficiaries across the state because they are the main users of CAHs. Once we obtain claims data, we can provide an updated estimate of the numbers of actual patients that may be affected by the innovation, but we will likely not provide outcomes on the individual patient level because this innovation is targeted at the CAH level.

Dose

Although the number and type of projects each CAH implements vary, we can use the three main components of the innovation in which most of the innovation activities have occurred to assess dose. Based on our current assessment, we can examine dose as it relates to Component 1 (workforce development) by assessing whether CAHs have (1) hired a BHIS and (2) adequately trained the BHIS to perform their duties. For Component 2 (community participation), we can examine dose by assessing whether CAHs have (1) completed the community needs assessment and (2) established a community collaborative in their respective communities. Lastly, for Component 3 (provider-based research network), we can examine dose by assessing whether CAHs have participated in three main research projects: (1) medication cost study, (2) end-of-life registry project, and (3) swing bed research study. We expect that the CAHs that are more heavily invested in the innovation (have a higher dose) may accordingly see dose-response improvements in health care utilization outcomes, as described in the following section (see ***Table 6***). We will continue to revise how we plan to assess dose once we receive data from Mineral on the innovation.

Table 6. Dose Received for CAH Participants Based on Three Main Components

Component	Number of CAHs	Percentage of CAHs
Workforce Development (Component 1)		
Completed/updated a BHIP	—	—
Completed/updated a BHIP *and* hired a BHIS	—	—
Community Participation (Component 2)		
Completed a CAN	—	—
Completed a CNA *and* established a community collaborative	—	—
Provider-Based Research Network (FRIN) (Component 3)		
Participated in formulary management	—	—
Participated in end-of-life registry	—	—
Participated in swing bed research study	—	—

Source: Mineral data to be provided to RTI.
BHIP = Better Health Improvement Plan; BHIS = Better Health Improvement Specialist; CAH = critical access hospital; CNA = community needs assessment; FRIN = Frontier Rural Information Network.
— Data not yet available.

Given the focus on completing Lean projects, we may also want to examine the number and type of project by CAH. ***Table 7*** provides a sample of how these data could be presented.

Table 7. Number and Type of Lean Projects

Type of Project Completed	Number of CAHs	Percentage of CAHs
Registration and billing	—	—
Supply management	—	—
Medication reconciliation	—	—
Care coordination	—	—
Patient education	—	—

Source: Mineral data to be provided to RTI.
CAH = critical access hospital.
— Data not yet available.

1.3 Evaluation Outcomes

RTI will use two types of quantitative data from awardees to assess the impact of the awardee’s innovation on key outcomes. These include claims data for Medicare or Medicaid beneficiaries, depending on who the awardee serves, and administrative or utilization data the awardee is collecting (which we have categorized as “other awardee-specific data,” reflecting the variability of the types of data elements available across awardees). We are finalizing our assessment of all the available data sources and requesting data directly from each awardee. As those data are received, we will incorporate the findings into our quarterly and annual reports. The following sections present descriptive findings from the quantitative outcome data provided to RTI and cleaned as of September 11, 2014.

1.3.1 Measures for Evaluation

The site visit for Mineral Regional occurred August 12–13, 2014. The measures listed in ***Tables 4*** (above) and ***8*** (below) reflect the current measures determined to be most relevant for our evaluation of Mineral Regional's innovation to date.

Table 8. Outcome Measures for Mineral Regional

Key Evaluation Domains	Subdomains	Measures	Data Source
Clinical effectiveness	Mental health	Percentage of patients aged 18 years or older screened for clinical depression using a standardized tool and follow-up plan documented	EHR
Health care outcomes	Utilization	ED visit rate	Claims
		Readmission rate	Claims
		Readmission rates for three main DRG codes (AMI, CHF, pneumonia)	EHR/claims
		Percentage of program participants with 1 or more readmission events for 3 main DRG codes (AMI, CHF, pneumonia)	EHR/claims
		Percentage of patients indicated for delivery to a CAH ED by ground transportation who are delivered	Ambulance logs
		Percentage of helicopter trips that went to the closest CAH	Helicopter logs
	Cost	Spending per patient	Claims
		Cost savings	Claims
		Per-patient per-month total paid cost by category/service type	Claims
		Percentage decrease in the cost of widely used medications	Claims

Source: Measures provided in Mineral Regional Q7 Self-Monitoring Measurement Plan.
AMI = acute myocardial infarction; CAH = critical access hospital; CHF = congestive heart failure; DRG = diagnosis-related group; ED = emergency department; EHR = electronic health record.

1.3.2 Claims Data

As part of a broad assessment of health care innovations, the Center for Medicare & Medicaid Innovation (CMMI) is assessing the impact of its programs, including those funded by HCIAs, on four core measures:

- health care spending per patient,
- hospital inpatient admissions,
- hospital unplanned readmissions, and
- ED visits.

Collectively, it is anticipated that CMMI programs will slow the increase in health care spending, reduce hospital admissions and readmissions, and prevent unnecessary ED visits. We are reporting these measures for all HCIA Community Resource Planning awardees so that the collective impact of the awards can be assessed. As discussed below, some awardees' innovations may not be focused on these measures. Other innovations target specific conditions (e.g., medical imaging, diabetes); they may significantly affect spending, admissions, readmissions, and ED visits for the targeted conditions, but not have a statistically detectable impact on the measures at the aggregate level because the targeted conditions represent only a fraction of total spending, inpatient admissions, and ED visits.

The measures are calculated through analysis of Medicare and Medicaid fee-for-service claims. Because of differences between Medicare and Medicaid patients in age, other demographic variables, and disease status, we report Medicare and Medicaid results separately. Complete Medicare claims are available through the end of 2013. Medicaid claims for Mineral Regional are available through the first quarter of 2013, although claims for the final quarter may not be complete. The innovation was launched in October 2012.

- **Health Care Spending per Patient.** For Medicare beneficiaries, health care spending per patient includes Part A and Part B Medicare expenditures for persons enrolled in the Part A and Part B fee-for-service program. The variable focuses on Medicare fee-for-service spending, so Medicare managed care (Part C) services are excluded, as are beneficiary copayments. Medicare Part D prescription spending is also excluded. Spending is reported on a per-person per-quarter basis. If a beneficiary is not enrolled for every month in a quarter, spending (except for hospital inpatient spending) is prorated to a quarterly basis using the number of days enrolled during the quarter. Because hospital inpatient admissions are both rare and expensive, spending is not prorated for hospital inpatient spending. Prorating is also not performed for beneficiaries who die during a quarter.

  For Medicaid beneficiaries, health care spending per patient is reported for fee-for-service beneficiaries. Beneficiaries are only included in the analysis for spending (and the other measures) during periods when they are enrolled in Medicaid.

- **Hospital Inpatient Admissions.** This variable measures hospitalization, the single most expensive component of health care spending. Patients kept overnight in observation beds are excluded from this measure. Inclusion criteria for the analysis are the same as for spending. Hospital inpatient admissions are not prorated based on the number of days eligible during the quarter. All-cause inpatient admissions and Ambulatory Care Sensitive Condition (ACSC) admissions are reported separately, under the assumption that a greater share of ACSC admissions can be prevented by appropriate ambulatory care. The mean quarterly admission rate per 1,000 patients is reported.

- **Hospital Readmissions.** Hospital readmission rates serve a dual purpose in evaluating HCIA impacts. Readmissions add to the costs of a prior hospitalization, and they often reflect a problem in the care provided during the first admission. All-cause readmissions are defined as a follow-up admission to any short-term acute general or long-term care hospital within 30 days of discharge from another hospital of the same type. We ignore multiple admissions within 1 day of an initial admission because these often represent transfers between hospitals. We define index hospitalizations that begin during the quarter and follow each index admission for 30 days, even when the follow-up period extends beyond the end of the quarter. Inclusion criteria for the analysis are the same as for spending. We also calculate ACSC readmissions. ACSC status is defined by the patient’s first hospitalization during the quarter. The readmission rate equals the number of readmissions divided by the number of index hospitalizations during the quarter. Planned readmissions are excluded from the calculation of the numerator. Quarterly mean readmission and ACSC readmission rates per 1,000 admissions are reported.

- **ED Visits.** ED visits are sometimes viewed as a symptom of the inability of the community’s health care system to provide adequate preventive and ambulatory care visits. We report an all-cause ED visit rate that excludes ED visits resulting in an inpatient admission (which presumably represent unavoidable visits) and includes overnight ED visits without an inpatient admission. Inclusion criteria for the analysis are the same as for spending, and ED visits are also subject to the same prorating formula as for spending. The mean quarterly ED visit rate per 1,000 patients is reported.

Medicare Claims Analysis

We expect to include Medicare claims analyses in subsequent reports but do not have patient identifiers to support Medicare analysis at this time. Mineral Regional’s innovation is targeted at CAHs, not at individual patients. The FMBHP innovation currently includes 25 CAHs, and results will likely be presented at the CAH level. RTI initially received a list of 20 CAHs and National Provider Identifiers (NPIs); in October, RTI updated the list to include all 25 participating CAHs. Because the complete list of CAHs was not available in time for RTI to include an analysis of outcomes in our Annual Report, we will present results in our next report. It is not yet clear how many Medicare beneficiaries will be included, because the innovation does not enroll individual patients. The analysis will focus on Medicare beneficiaries who were enrolled in fee-for-service Medicare Part A and Part B between 2010 and 2013 and received services at a participating CAH. For Medicare beneficiaries ever admitted during the baseline and intervention period in a participating CAH, we will analyze both expenditures and utilization within the CAH as well as their total expenditures and utilization. The analysis will use data from the CMS Chronic Conditions Data Warehouse

(CCW). Measures will be presented for these beneficiaries in the quarters before and after the innovation was launched in October 2012. ***Appendix A*** shows the claims analyses tables that will be presented for Medicare.

In addition to tables, we will present figures showing each measure as a function of time. Values for quarters prior to the innovation's launch in January 2013 will be shown in one color, and values for quarters during and after launch will be shown in another color. The figures will include a trend line based on a linear regression of prelaunch values.

Medicaid Claims Analysis

The Medicaid data analysis will use data from CMS Alpha-MAX data files. Currently, Medicaid claims for Mineral Regional are only available in Alpha-MAX through the first quarter of 2013, and claims for that quarter may not be complete. Because the innovation was only launched in October 2012, we are not presenting measures for Medicaid patients in this report. The innovation is targeting CAHs, not individual patients, so it is unclear how many Medicaid patients received services at a participating CAH. We will provide Medicaid analyses as applicable in subsequent reports as more data become available. We will report tables and figures similar to those for Medicare (see ***Appendix A***).

Discussion of Claims Analysis

The claims measures will provide descriptive data on patients enrolled in the FMBHP innovation before, during, and after its launch. Although it is necessary to report these measures to support CMS's broader assessment of its full portfolio of innovation projects, they may not provide a complete evaluation picture of the innovation for a number of reasons. First, the innovation helps CAHs implement system-level initiatives tailored to each hospital's needs and goals. These initiatives vary widely and many do not address issues related to health utilization (i.e., lowering admission or readmission rates, preventing ED use); Mineral Regional, for example, is not examining all-cause admissions. Although there are some common elements all CAHs must complete (e.g., complete a BHIP, hire BHISs), these are not directly related to health services utilization and thus may not lead to discernable differences in admission, readmission, ED visit, or spending measures. Second, the innovation is not targeting specific populations or high-cost conditions. Although Mineral Regional is assessing 30-day hospital readmission rates by three main diagnosis-related group codes (acute myocardial infarction, congestive heart failure, and pneumonia), to the best of our knowledge the innovation itself is not targeting patients or developing initiatives related to these conditions. Third, the innovation began enrolling hospitals in November 2012. The effect of the initiative in helping CAHs implement system-level changes may not be immediate because it takes time for hospitals and providers to implement new initiatives and make changes in the way they practice care. Finally, it is unclear what percentage of the population that CAHs serve receive Medicare fee-for-service or Medicaid.

Development of Comparison Groups

In addition to comparing the Medicare and Medicaid beneficiaries served at the 25 CAHs before and after implementation of the innovation, we will also compare these patients to Medicare and Medicaid beneficiaries receiving services at the 23 nonparticipating CAHs across the state of Montana. Because the innovation is aimed at the CAH level, we will ensure that our control group of nonparticipating CAHs is similar to participating CAHs in terms of geographic location, size, patient mix, and ownership status. The awardee is developing an inclusion plan to allow the remaining 23 nonparticipating CAHs to participate in some way in the innovation and potentially receive innovation resources and education without HCIA funding. This may affect construction of the control group for the innovation, because members of the control group could also be receiving some of the innovation.

1.3.3 Other Awardee-Specific Data

Overview of Data Requested

On September 30, 2014, we met with FMBHP innovation staff to request the raw patient-level (if available) and CAH-level data that were used to generate each of the measures in ***Tables 4*** and ***8*** for each quarter. FMBHP staff indicated during the site visit, however, that some of the measures may not be available. We will update the measures tables once we receive the data. To date, we have received names and unique NPIs for the 25 enrolled CAHs. We also have received zip codes corresponding to the areas that these 20 CAHs serve. During our recent meeting with FMBHP innovation staff, we also requested the additional five NPIs for the remaining CAHs and associated zip codes.

Health Outcome Results

Once we receive raw patient-level and site-level data from Mineral Regional, we will have a better understanding of what types of results we will provide. ***Table 9*** is an example shell of findings that we anticipate presenting.

Table 9. Health Processes Over Time

Measure	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Care Coordination							
Percentage of providers who enter notes into EHR systems each month	—	—	—	—	—	—	—
Percentage of program participants who schedule follow-up care with primary care or specialist visit within 7 days of discharge	—	—	—	—	—	—	—
Percentage of scheduled patients cancelled in a 30-day period	—	—	—	—	—	—	—

Source: Data to be provided by Mineral Regional to RTI.
EHR = electronic health record.
— Data not yet available.

Discussion of Other Awardee-Specific Findings

Once we receive data from Mineral Regional, we will review, clean, merge, and begin conducting descriptive analyses to fill in the table shells above. At that point, we will be in a better position to discuss findings related to the other awardee-specific data.

1.4 Overall Program Effectiveness to Date

This innovation is aimed at implementing change at the hospital level through five components that are employed to affect health improvement processes in the participating CAHs and their communities. Innovation activities are directed at specific needs of each CAH determined from the community health needs assessment and implemented through the each CAH’s improvement plan. As a result, these activities are somewhat varied, making it a challenge to adequately measure implementation effectiveness and the effects of the activities on improving health or health care outcomes of patients.

As we learned from our site visit in August, the FMBHP staff has worked diligently to standardize the nature of these activities within the five program components. The FMBHP innovation faced some initial challenges but appears to have recovered and finished enrolling all intended CAHs and implementing an infrastructure to increase information sharing across CAHs in the state of Montana. Although the innovation appears to be increasing access to information, increasing visibility in the community and helping CAHs meet some internal needs, we have yet to determine if the innovation is affecting utilization of ED and hospital inpatient admissions or lowering readmissions or total cost of care among patients. We will continue to analyze and report the innovation’s outcomes as data become available.

APPENDIX A

Table A-1. Baseline and Intervention Trends in Health Care Spending per Patient

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—

Savings per Patient

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Spending rate: total quarter (i.e., quarterized) payments/number of unique patients. Savings per patient: difference in comparison minus the intervention's average spending rates.
— Data not yet available.

Table A-2. Baseline and Intervention Trends in Admissions per 1,000 Patients

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Admit rate: total unquarterized admissions/number of unique patients.
— Data not yet available.

Table A-3. Baseline and Intervention Trends in Readmissions per 1,000 Admissions

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total admissions	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total Admissions	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Readmit rate: sum of all readmissions to eligible hospital within 30 days/all admissions in the quarter. Total admissions: all eligible admissions in the quarter.
— Data not yet available.

Table A-4. Baseline and Intervention Trends in ED Visits per 1,000 Patients

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: ED rate: total quarterized ED visits and observation stays/number of unique patients.
— Data not yet available.

October 2014

Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring

Annual and Site Visit Report

National Health Care for the Homeless Council (NHCHC)

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OVERALL EVALUATION SUMMARY

RTI International was selected to lead an independent evaluation of the 24 Health Care Innovation Award (HCIA) awardees categorized as Community Resource Planning, Prevention, and Monitoring (Community Resource). RTI is conducting an in-depth evaluation of each innovation and a cross-site evaluation that includes similar innovations targeting the same priority outcomes (e.g., emergency department [ED] visits). For 24 awardees, this report presents findings from the first year of the evaluation (beginning September 23, 2013, and including data obtained by RTI as of September 11, 2014). The report is based on multiple data sources, including operational reports, self-monitoring plans, site visits, and quantitative data analysis. The evaluation methods vary by awardee innovation, based on the type of innovation and availability of data. RTI has reviewed and coded all existing documents from the awardees through December 31, 2013, and has incorporated that knowledge into each awardee's overview. Our review included the awardees' original applications for funding, original and current operational and self-monitoring plans, and quarterly narrative and monitoring reports. For this annual report, we incorporated activities reported through the awardee's seventh quarterly report (i.e., through March 31, 2014).

Between April and August 2014, teams of at least two staff from the RTI team visited all 24 awardees for 2–4 days, depending on the number of interviews conducted. Teams included a subject matter expert, with training and experience specific to the awardee's innovation, and a master's- or bachelor's-level colleague to take notes. Before each visit, the teams reviewed all available documentation from the awardee to learn about the innovation's goals, objectives, and status. The purpose of the site visits was to clarify our understanding of the innovation, obtain detailed information on the implementation process, and review awardee-specific data to determine which elements to incorporate into the evaluation. By August 13, 2014, all 24 awardees had been visited and a thorough description of our findings included in each of the 24 awardee sections.

In addition to the site visits, we report quantitative data from two possible sources for several awardees. First, we present findings from claims analysis for awardees in this annual report if they both provided us with patient identifiers and reported enrolling participants who are Medicare and/or Medicaid beneficiaries. RTI has obtained patient identifiers from most of the 24 awardees to conduct claims analysis. Second, we present data RTI obtained directly from awardees to quantify their work in addressing health care costs, quality, and patient outcomes. Data from additional awardees will be analyzed and presented in future reports, as data become available and awardees enroll sufficient participants. An update on the availability of Medicare/Medicaid claims and other awardee-specific data, analysis of data available to us and cleaned as of September 11, 2014, a summary of the comparison groups, and a list of draft evaluation measures are included in each awardee section.

1. HCIA COMMUNITY RESOURCE AWARDEE: NATIONAL HEALTH CARE FOR THE HOMELESS COUNCIL (NHCHC)

1.1 Introduction

The National Health Care for the Homeless Council (NHCHC) is a nonprofit organization headquartered in Nashville, Tennessee, whose mission is to "bring about the reform of the health care system to best serve the needs of people who are homeless (and) to work in alliance with others whose broad purpose is to eliminate homelessness." Launched in February[1] 2013, the NHCHC innovation is focused on transitioning people experiencing homelessness who frequently use emergency departments (EDs) for health care into appropriate primary care settings. NHCHC was awarded $2,681,877 to develop and implement this innovation. The innovation has the following goals:

1. **Reduce costs** by decreasing hospital/ED utilization for nonurgent care and associated costs among people who are homeless and frequent users of EDs.
2. **Improve care** by collaborating with selected Health Care for the Homeless (HCH) primary care sites and local hospitals to ensure that people experiencing homelessness have access to quality health care and services and increasing the health workforce and clinical capacity of 11 NHCHC sites to improve quality of care.
3. **Improve health outcomes** and reduce health disparities by establishing medical homes for 969 patients who are homeless, are frequent users of EDs, and reside in 1 of 11 selected cities.

RTI is in the process of conducting an in-depth case study for NHCHC's program. As part of that case study, two RTI team members visited the Houston NHCHC site (Healthcare for Homeless – Houston [HHH]) on June 18, 2014,[2] and both before and after the visit, our team reviewed all documentation on the program. We are now actively working to obtain data directly from the awardee, which will help RTI assess many of the variables we discuss in this report section. This report describes findings from the site visit, document reviews, follow-up telephone calls, and analysis of data obtained and cleaned by RTI through September 11, 2014. We start by describing the innovation components in detail and the patients targeted by the awardee.

1.1.1 Innovation Components

NHCHC has established 11 clinical partners in 12 of its existing sites to implement this innovation (***Table 1***). NHCHC sites are federally qualified health centers (FQHCs) funded explicitly to provide primary care to the homeless population. The NHCHC office provides ongoing technical assistance to support the local sites in carrying out this innovation.

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[1] Data available in Lewin indicate the start date as January 2013, but the awardee stated in the review process that patients were not enrolled until February 2013.

[2] Our team also visited the Durham, NC, site (local to RTI) as a pilot site visit on February 25, 2014.

Table 1 displays NHCHC's 11 clinical partners across the various sites. The NHCHC site in San Fernando also subcontracts with a site in Los Angeles' Skid Row to provide a CHW in that location. Thus, there are 11 contracted sites and 12 programs.

Table 1. NHCHC Contracted Sites, Roles, and Locations

Partner Name	Role in HCIA Project	Location
Boston Health Care for the Homeless Program	Clinical	Boston, MA
Heartland Health Outreach	Clinical	Chicago, IL
Lincoln Community Health Center	Clinical	Durham, NC
Healthcare for the Homeless – Houston (HHH)	Clinical	Houston, TX
Duffy Health Center	Clinical	Hyannis, MA
HCH Manchester at Catholic Medical Center	Clinical	Manchester, NH
Harbor Homes, Inc.	Clinical	Nashua, NH
Charles Drew Health Center, Inc.	Clinical	Omaha, NE
Northeast Valley Health Corporation	Clinical	San Fernando, CA
Santa Clara Valley Health & Hospital System	Clinical	San Jose, CA
Care Alliance Health Center	Clinical	Cleveland, OH

Source: The Lewin Group, 2012–2013.
HCH = Health Care for the Homeless; HCIA = Health Care Innovation Award; NHCHC = National Health Care for the Homeless Council.

NHCHC has placed 15 CHWs across the 11 sites (12 programs) who serve as case coordinators/managers to establish peer navigator relationships with people experiencing homelessness who frequently seek medical care at local EDs. CHWs manage patient transitions of care from hospitals to medical homes at the NHCHC sites. This should decrease ED use by the targeted homeless patients, resulting in decreased Medicaid/Medicare and uncompensated care costs. This innovation has the following objectives:

- Establish peer navigator relationships across the 12 programs with 500 people experiencing homelessness who are frequent visitors to EDs[3] by managing patient transitions of care from hospitals to medical homes at NHCHC sites.
- Add 15 full-time equivalent CHWs to the staff of 11 NHCHC grantees or affiliated organizations and provide appropriate training.
- Demonstrate decreased hospital utilization by targeted homeless patients, resulting in decreased Medicaid/Medicare and uncompensated care costs.
- Demonstrate improved health status, quality of life, quality of care, and patient experience.

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[3] The awardee originally proposed 969 as the total target but as of their Q8 report (June 2014), they had adjusted their target to 500 participants.

As the headquarters of the organization, NHCHC provides administrative oversight of the innovation. The headquarters location in Nashville, Tennessee, does not provide patient care or employ CHWs locally. Instead, it oversees implementation of the innovation at the 11 sites, with each local organization adapting the innovation as needed to fit its local structure and needs of its target population. In this way, NHCHC has no direct access to patients or their identifiers, and each local program has had to establish contracts with its local hospital to monitor ED use among enrolled patients. These contracts have taken a great deal of time to put in place and are generally with the one local hospital most likely to see homeless or uninsured patients (i.e., public hospital). Contracting challenges are discussed in detail in ***Section 1.2***, Implementation Progress.

HHH is one of NHCHC's local sites that provides services to the homeless population in Houston, Texas. As a partner in this innovation, HHH has employed two CHWs to provide direct care coordination services to Houston's people experiencing homelessness who have had four or more ED visits in the last 2 years. The RTI team visited this site in June 2014 to better understand how each local program works.[4] ***Table 2*** lists the local organizations in Houston that HHH has partnered with to implement the innovation and obtain additional community services for the clients they serve. One local organization, SEARCH Homeless Services, provides clients with housing and job placement services. The HHH offices are located in the SEARCH building in Houston, so HHH staff can easily refer their clients to SEARCH services and vice versa. The Beacon provides a variety of services, including a day shelter, food, clothing, access to shower and laundry, medical and psychiatric care, and legal services. The Way Station at Palmer Memorial Episcopal Church also provides daily hot meals. The Mental Health and Mental Retardation Authority of Harris County (MHMRHA) provides referrals for mental health and substance abuse services. The City of Houston provides a number of services that have been critical to the success of this innovation, including providing an access bus for the homeless population, providing a housing waiver program, and creating identification (ID) cards through the police department mobile unit.

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[4] RTI also visited the site in Durham, NC, in February 2014 as our pilot site visit with the goal of testing our interview protocols. NHCHC was gracious in allowing us to spend one-half day with their staff to better understand their innovation. We then visited the Houston site as an official data collection visit with a focus on project implementation. The remainder of this report is based on information provided during the Houston site visit.

Table 2. HHH Partners, Roles, and Locations

Partner Name	Role in HCIA Project	Location
SEARCH Homeless Services	Infrastructure and day shelter	Houston, TX
The Beacon	Day center	Houston, TX
The Way Station at Palmer Memorial Episcopal Church	Daily meals	Houston, TX
Practice-Based Research Network	Board oversight	Nashville, TN
The Mental Health and Mental Retardation Authority of Harris County	Referral for mental health/substance abuse services	Houston, TX
City of Houston	Access bus and housing waiver	Houston, TX
Houston Police Department	ID cards for homeless	Houston, TX

Source: Site visit, June 18, 2014.
HCIA = Health Care Innovation Award; HHH = Healthcare for Homeless – Houston; ID = identification.

In the following sections, we describe the innovation in detail, drawing from the awardee's documentation (e.g., progress reports, operational plans) and supplemented with our findings from a site visit conducted in June 2014 at the HHH site. The NHCHC innovation has one program component, community health workers (CHWs), described below.

Component 1: Community Health Workers

As with other NHCHC sites, HHH currently employs CHWs to provide patient navigation services to recruited enrollees. HHH has employed two CHWs who were both previously homeless and received care at HHH. One CHW has been with the organization the longest and is currently the chair of the NHCHC National Consumer Advisory Board. Both CHWs have extensive networks in the community and relationships with various agencies that allow them to connect clients with necessary services easily. The program requires that CHWs hold a General Educational Development (GED) or high school diploma and have experienced homelessness to be able to fully understand the needs of the population they serve and to connect with their clients to a greater degree. The CHWs at this location fulfill a broad range of outreach/recruitment and service coordination functions (***Table 3***).

Table 3. HCIA Care Coordinator Functions and Training

Characteristic Type	CHW Role
Title	CHW
Minimal qualifications	GED/high school diploma CHWs must be from the population they are serving
Functions	Health education (individual and group) Informal counseling, individualized goal setting Outreach and recruitment Patient/community advocacy Patient monitoring and follow-up Service coordination Community linkages Instrumental support
Established continuing education program	No

Source: Site visit, June 2014.
CHW = community health worker; GED = General Educational Development; HCIA = Health Care Innovation Award.

Establishing the CHWs within each location was complex and time-consuming. Staff in the NHCHC headquarters worked with each local program to develop the new innovation, which required adapting it to each of the local organizations. Each site had to create a new position in its organization and set up an infrastructure (e.g., supervisors) to support the work. The work of the CHWs is very challenging since the population they serve has multiple social, health, and mental concerns that need to be addressed. Many steps need to be taken, and various service agencies need to be involved (e.g., MHMRHA, police department) to fully provide the clients with all the necessities that go along with betterment of health. For example, many of the clients do not have identification (ID) cards. Without IDs, clients may have difficulty obtaining housing, shelter, or other services for which they might qualify. A new police program in Houston has a mobile van unit that can help create IDs for the homeless. These processes are often overwhelming for HHH clients who, in addition to being homeless, might be dealing with health and mental challenges. The CHWs are able to refer or accompany clients to obtain their IDs as a first step in beginning the process of accessing critical health services. Also, many are eligible for social security benefits, Medicaid benefits, and food assistance programs of which they may not be aware. Thus, the CHWs help the clients obtain health and social services beyond those in the innovation and accompany clients to the organizations that provide suitable care for that client.

Potential HHH clients are identified through two methods: (1) the medical provider identifies a client at the time of the ED visit and refers him or her to the program or, more often, (2) the program project director (PD) and CHWs go through the public hospital electronic health records (EHRs) weekly (each Friday) and identify patients who have been seen in the ED that week and meet the criteria of being homeless with four or more ED visits in the last

2 years.[5] The CHWs have the challenging task of tracking and contacting each patient on the list and encouraging him or her to enroll in the HHH program to receive CHW and primary care services. (Case management and primary care services are provided to all clients; however, the unique CHW services are provided to those who enroll in the HCIA program.) This task is challenging because of the transient nature of this population; many patients do not have any contact information. The CHWs mostly use their networks within the homeless population to "track down" potential clients. Once a potential client is located, the HHH staff meet with the person to explain the program and ask if he or she wants to be in the program. Additional support in the form of bus passes are provided to clients of the HCIA program to allow them to get to their appointments.

1.1.2 Program Participant Characteristics

NHCHC's target population is people experiencing homelessness, regardless of insurance status, who frequently seek and access primary care in EDs and other hospital settings. All HCH sites target people experiencing homelessness who have had four or more ED visits in the last 2 years. During the site visit, we learned that in Houston, there tend to be two levels of homelessness, and depending on their level of homelessness, the clients have diverse needs:

1. People who are chronically homeless have been homeless for a long period and are likely to have some disabling condition. This group needs the most care and attention because they tend to have multiple challenges, including medical and psychological challenges and substance abuse. The clients in this group need continuous care coordination and help with every aspect of enrollment and service acquisition because they tend to easily "fall through the cracks." The CHWs help these clients with making appointments, filling out forms, accessing transportation, accompanying them to various appointments, and obtaining personal provisions.

2. People who are newly unstably housed have come to Houston, often in search of work, and were not able to find a job and were not able to leave. A few years ago, a shift was noticed in the homeless population of Houston because the city, and state of Texas, has been economically more prosperous than the rest of the country, so a lot of people began moving to Houston—estimated at about 1,000 people moving into the city per day. A lot of the newcomers tend to be laborers and are vulnerable because they have no means to support themselves or return to their home if they are not able to find work right away. This group of homeless clients is easier to work with because their main problem tends to be economic rather than psychological or drug related, and they mainly need "a little bit of direction."

To achieve its goals of reducing costs, improving care, and improving health outcomes of people who are unstably housed, the innovation employs CHWs to fulfill the role of case coordinator/manager and outreach enrollment agent. The NHCHC innovation expects that

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[5] Having access to the local hospital's EHRs, even when the NHCHC site has a contract with the hospital, is not typical. In Durham, the CHWs receive a printout of shared patients who have been to the ED, and their contract is with only one of three local EDs.

500 individuals participating in this CHW program would generate 1,453 hospitalizations annually before entering the program.

Table 4 lists the patient type planned for inclusion in the innovation once we receive aggregate-level data by site from NHCHC.

Table 4. Patients Planned for Inclusion in Innovation (Denominator Data)

Patient Type	Data Source	Current Count (Data Source)
Persons identified as experiencing homelessness	Hospital EHR	—
Persons identified as having four or more ED visits in a 2-year period	Hospital EHR	—

Source: Data to be requested from the NHCHC.
ED = emergency department; EHR = electronic health record.
— Data not yet available.

Table 5 shows the demographic characteristics of participants enrolled in the innovation through quarter 8 (Q8). The mean age across the 308 patients enrolled across all 12 programs was 47.2 years. As shown in the table, the majority (70%) of enrollees were male, about half were white, and another one-third were black. Most (71.5%) were either uninsured or covered by Medicaid.

Table 5. Characteristics of All Patients Enrolled in the Innovation through Quarter 8 (June 2014)

Characteristic[1]	Number of Patients	Percentage of Patients
Sex		
Female	90	29.2
Male	215	69.8
Transgender	2	0.7
Missing	1	0.3
Race/ethnicity		
White	158	51.3
Black	108	35.1
Hispanic	21	6.8
Asian	3	1.0
American Indian or Alaska Native	12	3.9
Other	5	1.6
Missing/refused	1	0.3

(continued)

Table 5. Characteristics of All Patients Enrolled in the Innovation through Quarter 8 (June 2014) (continued)

Characteristic[1]	Number of Patients	Percentage of Patients
Payer Category		
Medicaid	92	29.9
Medicare	15	4.9
Dually eligible	21	6.8
Private/other	42	13.6
Uninsured	128	41.6
Missing	10	3.2

Source: Aggregate-level data provided by the NHCHC to RTI in August 2014.

[1] The awardee only provided data that included the average age across participants by each program so this characteristic is not presented in the table.

1.2 Implementation Progress

The extent to which each awardee is able to implement its innovation as planned and reach a sufficient number of patients will be critical to assessing its impact on the total costs and utilization (i.e., hospitalizations, readmissions, ED visits) of health care services. The following section provides details on the implementation process, then the effectiveness, with a table (***Table 6***) that provides the list of measures RTI plans to use in assessing each. In ***Table 6***, we present the explanatory or independent variables we plan to use to assess the impact on outcomes of the innovation.

1.2.1 Process

The implementation process has been the initial focus of the evaluation. RTI defines implementation process as including execution of implementation, organizational capacity, engagement of key staff and partners, and client recruitment and enrollment. The implementation process is best evaluated through a combination of data variables, including execution of implementation that conforms to the operational plans, and capacity for implementing the innovation in a timely and effective manner. For this innovation, care coordination is a key subdomain of interest, including the number of patients enrolled to receive CHW and primary care services (***Table 6***). We focused on the implementation process during the HHH awardee site visit (June 18, 2014) and asked such evaluation questions as the following:

- What is the overall execution of the innovation implementation (e.g., the actual rate of expenditures relative to the projected rate)?
- What accomplishments are specific to hiring or training staff so that the organization can build its capacity to implement the innovation effectively?

- What is the implementation effectiveness, including fidelity, reach, and dose of the innovation thus far?

Table 6. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for NHCHC

Key Evaluation Domains	Subdomains	Measures	Data Source
Workforce development	Staff satisfaction	Burnout (using your own definition of "burnout," please indicate which statement best describes your situation at work)	Electronically administered survey
Implementation process	Care coordination	Availability of integrated behavioral health services	CHW will report use of behavioral health services in quarterly report
Implementation effectiveness	Reach	Number/percentage of patients by insurance status	Self-report by patient, NHCHC primary care patient record, hospital medical record (if available)
Implementation effectiveness (continued)	Dose	Number and type(s) of primary care services	Hospital cost records/NHCHC site records
		Number and type(s) of enabling services (e.g., transportation, interpretation services, health education/supportive counseling, outreach, case management [assessment, treatment and referral], eligibility assistance/ financial counseling)	Medical health record/CHW encounter form

CHW = community health worker; NHCHC = National Health Care for the Homeless Council.

Execution of Implementation

Execution is the extent to which the innovation has been implemented according to plan. We use a number of data variables to assess execution, including the extent to which the innovation has encountered delays in implementation, the effectiveness with which the awardee is able to allocate staffing and resources to support the innovation, and the organizational capacity for implementation. NHCHC has implemented its innovation across the 11 sites (12 programs) mostly as planned. The sites were faced with many challenges in the first year that led to a delay in project implementation, including staffing, administrative, and client enrollment; however, they have been able to manage each step and make steady progress.

Initially, NHCHC planned to employ 15 CHWs across 10 NHCHC sites. During Q2, two of the NHCHC sites made logistical changes that would have resulted in a shortage of the proposed

CHW staff. NHCHC was able to reallocate staffing to maintain the originally planned number of CHWs and increased the number of partner sites from 10 to 11. Furthermore, because the NHCHC sites are located in various cities, the sites must abide by different rules and regulations. Some of the cities' union regulations interrupted the CHW hiring process mainly because of the proposed CHW salary of $32,500 per year. This rate was too low for some of the East and West Coast cities where the cost of living is much higher. The affected programs chose to supplement the CHW salaries to bring it up to the cost of living for that city. The staffing changes and delays in hiring led to a slight delay with initiating training as planned to begin in October 2012. NHCHC postponed the 16-module webinar series to November 2012 to allow for all staff to be in place. This training was successfully conducted over a 6-week period for 2–3 days a week.

The first administrative challenge in implementation was difficulty in establishing memoranda of agreement (MOAs) with the public hospitals in the various NHCHC sites because of complicated policies and bureaucracies. Streamlining the administrative work of each NHCHC site was another challenge because each of the NHCHC project administrators was asked to take on a huge amount of additional work without additional compensation (i.e., participate in monthly calls, submit data, and supervise the CHWs). The lesson learned was that resources should be allocated appropriately for project administration and CHW supervision.

Although CHWs have encountered a fair number of potential clients (826 people as of the end of Q4), the actual enrollment was much slower than expected. At the end of Q4, 100 clients had been enrolled in all of the NHCHC sites. The innovation learned that time is needed for CHWs to build relationships and trust with clients. As previously mentioned, the transitory nature of this population often means that the potential clients either do not have contact information or simply "disappear" for long periods. Additionally, cases involving psychological challenges and drug abuse do not allow for consistent and dependable contact with the person. NHCHC has learned that providing more stringent initial training to CHWs on outreach and engagement of vulnerable populations is critical to the success of implementing care coordination with this population.

The HHH innovation has largely implemented its program as planned. Initially, HHH intended to partner with a local public hospital where the CHWs would be housed and directly enroll patients into the program when they presented for an ED visit. However, because of the large amount and overwhelming burden of work in the EDs, this arrangement was not established. Instead, HHH now purchases and shares access to the county public hospital (Harris Health System) EHR system. Consequently, the intended process of identifying the target population was modified from enrolling patients on site at the EDs to conducting a weekly search of the hospital EHR system to identify the target population that meets the criterion of four or more ED visits in the past 2 years. Providers may also refer patients or contact HHH directly regarding a homeless patient in their care.

Both the hospital and HHH have immediate and read-only access to the health records and can track patients who have visited the county ED. The only challenge with this method is that homeless patients who seek care at any of the other four hospitals in the area are not captured in this EHR, and the hospitals do not track homeless status. HHH has no way to access that portion of the population; however, we understand that 70% of homeless patients seek emergency care at the county hospital for which the awardee has EHR access.

Once this new method of identifying the target population was established, the CHWs were in place and began their work of locating the identified patients, informing them about the services offered by HHH, and enrolling them in the program. Because of contractual issues with working inside the public hospital ED, there was a delay in identifying the target population and starting the enrollment process. Despite setbacks, HHH has steadily progressed with its enrollment numbers and has currently reached its projected numbers of cumulative participants.

Respondents consistently voiced enthusiasm and support for the innovation, and one CHW affirmed that "our organization believes in CHWs and they believe in us to do our job." The CHWs, the PD, and chief executive officer (CEO) of the organization work together, and the CHWs feel that their efforts and ideas are valued. For example, one of the CHWs presented an idea of having a bus to transport the homeless population because transportation is a major barrier for people who are homeless to access agencies that provide basic necessities and federal assistance. HHH leadership supported this idea, and through a different funding mechanism, the city of Houston has implemented the Project Access Bus, which is free for the homeless in the city. Although this is not an HCIA-funded project, it positively affects implementation of the innovation because HHH clients are now able to access the many agencies required for them to obtain community services and medical care.

Organizational Capacity and Leadership

NHCHC has historically provided training and technical assistance with the goal of improving the health and health care of those experiencing homelessness. The organization has received 14 consecutive cooperative agreements from the Health Resources and Services Administration to provide technical assistance to FQHCs funded under Section 330(h), demonstrating its financial strength and stability, as well as its potential to support this initiative beyond the 3-year project period.[6] Additionally, all participating NHCHC sites are members of the Practice-Based Research Network (PBRN), which provides board-level oversight to the program. The PBRN was created in 2007 from the HCH's Research Coordinating Committee to facilitate improvement of health care practice and policy for homeless individuals and families through effective use of research.[7]

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[6] Source: funding application

[7] http://www.nhchc.org/resources/research/practice-based-research-network/

As RTI learned during the site visit, NHCHC and HHH leadership is highly supportive of the program, and overall, the program staff members seem to feel empowered and supported. The HHH CEO works down the hall from the CHWs and PD and has facilitated communication and strengthened team relations because of her "open-door" policy. One of the CHWs noted that "this organization is different in that we work like brothers and sisters teaching each other" (versus a hierarchical approach to management). This type of environment has built a sense of trust and respect among program staff and leadership. Furthermore, the dedication of organization leaders to maintaining the CHW positions beyond the HCIA funding period was evident. HHH plans to work toward sustainability of the program through Medicaid revenue, and the CEO noted, "If that doesn't cover the two CHWs then I will find a way to do it!"

1.2.2 Workforce Development

Hiring and Retention

Hiring and retention of CHWs to enroll clients into the program and assist them in accessing health care and other vital social services are critical to the success of this innovation. NHCHC has met its goal of hiring 15 CHWs to serve all of the NHCHC sites. Additionally, there are 3 individuals in management/administrative positions and 43 volunteers. The volunteers tend to be people in management positions or case management (e.g., social workers) who have assumed oversight of program staff as an added responsibility of their jobs. Initial discussions with the awardee indicated how challenging it has been to establish the program at all locations, both because supervision of CHWs is added to the responsibilities of a staff member who already has a full plate and because the organizational structure for the program and CHW reporting must be adapted to each location. As a result of the emotional nature of working with the homeless population, NHCHC monitors staff satisfaction and burnout among CHWs. Over a period of four quarters (Q4–Q7), more than half of the CHWs mentioned some level of burnout. To address issues related to burnout, a full day of training was conducted during the national conference in May 2014 to focus on trauma-informed care, compassion fatigue, vicarious trauma, and self-care. The CHW and management were positive about the training they received and expressed that they feel well equipped with the skills to implement their duties.

The HHH location has two CHWs on staff—one who was working with HHH long before this innovation began and one who was hired at the start of the implementation phase. As previously mentioned, HHH requires that CHWs have been homeless in the past to better understand the needs and circumstances of someone experiencing homelessness. Each of the two CHWs was previously homeless and received care at the HHH site. The first CHW to be hired was described as a "shoe-in" for the position because after his personal experience and receiving services at HHH that helped him out of homelessness, he has been greatly involved with the organization at the local and national (NHCHC) levels. Initially, he served on the community advisory board and then on the governing board until he became a staff member and had to step down because of a conflict of interest. Currently, he is chair of the National Advisory Board. He and the HHH CEO worked collaboratively to incorporate CHWs into the already existing program that provided services to the homeless. The second CHW completed the certified CHW program at Houston Community College and was hired by HHH in December 2012. Given the limited number of candidates who could fill the CHW role requirements, the process of finding a qualified CHW was described as mainly through "word of mouth" and personal connections.

Training

NHCHC has historically provided training and technical assistance to organizations that deliver direct care to those experiencing homelessness. Part of NHCHC's goal of improving care is to increase the health workforce and clinical capacity of its 11 NHCHC innovation partner sites (12 programs) by hiring and training 15 CHWs.

From the launch of the program through March 2014, NHCHC has offered a series of online/webinar or classroom/discussion trainings to all innovation staff, including CHWs, NHCHC, and clinical staff and volunteers for a total number of 1,266 cumulative hours. These trainings have included the following:

1. A 16-module webinar series focused on the core competencies of CHWs.
2. Monthly conference calls with program administrators and the CHWs sometimes provided an opportunity for continuing education and training webinars.
3. The history of the CHW movement, de-escalation techniques, and client assessment strategies were discussed at the national conference in Washington, DC, from March 12 to 16, 2013.
4. At the northeast regional training in Morristown, NJ, in May 2013, a 2-day training for the CHWs included workshops and plenary sessions focused on street outreach, adult learning styles, and the stages of change.
5. A webinar was made available on the NHCHC Website that entailed how CHWs can educate their clients about the signs and symptoms of medical problems that require emergency services. The purpose of the webinar was to assist CHWs in their work with clients in discerning when to call their CHW or NHCHC clinic and when it is appropriate to go directly to the ED.
6. A webinar introduced changes made to the survey protocol for Year 2.
7. A 2.5-day training for CHWs in Nashville, TN, was held in November 2013. Topics and content of this training were requested by CHWs and their supervisors based on their experience with clients and data collection. Workshops included Time Management, Using Dialogue to Build Individual and Community Resilience, Caring for the Self While Caring for Others, Learning the Lingo: Medical Terminology, Working Through Loss and Grief, Mental Health Crisis Intervention: Strategies for De-escalation, and Leading for Maximum Impact.

8. In March 2014, a training to pilot a costing toolkit developed by Brandeis University was held. The costing tool was designed to be used by administrators, directors, and financial officers of programs for people experiencing homeless to calculate health outcomes and cost savings of health center program grantees. Fourteen staff members, including administrative, clinical, and community-based personnel, attended the training.

1.2.3 Implementation Effectiveness

A major aspect of the evaluation will be to assess the effectiveness of the intervention in terms of the extent to which the intervention implemented aligns with what was planned (i.e., fidelity) and whether patients have been exposed to it. Their exposure will be measured through reach (i.e., the extent to which the total number of patients is reached who were targeted) and dose (i.e., the degree to which each patient is exposed to services provided by CHWs).

Fidelity

Since the project award in July 2012, NHCHC has not changed the original innovation concept. It has had to make certain procedural changes because of logistical and administrative challenges during project implementation; however, it has maintained the model of employing CHWs to provide case management and outreach to those experiencing homelessness at the NHCHC partner sites.

During our site visit at HHH, we learned that this site has also implemented the innovation mostly as intended; however, because of contracting issues with the local public hospital, it had to adjust its intended method of client enrollment. The enrollment process was modified from direct on-site enrollment in the ED to one of tracking the target population through the hospital EHR system. HHH was able to purchase access to the county hospital EHR and currently identifies its target population through a weekly review of ED patients who meet the client requirements of having had four or more ED visits in the last 2 years.

Reach

Reach is the extent to which the targeted numbers of patients are exposed to the innovation. The NHCHC target population is defined as people experiencing homelessness who frequently seek primary care in EDs or other hospital settings and have had four or more ED visits in the last 2 years. NHCHC partner sites have had many challenges with reaching this population, and enrollment was very slow in the first year. Although the CHWs were making a great deal of outreach efforts, they were not able to successfully enroll and engage the patients. During the HHH site visit on June 18, 2014, we discussed with HHH staff the unique barriers they have encountered with enrollment, particularly among a transient population, and the strategies put in place to overcome these barriers.

1. The major hurdle in reaching clients for HHH was not being able to establish a working relationship with the local public hospital. HHH was able to resolve this issue

by purchasing access to the hospital EHR to identify patients; however, this led to delays in locating the target population and starting enrollment.

2. By nature, the homeless population is transitory and hard to reach because they do not have contact information and often "disappear" for periods of time. People experiencing chronic homelessness may have issues with untreated mental health diagnoses and/or drug abuse that makes it even harder to make or maintain contact with them. The CHWs at HHH were previously homeless themselves and have been able to create strong ties of trust with the clients they serve, which facilitates reach because the client is more likely to return to HHH for health care and other services offered. Furthermore, these CHWs have expertise regarding the homeless population; they know and understand the target population because of their personal histories and involvement in the community as CHWs. Consequently, they are able to reach clients through their own networks and knowledge.

3. Both NHCHC and HHH have expressed that more stringent training on engagement of vulnerable populations and outreach is critical to the success of implementing care coordination with this population. NHCHC has provided additional trainings based on staff feedback (see Training section).

4. Other considerations for reaching this population discussed with the HHH CHWs include the following:
    - Transportation: Bus passes were discussed as a great incentive for this population because transportation is a huge barrier. The CHWs suggested that this type of program should be provided with a dedicated van for client transportation needs.
    - Petty cash: The CHWs felt that petty cash funds should be built into the grant. The clients need some essential items that may not be offered or available through other agencies. For example, one of the CHWs was working with a client going through the program and needed boots, which the program was unable to provide for him. Additional items are hygiene and personal items like underwear.
    - Housing: The CHWs were very eager about the new Medicaid 1115 waiver program because it was a way to connect their clients with long-term housing.

Dose

Dose assesses the extent to which participants have been exposed to new services. This intensity of services (e.g., frequency, duration) provided to participants is combined with outcome data to determine whether increasing exposure (or exposure at all) to the innovation is associated with changes in outcomes. Determining "dose" (i.e., the duration, length of time, and intensity of services received by each patient) for the NHCHC innovation has been challenging. NHCHC receives contact log data from all sites each month and aggregates them by enrollment (***Table 7***), services (***Table 8***), and contacts (***Table 9***). We have received some initial aggregate-level data by program from NHCHC. However, we are continuing to work with NHCHC to determine if data can be provided by quarter as well as by program. ***Table 8*** will provide a summary of the services provided and the number of patients receiving services through Q8. We are still working with NHCHC to determine whether they can provide data that can be used to fill in ***Table 8*** and ***Table 9***.

Table 7. Patient Enrollment and Reach for Each Quarter since Project Launch (across All NHCHC Programs)[1]

Column A	B	C	D	E
Quarter	Target Population (Denominator Assigned to the CHWs)	Number of Unduplicated Patients Enrolled and Receiving CHW Services	Total Reach per Quarter (%)	Percentage Change from Previous Quarter
June 2013	500	—	—	—
September 2013	500	—	—	—
December 2013	500	—	—	—
March 2014	500	—	—	—
Total enrolled as of March 2014	—	—	—	—

Source: Data to be requested from NHCHC.
[1] Data reported in Lewin do not match data provided by NHCHC directly to RTI. We are working with the awardee to resolve inconsistencies and will report more findings in future reports.
CHW = community health worker; NHCHC = National Health Care for the Homeless Council.
— Data not yet available.

Table 8. Number of Patients Receiving Specific Services

Services Provided to Patients	Number of Services per Patient
Transportation	—
Health education	—
Counseling	—
Referrals to community resources	—
Total	—

Source: Data to be requested from the NHCHC.
— Data not yet available.

Table 9. Number of Encounters with Enrolled Patients

Contact Type	Total Encounters
In-person visits	—
Phone calls	—
Counseling sessions (not in the home)	—
Total	—

Source: Data to be requested from NHCHC.
— Data not yet available.

1.3 Evaluation Outcomes

Awardees have two possible types of quantitative data that RTI will use in assessing the impact of the awardee's innovation on key outcomes. These include claims data for

Medicare or Medicaid beneficiaries, depending on who the awardee serves, and administrative or utilization data the awardee is collecting (which we have categorized as "other awardee-specific data," reflecting the variability of the types of data elements available across awardees). We are finalizing our assessment of all available data sources and requesting data directly from each awardee. As those data are received, we will incorporate the findings into our quarterly and annual reports. The following sections present descriptive findings from the quantitative outcome data available to RTI as of September 11, 2014.

1.3.1 Measures for Evaluation

After the site visit, the data management and site visit teams met to review each of the measures listed in the awardee's self-monitoring measurement plan. The measures listed in ***Tables 4*** and ***10*** reflect the measures determined to be the most relevant for our evaluation of NHCHC's innovation.

Table 10. Outcome Measures for NHCHC

Key Evaluation Domains	Subdomains	Measures	Data Sources
Clinical effectiveness	Asthma	Percentage of patients with asthma who were dispensed appropriate medications	Medical health record
	Diabetes	Percentage of patients with diabetes who received a foot exam	Medical health record
	Mental health	Percentage of patients with depression who were dispensed appropriate medication	Medical health record/ report from HCH staff
		Percentage of those who were hospitalized for treatment of mental illness and who had an outpatient follow-up visit within 30 days of discharge	Medical health record/report from hospital staff or HCH staff
	Patient perceived health and functioning	Quality of life scale	CHW administered survey to participants
		General self-efficacy scale	CHW administered survey to participants
Health outcomes	Diabetes	Percentage of patients with diabetes who had hemoglobin A1c >9.0%	Medical health record
	Hypertension	Percentage of patients with a diagnosis of hypertension with BP <140/90 mm Hg	Medical health record

Table 10. Outcome Measures for NHCHC (continued)

Key Evaluation Domains	Subdomains	Measures	Data Sources
Health care outcomes	Utilization	ED visit rate	Medical health record, CHW encounter report
		All-cause admission rate	Medical health record, CHW encounter report
	Cost	Spending per patient	Hospital cost records
		Cost savings	Hospital cost records

BP = blood pressure; ED = emergency department; CHW = community health worker; HCH = Health Care for the Homeless; NHCHC = National Health Care for the Homeless Council.

1.3.2 Claims Data

As part of a broad assessment of health care innovations, the Center for Medicare & Medicaid Innovation (CMMI) is assessing the impact of its programs, including those funded specifically by HCIAs, on four core measures. The four core measures are as follows:

- health care spending per patient,
- hospital inpatient admissions,
- hospital unplanned readmissions, and
- ED visits.

Collectively, it is anticipated that CMMI programs will slow the increase in health care spending, reduce hospital admissions, reduce avoidable hospital readmissions, and prevent unnecessary ED visits. RTI is required to report these measures for all HCIA Community Resource Planning awardees. However, NHCHC is not able to provide patient identifiers for their participants due to constraints in sharing patient identifiers.[8] Without a claims analysis, RTI is unable to independently assess the impact of the NHCHC innovation on the four priority measures, though the awardee is providing data collected for participants across awardees that we will use for the following analyses.

1.3.3 Other Awardee-Specific Data

Overview of Data Request

The Centers for Medicare & Medicaid Services has agreed that NHCHC does not need to provide RTI with patient-level data. Therefore, RTI met with NHCHC on July 24, 2014, to request aggregate-level data by program. During that meeting, we reviewed each of the

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[8] Since each local program has to obtain patient identifiers and consent has to be established with participants to share those identifiers with the national headquarters or RTI, NHCHC is unable to share this information so that a claims analysis can be conducted. CMS has approved their exemption from this requirement.

measures listed in ***Tables 6*** and ***10***. NHCHC provided data to RTI in August 2014. We are working with NHCHC to determine if they can provide the data by quarter as well.

Health Outcomes

Table 11 shows the number and percentage of patients by health condition for each of NHCHC's 12 programs. As shown in the table, the percentage of patients with asthma ranged from 8.3% (Hyannis, Massachusetts) to 60.0% (San Jose, California). The percentages for diabetes ranged from 10.0% (San Jose, California) to 33.3% (Durham, North Carolina), and the percentages for hypertension ranged from 31.0% (Nashua, New Hampshire) to 68.4% (Chicago, Illinois). Overall, nearly half of the patients (49.0%) had hypertension, about one-third (33.8%) had asthma, and about one-fifth had diabetes (20.5%).

Table 11. Number and Percent of Patients by Health Condition by Site

	Health Condition					
	Asthma		**Diabetes**		**Hypertension**	
Site	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Boston, MA (n=7)	3	42.9	1	14.3	3	42.9
Chicago, IL (n=19)	10	52.6	3	15.8	13	68.4
Cleveland, OH (n=19)	6	31.6	3	15.8	8	42.1
Durham, NC (n=27)	12	44.4	9	33.3	16	59.3
Houston, TX (n=68)	21	30.9	17	25.0	45	66.2
Hyannis, MA (n=12)	1	8.3	2	16.7	6	50.0
Los Angeles, CA (n=20)	3	15.0	6	30.0	7	35.0
Manchester, NH (n=25)	5	20.0	4	16.0	8	32.0
Nashua, NH (n=29)	11	37.9	3	10.3	9	31.0
Omaha, NE (n=47)	16	34.0	6	12.8	20	42.6
San Fernando, CA (n=25)	10	40.0	8	32.0	11	44.0
San Jose, CA (n=10)	6	60.0	1	10.0	5	50.0
Total	*104*	*33.8*	*63*	*20.5*	*151*	*49.0*

Source: Aggregate-level data provided by the National Health Care for the Homeless Council to RTI in August 2014.

Discussion of Other Awardee-Specific Findings

We are just beginning to work with NHCHC's awardee-specific data. Initial findings show that nearly half of enrollees have hypertension, one-third have asthma, and one-fifth have diabetes. We will continue to work with the aggregate-level data and report additional findings in future reports.

1.4 Overall Program Effectiveness Assessment

This innovation is based on the concept of employing CHWs to provide care coordination and case management to people experiencing homelessness in 11 NHCHC sites nationally. However, the implementation of this innovation is complex and has been challenging because of the number of partner sites involved and the administration and oversight necessary to keep them all aligned. NHCHC and HHH leadership have provided high levels of vision, management, and support for the innovation. The HHH CHWs, management, and leadership work collaboratively, and the CHWs have a strong sense of support and endorsement. The innovation has greatly enhanced the services that HHH provides to its target population because having CHWs allows the patients to have hands-on care to navigate the system.

In Houston, the program is thriving largely because of the strong foundation laid by the HHH founders and, in part, by the support of a number of other local initiatives. For example, the Houston Police Department has initiated a mobile unit with the capability of creating ID forms. Those experiencing homelessness often do not have IDs, and for them, this is often a first step in being able to access vital services such as health care. Furthermore, the City of Houston has implemented a Medicaid 1115 waiver program that facilitates access to long-term housing for the homeless population. The CHWs noted that they are lucky to have this program in Houston because for many of their target population, this is the key to helping them gain physical stability and security to focus on additional needs such as receiving health care and finding employment. Finally, the city has also funded a project introduced by one of the CHWs called the Project Access Bus, which is free bus service for all homeless in Houston. Transportation is usually a huge barrier for this population, and this service was created to run mainly through the city with stops at the various federal and local agencies that the homeless need to access for their needs (e.g., shelters, Social Security office, job search assistance).

Initial barriers to program effectiveness included staffing difficulties, administrative setbacks, and very slow participant enrollment. Strengths of NHCHC as a whole and the HHH site have been their adaptability and capacity for addressing challenges. NHCHC was able to quickly recruit two additional HCHs when two other sites made staffing changes that would have affected the total number of CHWs as proposed. Furthermore, administrative and contractual setbacks with establishing hospital MOAs jeopardized enrollment numbers in the first year of the project. Now that the innovation is under way, enrollment is gaining momentum and, in Q6, exceeded projected numbers significantly.

A great deal of effort has been put into conducting trainings (initially and continuously) and monitoring staff satisfaction. Quarterly staff satisfaction survey results have been generally positive. At the end of Q4, some CHWs indicated dissatisfaction with the large amounts of paperwork, and NHCHC has revised data collection tools for Year 2 to be more efficient. In the satisfaction surveys between Q4 and Q7, more than half of the CHWs consistently reported some level of burnout. NHCHC addressed the issues related to burnout through trainings conducted at their national conference in May 2014, including workshops on trauma-informed care, compassion fatigue, vicarious trauma, and self-care. During site visits interviewees shared a lesson learned: that providing more training for the CHWs on outreach and obtaining participant engagement would have benefited the program and aided enrollment in the first year.

Although sustainability did not seem to be a central focus at the HHH site, NHCHC has been leading efforts across the programs to determine ways for ensuring ongoing access to CHWs. To that end, NHCHC conducted a focus group in May 2014 at the national conference to explore avenues for sustainability. The Q7 progress report mentions that in this last year of funding, NHCHC plans to assist the programs with securing funds to continue beyond 2015. The HHH leadership stated that its goal is to sustain the program through increased Medicaid revenue being generated through the long-term medical home relationship that the CHWs have been able to create.

Thus far, anecdotally, CHWs feel that they are making a difference in the clients' lives and helping keep them out of the ED. In addition, the CHWs are able to accompany the clients to obtain essential services such as food, housing, Supplemental Security Income benefits, and jobs. This innovation has also helped create job opportunities for CHWs who were themselves previously homeless. As a result of the success of this innovation, HHH has hired six additional CHWs for other projects. Overall, the innovation, as it is being executed, has the potential to improve both the care and health of individuals who are experiencing homelessness in Houston and the 10 other NHCHC sites and to lower costs of care for these homeless populations.

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October 2014

Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring

Annual and Site Visit Report
Northeastern University

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OVERALL EVALUATION SUMMARY

RTI International was selected to lead an independent evaluation of the 24 Health Care Innovation Award (HCIA) awardees categorized as Community Resource Planning, Prevention, and Monitoring (Community Resource). In this role, RTI is conducting an in-depth evaluation of each innovation, as well as a cross-site evaluation that includes similar innovations targeting the same priority outcomes (e.g., emergency department [ED] visits). For each of the 24 awardees, this report presents findings from the first year of the evaluation (beginning September 23, 2013, and including data obtained by RTI as of September 11, 2014). The report is based on multiple data sources, including operational reports, self-monitoring plans, site visits, and quantitative data analysis.

The evaluation methods vary by awardee innovation, based on the type of innovation and availability of data. RTI has reviewed and coded all existing documents from the awardees through December 31, 2013, and incorporated that knowledge into each awardee's overview. Our review included the awardees' original applications for funding, original and current operational and self-monitoring plans, and quarterly narrative and monitoring reports. For this annual report, we incorporated activities reported through the awardee's seventh quarterly report (i.e., through March 31, 2014).

Between April and August 2014, teams of at least two staff from the RTI team visited all 24 awardees for 2 to 4 days, depending on the number of interviews conducted. Teams included a subject matter expert, with training and experience specific to the awardee's innovation, and a master's- or bachelor's-level colleague to take notes. Before each visit, the teams reviewed all available documentation from the awardee to learn about the innovation's goals, objectives, and status. The purpose of the site visits was to clarify our understanding of the innovation, obtain detailed information on the implementation process, and review awardee-specific data to determine which elements to incorporate into the evaluation. By August 13, 2014, all 24 awardees had been visited and a thorough description of our findings included in each of the 24 awardee sections.

In addition to the site visits, we report quantitative data from two possible sources for several awardees. First, we present findings from claims analysis for awardees in this annual report if they both provided us with patient identifiers and reported enrolling participants who receive Medicare and/or Medicaid. RTI has obtained patient identifiers from most of the 24 awardees to conduct claims analysis. Second, we present data RTI obtained directly from awardees to quantify their work in addressing health care costs, quality, and patient outcomes. Data from additional awardees will be analyzed and presented in future reports, as data become available and awardees enroll sufficient participants. An update on the availability of Medicare/Medicaid claims and other awardee-specific data, analysis of data available to us and cleaned as of September 11, 2014, a summary of the comparison groups, and a list of draft evaluation measures are included in each awardee section.

1. HCIA COMMUNITY RESOURCE AWARDEE: NORTHEASTERN UNIVERSITY

1.1 Introduction

Northeastern University (Northeastern) is a private university in Boston, Massachusetts. Awarded $8,000,002, Northeastern began enrolling health systems into its HCIA Community Resource innovation in November 2012. The aim of this innovation is to develop and enable professional collaboration between an industrial and systems engineering (ISyE) regional extension center model and health systems, improving health and health care and decreasing health care costs by $60.8 million over a span of 3 years. Specific goals are as follows:

1. Apply ISyE methods to health care by working with health systems, including health systems in the Boston area in Years 1–3, and health systems in Seattle, Washington, and Charlotte, North Carolina, in Year 3.
2. Develop and implement projects with potential cost savings and quality improvements at each health system, with up to three projects per health system.
3. Develop a workforce of health systems engineers.
4. Increase awareness and visibility for health systems engineering work.
5. Create a scalable and sustainable model for applying ISyE in health care.

Northeastern University's innovation applies principles of ISyE to improve health care processes. This approach is similar to the agricultural extension center model and to the regional extension center model employed by the Office of the National Coordinator for Health Information Technology (ONC). ONC's extension centers focus on assisting health care providers and health care systems adopt health information technology (HIT); Northeastern helps health systems incorporate ISyE principles to solve problems within systems.

RTI is conducting an in-depth case study for this innovation. As part of that case study, two RTI team members conducted a site visit in May 2014; before and after the visit, our team reviewed all documentation on the innovation. We are working to obtain data directly from the awardee to assess many of the variables we discuss in this report section. This report describes findings from RTI's site visit, document reviews, follow-up calls, and analysis of data obtained by RTI through September 11, 2014. We start by describing the innovation's components and the patients targeted by the awardee.

1.1.1 Innovation Components

Northeastern University's innovation executes multiple projects at various health systems; no two projects have the same scope, goals, or components, making Northeastern's innovation unique among HCIA Community Resource awardees. Therefore, we use a two-tiered approach to evaluate Northeastern's innovation:

- **Component 1: Regional Extension Center Model.** This part of our evaluation focuses on the high-level or macro aspects of the innovation and identifies common threads across projects (e.g., application of ISyE principles, staffing model, which includes examination of issues related to workforce development, engagement of health care partners, and project sustainability beyond the initial implementation period).
- **Component 2: Process Improvement Projects.** This part of the evaluation focuses on individual projects at the micro level. Since no two projects are identical, we evaluate each project amenable to evaluation separately. The uniqueness of each project means the scale and scope of each evaluation will also vary.

Component 1: Regional Extension Center Model

Every project in Northeastern's innovation uses core principles of ISyE, and deploys Northeastern students and staff to work with health care systems to improve processes based on these principles. The success of the regional extension center model depends on the extent to which Northeastern can identify appropriate projects located within different health systems. Determining which projects at which health systems are a good fit to receive services through a regional extension center requires considerable staff time (from 1 month to more than 3 months per health system, we learned during our May 2014 site visit).

To select projects that are based on principles of ISyE and consistent with the goals of the award, Northeastern first considers multiple projects based on individual health system needs and priorities. This scoping process, we learned during our site visit, is a detailed collaborative process between Northeastern and the health system, requiring significant dialogue before a decision to proceed (or not proceed) is reached. The process follows specific steps:

- *Identify a Health System*: During our site visit, we learned from staff at Northeastern that identification of health systems with which to have initial conversations about scoping can take place in two ways. Northeastern proactively reaches out to health systems and requests conferences to discuss potential projects. Conversely, health systems also contact Northeastern after hearing about projects at similar systems. During our site visit, Northeastern staff noted its increased visibility since the start of the HCIA. The innovation has piqued the interest of other systems, leading to conversations that, in turn, have led to scoping and implementing projects.
- *Select a Project*: Once a health system has been identified, the Northeastern team works with it to select a project that is a good fit for the HCIA, both for the health system and for Northeastern. The most promising project(s) are then discussed and scoped based on a range of factors: estimated impact on the triple aim, process measures, outcome measures, approach, implementation plan, spread potential, and timeline. Northeastern has formalized the process by developing a structured scoping document that incorporates all these factors. Northeastern completes the scoping

document with the health system, and uses the completed document to determine whether the project should be pursued.

On our site visit, we learned that although the scoping process has taken longer than expected (Northeastern hopes to complete scoping in 1 month, but it frequently takes more than 3 months), overall, having a process for scoping facilitates communication between parties. Northeastern staff indicated that slow responses from the health system have delayed the scoping phase. During the site visit, we learned from Northeastern that one possible reason for this delay could be the busy schedules of health system professionals. Once project scoping is complete (and a project is selected), baseline data are collected and the Northeastern project team assigned to the health system begins working on the project.

Another feature at the regional extension center level is the staffing model that Northeastern uses across projects:

- *Staffing Model Based on Cooperative Education Students***.** Northeastern University is renowned for its cooperative (coop) education program, which has a history that spans more than a century.[1] Undergraduate students graduate in 4 or 5 years, gaining 12 to 18 months of work experience during their time at the university.[2] One foundation of the innovation's effort at Northeastern is the extensive use of undergraduate cooperative education students to staff each health system project. The cooperative education model is an experiential learning experience, applied across Northeastern University (not specific to this innovation), and involves students gaining up to 18 months of work experience while completing their undergraduate education [http://www.northeastern.edu/coop/]. The purpose of cooperative education is to enable students to apply their classroom learnings to real-world work environments while still enrolled in their undergraduate program. Northeastern follows a staffing model across projects in which a project-specific team works with health system staff to design and implement projects. Each team has a lead, a postdoctoral fellow, a graduate student, and one or more undergraduate cooperative education students (***Figure 1***). Postdoctoral fellows support the students conducting the work, and health system leads provide overall advisory support for the project.

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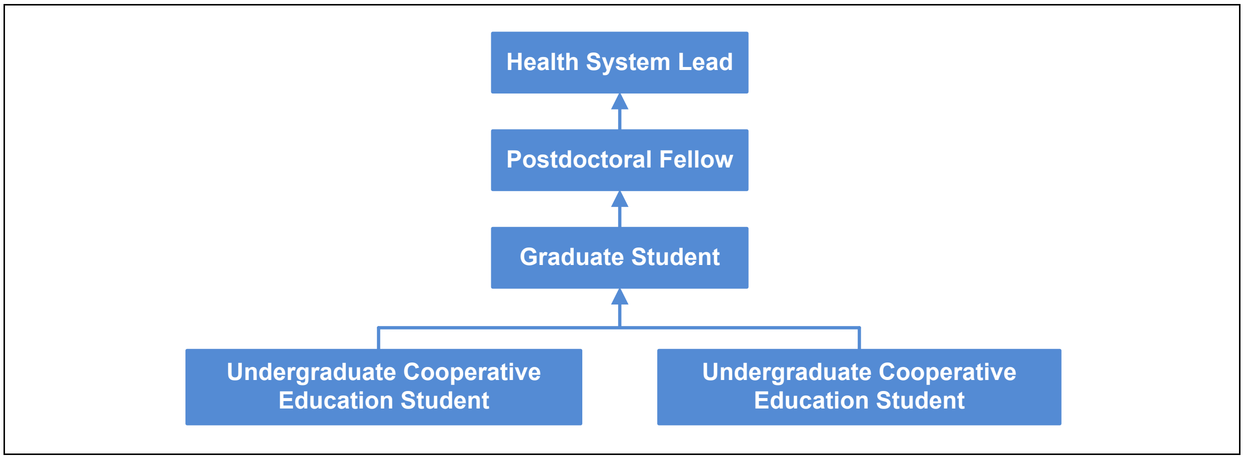
[1] Northeastern University. Cooperative Education. Available from: http://www.northeastern.edu/experiential-learning/cooperative-education/.

[2] Northeastern University. Cooperative Education. Available from: http://www.northeastern.edu/experiential-learning/cooperative-education/.

Figure 1. Northeastern's Staffing Model for Innovations at Health Systems



Participating Health Care Systems

Northeastern University currently works with 11 health systems,[3] and within health systems with administrators, health care professionals, and other staff, to implement projects based on ISyE principles that improve the ability of health systems to optimize various elements and provide cost-effective, high-quality care. ***Table 1*** lists health system partners to date. The list includes partners with whom Northeastern is currently working on a project, as well as partners with completed or discontinued projects. Thirteen partners are listed in Table 1.[4]

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[3] Quarter (Q)7 progress report.
[4] Q7 narrative progress report.

Table 1. Health System Partners and Location

Partner Name	Location
Atrius	Boston
Boston Children's Hospital[1]	Boston
Brigham and Women's Hospital[2]	Boston
Cambridge Health Alliance[3]	Boston
Commonwealth Care Alliance	Boston
Dana Farber Cancer Institute	Boston
Hallmark Health[3]	Boston
Harborview Medical Center	Seattle
Harvard Vanguard Medical Associates (HVMA)[2,3]	Boston
Northeastern-Lahey Health System[3]	Boston
Massachusetts General Hospital	Boston
Logix Health[1]	Boston
New England Quality Care Alliance/Southcoast	Boston

Source: Quarter (Q)7 narrative progress report. Bolded partner names and locations are where projects have been completed.

[1] Boston Children's Hospital and Logix Health are noted in Q7 Progress report as being both in "production" and "on hold."

[2] Past partner; no current projects underway. Brigham and Women's had projects that were sunset (not completed). HVMA has one completed project and one project that was not implemented.

[3] Partners with whom at least one project has been completed.

Component 2: Process Improvement Projects

As shown in ***Table 2***, Northeastern aims to complete at least 15 projects, mostly in the greater Boston area, but also in Seattle and Charlotte.[5] To date, Northeastern has completed four projects at four health systems, with 10 projects under way and four on hold.[6] We will clarify the status of projects as information becomes available.[7]

Table 2. Number of Projects to be Conducted by Location

	Year 1	Year 2	Year 3	Total
Boston	4	5	4	13
Seattle / Charlotte	—	—	2	2
Total	—	—	—	**15**

Source: Operational plan.
— Data not yet available.

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[5] Operational plan.

[6] Q7 narrative progress narrative report.

[7] Note: We were informed by Northeastern on August 5, 2014 that one project at Harvard Vanguard Medical Associates (Ultrasound Accessibility and Location Optimization) was not implemented and no measures are available. The other project at HVMA was completed (Obstetrics Optimal Hospital Admission).

Each Northeastern project has a different target population. ***Table 3*** shows completed and active projects.[8] Most completed projects focused on patient access or resource utilization. In some projects (e.g., Hallmark Health breast cancer access project), improving the efficiency of scheduling appointments, admissions, and discharges may have improved patient access to or experience with care. The "patients affected" in these cases were scheduled, admitted, or discharged during the project period. Some active projects also focus on patient access or resource utilization; others cover a range of issues, including reducing nonadherence to recommended diabetes care guidelines and reducing hospital-acquired central line infections. We will update Table 3 as information becomes available.

Table 3. Patients and Providers per Completed or In-progress Project

Health System	Project Name	Project Status	Project Length for Completed Projects[1]	Patients Affected	Providers Involved	Last Updated
Atrius[2]	Leakage	Active	—	Not listed	Not listed	N/A
Cambridge Health Alliance	Resident team scheduling – primary care continuity	Complete	8 months	~ 15,000	~3 +staff	1/2014
	Perioperative supply chain and inventory management[2]	Active	—	Not listed	Not listed	N/A
Commonwealth Care Alliance[2]	Skilled nursing facility care incentive design	Active	—	Not listed	Not listed	N/A
Dana Farber Cancer Institute[2]	Capacity/facility consolidation	Active	—	Not listed	Not listed	N/A
Hallmark Health	Breast cancer patient access	Complete	9 months	565	10	4/10/2014
Harborview Medical (Seattle)[2]	Simulation of GI suite	Active	—	Not listed	Not listed	N/A
Harvard Vanguard Medical Associates[2]	Obstetrics optimal hospital admissions for deliveries	Complete	8 months	Not listed	Not listed	N/A

(continued)

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[8] Q7 self-monitoring plan.

Table 3. Patients and Providers per Completed or In-progress Project (continued)

Health System	Project Name	Project Status	Project Length for Completed Projects[1]	Patients Affected	Providers Involved	Last Updated
Lahey Health System	CHF postdischarge scheduling	Complete	8 months	300	150	4/18/2014
	COPD readmission reduction	Active	—	Not listed	Not listed	N/A
Massachusetts General Hospital	ICU central line-associated bloodstream. Infection	Active	—	50% of MICU patients	~100	4/9/2014
	Neurology department appointment access project	Active	—	2,775	10	4/17/2014
	Neurology referrals	Active	—	Not listed	Not listed	N/A
New England Quality Care Alliance/ Southcoast	Improving diabetes care	Active	—	Not listed	Not listed	N/A

Source: Q7 self-monitoring plan.
[1] Estimated from Q7 narrative progress report.
[2] Project has not yet been implemented by the health system.
CHF = congestive heart failure; COPD = chronic obstructive pulmonary disease; GI = gastrointestinal; MICU = medical intensive care unit; N/A = not available.
— Data not yet available.

1.1.2 Participant Characteristics

Northeastern considers participants in all projects across health systems to be indirect participants and classifies no participants as direct since system innovations will be largely invisible to patients. Their goal was to reach 4,000 indirect participants across projects in Quarter (Q)7, but reported reaching only 3,000.[9] During our site visit in May 2014, we learned that delays in the scoping process to identify suitable projects may have contributed to the lower-than-expected indirect participant reach. We will clarify the number of indirect participants when the data become available.

Northeastern does not collect demographic or payer data on any patients affected by its projects, so RTI is working with the awardee to secure these data directly from the four institutions with completed projects. As of September 11, 2014, we had received 446

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[9] Q7 Lewin report.

Medicare identifiers from the Northeastern-Lahey Health System for their congestive heart failure (CHF) postdischarge scheduling project. The demographic characteristics of these patients will be presented in ***Table 4*** as soon as data have been cleaned and quality checked.

Table 4. Characteristics of Medicare Patients Enrolled in the Lahey Health System CHF Postdischarge Scheduling Project Through Q7

Characteristic	Number of Patients	Percentage of Patients
Age (average)	—	—
Sex (%)		
Female	—	—
Male	—	—
Race/ethnicity (%)		
White	—	—
Black	—	—
Hispanic	—	—
Asian	—	—
American Indian or Alaska Native	—	—
Other	—	—

Source: Medicare claims data.
CHF = congestive heart failure; Q = quarter.
— Data not yet available.

1.2 Implementation Progress

The extent to which each awardee is able to implement their innovation as planned and reach a sufficient number of patients will be critical to assessing the impact on improving health care and reducing costs. The following section first describes the implementation process at the regional extension center (Component 1) level, and then describes effectiveness and workforce development, with a table listing the measures RTI plans to use to assess each. The section concludes with a discussion of implementation progress for each completed project (Component 2).

While on site at Northeastern University, we examined several explanatory measures influencing innovation outcomes for the regional extension center model (Component 1), which added to information available in the Lewin and progress reports (***Table 5***). We detail these below.

Table 5. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for the Regional Extension Center Model

Key Evaluation Domains	Evaluation Subdomains	Measures	Data Sources
Implementation process	Execution	Time taken to complete scoping	Northeastern staff May 2014 site visit
Implementation effectiveness	Fidelity	Integrity to original plan Timeliness of implementation	Q7 progress and Lewin reports May 2014 site visit
	Reach	Number of projects completed Number of health systems conducting at least one project	Northeastern progress reports
	Dose	Number of contacts with health systems on the following topics: outreach, scoping, implementation, wrap-up, and evaluation of potential for replicability	Northeastern staff May 2014 site visit
	Sustainability	Number of process improvements sustained after project period [includes total number of completed projects sustained, as well as breakdown by project]	Northeastern and health system staff[1]
Workforce development	Staff recruitment and retention	Number of staff hired and retained	Northeastern reports May 2014 site visit
	Training	Types of training provided to northeastern staff Number of staff (including students) trained	Northeastern reports May 2014 site visit
	Roles and responsibilities	Effectiveness of staffing model	May 2014 site visit

For the second component of our evaluation, in the short term, we expect to focus on projects noted by Northeastern as being "completed" at health systems.[10] ***Table 6*** defines explanatory measures that influence outcomes at the project level. Most completed projects focus on improving patient access or resource utilization. We expect to refine, build on, and modify this preliminary list as additional information becomes available.

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[10] Q7 narrative progress report.

Table 6. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for Completed Process Improvement Projects

Health System	Project Name	Key Evaluation Domain	Subdomains	Measure	Data Source
Cambridge Health Alliance	Resident team scheduling – primary care continuity	Implementation process	Care coordination	Average percentage of primary care subteams represented in each regular family medicine clinic session, as a measure of availability and potential continuity	Analysis of daily provider spreadsheets
				Monthly percentage of appointments that occurred with a patient's primary care provider or someone on their subteam	EPIC EHR system
Cambridge Health Alliance (continued)	Resident team scheduling – primary care continuity (continued)	Implementation process (continued)	Care coordination (continued)	For all providers, average number of days until the third available appointment of any type (new patient physical, routine exam, or return visit exam), as a standard health care measure of appointment access in general	Site-wide ambulatory care goals report
Hallmark Health	Breast cancer patient access	Implementation effectiveness	Reach	Patient volume	Meditech data extract
Harvard Vanguard Medical Associates	Obstetrics optimal hospital admissions for deliveries	TBD	TBD	TBD	TBD

(continued)

Table 6. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for Completed Process Improvement Projects (continued)

Health System	Project Name	Key Evaluation Domain	Subdomains	Measure	Data Source
Lahey Health System	CHF postdischarge scheduling	Implementation process	Care coordination	CHF postdischarge scheduling process compliance	Appointment data
				Timely CHF postdischarge follow-up appointments made	Appointment data
				Postdischarge CHF follow-up appointments kept	Appointment data

Note: Table will be updated as we receive additional information.
CHF = congestive heart failure; EHR = electronic health record; TBD = to be determined.

1.2.1 Process

The implementation process has been the initial focus of the evaluation. Subsequent reports will assess the impact of the intervention as data become available. The implementation process is best evaluated through a combination of data variables, including execution of implementation that conforms to operational plans, and capacity for implementing the innovation in a timely and effective manner. We focused on the implementation process during the awardee site visit, asking such evaluation questions as:

- What is the overall execution of the innovation implementation (e.g., the actual rate of expenditures relative to the projected rate)?
- What accomplishments are specific to hiring or training staff so that the organization can build its capacity to implement the innovation effectively?
- What is the implementation effectiveness, including fidelity, reach, and dose of the innovation thus far?

Execution of Implementation

As is clear from detailed reports and from interviews conducted during our site visit, Northeastern University has a documented implementation plan that includes a timeline with expected milestones and staff assignments, which contributes to execution of the implementation.[11] Leaders of the innovation at Northeastern are involved in the project on a high level, and, we observed on our site visit, serve as motivators to project staff. Since the beginning of the award, Northeastern has made certain modifications to their execution to

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[11] Operational plan (2012), progress reports (Qs 1-7), Lewin reports (Qs 1-7).

deal with delays and ensure timely progress. We learned during our May 2014 site visit that substantial delays in execution were caused by delays in identifying and finalizing projects. To speed these initial processes, Northeastern staff developed a formalized scoping process to help streamline various steps as they begin interacting with health systems. A key lesson early in the innovation was to tighten the selection process by focusing on projects with smaller scope, using a streamlined scoping document to ensure that only appropriate projects are selected, and completing the scoping within 1 month. Learning to be more selective by focusing on expected outcomes, timelines, and so forth, has been part of the learning curve as Northeastern scales up efforts to incorporate ISyE into health care.

Northeastern has established an informal 1-month limit for the scoping process. The idea is that if a health system is not able to select a potential project and collect baseline data for that project in 1 month, the project is not likely to be conducted in a timely manner. However, Northeastern staff noted that completing scoping within 1 month has been extremely challenging, particularly due to schedule issues with staff at the health system. We will examine this challenge and other issues that may serve as barriers (or facilitators) to scoping.

Overall, the scoping process has helped reduce delays associated with identifying and moving ahead with projects, but such delays have not been eliminated.

Organizational Capacity and Leadership

The innovation at Northeastern has a clearly defined leader who is involved at a high-level in managing and overseeing their various projects. The leader is committed and involved in the implementation at a high level and also serves as a motivator for staff on the various projects. However, each project also has a health system lead who is involved on a more detailed level with his/her project than the overall award lead. This health system lead was brought into provide support to students and serve as a consistent point of contact for health systems. Northeastern, because it is a large institution of higher learning, has adequate resources to train cooperative education students for its projects. However, staff noted onsite that wider support from the university is lacking, particularly in terms of obtaining workspace.

1.2.2 Workforce Development

Building the skills and capacity of undergraduate cooperative education students is one of the hallmarks of Northeastern University’s innovation; all projects are staffed with at least one undergraduate student.

Hiring and Retention

Northeastern’s innovation at each health system is heavily dependent on the availability of undergraduate cooperative education students to staff projects. Typical coop projects are short-term efforts that undergraduates work on during the course of a semester (potentially returning for another semester later). To reduce the impact of student turnover, Northeastern is now focusing on shorter-term projects that last no more than a few months. Since student placements last about 6 months, this timing facilitates student participation from the beginning to the end of the project.

As of March 2014, Northeastern University had 28 full-time-equivalent (FTE) staff working on HCIA-funded projects. In Q7, 15 staff were management and administrative, and the remainder were other types of workers, primarily students. Six FTE staff were hired for the innovation during Q7. The retention rate for Q7 was 97.8%. The retention rate is based on the total number of employees working on the project in Q7 and the number of separations that occurred during this time. Northeastern's goal of building a regional extension center implies that they train a large number of students, and student turnover allows them to reach a larger number of students over time. During our site visit, our interviews with students confirmed that some intend to enter the health systems engineering field upon graduation. We are not aware at this time if the innovation team at Northeastern tracks students' career choices upon graduation.

The issue of student turnover, while a positive factor in allowing more students to be trained, presents a challenge in providing a consistent project team for health systems. Northeastern has attempted to address this challenge by including a health system lead, a senior-level Northeastern staff member, to oversee the project. This individual will remain on the project, provide consistent advisory support to incoming students, and serve as a constant point of communication for the health systems. During our site visit, we had the opportunity to speak with health system representatives who noted satisfaction with staff, particularly regarding the skill of undergraduate students. Undergraduate students we spoke with during the site visit in May 2014 expressed their enthusiasm for the cooperative education program, which provides exposure to various real-world projects (including HCIA projects) during their undergraduate education.

Training

Northeastern University, a large institute of higher learning, has adequate financial resources to support training, as well as space to conduct training. Due to the cooperative education program built into Northeastern's education process, training for undergraduate students is easily and readily available for all students. Leaders in this innovation are highly committed, involved, and accountable for the training of undergraduate students for this intervention. However, during our site visit, staff noted that the wider Northeastern administration is not as supportive of health systems engineering work as they hoped, and that procuring adequate workspace is an ongoing challenge.

Once the project team for each partner site is in place, they receive a 2- to 3-week training, which includes orientation/overview of the subject matter area, consulting/project management fundamentals, orientation/overview of the specific health system where they will be working, and internal project management protocols. Students involved in the innovation also take industrial and systems engineering courses as part of their degree requirements, although we are not aware of how many courses have been completed by students across all the innovations by the time they are staffed.

1.2.3 Implementation Effectiveness

A major aspect of the evaluation will be to assess the effectiveness of the intervention in terms of the extent to which the intervention implemented aligns with what was planned (i.e., fidelity) and whether patients have been exposed to it. Their exposure will be measured through reach (i.e., the extent to which the total number of patients is reached that were targeted) and dose (i.e., the degree to which each patient is exposed to services provided).

Fidelity

Northeastern's projects were developed with the goal of having impact on the triple aim. However, these projects are primarily process-improvement innovations that have distal impact, if any, on health outcomes. Additionally, Northeastern's projects are undertaken in complex adaptive environments where there are multiple confounding factors, making it challenging to attribute outcomes to Northeastern's innovation alone. Early on in the project timeline, Northeastern faced substantial delays in identifying and starting projects, which they have attempted to eliminate using a scoping process. Although delays still exist, Northeastern staff indicate that the extent of the delays have been reduced substantially.

Reach

Northeastern's goal is to conduct at least 15 projects over 3 years, with 13 projects in Boston and 2 in other locations.[12] As previously noted, 4 projects have been completed, 5 discontinued, and 4 put on hold. Reasons reported in progress reports include staff who want to focus on more productive projects, logistical issues, leadership changes, and pending finalization of legal documents. Northeastern staff members noted that the scoping process has helped initial project selection and ensured that appropriate projects are selected.

Dose

The assistance Northeastern provides to health systems involves ongoing collaboration with health system staff. The optimal dose, particularly during the scoping process, is fairly intense in the extent of interaction between Northeastern staff and staff at the health system. Northeastern can pique the interest of health systems via presentations, seminars, and word of mouth, but the scoping process is more intensive and typically involves several

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[12] Operational plan.

conversations over time, with health systems working with Northeastern to complete a scoping document that includes determining estimated impacts and expected measures. ***Table 7*** provides summary information on dose for each stage of the process. We will update data in ***Table 7*** as they become available.

Table 7. Contacts with Health Systems

Service Provided to Health Systems	Type of Contact
Outreach	A single presentation or seminar, or word of mouth
Scoping	Several dedicated conversations over the course of a month (varies by project and health system)
Project implementation	Staff (typically undergraduate coop students) on site throughout the week, weekly project status meetings (varies by project and health system; for some projects students remain at Northeastern for the most part)
Project wrap-up, evaluation of replicability	TBD

Source: Site visit, May, 2014.
TBD = to be determined.

1.3 Evaluation Outcomes

Awardees have two possible types of quantitative data that RTI will use in assessing the impact of the awardee's innovation on key outcomes. These include claims data for Medicare and/or Medicaid beneficiaries, depending on who the awardee serves, and administrative or utilization data the awardee is collecting (which we have categorized as 'other awardee specific data' reflecting the variability of the types of data elements available across awardees). We are in the process of finalizing our assessment of all the available data sources and requesting data directly from each awardee. As those data are received, we will incorporate the findings into our quarterly/annual reports. The following sections present descriptive findings from the quantitative outcome data provided to and cleaned by RTI as of September 11, 2014.

1.3.1 Measures for Evaluation

Following the site visit, the data management and site visit teams met to review each of the measures listed in the awardee's self-monitoring measurement plan. As noted earlier in the report, Northeastern has a unique innovation in that they execute multiple projects at various health systems and no two projects are identical. Thus, we have a two-tier evaluation of Northeastern's innovation:

- Component 1: Regional Extension Center Model
- Component 2: Process Improvement Projects

Descriptions of the components are available in Section 1.1 of this report. The measures listed in ***Tables 8*** and ***9*** are extracted from Northeastern's self-monitoring plan and reflect the measures determined as most relevant for our evaluation of both components of Northeastern's innovation. Measures to request at the regional extension center model level may not be available for all projects. As we continue to have conversations with the Northeastern team, we will determine the projects for which these measures are available. For the process improvement project level, our analysis at this time will focus on the completed projects. We plan to have conversations with the internal Northeastern team to understand the data sources better.

Table 8. Outcome Measures to Request from Northeastern University (Regional Extension Center Model Level)

Key Evaluation Domain	Subdomains	Measure	Data Source
Health indicators	Reduced adverse events	Total reduced averse events across projects	Internal records
	Diabetes management	Percentage of diabetic patients with A1c level within age-based appropriate ranges	Internal records, claims data
Health care outcomes	Utilization	Total avoided utilization of	Internal records
		All-cause 30-day admissions	Claims data
		Readmissions	Claims data
		ED visit rate	Claims data
	Cost	Total cost savings	Internal records
		Total cost of external referrals	Internal records
		Percent patients admitted into highest cost hospitals	Internal data
		Total monthly readmission costs	Internal records
		Total cost of care	Claims data

ED = emergency department.

Table 9 Outcome Measures to Request from Northeastern University Health System Partners for Completed Process Improvement Projects

Health System	Project Name	Key Evaluation Domain	Subdomains	Measure	Data Source
Cambridge Health Alliance	Resident Team Scheduling – Primary Care Continuity	Health care outcomes	Utilization	Prevention compliance rate (mammogram)	CHA site-wide ambulatory care goals report
				Prevention compliance rate (colorectal)	site-wide ambulatory care goals report
				Prevention compliance rate (pap smears)	CHA site-wide ambulatory care goals report
				Wellness compliance rate (well-child visits, 3-6 years)	CHA site-wide ambulatory care goals report
Hallmark Health	Breast Cancer Patient Access	Health care outcomes	Utilization	The number of business days between booking an appointment and the calendar date of that appointment	Meditech scheduling system data extract
Harvard Vanguard Medical Associates (HVMA)	Obstetrics Optimal Hospital Admissions for Deliveries	Health care outcomes	Cost	Total monthly cost incurred by HVMA for all deliveries in all hospitals	Atrius Health integrated claims and EMR enterprise data warehouse
				Percentage of deliveries in highest cost hospitals	Atrius Health integrated claims and EMR enterprise data warehouse

(continued)

Table 9. Outcome Measures to Request from Northeastern University Health System Partners for Completed Process Improvement Projects (continued)

Health System	Project Name	Key Evaluation Domain	Subdomains	Measure	Data Source
Northeastern-Lahey Health System	CHF Post-Discharge Scheduling	Health care outcomes	Utilization	Average days until CHF follow up	Appointment data
				Avoided 30-day readmissions	Appointment data and readmissions data
				Patient access to cardio by third next available appointment	Lahey Data
			Cost	Avoided readmission costs	Readmissions data

CHF = congestive heart failure.

1.3.2 Claims Data

As part of a broad assessment of health care innovations, the Center for Medicare & Medicaid Innovation (CMMI) is assessing the impact of its programs, including those funded specifically by HCIA, on four core measures. The four core measures are

- health care spending per patient;
- hospital inpatient admissions;
- hospital unplanned readmissions; and
- emergency department (ED) visits.

Collectively, it is anticipated that CMMI programs will slow the increase in health care spending, reduce hospital admissions, reduce avoidable hospital readmissions, and prevent unnecessary ED visits. We are reporting these measures for all HCIA Community Resource awardees so that the collective impact of the awards can be assessed. As discussed below, some awardees' innovations may not be focused on these measures. Other awardees' innovations target specific conditions (e.g., imaging, diabetes, etc.) and may have significant impacts on spending, admissions, readmissions, and ED visits for the targeted conditions but not have a statistically detectable impact on the measures at the aggregate level because the targeted conditions represent only a small fraction of total spending, inpatient admissions, and ED visits.

The measures are calculated through analysis of Medicare and Medicaid fee-for-service claims. Because of differences between Medicare and Medicaid patients in age, other demographic variables, and disease status, we report the Medicare and Medicaid results separately below. Currently, complete Medicare claims are available through the end of 2013. Medicaid claims for Northeastern are available through the Q3 2011. The Northeastern innovation was launched on September 19, 2012 and began enrolling patients in November 2012.

- **Health Care Spending per Patient**. For Medicare beneficiaries, health care spending per patient includes Part A and Part B Medicare expenditures for persons enrolled in the Part A and Part B fee-for-service program. The variable focuses on Medicare fee-for-service spending, so Medicare managed care (Part C) services are excluded, as are beneficiary copayments. Medicare Part D prescription spending is also excluded. Spending is reported on a per-person per-quarter basis. If a beneficiary is not enrolled for every month in a quarter, spending (except for hospital inpatient spending) is prorated quarterly based on the number of days enrolled during the quarter. Because hospital inpatient admissions are both rare and expensive, spending is not prorated for hospital inpatient spending. Prorating is also not performed for beneficiaries who die during a quarter.

  For Medicaid beneficiaries, health care spending per patient is reported for fee-for-service beneficiaries. Beneficiaries are only included in the analysis for spending (and the other measures) during periods when they are enrolled in Medicaid.

- **Hospital Inpatient Admissions**. This variable measures hospitalization, the single most expensive component of health care spending. Patients kept overnight in observation beds are excluded from this measure. Inclusion criteria for the analysis are the same as for spending. Hospital inpatient admissions are not prorated based on the number of days eligible during the quarter. All-cause inpatient admissions are reported. The mean quarterly admission rate per 1,000 patients is reported.

- **Hospital Readmissions**. Hospital readmission rates serve a dual purpose in evaluating HCIA impacts. Readmissions add to the costs of a prior hospitalization, and they often reflect a problem in the care provided during the first admission. All-cause readmissions are defined as a follow-up admission to any short-term acute general or long-term care hospital within 30 days of a discharge from another hospital of the same type. We ignore multiple admissions within 1 day of an initial admission because these often represent transfers between hospitals. We define index hospitalizations that begin during the quarter and follow each index admission for 30 days, even when the follow-up period extends beyond the end of the quarter. Inclusion criteria for the analysis are the same as for spending. The readmission rate equals the number of readmissions divided by the number of index hospitalizations during the quarter. Planned readmissions are excluded from the calculation of the numerator. Quarterly mean readmission and ACSC readmission rates per 1,000 admissions are reported.

- **ED Visits**. ED visits are sometimes viewed as a symptom of the inability of the community's health care system to provide adequate preventive and ambulatory care visits. We report an all-cause ED visit rate that excludes ED visits resulting in an inpatient admission (which presumably represent unavoidable visits) and includes overnight ED visits without an inpatient admission. Inclusion criteria for the analysis are the same as for spending, and ED visits are also subject to the same prorating formula as for spending. The mean quarterly ED visit rate per 1,000 patients is reported.

Medicare Claims Analysis

The analysis focuses on 277 Medicare beneficiaries enrolled in the Northeastern-Lahey Health System innovation through March 2014 who were enrolled in fee-for-service Medicare Part A and B at some point during or after the launch quarter. The analysis uses data from the CMS Chronic Conditions Warehouse (CCW). We present the measures for these beneficiaries in the quarters before and after the innovation was launched on September 19, 2012. We do not yet have data from other Northeastern projects.

Table 10 reports Medicare spending per patient in the 8 quarters before and the 6 quarters during and after the launch date.

Table 10. Medicare Spending per Patient: Northeastern-Lahey Health System

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year					
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**	**I5**	**I6**
Intervention Group															
1C1CMS331050	Northeastern-Lahey Health System Congestive Heart Failure Project														
	Spending rate	$3,132	$4,410	$4,566	$4,954	$4,438	$4,436	$4,263	$6,500	$6,965	$7,532	$12,033	$15,158	$15,665	$15,077
	Std dev	$6,069	$9,621	$10,519	$10,480	$9,366	$9,458	$7,944	$13,427	$19,434	$14,971	$19,835	$23,120	$22,758	$20,520
	Unique patients	229	229	255	255	259	260	264	266	269	271	275	276	277	277
Comparison Group															
1C1CMS331050	Northeastern-Lahey Health System														
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—	—	—

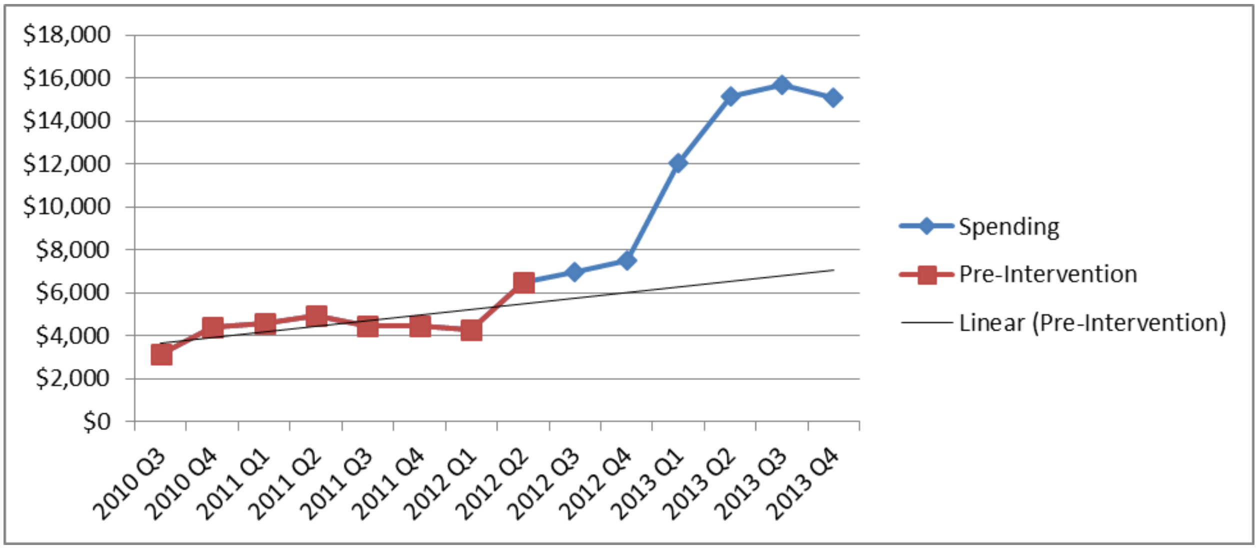
Savings per Patient

Baseline Quarters								First Intervention Year					
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**	**I5**	**I6**
—	—	—	—	—	—	—	—	—	—	—	—		

Source: Medicare fee-for-service claims.
Notes:
Spending rate: total quarter quarterized payments/n. of unique patients.
Savings per patient: Difference in comparison minus intervention average spending rates.
Northeastern-Lahey Health System began enrolling patients on 9/19/2012. I1 is 2012 Q3.
— Data not yet available.

Figure 2 plots spending as a function of time. The red line represents values in quarters prior to the innovation's launch date on September 19, 2012, and the blue line represents quarters during and after launch. The graph includes a trend line based on a linear regression of prelaunch values.

Figure 2. Medicare Spending per Patient: Northeastern-Lahey Health System



These results are only for Medicare patients enrolled in the innovation at Northwestern-Lahey Health System. Spending increases relative to the trend line in the quarters after innovation launch. This increase almost certainly occurs because this innovation targets CHF patients posthospitalization. Therefore, the innovation is targeting and enrolling higher cost patients who have definitely had a hospitalization in the enrollment quarter, but may not have had a hospitalization in earlier periods. In addition, the sample population is aging and we analyze the same individuals before and after the innovation was launched. Therefore, based solely on before and after launch data on patients who received the innovation, we cannot say whether these patients had higher spending than would have occurred in the absence of the innovation. Later in this report, we will discuss construction of a comparison group for the Northwestern-Lahey Health System innovation.

The all-cause inpatient admissions rate per 1,000 participants is shown in ***Table 11*** and ***Figure 3***.

Table 11. All-cause Inpatient Admissions Rate per 1,000 Enrollees: Northeastern-Lahey Health System

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

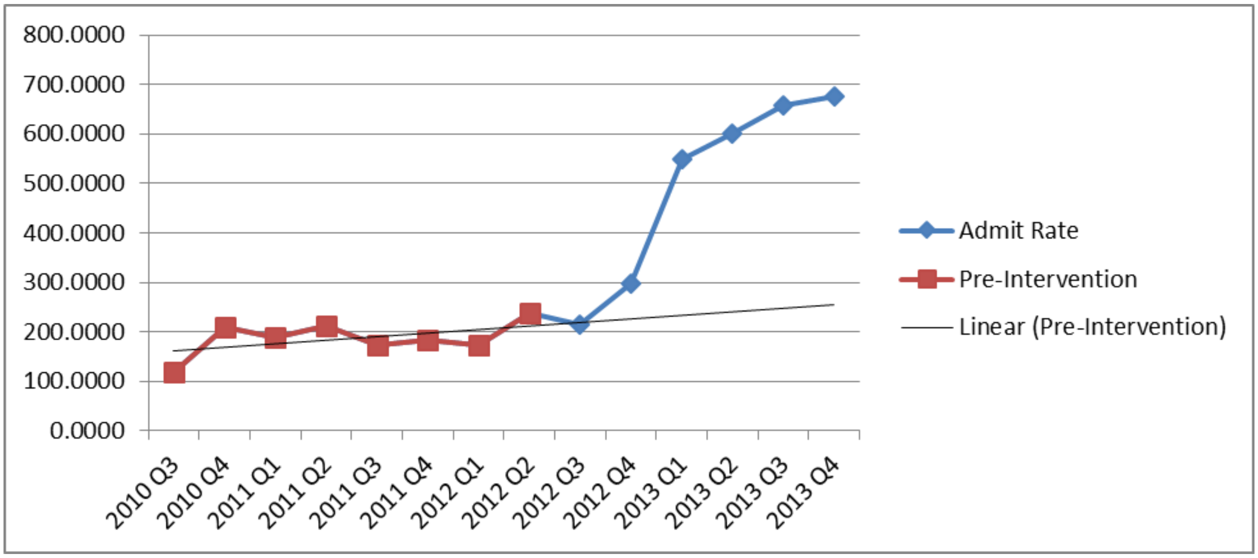
Awardee Number	Description	Baseline Quarters								First Intervention Year					
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4	I5	I6
Intervention Group															
1C1CMS331050	Northeastern-Lahey Health System Congestive Heart Failure Project														
	Admit rate	118	210	188	212	174	185	174	237	216	299	549	601	657	675
	Std dev	407	562	513	629	547	531	538	577	538	757	948	891	898	983
	N. of patients	27	229	255	255	259	260	264	266	269	271	275	276	277	277
Comparison Group															
1C1CMS331050	Northeastern-Lahey Health System														
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year					
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4	I5	I6
—	—	—	—	—	—	—	—	—	—	—	—		

Source: Medicare fee-for-service claims.
Notes:
Admit rate: total unquarterized admissions /unique patients.
Northeastern-Lahey Health System began enrolling patients on 9/19/2012. I1 is 2012 Q3.
— Data not yet available.

Figure 3. All-cause Inpatient Admissions Rate per 1,000 Enrollees: Northeastern-Lahey Health System



These results are only for Medicare patients enrolled in the innovation at Northeastern-Lahey Health System. Hospital admissions increase relative to the trend line in the quarters post innovation launch. As with spending, this increase almost certainly occurs because Northeastern-Lahey Health System's innovation targets CHF patients post hospitalization. Therefore, the innovation is targeting and enrolling higher cost patients who have definitely had a hospitalization in the enrollment quarter, but may not have had a hospitalization in earlier periods. Without statistical testing and a better-defined comparison group, it is premature to conclude that the innovation caused the increase; we will examine this question as the evaluation continues.

Hospital readmission rates per 1,000 admissions are shown in ***Table 12*** and ***Figure 4***.

Table 12. Hospital Readmission Rates per 1,000 Admissions: Northeastern-Lahey Health System

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

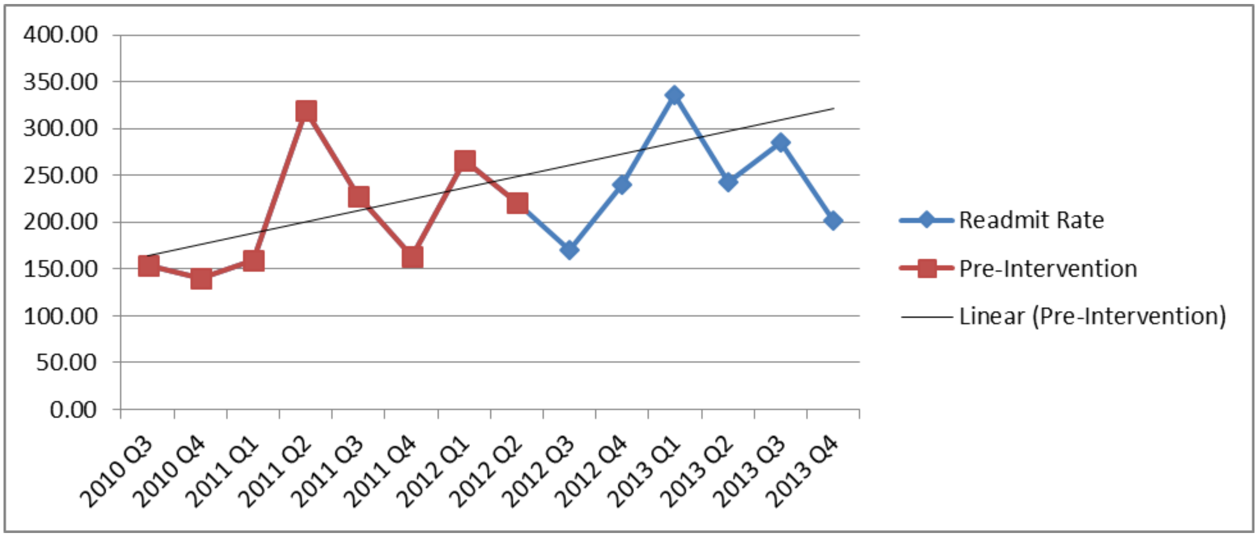
Awardee Number	Description	Baseline Quarters								First Intervention Year					
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**	**I5**	**I6**
Intervention Group															
1C1CMS331050	Northeastern-Lahey Health System Congestive Heart Failure Project														
	Readmit rate	154	140	159	320	227	163	267	220	170	240	336	243	285	201
	Std dev	361	347	366	467	419	369	442	415	376	427	472	429	451	401
	Total admissions	26	43	44	50	44	43	45	59	53	75	137	140	165	164
Comparison Group															
1C1CMS331050	Northeastern-Lahey Health System														
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Total admissions	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year					
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**	**I5**	**I6**
—	—	—	—	—	—	—	—	—	—	—	—	—	—

Source: Medicare fee-for service claims.
Notes:
Readmit rate: Sum all readmits to eligible hospital w/i 30 days/all admissions in quarter.
Total admissions: All eligible admissions in quarter.
Northeastern-Lahey Health System began enrolling patients on 9/19/2012. I1 is 2012 Q3.
— Data not yet available.

Figure 4. Hospital Readmission Rates per 1,000 Admissions: Northeastern-Lahey Health System



These results are only for Medicare patients enrolled in the innovation at Northeastern-Lahey Health System. The hospital readmission rate was extremely variable prior to innovation launch. Since innovation launch, the readmission rate has continued to fluctuate. Readmission rates dropped below the expected trend line in 5 of the 6 quarters postlaunch. Without statistical testing and a better-defined comparison group, however, it is premature to conclude that the innovation has caused a decrease in hospital readmission rates for quarter five; we will examine this question as the evaluation continues.

ED visits per 1,000 participants are shown in ***Table 13*** and ***Figure 5***.

Table 13. ED Visits per 1,000 Participants: Northeastern-Lahey Health System

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

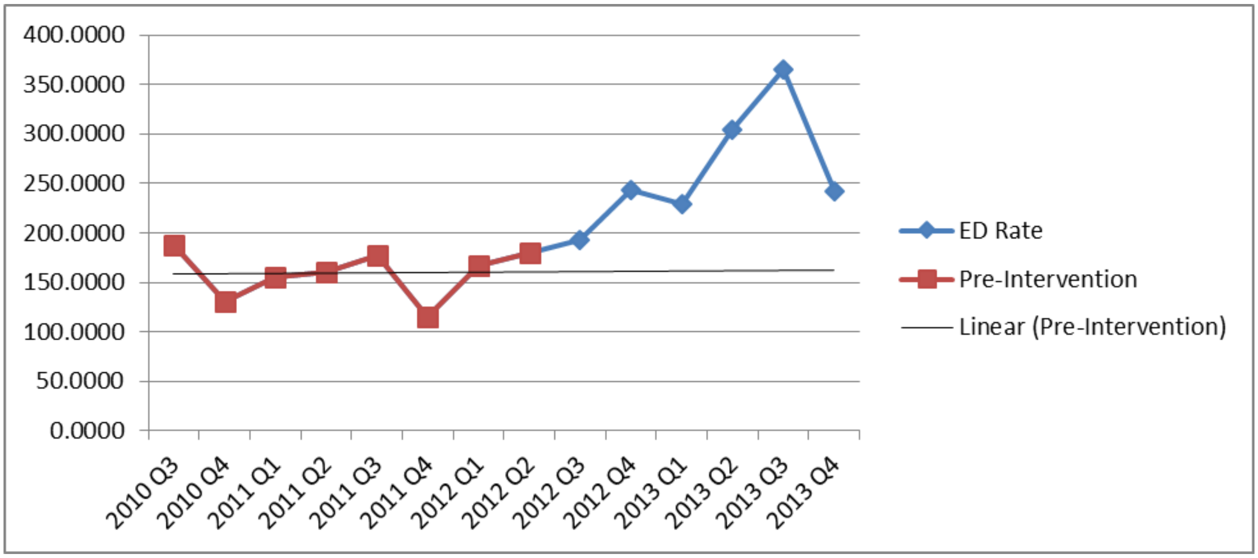
		Baseline Quarters								First Intervention Year					
Awardee Number	**Description**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**	**I5**	**I6**
Intervention Group															
1C1CMS331050	Northeastern-Lahey Health System Congestive Heart Failure Project														
	ED rate	188	131	156	161	178	115	167	180	193	244	229	304	365	242
	Std dev	640	532	762	523	609	262	919	354	564	576	760	360	969	572
	N. of patients	229	229	255	255	259	260	264	266	269	271	275	276	277	277
Comparison Group															
1C1CMS331050	Northeastern-Lahey Health System														
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year					
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**	**I5**	**I6**
—	—	—	—	—	—	—	—	—	—	—	—	—	—

Source: Medicare fee-for service claims.
Notes:
ED rate: total quarterized ED visits & observation stays /unique patients.
Northeastern-Lahey Health System began enrolling patients on 9/19/2012. I1 is 2012 Q3.
— Data not yet available.

Figure 5. ED Visits per 1,000 Participants: Northeastern-Lahey Health System



These results are only for Medicare patients enrolled in the innovation at Northeastern-Lahey Health System. Although some fluctuation occurs in the trend line before the innovation launch, the ED visit rate increases relative to the trend line in the first 6 quarters after innovation launch. This finding is consistent with the patients being sicker postlaunch (when they were hospitalized with CHF) and does not necessarily imply that the innovation caused ED visits to increase. Without a better-defined comparison group, it is premature to conclude that the innovation caused the increase; we will examine this question as the evaluation continues.

Medicaid Claims Analysis

The Medicaid data analysis will use data from the CMS Alpha-MAX data files. Currently, Medicaid claims for Northeastern are only available in Alpha-MAX through Q3 2011. Because the Northeastern innovation was launched on September 19, 2012 and claims for that quarter are not available, we are not presenting measures for Medicaid patients in this report. We will provide Medicaid analyses in subsequent reports as more data become available. We will report tables and figures similar to those for Medicare.

Discussion of Claims Analysis

The four measures provide descriptive data on patients enrolled in one of Northeastern's innovations before, during, and after the launch of the innovation. Although it is necessary to report these measures to support CMS's broader assessment of its full portfolio of innovation projects, the measures may not provide a complete evaluation picture of Northeastern's innovation portfolio for a number of reasons. First, the innovation was only launched on September 19, 2012 and includes multiple health systems each implementing their own innovation, some of which are focused on a specific disease, such as primary care, breast cancer, CHF, and obstetrics. Although the innovation may have a statistically significant impact on the spending, inpatient admissions, readmissions, or ED visits related to these conditions, it may not have a statistically detectable impact on the variables at the total cost or utilization level, because each condition individually only accounts for a small share of total spending or utilization. In later reports, we will also provide condition-specific cost and utilization data.

Currently we only have data for Northeastern-Lahey Health System. As with Northeastern more generally, the utilization measures discussed above may not provide a complete evaluation picture of Lahey's innovation for a number of reasons. First, Northeastern-Lahey Health System is targeting CHF patients postdischarge. Therefore, they are targeting and enrolling higher cost patients at the posthospitalization point. The simple trend lines provided in the figures represent trends for Lahey's patients before launch of the innovation. They do not control for the CHF hospitalization that coincides with the innovation launch. As described below, we are developing additional comparison groups for Lahey. Additionally, each of the four measures has a high standard deviation, suggesting that it may be difficult to statistically distinguish between innovation effects and random fluctuation. Finally, this analysis only included 277 Medicare patients.

Development of Comparison Groups

Given that Northeastern's innovation is a compilation of several different projects, we will construct separate comparison groups for each project. Even though we will attempt to evaluate as many of the projects at Northeastern as is feasible, at this time, we have prioritized the evaluation of completed projects at: Cambridge Health Alliance, Hallmark Health, Harvard Vanguard Medical Associates, and Northeastern-Lahey Health System. We will focus the first set of comparison groups on similar patients before and after each respective innovation is adopted. For Lahey, for example, we will compare CHF patients hospitalized before innovation launch to CHF patients hospitalized after innovation launch. This is important because this comparison will help isolate the impact of each innovation on outcomes among each group of patients and control for differences among participating patients for each innovation. We will choose patients with similar characteristics. For the Lahey innovation, for example, we will look at CHF patients hospitalized before the innovation was launched. For other Northeastern innovations, we will use propensity score matching to identify a comparison group of pre-innovation patients with similar characteristics as post-innovation patients. These characteristics may include chronic conditions, age, gender, race, and payer type. Results for the comparison group will be included in later reports.

1.3.3 Other Awardee-Specific Data

Overview of Data Request

In late June 2014, RTI reached out to the Northeastern staff to schedule a meeting to discuss obtaining other awardee-specific data (i.e., raw patient-level nonclaims data) to help us evaluate the innovation. Northeastern indicated that providing patient-level awardee-specific data would be a challenge because they receive de-identified, aggregate-level data from the health system partners. We will eventually include all of projects amenable to evaluation in our evaluation. However, at this time, we have prioritized the evaluation of completed projects at the following health systems: Cambridge Health Alliance, Hallmark Health, Harvard Vanguard Medical Associates, and Lahey Health System. Given that Northeastern's innovation is a compilation of several different projects, RTI is in the process of having conversations with Northeastern staff to understand the aims and details of each of the completed projects. Based on what we learn from these discussions, we will be able to modify the list of measures in Tables 8, 9a, and 9b. We will continue to check in with Northeastern and provide CMS with regular updates on the status.

Health Outcomes

Once we receive the data requested from Northeastern, we will have a better understanding of what type of results we will provide. The following table shells reflect examples of findings we anticipate presenting.

Table 14. Health and Health Care Outcomes over Time (Regional Extension Center Model Level)

Measure	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Health Indicators							
Total reduced averse events of	—	—	—	—	—	—	—
Percentage of patients with diabetes who had hemoglobin A1c > 9.0 %	—	—	—	—	—	—	—
Health Care Outcomes							
Total avoided utilization	—	—	—	—	—	—	—
Total cost savings	—	—	—	—	—	—	—
Total cost of external referrals	—	—	—	—	—	—	—
Percentage of patients admitted into highest cost hospitals	—	—	—	—	—	—	—
Total monthly readmission costs	—	—	—	—	—	—	—

Source: Patient-level data to be provided by Northeastern University.
— Data not yet available.

Table 15. Health Care Outcomes over Time (Process Improvement Project Level)

Health System	Project Name	Measure	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Cambridge Health Alliance	Resident Team Scheduling – Primary Care Continuity	Prevention compliance rate (mammogram)	—	—	—	—	—	—	—
		Prevention compliance rate (colorectal)	—	—	—	—	—	—	—
		Prevention compliance rate (pap smears)	—	—	—	—	—	—	—
		Wellness compliance rate (well-child visits, 3-6 years)	—	—	—	—	—	—	—
Hallmark Health	Breast Cancer Patient Access	The number of business days between booking an appointment and the calendar date of that appointment	—	—	—	—	—	—	—
Harvard Vanguard Medical Associates (HVMA)	Obstetrics Optimal Hospital Admissions for Deliveries	Total monthly cost incurred by HVMA for all deliveries in all hospitals	—	—	—	—	—	—	—
		Percentage of deliveries in highest cost hospitals	—	—	—	—	—	—	—
Lahey Health System	CHF Post-Discharge Scheduling	Average days until CHF follow-up	—	—	—	—	—	—	—
		Avoided 30-day readmissions	—	—	—	—	—	—	—
		Patient access to cardio by third next available appointment	—	—	—	—	—	—	—
		Avoided readmission costs	—	—	—	—	—	—	—

Source: Patient-level data to be provided by projects at health systems.
— Data not yet available.

Discussion of Other Awardee-specific Findings

Once we receive raw patient-level nonclaims data from Northeastern's health system partners, we will review, clean, merge, and begin conducting descriptive analyses to fill in the table shells above. At that point, we will be in a better position to discuss findings related to the other awardee-specific data.

1.4 Overall Program Effectiveness to Date

Northeastern University aims to complete at least 15 projects, mostly in the Boston area, but also in Seattle and Charlotte. They have completed 4 projects at 4 health systems, which means they will have to complete another 11 in the last year of the innovation in order to meet their goal. An additional 10 projects are currently under way and 4 more projects are on hold. Given these numbers, it appears likely that Northeastern will meet their goal of completing 15 projects during the course of the HCIA, unless unforeseen circumstances result in cancellation of existing projects or delay in implementation of new projects.

Northeastern's innovation has stayed true to the original plan except for several changes that were made to deal with specific barriers that were encountered. In particular, Northeastern experienced delays in project selection early in the award timeline. To address this and to ensure that they select projects that are suitable to the goals of the HCIA, Northeastern developed a formalized scoping process based on lessons learned to structure selection of appropriate projects for the HCIA. Additionally, they have set an informal deadline of 1 month within which to complete this scoping process. Although this 1-month deadline has been difficult to reach, overall the addition of the scoping process has been useful to Northeastern in clearly delineating factors important in project selection and setting expectations with each health system.

To ensure consistency from the health system perspective, considering the rotational nature of the cooperative education program, and to provide advisory support to students on the project, Northeastern has developed a formalized staffing model for each project that includes a staff member who serves as health system lead. From anecdotal conversations with health systems, this staffing model appears to be successful. In particular, representatives from health systems noted the skill of undergraduate cooperative education students. Considering that building the skills of these students in the area of health systems engineering is a key aim of Northeastern's innovation, the positive feedback about students points toward success of this innovation in the area of workforce development.

Overall, information available to date indicates that Northeastern's innovation has maintained integrity to the original plan and is on track to reach the desired number of health systems, despite challenges in identifying projects suitable for this award. Additionally, evidence collected to date also suggests that Northeastern has been and continues to be successful in the area of workforce development by training and placing skilled undergraduate cooperative education students at health systems. Evidence gathered to date also suggests that the sustainability of projects may vary based on the project and health systems, and this will need to be closely examined as projects wrap up to determine if innovations are maintained. Representatives from health systems to whom we spoke have indicated satisfaction with the projects and staffing model and noted that the projects have had positive impact in their areas of focus. As we receive additional data, we will be able to shed additional light on the impact of projects at health systems and on various outcomes of interest.

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October 2014

Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring

Annual and Site Visit Report
Prosser Public Hospital District

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OVERALL EVALUATION SUMMARY

RTI International was selected to lead an independent evaluation of the 24 Health Care Innovation Award (HCIA) awardees categorized as Community Resource Planning, Prevention, and Monitoring (Community Resource). In this role, RTI is conducting an in-depth evaluation of each innovation, as well as a cross-site evaluation that includes similar innovations targeting the same priority outcomes (e.g., emergency department [ED] visits). For each of the 24 awardees, this report presents findings from the first year of the evaluation (beginning September 23, 2013, and including data obtained by RTI as of September 11, 2014). The report is based on multiple data sources, including operational reports, self-monitoring plans, site visits, and quantitative data analysis.

The evaluation methods vary by awardee innovation, based on the type of innovation and availability of data. RTI has reviewed and coded all existing documents from the awardees through December 31, 2013, and incorporated that knowledge into each awardee's overview. Our review included the awardees' original applications for funding, original and current operational and self-monitoring plans, and quarterly narrative and monitoring reports. For this annual report, we incorporated activities reported through the awardee's seventh quarterly report (i.e., through March 31, 2014).

Between April and August 2014, teams of at least two staff from the RTI team visited all 24 awardees for 2 to 4 days, depending on the number of interviews conducted. Teams included a subject matter expert, with training and experience specific to the awardee's innovation, and a master's- or bachelor's-level colleague to take notes. Before each visit, the teams reviewed all available documentation from the awardee to learn about the innovation's goals, objectives, and status. The purpose of the site visits was to clarify our understanding of the innovation, obtain detailed information on the implementation process, and review awardee-specific data to determine which elements to incorporate into the evaluation. By August 13, 2014, all 24 awardees had been visited and a thorough description of our findings included in each of the 24 awardee sections.

In addition to the site visits, we report quantitative data from two possible sources for several awardees. First, we present findings from claims analysis for awardees in this report if they both provided us with patient identifiers and reported enrolling participants who are Medicare and/or Medicaid beneficiaries. RTI has obtained patient identifiers from most of the 24 awardees to conduct claims analysis. Second, we present data RTI obtained directly from awardees to quantify their work in addressing health care costs, quality, and patient outcomes. Data from additional awardees will be analyzed and presented in future reports, as data become available and awardees enroll sufficient participants. An update on the availability of Medicare/Medicaid claims and other awardee-specific data, analysis of data available to us and cleaned as of September 11, 2014, a summary of the comparison groups, and a list of draft evaluation measures are included in each awardee section.

1. HCIA COMMUNITY RESOURCE AWARDEE: PROSSER PUBLIC HOSPITAL DISTRICT

1.1 Introduction

Prosser Public Hospital District, a critical access hospital in Prosser, Washington, received an award of $1,470,017. The innovation, which began enrolling participants on January 1, 2013, seeks to achieve the following goals:

1. **Improve care** by increasing the number of patients who attend follow-up appointments and fill prescriptions according to discharge instructions.
2. **Lower costs** by reducing unexpected encounters and average annual health care charges for patients with a history of frequent use of emergency medical services.
3. **Improve health** by reducing the number of unexpected encounters due to complications after surgical procedures.

As part of the in-depth case study that RTI is conducting for this innovation, two RTI team members conducted a site visit June 17–18, 2014; before and after the visit, our team reviewed all documentation on the innovation. We are working to obtain data directly from the awardee to assess many of the variables we discuss. This report describes findings from RTI's site visit, document reviews, follow-up telephone calls, and analysis of data obtained and cleaned by September 11, 2014. We start by describing the innovation's components and target population.

1.1.1 Innovation Components

The innovation includes a community paramedic (CP) component in which trained CPs provide preventive and ongoing care by delivering home health services to targeted patients. In this relatively simple innovation, patients are identified for the program if they were previously identified as high utilizers of ED services and present for an ED visit or undergo surgery, readmission, or if a health care provider thinks they could benefit from the program due to chronic illnesses. Patients are recruited by being given a referral for a CP visit. At that point, patients can refuse services or schedule a CP appointment. Participants each receive a single visit from a CP after an ED visit, surgery, or referral; visits are completed within 48 hours of discharge from the hospital or provider appointment. During this visit, CPs tailor services to each participant's health condition (e.g., postsurgery visits include wound checks). At every visit, CPs reconcile medications, check that patients obtain prescriptions and make necessary follow-up appointments with their primary care provider (PCP), help patients understand and follow the discharge instructions, and evaluate the home environment. Prosser developed condition-specific protocols for CP visits. CPs document appointments in a CP program e-form that is part of Prosser's electronic medical record (EMR); CPs also send a letter to each patient's PCP to describe the follow-up care provided. A registered nurse (RN) manager reviews charts and follow-up letters to ensure fidelity of the program. As of June 2014, Prosser had two partners: Sue Jetter Consulting, the local evaluator, and Yakima Valley Community College, the training partner ***(Table 1).***

Table 1. HCIA Partners, Role, and Location

Partner Name	Role in HCIA Project	Location
Yakima Valley Community College	Training	Yakima, WA
Sue Jetter Consulting Services	Evaluation and project management/ administration	Sunnyside, WA

Source: June 2014 site visit.
Note: Heritage University is listed as a partner of Prosser in the Lewin data, but is not currently working on this innovation.
HCIA = Health Care Innovation Award.

Component 1: CPs

Prosser based its CP program on an Eagle County, Colorado, program model, which is a nationally recognized, evidence-based model that has been implemented in a similar rural county since 2009. To develop the Prosser CP program, the Prosser medical director developed protocols for each type of CP appointment, depending on the reason for referral. Every patient who is discharged from the ED or from surgery at Prosser will be “enrolled” to receive a CP visit (although patients can refuse services). Health care providers can also refer high-risk patients they believe will benefit. We learned at the site visit that the referral process is not systematic; some providers refer more patients to the program than others.

Prosser is following three cohorts of patients. Cohort 1 patients were identified before Prosser began the program; the cohort originally included 121 patients with a history of overuse of the ED (i.e., more than five ED visits to the Prosser Memorial Hospital [PMH] Medical Center from January 2011 to June 2012).[1] Cohort 1 patients are recruited like anyone else: if they present to the ED, have surgery, or are referred by a provider. Cohort 1 differs from the other cohorts in that these patients were identified before the start of the innovation. These already identified patients are “flagged” for a referral in the EMR if they present to the ED. Cohort 2 patients consist of all patients who undergo surgery at Prosser and receive a CP visit. Prosser originally planned to provide CP visits only following abdominal surgery based on readmission data prior to the innovation that they obtained on abdominal surgery patients from January 2011–2012; after launching the innovation, they found few patients had abdominal surgery, so they decided to include all types of surgery. Cohort 3 includes patients who receive a CP visit after they present to the ED (but are not part of Cohort 1) and patients referred for a CP visit by a provider.

Patients from all cohorts receive the same CP services. Every patient should receive a single follow-up visit from a CP within 72 hours of being discharged. Follow-up appointments are

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[1] Prosser site visit in mid-June 2014.

typically 30 to 45 minutes, but can last up to 1 hour. CP services include checking for infections (especially for postsurgical patients), ensuring patients fill prescriptions and understand how to take them, reviewing follow-up care instructions, evaluating the home environment,[2] referring patients for other services (e.g., transportation) or to a PCP (if they do not have one), providing disease education and health behavior counseling, and gathering lab specimens (e.g., blood or urine collection). CPs are often accompanied by interpreters for Spanish-speaking patients.

While each CP appointment is designed to address a specific patient's needs, each visit also includes similar components. To help illustrate what happens at a CP visit, we present the following example of a typical CP appointment. A CP appointment was scheduled for a man who had been taken to the ED and stayed in the hospital for 2 days because of a severe asthma attack. The appointment dialogue was translated into Spanish for the patient, a migrant farmworker who lived on a farm about 45 minutes from Prosser. During the appointment, the CP, with an interpreter, reviewed the patient's hospital discharge instructions, discussed his prescriptions, measured his vital signs (blood pressure, heart rate, temperature), listened to his lungs, talked with him about his recovery, and provided education about asthma and self-care. During the visit, the CP discovered that the patient had not picked up his prescribed antibiotics from the pharmacy and that his lungs were extremely dry. The CP counseled the patient to be sure to pick up his prescription and take it correctly, and to drink plenty of water to help lubricate his lungs.

CP Role and Functions

Prosser currently employs six CPs, including one part-time staff member. All CPs complete a 2-year paramedic program beyond emergency medical technician (EMT) training and complete and pass CP training; they must be certified via the CP program. CPs have skills beyond typical paramedics. They have received formal training to provide health education to patients, most often relating to improving health behaviors and adhering to prescription and discharge instructions. Because they visit patients in their homes, CPs often identify other factors that contribute to well-being, such as the home environment or family issues. CPs use a community referral guide to refer patients to nonmedical services, such as transportation or food assistance. The Prosser CPs fulfill the functions listed in ***Table 2***.

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[2] CPs evaluate the home environment to ensure that the home is safe for patients recovering from an ED visit or surgery. During one evaluation, for example, the CP found mold that was potentially exacerbating a patient's asthma.

Table 2. HCIA Care Coordinator Functions and Training

Characteristic Type	Prosser CP Role
Title	Community paramedic (CP)
Minimum qualifications	2-year paramedic program CP certification
Functions	Health education (individual) Informal counseling Patient monitoring and follow-up Service coordination Community linkages
Established continuing education program	None

Source: June 2014 site visit.
CP = community paramedic; HCIA = Health Care Innovation Award.

1.1.2 Program Participant Characteristics

The service area for Prosser's innovation includes approximately 40,000 rural residents in south-central Washington State. The target population includes adults with a history of frequent ambulance calls, ED visits, readmissions, or observations within the Prosser system and adults with chronic illnesses. To evaluate the innovation's impact, Prosser is looking at the outcomes of all patients who receive a CP visit, divided into three cohorts. Cohort 1 was a predetermined list of 121 patients with a history of overuse of the ED. Some of the original 121 patients have presented to the ED and some have not. Prosser does not reach out to patients in Cohort 1 who have not come back to the ED and only provides CP services if a Cohort 1 patient presents to the ED. As of June 2014, 76 unique patients were referred for a CP visit from Cohort 1. As discussed below, 49 of these 76 patients actually received a CP visit.

Cohorts 2 and 3 were not predetermined; they include patients who have received a CP visit. Originally, Prosser planned that Cohort 2 would include patients who have undergone open abdominal procedures, and Cohort 3 would include patients with a specific chronic illness (who are not necessarily heavy emergency medical services users, but risk becoming so), such as chronic obstructive pulmonary disease and diabetes. Prosser intended to use data from all cohorts to measure the impact of goals 1 and 2 and data from Cohort 2 to measure the impact of goal 3. We learned at our site visit in mid-June 2014 that the definitions of Cohorts 2 and 3 had changed slightly since the program launched in January 2013. Cohort 2 was originally to include only patients who have abdominal procedures, but we learned that individuals receiving any open abdominal procedure, all joint replacements, and other high-risk surgeries, as determined and referred by the physician, now receive the innovation. Likewise, Cohort 3 includes slightly different chronic illnesses than their original definition (e.g., no longer includes "headaches/migraines").[3] RTI is still working with Prosser to determine the specific cohort definitions by International Classification of Diseases, Ninth Revision (ICD-9) codes.

Based on the patient-level data Prosser provided to RTI in September 2014, the total number of patients *receiving* the innovation across all three cohorts as of June 2014 was 575: 49 patients in Cohort 1, 281 in Cohort 2, and 245 in Cohort 3 . Twelve patients were in more than one cohort. As shown in ***Table 3***, for Cohort 1, 148 referrals for a CP visit were made, corresponding to 76 unique patients, 49 of whom have received a CP visit. For Cohort 2, 329 referrals for a CP visit were made, corresponding to 324 unique patients, 281 of whom have received a CP visit. For Cohort 3, 417 referrals were made, corresponding to 358 unique patients, 245 of whom have received a CP visit.

Table 3. Patients Planned for Inclusion in Innovation (Denominator Data)

Patient Type	Number of Referrals[1]	Number of Unique Patients Referred[2]	Number of Patients Receiving Innovation[2]
Cohort 1	148	76	49
Cohort 2	329	324	281
Cohort 3	417	358	245

Source: Data provided by Prosser to RTI in September 2014.
[1] Includes all patient referrals to the program.
[2] Includes unique patients by cohort.

The majority of participants are aged 25–64 (53.5%) (***Table 4***). The majority are female (63.5%) and white (43.1%) or Hispanic (53.9%). We are still working with Prosser, however, to determine the payer mix for participants. We will provide this information in subsequent reports as it becomes available.

Table 4. Characteristics of All Patients Enrolled in the Innovation Through June 30, 2014

Characteristic	Number of Patients[1]	Percentage of Patients
Age		
0–18	24	4.2
19–24	46	8.1
25–44	163	28.3
45–64	145	25.2

(continued)

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[3] Prosser noted that they dropped patients with headaches and migraines from Cohort 3 because they were not suitable for CP visits. Headaches and migraines are common and do not usually require follow-up home visits.

Table 4. Characteristics of All Patients Enrolled in the Innovation Through June 30, 2014 (continued)

Characteristic	Number of Patients[1]	Percentage of Patients
Age (continued)		
65–74	71	12.3
75–84	78	13.6
85+	48	8.3
Missing	0	0.0
Sex		
Female	365	63.5
Male	210	36.5
Missing	0	0.0
Race/ethnicity		
White	248	43.1
Black	2	0.3
Hispanic	310	53.9
Asian	0	0.0
American Indian or Alaska Native	2	0.4
Other	0	0.0
Missing/refused	13	2.3
Payer Category[2]		
Medicare	—	—
Medicare Advantage	—	—
Medicaid	—	—
Dual eligible	—	—
Other	—	—
Missing	—	—

Source: Data provided by Prosser to RTI in September 2014.

[1] We are still working with Prosser to determine how the billing codes provided correspond to payer category.

— Data not yet available.

1.2 Implementation Progress

The extent to which each awardee is able to implement its innovation as planned and reach a sufficient number of patients will be critical to assessing impact on the Triple Aim. Below, we describe implementation and effectiveness; ***Table 5*** lists the measures RTI plans to use to assess each subdomain.

Table 5. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for Prosser

Key Evaluation Domains	Subdomains	Measure	Data Source
Implementation effectiveness	Reach	Number/percentage of patients referred to the CP program who had a CP visit within 7 days of discharge from PMH (ED, observation, or inpatient admission) by cohort	Daily discharge report; CP program e-form
	Dose	Number and type(s) of services received by patients from CPs	CP program e-form
		Number and type(s) of contacts received by patients from CPs	CP program e-form

Source: Based on Prosser self-reported data and data provided to RTI in September 2014.
CP = community paramedic; ED = emergency department; EHR = electronic health record; PMH = Prosser Memorial Hospital.

1.2.1 Process

The implementation process has been the initial focus of the evaluation. RTI defines the implementation process as including execution of implementation, organizational capacity, engagement of key staff and partners, and client recruitment and enrollment. The implementation process is best evaluated through a combination of data variables, including execution of implementation that conforms to operational plans, and capacity for implementing the innovation in a timely and effective manner. We focused on the implementation process during the awardee site visit and asked such evaluation questions as the following:

- What is the overall execution of the innovation implementation (e.g., the actual rate of expenditures relative to the projected rate)?
- What accomplishments are specific to hiring or training staff so that the organization can build its capacity to implement the innovation effectively?
- What is the implementation effectiveness, including fidelity, reach, and dose of the innovation thus far?

Execution of Implementation

The rate at which awardees expend funds or enroll patients, compared to projection, provides useful information to assess the innovation’s status. If expenditure or enrollment rates are particularly low (because of such issues as length of time to recruit and train new staff, or time to implement their training program), these variables help assess the awardee’s readiness to implement the innovation at the start and the extent to which they can spend all funding and meet their overall goals by the end of the project (e.g., can they effectively allocate the funds provided?). Prosser has been on track with its expenditure rate since Q4. Enrollment of direct participants began in Q2. From the project's inception through Q7, Prosser enrolled 486 total unique direct participants, which is at projection.

As part of its progress in executing the innovation, Prosser developed a well-defined implementation plan with a detailed timeline, milestones, staffing assignments, and contingency plan. Prosser was also able to work with the necessary entities to implement the innovation. Virtually all the required tasks of the implementation, such as training and hiring staff and establishing protocols for data collection, have been completed on time. The innovation's decision-making process enables the staff affected by an activity to provide input and ensures that their feedback is acted upon.

Although at projection for recruiting and serving patients, Prosser faced several barriers to implementation. Staff explained that many patients in Cohort 1 refused services because they want to continue to use the ED as their main source of medical care. As we learned on the site visit, Cohort 1 participants have used the ED as their regular source of care for several years. Some refused the CP visit or provided a fake address, and others refused service when the CP arrived at their door. We heard this reluctance might be the result of mistrust of the CP role or the existence of illegal activities at the residence. The program also faced challenges with scheduling appointments. Initially, EMTs scheduled CP appointments. Because the EMTs had little scheduling training and struggled with scheduling CP visits, there were CP appointment delays and some cases lost to follow-up. When Prosser decided to schedule CP appointments via its regular appointment schedulers, the scheduling improved. In April 2013, staff integrated scheduling of CP visits with the hospital's central scheduling system.

Other challenges to implementation execution include the paradigm shift for paramedics to work in a prevention rather than emergency role. Individuals who become paramedics often do so because they are interested in working in a critical care environment. We learned on the site visit that some paramedics felt the CP program was imposed on them because it was not part of their original job description. CPs were also not used to the amount of documentation needed for their expanded role. They were accustomed to more straightforward, checklist reports that followed specific algorithms. Consequently, CPs struggled initially with the e-forms and computer system and relied heavily on the nurse case manager to help troubleshoot issues. The nurse case manager had to take on a large amount of work and responsibility to oversee and implement care coordination, including making follow-up appointments for patients to access community resources, writing letters to the referring doctors, and helping with patient coordination, because some administrators were skeptical that CPs had those skills. As CPs have become more knowledgeable about resources in the community, they have taken on more responsibility handling provider communication and making appointments. As a result, the nurse case manager's role has turned into being more of a resource.

The program also faced challenges fostering buy-in from staff and leaders in other hospital departments, from health care providers, and from community organizations like the fire department who were unclear about the new CP role and uneasy about CPs taking on new responsibilities that might interfere with their own. The Prosser Home Health Agency (housed within PMH) was reportedly fairly skeptical about the CP program. As a result, innovation staff educated the Home Health Agency about the specific and finite role that CPs play in preventing repeat ED visits postdischarge and hospital readmissions. We learned that this relationship has improved and there is some resource sharing and team building. For instance, the home health program now asks CPs to help start IVs for their patients when necessary. Finally, Prosser has faced challenges in trying to adequately evaluate short-term outcomes (e.g., cost savings, ED visits) with such a small number of participants.

Organizational Capacity and Leadership

The project director, a seasoned paramedic, is the designated leader of the innovation though he is not dedicated full time to the program. As we learned on site, he fills many different roles. Having no staff funded full time on the project has resulted in some fragmentation of effort because the nurse case manager and project director have other clinical and management responsibilities outside the project that sometimes pull them away from the innovation. The two have worked to overcome this and meet often to address implementation issues. Without a full-time person leading the project, some hospital staff do not know who the “go-to” person is or who has full responsibility for the program.

The project director is also the key champion of the program and had the vision to apply for the award and develop such a program, having learned about other CP programs across the country and becoming particularly familiar with work being done in Colorado. He has the experience as a paramedic to understand the skills and requirements for such a program, but his experience in grants administration is less strong. Other staff who are frontline health care workers also struggle with the administrative and reporting responsibilities of the award. The CP program staff are new to managing and evaluating a grant such as this and because they are busy with program implementation, data collection and reporting often take a back seat to other responsibilities.

While internal organizational capacity to administer the award among PMH-funded staff is comparatively low, the local evaluator who is paid on a contractual basis has been able to serve as somewhat of a program manager to the team due to her decades of experience writing federal grants. In addition to her evaluation role preparing quarterly reports and measures for the self-monitoring plan, she has taken on a larger role of ensuring that staff members are accountable for project milestones. For example, she constantly follows up with the innovation team to ensure they are accountable in their reporting and that they complete the required paperwork in a timely manner. This expanded role poses challenges as the evaluator is only contracted for an average of 8 hours per week, yet other staff lack the experience or time to manage the data aspects of the award. It is unclear the level of accountability the team would be able to achieve if the local evaluator had not stepped into this expanded role.

Support from senior leadership within PMH is relatively strong, despite initial skepticism that the proposed team had the skills and capacity to implement the innovation. In fact, they were quite surprised when they received the award, and it took time for the hospital board and several department heads to fully understand the innovation. As mentioned, the project director dedicated a lot of time to educating senior leaders about the innovation, particularly the roles and responsibilities of CPs and how they would interface with the hospital system. Greater awareness of the program as it has unfolded both in the hospital and larger community has resulted in stronger leadership and provider support. Leaders have prioritized the innovation within the hospital with respect to resources, attention, and commitment, as evidenced by the offer to shift appointment scheduling to the hospital's central scheduling system and providing staff time for the hospital's social worker to help CPs link patients to community resources and coordinate difficult cases.

1.2.2 Workforce Development

Recruiting and training CPs to help patients manage their self-care postdischarge and appropriately access and use the health care system are critical to the success of this innovation.

Hiring and Retention

As of March 2014, Prosser employed nine individuals who were partially funded by the grant (3.8 full-time-equivalent staff total), including six paramedics, two management or administrative staff, and one RN. A key challenge is that no single staff person works full time on the project. As described earlier, the lack of a staff member who can devote full attention to program administration and implementation has frustrated some Prosser staff because they are not sure who to turn to with questions about the program.

Training

One of the project's key outcomes is to train certified paramedics to become CPs and deliver at-home services that improve health outcomes and reduce ED and other unplanned visits. Prosser developed their own CP curriculum, which now includes 100 hours of training, 20 in the classroom and 80 for on-site shadowing. To develop the training, they reviewed other CP training curricula such as the one developed by Eagle County, Colorado. The Colorado curriculum was more centered on providing primary care and home health. Prosser developed a curriculum to address the primary purpose of their CP innovation, which is to provide a single CP visit after an ED visit, surgery, or referral that will ensure correct use of discharge instructions, medication adherence, and appropriate follow-up with a PCP if necessary.

Prosser reached out to Heritage University to develop a full CP program certificate; the first training was offered at Prosser in December 2012 and was 120 hours. PMH had partnered previously with Heritage University, where several nurses provided nursing education. At the site visit in June, we learned that Prosser had changed implementation of the training program from Heritage University (a private university) to Yakima Valley Community College to make the training more affordable, thereby building program sustainability and increasing access for paramedics from neighboring communities. The change will enable the program to become institutionalized in the Washington community college system and allow for expansion of CP training across the region. The course will be a noncredit course, which means it will not have to be approved through the community college board, allowing for flexibility and further testing of the curriculum. For the second year, program staff have engaged two of the most experienced CPs from the first CP training course to help revise the curriculum so that the training will resonate with a paramedic audience. They plan to add more instruction on diabetes management to the next training course, as CPs have requested this as a result of encountering a large number of patients with this disease. They also plan to add more information about physical therapy, as well as provide more time in the field. The course will be 100 hours over 4 to 6 weeks and will be led by CPs instead of an RN as in Year 1.

Currently, there is no formal continuing education for CPs. In the near future, staff plan to develop an annual training update for CPs that will allow them to obtain continuing education credits. In the meantime, the part-time nurse case manager, evaluator, and project director meet monthly with the hospital physicians and medical director to discuss patient issues and to learn how to better coordinate work with the CPs. These lessons learned are shared with CPs on an o-going basis. In addition, the nurse case manager conducts chart reviews for each CP visit. She then follows up directly with the CP to discuss any issues or suggestions for improving the visit and reporting process.

1.2.3 Effectiveness

A major aspect of the evaluation is to assess the effectiveness of the intervention in terms of the extent to which it is implemented as planned (i.e., fidelity) and patients have been exposed to the innovation. Their exposure will be measured through reach (e.g., the number of targeted individuals in the population that were enrolled in the innovation) and dose (e.g., the degree to which each enrolled patient is exposed to services).

Fidelity

After conducting the site visit and learning firsthand about the innovation and implementation process, the site visit team devised criteria that would enable us to rate the extent to which the innovation was implemented with fidelity to the planned model. Prosser's innovation criteria includes three key components: 1) within 72 hours of discharge, a single home visit by a trained CP that addresses reviewing medication adherence, understanding discharge instructions, and ensuring follow-up PCP appointments and for individuals referred to the program; 2) the hiring and training of CPs with the necessary skills to deliver the CP visit; and 3) identifying high users of the health care system (Cohort 1), those who have undergone open abdominal procedures (Cohort 2), and those patients with a specific chronic illness (who are not necessarily heavy emergency medical services users—Cohort 3). Using these criteria, we determined that nearly all of program components (e.g., 76–100%) are implemented and being provided to the innovation's intended targets as designed.

The primary reason we provided this rating of innovation fidelity was that aside from the changes in the definition and target numbers for each of the three cohorts, program components have been implemented as designed. Despite the challenges in implementation execution described above, Prosser was able to develop training curriculum and train CPs in the necessary skills for delivering the program as well as implement the CP site visits to the three cohorts as projected. The area where the innovation deviated from the original plan was in the expected target population for the innovation as a result of the change in definition of the cohorts. As described earlier, the first cohort population was changed to exclude those individuals enrolled in home health and hospice services, those enrolled in Washington State's Consistent Care program to reduce repeat patients who have proven history of "shopping" at various hospitals for duplicative pain medication, and those who are deceased. In addition, changes in Cohort 2 also affected the fidelity of the innovation: adult patients with any high-risk surgical procedures (as determined by their physician) and patients receiving total joint replacements are now referred instead of only those who have an open abdominal procedure. Cohort 3, which now includes slightly different chronic illnesses from the original definition, is still focused on patients with a high probability of readmission as determined by their health care provider.

Reach

Reach is the extent to which the targeted number of patients is exposed to the innovation. Given Prosser has achieved its goals regarding the number of unique patients receiving a visit (i.e., 50 for Cohort 1 and 150 for Cohorts 2 and 3, respectively), it is best to assess reach by determining the percentage of unique patients referred for a CP program visit who enroll in the program and receive a visit within 7 days of discharge from PMH. Unique patient enrollment and reach of the program for each quarter since the program launch are listed separately for each of the three cohorts in ***Tables 6, 7,*** and ***8***. Enrollment and reach are highest for Cohort 2.

Table 6. Patient Enrollment and Reach for Cohort 1 for Each Quarter Since Project Launch[1]

Quarter	Number of Unique Patients Referred for CP Services	Number of Unique Patients Who Received CP Services	Total Reach per Quarter, % (Column C Divided by B)	Percentage Change from Previous Quarter
March 2013	17	11	64.7	N/A
June 2013	18	14	77.8	13.1
September 2013	9	6	66.7	−11.1
December 2013	12	6	50.0	−16.7
March 2014	12	5	41.7	−8.3
June 2014	8	7	87.5	45.8
Total enrolled as of June 2014	76	49	64.5	N/A

Source: Data provided by Prosser to RTI in September 2014.
[1] Includes all unique patients indicated as Cohort 1 by Prosser referred to and seen.
CP = community paramedic.
N/A= not applicable.

Table 7. Patient Enrollment and Reach for Cohort 2 for Each Quarter Since Project Launch[1]

Quarter	Number of Unique Patients Referred for CP Services	Number of Unique Patients Who Received CP Services	Total Reach per Quarter, % (Column C Divided by B)	Percentage Change from Previous Quarter
March 2013	41	35	85.4	N/A
June 2013	46	40	87.0	1.6
September 2013	54	43	79.6	−7.3
December 2013	71	60	84.5	4.9
March 2014	57	54	94.7	10.2
June 2014	55	49	89.1	−5.6
Total enrolled as of June 2014	324	281	86.7	N/A

Source: Data provided by Prosser to RTI in September 2014.
[1] Includes all unique patients indicated as Cohort 2 by Prosser referred to and seen.
CP = community paramedic.
N/A= not applicable.

Table 8. Patient Enrollment and Reach for Cohort 3 for Each Quarter Since Project Launch[1]

Quarter	Number of Unique Patients Referred for CP Services	Number of Unique Patients Who Received CP Services	Total Reach per Quarter, % (Column C Divided by B)	Percentage Change from Previous Quarter
March 2013	66	57	86.4%	N/A
June 2013	67	49	73.1	−13.2
September 2013	51	28	54.9	−18.2
December 2013	39	26	66.7	11.8
March 2014	*80*	48	60.0	−6.7
June 2014	55	37	67.3	7.3
Total enrolled as of June 2014	358	245	68.4	N/A

Source: Data provided by Prosser to RTI in September 2014.
[1] Includes all unique patients indicated as Cohort 3 by Prosser referred to and seen.
CP = community paramedic.
N/A=not applicable.

In addition, we also examined reach by the total number of referrals and total number of visits (not unique patients) (***Table 9***). Based on total number of referrals and visits, reach for Cohort 1 is 58.8%, reach for Cohort 2 is 86.3%, and reach for Cohort 3 is 67.6%.

Table 9. Total Number of Referrals and Total CP Visits by Cohort

Cohort	Total Number of Referrals	Total Number of Visits	Total Reach, %
Cohort 1	148	87	58.8
Cohort 2	329	284	86.3
Cohort 3	417	282	67.6
Total	894	653	73.0

Source: Data provided by Prosser to RTI in September 2014.
[1] Includes total number of referrals and patients indicated by cohort by Prosser.

Dose

Any innovation that involves delivery of direct services to participants needs to assess the extent to which those participants have actually been exposed to the new services. This intensity of services (e.g., frequency, duration) provided to participants is combined with outcome data, such as from claims analysis, to determine whether increasing exposure (or exposure at all) to the innovation is associated with changes in outcomes. As mentioned, each patient receives one follow-up visit as part of the innovation. On occasion, CPs will visit a patient with additional needs more than once, but this is not typical. During our site visit, staff explained that the CP program is distinct from ongoing care programs, such as home health care or hospice care, and CPs are not intended to see patients multiple times (***Table 10***).

Table 10. Number of Patients Receiving Specific CP Services from January 2013 to June 2014

CP Service Provided to Patients	Number of Patients Receiving CP Service[1,2]
Help making PCP appointments	122
Help filling prescriptions	36
Review of discharge instructions	104
Total	213

Source: Data provided by Prosser to RTI in September 2014.
[1] Includes total number of referrals and patients indicated by Prosser.
[2] Includes all patients that indicated "no" on the preassessment of activities to be provided by the CP.
CP = community paramedic; PCP = primary care provider.

1.3 Evaluation Outcomes

RTI will use two types of quantitative data from awardees to assess the impact of the awardee's innovation on key outcomes. These include claims data for Medicare and/or Medicaid beneficiaries, depending on who the awardee serves, and other administrative or utilization data the awardee is collecting (which we have labeled as "other awardee-specific data" reflecting the variability of the types of data elements available across awardees). We are in the process of finalizing our assessment of all the available data sources and requesting data directly from each awardee. As those data are received, we will incorporate the findings into subsequent quarterly/annual reports. The following sections present descriptive findings from the quantitative outcome data provided to RTI as of September 2014.

1.3.1 Measures for Evaluation

Following the site visit, the data management and site visit teams met to review each of the measures listed in the awardee's self-monitoring measurement plan (i.e., data review meeting). The measures listed in ***Tables 5*** (above) and ***11*** (below) reflect the measures determined as most relevant for our evaluation of Prosser's innovation outcomes.

Table 11. Draft Outcome Measures Requested from Prosser

Key Evaluation Domain	Subdomains	Measure	Data Source
Clinical effectiveness	General health and wellness	Percentage of patients who: a. Make follow-up appointments b. Fill their prescriptions c. Understand their discharge instructions from beginning until end	CPP e-form
	Patient perceived health and functioning	Patient perception of own health (adapted SF 12v2)	CPP e-form
		Percentage of CPP patients will report on and evaluate their experiences with health care since being involved in the innovation	In-house survey (phone, paper, or email)
Health care outcomes	Utilization	ED visit rate	Claims
		All-cause admission rate	Claims
		Rate of patients who have an unplanned ED, observation, or admission within 30 days of a CP in-home visit	CPSI EHR system, claims
		Readmission rate	Claims
		Number open abdominal procedure readmissions (within 30-day period) after implementation of CPP	Infection control nurse surveillance system, claims
	Cost	Spending per patient	Claims
		Cost savings	
		Actual annual health care charges for 100 Cohort 1 patients will be tracked after their first CP visit	CPSI EHR system

CPP = Community Paramedic Program; CPSI = Computer Programs & Systems, Inc.; ED = emergency department; EHR = electronic health record; PCP = primary care provider.

1.3.2 Claims Data

As part of a broad assessment of health care innovations, the Center for Medicare & Medicaid Innovation (CMMI) is assessing the impact of its programs, including those funded specifically by HCIAs, on four core measures. The four core measures are

- health care spending per patient,
- hospital inpatient admissions,
- hospital unplanned readmissions, and
- ED visits.

Collectively, it is anticipated that CMMI programs will slow the increase in health care spending, reduce hospital admissions, reduce avoidable hospital readmissions, and prevent unnecessary ED visits. We are reporting these measures for all HCIA Community Resource awardees so that the collective impact of the awards can be assessed. As discussed below, some awardees' innovations may not be focused on these measures. Other awardees' innovations target specific conditions (e.g., imaging, diabetes) and may have significant impacts on spending, admissions, readmissions, and ED visits for the targeted conditions but not have a statistically detectable impact on the measures at the aggregate level because the targeted conditions represent only a small fraction of total spending, inpatient admissions, and ED visits.

The measures are calculated through analysis of Medicare and Medicaid fee-for-service claims. Because of differences between Medicare and Medicaid patients in age, other demographic variables, and disease status, we report the Medicare and Medicaid results separately below. Currently, complete Medicare claims are available through the end of 2013. Medicaid claims for Prosser are available through the second quarter of 2013, although claims for the final quarter may not be complete. The Prosser innovation was launched on January 1, 2013.

- **Health Care Spending per Patient.** For Medicare beneficiaries, health care spending per patient includes Part A and Part B Medicare expenditures for persons enrolled in the Part A and Part B fee-for-service program. The variable focuses on Medicare fee-for-service spending, so Medicare managed care (Part C) services are excluded, as are beneficiary copayments. Medicare Part D prescription spending is also excluded. Spending is reported on a per-person per-quarter basis. If a beneficiary is not enrolled for every month in a quarter, spending (except for hospital inpatient spending) is prorated to a quarterly basis based on the number of days enrolled during the quarter. Because hospital inpatient admissions are both rare and expensive, spending is not prorated for hospital inpatient spending. Prorating is also not performed for beneficiaries who die during a quarter.

  For Medicaid beneficiaries, health care spending per patient is reported for fee-for-service beneficiaries. Beneficiaries are only included in the analysis for spending (and the other measures) during periods when they are enrolled in Medicaid.

- **Hospital Inpatient Admissions.** This variable measures hospitalization, the single most expensive component of health care spending. Patients kept overnight in observation beds are excluded from this measure. Inclusion criteria for the analysis are the same as for spending. Hospital inpatient admissions are not prorated based on the number of days eligible during the quarter. All-cause inpatient admissions are reported. The mean quarterly admission rate per 1,000 patients is reported.

- **Hospital Readmissions.** Hospital readmission rates serve a dual purpose in evaluating HCIA impacts. Readmissions add to the costs of a prior hospitalization, and they often reflect a problem in the care provided during the first admission. All-cause readmissions are defined as a follow-up admission to any short-term acute general or long-term care hospital within 30 days of a discharge from another hospital of the same type. We ignore multiple admissions within 1 day of an initial admission because these often represent transfers between hospitals. We define index hospitalizations that begin during the quarter and follow each index admission for 30 days, even when the follow-up period extends beyond the end of the quarter. Inclusion criteria for the analysis are the same as for spending. The readmission rate equals the number of readmissions divided by the number of index hospitalizations during the quarter. Planned readmissions are excluded from the calculation of the numerator. Quarterly mean readmission rates per 1,000 admissions are reported.

- **ED Visits.** ED visits are sometimes viewed as a symptom of the inability of the community's health care system to provide adequate preventive and ambulatory care visits. We report an all-cause ED visit rate that excludes ED visits resulting in an inpatient admission (which presumably represent unavoidable visits) and includes overnight ED visits without an inpatient admission. Inclusion criteria for the analysis are the same as for spending, and ED visits are also subject to the same prorating formula as for spending. The mean quarterly ED visit rate per 1,000 patients is reported.

Medicare Claims Analysis

The analysis focuses on 110 Medicare beneficiaries enrolled in Cohort 3 of the Prosser innovation through March 2014 who were enrolled in fee-for-service Medicare Part A and Part B at some point during 2013. The analysis uses data from the CMS Chronic Conditions Data Warehouse (CCW). We present the measures for these beneficiaries in the quarters before and after the innovation was launched on January 1, 2013. Cohorts 1 and 2 had too few observations (<20 each) to support analyses at this time; results for these cohorts will be included in later reports.

Table 12 reports Medicare spending per patient in the eight quarters before and the four quarters during and after the launch date.

Table 12. Medicare Spending per Patient: Prosser Cohort 3

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
1C1CMS331036	Prosser												
	Spending rate	$2,341	$1,667	$3,384	$3,309	$1,955	$3,414	$3,288	$5,049	$7,272	$5,821	$5,512	$5,710
	Std dev	$6,122	$4,674	$10,910	$9,456	$4,023	$7,911	$7,286	$16,993	$16,220	$18,122	$14,566	$12,578
	Unique patients	92	92	95	96	93	100	101	101	108	110	109	110
Comparison Group													
1C1CMS331036	Prosser												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—

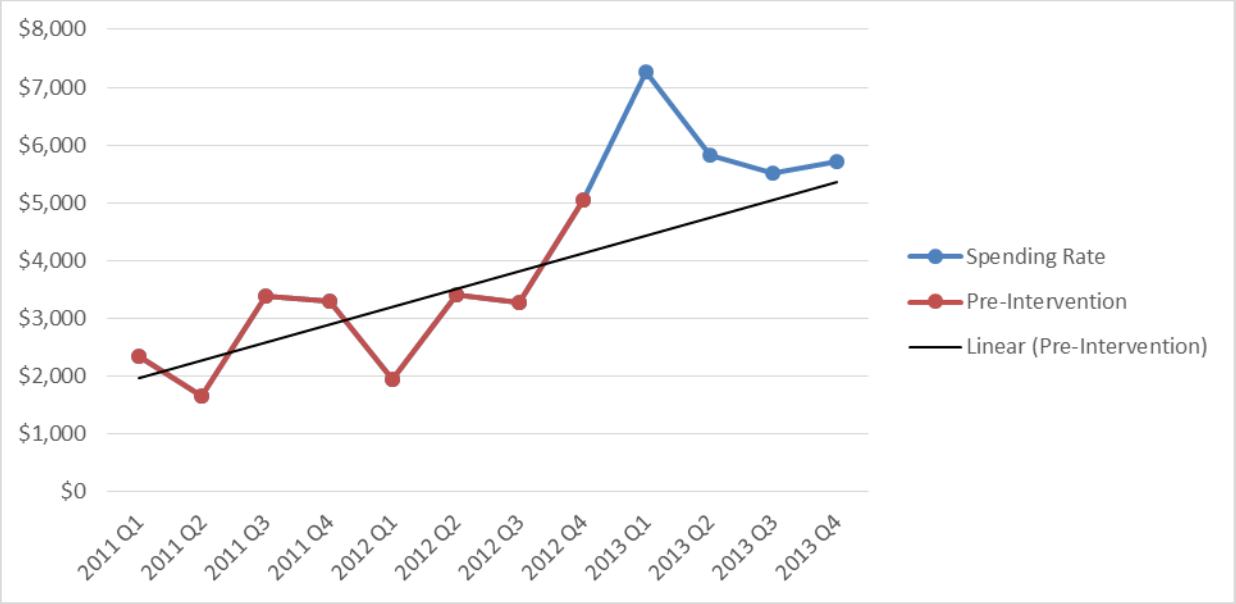
Savings per Patient

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Prosser began enrolling patients on 1/9/2013. I1 is 2013 Q1. Spending rate: total quarter (i.e., quarterized) payments/number of unique patients. Savings per patient: difference in comparison minus the intervention’s average spending rates.
— Data not yet available.

Figure 1 plots spending as a function of time. The red line represents values in quarters prior to the innovation's launch date on January 1, 2013, and the blue line represents quarters during and after launch. The graph includes a trend line based on a linear regression of prelaunch values.

Figure 1. Medicare Spending per Patient: Prosser Cohort 3



The trend line for spending based on the preintervention period increases because of aging of the sample population (because we analyze the same individuals before and after the innovation was launched) and general medical care inflation. Spending is higher than the trend line for the last quarter before and the first four quarters after innovation launch, though spending returns close to the trend line in the third and fourth intervention quarters. We have not yet tested whether postlaunch spending is statistically different than trend values. As shown in ***Table 12***, the standard deviation for spending is very high, representing the skewed nature of expenditures. We will estimate the statistical impact of the innovation in later reports as more data become available.

The all-cause inpatient admissions rate per 1,000 participants is shown in ***Table 13*** and ***Figure 2***.

Table 13. All-Cause Inpatient Admissions Rate per 1,000 Enrollees: Prosser Cohort 3

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

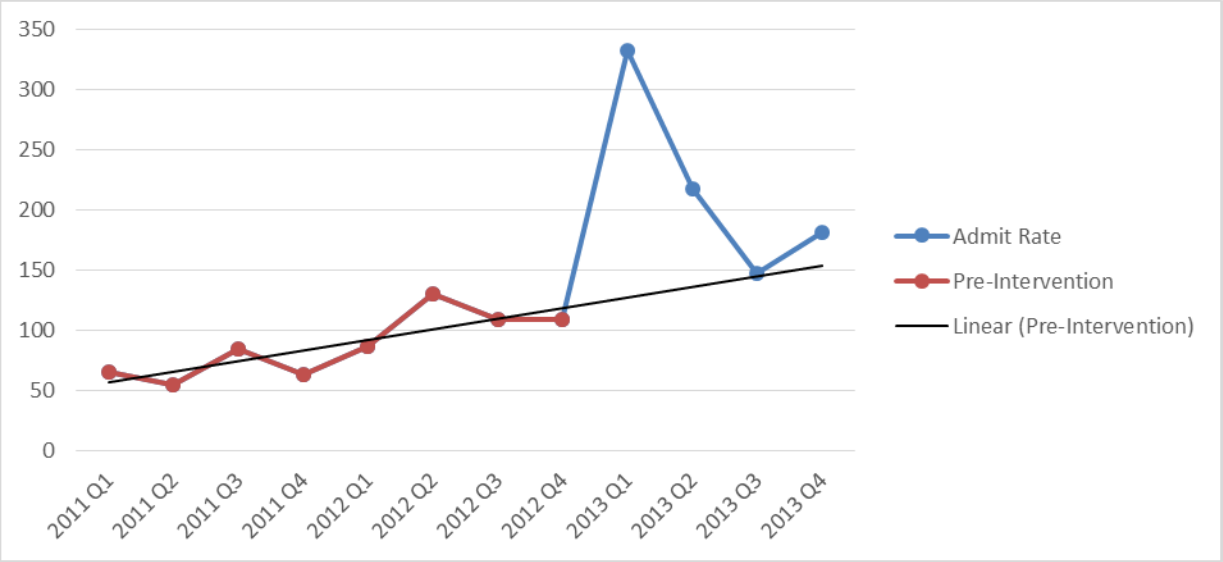
Awardee Number	Description	Baseline Quarters B1	B2	B3	B4	B5	B6	B7	B8	First Intervention Year I1	I2	I3	I4
Intervention Group													
1C1CMS331036	Prosser												
	Admit rate	65	54	84	63	86	130	109	109	333	218	147	182
	Std dev	357	272	315	243	282	393	372	344	684	514	606	510
	N. of patients	92	92	95	96	93	100	101	101	108	110	109	110
Comparison Group													
1C1CMS331036	Prosser												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters B1	B2	B3	B4	B5	B6	B7	B8	First Intervention Year I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Prosser began enrolling patients on 1/9/2013. I1 is 2013 Q1. Admit rate: total unquarterized admissions/number of unique patients.
— Data not yet available.

Figure 2. All-Cause Inpatient Admissions Rate per 1,000 Enrollees: Prosser Cohort 3



The inpatient admission rate increases substantially in the launch quarter and remains above the overall admissions time trend except in the third intervention quarter. This finding may reflect the selection criteria for enrollment: Prosser seeks to enroll patients who have had surgery, a hospital readmission, or an ER visit; therefore, many enrollees will have had a hospital admission just before enrollment, but not necessarily in the quarters prior to the launch of the innovation. Without statistical testing and a better-defined comparison group, it is premature to conclude that the innovation caused the increase; we will examine this question as the evaluation continues.

Hospital readmission rates per 1,000 admissions are shown in ***Table 14*** and ***Figure 3***.

Table 14. Hospital Readmission Rates per 1,000 Admissions: Prosser Cohort 3

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

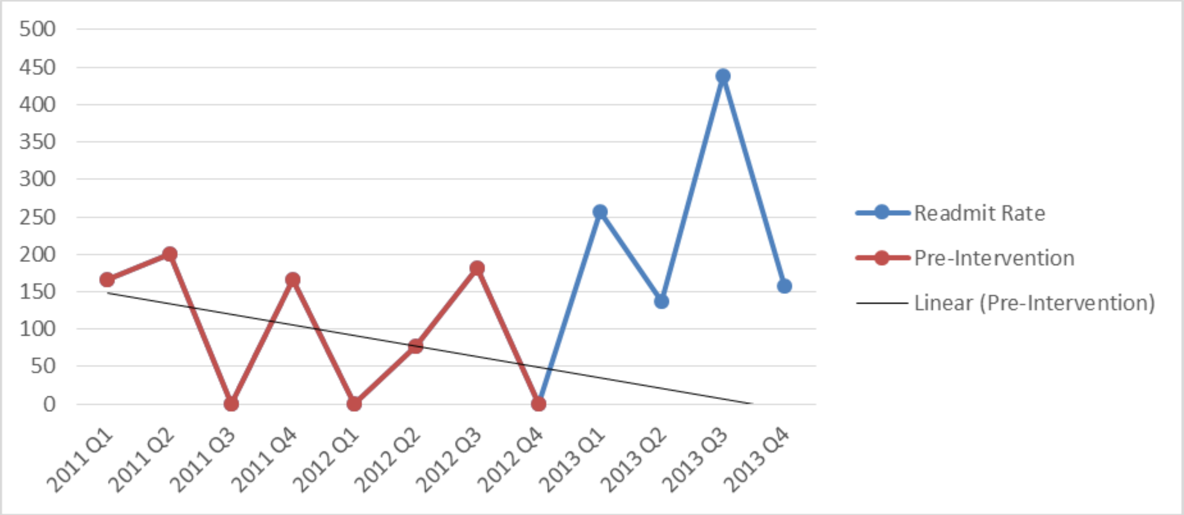
Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
1C1CMS331036	Prosser												
	Readmit rate	167	200	0	167	0	77	182	0	257	136	438	158
	Std dev	373	400	0	373	0	267	386	0	437	343	496	365
	Total admissions	6	5	8	6	8	13	11	11	35	22	16	19
Comparison Group													
1C1CMS331036	Prosser												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total admissions	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Prosser began enrolling patients on 1/9/2013. I1 is 2013 Q1. Readmit rate: sum of all readmissions to eligible hospital within 30 days/all admissions in the quarter. Total admissions: all eligible admissions in the quarter.
— Data not yet available.

Figure 3. Hospital Readmission Rates per 1,000 Admissions: Prosser Cohort 3



Readmission rates trend downward prior to the innovation's launch, although the quarterly rate has been extremely variable, and the trend line is sensitive to the inclusion of the last prelaunch quarter, when no readmissions were recorded. The readmission rate is above the trend line in the first four quarters during and after launch; the rate is quite variable during that period. As with the other variables, we will include statistical tests on the readmission rate in subsequent reports as more data become available.

Table 15. ED Visits per 1,000 Participants: Prosser Cohort 3

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

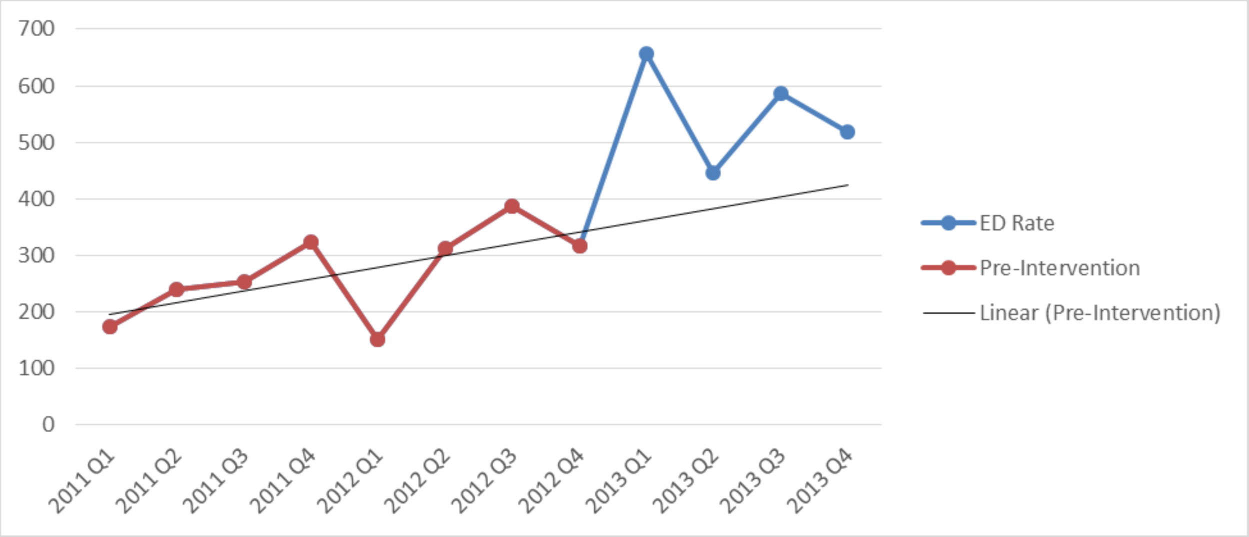
Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
1C1CMS331036	Prosser												
	ED rate	174	239	253	323	151	313	386	317	657	445	587	518
	Std dev	900	1,399	594	523	699	729	1,315	814	869	613	1,452	1,122
	N. of patients	92	92	95	96	93	100	101	101	108	110	109	110
Comparison Group													
1C1CMS331036	Prosser												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Prosser began enrolling patients on 1/9/2013. I1 is 2013 Q1. ED rate: total quarterized ED visits and observation stays/number of unique patients.
— Data not yet available.

Figure 4. ED Visits per 1,000 Participants: Prosser Cohort 3



The ED visit rate follows an increasing trend prior to launch. The rate is above the trend line during the first four quarters during and after launch. As with the other variables, we will include statistical tests on the ED visit rate in subsequent reports as more data become available.

Medicaid Claims Analysis

The Medicaid data analysis will use data from the CMS Alpha-MAX data files. Currently, Medicaid claims for Prosser are only available in Alpha-MAX through the second quarter of 2013, and claims for that final quarter may not be complete. Analysis of Prosser Medicaid claims will be included in subsequent reports. We will report tables and figures similar to those for Medicare.

Discussion of Claims Analysis

The four measures provide descriptive data on patients enrolled in the Prosser innovation before, during, and after the launch of the innovation. Although it is necessary to report these measures to support CMS's broader assessment of its full portfolio of innovation projects, the measures may not provide a complete evaluation picture of the Prosser innovation for a number of reasons. First, the innovation was only launched on January 1, 2013. The impact of a CP innovation may not be immediate because time is needed for patient management to achieve changes in health care utilization. Second, Prosser enrollment accrued gradually over time following the launch date, so many enrollees have less than a year of enrollment. In future analyses, we will control for a patient's enrollment date. Third, the simple trend lines provided in the figures represent trends for Prosser patients before launch of the innovation. They do not control for external factors that coincide with the innovation launch and affect the measures both for Prosser and for other providers. As described below, we are developing additional comparison groups for Prosser. Finally, each of the four measures has a high standard deviation, suggesting that it may be difficult to statistically distinguish between innovation effects and random fluctuation. This is particularly true for the hospital readmission rate where the underlying number of index hospitalizations (the denominator in the readmission rate) is low and small differences in the number of readmissions (the numerator) can lead to large swings in the readmission rate.

Development of Comparison Groups

In addition to comparing Prosser patients before and after implementation of the innovation, we are constructing a comparison group of Medicare and Medicaid fee-for-service patients in Washington. We intend to follow three possible identification strategies for the three cohorts as applicable:

- Within Prosser Public District Hospital, determine if the pool of eligible candidates for each of the three cohorts has been exhausted by the innovation. All individuals discharged from the hospital are eligible to receive one CP visit within 7 days of discharge. We have learned from the awardee that a fair number of eligible individuals refuse the innovation. We expect to receive identifiers from Prosser for those who met the eligibility criteria for each one of the three cohorts but refused to participate (including those who accepted but were not available when the CP did the home visit). This could be a possible comparison group. Prosser will exclude from this group those who receive alternative care already (e.g., through a skilled nursing facility). The caveat here is the possible selection endogeneity in the decision to participate.

- Use regression discontinuity techniques to compare patients at the margin, just above and below the cutoff rule for enrollment. This approach would be applicable only for Cohort 1 and possibly Cohort 3 (we await to hear from Prosser the inclusion criteria for chronic conditions). We will thus compare individuals who have had four ED visits in the past 18 months with those who have had five visits and thus benefited from the CP innovation. Regression discontinuity would not be applicable for Cohort 2 (after open abdominal procedures).

- Use propensity score matching to construct alternative cohorts, using data from other hospitals operating in the same county as Prosser. This option is possibly the most robust. Under this approach, however, the impact of the innovation may be diluted if we cannot rule out the possibility that other hospitals in Benton County have similar programs in place. Using this approach, we have two possible ways to find a comparison group: 1) search patients at the zip code level with similar characteristics and exclude those ever discharged by Prosser in the 3 years before and after the innovation and (2) search patients by National Provider Identifier hospital codes. ***Table 16*** shows Benton County hospitals and their surrounding zip codes.

Table 16. Potential Areas to be Used to Construct Comparison Groups

City	Zip Code	Population[1]	Hospital[2]
Benton City	99320	3,142	Central Washington Hospital
Finley	99336	6,012	Columbia Hospital
Kennewick	99336, 99337, 99338	75,971	Kennewick General Hospital, Yakima Valley Memorial Hospital
Prosser	99350	5,799	Prosser Public District Hospital
Richland	99352, 99353, 99354	51,440	Saint Anthony Hospital, Wenatchee Valley Hospital
West Richland	99352, 99353	12,663	Walla Walla General Hospital

[1] Figures are from U.S. Census Bureau. (2012). Incorporated places and minor civil divisions: Washington. *Population census*.
[2] Information on hospital proximity was found in http://www.healthgrades.com/hospital-directory/search/.

1.3.3 Other Awardee-Specific Data

In early July, following the data review meeting, RTI met with Prosser to request the raw patient-level data that were used to generate each of the measures in ***Tables 5*** and ***11*** for each quarter.

Overview of Data Received

We received the initial raw data from Prosser in September 2014, including most of the variables we requested. We received data on patients that were referred for a CP visit; participants who actually received a visit; participant demographics; and the number of participants who make follow-up appointments, fill their prescriptions, and understand their instructions from beginning to end. We are still, however, working with Prosser to ensure we understand all the data provided. Prosser noted that all referrals and visits should be documented in their system, but we have uncovered some minor discrepancies and thus will continue to work with Prosser on how best to handle these issues. As we get further clarification, we will be able to refine the tables presented below in subsequent reports.

Clinical Effectiveness

We are continuing to work with the data received from Prosser. Most of the tables presented in the Prosser awardee section thus far are based on the raw patient-level data provided to RTI in September 2014. As discussed above, once we receive further clarification and additional data over time, we will create additional tables in subsequent reports.

Table 17 indicates the total percentage of patients who indicated “yes” on the postassessment as a percentage of those receiving the services at all (i.e., those indicating “no” on the preassessment). Although the vast majority of patients who received help reviewing their discharge instructions indicated that they understood their discharge instructions after the CP visit, the majority of patients did not note a change after the CP visit regarding help making a PCP appointment or help filling their prescription.

Table 17. Number and Percentage of Patients Achieving Outcomes Based on Specific CP Services Provided from January 2013 to June 2014

CP Service	Total Number of Patients Receiving CP Service[1]	Total Number of Patients Achieving Outcome[2]	Percentage of Patients Receiving CP Service that Achieved Outcome
Help making PCP appointments	122	50	41.0
Help filling prescriptions	36	3	8.3
Review of discharge instructions	104	94	90.4
Total	213	147	69.0

Source: Data provided by Prosser to RTI in September 2014.

[1] Includes all patients that indicated "no" on the preassessment of activities to be provided by the CP.

[2] Includes all patients that indicated "yes" on the postassessment of activities to be provided by the CP.

CP = community paramedic; PCP = primary care provider.

Table 18 will also present data on CP visits in which patients indicated "no" on the preassessment of activities to be provided by the CP and "yes" on the postassessment of activities provided by the CP (i.e., changed from "no" to "yes"). We are still working to analyze these measures over time.

Table 18. Clinical Effectiveness Measures for Prosser over Time for All Cohorts

Measure	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Increase in the number of patients who:[1,2]							
a. Make follow-up appointments	—	—	—	—	—	—	—
b. Fill their prescriptions	—	—	—	—	—	—	—
c. Understand their discharge instructions from beginning until end	—	—	—	—	—	—	—

Source: Data provided by Prosser to RTI in September 2014.

[1] Includes total number of referrals and patients indicated by Prosser.

[2] Includes all patients who indicated "no" on the preassessment of activities to be provided by the CP and "yes" on the postassessment of activities provided by the CP.

— Data not yet available.

Prosser has also provided data on patient perceptions of their own health prior to obtaining a CP visit. Unfortunately, we do not have measures of patient perceptions of their own health after a CP visit. In addition, we do not have data on patient experiences with health care since being involved in the innovation. We will continue to work with Prosser to see if we can obtain these data. Once we know whether these data are available, we will continue to refine the tables presented in this section in subsequent reports, for example, ***Table 19.***

Table 19. Patient Reported Measures by Cohort

Measure	Cohort 1	Cohort 2	Cohort 3
Patient perception of own health (adapted SF-12v2)	—	—	—
Patient experiences with health care since being involved in the innovation	—	—	—

Source: Data not yet provided by Prosser to RTI.
— Data not yet available.

Discussion of Other Awardee-Specific Findings

Overall, many of the patients Prosser is reaching are indicating they do not need help making a PCP appointment or filling their prescription. Of those that do, the majority do not note that the CP visit resulted in making a PCP appointment or a filled prescription. Interestingly, a large number of patients did note, however, that they did not understand their discharge instructions before the CP visit, and the vast majority noted they did understand their instructions after the CP visit. These results, however, are based on a small sample size. As we receive additional data from Prosser, we can continue to update our findings. We also will continue to work with Prosser to obtain any additional data and understand all data provided, so we can continue to provide an update to our evaluation of Prosser's innovation.

1.4 Overall Program Effectiveness to Date

This fairly simple innovation has been implemented successfully. The innovation has transformed the paramedic role at this rural community hospital; paramedics now use their medical expertise and what would be potentially unused downtime to provide follow-up home-based services to high-needs patients. Since the beginning of the program launch, the innovation has seen more individuals for CP visits than their goal, and we expect that Prosser will continue this trend. Although some staff, including paramedics and leaders, initially resisted the innovation, at the time of our site visit in June 2014, staff from all levels of the organization were highly committed to the project. Leadership on the project has come from the project director (a CP himself) who had the vision for the program. One key issue with the innovation is that no single person works full time to provide full project management. The project director, outside evaluator, and nurse case manager have been able to share project management duties, but it is a struggle to handle all the administrative tasks.

Alternatively, having a small and nimble staff is one key strength of the program. Prosser was able to train paramedics as CPs and roll out the innovation relatively quickly. There were some minor staffing challenges, however. First, some paramedics were resistant to changing their role from emergency medicine to preventative health education. Second, Prosser realized that the regular hospital schedulers would be more efficient at making CP appointments than EMT staff.

Through program implementation, Prosser learned that the original cohort definitions did not work well. Few patients preassigned to Cohort 1 showed up at the ED to initiate receiving a CP appointment, some Cohort 1 patients were removed and many Cohort 1 patients have been resistant to CP visits and preventative health care. The definition of Cohort 2 became problematic because fewer patients than anticipated received abdominal surgeries after the launch of the program, so Prosser expanded Cohort 2 to include anyone who underwent any high-risk surgeries or total joint replacements. Finally, Cohort 3’s definition has been somewhat broad and includes all individuals who receive a CP visit and are not in Cohort 1 or 2. RTI will continue to work with Prosser to clarify cohort definitions and obtain reach and dose data by each cohort.

Prosser’s CP program has been highly recognized in Washington State as a promising program that other rural hospitals may want to replicate. Prosser has shared information about their program and lessons learned in various conferences and discussions with state-level organizations (e.g., Washington State Hospital Association). Some hospitals are reaching out to Prosser to learn more about how they have implemented this program. As Prosser continues to implement the program, they want to find ways to demonstrate that the program is cost-effective and improves health outcomes.

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October 2014

Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring

Annual and Site Visit Report
Regional Emergency Medical Services Authority (REMSA)

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OVERALL EVALUATION SUMMARY

RTI International was selected to lead an independent evaluation of the 24 Health Care Innovation Award (HCIA) awardees categorized as Community Resource Planning, Prevention, and Monitoring (Community Resource). In this role, RTI is conducting an in-depth evaluation of each innovation, as well as a cross-site evaluation that includes similar innovations targeting the same priority outcomes (e.g., emergency department [ED] visits). For each of the 24 awardees, this report presents findings from the first year of the evaluation (beginning September 23, 2013, and including data obtained by RTI as of September 11, 2014). The report is based on multiple data sources, including operational reports, self-monitoring plans, site visits, and quantitative data analysis.

The evaluation methods vary by awardee innovation, based on the type of innovation and availability of data. RTI has reviewed and coded all existing documents from the awardees through December 31, 2013, and incorporated that knowledge into each awardee's overview. Our review included the awardees' original applications for funding, original and current operational and self-monitoring plans, and quarterly narrative and monitoring reports. For this annual report, we incorporated activities reported through the awardee's seventh quarterly report (i.e., through March 31, 2014). Between April and August 2014, teams of at least two staff from the RTI team visited all 24 awardees for 2 to 4 days, depending on the number of interviews conducted. Teams included a subject matter expert, with training and experience specific to the awardee's innovation, and a master's- or bachelor's-level colleague to take notes. Before each visit, the teams reviewed all available documentation from the awardee to learn about the innovation's goals, objectives, and status. The purpose of the site visits was to clarify our understanding of the innovation, obtain detailed information on the implementation process, and review awardee-specific data to determine which elements to incorporate into the evaluation. By August 13, 2014, all 24 awardees had been visited and a thorough description of our findings included in each of the 24 awardee sections.

In addition to the site visits, we report quantitative data from two possible sources for several awardees. First, we present findings from claims analysis for awardees in this report if they both provided us with patient identifiers and reported enrolling participants who are Medicare and/or Medicaid beneficiaries. RTI obtained patient identifiers from most of the 24 awardees to conduct claims analysis. Second, we present data RTI obtained directly from awardees to quantify their work in addressing health care costs, quality, and patient outcomes. Data from additional awardees will be analyzed and presented in future reports, as data become available and awardees enroll sufficient participants. An update on the availability of Medicare/Medicaid claims and other awardee-specific data, analysis of data available to us and cleaned as of September 11, 2014, a summary of the comparison groups, and a list of draft evaluation measures are included in each awardee section.

1. HCIA COMMUNITY RESOURCE AWARDEE: REGIONAL EMERGENCY MEDICAL SERVICES AUTHORITY (REMSA)

1.1 Introduction

The Regional Emergency Medical Services Authority (REMSA) is a nonprofit emergency medical services (EMS) provider in Reno, Nevada. REMSA, which uses a public utility model, is the exclusive provider of ground transport services for the cities of Reno and Sparks and for Washoe County. REMSA received an award of $10,824,025, beginning on December 10, 2012,[1] and began seeing patients in each component at different times during 2013 (see the Execution of Implementation section) to achieve the following goals:

1. **Reduce cost** (per-patient cost by $10.5 million over 3 years for Washoe County acute and nonacute patients) by reforming existing payment systems to achieve sustainable funding for patient care services.

2. **Improve care** by increasing access to appropriate levels of quality care and treatment.

3. **Improve health** by establishing new linkages between the emergency ambulance delivery system and the broader health care delivery system; by engaging key health care partners, community stakeholders, and target patient populations; and by finding alternative pathways for patients seeking evaluation of urgent medical conditions.

RTI is currently conducting an in-depth case study for this innovation. As part of that case study, two RTI team members conducted a site visit in June 2014, and before and after the visit, our team reviewed all documentation on this innovation. We are working to obtain data directly from the awardee to assess many of the variables we discuss. This report describes findings from the site visit, document reviews, follow-up telephone calls, and analysis of data obtained and cleaned by RTI through September 11, 2014. We start by describing the innovation's components and the patients targeted by the awardee.

1.1.1 Innovation Components

REMSA's Community Health Program (CHP) is complex and includes three unique components: Community Paramedics (CPs), Ambulance Transport Alternatives (ATA), and the Nurse Health Line (NHL). A health information technology (HIT) infrastructure and a community outreach program support these components. The innovation has the following objectives and relies on the partners listed in ***Table 1***:

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[1] The initial REMSA award was to be slightly lower, but the CMS added funding for ambulance transports not otherwise covered by Medicare. This addition delayed the award, so REMSA could not start its program until December 2012. The work it accomplished before that date was an in-kind contribution that has since been mostly reimbursed through the HCIA grant.

- Establish and implement the ATA service, in which low-acuity patients who call 911 can be transported by ambulance to a more appropriate location than the ED (e.g., urgent care center, community triage center, detoxification center, mental health hospital, or clinic).

- Establish and implement the CP intervention to reduce avoidable hospital readmissions by conducting home visits to help recently discharged patients understand their current care plan, by performing medication reconciliation, and by educating patients on diet and alcohol issues. Target populations for this intervention include people with congestive heart failure (CHF) or chronic obstructive pulmonary disease (COPD) and hotspotters (individuals who contact 911 frequently).

- Establish and implement the NHL, an alternate nonemergency number (instead of 911), in which callers with low-acuity problems gain access to a health professional who can ask questions, triage the call, and determine a recommended level of care.

Table 1. HCIA Partners, Role, and Location

Partner Name	Role in HCIA Project	Location
University of Nevada, Reno	Evaluation	Reno, NV
TrueSimple, LLC	Project management/administration consultant	Austin, TX
Priority Solutions, Inc.	HIT (provides NHL system)	Salt Lake City, UT
FirstWatch Solutions, Inc.	HIT (provides data integration)	Encinitas, CA
KPS3 Marketing	Marketing contractor (e.g., developed the campaign for NHL)	Reno, NV
Renown Health	Primary liaison for CP component, training, care management, and HIT integration support	Reno, NV
Community health providers	Patient referrals to CP and NHL, support for alternative care for low-acuity patients, acceptance of low-acuity patients (e.g., 14 urgent care centers, alternative sites such as the local triage/detoxification center)	Washoe County, NV

Source: RTI site visit, June 2014.
CP = Community Paramedic; HCIA = Health Care Innovation Award; HIT = health information technology; NHL = Nurse Health Line.

Component 1: CPs

The CP program is unique, creating a bridge between EMS and health care. The core of the CP program involves working with patients whose illnesses (e.g., COPD, myocardial infarction [MI], CHF, pneumonia) have caused them to have a recent hospital stay. CPs will visit potential patients with these specific illnesses who meet the other qualifying factors (e.g., Washoe County residents) while they are still hospitalized and introduce the program to seek consent for patients' enrollment. During our June 2014 site visit, CPs noted that the process of obtaining consent for enrollment was not very successful at the beginning but that over time, the CPs gained more skills in marketing the program to the patients and obtaining consent.

After patient enrollment, CPs will visit patients within 24–48 hours of discharge from the hospital (because 48 hours of discharge is the most likely period in which a patient will be readmitted). During that initial home visit, the CPs will help patients to understand their current care plan, to reconcile medications, and to learn about ongoing health-related issues (e.g., diet, alcohol use). The CP will also provide each enrolled patient with a number to call in case any health issues or concerns arise, and the CP will respond within 1 hour of a call to check on the patient's status and determine whether he or she has a medical emergency, intervene as necessary, and evaluate for need to be transported by ambulance to the ED. CPs will typically visit patients 7–10 times during the 4-week enrollment. A patient who has been enrolled for 30 days and has not been readmitted to the hospital has graduated from the program. A benefit of this program is that the CPs have the flexibility to visit higher-needs patients as often as necessary, and medically fragile adults who would normally call 911 are now being given the opportunity to be evaluated by a highly skilled certified paramedic (who works in tandem with the patient's primary care provider [PCP]) to determine appropriate levels of care.

The second and relatively new offering of the CP program is known as Evaluate and Refer. Initially marketed to cardiology and gerontology physicians for their patients, this program offers an alternative for physicians who (because of weekends, holidays, or lack of available appointments) would normally send patients calling their office with a complaint to the ED. Evaluate and Refer provides the opportunity for a paramedic to evaluate the patient and to determine whether an immediate ED visit is necessary or whether the patient can wait to be seen by the physician during office hours. When called to an Evaluate and Refer case, CPs do not use lights and sirens, and they promise a 1-hour response time. The goal of the program is to avoid unnecessary ED visits (and unnecessary 911 calls), while still confirming the patient's health and ensuring that he or she is not experiencing an emergency medical situation.

REMSA currently has 6 CPs, who have a collective case load of approximately 40 patients in addition to the Evaluate and Refer calls (approximately 41 calls from February 2014–June 2014[2]). ***Table 2*** shows details of the CPs' functions and training.

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[2] Data obtained from REMSA Q8 Self-Monitoring report.

Table 2. HCIA CP Functions and Training

Characteristic Type	REMSA Community Paramedic Role
Title	Community paramedic
Minimum qualifications	Paramedic certification, additional CP education
Functions	Health education (individual) Direct service delivery Medication management Patient monitoring and follow-up Service coordination
Established continuing education program	Paramedics in general are required to receive continuing education credits, and each CP is trained and licensed.

CP = Community Paramedic; HCIA = Health Care Innovation Award; REMSA = Regional Emergency Medical Services Authority.

Component 2: ATA

The ATA provides patients who call 911 and meet certain eligibility criteria for a low-priority case with transport to an alternate facility (i.e., not an ED). The process for transport to an alternative location is complex. When a patient calls 911 and it is determined that the call is of a medical nature, an ambulance is immediately dispatched to the patient's location. While the ambulance is en route, the emergency medical dispatcher (EMD) follows a protocol to determine the urgency of the patient's situation and to help him or her prepare for the ambulance's arrival. Upon arrival, paramedics assess whether the patient has a medical emergency and needs immediate transport to the ED. If the patient does not have a medical emergency, paramedics will conduct an advanced assessment, using their Sansio electronic medical record (EMR) software, to determine whether a patient is clinically eligible to go to an alternative destination (e.g., urgent care center, community triage/detoxification center, mental health hospital). If a patient is eligible for an alternative destination, his or her insurance status is determined, and the alternative destination that accepts the patient's insurance is queried to determine whether space is available. If all three of these factors are confirmed, (1) the patient is clinically eligible, (2) the patient has insurance that the alternative destination will accept, and (3) space is available at the destination, then the patient will be asked to consent to transport to the alternative destination instead of the ED. If the patient consents and is transported to an alternative destination, a positive outcome is measured by both the avoided ED visit and whether the patient does not experience repatriation (being transported to the ED) within 6 hours of transport to an alternative location.

Component 3: NHL

The third component of this complex intervention is the NHL, which is an alternate number (775-858-1000) being marketed by Washoe and surrounding counties as an alternative to 911 for nonemergency situations. Callers to the NHL with low-acuity problems gain access to a registered nurse who can answer their questions, and nurse navigators, who use algorithm-based protocols, will triage the call and determine the appropriate level of care. Callers can reach the NHL either directly or by being routed to the nurse navigators if they call 911 but are assessed as a no-acuity case (an Omega protocol).

Omega protocols are also a part of this component; they are no-acuity protocols (REMSA has adopted 40 of them) for conditions like colds, ankle sprains, and so forth that do not require transport to an ED. When a patient dials 911, an ambulance is immediately dispatched, and the EMD asks a series of protocol questions to determine the patient's priority/acuity level. If the EMD determines that the patient is a no-acuity, Omega patient, he or she will transfer the call to the NHL for the nurse navigators to speak with the patient and offer advice for what the patient can do for his or her medical conditions (e.g., visit your physician during office hours, go to an urgent care center). In the pilot phase, the ambulance still went to the patient's location even if the patient was determined to be an Omega, and the paramedic conferred with the nurse navigators at the NHL and took over patient assessment. When the program officially launched (planned for December 1, 2014), at the point where the EMD determines that the call is an Omega and switches it over to the NHL, the ambulance will be called off and will not go to that caller's location.

Supporting Element: HIT

HIT is a supporting element of all three components of the innovation (CP, ATA, NHL). REMSA is currently finalizing the purchase of a new system (i.e., ZOLL) that the ground paramedics will use as their primary EMR. Each program component uses a different system, none of which are currently linked. The EMDs use a computer-assisted dispatch system that tracks elements of a 911 call (e.g., logging the time between the call and the ambulance arrival, pre-arrival instructions, a Global Positioning System for locating patients, other logistical support). The paramedics on the ambulance or helicopter use the EMR (currently in Sansio, with the transition to ZOLL expected over the summer of 2014) to enter patient data. The CPs use this same system to enter their patient encounters. The NHL uses a system called Low Code, which logs specific information about each received call and provides detailed information such as patient demographics, current complaint, availability of a regular source of care, and a question asking patients to specify what they would have done had they not called the NHL (i.e., was an ED visit diverted?). REMSA also recently added a question to obtain payer source information from each caller. A major issue for REMSA is that none of these systems are currently linked. However, a local hospital partner (Renown Health) has offered to build a platform to integrate REMSA with its Epic HIT system so that CPs, in particular, can enter information about patient contacts that the hospital (and collocated providers) can access. REMSA also plans to focus on system linkages during the final year of HCIA funding so that the program components become increasingly integrated.

Supporting Element: Community Outreach

Another crucial supporting element of the REMSA innovation is community outreach. REMSA has focused on educating the public and clinical partners about the availability of the NHL and, as noted in the previous section, has seen a tremendous increase in use. (REMSA had projected 2,500 calls per year in its application.) For the NHL, REMSA initially performed a soft launch in September 2013 by distributing brochures to key organizations such as retirement homes, senior centers, and so forth. In October 2013, REMSA ran an advertisement for the NHL that was delivered via TV, radio, and the newspaper. The ad describes an emergency situation to help the public determine when to call 911 (i.e., there is an emergency) and when alternative types of care are warranted. The response to the ad was overwhelming; the NHL quickly went from receiving only a few calls per day to more than 2,000 calls per month.

1.1.2 Program Participant Characteristics

REMSA's target population includes the general public that resides in the urban, suburban, and rural areas of Washoe County, as well as individuals in Washoe County who overuse the ED (i.e., hotspotters) and the ambulance services. The specific target populations for each component differ slightly. For the ATA component, REMSA targets individuals who have dialed 911 for a condition or situation that could be addressed at an alternative location and does not require transport to the ED (i.e., their condition is not medically emergent).The CP program focuses on patients who are discharged from the hospital with serious conditions (e.g., CHF, COPD), and the NHL is a nonemergency resource available to everyone interested in obtaining advice and referral from a skilled provider. (Although the NHL was meant to serve Washoe County, Nevada, REMSA has found that because the number is listed on the Internet, the NHL has received calls from California, other Nevada counties, and as far away as Maine and even Canada.) ***Table 3*** shows the available demographic information for patients in each component. As shown in the table, about one-half (48.5%) of patients were between 25 and 64 years of age, and 63% were female. Patients' race/ethnicity were not included in the data file. ***Table 4*** displays the counts of the patients planned for inclusion in the innovation. About 65% of patients enrolled in CHP are in the ATA component.

Table 5 displays the number of multiple encounters for each of these components. Because of the nature of the ATA and NHL components, each individual encounter is considered separately, and an individual can have more than one encounter. The table reflects the number of unique patient encounters for each of these components.

Table 3. Characteristics of REMSA Patients Included in the Patient Identifier Data File

Characteristic	Number of ATA Patients[1,2]	Number of CP Patients[3]	Number of NHL Patients[1,4]	Total Number of Patients	Total Percentage of Patients
Age					
0–18	4	0	850	854	24.7
19–24	26	2	317	345	10.0
25–44	151	16	639	806	23.3
45–64	172	81	618	871	25.2
65–74	40	44	187	271	7.8
75–84	7	36	114	157	4.5
85+	8	71	65	144	4.2
Sex					
Female	99	118	1,749	1,966	57.0
Male	309	132	1,041	1,482	43.0

Source: Patient-level data provided to RTI by REMSA in July 2014.

[1] This number includes only ATA patients who were assessed and actually transported to an alternative location.

[2] ATA and NHL patients can be duplicated, as each assessment and transport (ATA) or call (NHL) is considered a unique event. The number of duplicates for ATA are 58 individuals with >1 encounter, and the number of duplicates for NHL are 111 individuals with >1 encounter.

[3] For the purposes of this report CP Patients are considered those who enrolled and had at least 1 home visit.

[4] This number includes NHL patients for whom a Low Code Protocol was initiated.

ATA = Ambulance Transport Alternatives; CP = Community Paramedic; NHL = Nurse Health Line; REMSA = Regional Emergency Medical Services Authority.

Table 4. Patients Planned for Inclusion in Innovation (Denominator Data)

Innovation Component	Patient Type	Data Source	Current Cumulative Count
CHP (all components)	All CHP requests	REMSA self-monitoring plan and patient-level data provided to RTI by REMSA May–July 2014.	29,411
CP	All patients referred to CP program	Patient-level data provided to RTI by REMSA May–July 2014.	634
ATA	Total number of ATA assessments done in the field by paramedics	Patient-level data provided to RTI by REMSA May–July 2014.	18,973
NHL	Total calls to NHL and Omega Calls	REMSA self-monitoring plan	9,780

Source: Patient-level data provided to RTI by REMSA July 2014.

ATA = Ambulance Transport Alternatives; CHP = Community Health Program; CP = Community Paramedic; NHL = Nurse Health Line; REMSA = Regional Emergency Medical Services Authority.

Table 5. Multiple Encounters in the ATA and NHL Component by Individuals, and Resulting Total Encounters

Number of Encounters	ATA Patients with Multiple Encounters	NHL Patients with Multiple Encounters
2	34	101
3	13	5
4	7	2
5	2	0
6	0	1
7	1	1
8	0	1
9	0	0
10	0	0
11	1	0
TOTAL number of patients (and multiple encounters)	58 (163 multiple encounters)	111 (246 multiple encounters)

Source: Patient-level data provided to RTI by REMSA in July 2014.
ATA = Ambulance Transport Alternatives; NHL = Nurse Health Line; REMSA = Regional Emergency Medical Services Authority.

1.2 Implementation Progress

The extent to which each awardee can implement its innovation as planned and reach a sufficient number of patients will be critical to assessing the innovation's impact on the triple aim. The following section provides details on the implementation process and its effectiveness, and ***Table 6*** lists the measures RTI plans to use in assessing each.

Table 6. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for REMSA

Key Evaluation Domains	Subdomains	Measures	Data Source
Implementation process	Care coordination	Repatriation to ED	ATA (ATA 06)
		Evaluate and refer patients sent to ED by CP	CP (CP 04)
		Number of protocols completed with callers	NHL (NHL 01, 02, 03)
		Number of patients receiving nonambulance referral	NHL (NHL 04)
		Number of calls transferred from NHL to 911/repatriation	NHL (NHL 07)
		Number of patients referred to CPs	CP (CP 04)

(continued)

Table 6. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for REMSA (continued)

Key Evaluation Domains	Subdomains	Measures	Data Source
Implementation process (continued)	Patient characteristics	Increase in patient-reported quality of life	CP (CP 09)
		Number of emergency requests classified as Omega cases	ATA/NHL (AIM 03)
Implementation effectiveness	Reach	Number/percentage of clinically eligible patients	ATA (ATA 03)
		Number/percentage of 911 calls	ATA (AIM 02)
		Number/percentage of NHL callers	NHL (NHL 05)
		Total Washoe County population	NHL and ATA (AIM 07)
	Dose	Number of clinically eligible patients transported to ATA (by type)	ATA (ATA 03)
		Number of encounters/CP visits	CP (CP 01)
		Number of services provided	CP
		Number of program-level (CHP) requests	All (AIM 01)

ATA = Ambulance Transport Alternatives; CHP = Community Health Program; CP = Community Paramedic; ED = emergency department; NHL = Nurse Health Line; REMSA = Regional Emergency Medical Services Authority.

1.2.1 Process

The implementation process has been the initial focus of the evaluation. RTI defines *implementation process* as including execution of implementation, organizational capacity, engaging key staff and partners, and client recruitment and enrollment. The implementation process is best evaluated through a combination of data variables, including execution of implementation that conforms with operational plans, and capacity for implementing the innovation effectively and on time. We focused on the implementation process during the awardee site visit (June 10 and 11) and asked evaluation questions such as the following:

- What is the overall execution of the innovation implementation (e.g., what is the actual rate of expenditures relative to the projected rate?)? What is the rate of enrollment relative to projection? What are the lessons learned?

- What accomplishments are specific to hiring or training staff so that the organization can build its capacity to implement the innovation effectively?

- What is the implementation effectiveness, including fidelity, reach, and dose of the innovation thus far?

Execution of Implementation

Implementation of the REMSA innovation was at a disadvantage from the start because of delays in receiving the award. Because of special circumstances that led to the HCIA negotiations lasting for more than 6 months, the award was not actually received until December 2012 (other awardees typically received their awards in June or July 2012). These delays can devastate project initiation because new staff cannot be hired, contracts with key partners cannot be instituted, and other aspects of the innovation that require government funding (e.g., transports to alternative locations) cannot be started. Because HCIA was funded for only 3 years, losing at least half of the first year of implementation could greatly affect REMSA’s ability to demonstrate outcomes in priority measures by the end of the project.

Regardless of this delay in the award, REMSA self-funded the first 6 months of start-up to the extent possible so that upon award, it would be ready to implement program components. Negotiations with local health care providers and training efforts were already under way. All three components were initiated by the end of June 2013. For each component, we describe the execution of the innovation, recognizing that important evaluation measures are specific to care management because this is what each will need to impact to influence key outcomes (***Table 6***).

Component 1: CPs

For this innovation, CPs provide follow-up care to patients recently discharged from the hospital for conditions most likely to require readmission or ED visits after discharge. Patient enrollment in this program began in June 2013. CPs work closely with the nurse navigator at Renown Health to obtain daily rosters of patients who are eligible for the program (i.e., Washoe County residents) and to visit the patients to recruit them into the program. Current CPs report that the face-to-face interaction before discharge from the hospital has been much more successful in enrolling patients than calling them on the phone after discharge, because patients seem to be less skeptical when having initial face-to-face contact. Patients who consent are enrolled for 30 days. During that time, CPs check in with the patients through in-home visits to assess their current vital signs, to reconcile medications, to assess their blood panels to identify risk for a declining health condition, and to communicate findings to cardiologists. The patients are also given the opportunity to call the CPs 24 hours a day (i.e., instead of calling 911) if they are feeling worse so the CP can assess them. In certain cases, the CP may assess the patient either by phone or in person and determine that the patient should indeed call 911. In March 2014, only 4 of the 41 enrolled in the CP program were transported by ambulance to the ER, according to REMSA’s Q7 Self-Monitoring report.

Implementation of the CP role has encountered barriers, particularly because it is a new role for paramedics. At first, paramedics were unsure of their desire to adopt this role because it was a big shift from their usual scope of work. REMSA sought its most seasoned paramedics for this role because they would have the best clinical experience and the best ability to assess patients in different situations. The six current CPs agree that the new role does require a paramedic with extensive field experience who can quickly assess patient situations. Because paramedics are used to being in critical situations in which they quickly assess the patient and take him or her to the hospital (i.e., "load and go"), transitioning to this new role of providing follow-up care to patients who are no longer in an urgent medical situation has been a big shift. One barrier to this role being firmly established was lack of protocol for difficult situations. CPs noted that they typically operate with very specific protocols and do not make medical decisions about patient care. The new chief medical officer (CMO) at REMSA had been working to establish protocols and, as new ones were established, the CPs could provide care to more patients. As an example, CPs started by focusing their care on CHF patients who were being discharged from the hospital and expanding care to those with COPD and high users of the ED (hotspotters). REMSA was actively working to expand service delivery for CPs so a broader array of patients could be served. (The Evaluate and Refer component was just getting started at the time of the site visit, and protocols had recently been completed.) No information is currently available on the implementation of the new Evaluate and Refer program because it was launched in April 2014.

From October 2013 through March 2014, the CPs have enrolled between 24 and 41 patients per month into the program. With development of new protocols, REMSA has been slowly adding to its rosters (e.g., COPD, post-MI, hotspotters) so that enrollees increased from 30 in January 2014 to 41 in March 2014. ***Table 7*** shows the number newly enrolled patients in the CP program, and the number of contacts to the CPs each quarter for both phone calls and home visits. As the table shows, the number of new patients enrolled in the CP program has steadily increased. The awardee attributes this to greater awareness among providers of the CP services, ability to expand to additional types of patients (e.g., just added "Evaluate and Refer" patients), and high patient satisfaction (i.e., word of mouth).

Table 7. Number of Contacts (Home Visits, Phone Calls) Made by the CPs, by Quarter

Quarter	Number of Patients Newly Enrolled in CP Program	Number of Phone Calls Tasked to CP (from CP Patients)	Number of Home Visits Made by CPs[1]
Quarter 4	14	59	140
Quarter 5	58	340	320
Quarter 6	75	499	468
Quarter 7	103	505	371
Total	250	1,403	1,299

Source: Patient-level data provided to RTI by REMSA in July 2014.

[1] Due to the way the data was provided to RTI, we only have the number of home visits done and the day they started. All home visits for a patient are being counted in the quarter that the first home visit occurred.

CP = Community Paramedic; REMSA = Regional Emergency Medical Services Authority.

Component 2: ATA

This program component will have the most difficulty in demonstrating an effect on outcomes within 3 years simply because of what REMSA is attempting to do. The ATA component's primary goal is reducing the proportion of people who are transported to the ED unnecessarily (i.e., their condition is not medically emergent), and patients began being assessed for alternative transport in January 2013.

The notion of taking patients to any location other than an ED is against social norms in the United States (i.e., we have been taught to call 911 in an emergency and expect to be taken to the ED), so patients have been reluctant to agree to this change. Although 2,482 911 responses were coded as Priority 3 (i.e., low acuity) from January to March 2014, only 9% of those patients who dialed 911 and were assessed and determined clinically eligible agreed to go to a location other than an ED (REMSA's Q7 Self-Monitoring report). This change has also required paramedics to accept a new role by not always taking patients to the ED (i.e., "load and go"). REMSA has experienced challenges with this change because it requires paramedics to identify another location that may be willing to accept a patient, obtain the patient's insurance information, determine which location may accept the patient (and be open), call the location to ensure space, and transport the patient to a location that may be farther away than the ED. Barriers to patients using alternative locations, in addition to the changes in social norms for both patients and paramedics, have included the following:

- Lack of capacity among urgent care centers in the area (e.g., hours of operation)
- Limited availability of other locations that will accept uninsured and/or Medicaid patients

- Time involved for paramedics to identify another location, ensure that the patient would be accepted upon arrival, and transport him or her there
- Current payment models for reimbursement of patient transport to non-ED locations

One of the methods of measuring success of this component is the number of times an individual needs to be taken to the ER within 6 hours of having been transported to an alternative location, called repatriation. Only 3.6%[3] of all ATA patients have experienced repatriation.

Table 8 displays the number of ATA assessments performed by quarter, and the result of those assessments (transport to an alternative location, eligible for transport but refused, repatriated). A large number of patients who are eligible for transport to an alternative location refuse and want to be transported to the ED, because that is what the general public expects will happen when they dial 911. Societal norms about where an individual who has a nonemergent medical issue needs to be seen will have to be changed for this component to be generally accepted.

Table 8. Number of Patients Assessed for ATA Transport, the Result of the Assessment, and Repatriation, by Quarter

Month	Patients Assessed for ATA Transport and Transported to an Alternative Location	Total Number of Patients Eligible for Transport to an Alternative Location that Refused	Total Number of Assessments Made for the ATA	ATA Patients Transported to an Alternative Location Who Were Then Transported to the ED (Repatriated)*
Quarter 1	0	—	0	0
Quarter 2	4	—	11	0
Quarter 3	39	—	56	0
Quarter 4	76	—	1,995	5
Quarter 5	111	—	5,754	2
Quarter 6	91	—	5,542	4
Quarter 7	87	—	5,615	4
Total	408	—	18,973	15

Source: Patient-level data provided to RTI by REMSA in July 2014. *Data obtained from REMSA Q7 Self-Monitoring report.
ATA = Ambulance Transport Alternatives; REMSA = Regional Emergency Medical Services Authority.
— Data not yet available

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[3] The numerator (n=15) was obtained from self-monitoring reports for quarters 4-7 while the denominator (n=408) was obtained directly from data REMSA sent to RTI when they provided patient level data in July 2014.

Component 3: NHL

The NHL is staffed by experienced and well-rounded registered nurses (RNs) with hospital and clinic experiences, and some telephonic medicine experience, and began receiving calls in September 2013. The overall call volume for the NHL increased dramatically starting in November 2013, after REMSA released advertisements for the service. A large proportion of the callers are new mothers or patients questioning whether their children need to go to the ED. ***Table 9*** shows the total number of calls made directly to the NHL (and Omega Calls transferred to the NHL), the number of protocols initiated, the number of protocols completed, the number of patients receiving a nonambulance referral, and the number of calls transferred to 911 from the NHL, per quarter. The increase in use of the NHL component over time by the population demonstrates the need the population has for an avenue to obtain medical advice about situations the general population perceives as nonemergent.

Table 9. NHL Call Activity and Dispositions, by Quarter

Quarter	Total Calls to NHL and Omega Calls[1]	Number of Calls to the NHL with a Low Code Protocols Initiated (Percentage of total[2])	Number of Low Code Protocols Completed by NHL[1] (Percentage of total[2])	Number of Patients Receiving a Non-ambulance Referral by NHL[1] (Percentage of total[2])	Number of Calls Transferred from the NHL to 9-1-1[1] (Percentage of total[2])
Quarter 4	—	0	—	—	—
Quarter 5	—	28	—	—	—
Quarter 6	2,405	975 (40.5%)	919 (38.2%)	739 (30.7%)	158 (6.6%)
Quarter 7	7,375	1,787 (24.2%)	1,617 (21.9%)	1,260 (17.1%)	357 (4.8%)
Total	9,780	2,790 (28.5%)	2,536 (25.9%)	1,999 (20.4%)	515 (5.1%)

Source: Patient-level data provided to RTI by REMSA July 2014.
[1] Data obtained from REMSA Q7 Self-Monitoring report.
[2] Each of these percentages is based on the denominator of Total Calls to NHL and Omega Calls
NHL = Nurse Health Line.
— Data not yet available.

Supporting Element: HIT

The HIT element of this innovation is complicated to implement because none of the currently existing systems can interact. Each component uses a different system, in addition to the fact that billing and quality assurance occur on the fourth and fifth systems (ZOLL and FirstWatch, respectively).

REMSA is starting to simplify the HIT that this innovation uses. The ground and air paramedics (who conduct the ATA assessments) and the CPs will be getting a new EMR system (built by ZOLL), which will be able to integrate into the Renown Health Epic EMR to exchange information. Another issue is the ability for the current systems to interact with the Nevada Health Information Exchange (a health information exchange system). Currently, health exchanges are not developed to understand the work or the language used by EMS. REMSA is working with the engineer at ZOLL to determine whether this problem can be fixed in building the new EMR.

Supporting Element: Community Outreach

The implementation of a strong community outreach program has been instrumental in introducing the components of this innovation to the target population. A community outreach plan was developed that included a strong marketing component with press conferences and radio and TV advertisements. This campaign centered on educating the public about what constitutes an emergency situation (and a nonemergency situation) in an effort to begin to change social norms about when it is appropriate to call 911 and when to seek medical advice from a nonemergency phone line, urgent care center, or PCP. The success of this campaign can be seen in the jump in the number of calls to the NHL that occurred in November, 2013, when the campaign was launched.

Although the external marketing component focused on educating the target audience about the NHL, some significant internal (within REMSA) marketing was also necessary. Employees are the ambassadors of this innovation, and it is extremely important to change the social norms of emergency medicine within the organization, so that when the paramedics and emergency personnel are in public, they can enforce the messages that the target population sees.

Organizational Capacity and Leadership

REMSA is a nonprofit EMS provider that began service in Washoe County, Nevada, in 1986 and has a strong commitment to providing the best patient care possible. This innovation has a clearly designated leader with the requisite experience, skills, and authority to marshal resources and make decisions. The project director, Ms. Brenda Staffan, has significant experience working for ambulance companies, understands the billing and policy aspects, and has both a local and national perspective on issues regarding emergency medicine. This innovation has a high level of leadership support across all levels of the organization; the chief executive officer (CEO), CMO, managers, supervisors, and coordinators all understand the innovation and can articulate their direct involvement.

Upper-level leadership has changed several times since the grant was awarded. The first change was the retirement of the CEO and the installation of the new one in January 2013. Based on discussions during the site visit, this change did not affect the daily workings of the innovation because both CEOs fully support the program components, and the new CEO is familiar with and committed to the innovation. The second leadership change was the CMO, which occurred in November 2013. The previous CMO was well liked and respected and had a collegial relationship with the CPs; his departure left many questions regarding the direction that the innovation would take. However, the new CMO, Dr. Brad Lee, has integrated into the organization well and supports the innovation. At the time of the site visit, the CPs felt the innovation was on track with its original goals, and they were comfortable with the leadership changes.

1.2.2 Workforce Development

The innovation at REMSA was built on a strong existing staff in an industry in which training and continuing education are of utmost importance.

Hiring and Retention

To appropriately staff the grant management and the implementation of each component of the innovation, REMSA hired from both outside of and within the organization. Upon receiving the grant, REMSA immediately hired a project director from outside the organization who has significant experience in the ambulance company business. This project director handles the overall grant management. Hires from outside the REMSA organization also occurred for all of the NHL positions. A clinical operations manager with experience in telephone triage was hired to oversee the RNs working at the NHL, and six RNs were hired as nurse navigators for the NHL. Although there has been turnover for the nurse navigators, REMSA maintains desired staffing levels.

For the CP component of the intervention, REMSA staffed from within and hired nine of its best and brightest paramedics to participate in the CP training program. As of the site visit, six of the nine CPs are still involved with the program, and no new CPs have been trained.

The ATA innovation did not require hiring additional personnel; it involves training current emergency services personnel to successfully implement a new protocol.

Training

During the site visit, RTI determined that training is a high priority for REMSA, both because of this intervention and because it is imperative for emergency service providers to be proficient in their skills. Significant resources (time, financial, equipment, physical space) have been dedicated to support rigorous training programs for the CPs and the NHL nurse navigators.

The current CPs went through a 16-week training program that REMSA supported with the University of Nevada, Reno, to ensure that participants received continuing education credits. The program included a classroom component, community components, and clinical work with local physicians. On the basis of experiences with that initial group of CPs, RTI was told during the site visit that the next group of CPs will undergo a shorter training program (potentially 4 weeks) and do preceptorships with current CPs. NHL nurse navigators received training on both the emergency dispatch system and on Low Code, the NHL system that provides protocols for the appropriate low- and no-acuity conditions that are to be routed to the NHL. CPs and nurse navigators also keep their paramedic certifications and nursing licenses current by obtaining continuing education credits.

The ATA intervention affects all personnel who respond to emergency calls; thus, all ground paramedics and EMTs have been trained on the protocol, because they are all expected to conduct an advanced assessment (when appropriate) on each emergency call to which they are dispatched.

1.2.3 Implementation Effectiveness

A major aspect of the evaluation will be to assess the effectiveness of the intervention in terms of the extent to which it is implemented as planned (fidelity) and patients have been exposed to the innovation. Their exposure will be measured through reach (i.e., the extent to which the total number of targeted patients is reached) and dose (i.e., the degree to which each patient is exposed to services provided).

Fidelity

Nearly all of the components are implemented according to the original plan and are being provided to intended program targets as designed, with the level of experience, qualifications, and training consistent with intended levels of quality and service standards. Because this innovation involves continuous quality improvement, REMSA is constantly assessing and revising program components to address concerns as they are identified.

Reach

From the start of the innovation through March 31, 2014, REMSA had a total of 22,013 contacts with patients through the three components of this intervention (Patient-level data provided to RTI by REMSA May–July 2014). This number is defined as patients who have been "touched" by any REMSA service and could include duplicate counts. The total local population is 429,908, which includes people who have never used 911 services (i.e., this is not the best denominator for calculating this innovation's reach). An additional complication of determining reach is that many people who are not located in Washoe County are accessing the NHL. The NHL advertises on the radio and TV, and with a Website, and it reports receiving calls from other counties in Nevada and California. The Website has even brought in calls from as far east as Maine. RTI will work with REMSA to determine the pool of patients that should be considered as the total target population. ***Table 10*** presents the total reach for each program component since project launch, including the total patients enrolled in CP with at least one home visit, the number of ATA patients assessed and transported, and the total number of NHL callers where a Low Code protocol is initiated. REMSA's success in reaching patients for the CP and NHL components is increasing over time; however, although the number of individuals assessed for transport to an alternative location has increased each quarter for the ATA component (see Table 8), there has been a decrease in patients transported to alternative locations between Q5 and Q7.

Table 10. Patient Reach for Each Quarter Since Project Launch

Quarter	Total CP Patients Reached (CP Patients Enrolled and At Least One Home Visit)	Total ATA Patients Reached (Assessed and Transported)	Total NHL Patients Reached (Calls to the NHL where a Low Code Protocol is Initiated)	Total CHP Patients Reached
Quarter 2	—	4	—	4
Quarter 3	—	39	—	39
Quarter 4	14	76	0	90
Quarter 5	58	111	28	197
Quarter 6	75	91	975	1,141
Quarter 7	103	87	1,787	1,977
Total enrolled as of March 2014	250	408	2,790	3,448

Source: Patient-level data provided to RTI by REMSA July 2014.
ATA = Ambulance Transport Alternatives; CHP = Community Health Program; CP = Community Paramedic; NHL = Nurse Health Line; REMSA = Regional Emergency Medical Services Authority.
— Data not yet available.

Dose

Any innovation that involves delivering direct services to participants needs to assess the extent to which those participants have actually been exposed to the new services. This intensity of services (e.g., frequency, duration) provided to participants are combined with outcome data (e.g., from claims analysis) to determine whether increasing exposure (or exposure at all) to the innovation is associated with changes in outcomes. Both the ATA and NHL program components consist of a single contact (even if an individual calls 911 or the NHL multiple times, he or she will be considered a unique contact); therefore, no patients are "enrolled" in the program. REMSA is currently exploring ways that the dose can be determined for recipients of these programs, although at this time, there are none.

Patients enrolled in the CP program receive multiple visits or calls from the CPs regularly over the 30-day enrollment period. Most patients are visited between 7 and 10 times during enrollment in the program, and they can call the CPs at any time of day or night (i.e., a CP is always on call) for medical issues or questions. ***Table 11*** summarizes the contacts (home visits and phone calls) to patients enrolled in the CP program from June 2013 through March 2014. On average, CPs have 10 contacts with enrolled patients via home visits and phone calls.

Table 11. Average Number of Services Received by Patients Enrolled in the CP Program, June 2013–March 2014

Types of Patient Contact	Average Number of Services Per Patient
Home visits	5.21
Phone calls	5.61

Source: Patient-level data provided to RTI by REMSA July 2014.
CP = Community Paramedic.

1.3 Evaluation Outcomes

Awardees have three possible types of quantitative data that RTI will use in assessing the impact of the awardee's innovation on key outcomes. These include claims data for Medicare and/or Medicaid beneficiaries, depending on who the awardee serves, and administrative or utilization data the awardee is collecting (which we have categorized as "other awardee specific data" reflecting the variability of the types of data elements available across awardees). We are in the process of finalizing our assessment of all the available data sources and requesting data directly from each awardee. As those data are received, we will incorporate the findings into our quarterly/annual reports. For REMSA, we have already obtained both patient identifiers so that we can present claims data, as well as other patient-level data presented below. The following sections present descriptive findings from the quantitative outcome data provided to RTI and cleaned as of September 11, 2014.

1.3.1 Measures for Evaluation

After the site visit, the data management and site visit teams met to review each measure listed in the awardee's self-monitoring measurement plan. The measures listed in ***Table 6*** (page 11) and ***Table 12*** reflect the measures determined as most relevant for our evaluation of REMSA's innovation.

Table 12. Outcome Measures Requested from REMSA

Key Evaluation Domains	Subdomains	Measures	Data Source
Health Care Outcomes	Utilization	ED visit rate	Claims
		ED visits during CP enrollment	Claims
		Ambulance transports to ED	All (AIM 05)
		Priority 3 ambulance transports to ED	ATA (ATA 04)
		All-cause admission rate (CP program)	Claims
		Readmission rate (CP program)	Claims
		Postdischarge patients readmitted within 30 days	Claims
	Cost	Spending per patient	Claims
		Cost savings	Claims

ATA = Ambulance Transport Alternatives; CP = Community Paramedic; ED = emergency department; REMSA = Regional Emergency Medical Services Authority.

1.3.2 Claims Data

As part of a broad assessment of health care innovations, CMMI is assessing the impact of its programs, including those funded specifically by HCIAs, on four core measures. The four core measures are

- health care spending per patient,
- hospital inpatient admissions,
- hospital unplanned readmissions, and
- ED visits.

Collectively, it is anticipated that CMMI programs will slow the increase in health care spending, reduce hospital admissions, reduce avoidable hospital readmissions, and prevent unnecessary ED visits. We are reporting these measures for all HCIA Community Resource Planning awardees so that the collective impact of the awards can be assessed. As discussed below, some awardees' innovations may not be focused on these measures. Other awardees' innovations target specific conditions (e.g., imaging, diabetes) and may have significant impacts on spending, admissions, readmissions, and ED visits for the targeted conditions but not have a statistically detectable impact on the measures at the aggregate level because the targeted conditions represent only a small fraction of total spending, inpatient admissions, and ED visits.

The measures are calculated through analysis of Medicare and Medicaid fee-for-service claims. Because of differences between Medicare and Medicaid patients in age, other demographic variables, and disease status, we report the Medicare and Medicaid results separately below. Currently, complete Medicare claims are available through the end of 2013. Medicaid claims for REMSA are available through the first quarter of 2013, although claims for the final quarter may not be complete. The REMSA ATA innovation was launched on December 10, 2012, but only a handful of patients were seen in that month. Therefore, for purposes of this analysis, we treat the effective enrollment date as January 1, 2013.

- **Health Care Spending per Patient.** For Medicare beneficiaries, health care spending per patient includes Parts A and Part B Medicare expenditures for persons enrolled in the Part A and Part B fee-for-service program. The variable focuses on Medicare fee-for-service spending, so Medicare managed care (Part C) services are excluded, as are beneficiary copayments. Medicare Part D prescription spending is also excluded. Spending is reported on a per-person per-quarter basis. If a beneficiary is not enrolled for every month in a quarter, spending (except for hospital inpatient spending) is prorated to a quarterly basis based on the number of days enrolled during the quarter. Because hospital inpatient admissions are both rare and expensive, spending is not prorated for hospital inpatient spending. Prorating is also not performed for beneficiaries who die during a quarter.

For Medicaid beneficiaries, health care spending per patient is reported for fee-for-service beneficiaries. Beneficiaries are only included in the analysis for spending (and the other measures) during periods when they are enrolled in Medicaid.

- **Hospital Inpatient Admissions**. This variable measures hospitalization, the single most expensive component of health care spending. Patients kept overnight in observation beds are excluded from this measure. Inclusion criteria for the analysis are the same as for spending. Hospital inpatient admissions are not prorated based on the number of days eligible during the quarter. All-cause inpatient admissions are reported. The mean quarterly admission rate per 1,000 patients is reported.

- **Hospital Readmissions**. Hospital readmission rates serve a dual purpose in evaluating HCIA impacts. Readmissions add to the costs of a prior hospitalization, and they often reflect a problem in the care provided during the first admission. All-cause readmissions are defined as a follow-up admission to any short-term acute general or long-term care hospital within 30 days of a discharge from another hospital of the same type. We ignore multiple admissions within 1 day of an initial admission because these often represent transfers between hospitals. We define index hospitalizations that begin during the quarter and follow each index admission for 30 days, even when the follow-up period extends beyond the end of the quarter. Inclusion criteria for the analysis are the same as for spending. The readmission rate equals the number of readmissions divided by the number of index hospitalizations during the quarter. Planned readmissions are excluded from the calculation of the numerator. Quarterly mean readmission and Ambulatory Care Sensitive Conditions (ACSC) readmission rates per 1,000 admissions are reported.

- **ED Visits**. ED visits are sometimes viewed as a symptom of the inability of the community's health care system to provide adequate preventive and ambulatory care visits. We report an all-cause ED visit rate that excludes ED visits resulting in an inpatient admission (which presumably represent unavoidable visits) and includes overnight ED visits without an inpatient admission. Inclusion criteria for the analysis are the same as for spending, and ED visits are also subject to the same prorating formula as for spending. The mean quarterly ED visit rate per 1,000 patients is reported.

Medicare Claims Analysis

The analysis focuses on 57 Medicare beneficiaries enrolled in the REMSA—ATA innovation through March 2014 who were enrolled in fee-for-service Medicare Parts A and B at some point during 2013. The analysis uses data from the CMS Chronic Conditions Data Warehouse (CCW). We present the measures for these beneficiaries in the quarters before and after the ATA innovation was launched on January 1, 2013. Analyses on the CP and NHL innovations, which were launched late in 2013, will be presented in later reports.

Table 13 reports Medicare spending per patient in the eight quarters before and the four quarters during and after the launch date.

Table 13. Medicare Spending per Patient: REMSA: ATA

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
1C1CMS330971	REMSA												
	Spending rate	$5,297	$6,159	$5,722	$5,155	$4,363	$3,871	$7,384	$8,163	$8,920	$5,189	$6,870	$5,188
	Std dev	$11,792	$11,529	$9,820	$11,800	$12,881	$7,549	$17,497	$15,517	$13,034	$7,778	$11,741	$8,351
	Unique patients	48	49	50	51	50	49	52	53	53	54	57	56
Comparison Group													
1C1CMS330971	REMSA												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—

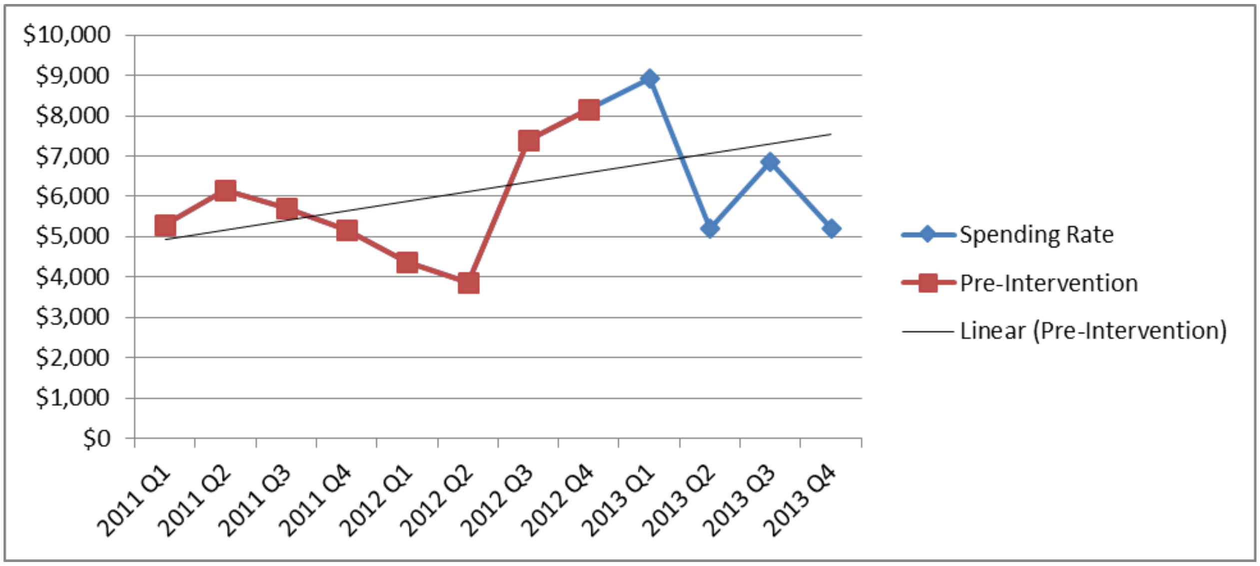
Savings per Patient

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: REMSA began enrolling patients on 1/1/2013. I1 is 2013 Q1. Spending rate: total quarter (i.e., quarterized) payments/number of unique patients. Savings per patient: difference in comparison minus the intervention’s average spending rates.
— Data not yet available.

Figure 1 plots spending as a function of time. The red line represents values in quarters prior to the innovation's launch date on January 1, 2013, and the blue line represents quarters during and after launch. The graph includes a trend line based on a linear regression (with an intercept and time trend) of prelaunch values.

Figure 1. Medicare Spending per Patient: REMSA: ATA



The trend line for spending increases due to aging of the sample population (because we analyze the same individuals before and after the innovation was launched) and general medical care inflation. Although spending is higher than the trend line for the first quarter during and after launch, spending is below the trend line in later quarters. We have not yet tested whether postlaunch spending is statistically different than trend values. As shown in Table 1, the standard deviation for spending is very high, representing the skewed nature of expenditures and the relatively small number of observations for the ATA innovation. We will estimate the statistical impact of the innovation in later reports as more data become available.

The all-cause inpatient admissions rate per 1,000 participants is shown in ***Table 14*** and ***Figure 2***.

Table 14. All-Cause Inpatient Admissions Rate per 1,000 Enrollees: REMSA: ATA

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

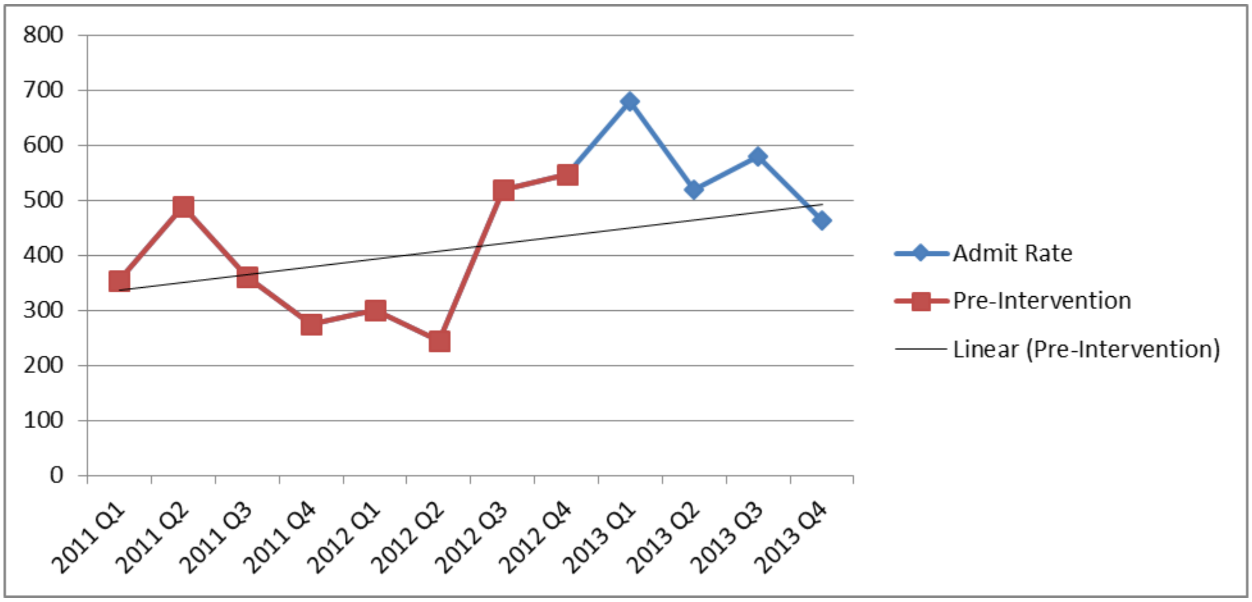
Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
1C1CMS330971	REMSA												
	Admit rate	354	490	360	275	300	245	519	547	679	519	579	464
	Std dev	758	982	693	777	863	596	1,000	1,084	1,052	926	1,149	852
	N. of patients	48	49	50	51	50	49	52	53	53	54	57	56
Comparison Group													
1C1CMS330971	REMSA												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: REMSA began enrolling patients on 1/1/2013. I1 is 2013 Q1. Admit rate: total unquarterized admissions/number of unique patients.
— Data not yet available.

Figure 2. All-Cause Inpatient Admissions Rate per 1,000 Enrollees: REMSA: ATA



The inpatient admission rate (***Figure 2***) increases in the launch quarter before declining over the next three quarters; spending is below the pre-intervention trend line by the fourth quarter after launch. Without statistical testing and a better-defined comparison group, it is premature to conclude that the innovation caused the increase; we will examine this question as the evaluation continues and more data become available.

Hospital readmission rates per 1,000 admissions are shown in ***Table 15*** and ***Figure 3***.

Table 15. Hospital Readmission Rates per 1,000 Admissions: REMSA: ATA

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
1C1CMS330971	REMSA												
	Readmit rate	250	333	200	429	455	125	412	235	286	133	353	0
	Std dev	433	471	400	495	498	331	492	424	452	340	478	0
	Total admissions	8	12	10	7	11	8	17	17	14	15	17	11
Comparison Group													
1C1CMS330971	REMSA												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total admissions	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

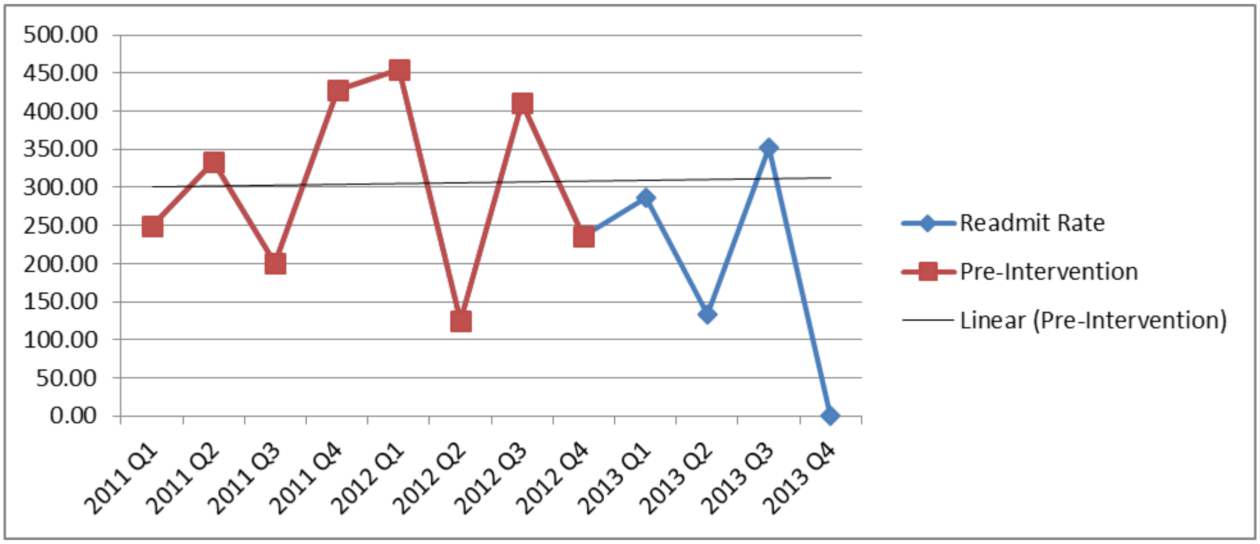
Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.

Note: REMSA began enrolling patients on 1/1/2013. I1 is 2013 Q1. Readmit rate: sum of all readmissions to eligible hospital within 30 days/all admissions in the quarter. Total admissions: all eligible admissions in the quarter.

— Data not yet available.

Figure 3. Hospital Readmission Rates per 1,000 Admissions: REMSA: ATA



Readmission rates are highly variable before and after the launch of the innovation, reflecting the relatively small number of hospital admissions for participants during each quarter. With few admissions (the denominator in the readmission rate) and a relatively low underlying percentage of readmissions, the readmission rate exhibits a high variance over time. As with the other variables, we will include statistical tests on the readmission rate in subsequent reports as more data become available.

ED visits per 1,000 participants are shown in ***Table 16*** and ***Figure 4***.

Table 16. ED Visits per 1,000 Participants: REMSA: ATA

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

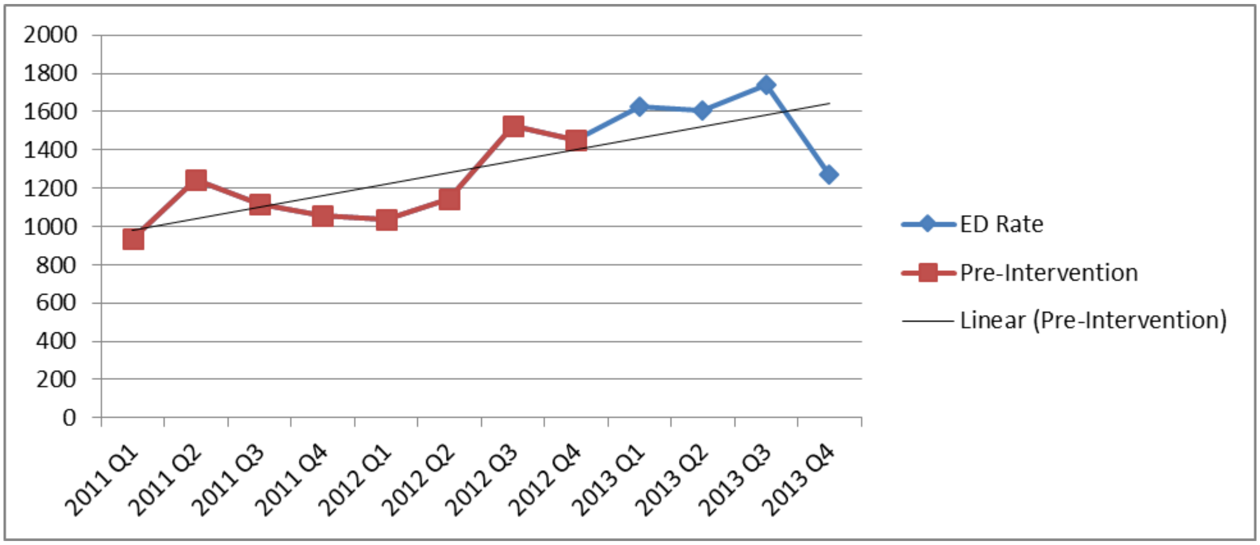
Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
1C1CMS330971	REMSA												
	ED rate	938	1,245	1,120	1,059	1,040	1,143	1,526	1,453	1,623	1,605	1,743	1,268
	Std dev	1,687	1,671	2,953	2,167	2,228	2,610	4,337	2,536	2,897	2,066	2,783	2,937
	N. of patients	48	49	50	51	50	49	52	53	53	54	57	56
Comparison Group													
1C1CMS330971	REMSA												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: REMSA began enrolling patients on 1/1/2013. I1 is 2013 Q1. ED rate: total quarterized ED visits and observation stays/number of unique patients.
— Data not yet available.

Figure 4. ED Visits per 1,000 Participants: REMSA: ATA



The ED visit rate (***Figure 4***) follows an increasing trend prior to launch, and the rate remains close to the trend in the first three postlaunch quarters before falling in the fourth quarter. As with the other variables, we will include statistical tests on the ED visit rate in subsequent reports.

Medicaid Claims Analysis

The Medicaid data analysis will use data from the CMS Alpha-MAX data files. Currently, Medicaid claims for REMSA are only available in Alpha-MAX through the first quarter of 2013, and claims for that final quarter may not be complete. Because, the REMSA innovation was launched on January 1, 2013, and claims for that quarter are not complete, we are not presenting measures for Medicaid patients in this report. We will provide Medicaid analyses in subsequent reports as more data become available. We will report tables and figures similar to those for Medicare.

Discussion of Claims Analysis

The four measures provide descriptive data on patients enrolled in the REMSA innovation before, during, and after the launch of the innovation. Although it is necessary to report these measures to support CMS's broader assessment of its full portfolio of innovation projects, the measures may not provide a complete evaluation picture of the REMSA innovation. There are a number of reasons for this. First, the REMSA ATA innovation was launched on January 1, 2013, but some participants were not seen until later in the year. In future analyses, we will account for the participants' first date of participation. Second, we do not yet have claims data for participants in REMSA's CP and NHL innovations, which began later than the ATA. We will analyze these innovations in later reports. Third, the simple trend lines provided in the figures represent trends for REMSA ATA patients before launch of the innovation. They do not control for external factors that coincide with the innovation launch and affect the measures both for REMSA and for other providers or patients. As described below, we are developing additional comparison groups for REMSA. Finally, each of the four measures has a high standard deviation, suggesting that it may be difficult to statistically distinguish between innovation effects and random fluctuation. This problem is compounded by the relatively small number of REMSA participants.

Development of Comparison Groups

The comparison groups for REMSA will vary by innovation. For ATA, we currently have information for persons who are eligible for and accept ATAs. We may be able to obtain identifiers for persons who are eligible for but decline transport alternatives. This information would allow us to compare the four core measures for the two groups. We expect that ED visits will be the core measure most likely to be affected by the ATA. We will also analyze the impact on ED and ambulance spending. These components may be significantly affected by ATA, whereas any impact on total spending per patient may not be statistically detectable, because of the underlying variation in total spending.

For CP, about half of the persons referred to the innovation enrolled in the program, while the other half declined to participate. If we can obtain identifiers, the decliner group may be a strong comparison group. If identifiers are not available, we will use propensity score matching to match participants with nonparticipants who appear to meet the eligibility requirements (persons with congestive heart failure, COPD, or high use of services) for the CP innovation.

For NHL, the best approach may be to compare ED visits in Washoe County before and after the NHL went live. The NHL is designed to reduce ED visits that could otherwise be treated on a nonemergency basis. It is not clear that this innovation would have an effect on hospital admissions because the program is designed to only divert minor problems from the ED. These minor problems would be unlikely to result in inpatient admissions. The NHL comparison could be done using claims data for all Medicare and Medicaid beneficiaries in Washoe County. Alternatively, the comparison could use data on ambulance trips from REMSA or data on ED visits from Washoe County hospitals.

1.3.3 Other Awardee-Specific Data

In mid-June 2014, following the data review meeting, RTI met with REMSA to request the raw patient-level data that were used to generate the measures in ***Tables 6*** and ***12***.

Overview of Data Received

We received data from REMSA in early July 2014. We did receive most of the data we requested. At the time of this report, we are awaiting patient-level outcome data for the two data elements that are not based on claims data (i.e., ambulance transports to ED and Priority 3 ambulance transports to ED).

Health Indicator Outcomes

We are continuing to work with the data received from REMSA. Most of REMSA's outcome measures will be based on claims data, and we have not yet received the other (nonclaims) outcome data. Once we receive those data, we will complete ***Table 17***, which will show the total number of REMSA ambulance transports by quarter, the total number of Priority 3 (low priority) transports to the ED, and the percentage of overall ambulance transports to the ED that were Priority 3.

Table 17. Number of Overall and Priority 3 of Ambulance Transports to the ED, by Quarter

Quarter	Number of Ambulance Transports to the ED Overall	Number of Priority 3 Ambulance Transports to the ED	Percentage of Overall Ambulance Transports to the ED that were Priority 3
Q1	—	—	—
Q2	—	—	—
Q3	—	—	—
Q4	—	—	—
Q5	—	—	—
Q6	—	—	—
Q7	—	—	—

Source: Data to be provided to RTI by REMSA.
ED = emergency department; REMSA = Regional Emergency Medical Services Authority.
— Data not yet available.

Discussion of Other Awardee-Specific Findings

Once we receive outcome data from REMSA, we will be in a better position to discuss findings related to the other awardee-specific data.

1.4 Overall Program Effectiveness to Date

REMSA's CHP is a complex innovation that has three unique components seeking to reduce costs and improve care for patients with nonemergent conditions by keeping them out of the ED, while providing them with appropriate care and advice specialized to their condition. The three components, the ATA, the NHL, and the CP program, are each freestanding programs whose elements complement each other.

The strengths of REMSA's innovation are summarized in this report and include the following:

- Significant organizational support, demonstrated by their ability to self-fund for the first 6 months of the grant so that implementation was not delayed when funds came through. This organizational support is also clearly demonstrated in the protocol changes that affect the day-to-day operations of the organizations, in furtherance of the goals of the innovation.
- Dedicated and knowledgeable staff, both existing and newly hired, who (based on the component of the innovation) dedicate 100% of their time to the innovation.
- Established training and continuing education programs for all paramedics and nurses, which have been updated to include aspects of the innovation.
- Internal quality assurance and improvement checks, which are the norm in emergency medicine, have been used in the innovation regularly to ensure appropriate use of the new protocols.

The implementation of the innovation and program components has proceeded at a good pace. The awardee noted how they focused on implementing each individual program component first and, during the last year of funding, will be focused on integrating the components to better leverage staff and resources. While this issue is currently being addressed with a vendor, a limitation of this innovation is the current technology system's inability to integrate across the three program components. Based on information learned during the site visit, REMSA's new ZOLL system should provide better communication between systems.[4] Other limitations, which are out of REMSA's hands, include the slow speed at which cultural norms (e.g., patients' beliefs that if they call 911, they should be taken to the ED) are changed and the need for multiple aspects to align in the ATA component (patient consent, space availability at alternative location, insurance status) for an alternative transport to be achieved.

REMSA is assessing the impacts of this innovation. At this point in the evaluation, the data are inconclusive, because there has not been enough time to track the impact of the implementation. We will continue to track REMSA's progress as they move forward with the innovation and evaluation plans.

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[4] We learned in a follow-up telephone call with REMSA in July 2014 that they had not moved to ZOLL as planned. We will verify with the awardee when and if this transition occurs.

October 2014

Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring

Annual Evaluation Report

South County Community Health Center

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OVERALL EVALUATION SUMMARY

RTI International was selected to lead an independent evaluation of the 24 Health Care Innovation Award (HCIA) awardees categorized as Community Resource Planning, Prevention, and Monitoring (Community Resource). In this role, RTI is conducting an in-depth evaluation of each innovation, as well as a cross-site evaluation that includes similar innovations targeting the same priority outcomes (e.g., emergency department [ED] visits). For each of the 24 awardees, this report presents findings from the first year of the evaluation (beginning September 23, 2013, and including data obtained by RTI as of September 11, 2014). The report is based on multiple data sources, including operational reports, self-monitoring plans, site visits, and quantitative data analysis.

The evaluation methods vary by awardee innovation, based on the type of innovation and availability of data. RTI has reviewed and coded all existing documents from the awardees through December 31, 2013, and incorporated that knowledge into each awardee's overview. Our review included the awardees' original applications for funding, original and current operational and self-monitoring plans, and quarterly narrative and monitoring reports. For this annual report, we incorporated activities reported through the awardee's seventh quarterly report (i.e., through March 31, 2014).

Between April and August 2014, teams of at least two staff from the RTI team visited all 24 awardees for 2 to 4 days, depending on the number of interviews conducted. Teams included a subject matter expert, with training and experience specific to the awardee's innovation, and a master's- or bachelor's-level colleague to take notes. Before each visit, the teams reviewed all available documentation from the awardee to learn about the innovation's goals, objectives, and status. The purpose of the site visits was to clarify our understanding of the innovation, obtain detailed information on the implementation process, and review awardee-specific data to determine which elements to incorporate into the evaluation. By August 13, 2014, all 24 awardees had been visited and a thorough description of our findings included in each of the 24 awardee sections.

In addition to the site visits, we report quantitative data from two possible sources for several awardees. First, we present findings from claims analysis for awardees in this report if they both provided us with patient identifiers and reported enrolling participants who are Medicare and/or Medicaid beneficiaries. RTI has obtained patient identifiers from most of the 24 awardees to conduct claims analysis. Second, we present data RTI obtained directly from awardees to quantify their work in addressing health care costs, quality, and patient outcomes. Data from additional awardees will be analyzed and presented in future reports, as data become available and awardees enroll sufficient participants. An update on the availability of Medicare/Medicaid claims and other awardee-specific data, analysis of data available to us and cleaned as of September 11, 2014, a summary of the comparison groups, and a list of draft evaluation measures are included in each awardee section.

1. HCIA COMMUNITY RESOURCE AWARDEE: SOUTH COUNTY COMMUNITY HEALTH CENTER

1.1 Introduction

South County Community Health Center[1] is a community health center in Palo Alto, California, that received an award of $7,060,843 and began enrolling patients in January 2013. It has the following goals:

1. **Enhance access** to chronic disease services to successfully manage care and utilization.
2. Plan and manage care for complex patients to **improve health and reduce costs**.
3. Create and implement a **workforce development** and training coordination deployment plan.

RTI is conducting an in-depth case study for this innovation. As part of that case study, two RTI team members conducted a site visit in April 2014; before and after the visit, our team reviewed all documentation on the innovation. We are working to obtain data directly from the awardee to assess many of the variables we discuss. This report describes findings from RTI's site visit, document reviews, follow-up calls, and analysis of data obtained and cleaned by RTI through September 11, 2014. We start by describing the innovation's components and the patients targeted by the awardee.

1.1.1 Innovation Components

This single-site, care coordination innovation is complex and has transformed South County's internal care coordination processes, staff roles, and clinic flow. The innovation involves both care coordination changes within the clinic and increased linkages with community resources, primarily linkages with South County's partners. The innovation includes the following range of patient care coordination components:

- initial risk stratification to assign a patient a risk category based on his or her health condition and a follow-up comprehensive health assessment conducted at the time of an initial appointment to further clarify each patient's risks and barriers to care;
- panel management that prioritizes "super-high"– and "high"-risk patients to receive more concentrated services;
- tailored care management services and health coaching for patients at "high" or "super-high" risk and/or high users of the emergency department (ED) through a registered nurse (RN) care coordinator; and
- intensified referrals and linkages, including "warm handoffs" to the awardee's partners for patients with behavioral health or substance abuse issues or in need of

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[1] Also referred to as Ravenswood in some documents; South County is the legal name.

additional resources such as housing and transportation (see ***Table 1*** for a list of partners).

South County's care coordination innovation focuses on providing care coordination to treat or prevent complications of chronic diseases, such as diabetes, high blood pressure, heart disease, and asthma. The innovation has required an entire change to South County's patient flow and the systems within the organization; therefore, every South County patient experiences the innovation, although higher-risk patients receive more concentrated attention from health coaches than lower-risk patients.

Table 1. HCIA Partners, Roles, and Locations

Partner Name	Role in HCIA Project	Location
Nuestra Casa	Case management for those needing specialized services such as housing and transportation	East Palo Alto, CA
Voices of Recovery (VOR)	Substance abuse and recovery peer support	Belmont, CA
San Mateo County Health System Behavioral Health & Recovery Services (BHRS)	Clinical psychiatric medication management, mental health therapy, and counseling	San Mateo, CA

Source: RTI site visit, April 2014.
HCIA = Health Care Innovation Award.

Component 1: Comprehensive Health Assessments

When South County applied for a Health Care Innovation Award (HCIA), its staff planned to target all of the patients they had seen who were part of the Health Plan of San Mateo (HPSM). At the time of South County's application, its staff estimated that 70% of the total patients were part of HPSM, which would allow South County to track the use of services, such as admissions and ED visits. Because the innovation has required a total transformation of care, South County quickly learned that to implement the panel management as planned, staff needed a better way to assess patients at the first appointment. South County also recognized that many patients initially included in the counts were no longer active patients. To better assess patients from the start, South County recently revamped how patients are "admitted" and created the role of "health navigators," who complete a comprehensive health assessment form with new patients before the first appointment or with returning patients who have not already been assessed. Items collected through this form and entered into the electronic health record (EHR) system (called NextGen) include a thorough personal and family medical history, current chronic conditions, prescribed medications, allergies, and patient barriers to care.

Component 2: Panel Management and Family Practice Care Teams

Before the innovation, patients went through a typical family practice care process: they made appointments, saw a provider, and received treatment for the issue at hand. South County's highest-risk patients have multiple health problems that are often exacerbated by many social and economic barriers to health. Therefore, the central component of South County's innovation is population-based panel management to manage care for all patients, with intensified care management services for patients with chronic diseases and complex patients. Health center staff members are organized into family practice care teams that include family practice health care providers (nurse practitioner, physician's assistant, or physician), medical assistants, and health coaches/panel managers.[2] These teams work collaboratively to manage and provide care and treatment, as well as proactive care plans, for panels of patients.[3] The panel management design at South County was guided by the patient-centered medical home framework, which emphasizes providing high-quality medical care that is patient centered, comprehensively addresses patient needs, is delivered by a team of coordinated health care professionals, and increases patients' access to services in the clinic and in the community.

Panel Management

Every patient at South County is assigned to a primary care provider (PCP) when registering as a patient to make an appointment. Through this assignment, each patient is assigned to a family practice care team's patient panel.[4] Each panel has approximately 2,000 to 3,000 patients.[5] Panel managers work with their family practice care team to manage and track their respective patient panel. Panel managers set time aside, away from direct services delivery, to conduct panel management activities. These activities include using South County's disease registry program (i2iTracks) and EHR system to ensure that patients are scheduled for timely appointments and laboratory tests, maintaining the disease registry and reviewing the panel regularly with the care team, tracking internal and external referrals, and meeting with care teams at least once a month to discuss the panel.

Family Practice Care Teams

Family practice care teams also deliver direct medical services together. Each day, one "teamlet" of team members is scheduled to provide services. A teamlet includes a single provider, medical assistant, and health coach/panel manager who work together to provide care for the patients who have appointments that day. These teams meet daily to talk about the patients who are scheduled to be seen that day. Before each day's huddle, the health coach/panel manager reviews (or "scrubs") the charts to identify necessary services, such

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[2] Health coaches and panel managers are the same person, but these two titles describe the different tasks for which they are responsible.

[3] Source: Family practice care teams document provided by South County at the April 2014 site visit.

[4] Note that since the site visit in April 2014 South County has added pediatric care teams.

[5] Source: Site visit interview with the South County medical director.

as specific laboratory tests, and to anticipate anything else that each patient might need. The health coach/panel manager reviews this information with the other team members to help prepare the team for the day’s patients.

Component 3: RN Care Coordinator and Health Coaches

Care management is part of every component of the South County innovation; however, two specific resources are now provided to patients to help improve two aspects of care: (1) reducing the use of ED visits by having an RN care coordinator work with the Stanford University Medical Center ED (Stanford) and (2) accessing follow-up care to help make long-term changes to health risks through health coaches.

RN Care Coordinator

South County recently established the role of an RN care coordinator after finalizing an agreement with Stanford to share patient information. The nurse navigator works directly with the Stanford ED to manage South County patients who visit the ED. At the time of the site visit in April 2014, she had just begun the process of identifying frequent ED users who are also South County patients and was working to reach out to them to determine which preventive measures could be taken to avoid more ED use. She was working with ED staff to manage shared patients and provide follow-up care with the goal of reducing ED visits over time. This aspect of care management was relatively new at South County at the time of our visit, but respondents expressed optimism that they would be able to reach at least 100 patients by July 2015 through this service.

Health Coaches

During an appointment with the family practice care team, patients are offered health coaching with the goal of helping patients set goals for their health (e.g., losing weight, quitting smoking) and improving self-management of chronic conditions. Individualized health coaching is tailored based on patient needs, timing, and availability of a health coach. Health coaches may meet with patients before, during, and after a visit with their PCP. Some established patients and some new patients see a health coach before their appointment. During a patient’s preappointment meeting with the health coach, the health coach helps them set an agenda for the appointment and encourages the patient to be prepared to actively participate in the appointment. Either during each patient’s appointment (if there is time) or at a follow-up health coaching appointment, the health coach will provide tailored education to patients on healthy lifestyle choices, preventive health maintenance, and medication management; make sure that patients understand and agree with the provider’s instructions discussed during the visit; develop or review customized care plans that include patient-driven health goals and action plans; and address any barriers to care, often by linking the patient to local resources. Two weeks after the visit, the health coach will contact high-risk patients to follow up on each patient’s concerns, needs, and progress on their care plans and completion of their self-management goals.

In quarter 3 (Q3, January–March 2013), South County piloted panel management and health coaching with high-risk diabetes patients.[6] There are no strict eligibility requirements to receive health coaching services, but patients with chronic diseases or high needs are prioritized. Most often, patients are identified for health coaching during their appointment. The provider identifies patients either by using a risk stratification scale that quantifies a patient's health risk by several domains, classifies patients by risk level ("low-complexity risk," "moderate risk," "high risk," and "super-high risk"[7]), and refers the high- and super-high–risk patients to receive health coaching, or by judging that the patient could benefit from health coaching services. During our site visit, respondents shared that patients have responded positively to the health coaching component of the intervention. Staff reported that patients appreciate having one-on-one time to discuss their health and their goals. Sometimes patients proactively contact the clinic to request health coaching sessions. Health coaches use any of the developed tools to empower patients to change behavior for the benefit of their health: care plan, after-visit summary, self-management plan, and action plan.

Care Plan

When a patient receives health coaching, the care team develops a patient care plan. The care plan is intended to be used by the staff to help manage the patient and is not typically provided to the patient. A care plan template in South County's EHR is used to document the plan and is populated as staff gather information (e.g., health history, barriers assessment). The template tracks comprehensive information, including the date the health assessment was completed, barriers to care, whether the patient has signed consent to release information to referral agencies and has been referred for other services, patient medications, and health maintenance services that the patient has completed or needs to complete (e.g., mammography, Pap smear, vaccines). Staff document this information in several templates in the EHR, and they use the customized template to generate a complete care plan document for that year.

After-Visit Summary

After a visit, patients receive an after-visit summary that includes information about what happened at the appointment, information about their medications, and any necessary follow-up.

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[6] Source: Q3 narrative progress report.

[7] Source: Risk stratification elements document provided to RTI from South County during the April 2014 site visit.

Self-Management Plan

The provider initiates the self-management plan during the patient's appointment. The provider and the patient agree on one or more self-management goals (e.g., lose weight, adhere to medications), and the patient receives a paper copy of the self-management plan at the end of the visit.

Action Plan

During a health coaching session, the health coach leads the patient through an action plan template to help him or her develop a personalized action plan. The goal of this plan is to empower the patient to identify ways to take responsibility for improving his or her health (e.g., lose weight, better control diabetes). First, the health coach reviews the self-management plan and, through motivational interviewing, helps the patient identify a priority goal or goals that he or she wants to work on first. The action plan is used to provide the patient with small, doable steps to achieve one or more of the goals identified in the self-management plan. For example, a patient's self-management goal could be to get his or her glycated hemoglobin (HbA1c) below 7, and the action plan could be to improve food choices. The action plan template includes prompts to the patient to enter the details of the chosen action. The health coach will follow up with the patient about his or her progress with completing the action plan.

Component 4: Community Resources Referrals

South County is partnering with three key community organizations—Nuestra Casa, Voices of Recovery (VOR), and the San Mateo County Health System Behavioral Health & Recovery Services (BHRS)—to provide more intensified and immediate referrals and linkages for patients who need assistance with behavioral health or substance abuse issues or who need help accessing nonhealth resources, such as transportation, housing, and food assistance. To help facilitate patient information sharing between South County and partner organizations, during Q2, South County developed a patient referral consent form that patients can use to consent to be referred to a partner organization,[8] as well as consent to exchange health information. South County also developed referral forms for each partner organization.

The partnerships with VOR and BHRS have been particularly active with increased referrals of patients to these services. Interviews during our site visit indicated that incorporating Nuestra Casa into the patient care process at South County has been more challenging, primarily because its health promoters do not have a background in health care and are, therefore, in need of additional training to work with South County patients. The awardee is working to address this challenge.

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[8] Source: Q2 narrative progress report.

- Nuestra Casa is a community-based organization that is using multilingual, multicultural health promoters to provide South County patients with referrals and linkages to community resources (e.g., housing, employment, transportation).

- VOR is a peer-to-peer recovery support agency that provides group recovery support and helps participants who are dealing with health issues and recovery.

- BHRS provides direct behavioral health and recovery services for referred South County patients.

1.1.2 Program Participant Characteristics

Because the innovation is transforming the care process, all current South County patients are exposed. At first, the target population (for the purpose of evaluating the program) included 6,183 patients[9] who were current patients of South County and had the HPSM at the time of South County's application.[10] The challenge with using this number as the denominator is many of those patients have moved out of the area, died, or are otherwise not seeking services from South County. We are working with the awardee to determine which population of patients to use in calculating outcomes.

The total number of patients receiving the innovation (i.e., who completed a comprehensive assessment *and* care plan) as of March 2014 was 1,073 of the 6,183 target patients (17%).[11] Once we have reviewed and cleaned the patient-level data from South County, we will update ***Table 2*** to show the characteristics of the patients enrolled in the innovation.

Table 2. Characteristics of All Patients Enrolled in the Innovation

Characteristic	Number of Patients	Percentage of Patients
Age		
< 18	—	—
18–24	—	—
25–44	—	—
45–64	—	—
65–74	—	—
75–84	—	—
85+	—	—
Missing	—	—

(continued)

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[9] This number was adjusted from 6,200 as of the Q5 report.

[10] In its self-monitoring plan, the awardee has not been providing the denominators for the statistics it is reporting, so it is challenging to know which patients are being counted. The awardee agreed during the site visit to clarify these numbers in future reports (starting in Q8).

[11] Source: Lewin Q7 data.

Table 2. Characteristics of All Patients Enrolled in the Innovation (continued)

Characteristic	Number of Patients	Percentage of Patients
Sex		
Female	—	—
Male	—	—
Missing	—	—
Race/ethnicity[1]		
White	—	—
Black	—	—
Hispanic	—	—
Asian	—	—
American Indian or Alaska Native	—	—
Other	—	—
Missing/refused	—	—
Payer Category		
Dually eligible	—	—
Medicaid	—	—
Medicare	—	—
Medicare Advantage	—	—
Uninsured	—	—

Source: Patient-level data provided to RTI.

[1] Consistent with the Standards for the Classification of Federal Data on Race and Ethnicity (http://www.whitehouse.gov/omb/fedreg_1997standards/), the table includes a combined race and Hispanic ethnicity category that is equal with other categories of race. South County provided a race variable with a Hispanic category, as well as an ethnicity variable with a Hispanic or Latino category. However, those indicated as Hispanic were not consistent across the two variables, so we combined them into one variable.

— Data not yet analyzed.

Based on an algorithm, patients are assigned a risk level from “low” to “super-high” risk because of diagnoses of multiple chronic diseases, medication use, ED utilization, and hospitalizations.[12] Based on this risk stratification or a physician’s judgment, patients receive varying levels of the innovation. Further, a patient’s set of health conditions determines the types of clinical services provided (e.g., patients with diabetes should receive a foot exam once a year). Therefore, the denominator used to measure each of South County’s services is different. ***Table 3*** specifies the denominators RTI will use to determine such variables as reach and dose of the innovation (e.g., the proportion of diabetes patients who receive health coaching). We will complete Table 3 for future reports after we have reviewed and cleaned the patient-level data from South County.

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[12] Source: Risk stratification elements document, provided to RTI at April 2014 site visit.

Because the innovation is an overhaul of the clinic workflow, the innovation will eventually affect all current and new patients. RTI learned during the site visit that data reporting has been a challenge for the awardee because it is working with a new EHR system, and staff entered data incorrectly. We expect the awardee's numbers to improve dramatically by the end of the next quarter because of its concerted efforts to increase reporting and correct missing data fields.

Table 3. Patients Planned for Inclusion in Innovation (Denominator Data)

Patient Type	Data Source	Current Count
Population of focus: current patients of South County who have had the HPSM at the time of South County's application	Self-monitoring data, Q7	6,183
Patients 18–75 years old with diabetes[1]	Self-monitoring data, Q7	722
Patients 18–85 years old who had a diagnosis of hypertension[1]	Self-monitoring data, Q7	779
Patients with diabetes, chronic obstructive pulmonary disease, coronary artery disease, and heart failure[1]	Self-monitoring data, Q7	610
Patients in intervention group who are identified as high risk, high cost, and high utilization	Self-monitoring data, Q7	798

Source: Q7 self-monitoring data.
[1] Within the population of focus.
HPSM = Health Plan of San Mateo; Q = quarter.

1.2 Implementation Progress

The extent to which each awardee is able to implement its innovation as planned and reach a sufficient number of patients will be critical to assessing its impact on the total costs and utilization (i.e., hospitalizations, readmissions, ED visits) of health care services. The following section describes implementation and effectiveness; ***Table 4*** lists the measures RTI plans to use to assess each. The table shows the explanatory or independent variables we plan to use to assess the impact on outcomes of the innovation.

1.2.1 Process

The implementation process has been the initial focus of the evaluation. RTI defines implementation process as including execution of implementation, organizational capacity, engagement of key staff and partners, and client recruitment and enrollment. The implementation process is best evaluated through a combination of data variables, including execution of implementation that conforms with operational plans, and capacity for implementing the innovation in a timely and effective manner. For this innovation, care coordination is a key subdomain of interest, including the number of patients assigned to a family practice team and those who completed a health assessment (***Table 4***). We focused on the implementation process during the awardee site visit (April 8–10) and asked such evaluation questions as the following:

- What is the overall execution of the innovation implementation (e.g., the actual rate of expenditures relative to the projected rate)?
- What accomplishments are specific to hiring or training staff so that the organization can build its capacity to implement the innovation effectively?
- What is the implementation effectiveness, including fidelity, reach, and dose of the innovation thus far?

Table 4. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for South County

Key Evaluation Domains	Subdomains	Measures	Data Sources
Implementation process	Care coordination	Number of patients assigned to PCP and/or to specific innovation interventions	EHR/i2iTracks
		Number of patients with completed comprehensive assessments	EHR/i2iTracks

EHR = electronic health record; PCP = primary care provider.

Execution of Implementation

Execution is the extent to which the innovation has been implemented according to plan. We use a number of data variables to assess execution, including the extent to which the innovation has encountered delays in implementation, the effectiveness with which the awardee is able to allocate staffing and resources to support the innovation, and the organizational capacity for implementation.

Overall, South County took longer than expected to start the innovation, primarily because of the complexity attempted and the degree to which staff had to be trained to transform the system. Reasons for delays included length of time required for staff trying to both operationalize the innovation into practice and adjust to the new system of care. Concurrent to initial implementation was initiation of a new EHR system, which also affected how staff were spending their time (e.g., attending trainings specific to the EHR) and how health services were provided. For these reasons, innovation implementation has also been more iterative than expected. For example, the roles of health coaches and panel managers have been revised throughout implementation, and South County added other staff (health navigators and staff development specialists) to the innovation to address unanticipated needs (see ***Section 1.2.2***, Workforce Development). Although the innovation has taken time to be fully operational across the organization, respondents described major changes to the entire system of care. The amount of buy-in and enthusiasm for the innovation was consistently voiced by respondents, and they noted that they are beginning to see improvements in patient satisfaction, staff satisfaction, and other short-term outcomes.

These delays have affected the awardee's ability to effectively use resources. South County is slightly below its projected expenditure rate (< 10%) as of Q7. The awardee piloted its innovation with a subset of patients with diabetes in July 2012 (Q3). After the pilot, South County scaled up the innovation, and now all patients are automatically enrolled, although high- and super-high–risk patients receive more innovation components. Since the innovation's inception through March 2014, the innovation has served 4,537 unique direct patients,[13] exceeding participant projection. However, assessing the extent to which patients have received services as a result of the innovation is more difficult to determine. Because the awardee is implementing a new EHR, its staff have discovered a lot of erroneous data (e.g., data entered in wrong fields) that are requiring them to revise and reassess medical chart information. This process is taking time, and for now, the data from the awardee are not an accurate representation of all that it has accomplished. RTI is working with the awardee to understand what data it has available and when it will be best to start obtaining those data for reporting to the Centers for Medicare & Medicaid Services (CMS).

Organizational Capacity and Leadership

The innovation is led by two key South County leaders: the chief executive officer (CEO) and medical director. Although the medical director had the "vision" to integrate panel management and health coaching into South County services, the CEO had the leadership and management skills to help operationalize the medical director's concept into a reality. The CEO has also been successful at uniting staff to make the innovation happen; nearly all staff members with whom we spoke were enthusiastic and relayed their support of the innovation. South County has extensive prior experience with federal, state, and local grants to undertake innovative health care services projects, including a diabetes demonstration that had some aspects similar to this current innovation. During the site visit, staff explained that the organizational culture of being adaptable and ready for change makes South County an ideal setting to pilot a health innovation project.

1.2.2 Workforce Development

As previously noted, workforce development is a critical component of this innovation. South County has established three new roles for several aspects of care coordination (i.e., health navigator, health coach, panel manager) to improve key health outcomes and has provided extensive training to the entire staff to accomplish a transformation in the care process. ***Table 5*** describes roles and responsibilities. South County relies on three key

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[13] Source: Lewin Q7 data.

partners to provide support and care coordination to patients through health promoters (Nuestra Casa), behavioral health care providers (BHRS), and recovery coaches (VOR).

Table 5. Community Health Worker Roles, Responsibilities, Minimum Qualifications, and Training[1]

Role	Responsibilities	Minimum Qualifications
Community health advocate[2]	Helps patients determine eligibility and assists with enrollment in health insurance or coverage (e.g., HPSM). Most often, patients meet with a community health advocate before their appointments	High school degree
Health navigator	Helps patients navigate through the administrative part of the health system. Completes the comprehensive health assessment (which includes the patient health history form and barriers assessment screening) with patients before their appointments. This information is entered into South County's EHR system. If health navigators identify barriers that need to be addressed for the patient to come to the appointment (e.g., transportation issues), they will try to help link them to or provide the patient with resources to help address the barriers (e.g., bus tokens)	High school degree Basic health coaching training
Medical assistant[2,3]	Performs standard back-office medical assistant duties, such as scrubbing charts (i.e., reviews the charts of patients who have appointments for the day to determine what their needs will be), taking patient vitals, preparing and cleaning exam rooms, documenting patient history and problems, and working with the teamlets to support patient self-management goals and do light coaching	High school degree Medical assistant certification Basic health coaching training
Health coach[3]	Receives referrals from providers for patients, focuses on those who are high risk or super-high risk.[2] Completes the community health assessment with patients if it has not yet been done. Helps develop a care plan (with a provider and medical assistant), after-care plan, and action plan (with the patient). Follows up with patients about their action plans 2 weeks after their visits. Assists patient with self-management and education of chronic disease, informal goal setting, counseling for health behavior change, and medication management	High school degree Medical assistant certification Advanced panel management/health coaching training
Panel manager[3]	Organizes the teamlets, scrubs charts, screens panels of patients to determine follow-up care needed for high-risk or super-high–risk patients, follows up with patients on their care plan progress	High school degree Medical assistant certification Advanced panel management/health coaching training

Source: RTI site visit, April 2014.

[1] Employed at South County, not at a partner organization.

[2] Role existed before the innovation.

[3] Health coaches and panel managers are the same staff, but they have different titles, depending on their role at hand. Health coaches and panel managers are all certified medical assistants.

EHR = electronic health record; HPSM = Health Plan of San Mateo.

South County's innovation has altered staff roles and added new staff positions. Through the new positions, South County is expanding the roles of community health workers to provide more holistic care, streamline the care coordination process, engage patients with preventive care, ensure that all employees are working at the top of their license, and guarantee that patients are not being "lost in the system." As mentioned earlier, South County developed panel manager and health coach roles to be filled by existing medical assistants and reorganized staff to work in family practice care teams. In addition, South County relies on three other types of community health workers to facilitate comprehensive patient care coordination, from the time individuals register as patients to after their appointments are over. These community health workers include both employees of South County and those of partners. Community health advocates, health navigators, medical assistants, health coaches, and panel managers are employees of South County who provide different functions in patient care (***Table 5***). Partner community health workers include Nuestra Casa health promoters and recovery coaches (VOR) (***Table 6***). South County was already using community health advocates to help patients access medical coverage and medical assistants to work with providers to deliver health care services.

South County serves a diverse community, primarily represented by African American, Tongan, and Latino patients. In line with its patient-centered approach, South County has put forth a concerted effort to hire community health workers who reflect the culture and first language (English, Tongan, Spanish) of their patients. Nuestra Casa's health promoters are hired specifically to conduct culturally competent and linguistically matched outreach and community education to African American, Tongan, and Latino patients.

Table 6. Partner Community Health Worker Roles, Responsibilities, Minimum Qualifications, and Training

Role	Responsibilities	Minimum Qualifications
Health promoter *(Nuestra Casa)*	For partner organization Nuestra Casa, receives referrals for patients who need assistance with a variety of issues, such as housing, food, transportation, and employment; conducts culturally appropriate health promotion classes, such as healthy cooking classes on Latin, African American, and Tongan cooking	High school education Trainings in the community, as required by Nuestra Casa
Recovery coach *(VOR)*	As a trained peer mentor for partner organization VOR, supports and coaches patients who are recovering from substance abuse and addiction; conducts WRAP sessions	WRAP recovery coach certification

Source: RTI site visit, April 2014.
VOR = Voices of Recovery; WRAP = Wellness Recovery Action Plan.

Hiring and Retention

As of March 2014, a total of 42 South County staff worked on the innovation, including 14 health coaches/panel managers/medical assistants; 9 management or administrative staff; 6 community health advocates; 4 information technology (IT) technicians/specialists; 3 health navigators; 2 pharmacy technicians; and one each of behavioral health worker, care transition specialist, clinical support staff, and physician, among other staff.[14]

The main hiring challenge has related to recruiting and hiring a psychiatric nurse practitioner. Two main challenges related to hiring this person include (1) the psychiatric nurse practitioner would be shared by BHRS and South County, so it took additional time for the two entities to develop and agree on a job description, and policies and procedures; and (2) there were few interested and qualified candidates. A psychiatric nurse practitioner was finally hired in December 2013 and started working in February 2014.

One byproduct of the expansion of community health worker roles is that lay health worker staff employed by South County have more opportunities to grow in their professions. Medical assistants, who were formerly relegated to back-office duties, can have more responsibility as health coaches and panel managers. Likewise, community health advocates and health navigators are encouraged to obtain their medical assistant certification to move into roles with greater responsibility.

Training

One of the three goals of South County's innovation is "to create and implement a workforce development and training coordination deployment plan." The innovation has required intense training because it has changed the roles and duties of all South County staff, as well as added new positions. At the site visit, we learned that because of the overarching workflow shift, one of the biggest challenges has been to train staff and support the new paradigm of health care service provision in South County. Not surprisingly, South County has devoted a lot of resources to training staff and enhancing its training and staff development program.

From the launch of the program through March 2014, South County has offered 34 trainings that have trained 367 participants for a total of 4,474 cumulative hours.[15] A sample of some of the training topics includes patient coaching and self-management, panel management, health education, motivational interviewing, peer-to-peer specialist training, quality improvement, and medication reconciliation, among many others.

The most highly attended trainings have centered on getting all South County staff on board with the innovation and training health care staff on health coaching and panel management. South County contracted the University of California San Francisco (UCSF)

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[14] Source: Lewin Q7 data.
[15] Source: Q7 narrative progress report.

Center for Excellence in Primary Care to train staff in health coaching, panel management, "Share the Care," and team building. During Q4 (April–June 2013), South County organized a massive, all-staff training to promote the innovation, engender staff buy-in, and ensure that all staff understood the new changes and expectations. In addition, 61 clinical staff, including providers, medical assistants, managers, and other health care staff, as well as partner staff from BHRS and Nuestra Casa, attended a 6-week, 20-hour training course on health coaching and panel management. This training was designed from the Bodenheimer health coaching/panel management techniques.[16] To ensure health coaching and panel management competency, South County established a testing and certification policy in which all health care staff were required to pass a written and oral health coaching exam conducted by UCSF trainers. Health care providers and health coaches/panel managers are required to pass with 80% or higher, and medical assistants and other staff are required to pass at 70% or higher. Staff are given the opportunity to retake the exam if they do not pass the first time.

Staff Development Department

South County has expanded its staff development department to develop, conduct, evaluate, and manage the considerable number of staff trainings necessary to implement this innovation. South County hired a staff development director in February 2013 and a curriculum developer in April 2014. South County also began using a Stanford Public Interest Network (SPIN) fellow to function as a staff development program assistant in March 2013.[17] The staff development department works with the quality improvement officer to identify training needs, standardize workflows and subsequent trainings, and ensure that necessary workflow changes are made. For example, South County staff noticed that the rate of foot exams for patients with diabetes was low, so the staff development department developed a new workflow protocol that indicated that medical assistants should conduct foot exams for diabetes patients. They conducted a new training and facilitated the implementation of the workflow protocol change.

1.2.3 Implementation Effectiveness

Fidelity

Since project award in July 2012, South County has made some changes to the original innovation concept. Although it has maintained the basic innovation vision of implementing panel management and health coaching, South County has made small iterative changes to the makeup of family practice care teams (i.e., how many and what kinds of staff), staff roles, and innovation components since the beginning of the innovation. The awardee's implementation process included trying systems, figuring out what did not work well,

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[16] Source: Bodenheimer, T., and Laing, B.: The teamlet model of primary care. Ann. Fam. Med. 5(5):457-461, 2007.

[17] Source: Q3 narrative progress report.

regrouping and discussing, and adapting the innovation to make it work. Given the complexity of the changes to the patient processes, implementation took more time than planned.

One significant change is that South County hired a RN care coordinator to follow up with South County patients who have been discharged from the ED. Her role is to review each patient's ED notes (if she can access them from the hospital[18]), contact the patient to review and ensure that he or she understands the discharge instructions, schedule the patient for a follow-up appointment with the PCP, and talk to the patient about the circumstances that brought him or her to the ED. The RN care coordinator educates the patient on the urgent care services that South County provides (e.g., same-day appointments, triage call line, after-hours clinic) so that patients understand South County's nonemergency urgent medical care services. The RN care coordinator's role is intended to help follow up on South County patients who go to the ED and to prevent unnecessary future visits to the ED.

Additionally, South County hired three health navigators in Q5 to provide support to the family practice care teams. Health navigators search through the clinic's schedule 2 weeks in advance to identify any high- or super-high–risk patients who will be coming in for an appointment. If the patients do not have all of their health forms completed, the health navigator contacts the patients and helps them complete the community health assessment form and consent forms to receive services from community partners.

Reach

South County's "target population" is defined as individuals who were current patients of South County and had the HPSM at the time of South County's application to receive CMS funding. However, all patients who receive medical services at South County are exposed to the innovation. Even the low- and moderate-risk patients' care is coordinated through panel management, and they receive health services via the teamlets. All high- or super-high–risk patients receive additional innovation components, such as health coaching, if they are high or super-high risk or if the provider thinks that an innovation component would benefit the patient. As of March 2014, 1,058 patients had completed comprehensive community health assessments (as opposed to 1,073 who had completed both a health assessment and a care plan) out of the original 6,183 target population patients (17.1%) (***Table 7***). Of the target population patients who have been identified as high risk, high cost, and high utilization (n = 798 as of March 2014), 55.6% have had a care plan initiated (***Table 8***). RTI is working with South County to clarify data elements and resolve inconsistencies.

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[18] Stanford ED has a patient health information exchange agreement with South County; San Mateo Medical Center does not have an agreement, and South County is having trouble accessing their ED records.

Table 7. Percentage of Target Population Patients Identified and Completed Comprehensive Assessments

Quarter	Target Population[1] (Denominator)	Cumulative Number of Unduplicated Target Patients with Completed Health Assessments[2]	Total Reach per Quarter (Column C Divided by B) (%)	Percentage Change from Previous Quarter
March 2013	—	—	—	—
June 2013	—	—	—	—
September 2013	—	—	—	—
December 2013	—	—	—	—
March 2014	—	—	—	—

Source: Data provided by South County.

[1] Individuals who were current patients of South County and had the Health Plan of San Mateo (HPSM) at the time of South County's application.

[2] Completed health assessment = had first appointment at South County and was seen by a health navigator (i.e., the denominator used in this calculation is not representative of the actual reach, which would be the number of new patients in the HPSM who had a first appointment).

— Data not yet analyzed.

Dose

Determining "dose" (i.e., the duration, length of time, and intensity of services received by each patient) for the South County innovation has been challenging. As previously mentioned, all patients who receive medical services at South County are exposed to the innovation. The lowest-risk patients are part of a managed panel and have their care coordinated through teamlets. Higher-risk patients may receive varying amounts of the innovation, but this is highly tailored to their health condition, risk stratification, and situational factors during their appointment (e.g., whether a health coach is available to meet with them). Once we have reviewed and analyzed the patient-level data provided by South County, we will complete ***Table 8*** to show the percentage of patients identified as high risk, high cost, and/or high utilization reached (received a care plan) by the innovation.

Table 8. Percentage of Target Population Patients Identified as High Risk with a Care Plan Initiated

Quarter	Number of Patients in the Intervention Group who are Identified as High Risk, High Cost, and/or High Utilization (Denominator)	Number of Patients who Receive a Care Plan[1]	Total Reach per Quarter (Column C Divided by B) (%)	Percentage Change from Previous Quarter
March 2013	—	—	—	—
June 2013	—	—	—	—
September 2013	—	—	—	—
December 2013	—	—	—	—
March 2014	—	—	—	—

Source: Data provided by South County.

[1] Initiated a care plan = had an appointment in which a provider initiated a care plan, thus enrolling the patient to receive health coaching.

— = Data not yet analyzed.

Table 9 summarizes the services provided and the available number of patients receiving services between January 2013 and March 2014. In addition to the dose for the patients overall, South County has been focused on providing concentrated services to patients with diabetes. At the time of our site visit, South County was working to train medical assistants to conduct annual foot exams and record them in the EHR. As of Q7, South County reported that 236 of the 722 patients with diabetes in the innovation (33%) had received a foot exam, and this number is expected to increase dramatically in the coming months.

Table 9. Number of Patients Receiving Specific Services between January 2013 and March 2014

Services Provided to Patients	Number of Patients Receiving Services	Denominator
Completed community health assessment—target population	1,058	6,183 (target population)
Completed community health assessment—high-risk population	456	798 (high-risk, high-cost, high-utilization patients)
Care plan initiated—high-risk population	444	798 (high-risk, high-cost, high-utilization patients)

Source: Quarter 7 self-monitoring data.

1.3 Evaluation Outcomes

RTI will use two types of quantitative data from awardees to assess the innovation's impact on key outcomes. These include claims data for Medicare or Medicaid beneficiaries, depending on who the awardee serves, and administrative or utilization data the awardee is collecting (which we have categorized as "other awardee-specific data," reflecting the variability of the types of data elements available across awardees). We are finalizing our assessment of all available data sources and requesting data directly from each awardee. As those data are received, we will incorporate the findings into our quarterly and annual reports. The following sections present descriptive findings from the quantitative outcome data available to RTI as of September 11, 2014.

1.3.1 Measures for Evaluation

The measures listed in ***Tables 4*** and ***10*** reflect the measures determined to be the most relevant for our evaluation of South County's innovation.

Table 10. Outcome Measures for South County

Key Evaluation Domains	Subdomains	Measures	Data Sources
Clinical effectiveness	Diabetes	Percentage of patients with diabetes who received a foot exam	EHR/i2iTracks
		Percentage of patients with diabetes who received a nephropathy screening test	EHR/i2iTracks
Health outcomes	Diabetes	Percentage of patients with diabetes who had hemoglobin A1c > 9.0%	EHR/i2iTracks
		Percentage of patients with diabetes, who have optimally managed modifiable risk factors	EHR/i2iTracks
Health care outcomes	Utilization	ED visit rate	Claims data
		ED visit rate that did not result in hospital admission, by condition	Claims data
		All-cause admission rate	Claims data
		Readmission rate	Claims data
		Number/percentage of patients defined as high risk, high cost, high use who had at least 3 PCP visits in the last 12 months	EHR/ i2iTracks
	Cost	Sum of total inpatient/hospitalization costs, ED visit costs, and specialty care visit costs	Aggregation and validation of data from multiple internal and external/ partner sources
		Spending per patient	Claims data
		Cost savings	Claims data

ED = emergency department; EHR = electronic health record; PCP = primary care provider.

1.3.2 Claims Data

As part of a broad assessment of health care innovations, the Center for Medicare & Medicaid Innovation (CMMI) is assessing the impact of its programs, including those funded by HCIAs, on four core measures:

- health care spending per patient,
- hospital inpatient admissions,
- hospital unplanned readmissions, and
- ED visits.

Collectively, CMMI programs are anticipated to slow the increase in health care spending, reduce hospital admissions and readmissions, and prevent unnecessary ED visits. We are reporting these measures for all HCIA Community Resource Planning awardees so that the collective impact of the awards can be assessed. Discussed as follows, some awardees' innovations may not be focused on these measures. Other innovations target specific conditions (e.g., medical imaging, diabetes); they may significantly affect spending, admissions, readmissions, and ED visits for the targeted conditions but not have a statistically detectable impact on the measures at the aggregate level because the targeted conditions represent only a small fraction of total spending, inpatient admissions, and ED visits.

The measures are calculated through analysis of Medicare and Medicaid fee-for-service claims. Because of differences between Medicare and Medicaid patients in age, other demographic variables, and disease status, we report the Medicare and Medicaid results separately as follows. Currently, complete Medicare claims are available through the end of 2013. Medicaid claims for South County are available through the third quarter of 2011. South County's innovation was launched in January 2013.

- **Health Care Spending per Patient**. For Medicare beneficiaries, health care spending per patient includes Parts A and B Medicare expenditures for persons enrolled in the Part A and Part B fee-for-service program. The variable focuses on Medicare fee-for-service spending, so Medicare managed care (Part C) services are excluded, as are beneficiary copayments. Medicare Part D prescription spending is also excluded. Spending is reported on a per-person per-quarter basis. If a beneficiary is not enrolled for every month in a quarter, spending (except for hospital inpatient spending) is prorated to a quarterly basis using the number of days enrolled during the quarter. Because hospital inpatient admissions are both rare and expensive, spending is not prorated for hospital inpatient spending. Prorating is also not performed for beneficiaries who die during a quarter.

  For Medicaid beneficiaries, health care spending per patient is reported for fee-for-service beneficiaries. Beneficiaries are only included in the analysis for spending (and the other measures) during periods when they are enrolled in Medicaid.

- **Hospital Inpatient Admissions**. This variable measures hospitalization, the single most expensive component of health care spending. Patients kept overnight in observation beds are excluded from this measure. Inclusion criteria for the analysis are the same as for spending. Hospital inpatient admissions are not prorated based on the number of days eligible during the quarter. All-cause inpatient admissions and ACSC admissions are reported separately, under the assumption that a greater share of ACSC admissions can be prevented by appropriate ambulatory care. The mean quarterly admission rate per 1,000 patients is reported.

- **Hospital Readmissions**. Hospital readmission rates serve a dual purpose in evaluating HCIA impacts. Readmissions add to the costs of a prior hospitalization, and they often reflect a problem in the care provided during the first admission. All-cause readmissions are defined as a follow-up admission to any short-term acute general or long-term care hospital within 30 days of discharge from another hospital of the same type. We ignore multiple admissions within 1 day of an initial admission because these often represent transfers between hospitals. We define index hospitalizations that begin during the quarter and follow each index admission for 30 days, even when the follow-up period extends beyond the end of the quarter. Inclusion criteria for the analysis are the same as for spending. We also calculate ACSC readmissions. ACSC status is defined by the patient’s first hospitalization during the quarter. The readmission rate equals the number of readmissions divided by the number of index hospitalizations during the quarter. Planned readmissions are excluded from the calculation of the numerator. Quarterly mean readmission and ACSC readmission rates per 1,000 admissions are reported.

- **ED Visits**. ED visits are sometimes viewed as a symptom of the inability of the community’s health care system to provide adequate preventive and ambulatory care visits. We report an all-cause ED visit rate that excludes ED visits resulting in an inpatient admission (which presumably represent unavoidable visits) and includes overnight ED visits without an inpatient admission. Inclusion criteria for the analysis are the same as for spending, and ED visits are also subject to the same prorating formula as for spending. The mean quarterly ED visit rate per 1,000 patients is reported.

Medicare Claims Analysis

The analysis focuses on Medicare beneficiaries enrolled in the innovation who were enrolled in fee-for-service Medicare Parts A and B between 2010 and 2013. The analysis uses data from the CMS Chronic Conditions Data Warehouse (CCW), via the Virtual Research Data Center (VRDC). We present the measures for these beneficiaries before and after the innovation was launched on January 26, 2013. ***Table 11*** reports Medicare spending per patient in the eight quarters before and the four quarters during and after the launch date.

Table 11. Medicare Spending per Patient: South County Community Health Center

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
1C1CMS330972	South County												
	Spending rate ($)	5,307	3,657	3,499	2,763	3,577	4,179	2,429	1,750	3,599	3,889	2,733	4,507
	Std dev ($)	16,205	9,646	10,703	8,346	11,313	10,591	6,851	5,056	12,064	10,326	7,149	13,733
	Unique patients	77	79	83	79	82	78	90	95	97	106	116	113
Comparison Group													
1C1CMS330972	South County												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—

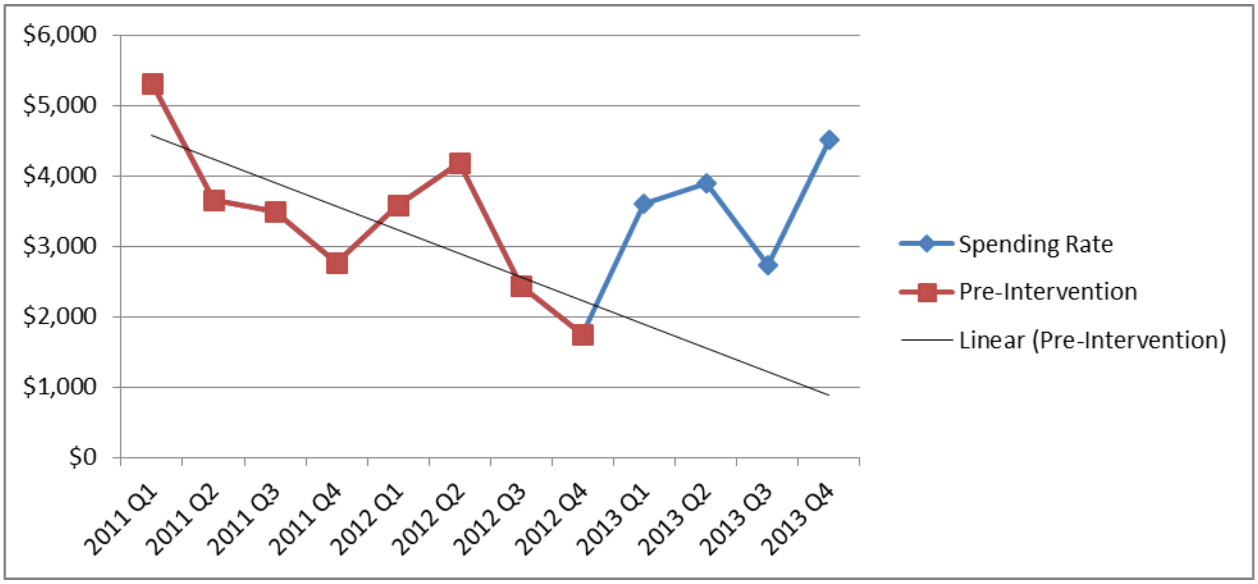
Savings per Patient

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of Chronic Conditions Data Warehouse Medicare claims.
Note: The innovation was launched on January 26, 2013. I1 is 2013 Q1. Spending rate: total quarter (i.e., quarterized) payments/number of unique patients. Savings per patient: difference in comparison minus the intervention’s average spending rates.
— Data not yet available.

Figure 1 plots spending as a function of time. The red line represents values in quarters before the innovation's launch date on January 26, 2013, and the blue line represents quarters during and after launch. The graph includes a trend line based on a linear regression of prelaunch values.

Figure 1. Medicare Spending per Patient: South County Community Health Center



The trend line for spending slopes steeply down before launch but is exaggerated by the high-spending quarter (2011 Q1) at the beginning of the series. Spending increases after the innovation begins relative to the trend line; however, it is premature to conclude that the innovation increased spending because we have not yet included a comparison group and tested whether postlaunch spending is statistically different from trend values. As shown in ***Table 11***, the standard deviation for spending is very high, which is a result of the relatively small sample size. We will estimate the statistical impact of the innovation in later reports as more data become available.

The all-cause inpatient admissions rate per 1,000 participants is shown in ***Table 12*** and ***Figure 2***.

Table 12. All-Cause Inpatient Admissions Rate per 1,000 Enrollees: South County Community Health Center

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare

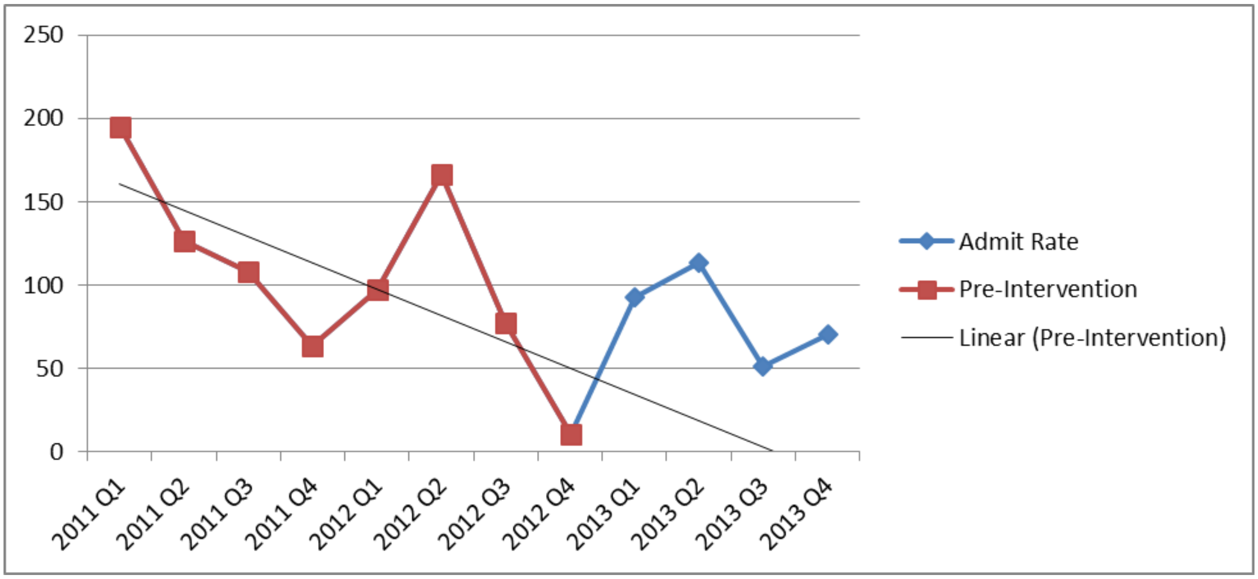
Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
1C1CMS330972	South County												
	Admit rate	195	127	108	63	98	167	78	11	93	113	52	71
	Std dev	689	435	350	293	404	545	374	103	410	347	259	320
	Unique patients	77	79	83	79	82	78	90	95	97	106	116	113
Comparison Group													
1C1CMS330972	South County												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—

Savings per Patient

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of Chronic Conditions Data Warehouse Medicare claims.
Note: The innovation was launched on January 26, 2013. I1 is 2013 Q1. Spending rate: total quarter (i.e., quarterized) payments/number of unique patients. Savings per patient: difference in comparison minus the intervention’s average spending rates.
— Data not yet available.

Figure 2. All-Cause Inpatient Admissions Rate per 1,000 Enrollees: South County Community Health Center



The inpatient admission rate increases relative to the trend line after the innovation launches. Without statistical testing and a better-defined comparison group, it is premature to conclude that the innovation caused the increase. As shown in ***Table 12***, the standard deviation for inpatient admissions is very high, which is a result of the relatively small sample size. We will estimate the statistical impact of the innovation in later reports as more data become available.

Hospital readmission rates per 1,000 admissions are shown in ***Table 13*** and ***Figure 3***.

Table 13. Hospital Readmission Rates per 1,000 Admissions: South County Community Health Center

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

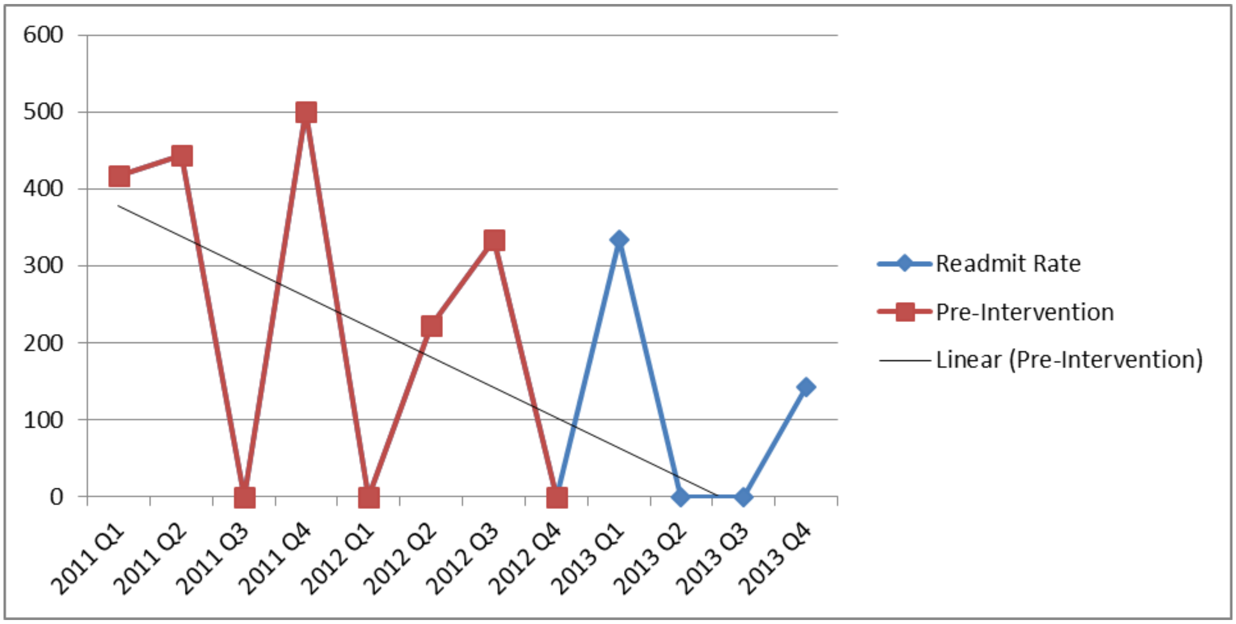
Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
1C1CMS330972	South County												
	Readmit rate	417	444	0	500	0	222	333	0	333	0	0	143
	Std dev	493	496.9	0	500	0	415.7	471.4	0	471.4	0	0	349.9
	Total admissions	12	9	6	4	5	9	6	1	9	9	5	7
Comparison Group													
1C1CMS330972	South County												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total admissions	—	—	—	—	—	—	—	—	—	—	—	—

Savings per Patient

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of Chronic Conditions Data Warehouse Medicare claims.
Note: The innovation was launched on January 26, 2013. I1 is 2013 Q1. Spending rate: total quarter (i.e., quarterized) payments/number of unique patients. Savings per patient: difference in comparison minus the intervention’s average spending rates.
— Data not yet available.

Figure 3. Hospital Readmission Rates per 1,000 Admissions: South County Community Health Center



Readmission rates are highly variable before and after the launch of the innovation, reflecting the relatively small number of hospital admissions for participants during each quarter. With few admissions (the denominator in the readmission rate) and a relatively low underlying percentage of readmissions, the readmission rate exhibits a high variance over time. As with the other variables, we will include statistical tests on the readmission rate in subsequent reports.

ED visits per 1,000 participants are shown in ***Table 14*** and ***Figure 4***.

Table 14. ED Visits per 1,000 Participants: South County Community Health Center

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

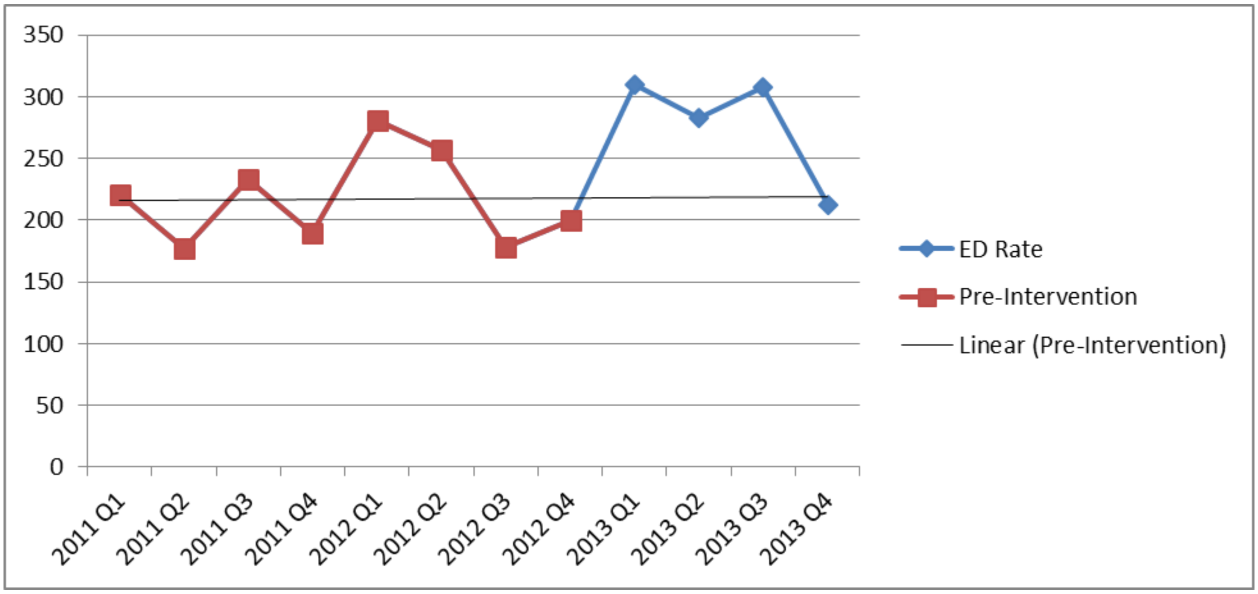
Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
1C1CMS330972	South County												
	ED rate	221	177	233	190	280	256	178	200	309	283	307	212
	Std dev	1,506	699	1,160	972	1,091	1,251	1,265	745	1,260	734	1,939	562
	Unique patients	77	79	83	79	82	78	90	95	97	106	116	113
Comparison Group													
1C1CMS330972	South County												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—

Savings per Patient

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of Chronic Conditions Data Warehouse Medicare claims.
Note: The innovation was launched on January 26, 2013. I1 is 2013 Q1. Spending rate: total quarter (i.e., quarterized) payments/number of unique patients. Savings per patient: difference in comparison minus the intervention's average spending rates.
ED = emergency department.
— Data not yet available.

Figure 4. Emergency Department Visits per 1,000 Participants: South County Community Health Center



The ED visit rate trend line is virtually flat before launch, although the time series exhibits a fair amount of variability. The ED visit rate is above the trend line for three quarters immediately after launch and then reverts to the trend line in the fourth quarter after launch. As with the other variables, we will include statistical tests on the ED visit rate in subsequent reports as more data become available.

Medicaid Claims Analysis

The Medicaid data analysis will use data from CMS Alpha-Medicaid Analytic eXtract (MAX) data files. Currently, Medicaid claims for South County are only available in Alpha-MAX through the third quarter of 2011. Because the innovation was launched in January 2013, we are not presenting measures for Medicaid patients in this report. We will provide Medicaid analyses in subsequent reports as more data become available. We will report tables and figures similar to those for Medicare.

Discussion of Claims Analysis

The four measures provide descriptive data on patients enrolled in the South County innovation before, during, and after the launch of the innovation. Although it is necessary to report these measures to support CMS's broader assessment of its full portfolio of innovation projects, they may not provide a complete evaluation picture of the innovation for a number of reasons. First, the innovation was only launched in January 2013. The effect of a care coordination innovation may not be immediate because it takes time to change patient flow and systems within an organization, and eventually these may affect health outcomes and utilization. Second, Medicare fee-for-service beneficiaries represent only 3% of the patients served by South County, and Medicaid beneficiaries represent only 35% of patients. The vast majority of patients are uninsured. Last, South County is not focused on preventing hospital admissions or readmissions, so the innovation may not affect these measures.

Development of Comparison Groups

In addition to comparing South County patients before and after implementation of the innovation, we are constructing a comparison group of Medicare and Medicaid fee-for-service patients in San Mateo County. This comparison group will control for external, noninnovation factors affecting both South County and non–South County–served patients. We are using propensity score matching to identify patients with similar characteristics as South County patients, such as age, chronic conditions, and gender. Results for the comparison group will be included in later reports.

1.3.3 Other Awardee-Specific Data

Overview of Data Request

South County, RTI, CMS, and the HealthInsight technical assistance provider (a CMS contractor) met on July 30, 2014, to discuss the raw patient-level data used to generate each of the measures for each quarter that RTI is requesting. These data will be used to assess improvement in health outcomes relevant to the innovation components (i.e., diabetes management measures). RTI is working with the awardee to understand its data (and denominators) and will report more findings in the fourth quarterly report. South County provided data to RTI in mid-August 2014.

Health Outcomes Results

Once we review and clean the data received from South County, we will have a better understanding of what type of results we will provide. ***Tables 15*** and ***16*** are example shells of findings we anticipate presenting.

Table 15. Average Patient Health Outcomes over Time

Health Indicator	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Diabetes							
LDL-C	—	—	—	—	—	—	—
Hemoglobin A1c	—	—	—	—	—	—	—

Source: Patient-level data to be provided to RTI.
LDL-C = low-density lipoprotein cholesterol; Q = quarter.
— Data not yet available.

Table 16. Percentage of Patients by Measures of Health Outcomes Over Time

Measure[1]	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Diabetes							
Percentage of patients with diabetes aged 18–75 years who received a foot exam	—	—	—	—	—	—	—
Percentage of patients with diabetes who had hemoglobin A1c >9.0 %	—	—	—	—	—	—	—
Percentage of patients aged 18–75 years with diabetes who received a nephropathy screening test	—	—	—	—	—	—	—
Percentage of patients aged 18–75 years with a diagnosis of diabetes, who have optimally managed modifiable risk factors (A1c <8.0%, LDL-C <100 mg/dL, blood pressure <140/90 mm Hg, tobacco nonuse and daily aspirin usage for patients with diagnosis of IVD)	—	—	—	—	—	—	—

Source: Patient-level data to be provided to RTI.
[1] Measures are stated per Centers for Medicare & Medicaid Services guidance.
IVD = ischemic vascular disease; LDL-C = low-density lipoprotein cholesterol; Q = quarter.
— Data not yet available.

Discussion of Other Awardee-Specific Findings

Once we review and clean the data received from South County, we will begin conducting descriptive analyses to fill in the table shells above. At that point, we will be in a better position to discuss findings related to the other awardee-specific data.

1.4 Overall Program Effectiveness Assessment

This complex innovation, which has transformed South County's model of patient care, staff roles, and clinic organization and flow, has been somewhat successful. South County leaders have high levels of vision, management, and support for the innovation. The innovation has completely transformed the way that South County provides health services. Employees of different statuses in the medical hierarchy now work more collaboratively in teamlets, there are more roles for community health workers (e.g., health navigators), many community health workers have more responsibilities (e.g., panel managers), preappointment services and postappointment follow-up services have been developed and are being implemented, and the overall approach and philosophy for care is now more focused on the patient. This transformation required more time than anticipated and encountered unexpected roadblocks. Some staff initially resisted the innovation, although most respondents during the site visit accepted the innovation as implementation has rolled out. Some staff mentioned that burnout from the continual changes of the innovation has been a problem.

Not only have there been changes in how care is delivered by South County, but the innovation was implemented at the same time as the transition from a paper-based system to an EHR system. Rolling out two concurrent innovations in South County was frustrating for a lot of staff, and it was challenging for them to see as many patients as before. Having to learn about the new EHR took staff's attention away from the changes in the care processes, slowing their ability to reach and enroll more participants. One RTI concern is whether South County will have a sufficient sample of patients who receive adequate exposure to the innovation for changes in key outcomes to be detected. Further, delays in creating a care plan template within the new EHR system—which is how South County is now tracking and monitoring patient exposure to health coaching (a key component of the innovation)—meant that the task had not been completed as of July 2014 (but has since been implemented).

Strengths of South County are its adaptability as an organization and willingness to openly address challenges and implement solutions. For example, family practice care teams struggled to provide panel managers enough time for panel management, which limited panel managers' abilities to run panel reports and identify patients for the innovation. This issue of staff time is the primary reason South County created the health navigator role. When patients came for appointments, staff did not have enough time to obtain a thorough health assessment, which they need to assess patient risks and manage panels. The health navigator role was implemented to ensure that patients are assessed at the first appointment. The organization's adaptability has been supported by an impressive number of trainings, either from outside contractors or its own training staff, to help staff transition into new roles and ways of providing health services. Developing staff to work at the highest capacity has been a priority that has already proven helpful; after finding that patients with diabetes did not routinely receive foot screenings, they developed appropriate training to teach medical assistants to conduct foot screenings for patients with diabetes.

During the site visit, respondents explained that efforts to streamline patient services have helped save time and ensure that patients receive services they need. Using health navigators to complete the community health assessment (which includes a health history and barriers assessment) before a patient's appointment has been very helpful in saving practitioner time during the appointment. Likewise, having panel managers review groups of patients helps practitioners save follow-up time. Efforts to provide warm hand-offs have helped patients immediately receive the help they need, instead of having to come back another day for services. A particular challenge for South County will be to assess the innovation's effects on patient outcomes such as ED visits and total costs of care; patients are exposed to different program components, and this exposure has not been systematically tracked for each patient.

October 2014

Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring

Annual and Site Visit Report

Southeast Mental Health Services (SEMHS)

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OVERALL EVALUATION SUMMARY

RTI International was selected to lead an independent evaluation of the 24 Health Care Innovation Award (HCIA) awardees categorized as Community Resource Planning, Prevention, and Monitoring (Community Resource). In this role, RTI is conducting an in-depth evaluation of each innovation, as well as a cross-site evaluation that includes similar innovations targeting the same priority outcomes (e.g., emergency department [ED] visits). For each of the 24 awardees, this report presents findings from the first year of the evaluation (beginning September 23, 2013, and including data obtained by RTI and cleaned as of September 11, 2014). The report is based on multiple data sources, including operational reports, self-monitoring plans, site visits, and quantitative data analysis.

The evaluation methods vary by awardee innovation, based on the type of innovation and availability of data. RTI has reviewed and coded all existing documents from the awardees through December 31, 2013, and incorporated that knowledge into each awardee's overview. Our review included the awardees' original applications for funding, original and current operational and self-monitoring plans, and quarterly narrative and monitoring reports. For this annual report, we incorporated activities reported through the awardee's seventh quarterly report (i.e., through March 31, 2014).

Between April and August 2014, teams of at least two staff from the RTI team visited all 24 awardees for 2 to 4 days, depending on the number of interviews conducted. Teams included a subject matter expert, with training and experience specific to the awardee's innovation, and a master's- or bachelor's-level colleague to take notes. Before each visit, the teams reviewed all available documentation from the awardee to learn about the innovation's goals, objectives, and status. The purpose of the site visits was to clarify our understanding of the innovation, obtain detailed information on the implementation process, and review awardee-specific data to determine which elements to incorporate into the evaluation. By August 13, 2014, all 24 awardees had been visited and a thorough description of our findings included in each of the 24 awardee sections.

In addition to the site visits, we report quantitative data from two possible sources for several awardees. First, we present findings from claims analysis for awardees in this report if they both provided us with patient identifiers and reported enrolling participants who are Medicare and/or Medicaid beneficiaries. RTI has obtained patient identifiers from most of the 24 awardees to conduct claims analysis. Second, we present data RTI obtained directly from awardees to quantify their work in addressing health care costs, quality, and patient outcomes. Data from additional awardees will be analyzed and presented in future reports, as data become available and awardees enroll sufficient numbers of participants. An update on the availability of Medicare/Medicaid claims and other awardee-specific data, analysis of data available to us and cleaned as of September 11, 2014, a summary of the comparison groups, and a list of evaluation measures are included in each awardee section.

1. HCIA COMMUNITY RESOURCE AWARDEE: SOUTHEAST MENTAL HEALTH SERVICES (SEMHS)

1.1 Introduction

Southeast Mental Health Services (SEMHS) provides mental health care and substance abuse treatment in the rural, frontier southeast corner of Colorado. Awarded $1,405,924, SEMHS began enrolling patients into its Health Care Innovation Award (HCIA) Community Resource innovation in October 2012 to achieve the following goals, refined from three original goals:

1. **Increase access** to prevention, early detection, and early intervention for primary care, mental health, and substance abuse by engaging high-risk patients in health navigation services by January 2013.
2. **Reduce the cost** of health care for the highest users of Medicaid, Medicare, and Child Health Plan Plus (CHP+) by 15% from baseline or $1.875 million by June 2015.

As part of the in-depth case study RTI is conducting for this innovation, two RTI team members visited the Lamar, Colorado, site on May 1–2, 2014; before and after the visit, our team reviewed all documentation on this innovation. We are working to obtain data directly from the awardee to assess many of the variables we discuss. This report describes findings from RTI's site visit, document reviews, follow-up telephone calls, and analysis of data obtained by RTI as of September 11, 2014. We start by describing the innovation's components and target population.

1.1.1 Innovation Components

The innovation at SEMHS includes two components: (1) develop and institutionalize a training program for community health workers (CHWs) (or health navigators [HNs]) through a partnership with Otero Junior College (OJC), and (2) provide health navigation services to patients at high risk of overusing the health system.[1] The innovation has the following objectives and relies on the partners presented in ***Table 1***:

- Develop a partnership/subcontract with OJC to establish and maintain a comprehensive training program for health navigation.
- Hire and train six new bachelor's-level HN positions within SEMHS and dispatch them to Prowers County to help individuals with Medicaid, Medicare, and CHP+ manage their health care needs.
- Offer health education classes to the local community and use media outreach to encourage healthier lifestyles in Prowers County.

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[1] Patients assigned a severity level of 3 or 4, who are among the most costly (i.e., more than $10,000 in services in the past year) and the most ill (i.e., 10 or more ED visits, more than 1 inpatient admission).

- Support high-risk users of Medicaid, Medicare, and CHP+ by offering transportation, care coordination, benefit management, nutrition support, and active lifestyle training.

Table 1. HCIA Partners, Roles, and Locations

Partner Name	Role in HCIA Project	Location
Otero Junior College	Train incumbent health workers, future associate's-level HNs, and future bachelor's-level social workers	La Junta, CO
Prowers Medical Center	Provide access to patient identifiers and space for HNs	La Junta, CO

Source: Site visit, May 1–2, 2014.
Note: The High Plains Community Health Center is listed as a partner of Southeast Mental Health Services in the Lewin data but is not currently working on this innovation.
HCIA = Health Care Innovation Award; HN = health navigator.

Component 1: CHW Training Program

SEMHS worked with OJC to develop an initial course (Introduction to Community Health Work). The course was provided in fall 2012 to 22 students, including 5 of the 6 currently employed HNs, and was repeated for 5 new students in spring 2013. Additional courses were planned to create a CHW certificate program with 31.5 hours of course and fieldwork. Because student counts dropped between fall 2012 and spring 2013, OJC began to more aggressively market the curriculum to local workers already employed in related positions and to potential employers. OJC also hired a full-time faculty member to oversee implementation of the curriculum. Six students started the curriculum in fall 2013 and were finishing their final exams at the time of our site visit in May 2014. Students must complete a practicum over the summer to receive their certificate. OJC plans to expand the curriculum and is working to receive approval from the community college system to deliver the program as an associate's degree. To develop the curriculum into a degree program, OJC recently convened an advisory committee of local employers and potential students to guide curriculum development.

Component 2: Health Navigation Services

The innovation's second component is to introduce HNs to the health care process, with the primary role of increasing patients' access to behavioral care, primary care, and early intervention services, as well as offering team-based education and coaching to improve self-management of disease. Initially, HN services were to be delivered in collaboration with the High Plains Community Health Center (HPCHC), a major primary care provider (PCP) for high-risk patients in the Prowers County area located in the same complex as SEMHS. HNs would coordinate care between patients at SEMHS and HPCHC to increase access to primary care for the SEMHS patients and to affect key outcomes such as emergency department (ED) visits. SEMHS initially colocated an HN full time with HPCHC to assist with a smooth transition of accepting referrals from HPCHC for behavioral health services. This HN worked in the clinic alongside the existing patient navigator[2] at HPCHC. However, challenges in collaboration and communication developed between HPCHC providers and a few colocated HNs. After several attempts to improve relations, SEMHS decided in June[3] 2013 to remove the HN position from HPCHC and instead have HNs collaborate through regular communication and meetings with the patient navigator at HPCHC regarding eligible patients seen at the clinic. SEMHS still has an HN colocated at Prowers Medical Hospital.

Although it is a frontier area, Prowers County has several PCPs in the area, including the Prowers Medical Center (PMC) and HPCHC. During the site visit an SEMHS leader shared that because of the highly competitive local market for primary care, they decided to focus on providing navigation services to patients who selected SEMHS as their PCP or who do not already have a PCP. SEMHS HNs collaborate with the patient navigator at HPCHC to reach patients at the clinic who are also SEMHS patients or new patients who need mental health or substance abuse services. The HPCHC patient navigator estimated that the two agencies share 100–120 patients.

HN Role and Functions

SEMHS currently employs six HNs, all with bachelor's degrees in disciplines such as psychology and social work, to provide support services and care coordination to SEMHS patients. When high-risk patients have a relationship with an HN and are engaged in SEMHS as their medical home, they gain access to transportation and various levels of case management and ongoing support. Potential patients for HN services are identified through a list provided through the Integrated Colorado Health Program (ICHP), which is the Accountable Care Collaborative (ACC) organization for the region; patients on the list have agreed to be contacted by organizations in the ACC (i.e., fewer patients are on this list than are covered by Medicaid in Prowers County).[4]

Each month, HNs receive a list of eligible patients (i.e., on the ICHP list, have no designated PCP, or have SEMHS as designated PCP[5]) to call during the month and offer services such as transportation or assistance making a medical appointment. HNs shared that they do not have specific protocols that they follow when contacting patients. The HN supervisor assigns about 60–70 patients to each HN to contact each month, but respondents noted that the number of new patients has decreased markedly as duplicates are removed from the list.

Services Provided by HNs

SEMHS HNs fulfill the functions shown in ***Table 2***. Four HNs work in the Southeast Health Group offices (i.e., mental health, wellness, and substance abuse services) in the same

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[2] During our site visit, we confirmed this job title with the patient navigator at HPCHC. Throughout this report, HNs refer to those working at SEMHS, and at HPCHC, the navigator is a patient navigator.
[3] Respondents during the site visit shared that this relationship was changed in June 2013.
[4] Information confirmed during site visit in May 2014.
[5] These eligibility criteria were confirmed with several respondents during the site visit.

building complex as HPCHC and PMC and provide services such as transportation, individual counseling, and patient follow-up. Each month, they work from their list of ongoing patient contacts and obtain a new list of patients from ICHP. They call all patients who have agreed to be contacted on the ICHP list (with the priority of contacting the high utilizers with a severity level of 3 or 4), explain their services, and provide the option to participate.

Table 2. HCIA Care Coordinator Functions and Training

Characteristic Type	SEMHS HN Role
Title	HN
Minimal qualifications	Bachelor's level[1]
Functions	Health education (individual and group) Informal counseling, individualized goal setting Outreach and recruitment Patient monitoring and follow-up Service coordination Community linkages Instrumental support
Established continuing education program	None

Source: Site visit, May 1–2, 2014.

[1] The program requires that HNs hold a bachelor's degree for their services to be included in the state's Medicaid capitation rates.

HCIA = Health Care Innovation Award; HN = health navigator.

Using a health navigation form, HNs conduct an initial assessment with patients to determine their health needs, use of health care services, access to care, and relationship with a PCP. HNs then develop a care plan with patients using goal statements and objectives to outline the support services needed to ensure that patients obtain adequate and timely care for their diagnosed conditions. We present data on the services received by patients in ***Section 1.2***, under Dose. HNs also provide health education to residents in Prowers County. SEMHS uses several approaches to deliver public education, including media outreach, widespread community mental health first aid training, and peer support for chronic health management.

Two HNs work at different locations and have taken on slightly different roles that complement the other HNs. One HN, in SEMHS's Choices Recovery Program, serves more of a case management role with severely and persistently mentally ill patients who have experienced multiple hospitalizations. The HN has contact with patients almost daily and handles issues like medication management, housing, linking to community resources, and connecting with other HNs for transportation services. This role was expanded to provide more case management services for this patient population and to reduce duplication with other HNs.

As of February 2014, the other HN not located in the Southeast Health Group office worked at PMC with patients who use the ED and are already SEMHS patients or are referred for mental health or substance abuse services. She coordinates care between the ED and PCPs, ensuring that high-need patients have access to the resources they need after discharge. PMC also has a patient advocate who works in a related role for all other patients who use the ED. Each morning, the patient advocate and the chief clinical officer review the patients who used the ED during the previous day to determine who would benefit from a referral to the SEMHS HN. They do not include the SEMHS HN colocated at PMC in these meetings.

1.1.2 Program Participant Characteristics

The target population includes high-risk users of Medicaid, Medicare, and CHP+ in Prowers County. Participants do not have to be enrolled patients of SEMHS; they include residents who are high risk, high cost, and chronically ill. SEMHS is focusing delivery of services on patients who are among the most severe cases.

Table 3 describes the characteristics of all 836 participants enrolled in this innovation from its inception through June 30, 2014. The majority of enrolled patients were between the ages of 25 and 64 (55.8%). Approximately two-thirds of enrolled patients were female (67.5%), and the majority of those with nonmissing race/ethnicity (73.1%) were white. Payer information was available for approximately three-quarters of enrolled patients (75.5%). A large majority of these patients were on Medicaid (71.2%) with a small proportion of dually eligible patients (2.9%) and Medicare-only patients (1.4%).

Table 3. Characteristics of All Patients Ever Enrolled in the Innovation through June 30, 2014

Characteristic	Number of Patients	Percentage of Patients
Age		
<18	178	21.3
18–24	83	9.9
25–44	231	27.6
45–64	236	28.2
65–74	67	8.0
75–84	33	3.9
85+	8	1.1
Missing	0	0.0
Sex		
Female	564	67.5
Male	271	32.4
Missing	1	0.1

(continued)

Table 3. Characteristics of All Patients Ever Enrolled in the Innovation through June 30, 2014 (continued)

Characteristic	Number of Patients	Percentage of Patients
Race/ethnicity		
White	193	23.1
Black	1	0.1
Hispanic	31	3.7
Asian	0	0.0
American Indian or Alaska Native	4	0.5
Other	35	4.2
Missing/refused	572	68.4
Payer Category		
Dually eligible	24	2.9
Medicaid	595	71.2
Medicare	12	1.4
Missing	205	24.5

Source: Patient-level data provided by Southeast Mental Health Services.

In its application, SEMHS mentioned that high-risk users in Prowers County included 133 patients who were diagnosed with chronic conditions and were Medicaid patients in 2009, as well as a subset of patients who were dually diagnosed with a mental illness. SEMHS provided those patients in the application to illustrate the types of patients on whom the innovation planned to focus. During RTI's site visit, SEMHS explained that 133 high users was established as a "threshold" number of high users based on health care cost, did not correspond to a specific set of individuals who would receive services, and therefore could be followed to assess program impact.

As a result, SEMHS faced a challenge in determining how many of the more than 700 individuals identified in the Lewin data as being served by HNs are in fact part of the target population identified in the application (i.e., 133 high-risk users of Medicaid, Medicare, and CHP+ in Prowers County). According to CMS, demonstrating savings based on these 133 high utilizers was important because the application was based on this high-risk and high-user category. Yet, as described previously, SEMHS staff reported that they were only using these 133 high utilizers as a reference point in the application for demonstrating potential need and savings. Reconciling these two differing perspectives on the high-risk user pool has been a challenge, although with recent access to ICHP data, SEMHS staff are working to remedy this discrepancy.

SEMHS recently analyzed ICHP utilization data to identify and locate those original 133 patients because CMS required that these patients be reached by the intervention. Unfortunately, the 133 patients could now be deceased, moved out of the county or state, or no longer SEMHS patients for another reason. Through analysis, SEMHS determined that 40 of the original 133 high users from 2009 received services in fiscal year 2013 (i.e., the patients who were seen by SEMHS are the only ones it can go back and identify). SEMHS plans to focus on contacting those patients through health navigation services, as well as other high users identified through ICHP data. In addition, as indicated in ***Table 4***, SEMHS is using the list of patients with 3 or 4 severity level from the ICHP data to target for HN services. These users are typically the most medically complex and high utilizers of the health care system. According to SEMHS staff, this list provides detailed information on whom a patient has seen, when the patient has seen them, and the amount of costs accumulated in the time frame provided. For eligible patients, the list helps HNs know what providers (e.g., specialists) to work with in regard to a patient who is a high utilizer (with 3 or 4 severity level) and helps the HN who is colocated at PMC to target specific patients in the ED.

Table 4. Patients Planned for Inclusion in Innovation (Denominator Data)

Patient Type	Data Source	Current Count (Data Source)
High users of health care who consent to be contacted for services (i.e., are on the ICHP list)	ICHP list of patients with a severity level of 3 or 4	—
Patients who are high users and either have no PCP or have SEMHS as their PCP	Patients (on the ICHP list) assigned to HNs for contacting	—

Source: Site visit, May 1–2, 2014.
HN = health navigator; ICHP = Integrated Colorado Health Program; PCP = primary care provider; SEMHS = Southeast Mental Health Services.
— Data not yet available.

It is important to understand the patients included in ICHP, which is part of a statewide initiative that obtains data from agencies collaborating as ACCs; SEMHS participates as an agency in the six-county region that includes Prowers and Otero Counties (i.e., the locations of the main SEMHS office and OJC, a key innovation partner). ICHP includes Medicaid patients who agree to receive "value-added" services, meaning they are willing to be contacted to receive specific health services. SEMHS obtains a monthly list of ICHP patients who elected the value-added service and obtained care during the prior month. According to the SEMHS presentation, the ACC's goal is to improve health outcomes through a coordinated, client-centered system and to control costs by reducing avoidable, duplicative, variable, and inappropriate use of health care resources. Key components of the ACC include medical management, care coordination, provider support, and a cadre of PCPs that act as medical homes. Through ICHP and the statewide database, SEMHS can access utilization data from all participating agencies for patients who designate Southeast Health Group as their PCP. ICHP data are available approximately 45 days after a patient's encounter; can be easily accessed for Prowers County alone; and include the patient's PCP, if known, and severity level. This list also provides other information about members, such as whom a patient has seen and when, and the costs accumulated in the time frame provided, enabling HNs to know which providers to contact for the high users.

1.2 Implementation Progress

The extent to which awardees are able to implement their innovation as planned and reach a sufficient number of patients will be critical to assessing their impact on the Triple Aim. As follows, we describe implementation and effectiveness; ***Table 5*** lists the explanatory or independent variables we plan to use to assess the innovation's effect on outcomes.

Table 5. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for SEMHS

Key Evaluation Domains	Subdomains	Measures	Data Sources
Implementation process	Care coordination	Number of patients for whom HN helped to identify PCP and link with primary care	EHR, HN tracking
Implementation effectiveness	Reach	Number/percentage of patients who receive services from HNs	EHR
		Number/percentage of participants by insurance type	EHR
		Number/percentage of patients enrolled on the ICHP list by severity level	EHR, HN tracking
	Dose	Number of HN contacts with patients	EHR, HN tracking
		Length of assistance from HN per patient (e.g., 1 month, 1 week)	EHR, HN tracking
		Number and types of services provided to each enrollee	EHR, HN tracking

EHR = electronic health record; HN = health navigator; ICHP = Integrated Colorado Health Program; PCP = primary care provider; SEMHS = Southeast Mental Health Services.

1.2.1 Process

The implementation process has been the initial focus of the evaluation. RTI defines the implementation process as including execution of implementation, organizational capacity, engagement of key staff and partners, and client recruitment and enrollment. The implementation process is best evaluated through a combination of data variables, including execution of implementation that conforms to operational plans, and capacity for implementing the innovation in a timely and effective manner. We focused on the implementation process during the awardee site visit and asked such evaluation questions as the following:

- What is the overall execution of the innovation implementation (e.g., the actual rate of expenditures relative to the projected rate)?
- What accomplishments are specific to hiring or training staff so that the organization can build its capacity to implement the innovation effectively?
- What is the implementation effectiveness, including fidelity, reach, and dose of the innovation thus far?

Execution of Implementation

Execution is the extent to which the innovation has been implemented according to plan. We use a number of data variables to assess execution, including the extent to which the innovation has encountered delays in implementation, the effectiveness with which the awardee is able to allocate staffing and resources to support the innovation, and the organizational capacity for implementation.

Overall, SEMHS encountered a number of challenges in initiating and maintaining its innovation. It has taken more time than expected to develop the CHW training at OJC and enroll enough students to grow the program as planned. With a new faculty member focused on the program, much progress has been made in 2014. OJC also initiated a local advisory group to inform curriculum development and increase knowledge about the program within the region, providing a structure to increase student enrollment.

Training, recruiting, and hiring the six HNs has gone according to plan. Two HNs did resign early in 2013, but we learned on the site visit that they were not a good fit for the position. HNs moved quickly into their role and learned to be proactive, critical thinkers, serving as more than case coordinators for patients who often had complex health issues. HNs discovered that much of their work revolves around arranging transportation, assisting with provider appointments, conducting community education, and creating awareness about health navigation services in the larger community. Their encounters with some enrolled patients are short-lived and episodic, limiting their ability to adequately coordinate care for high-risk patients. HNs also face challenges with other providers, who misunderstand their role and think they conflict with roles like health coaches. We also heard that some staff in Lamar are unclear about the role of HNs. Because HNs are not seen as a regular part of the larger SEMHS provider team, their work is not well integrated with other health care activities at SEMHS or fully understood. Recently, there has also been a drop-off in health navigation activities, attributed on the site visit to difficulty signing up patients through the ICHP system. The innovation was unable to get support to conduct the healthier living class at the Lamar Community Resource & Senior Center (quarter 7 [Q7] project report).

Enrollment of direct participants began in Q2 and increased steadily through Q6. The health navigation team served 50 unduplicated individuals in Q7, down by 31 participants from Q6. According to the Q7 narrative progress report, the 6 HNs had only enrolled 15–18 new unduplicated individuals per month this quarter. (The number of new enrollees started at 50 in September 2012, peaked at 138 in April 2013, and dropped to 18 in March 2014.) This trend was supported by comments made during the site visit that HNs may have begun to reach a point of saturation in Prowers County for enrollment of new patients.

In addition to enrollment, the rate at which awardees expend funds or enroll patients, compared to projection, provides useful information to assess the innovation's status. If expenditure or enrollment rates are particularly low (because of such issues as length of time to recruit and train new staff, or time to implement training and recruit HNs), these variables help assess the awardee's readiness to implement the innovation at the start and the extent to which it can spend all funding and meet the overall goals by the end of the project (e.g., can it effectively allocate the funds provided?). The SEMHS expenditure rate has met projections since Q4.

As part of its progress in executing the innovation, SEMHS developed a well-defined implementation plan with a detailed timeline, milestones, and staffing assignments. Virtually all the required tasks of the implementation, such as training and hiring staff and establishing protocols for data collection, have been completed on time. The innovation's decision-making process enables the staff who will be affected by an activity to provide input and ensures that their feedback is acted upon.

Based on what we learned during the site visit, execution of the innovation was hindered by the change in organizational arrangements with HPCHC. Since the crux of the SEMHS innovation was to improve the integration of care for patients with substance abuse and/or mental health issues with primary care services, the awardee has a diminished ability to accomplish their original goals. HNs still collaborate with HPCHC to access patients for recruitment in the program and to coordinate care for the 100–120 shared patients, but they are no longer colocated at the clinic; this arrangement may limit their ability to engage patients as well as they do at PMC, where an HN *is* colocated.

Organizational Capacity and Leadership

This is the first federal government award to SEMHS, so staff experience in managing a federally funded project is limited. Staff members are engaged in solving day-to-day problems and addressing implementation challenges, but initial leadership for the project was limited. The chief operating officer (COO) of SEMHS is the formal project director and key champion of the innovation, but his direct oversight was initially minimal due to other time commitments. The COO became more involved when challenges began to arise with the HPCHC relationship and the delay in full implementation of the CHW course. A senior administrator, who has a clinical background and strong local connections, was then hired to address challenges of the program. This administrator's role, however, has focused on resolving challenges such as with the OJC implementation of the CHW curriculum but has relied less on her vast clinical expertise to provide oversight to the work of the HNs. Staff working directly in providing navigation have no formal clinical training and limited experience providing direct services to the target population. During the site visit, we observed that staff directly involved in the day-to-day innovation work as a team but have limited oversight or leadership. For example, the HNs are located in an office in Prowers County while their direct supervisor primarily communicates with them by phone or e-mail, except for the 1–2 days per week when she travels from Otero County to the main office. Respondents shared that there has been concern about how some of the HNs are spending their time without direct daily supervision.

We learned from our site visit that although the staff worked well together as a team, they felt better about the direction of development when the COO stepped in to handle important issues. As an example of his involvement, the COO was asked to join the group when it appeared staff were having difficulty clarifying the contradictions in the Year 1 data reporting. Consequently, the COO brought in SEMHS's data manager to assist with clarifying data discrepancies, which eventually revealed that the innovation had neither achieved the savings initially described nor targeted the high utilizers as proposed in the application. Since the COO has become more involved in the innovation, he has gained a better understanding of the data and metrics needed to demonstrate success.

For the HNs' actual work, we expected protocols to be in place so that HNs clearly understood what they should try to accomplish with each patient contact and how they should handle various challenging situations (e.g., a patient threatening suicide, domestic violence). We also expected that the HNs would be receiving ongoing training opportunities to build their skills in working with this challenging population. Although the senior administrator is a registered nurse with extensive clinical and public health experience, her focus has been almost entirely administrative and includes managing partner and provider relationships. A lack of clinical oversight poses challenges to implementation if HNs are unprepared to proactively address health care issues with patients. HNs who lack clinical training of some sort, even at the level that typical CHWs are trained to recognize key situations, may not adequately assess patient needs or recognize potential preventive measures that can be taken. The person who supervises the HNs and directly oversees their work also lacks expertise in providing care to this population. A leader with clinical and/or direct social work/psychological experience and involved in the day-to-day supervision of the HNs could ensure that program elements lead to better care and lower costs for high users. The organization's upper management appears to support and understand the innovation and can articulate their involvement (namely, resolving difficult situation) in carrying out the innovation.

1.2.2 Workforce Development

Recruiting and training HNs to help patients manage their access and use of the health care system is critical to the success of this innovation.

Hiring and Retention

Since the HCIA Community Resource innovation started, a total of 26 HNs have been trained as part of the workforce training project established at OJC. In Q7, SEMHS reported that 6 individuals employed in the innovation are care coordinators, case managers, or patient navigators; 3 are management or administrative staff; and 1 is classified as another type of worker. SEMHS has had a stable workforce throughout the duration of the intervention. SEMHS lost 2 HNs early in the implementation process. It was believed that these individuals were not a good fit for the HN role, and they left on their own accord. Two new individuals were hired in the beginning of 2013 and were quickly integrated into the HN team.

Although SEMHS experienced few challenges hiring and retaining staff, we learned during the site visit that OJC was slower than expected in developing the health navigation certification course and has seen a steady decline in enrollment. In the fall 2012 semester, OJC conducted a pilot health navigation certification course with 20 students. In the spring 2013 semester, OJC conducted a second training with 6 students, and in the fall 2013 semester, only 3 students enrolled in the certification course. To reverse this downward trend in enrollment and generate more interest in the program, OJC is conducting targeted outreach in the college and larger community. OJC convened an advisory committee made up of diverse members of the community to provide input on effective recruitment and program delivery. Based on this feedback, OJC plans to provide flexible formats for delivery of the navigation curriculum in hopes of attracting more students in spring 2014. The college is also exploring with area universities the possibility for an articulation agreement to a 4-year bachelor’s degree program in a related curriculum such as social work or public health. Despite these efforts, OJC continues to face challenges in clarifying the role and job functions of the innovation’s HNs to other training institutions and becoming a recognized program, as evidenced by the lack of approval thus far for the certificate program from the Colorado Community College System.

Training

Over the course of the innovation, SEMHS and its partners have conducted many training courses to prepare HNs and community clinical and nonclinical personnel to effectively implement this health innovation. Since July 2012, a total of 172 trainees have participated in training courses such as first aid, motivational interviewing, mental health first aid, and healthy living for diabetes, in addition to the health navigation certification courses.[6] The courses support the innovation’s objectives to prepare HNs and staff for their unique and essential role in the innovation and to encourage healthier lifestyles among the general population in Prowers County.

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[6] Source: Lewin database, March 2014.

Notably, HNs have not participated in ongoing training and attended only the first course of the OJC program (i.e., Introduction to Community Health). During the site visit, a concern was raised about the lack of ongoing HN training and oversight, particularly given their limited experience. Some individuals felt that HNs would benefit from continuing education opportunities and monthly in-service training to expand their knowledge and increase skills. Topics could include how to work effectively with patients with severe behavioral health issues or how to collaborate effectively with partner organizations and integrate HN activities among larger SEMHS efforts with the intended audience.

1.2.3 Effectiveness

Effective implementation (also known as implementation success) is the presence of the innovation delivered as intended (fidelity) to a substantial proportion of the targeted population (reach) in doses associated with effectiveness (dosage).

Fidelity

After conducting the site visit and learning firsthand about the innovation and implementation process, the site visit team devised fidelity criteria to rate the extent to which the innovation was implemented with fidelity to the planned model. The criteria include four key components: integrating with primary care, partnering with HPCHC and PMC, hiring and training HN personnel able to deliver health navigation services, and identifying high health care system users and getting them into primary care. Using these criteria, we determined that some program components (e.g., 26%–50%) are implemented and being provided to the innovation's audience as designed.

The primary reason for this relatively low rating of innovation fidelity was that the innovation deviated from the planned approach in that there is no longer an HN colocated at HPCHC to recruit patients. Despite this, SEMHS HNs still work directly with the HPCHC patient navigator on patients they share (i.e., patients receiving services from both organizations), although SEMHS has had to devise other strategies for linking patients with primary care. Its ability to create these linkages in Prowers County, however, is fairly limited because it does not provide primary care to clients.

The innovation's fidelity is strongest for developing the CHW certification course and hiring and retaining HNs. It is less certain whether health navigation activities have focused on getting high-risk patients into primary care. During the site visit, it was reported that the main service that HNs provide is transportation, but the extent to which transportation is provided for primary care services is unclear. The site visit team more often heard that HNs were transporting patients to appointments with specialists outside the county. Because of the rural and frontier environment in Prowers County, lack of a transportation network to link patients to health care services is a major challenge. The HNs spend much time on the road ensuring that patients get to their assigned appointments to deter exacerbation of problems.

Reach

This innovation targets high-risk ED users covered by Medicaid, Medicare, or CHP+ in Prowers County and is based on the initial 133 high users SEMHS cited in its application. Assessing effectiveness based on what proportion of the target audience is reached through several channels, including (1) one of the original 133 high users identified, (2) a severity level 3 or 4 patient on the ICHP list identified by the HN, (3) a high user referred by PMC or HPCHC with either no PCP or SEMHS as the PCP, and (4) an individual among these groups who actually enrolls in the program.

Table 5 aims to show the proportion of patients from the potential pool of various subgroups of high users who enroll and receive services. Patient enrollment from these subgroups will determine the overall effectiveness of the innovation in reaching the intended audience. Thus far, SEMHS has been able to use the ICHP data to identify 40 of the application's 133 high users. SEMHS has provided client lists of enrolled patients but has not been able to quantify those eligible for services but who have not been contacted or have refused treatment. Efforts to find the accurate denominator (target population) by directly obtaining ICHP data are under way. As we receive data from SEMHS and ICHP, we will revise ***Table 6*** in future reports.

Table 6. Patient Enrollment and Reach for Each Quarter since Project Launch

Quarter	Target Population (Denominator Assigned to HNs)	Unduplicated Patients Enrolled and Receiving HN Services (#)	Total Reach per Quarter (Column C Divided by B)	Percentage Change from Previous Quarter
December 2012	—	312	—	—
March 2013	—	127	—	—
June 2013	—	182	—	—
September 2013	—	72	—	—
December 2013	—	53	—	—
March 2014	—	41	—	—
June 2014	—	49	—	—
Total enrolled as of June 2014	—	836	—	—

Source: Lewin database, 2012–2014.
RTI will seek to obtain patient-level data from the Integrated Colorado Health Program for future reports.
HN = health navigator.
— Data not yet available.

Dose

Dose is an important component of implementation effectiveness and can be captured by looking at the average number of different types of services offered per patient. ***Table 7*** lists the services provided by HNs and the total number of patients receiving each type. Outreach and case management were the two most common billable services, and many enrollees received more than one service. As with many programs in rural or frontier areas, a primary need of patients is transportation, which the HNs often provide. Other important services include referrals to community resources and health education, particularly medication management. In total, all 836 enrolled patients through June 30, 2014, received one or more services from a health navigator. ***Table 8*** shows the number of patients contacted by HNs in person or by phone. All patients were contacted one or more times by a health navigator through multiple channels (in-person visit, telephone call, or written communication). In-person visits and telephone calls were the most common forms of patient contact, with more than half of enrolled patients receiving contact through each of those channels. For our overall analysis (described in ***Section 1.3***), RTI will need to obtain patient-level data of services received by each patient in order to link his or her exposure to HNs to key HCIA outcomes.

Table 7. Number of Patients Receiving HN Services since Project Launch

Type of HN Service	Patients Receiving Service (#)
Outreach	585
Case management	136
Individual skills training	12
Group skills training	23
Transportation	58
Nonbillable (scheduling, reminders)	297
Total	1,111

Source: HN data provided by Southeast Mental Health Services.
HN = health navigator.

Table 8. Number of Patients Contacted by HNs since Project Launch

Type of HN Contact	Patients Contacted (#)
In-person visit	488
Telephone call	449
Total	937

Source: Health navigator data provided by Southeast Mental Health Services.
HN = health navigator.

1.3 Evaluation Outcomes

Awardees have two types of quantitative data that RTI will use in assessing the impact of the awardee's innovation on key outcomes: claims data for Medicare and/or Medicaid beneficiaries, depending on who the awardee serves, and administrative or utilization data the awardee is collecting (which we have categorized as "other awardee-specific data," reflecting the variability of the types of data elements available across awardees). We are in the process of finalizing our assessment of all the available data sources and requesting data directly from each awardee. As those data are received, we will incorporate the findings into our quarterly/annual reports. The following sections present descriptive findings from the quantitative outcome data provided to RTI as of September 11, 2014.

1.3.1 Measures for Evaluation

After the site visit, the data management and site visit teams met to review each of the measures listed in the awardee's self-monitoring measurement plan. The measures listed in ***Tables 5*** and ***9*** reflect the measures determined as most relevant for our evaluation of SEMHS's innovation.

Table 9. Outcome Measures Requested from SEMHS

Key Evaluation Domains	Subdomains	Measures	Data Sources
Clinical effectiveness	General health and wellness	Number of high-risk patients who step down to lower risk level during HN intervention	HN ratings of high-medium-low risk status; ICHP list
Health care outcomes	Utilization	ED visit rate	PMC ED use roster, claims data
		All-cause admission rate	Claims data
		Readmission rate	Claims data
		Reduction in visits to PMC ED by high users who receive services from HNs	Claims data, ICHP list
	Cost	Total Medicare Parts A and B cost calculation	Claims data
		Spending per patient	Claims data
		Cost savings	Claims data

ED = emergency department; HN = health navigator; ICHP = Integrated Colorado Health Program; PMC = Prowers Medical Center; SEMHS = Southeast Mental Health Services.

1.3.2 Claims Data

As part of a broad assessment of health care innovations, the Center for Medicare & Medicaid Innovation (CMMI) is assessing the impact of its programs, including those funded specifically by HCIAs, on four core measures. The four core measures are

- health care spending per patient,
- hospital inpatient admissions,
- hospital unplanned readmissions, and
- ED visits.

Collectively, it is anticipated that CMMI programs will slow the increase in health care spending, reduce hospital admissions, reduce avoidable hospital readmissions, and prevent unnecessary ED visits. We are reporting these measures for all HCIA Community Resource awardees so that the collective impact of the awards can be assessed. The measures are calculated through analysis of Medicare and Medicaid fee-for-service claims. Because of differences between Medicare and Medicaid patients in age, other demographic variables, and disease status, we report the Medicare and Medicaid results separately as follows. Currently, complete Medicare claims are available through the end of 2013. Medicaid claims for SEMHS are available through the third quarter of 2011. The SEMHS innovation was launched on October 3, 2012.

- **Health Care Spending per Patient.** For Medicare beneficiaries, health care spending per patient includes Parts A and B Medicare expenditures for persons enrolled in the Part A and Part B fee-for-service program. The variable focuses on Medicare fee-for-service spending, so Medicare managed care (Part C) services are excluded, as are beneficiary copayments. Medicare Part D prescription spending is also excluded. Spending is reported on a per-person per-quarter basis. If a beneficiary is not enrolled for every month in a quarter, spending (except for hospital inpatient spending) is prorated to a quarterly basis based on the number of days enrolled during the quarter. Because hospital inpatient admissions are both rare and expensive, spending is not prorated for hospital inpatient spending. Prorating is also not performed for beneficiaries who die during a quarter.

  For Medicaid beneficiaries, health care spending per patient is reported for fee-for-service beneficiaries. Beneficiaries are only included in the analysis for spending (and the other measures) during periods when they are enrolled in Medicaid.

- **Hospital Inpatient Admissions.** This variable measures hospitalization, the single most expensive component of health care spending. Patients kept overnight in observation beds are excluded from this measure. Inclusion criteria for the analysis are the same as for spending. Hospital inpatient admissions are not prorated based on the number of days eligible during the quarter. All-cause inpatient admissions and ACSC admissions are reported separately, under the assumption that a greater share of ACSC admissions can be prevented by appropriate ambulatory care. The mean quarterly admission rate per 1,000 patients is reported.

- **Hospital Readmissions.** Hospital readmission rates serve a dual purpose in evaluating HCIA impacts. Readmissions add to the costs of a prior hospitalization, and they often reflect a problem in the care provided during the first admission. All-cause readmissions are defined as a follow-up admission to any short-term acute general or long-term care hospital within 30 days of a discharge from another hospital of the same type. We ignore multiple admissions within 1 day of an initial admission because these often represent transfers between hospitals. We define index hospitalizations that begin during the quarter and follow each index admission for 30 days, even when the follow-up period extends beyond the end of the quarter. Inclusion criteria for the analysis are the same as for spending. We also calculate readmissions for persons with ACSC. The person's ACSC status is defined by his or her first hospitalization during the quarter. The readmission rate equals the number of readmissions divided by the number of index hospitalizations during the quarter. Planned readmissions are excluded from the calculation of the numerator. Quarterly mean readmission and ACSC readmission rates per 1,000 admissions are reported.

- **ED Visits.** ED visits are sometimes viewed as a symptom of the inability of the community's health care system to provide adequate preventive and ambulatory care visits. We report an all-cause ED visit rate that excludes ED visits resulting in an inpatient admission (which presumably represents unavoidable visits) and includes overnight ED visits without an inpatient admission. Inclusion criteria for the analysis are the same as for spending, and ED visits are also subject to the same prorating formula as for spending. The mean quarterly ED visit rate per 1,000 patients is reported.

Medicare Claims Analysis

We expect to include Medicare claims analyses in subsequent reports, but SEMHS does not yet have enough Medicare enrollees to support Medicare analysis. The analysis will focus on Medicare beneficiaries enrolled in the SEMHS innovation who were enrolled in fee-for-service Medicare Parts A and B at some point between 2010 and 2013. The analysis will use data from the CMS Chronic Conditions Data Warehouse. Measures will be presented for these beneficiaries in the quarters before and after the innovation was launched on October 3, 2012. ***Appendix A*** shows the claims analyses tables that will be presented for Medicare if the awardee has sufficient enrollees who are beneficiaries (i.e., nearly all of their patients are recruited from the list of Medicaid beneficiaries). In addition to the tabular format, we will present figures showing each measure as a function of time. Values in quarters before the innovation's launch in October 2012 will be shown in one color, and values for quarters during and after launch will be shown in another color. The figures will include a trend line based on a linear regression of prelaunch values.

Medicaid Claims Analysis

The Medicaid data analysis will use data from the CMS Alpha-Medicaid Analytic eXtract (MAX) data files. Currently, Medicaid claims for SEMHS (i.e., the state of Colorado) are only available in Alpha-MAX through the third quarter of 2011. Because the SEMHS innovation was launched in October 2012 and claims for that quarter are not available, we are not presenting measures for Medicaid patients in this report. We will provide Medicaid analyses in subsequent reports as more data become available. We will report tables and figures similar to those for Medicare (see ***Appendix A***).

Discussion of Claims Analysis

The claims measures will provide descriptive data on patients enrolled in the SEMHS innovation before, during, and after the launch of the innovation. In addition to the standard measures being reported across all awardees, we will examine claims for common types of services used by SEMHS enrollees. About 70% of SEMHS enrollees have been diagnosed with both a mental illness and chronic disease. In later reports, we will also provide mental illness– and chronic disease–specific spending and utilization data.

Development of Comparison Groups

In addition to comparing SEMHS patients before and after implementation of the innovation, we are constructing a comparison group of Medicare and Medicaid fee-for-service patients in rural eastern Colorado. This comparison group will control for external, noninnovation factors affecting both SEMHS and non-SEMHS patients. The comparison area will be limited to rural eastern Colorado, avoiding the larger metropolitan areas such as Denver, Colorado Springs, and Pueblo. We are using propensity score matching to identify patients with similar characteristics as SEMHS patients; consequently, many of the comparison group patients will have mental illness and at least one chronic disease. Results for the comparison group will be included in later reports.

1.3.3 Other Awardee-Specific Data

In late June 2014, after the data review meeting, RTI met with SEMHS to request the raw patient-level data that were used to generate each of the measures in ***Tables 5*** and ***9*** for each quarter.

Overview of Data Requested and Received

SEMHS noted that providing data from the ICHP list will be a challenge for the following reasons: (1) SEMHS might not have retrospective data, (2) ICHP data are complex, and (3) a response to a request may be delayed. In early October, SEMHS informed RTI that it would not be able to share ICHP data with RTI and that we would need to contact ICHP directly regarding any data transfers. We are reaching out to ICHP and will continue to provide CMS with updates on the status of the obtaining ICHP data.

Health Care Outcomes

We have just begun to analyze the data received from SEMHS. Subsequent reports will include additional findings, such as those in ***Tables 10*** and ***11***.

Table 10. Shell for Health Care Utilization over Time

Measure	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Number of high-risk patients who step down to lower risk level during HN intervention	—	—	—	—	—	—	—
Reduction in visits to PMC ED by high users who receive services from HNs	—	—	—	—	—	—	—

Source: Patient-level data to be provided to RTI by Southeast Mental Health Services.
ED = emergency department; HN = health navigator; PMC = Prowers Medical Center; Q = quarter.
— Data not yet available.

Table 11. Shell for Health Care Utilization by Dose

	Dose		
Measure	Low	Moderate	High
Number of high-risk patients who step down to lower risk level during HN intervention	—	—	—
Reduction in visits to PMC ED by high users who receive services from HNs	—	—	—

Source: Patient-level data to be provided to RTI by Southeast Mental Health Services.
ED = emergency department; HN = health navigator; PMC = Prowers Medical Center.
— Data not yet available.

Discussion of Other Awardee-Specific Findings

Once we analyze data received from SEMHS, we will fill in the table shells above. At that point, we will be in a better position to discuss findings related to the other awardee-specific data.

1.4 Overall Program Effectiveness to Date

Lamar, Colorado, is a small rural community where providers know each other well and have collaborated on many initiatives in the past. The larger Prowers County, for which Lamar is the county seat, has areas that are designated as frontier, so obtaining health services can be challenging for many residents. SEMHS's innovation involves both a training component and establishment of HNs who contact high-risk users of Medicaid, Medicare, and CHP+ in Prowers County to ensure they have no unmet needs that the navigators can fulfill. SEMHS has experienced a number of major challenges in implementation. The change in its partnership with HPCHC and direct involvement of HNs at the health center make it uncertain that the patients being contacted by the HNs will demonstrate a change in their utilization of health care services over the course of the innovation. Although SEMHS has been creative in tackling this challenge by having HNs contact patients on the ICHP list who do not have a PCP and referring them to one, the partnership with HPCHC was a critical component for how SEMHS hypothesized they would be able to affect costs and health care utilization that it now compromised.

Although they were able to develop, train, and hire individuals early on who were in the field quickly enrolling patients into the program, no medical supervision is provided to the HNs, and no protocols are in place to guide them in addressing the myriad of situations they will likely encounter in assisting patients. The training program at OJC has experienced slow growth, and most of the HNs had not received formal training beyond the introductory course. They have a small group of dedicated staff who work effectively as a team in carrying out the innovation and troubleshooting implementation issues, although respondents were concerned about the lack of direct supervision provided to the navigators. The project also has strong support among senior leadership but lacks an innovation leader with a focus on providing clinical oversight to the services HNs provide. The HNs are relatively separate from the other SEMHS staff in the same location (e.g., do not attend in-service trainings/meetings with other staff) and not fully integrated in care delivery in a way that allows them to fill other patient needs. SEMHS staff are providing informal continuing education and resources so HNs can work more proactively with patients and anticipate needs would improve the ability of HNs to affect patient care.

In addition, despite its relative simplicity, some aspects of the innovation have not been implemented as planned; it is unclear how these changes will affect innovation outcomes. For instance, the need to change course in finding other ways to get patients into primary care likely will affect the innovation’s fidelity and reach and, ultimately, its goals. HNs may have begun to reach a saturation point with the intended audience, which will affect their work. Staff members are aware of this and other issues and are working hard to determine the best strategies for measuring HN impact, especially in light of the potential availability of the ICHP data and the ability to track the original 133 high users. RTI will continue to track progress as the innovation and evaluation plans move forward.

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APPENDIX A

Table A-1. Baseline and Intervention Trends in Health Care Spending per Patient

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—

Savings per Patient

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Spending rate: total quarter (i.e., quarterized) payments/number of unique patients. Savings per patient: difference in comparison minus the intervention's average spending rates.
— Data not yet available.

Table A-2. Baseline and Intervention Trends in Admissions per 1,000 Patients

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Admit rate: total unquarterized admissions/number of unique patients.
— Data not yet available.

Table A-3. Baseline and Intervention Trends in Readmissions per 1,000 Admissions

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total admissions	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total Admissions	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.

Note: Readmit rate: sum of all readmissions to eligible hospital within 30 days/all admissions in the quarter. Total admissions: all eligible admissions in the quarter.

— Data not yet available.

Table A-4. Baseline and Intervention Trends in ED Visits per 1,000 Patients

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: ED rate: total quarterized ED visits and observation stays/number of unique patients.
— Data not yet available.

October 2014

Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring

Annual and Site Visit Report
University of Chicago

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OVERALL EVALUATION SUMMARY

RTI International was selected to lead an independent evaluation of the 24 Health Care Innovation Award (HCIA) awardees categorized as Community Resource Planning, Prevention, and Monitoring (Community Resource). In this role, RTI is conducting an in-depth evaluation of each innovation, as well as a cross-site evaluation that includes similar innovations targeting the same priority outcomes (e.g., emergency department [ED] visits). For each of the 24 awardees, this report presents findings from the first year of the evaluation (beginning September 23, 2013, and including data obtained by RTI as of September 11, 2014). The report is based on multiple data sources, including operational reports, self-monitoring plans, site visits, and quantitative data analysis.

The evaluation methods vary by awardee innovation, based on the type of innovation and availability of data. RTI has reviewed and coded all existing documents from the awardees through December 31, 2013, and incorporated that knowledge into each awardee's overview. Our review included the awardees' original applications for funding, original and current operational and self-monitoring plans, and quarterly narrative and monitoring reports. For this annual report, we incorporated activities reported through the awardee's seventh quarterly report, the RTI site visit, and all data received by September 11, 2014.

Between April and August 2014, teams of at least two staff from the RTI team visited all 24 awardees for 2 to 4 days, depending on the number of interviews conducted. Teams included a subject matter expert, with training and experience specific to the awardee's innovation, and a master's- or bachelor's-level colleague to take notes. Before each visit, the teams reviewed all available documentation from the awardee to learn about the innovation's goals, objectives, and status. The purpose of the site visits was to clarify our understanding of the innovation, obtain detailed information on the implementation process, and review awardee-specific data to determine which elements to incorporate into the evaluation. By August 13, 2014, all 24 awardees had been visited and a thorough description of our findings included in each of the 24 awardee sections.

In addition to the site visits, we report quantitative data from two possible sources for several awardees. First, we present findings from claims analysis for awardees in this report if they both provided us with patient identifiers and reported enrolling participants who are Medicare and/or Medicaid beneficiaries. RTI has obtained patient identifiers from most of the 24 awardees to conduct claims analysis. Second, we present data RTI obtained directly from awardees to quantify their work in addressing health care costs, quality, and patient outcomes. Data from additional awardees will be analyzed and presented in future reports, as data become available and awardees enroll sufficient participants. An update on the availability of Medicare/Medicaid claims and other awardee-specific data, analysis of data available to us and cleaned as of September 11, 2014, a summary of the comparison groups, and a list of draft evaluation measures are included in each awardee section.

1. HCIA COMMUNITY RESOURCE AWARDEE: UNIVERSITY OF CHICAGO (U-CHICAGO)

1.1 Introduction

The University of Chicago (U-Chicago), an academic research organization on the South Side of Chicago, received an award of $5,862,027. Launched on March 21, 2013, the CommunityRx (CommRx) innovation has the following goals:

1. **Reduce costs** by providing community referrals for healthier lifestyles and self-care. One area in which costs may be reduced is through decreased low-acuity ED visits.
2. **Improve care** by providing primary care and emergency care providers with a patient-centered prescription for community services (Health*eRx*) for healthy lifestyles, disease management, and social services in their neighborhood.
3. **Improve health** by providing information on community programs and services available to local residents for health maintenance and disease management.

RTI is in the process of conducting an in-depth case study for this innovation. As part of that case study, two RTI team members conducted a site visit in May 2014 and both before and after the visit, our team reviewed all documentation on this innovation. We are working to obtain data directly from the awardee to assess many of the variables we discuss. This report describes findings from RTI's site visit, document reviews, follow-up calls, and analysis of data obtained and cleaned by RTI through September 11, 2014. We start by describing the innovation's components and the patients targeted by the awardee.

1.1.1 Innovation Components

This multisite, multifaceted innovation includes a range of educational, technological, and analytical components that target providers and patients at the University of Chicago Medical Center (UCMC) and community health centers (CHCs) on the South Side of Chicago. The partners provide information technology (IT), training, implementation expertise, and clinical health services to link a patient's medical record data with a patient-centered e-prescription for community-based health and social services (Health*eRx*). The innovation is supported by several key partners (***Table 1***) that help CommRx meet the following three objectives:

- Deliver three main services over the 3-year period:
    1. Aggregate electronic health record (EHR) and CommRx referral data that inform program planning for community-based service providers (CBSPs) (referred to as CommunityRx Reports).
    2. Provide patient-centered e-prescriptions for community health and social services (Health*eRx*).

3. Deploy Information Specialists[1] to support recipients of the Healthe*Rx* who desire more information or assistance with connecting to local health and social services for self-care (Information Specialists).

Table 1. HCIA Partners, Roles, and Locations

Partner Name	Role in HCIA Project	Location
Northwestern University Chicago Health Information Technology Regional Extension Center (CHITREC)	HIT expertise and training	Chicago, IL
Alliance of Chicago Community Health Services, LLC	Training and HIT expertise	Chicago, IL
Centers for New Horizons	Implementation expertise and workforce development expertise	Chicago, IL
Chicago Family Health Center	Clinical health services	Chicago, IL
Friend Family Health Center	Clinical health services	Chicago, IL
Greater Auburn-Gresham Development Corporation	Implementation expertise and workforce development expertise	Chicago, IL
Near North Health Service Corporation	Clinical health services	Chicago, IL
University of Chicago	Project leadership and operations, management/administration expertise, HIT training and workforce development expertise, clinical health services, and implementation and evaluation expertise	Chicago, IL
Claretian Associates	Implementation expertise and workforce development expertise	Chicago, IL

Source: Site visit, May 7–8, 2014.
HCIA = Health Care Innovation Award; HIT = health information technology.

The key components of the innovation are closely aligned to the objectives. The first component, delivery of the Healthe*Rx*, required connecting the three EHR systems at the CHCs and at the U-Chicago pediatric and adult EDs to the CommRx database (see Component 1). The awardee initially planned to include the current clinical sites (e.g., CHCs and EDs) to serve residents who live in a 10-zip code target area and has since expanded to include residents in an additional zip code (from 10- to 11-zip code areas) to increase the innovation's reach. The awardee's planned expansion of the innovation maintains a focus on population health management, which in this innovation links the high-poverty, minority target population to community-based health and social services. Likewise, the delivery of the Healthe*Rx* via the various clinical sites is a critical handoff of information about community-based self-care services and public health information from the clinic/ED setting

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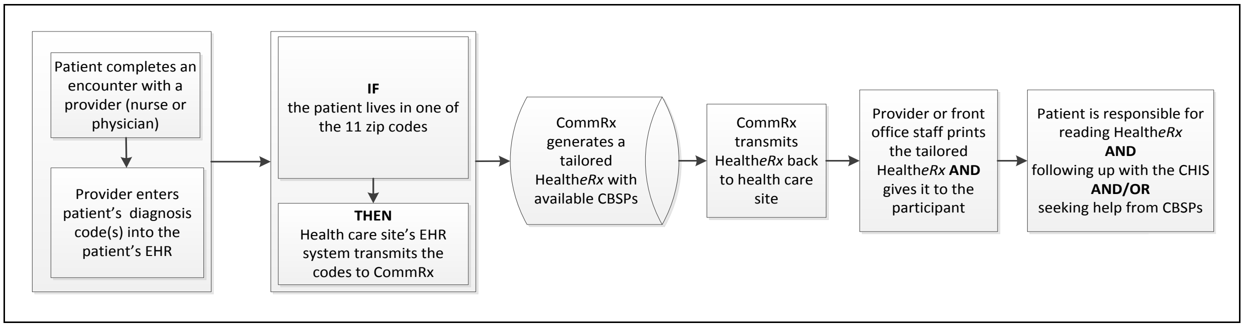
[1] During the May site visit, we were told that Community Health Information Specialist (Information Specialist) was the preferred title. In the original application, it was Community Health Information Experts (CHIE). So it has evolved over time. The preferred title now is Information Specialist, which we use in this report.

to the patient during the care visit (see Component 2). The third component—the Information Specialists—strengthens the delivery of the Health*eRx*, which is outlined in two previous components. Furthermore, the Information Specialist is a community contact for participants who seek information and assistance to connect with the available community-based health and social services provided on the tailored Health*eRx* or who seek other services not listed on the Health*eRx*.

Before explaining the specific innovation components, it is important to first understand the automated, multistep process for generating and transmitting a Health*eRx* (***Figure 1***). The final steps may vary to accommodate the workflow at the health care site (e.g., who gives the Health*eRx* to the patient and at what point in the process). At the majority of sites, the provider (nurse or physician) gives the Health*eRx* to the participant; however, at Chicago Family Health Center, a CHC, the front-office staff members have that role.[2]

Figure 1. Flowchart of CommunityRx Innovation[3]



CBSP = community-based service provider; CHIS= Community Health Information Specialist; EHR = electronic health record.

Component 1: HealtheRx via CommRx

The first component of the innovation involves developing and using a health information technology (HIT) database called CommRx, which receives EHR data from the participating health care sites to produce a meaningful Health*eRx* for participants that is tailored to their condition and the resources available in their community.

Collecting Place-Based Data

The CommRx database software was programmed by the U-Chicago Biomedicine Information Services with support from its Information Technology Services unit. The EHR software interface/application development is currently supported by the three HIT partners: the University of Chicago Biomedicine Information Services; the Alliance of Chicago Community Health Services, LLC (the Alliance); and Northwestern University

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[2] Site visit interviews, May 7–8, 2014.
[3] If patients do not present with one of the diagnoses that map to one or more ontologies, they will receive wellness HealtheRx.

Chicago Health Information Technology Regional Extension Center (CHITREC). The HIT partners created interfaces/applications to enable different EHRs to send health (e.g., International Classification of Diseases, ninth revision [ICD-9] diagnostic codes) and demographic data (e.g., address, age, gender) to the CommRx database. The CommRx database generates a tailored Health*eRx* for patients that is printed and delivered to patients during their care visit. The CommRx database also houses all CBSP resource data for the 11–zip code area. Data collection for the CommRx database begins with MAPSCorps, dedicated teams of employed youth who have been mapping all public-facing resources in the South Side of Chicago neighborhoods through door-to-door inquiries and wireless cellphone technology each summer since 2009. Before the innovation, MAPSCorps youth had identified approximately 2,000 operating businesses and organizations. For the innovation (quarter 1 [Q1]), field teams canvassed the 10–zip code target area and used smartphones to update and collect information on more than 8,000 health and social services resources, which substantially expanded the resource.

Service Mapping

The second step (service mapping) is built on the place-based data (e.g., name, location, contact information) collected by the MAPSCorps youth. Following a script and a service-mapping protocol, the Information Specialists make telephone contact with the potential CBSP to verify the data collected and expand the information to include a specific CBSP's available goods and services, hours of operation, parking availability, languages spoken, handicap accessibility, and source of payment accepted (if any at all). The Information Specialists enter and save the CBSP data in the CommRx database using a survey interface designed by the U-Chicago operations and research teams and programmed by the U-Chicago HIT team.

Developing Ontologies

Ontologies are developed using the best available public health and medical evidence to connect health conditions (e.g., diagnoses, problems, social conditions) to relevant community resources that were identified through the previous service-mapping process. Geocoding of community resource data allows for the Health*eRx* to make participants aware of the community resources closest to their home address. These ontologies match targeted (determined in partnership with the provider site) health conditions (diagnoses) to the appropriate health and social services. For example, a provider sees a patient from the South Side of Chicago target population. The provider (physician or nurse) enters a problem, diagnosis, condition, or symptom into the EHR during the standard workflow for that practice. The provider uses the EHR to code the problem, diagnosis, condition, or symptom with the ICD-9 code. For a patient with the condition "obesity," the provider completes the usual clinical encounter and closes the patient chart. Typically, the chart is closed when the provider clicks the "after visit summary" or "office visit summary" button.

When this button is clicked, the EHR sends a Web call to the CommRx database, which matches the ICD-9 code via the "obesity" ontology to a list of community programs and services for obesity.

The database will sort through and compile contact information for the CBSPs in the patient's community who offer services such as nutrition, weight loss, or exercise. The CommRx database would then transmit a tailored Healthe*Rx* for that particular patient to a designated printer at the health care site (i.e., CHC or ED). The provider or front-office staff would discuss the available community-based resources with the patient during the visit or during the checkout process. When the CommRx database functions as intended, it has the capacity to track the date and clinical site at which each Healthe*Rx* was generated. In addition, the database stores the following data points received in the Web call from the EHR: zip code, age, gender, race/ethnicity, and problem list (ICD-9 codes). The unique URL for each Healthe*Rx*, which can be referenced at a later point, is stored in the patient's medical record. In summary, the CommRx database receives information from the participating sites and generates a tailored Healthe*Rx* based on the participant's ICD-9 codes and demographic data (e.g., zip code, age). The Healthe*Rx* is then provided to the patient for his or her use.

Component 2: Identifying and Engaging Clinical Sites in the Innovation

Identifying, engaging, and preparing clinical sites to participate are essential components of the innovation. Without clinical sites and providers who are willing to deliver and potentially explain the Healthe*Rx* to the patients, the innovation could not be implemented.

Engaging and Preparing the Site

During the site visit, U-Chicago outlined a multistep process to engage and prepare a clinical site to implement the innovation:[4]

- Approach senior leadership to explain the program, highlight the benefits and requirements, and assess the level of commitment.
- Formalize agreement (i.e., sign a data use agreement).
- Identify a working group for the site (e.g., medical director or provider champion; IT specialist; representatives from nursing, social work, and front-office/patient services; an adoption specialist).
- Observe EHR workflow to understand what is recorded in the EHR (e.g., problem list, demographics), by whom (e.g., provider or front desk staff), and how (e.g., check box, free text); the mechanism for correcting address errors; how the after-visit summary (AVS) is triggered and who gives it to the patient; and who will give the Healthe*Rx* to the patient (same as or different from AVS).

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[4] Information from a document provided by U-Chicago during the site visit (*Steps to Engage Clinical Sites*, draft 2/11/14).

- Build or apply the CommRx technology to link to the site's EHR (e.g., technology readiness; timeline for development, piloting, and launching).
- Identify the location of current and future printers for the AVS and the Health*eRx* (e.g., the same or different printers for both, at workstations, or in each exam room).
- Identify providers who are "super users" to live-test the technology.
- Complete service-level survey with site manager.
- Review existing ontologies.
- Develop site- and department-specific ontologies.
- Edit and deliver marketing materials (e.g., posters, pamphlets, waiting room videos or DVDs).
- Tailor training to site (i.e., provide overview of the Health*eRx*, its purpose/benefits, and the location of the Health*eRx* [workflow with EHR screenshots]; set provider and staff expectations).
- Set training and launch (go live) timeline.
- Schedule for Information Specialists to be embedded on-site to get to know providers, answer questions, and facilitate their engagement with the project.
- Create feedback mechanism (i.e., adoption specialist and IT representative collect feedback and address issues).
- Monitor impact on flow and utilization of services through quarterly reports.
- Designate personnel to update service-level survey.
- Establish process to train new providers and staff (e.g., use an EHR test patient, incorporate into existing new employee orientation, develop training CDs) and provide updates about changes to the system.

Supporting the Providers

Providers for this innovation are operationally defined as anyone who is trained to implement the innovation, has access to the designated printer, and hands off and potentially explains the Health*eRx* to a patient (physicians, nurses, and front-office staff). In general, the provider is a nurse or physician at most sites (CHCs and adult and pediatric EDs within UCMC) with the exception of the Chicago Family Health Center, which uses the front-office staff to hand off the Health*eRx* to the participant. The patients are the indirect recipients of the innovation when they receive the Health*eRx* from the site's providers, who are considered to be the users of the innovation.

The provider is a critical link in implementing the CommRx innovation. Engaging the provider in the process of delivering the Health*eRx* to the patient raises provider awareness about the patient's community and about the availability of or gaps in local resources to support the patient. Improving patient and provider awareness of community resource availability and gaps has the potential to drive health system transformation. The premise is that if patients understand how their health conditions can be prevented or managed through awareness of available community-based service options, patients will learn how to manage their own health conditions and use health care services less frequently.

To date, training providers has involved three modalities, and feedback from providers has been used to update and inform the training offered. The training is tailored to the unique setting and needs of the practice. Initially, providers were trained in-person via didactic sessions using a Microsoft PowerPoint presentation followed by Q&A and a brief survey. In another setting, a similar approach was used, but with a train-the-trainer model (managers were trained, then they trained other provider staff). Currently, training is conducted via a Web-based learning management system, which allows for scale and tracking, including provider evaluation and satisfaction tracking. The deployment of the Healthe*Rx* is supported with the provision of equipment (e.g., printers) and technical support from an adoption specialist located at the specific site. An on-site resource to support the providers, the adoption specialist, provides approximately 6 months of technical support to help users integrate the innovation into their workflow and assists with any troubleshooting. The adoption specialist also serves as the liaison between the health care service site and the HIT team that supports the delivery of the Healthe*Rx* via the CommRx database. According to a document provided during the site visit, the adoption specialist uses an issue tracker form to log the type of issue encountered with the CommRx innovation (e.g., printer issue, unexpected error message, system down, workflow issue), the time the issue occurred, and a detailed description of what happened so that issues can be addressed.

Component 3: Information Specialists

The Information Specialists have an essential role in implementing the innovation, as described in ***Table 2***. Although U-Chicago sought to hire five Information Specialists to support the innovation, it currently has two specialists working on the innovation. Although U-Chicago was successful in recruiting three specialists by Q4, some turnover occurred when one of the host organizations closed in Q5, resulting in the loss of one Information Specialist. A third Information Specialist was recruited and trained, but this individual later resigned to pursue another opportunity. The two Information Specialists currently on staff have been working with the innovation for more than a year, and both are well connected (culturally and demographically) to the communities they serve. In addition to covering specific zip codes, the Information Specialists are assigned to specific health care sites so that they can develop rapport with the providers and make sure providers understand the availability of the specialists to support the implementation of the innovation. The Information Specialists are also available to respond to requests from patients (e.g., call, text, e-mail, office visit) for additional information, to assist patients with linking to community-based health and social services on their tailored Health*eRx* or other services not listed on their Health*eRx*, or to generate through the healtherx.org Website a list of resources for family members and friends of the patients.

Table 2. HCIA-Funded Care Coordinator Functions and Training[1]

Characteristic Type	U-Chicago Information Specialist Role
Title	Information Specialist
Minimal qualifications	GED/high school diploma
Functions	Conduct service-mapping telephone interviews with community-based service providers (or close case if unable to reach) Respond to calls from patients who received the Health*eRx* Participate in monthly collaborator meetings Meet monthly with MAPSCorps Visit the assigned clinical sites to answer questions from providers and patients Attend approximately two community events per quarter (e.g., health fairs)
Established continuing education program	None

[1] Employed at a partner organization.
GED = General Educational Development; HCIA = Health Care Innovation Award.

The Information Specialists are responsible for tracking the calls that they make to and receive from patients and CBSPs. As the RTI team learned during the site visit, the majority of patients who call an Information Specialist want information on employment resources, housing, health insurance, fitness, dental care, and places that offer health care services on a sliding scale. The Information Specialists average four to five calls per week from participants, which range from 5 to 25 minutes per call. Information Specialists are trained to ask participants whether they have been to a CBSP and to inquire about the participant's experience. This yields an informal understanding about participant use of the Health*eRx* that is shared during weekly case conferences with the Information Specialists and used in continuous quality improvement and rapid-cycle iteration activities.

In addition, participant use of the Health*eRx* is assessed via voluntary call-in surveys. The budget allows for 20 Health*eRx* recipients to call in each month to participate in a survey about the Health*eRx*. Each caller is given $25 for completing the survey. This system yields quantitative data, albeit limited by potential bias resulting from a volunteer sample, about use of the community resources on the Health*eRx*, contact with Information Specialists, satisfaction with the Health*eRx*, and sharing of information from the Health*eRx* with others. Data are also collected to assess overall satisfaction with and usefulness of the Health*eRx*. Currently, U-Chicago is doing what it can to assess how participants use the Health*e*R*x*. The system in place as of the May 2014 site visit—self-reported information calls from participants to Information Specialists; responses on the participant survey that limit compensation to the first 20 callers each month; and intermittent feedback from CBSPs to the Information Specialists. Because the patient must initiate contact with an Information Specialist, this passive role does not allow an accurate assessment of how participants use the HealtheRx.[5] This information may be helpful for internal evaluation; however, for the external evaluation, there are insufficient data to support the relationship between a participant's receipt of a Health*e*R*x* and the utilization of services recommended on the Health*e*R*x*. These data would be necessary to demonstrate a link between the innovation and the desired health outcomes.

1.1.2 Program Participant Characteristics

A program participant is defined as an individual who lives in one of the 11 high-poverty zip codes on Chicago's South Side (i.e., target population), receives a health care visit at one of the participating sites, and for whom the CommRx database generated a Health*eRx* during the health care visit. The target South Side population includes Medicaid and/or Medicare beneficiaries (approximately 63%) and a high percentage of minorities: 75.3% are African American, 14.1% are Hispanic, and 10.6% represent another race/ethnicity (e.g., white, Asian American, unknown).[6] The innovation's estimated target population (170,000) is determined from a subset of the total population (528,000) in the 62–square mile geographic area. Participants receive care at one or more clinical care settings at which CommRx is live, including (1) 15 CHCs (3 corporations) that serve large Medicaid and self-pay (sliding scale) and minority populations; and/or (2) two EDs at UCMC, adult and pediatric; or (3) 3 outpatient UCMC clinics.[7] The awardee's application also describes these individuals as patients who routinely leave the clinic with recommendations about steps they should take to be healthy but with very poor-quality information about where to go, therefore making them a priority population for the innovation.

As of March 2014, approximately 29,000 unique patients (about 17% of the 170,000 targeted residents) were served by the CommRx innovation (i.e., the number for whom the CommRx database generated a tailored Health*eRx*).[8] In future reports we will complete ***Table 3*** with the characteristics of patients enrolled in the innovation once we receive patient-level data from U-Chicago and other clinical sites.

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[5] The awardee received National Institutes of Health funding (as of 9/1/14) to prospectively assess how participants use the HealtheRx.

[6] Documents received from the awardee during site visit, May 7–8, 2014.

[7] Total population is based on a demographic data table received from the awardee during our May 2014 site visit.

[8] Lewin data, quarter 7 report.

Table 3. Characteristics of Patients Ever Enrolled in the Innovation

Characteristic	Number of Patients	Percentage of Patients
Age		
0–18	—	—
19–24	—	—
25–44	—	—
45–64	—	—
65–74	—	—
75–84	—	—
85+	—	—
Missing	—	—
Sex		
Female	—	—
Male	—	—
Missing	—	—
Race/ethnicity		
White	—	—
Black	—	—
Hispanic	—	—
Asian	—	—
American Indian or Alaska Native	—	—
Other	—	—
Missing/refused	—	—
Payer category		
Medicare	—	—
Medicaid	—	—
Dually eligible	—	—
Missing	—	—

Source: Patient-level data to be provided to RTI by U-Chicago and other clinical sites.
— Data not yet available.

As the RTI team learned during the site visit in May 2014, expanding the innovation to additional clinical sites within the 11 zip codes should help U-Chicago reach more of its target population.[9] RTI will continue to work with the awardee to determine the best denominator to use in calculating outcomes. ***Table 4*** includes the participants planned for inclusion in the innovation, the related data source, and the current count.

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[9] The awardee stated the initial target population of 131,000 in their original application. During our site visit in May 2014, we learned that this target expanded to 170,000.

Table 4. Participants Planned for Inclusion in Innovation (Denominator Data)

Participant Type	Data Source	Current Count
Target program participants, a subset of the population living in 11 targeted zip codes (high proportion of minorities, Medicaid/Medicare beneficiaries) who receive a Health*eRx*	Census data; South Side Health & Vitality Studies conducted by U-Chicago[1]	170,000 [2]
Unique participants for whom CommRx database generated at least one Health*eRx*	EHR	29,000 (Total across the 11 zip codes that received a HealtheRx; Q7 data collected at May 2014 site visit)
Unique participants for each ontology for whom the CommRx database generated a Health*eRx*	EHR	Unknown

Source: Lewin Q7 quarterly report.

[1] For more information on the ongoing work of the South Side Health & Vitality Studies, see this Website: https://thestudies.uchicago.edu/page/about-studies, accessed July 21, 2014.

[2] Total population identified as patients across 11 zip codes (May 2014 site visit).

EHR = electronic medical record; Q = quarter.

It is important to understand who is considered a program participant in the CommRx innovation. The organizational leadership at U-Chicago, particularly the Urban Health Initiative (UHI), is focused on improving population health in Chicago's South Side. For the purposes of our evaluation, RTI will focus on the total indirect participants, which include patients who accessed services at one or more of the previously defined care settings and, in turn, for whom the CommRx database generated a Health*eRx* during the health care visit. The patients' medical care is neither based on nor delivered through the innovation. The patient's health care visit triggers the innovation, which includes the tailored Health*eRx*. According to U-Chicago, the count of unique participants across the 11 zip codes is available from EHRs, not the CommRx database.

The U-Chicago and CHC sites that serve a high-poverty population (an estimated 63% are Medicaid/Medicare beneficiaries) are disseminating the Health*eRx* among those who may be using health care services frequently. This is important to measure because these individuals may not have previously received or known about adequate resources in their own communities for self-management of health and medical conditions. The CommRx database captures the frequencies with which the Health*eRx* is disseminated. As of Q7, the innovation disseminated 48,709 Health*eRx*s to participants in the 11 zip codes. This count includes every Health*eRx* generated, and because an individual can receive more than 1 Health*eRx*, it is greater than the count of approximately 29,000 unique indirect participants served.

In addition, it is critical to understand the health conditions that affect the target population's utilization of health care services. Currently, the awardee can determine the prevalence of health conditions among target populations based on EHR data (ICD-9 codes) and potentially, claims data. The awardee cannot determine causal relationships between specific health conditions and utilization of health care services from the Health*eRx*. As the number of participants and frequencies of Health*eRx* continue to increase, the awardee will expand its ontologies for preparing tailored Health*eRx* based on specific ICD-9 codes. Currently, the ontologies include the following conditions: asthma, diabetes, HIV, hypertension, homelessness, mental health, minor trauma, obesity, pregnancy, sexually transmitted infections, sickle cell anemia, substance abuse, wellness (younger than age 12, aged 12–17, aged 18–64, and aged 65 or older). Information provided during the site visit indicated that wellness for youth younger than age 12 most frequently generated a Health*eRx*. A participant can have multiple conditions and receive one or more tailored, condition-specific Health*eRx*, such as diabetes and hypertension. For all participants, the evaluation would track health outcomes for all conditions. We intend to define clearly the high-frequency ICD-9 codes to evaluate whether these participants are experiencing an increase or decrease in health care ED visits and costs based on available claims data.

1.2 Implementation Progress

The extent to which each awardee can implement its innovation as planned and reach a sufficient number of patients will be critical to assessing its impact on improving health and health care and reducing costs. The following provides details on first the implementation process and then the effectiveness, with a table that provides the list of measures that RTI plans to use in assessing each. In ***Table 5***, we present the explanatory or independent variables that we plan to use to assess the impact on outcomes of the innovation.

Table 5. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for U-Chicago

Key Evaluation Domains	Subdomains	Measures	Data Source
Workforce development	Provider satisfaction	Provider satisfaction with the Health*eRx*	Provider satisfaction survey
Implementation process	HIT workflow	Number and type of technical problems with the Health*eRx*	CommRx database
Implementation effectiveness	Reach	Number/percentage of unique participants who have received a Health*eRx* across and within the 11–zip code area	CommRx database EMR
		Number/percentage of unique participants who received a Health*eRx* based on a specific ontology across and within the 11–zip code area	CommRx database EMR

(continued)

Table 5. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for U-Chicago (continued)

Key Evaluation Domains	Subdomains	Measures	Data Source
Implementation effectiveness (continued)	Dose	Number of tailored Health*eRx* reports generated for each patient	EMR
		Number of times Information Specialists are contacted by phone, text, email, in person, or instant message	CommRx database

EMR = electronic medical record; HIT = health information technology.

1.2.1 Process

The implementation process has been the initial focus of the evaluation. RTI defines the implementation process as including execution of implementation, organizational capacity, key staff and partners' engagement, and client recruitment and enrollment. The implementation process is best evaluated through a combination of data variables, including execution of implementation that conforms to operational plans and capacity for implementing the innovation effectively and on time. The RTI team focused on the implementation process during the awardee site visits (May 7–8) and sought information to address evaluation questions such as the following:

- What is the overall execution of the innovation implementation (e.g., the actual rate of expenditures relative to the projected rate)?
- What accomplishments are specific to hiring or training staff so that the organization can build its capacity to implement the innovation effectively?
- What is the implementation effectiveness, including fidelity, reach, and dose of the innovation thus far?

Execution of Implementation

Execution is the extent to which the innovation has been implemented according to plan. We use a number of data variables to assess execution, including the extent to which the innovation has encountered delays in implementation, the effectiveness with which the awardee is able to allocate staffing and resources to support the innovation, and the organizational capacity for implementation.

U-Chicago's innovation involves extensive communication and coordination between large highly interdisciplinary working groups (e.g., HIT Development Working Group, Clinical Partners Working Group, Workforce Development and Continuous Quality Improvement Working Group) that work on the different components of the innovation. The significant roles of these working groups and the demanding timeline for innovation require frequent and full engagement of the working group members to address their specific area of responsibility and provide feedback on other components. An early lesson was the critical need to develop and apply a common terminology across the project's working groups, for example, the different use and meaning of terms (e.g., service, program).

Overall, the launch of the innovation was later than planned (March 21, 2013 rather than January 1, 2013) because of a delay of several months in U-Chicago's ability to execute the Notice of Award (NOA). This delay occurred as a result of language in the NOA that U-Chicago found incompatible with its principle of academic freedom. To make up for this delay, the HIT team accelerated software development and other technical activities, achieving launch in fewer than 5 months from the start of funding (the revised NOA was issued on October 25, 2012). The revision to the NOA delayed the execution of the HIT subcontracts (i.e., the Alliance and CHITREC) and consultant agreements. Development of the technology for the CommRx innovation required extensive programming time and effort to build and launch, which did not begin until mid-December 2012 because of delays in getting the programming team in place (caused, in turn, by delays in executing the NOA).

Although the Health*eRx* appears to be a simple product, the overall architecture of the CommRx innovation and variety of implementation processes to produce and deliver the Health*eRx* is moderately complex. As detailed previously, the infrastructure behind the innovation has three key components that each involved implementing several labor-intensive, multistep processes. For example, delivery of the Health*eRx* via CommRx (Component 1) involves collecting the place-based data, contacting the CBSPs to verify location data, compiling additional information about what services the organization offers (service mapping), and linking services to ICD-9 diagnostic codes. In addition, the awardee spent time programming the databases and interfaces for collecting and storing data, as well as time generating the Health*eRx* from the combined EHR and CommRx database. This labor-intensive programming ensured that data entered would match the data elements received from the EHR. Recruiting and preparing sites (Component 2) is an extensive, iterative process that is affected by the local context (e.g., getting buy-in from site leadership) and involves detailing the expected workflow and outcomes at each site, programming the interface that connects the sites' EHR and CommRx database, training providers, and generating and distributing the Health*eRx*. Implementation has progressed gradually from the launching of Health*eRx* at the initial site—Komed Holman Health Center in March 2013—to a total of 20 sites to date.

For this technology-driven innovation, more recent challenges were encountered when scaling to the third CHC that had a different EHR system, which delayed the projected time for launch by 2 weeks. Although the HIT partners expected and planned for the lack of interoperability between the three different EHRs (GE Healthcare, Epic, and NextGen), the HIT partners experienced some challenges (i.e., one of the EHR systems did not have a codebook), which required time to map the system. When a new clinical site was added with a different EHR, delays beyond U-Chicago's control occurred due to the clinical site's IT system. To mitigate these delays, the HIT partners iterated for the new EHR systems, which strengthened the technology for the CommRx database. Many different companies develop EHRs and use different architecture. Even after a site is operational, changes to any component of the site's technology (e.g., upgrading the EHR system, changing the vendor that hosts the EHR) may require more customization by the HIT partner. Because the CommRx database communicates with all EHRs and sites participating in the innovation, the HIT team provides technical support for any problems that the adoption specialist elevates to their attention. An early lesson learned was the need to work closely with the EHR vendor to resolve challenges in the system communicating with the CommRx database. Understanding the potential impact of these issues on scalability of the innovation, the awardee is exploring how to minimize customization of the CommRx database to be compatible with various EHR systems.

Additionally, factors at the clinical sites affected implementation of the innovation as planned. The clinical partners observed that having a physician champion at the CHCs and a nurse champion within the EDs to create the necessary buy-in with users was a facilitator, especially in integrating the Health*eRx* into the clinic's workflow. However, the implementation process was negatively affected if providers (physicians and nurses) had difficulties (e.g., printing the Health*eRx*) and lacked time for the adoption specialist to resolve issue. For example, a common problem at the beginning of the innovation was that the printer designated to generate the actual Health*eRx* did not function. Another issue is that the Health*eRx* can have the same or similar information that the patient received at a previous visit (i.e., a follow-up visit for the same diagnosis). As shared during the site visit, some providers do not see the utility of distributing multiple copies of the Health*eRx* with the same information; therefore, they do not give the Health*eRx* to the patient.

U-Chicago deployed a new type of community health worker (Information Specialists) who are considered to be "community specialists" and have a visible, prominent role in implementing the innovation (i.e., their names, pictures, and contact information are printed on each Health*eRx* generated at their assigned site). U-Chicago initially proposed to hire five Information Specialists but finally hired three. Their role includes conducting service-mapping telephone interviews with CBSPs to document what services they provide, responding to calls from patients who received the Health*eRx*, and helping patients find community resources for family members and friends. They are also members of the Workforce Development and Continuous Quality Improvement Working Group. Initially, the delay in the notice of award also negatively affected the hiring of the Information Specialists. The community-based workforce development partners of U-Chicago—who are responsible for recruiting, hiring, and supervising the Information Specialists—missed the opportunity to hire a "promising candidate." An early lesson learned was the need for early and clear communications with the partners about expectations related to level of effort, role of the Information Specialists, and workload. With the sudden closure of Washington

Park Consortium, U-Chicago partnered with a different community development organization in Q6—Claretian Associates—to help hire a third Information Specialist.

Finally, partly because of turnover of partners and staff, U-Chicago has faced challenges with hiring and deploying the five Information Specialists as initially planned for the innovation. As of the site visit (May 7–8, 2014), the innovation was operating with two Information Specialists. In Q7, U-Chicago recruited and trained the third Information Specialist, a local resident fluent in Spanish. However, he resigned when offered another career opportunity. The awardee is interested in hiring an additional Information Specialist who is bilingual to serve the predominantly Spanish-speaking patients at the Chicago Family Health Center. Although the plan is to hire additional Information Specialists, the capacity of the two Information Specialists to handle the workload is a potential issue, particularly if the volume of calls increases.

Despite the initial delays and the challenges, implementation of the Health*eRx* has gone well because of its strong organizational capacity, integration with existing urban health initiatives, extensive planning, involvement of key stakeholders in the working group structure, and formal process for getting buy-in from a new site. However, the delays have affected the awardee's ability to effectively use resources, which is slightly more than half (56.1%) of projected expenditures and 10%–20% below the projected spending rate.

Organizational Capacity and Leadership

Based on the RTI team learnings during the site visit in the first week of May 2014, the team assessed an impressively high level of buy-in, enthusiasm, and support for the innovation at all levels of the organization. Leadership and governance infrastructure were clearly defined on paper and articulated during the site visit interviews. U-Chicago is the primary lead for the multisite innovation. According to the organizational chart, U-Chicago's CommRx innovation is nested with UCMC's Department of Obstetrics and Gynecology. The designated primary leader of the innovation (project director) is based at U-Chicago and oversees the South Side Health & Vitality Studies, which is a part of the UHI. The innovation evolved from the university's core community engagement strategy initiated in 2002. The leader of the UHI, an initiative that was sustained through the change in university leadership (dean), is an institutional champion for the innovation. The UHI funds the South Side Healthcare Collaborative, which includes 30 sites and 5 hospitals and allows community-based health center organizations and hospitals to share best practices. Through the UHI, U-Chicago had experience with implementing similar community-engaged innovations such as MAPSCorps, which is now part of the CommRx innovation.

The steering committee, led by the project director, provides leadership for U-Chicago's CommRx innovation. Other members of the steering committee include the leaders of the three working groups, key consultants, and medical center legal counsel. The core operations team supports the working groups and facilitates the flow of information between the groups. As mentioned previously, the implementation partners collaborate through the working groups that have primary responsibility for developing key components of the innovation. Feedback from all working groups informs subsequent revisions or redesigns of the key components. RTI's assessment is that the innovation has strong and capable leadership; the various working groups seemed to include the right stakeholders and appeared to be working well.

U-Chicago's CommRx innovation also requires the commitment of designated leaders at each of the implementation sites (three CHC corporations and UCMC or 20 clinical sites total). Ultimately, the site representative determines the workflow and how the innovation will be implemented at the site. At one site, for example, an administrative staff member gives the Health*eRx* to the patient at checkout (instead of the provider during the encounter visit). This tailoring suggests that the leaders at the sites have discretion in how they implement the innovation. Based on the site visit interviews with the U-Chicago team, RTI concluded that implementation is a high priority for these 4 corporations (3 CHC corporations and UCMC) and their 20 clinical sites at which CommRx is live. However, that aspect was not fully assessed because we did not interview any leaders from the implementation sites. During our site visit, we did meet with the members of the Clinical Partners Working Group, which supports the sites.

1.2.2 Workforce Development

As stated earlier, recruiting and training Information Specialists to assist patients in using the Health*eRx* and engage CBSPs in meaningful use of the CommRx Report are critical to the success of this innovation. The various information sources indicated that U-Chicago is highly committed, involved, and accountable for training the workforce to implement the innovation by investing adequate financial and physical resources to support training and by involving the partner organizations in the working groups. The Information Specialists are full-time employees of U-Chicago partner organizations and provide a variety of functions to support implementation.

Hiring and Retention

As of March 2014, a total of 39 staff work on the CommRx innovation: 32 management or administrative staff, 4 IT technicians/specialists, and 3 community health workers (i.e., Information Specialists) who are not formal members of the health care team and interact with a health care team liaison or working group only as needed. As discussed previously, the one separation was the Information Specialists for the third site. According to Lewin data for Q7, U-Chicago had a total of 15 full-time equivalents (FTEs), which was 2.9 below the projected number of FTEs.

Training

Project leadership is highly committed, involved, and accountable for the training and workforce development for this intervention. Over the course of the innovation, U-Chicago and its partners have conducted a myriad of training courses for Information Specialists, as well as community clinical and nonclinical personnel, to prepare them to implement this health innovation effectively. Three Information Specialists completed the certificate training program designed specifically for their role and covered with Health Care Innovation Award (HCIA) funds. The training program for the Information Specialists consists of five core competencies delivered through the following five modules:

- Module 1, Understanding Your Target Community & MAPSCorps Model, involves learning about the South Side community, health disparities, and the background of MAPSCorps. The module explains how place-based asset mapping aligns with service-level mapping.
- Module 2, Centers for Medicare & Medicaid Services (CMS) HCIA and CommRx, is a self-guided session about the innovation, the funding structure, the role of CMS, and the importance and success of project. The Information Specialists also underwent an immersion experience to understand the purpose of CommRx in their community.
- Module 3, Introduction to Service Mapping, covers service-level mapping, personalized scripts and protocols for calling the CBSPs identified by the MAPSCorps youth, and the methods for correctly and efficiently adding the information to the CommRx database.
- Module 4, Introduction to Emerging HIT, covers how to use health information technologies (e.g., set up e-mail, text messages), how to differentiate between personal health records and EHRs, and how to work with the CommRx interfaces. Information Specialists applied their newly acquired knowledge by completing surveys with the CBSPs.
- Module 5, Introduction to Healthe*Rx*, is the final training session, which covered how to respond to program participants, help them find missing services, track calls and text messages, and create a Healthe*Rx* (e.g., a new Healthe*Rx* for the participant or a Healthe*Rx* for family members of patients who have not been seen at one of the implementation sites).

The Information Specialists received optimization training, which was designed, in part, to train them on updates made to improve the service-mapping system. In Q7, upgrades to the CommRx database to improve the service mapping and support the Information Specialists caused a delay in the optimization training. After the upgrades were complete, the optimization training was deployed to the Information Specialists.

In addition to the training provided by the CommRx operations team, the HCIA supported the two Information Specialists who felt that the training program was adequate and provided them with resources to fulfill their job requirements successfully. As a refresher, the two Information Specialists, who were hired in 2012, completed a supplemental training module (i.e., an 8.5-hour session on content from Modules 1 and 2). In collaboration with the U-Chicago Graham School of Continuing Liberal and Professional Studies, the new certification program includes seven required courses and one elective course, totaling more than 180 hours of instruction. Courses include Ethical Considerations in Healthcare (22.5 hours); an Overview of Patient Care, Healthcare Systems, Economics of Healthcare and Health Disparities (Graham School) (22.5 hours); Health Promotion and Coaching (22.5 hours); Patient Advocacy (22.5 hours); and Health Data (24 hours).To complete the certification program (provided at no direct cost to the Information Specialists), the Information Specialists attend classes 3 days a week.

Through HCIA funding, training was provided to adoption specialists, providers, and MAPSCorps field coordinators and high school youth. The adoption specialists complete a 2-hour online training session that was an adaptation of the Information Specialist training session (Modules 1 and 2). Providers receive a one-time brief orientation on how to generate and deliver the Health*eRx*. During the site visit, we learned that the type of clinical setting (CHC, ED) determined the length and mode of training. For example, a brief ED provider training was integrated into the hospital's existing online Oracle system and supported with announcements at staff meetings, rather than the primarily face-to-face training delivery mode conducted with providers at some of the CHCs. The online training mode facilitated the collection of baseline provider survey data, which are integrated into the organization's existing training system. Finally, U-Chicago trained the college-level MAPSCorps field coordinators (11.5 hours) and local high school youth who collect the place-based data on businesses and services organizations in the South Side community for the CommRx database (10 hours). Responsive to the contextual needs of each site, the clinical education support staff at U-Chicago streamlined the Webinar for providers (i.e., the users who are responsible for distributing the Health*eRx*) so that they complete adequate training more efficiently. The training of the providers (the users) and implementation of the innovation (at the sites) seemed to be in place with strong communication among the working groups.

Since July 2012, a total of 607 individuals have participated in training courses (for a total of 2,927 training hours).[10] These courses are consistent with the innovation's objectives to offer training courses to prepare Information Specialists, providers, and staff for their unique and essential role in the innovation. Through Q7, the awardee and its partners conducted 34 trainings. As the RTI team learned during the site visit, several changes to the Information Specialist training (e.g., combining online with in-person training, having a group-based rather than immersion experience and shadowing opportunities) have increased training efficiency, condensing the previous 1-month training schedule to complete the five required modules to 1 week.

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[10] Q7 Lewin Report.

1.2.3 Effectiveness

The innovation's effectiveness can be measured through the execution of an innovation as planned (fidelity) with the intended number of participants (reach) and with sufficient frequency and intensity (dose). After our site visit, the RTI team assessed that the awardee had a well-developed implementation plan that included detailed staff assignments, milestones, and documentation, especially as the plan relates to a variety of working groups facilitating the decision-making processes.

Fidelity

RTI's assessment is that most of the key or essential program components (e.g., CommRx, participating clinical sites, Information Specialists) are being implemented as intended. Staff members have the expected level of qualifications, training, and experience; however, the number of Information Specialists remains fewer than what the awardee had planned. During the site visit, the awardee discussed changes to the innovation. The awardee is expanding the innovation by increasing the number of clinical sites in ambulatory care settings within the UCMC. The process for training and surveying providers is also evolving, as is the process for distributing the Health*eRx* to patients (i.e., provider, front-office staff).

Currently, Information Specialists wait for participants to contact them with any questions about the CBSPs listed on the Health*eRx*. The Information Specialists may begin to use short message service text messaging, which will provide feedback more quickly and increase their ability to help patients access community-based health and social resources. U-Chicago will need to assess the capacity of two Information Specialists to handle this expanded role and the increased number of patients as they scale the innovation to additional sites.

Reach

As the RTI team learned during the site visit, U-Chicago intends to reach 170,000 unique, unduplicated participants from the approximately 500,000 residents living in the targeted 11–zip code area.[11] To participate in U-Chicago's CommRx innovation, a resident from the targeted zip code area must have at least one health care visit at one of the participating clinical sites (e.g., CHCs, EDs). At each visit, the CommRx database automatically generates a customized Health*eRx* for that patient based on the ontologies. The assumption is that the provider (i.e., physician, nurse, patient representative) delivered each generated Health*eRx* to the patient and that having this information may motivate the patient to use at least one of the services listed on the Health*eRx*.

U-Chicago has made some strides in reaching its target population. ***Table 6*** illustrates the enrollment of unique indirect participants from the project launch (March 2013) to the current available data (Q7, March 2014). Currently, the innovation has reached an

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[11] Reach definition from interviews with site visit, May 7–8, 2014.

estimated 29,000 unique participants, which is an increase in number by more than 10,000 from December 2013. The data about unique participants and Health*eRx* frequency per patient across the 11 zip codes are readily available from the EHR data.

Table 6. Participant Reach for Each Quarter Since Project Launch

Quarter (End Date)	Target Population (Denominator Designated by Organizational Leadership)	Estimated Cumulative Number of Unduplicated Participants with at Least One Generated Health*eRx*	Estimated Total Reach per Quarter (%)	Percentage Change from Previous Quarter
Q3 (March 2013)	170,000	253	0.2	N/A
Q4 (June 2013)	170,000	2,864	1.7	1.5
Q5 (September 2013)	170,000	7,275	4.3	2.6
Q6 (December 2013)	170,000	18,409	10.8	6.5
Q7 (March 2014)	170,000	28,888	17.0	6.2
Total enrolled as of March 2014	170,000	28,888	17.0	6.2

Source: Data provided to RTI during the site visit on Q7.
N/A = not available; Q = quarter.

The awardee is striving to increase the reach of its target population by scaling the innovation at additional clinical sites.

Dose

Measuring exposure to the CommRx innovation (e.g., defining and tracking “dose” such as the number of tailored Health*eRx*s generated by the CommRx database for each unique patient, the period and frequency of the Health*eRx*, the type of services on the Health*eRx* used by each patient) is somewhat limited by available data collection systems. Currently, the CommRx database tracks the number of tailored Health*eRx*s that it generates. As of Q7, for participants seen at CHCs, the CommRx database generated at least 1 Health*eRx* for 10,079 unique participants (approximately 66% of all CHC patients), 2 Health*eRx*s for 4,163 unique CHC patients (23%), 3 Health*eRx*s for 1,941 unique CHC patients (approximately 13% of the total), and 16 Health*eRx*s for one unique CHC participant. For remaining CHC patients (an unduplicated count of 1,874; 10%), the CommRx database generated from 4 to 15 Health*eRx*s.[12] A patient’s identifying information is not listed on the Health*eRx*; therefore, the CommRx database cannot report the number of unique participants for whom the system generated one or more tailored Health*eRx*s.

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[12] Data by zip code frequency and Health*eRx* received from awardee at site visit, May 7–8, 2014.

In addition to data on Health*eRx*s generated, U-Chicago also tracks the number of times (frequency) the services of a CBSP are listed on the Health*eRx*. The CommRx database creates quarterly reports that aggregate data on the demographics for patients who received a Health*eRx* and the health and social services programs to which they were referred. At the time of the site visit, U-Chicago had provided reports to three partner CBSPs and two clinical sites. The team also learned that U-Chicago is evaluating the most effective and efficient mode and time frame (e.g., quarterly, annual) to share that information with the CBSPs. Also, U-Chicago tracks the number of participant-initiated contacts with the Information Specialists (e.g., phone call, voicemail, text messages, e-mail, in-person) to seek information or assistance with accessing services on their tailored Health*eRx* or other needs.

Although U-Chicago is utilizing a volunteer call-in survey of 20 Health*e*R*x* recipients per month, the data being collected are limited and, thus, hinder the ability to sufficiently assess dose, according to the definition the external evaluation (RTI) team is using (e.g., defining and tracking the number of tailored Health*e*R*x*s generaged by the CommRx database, for each unique patient, the period and frequency of the Health*e*R*x*, the type of services on the Health*e*R*x* used by each patient). At this time, the only way for U-Chicago to know whether a participant contacted a CBSP is if the patient noted this information in the participant survey (which is limited to 20 patients each month) or if the CBSP or the patient mentioned it to one of the Information Specialists, who then documented this count in his or her log. Otherwise, U-Chicago would have to call patients to collect that information. Alternatively, the burden would shift to the CBSP to collect that information at point of service. However, the challenge is that CBSPs have no obligation or incentive to collect and report that information. Also, CBSPs vary depending on the zip code; thus, the data will likely need to be assessed at the patient identifier level, not at the zip code level. Another issue is defining the period for tracking dose (e.g., within 12 months of the date that the system generated the Health*eRx*). Because of these challenges, measuring dose, according to the definition the external evaluation (RTI) team is using, will not be possible with this awardee.

1.3 Evaluation Outcomes

RTI will use two types of quantitative data from awardees to assess the impact of the awardees' innovation on key outcomes. These include claims data for Medicare and/or Medicaid beneficiaries, depending on who the awardee serves, and administrative or utilization data the awardee is collecting (which we have categorized as "other awardee-specific data," reflecting the variability of the types of data elements available across awardees). We are in the process of finalizing our assessment of all the available data sources and requesting data directly from each awardee. As those data are received, we will incorporate the findings into our quarterly/annual reports. The following sections present descriptive findings from the quantitative outcome data provided to RTI as of September 11, 2014.

1.3.1 Measures for Evaluation

After the site visit, the data management and site visit teams met to review each of the measures listed in the awardee's self-monitoring measurement plan. The measures listed in ***Tables 5*** and ***7*** reflect the measures determined as most relevant for our evaluation of U-Chicago's innovation.

Table 7. Outcome Measures for U-Chicago

Key Evaluation Domains	Subdomains	Measures	Data Sources
Clinical effectiveness	Weight management	Percentage of patients who are overweight (BMI 25.0–29.9) or obese (BMI >30)	EHR
Health outcomes	Diabetes	Percentage of patients with diabetes who had HbA1c >9.0 %	EHR
	Hypertension	Percentage of patients with a diagnosis of hypertension with BP <140/90 mm Hg	EHR
Health care outcomes	Utilization	ED visit rate	Claims data
		All-cause admission rate	Claims data
		Readmission rate	Claims data
	Cost	Spending per patient	Claims data
		Cost savings	Claims data

BMI = body mass index; BP = blood pressure; ED = emergency department; EHR = electronic health record; HbA1c = glycated hemoglobin.

1.3.2 Claims Data

As part of a broad assessment of health care innovations, the Center for Medicare & Medicaid Innovation (CMMI) is assessing the impact of its programs, including those funded specifically by HCIA, on four core measures. The four core measures are

- health care spending per patient,
- hospital inpatient admissions,
- hospital unplanned readmissions, and
- ED visits.

Collectively, CMMI programs are anticipated to slow the increase in health care spending, reduce hospital admissions, reduce avoidable hospital readmissions, and prevent unnecessary ED visits. We are reporting these measures for all HCIA Community Resource Planning awardees so that the collective impact of the awards can be assessed. However, discussed as follows, some awards may not be focused on these measures, and other awards that target specific conditions (e.g., imaging, diabetes) may have significant impacts on spending, admissions, readmissions, and ED visits for the targeted conditions but not have a statistically detectable impact on the measures at the aggregate level because the targeted conditions represent only a small fraction of total spending, inpatient admissions, and ED visits.

The measures are calculated through analysis of Medicare and Medicaid fee-for-service claims. Because of differences between Medicare and Medicaid patients in age, other demographic variables, and disease status, we report the Medicare and Medicaid results separately as follows. Currently, complete Medicare claims are available through the end of 2013. Medicaid claims for U-Chicago's CommRx innovation, which was launched on March 21, 2013, are available through the third quarter of 2012.

- **Health Care Spending per Patient.** For Medicare beneficiaries, health care spending per patient includes Part A and Part B Medicare expenditures for persons enrolled in the Part A and Part B fee-for-service program. The variable focuses on Medicare fee-for-service spending, so Medicare managed care (Part C) services are excluded, as are beneficiary copayments. Medicare Part D prescription spending is also excluded. Spending is reported on a per-person per-quarter basis. If a beneficiary is not enrolled for every month in a quarter, spending (except for hospital inpatient spending) is prorated to a quarterly basis based on the number of days enrolled during the quarter. Because hospital inpatient admissions are both rare and expensive, spending is not prorated for hospital inpatient spending. Prorating is also not performed for beneficiaries who die during a quarter.

  For Medicaid beneficiaries, health care spending per patient is reported for fee-for-service beneficiaries. Beneficiaries are only included in the analysis for spending (and the other measures) during periods when they are enrolled in Medicaid.

- **Hospital Inpatient Admissions.** This variable measures hospitalization, the single most expensive component of health care spending. Patients kept overnight in observation beds are excluded from this measure. Inclusion criteria for the analysis are the same as for spending. Hospital inpatient admissions are not prorated based on the number of days eligible during the quarter. All-cause inpatient admissions and ACSC admissions are reported separately, under the assumption that a greater share of ACSC admissions can be prevented by appropriate ambulatory care. The mean quarterly admission rate per 1,000 patients is reported.

- **Hospital Readmissions.** Hospital readmission rates serve a dual purpose in evaluating HCIA impacts. Readmissions add to the costs of a prior hospitalization, and they often reflect a problem in the care provided during the first admission. All-cause readmissions are defined as a follow-up admission to any short-term acute general or long-term care hospital within 30 days of a discharge from the same or another hospital of the same type. We ignore multiple admissions within 1 day of an initial admission because these often represent transfers between hospitals. We define index hospitalizations that begin during the quarter and follow each index admission for 30 days, even when the follow-up period extends beyond the end of the quarter. Inclusion criteria for the analysis are the same as for spending. We also calculate readmissions for persons with ACSC. The person's ACSC status is defined by his or her first hospitalization during the quarter. The readmission rate equals the number of readmissions divided by the number of index hospitalizations during the quarter. Planned readmissions are excluded from the calculation of the numerator. Quarterly mean readmission and ACSC readmission rates per 1,000 admissions are reported.

- **ED Visits.** ED visits are sometimes viewed as a symptom of the inability of the community's health care system to provide adequate preventive and ambulatory care visits. We report an all-cause ED visit rate that excludes ED visits resulting in an inpatient admission (which presumably represent unavoidable visits) and includes overnight ED visits without an inpatient admission. Inclusion criteria for the analysis are the same as for spending, and ED visits are also subject to the same prorating formula as for spending. The mean quarterly ED visit rate per 1,000 patients is reported.

Medicare Claims Analysis

Based on U-Chicago's proposal, we initially anticipated that Medicare enrollees would account for a relatively small share (less than 5%) of the patients covered by U-Chicago's CommRx innovation. Based on U-Chicago's patient ID submission, it appears that Medicare accounts for a higher percentage of patients enrolled in the innovation. Therefore, we will include Medicare claim analyses in subsequent reports.

Medicaid Claims Analysis

The Medicaid data analysis will use data from the CMS Alpha-Medicaid Analytic eXtract (MAX) data files. Currently, Medicaid claims for U-Chicago's CommRx innovation are only available in Alpha-MAX through the third quarter of 2012. Because the innovation was launched on March 21, 2013, and claims for that quarter are not complete, we are not presenting measures for Medicaid patients in this report. We will provide Medicaid analyses in subsequent reports as more data become available. Measures will be presented for these beneficiaries in the quarters before and after the innovation, which was launched on March 21, 2013. ***Appendix A*** shows the claims analyses tables that will be presented for Medicaid.

In addition to the tabular format, we will present figures showing each measure as a function of time. Values in quarters before the innovation's launch (March 21, 2013) will be shown in one color, and values for quarters during and after launch will be shown in another color. The figures will include a trend line based on a linear regression of prelaunch values.

Discussion of Claims Analysis

The claims measures will provide descriptive data on a subset of Medicaid patients enrolled in the CommRx innovation before, during, and after its launch. Although it is necessary to report these measures to support CMS's broader assessment of its full portfolio of innovation projects, the measures may not provide a complete evaluation picture of U-Chicago's CommRx innovation for a number of reasons. First, the innovation was only launched on March 21, 2013. The impact of having received a tailored Health*eRx* with community-based resources specific to the patient's diagnosis on these more distal outcomes may not be immediate. As discussed previously, the assumption is that the provider gave the Health*eRx* to patients, patients used those community resources listed on the Health*eRx*, and as a result, learned how to manage their chronic conditions better and change their behaviors. Because U-Chicago is not tracking whether patients access and use the services on their tailored Health*eRx*, we will not know which patients used the services. Second, although all U-Chicago CommRx beneficiaries may potentially benefit from the innovation, the benefits may be most pronounced for patients with certain diseases or conditions. The claims measures listed previously will be reported at the aggregate level for all Medicaid patients. Finally, many patients served by U-Chicago's CommRx innovation will not be enrolled in Medicaid.

Development of Comparison Groups

In addition to comparing U-Chicago innovation patients before and after implementation of the innovation, we will construct a comparison group of Medicaid patients in areas of Chicago that are not served by U-Chicago's CommRx innovation and patients in the 11–zip code areas targeted by the U-Chicago CommRx innovation but not enrolled in the innovation (i.e., for whom the CommRx database did not generate a Health*eRx*). We will use propensity score matching to identify patients with similar characteristics as patients for whom the CommRx database did generate a Health*eRx*. Results for the comparison group will be included in later reports.

1.3.3 Other Awardee-Specific Data

In June 2014, during the data review meeting, RTI identified the additional data that will be helpful to the evaluation, particularly measures related to diabetes, hypertension, and obesity. We met with U-Chicago in September 2014 to request the raw patient-level data for each quarter used to generate each of the measures in ***Tables 8*** and ***9***. We are also working with U-Chicago's three clinical sites, Chicago Family Health Center, Friend Family Health Center, and Near North Health Service Corporation, to obtain patient identifiers and other data. We have received patient identifiers from two of the three clinical sites and expect to receive patient identifiers from the third site, Near North, by the end of October 2014.

Overview of Data to be Requested

As noted previously, we met with U-Chicago in September 2014 to request patient-level data. After that request, U-Chicago indicated that they would like a business associate agreement (BAA) with RTI before providing the data. RTI received the BAA documentation in mid-October 2014 and expects the BAA to be executed by early November 2014. At that point, U-Chicago has agreed to upload the requested data. We will also work with the three clinical sites to understand other data they may have available that would be useful for our evaluation.

Health Outcomes

Once we receive the raw patient-level data from U-Chicago, we will have a better understanding of what type of results we will provide. The following table shells reflect examples of findings we anticipate presenting.

Table 8. Health Outcomes over Time

Measure	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Diabetes							
Percentage of patients with diabetes who had HbA1c >9.0%	—	—	—	—	—	—	—
Hypertension							
Percentage of patients with a diagnosis of hypertension with BP <140/90 mm Hg	—	—	—	—	—	—	—
Obesity							
Percentage of patients who are overweight (BMI 25.0–29.9) or obese (BMI >30)	—	—	—	—	—	—	—

Source: Data to be provided to RTI from U-Chicago.
BMI = body mass index; BP = blood pressure; HbA1c = glycated hemoglobin; Q = quarter.
— Data not yet available.

Table 9. Health Indicator Outcomes for Priority Populations

	Priority Populations	
Measure	Black	Hispanic
Diabetes		
Percentage of patients with diabetes who had HbA1c >9.0%	—	—
Hypertension		
Percentage of patients with a diagnosis of hypertension with BP <140/90 mm Hg	—	—
Obesity		
Percentage of patients who are overweight (BMI 25.0–29.9) or obese (BMI >30)	—	—

Source: Data to be provided to RTI from U-Chicago.
BMI = body mass index; BP = blood pressure; HbA1c = glycated hemoglobin.
— Data not yet available.

Discussion of Other Awardee-Specific Findings

Once we receive data from U-Chicago, we will conduct descriptive analyses to fill in the aforementioned table shells. At that point, we will be in a better position to discuss findings related to the other awardee-specific data.

1.4 Overall Program Effectiveness to Date

Based on the awardee definition of success (i.e., proportion of the targeted population for whom the CommRx database generated at least one Health*eRx*), implementation of the innovation is partially or somewhat successful. To date, the innovation has reached an estimated 29,000 unique patients (cumulative total across all quarters), which is 17% of the estimated 170,000 target population from the 11–zip code area of the South Side of Chicago that has approximately 500,000 residents. U-Chicago is covering more zip codes and more CHCs within the defined zip codes to reach more of the target population. During the May site visit, the RTI team learned that the awardee is making a concerted effort to increase the number of UCMC participants by expanding the Health*eRx* training to additional CHC sites and ambulatory clinics. All innovation leads, especially the nurse champions at U-Chicago, are supportive of expanding the Health*eRx* to other settings. The qualitative data collected during the site visit illustrated the awardee's focus on scaling up the program to increase reach.

However, the innovation has experienced challenges in the other two areas of effectiveness (fidelity and dose). There is no systematic data collection to document that the provider gave the Health*eRx* to the patient (e.g., recorded in the EHR). Additionally, while U-Chicago is doing what it can to collect information on patient utilization of the services on the Health*eRx* that the CommRx database generated, it is currently only able to collect information from 20 participants per month. This limits the evaluation's ability to sufficiently characterize dose in accordance with the definition RTI is applying, and represents an area that will not be evaluated with this awardee. Currently, Information Specialists play a passive role and wait for the participant to contact them with any questions about the CBSPs listed on the Health*eRx*. U-Chicago plans to expand how patients interact with the Information Specialists so that patients have the capacity to send short text messages to the Information Specialists. Text messaging will provide quick access to the Information Specialists and increase the Information Specialists' ability to help patients access community-based health and social services. The challenge is whether the two Information Specialists will have the capacity to handle the increased workload and how this increase will impact implementation effectiveness.

APPENDIX A

Table A-1. Baseline and Intervention Trends in Health Care Spending per Patient

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—

Savings per Patient

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Spending rate: total quarter (i.e., quarterized) payments/number of unique patients. Savings per patient: difference in comparison minus the intervention’s average spending rates.
— Data not yet available.

Table A-2. Baseline and Intervention Trends in Admissions per 1,000 Patients

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Admit rate: total unquarterized admissions/number of unique patients.
— Data not yet available.

Table A-3. Baseline and Intervention Trends in Readmissions per 1,000 Admissions

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total admissions	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total Admissions	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.

Note: Readmit rate: sum of all readmissions to eligible hospital within 30 days/all admissions in the quarter. Total admissions: all eligible admissions in the quarter.

— Data not yet available.

Table A-4. Baseline and Intervention Trends in ED Visits per 1,000 Patients

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: ED rate: total quarterized ED visits and observation stays/number of unique patients.
— Data not yet available.

October 2014

Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring

Annual and Site Visit Report
University of Miami

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OVERALL EVALUATION SUMMARY

RTI International was selected to lead an independent evaluation of the 24 Health Care Innovation Award (HCIA) awardees categorized as Community Resource Planning, Prevention, and Monitoring (Community Resource). In this role, RTI is conducting an in-depth evaluation of each innovation, as well as a cross-site evaluation that includes similar innovations targeting the same priority outcomes (e.g., emergency department [ED] visits). For each of the 24 awardees, this report presents findings from the first year of the evaluation (beginning September 23, 2013, and including data obtained by RTI as of September 11, 2014). The report is based on multiple data sources, including operational reports, self-monitoring plans, site visits, and quantitative data analysis.

The evaluation methods vary by awardee innovation, based on the type of innovation and availability of data. RTI has reviewed and coded all existing documents from the awardees through December 31, 2013, and incorporated that knowledge into each awardee's overview. Our review included the awardees' original applications for funding, original and current operational and self-monitoring plans, and quarterly narrative and monitoring reports. For this annual report, we incorporated activities reported through the awardee's seventh quarterly report (i.e., through March 31, 2014).

Between April and August 2014, teams of at least two staff from the RTI team visited all 24 awardees for 2 to 4 days, depending on the number of interviews conducted. Teams included a subject matter expert, with training and experience specific to the awardee's innovation, and a master's- or bachelor's-level colleague to take notes. Before each visit, the teams reviewed all available documentation from the awardee to learn about the innovation's goals, objectives, and status. The purpose of the site visits was to clarify our understanding of the innovation, obtain detailed information on the implementation process, and review awardee-specific data to determine which elements to incorporate into the evaluation. By August 13, 2014, all 24 awardees had been visited and a thorough description of our findings included in each of the 24 awardee sections.

In addition to the site visits, we report quantitative data from two possible sources for several awardees. First, we present findings from claims analysis for awardees in this report if they both provided us with patient identifiers and reported enrolling participants who are Medicare and/or Medicaid beneficiaries. RTI has obtained patient identifiers from most of the 24 awardees to conduct claims analysis. Second, we present data RTI obtained directly from awardees to quantify their work in addressing health care costs, quality, and patient outcomes. Data from additional awardees will be analyzed and presented in future reports, as data become available and awardees enroll sufficient participants. An update on the availability of Medicare/Medicaid claims and other awardee-specific data, analysis of data available to us and cleaned as of September 11, 2014, a summary of the comparison groups, and a list of draft evaluation measures are included in each awardee section.

1. HCIA COMMUNITY RESOURCE AWARDEE: UNIVERSITY OF MIAMI

1.1 Introduction

The University of Miami (U-Miami), a private nonprofit university in Miami, Florida, was awarded $4,097,198 to improve the health of school-aged children who attend nine target schools in Miami-Dade County, and enrollment began in July 2012. For the innovation, interdisciplinary teams of doctors, nurses, social workers, dental hygienists, and community health workers (CHWs) provide services at school-based health centers (SBHCs) at the nine schools and one additional clinic to serve their families. The innovation has the following goals:

1. Build on the current SBHC network to provide preventive dental and mental health services to children.
2. Provide a medical home and quality medical care by engaging payers and plans to serve Medicaid-eligible children in the SBHCs.
3. Link the family members of Medicaid-eligible children to appropriate primary care through an emergency department (ED) diversion program.
4. Improve access and adherence to care plans through the use of CHWs as peer educators and coordinators of care.
5. Develop new patient payment mechanisms that reward quality, innovation, and economic efficiency by working with all partners, including two health maintenance organizations (HMOs) and the Centers for Medicare & Medicaid Services (CMS).

RTI is in the process of conducting an in-depth case study for this innovation. As part of that case study, RTI team members conducted a site visit in April 2014, and both before and after the visit, our team reviewed all documentation on this innovation. We are actively working now to obtain data directly from the awardee that will help assess many of the variables we discuss in this report section. This report describes findings from the site visit, document reviews, follow-up telephone calls, and analysis of data obtained by RTI through September 11, 2014. We start by describing the innovation components in detail and the patients targeted by the awardee.

1.1.1 Innovation Components

The U-Miami innovation is an expansion of a long-standing program called the School Health Initiative, which was created through a partnership between the Dr. John T. Macdonald Foundation and the U-Miami Miller School of Medicine. It provides comprehensive health care to communities in Miami-Dade County with high Medicaid eligibility. When the program was established in 2000, it provided services in five schools and has since expanded to nine SBHCs. The innovation centers on a simple model: provide on-site services to children using a feeder pattern to enable continuity of care as a student progresses from elementary through high school. Three SBHCs are main hubs, and six are satellite sites. The main hubs are staffed with a physician or physician extender. The satellite sites provide fewer services and are staffed by a school nurse or medical assistant. Each school also has access to a social worker.

The innovation built on these services by adding five components: CHWs, expansion of dental services, telemedicine, an ED diversion clinic, and a new payment mechanism. Implementation of these components is necessary for the innovation to meet its objectives:

- Expand health care services for school-aged children, including providing more robust mental health services, dental care, and chronic disease management.
- Fully engage CHWs to provide health education and social support services.
- Actively enroll eligible children, adolescents, and caregivers into Medicaid.
- Identify alternate payment mechanisms and engage billing services to cover Medicaid-eligible students who receive uncompensated care at SBHCs.

As shown in ***Table 1***, U-Miami works with three partners. Psychiatry resident physicians at Larkin Community Hospital provide psychiatry services at the nine target schools while supervised by attending physicians through telemedicine. The Center for Haitian Studies (CHS) administers the ED diversion clinic for uninsured parents of school-aged children at the schools and was involved initially in recruiting and employing CHWs before those staff were transferred to U-Miami in May 2014. During our site visit, we learned that these changes were due to logistical difficulties and delays in processing CHW and social worker salaries. Nova Southeastern University replaced the University of Florida as the partner providing dental services because of delays establishing a subcontract. The University of Florida was involved in the design and implementation of CHOICES (Community & Child Health Outreach for Improving Clinical and Educational Success), a Web-based data tracking system CHWs use for tracking and reporting patient referrals.

Table 1. Key U-Miami HCIA Partners, Roles, and Locations

Partner Name	Role in HCIA Project	Location
Larkin Community Hospital	Clinical, training	Miami, FL
Center for Haitian Studies	Administration of ED diversion clinic	Miami, FL
Nova Southeastern University	Clinical, training	Fort Lauderdale, FL
University of Florida	Design and implementation of CHOICES	Gainesville, FL

Source: Self-monitoring plan; site visit in April 2014.
ED = emergency department; HCIA = Health Care Innovation Award.

In the following sections, we describe the five components based on the awardee's documentation (e.g., progress reports, operational plans) and our findings from the April 2014 site visit.

Component 1: Community Health Workers (CHWs)

CHWs provide coordination services in the clinic, social services, and assistance with Medicaid enrollment in this innovation. By the end of quarter 7 (Q7), 10 CHWs were providing a range of services to students in SBHCs (see ***Table 2***). Each CHW is assigned to a clinic. They will conduct home visits for students and families as needed or go to another clinic to fill in if another CHW is out, but the majority of their time is in their assigned school. At each clinic, CHWs support coordination by completing intake forms indicating all the students' needs, including medical background; insurance or lack thereof; chronic diseases; and financial, housing, and personal needs. Based on these forms, a member of the medical team or a social worker may ask the CHW to facilitate referrals to other services, such as social services. These forms are also used to generate a list of students with a chronic condition at each SBHC site. CHWs noted that the outreach process varies, but they typically contact students who appear on that list and their parents to encourage students with a chronic condition to be seen at the clinic. While in the clinic, CHWs provide minor medical services in the clinic, such as blood pressure checks, blood glucose finger sticks, and asthma meter readings.

During the site visit, CHWs explained that although they perform a range of functions, they see their primary function as providing social support. The social workers and nurses both indicated that they viewed CHWs as extensions of social workers. CHWs conduct home visits and a variety of safety assessments depending on the needs of the student and family and the reasons for the request. Helping families with Medicaid enrollment is another important CHW function. During the site visit, we learned that this was a primary focus of the CHW role so that clinics could be reimbursed by students receiving services in the clinic. Program sustainability is partially hinged upon successful Medicaid enrollment and billing potential. Because of increased insurance enrollment due to the Affordable Care Act, the site reported an increase in parent inquiries and requests for assistance with insurance enrollment. CHWs educate families about Medicaid benefits and often complete their paperwork because of language and literacy barriers. During the site visit, we learned that U-Miami is not a Medicaid enrollment site, so CHWs were able to assist with completing the application but not actually enroll students and their families in Medicaid. Site leadership indicated that plans were in place to become an enrollment site so that CHWs could enroll students directly. After the initial push for ACA enrollment was completed, the awardee's Project Officer reported a decrease in emphasis on Medicaid enrollment in the CHW role so that they could focus on other items.

Table 2. HCIA Care Coordinator Functions and Training

Characteristic Type	U-Miami CHW Role
Title	Community health worker
Minimal qualifications	High school diploma or equivalent
Functions	Enrollment of students and their families in Medicaid Health education (individual and group) Informal counseling, individualized goal setting Outreach and recruitment Direct service delivery (first aid, health screening tests, blood pressure checks) Patient/community advocacy Patient monitoring and follow-up Service coordination (assistance with enrollment, appointments, referrals) Community linkages Instrumental support
Established continuing education program	None

Source: RTI site visit, April 2014.
CHW = community health worker; HCIA = Health Care Innovation Award.

Component 2: Dental Services Expansion

An important component of the innovation is expansion of dental services provided to students enrolled in the innovation. Dental services include oral exams and screenings, cleanings, fluoride varnish applications, placement of dental sealants, and fluoride rinses in all nine SBHCs. Before the Health Care Innovation Award (HCIA), all sixth graders and 200 second graders received these services. HCIA funding is allowing the innovation to include the rest of the second graders and all other grade levels.

U-Miami originally planned to partner with the University of Florida to provide dental care services. The contract took longer than expected to finalize, so U-Miami discontinued that partnership for dental services and contracted with Nova Southeastern University instead. U-Miami and Nova had worked together before to provide dental services for students in the target schools, so this was an expansion of that partnership. The partnership details were being finalized during our visit.

Component 3: Telemedicine

Telemedicine is one component of the innovation intended to increase access to primary care, mental health care, nutritional counseling, and dermatology care. Each clinic has been equipped with telemedicine capabilities so that patients can be seen by an off-site physician for a limited physical exam with the aid of a nurse or medical assistant. Services include telepsychiatry, telenutrition, teledermatology, and school-to-school teleservices where a provider is present in one school and not another. Telepsychiatry services are currently provided by Larkin Community Hospital and are being expanded through a new partnership with U-Miami Psychiatry.

Teleservice provision varies by specialty. Telepsychiatry is a hybrid model in which resident physicians provide psychiatry services both on site and virtually. Teledermatology and telenutrition services are entirely virtual, using U-Miami's telemedicine facility. School-to-school services are provided when a physician or nurse practitioner is at one school, but a student needs to be seen that day at another school. In these cases, providers use telemedicine facilities to see the student with the help of a nurse or CHW who is on site with the student. Telemedicine is not traditionally reimbursed by insurance companies or Medicaid, so telemedicine encounters are treated like consultations, and referring providers are responsible for documenting the encounter and writing any prescriptions.

Component 4: ED Diversion Clinic

As part of the innovation, an ED diversion clinic was created at the CHS partner site for families of students attending the target schools. In addition to clinical care, the parents and families of students receive CHW services, including help with Medicaid and insurance enrollment, home visits, home health assessments, and referrals to social services (food stamps, transportation, home foreclosure prevention, etc.). Parents and families of students in the nine target schools are considered direct participants; indirect participants include anyone outside the school catchment areas who received CHW services but will not receive any clinical services.

Component 5: New Payment Mechanism

Currently, SBHCs provide uncompensated care to many Medicaid-eligible students, including students eligible for but not enrolled in Medicaid and students whose Medicaid plan does not include the SBHC in its network. Effective July 1, 2014, Florida uses a Statewide Medicaid Managed Care program in which Medicaid recipients receive their health care through a managed care plan. Benefits will not change, but each Medicaid recipient must choose a managed care company and a primary care provider. Medicaid enrollees can choose from a number of local Medicaid managed care organizations (MCOs), so establishing agreements with them is important for U-Miami to cover the care of these students and is critical to SBHC sustainability. Medicaid enrollees can also select a primary care provider from the network, which includes the SBHC network.

1.1.2 Program Participant Characteristics

The target population is all school-aged children who attend the nine schools that are part of the U-Miami Miller School of Medicine's Dr. John T. Macdonald Foundation School Health Initiative. The schools are in three communities organized into a feeder pattern to facilitate continuity of care from kindergarten through 12th grade:

- North Miami Beach, Florida
  - North Miami Beach Sr. High
  - John F. Kennedy Middle
  - Fulford Elementary
  - Gertrude K. Edelman Sabal Palm Elementary
  - Greynolds Park Elementary
- North Miami, Florida
  - North Miami Sr. High
  - North Miami Middle
  - Arch Creek Elementary
- Overtown, Miami, Florida
  - Booker T. Washington Sr. High

All students at the target schools at which the School Health Initiative provides services are eligible for care. As of Q7, U-Miami reported serving 8,499 direct participants, including 451 students covered by Medicaid (see ***Table 3***). Based on information obtained during the site visit, 11,063 is the total population of children receiving care at the SBHC program, not just those who receive services from CHWs, dental care, or telemedicine as part of the innovation. Enrolled patients are students whose parents have signed treatment consent forms.

Table 3. Patients Planned for Inclusion in Innovation (Denominator Data)

Patient Type	Data Source	Current Count (Data Source)
Eligible patients of SBHC (students whose parents have signed a consent form for treatment)	CHOICES, CHEERS	8,499 (file provided by U-Miami)
Patients (students) enrolled in Medicaid/KidCare	CHOICES, Medicaid enrollment, HMO data	451 (quarter 7 self-monitoring plan)

HMO = health maintenance organization; SBHC = school-based health center.
CHEERS = Child Health Education Easy Report)

Of the eligible population of students seen at SBHCs (11,063), 55.3% are female and 44.7% are male. A majority of students (58%) are 12–18 years of age, followed by 1–11 years (37.8%). Most students are black or African American (73.9%), followed by Hispanic or Latino (21.4%), white (2.4%), or Asian (1.7%). The 8,499 identifiers provided by U-Miami reflect an aggregate number of patients served between July 1, 2012, and June 30, 2014. We are working with U-Miami to clarify the source of these numbers and reconcile them with its other reporting.

Table 4 includes demographic information for the 369 patient identifiers in the raw data file provided to RTI. From our understanding, that file includes only those children for whom the U-Miami CHWs are assisting the family with their Medicaid or Children's Health Insurance Program (CHIP) application. We will update the table to reflect demographic characteristics for all students and family members enrolled in the innovation as the data become available. The majority of children who received assistance with their application (84.6%) were between the ages of 6 and 18 at enrollment, with about equal numbers of females and males. More than half are black (54.20%), another one-third are Hispanic (33.33%), and the remaining 10% are white, Asian, or another race. About 20% have been approved for either Medicaid (13.82%) or CHIP (5.96%). Another one-third of applications are pending (30.08%), with the remaining applications either being denied (1.70%) or canceled/withdrawn (28.45%).

Table 4. Characteristics of Enrolled Students for Those Included in the Patient Identifier Data File

Characteristic	Number of Patients	Percentage of Patients
Age		
0–2 years	18	4.9
3–5 years	27	7.3
6–8 years	67	18.2
9–11 years	65	17.6
12–15 years	115	31.2
16–18 years	65	17.6
19–25 years	12	3.2
Sex		
Female	185	50.1
Male	184	49.9
Race/ethnicity		
White	24	6.5
Black	200	54.2
Hispanic	123	33.3
Asian	11	3.0
American Indian or Alaska Native	0	0.0
Other	11	3.0
Payer Category		
Medicaid—approved	51	13.8
Children's Health Insurance Program— approved	22	5.9

Source: Demographic information included with patient identifier data provided to RTI by U-Miami, May 2014.

1.2 Implementation Progress

The extent to which each awardee is able to implement its innovation as planned and reach a sufficient number of patients will be critical to assessing its impact on the total costs, utilization of health services, and health status. The following provides details on first the implementation process, then the effectiveness, with a table (***Table 5***) that provides the list of measures RTI plans to use in assessing each. In ***Table 6***, we are presenting the explanatory or independent variables we plan to use to assess the impact on outcomes of the innovation.

Table 5. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for U-Miami

Key Evaluation Domains	Subdomains	Measures	Data Source
Implementation process	Care coordination	Number of ED diversion program referrals by CHWs for uninsured families	CHOICES
Implementation effectiveness	Reach	Cumulative unique program participants by quarter	Lewin, CHOICES, CHEERS
		Number/percentage of children or families enrolled in Medicaid dental insurance	CHOICES, HMO data, Medicaid enrollment database
		Number/percentage of children or families enrolled in Medicaid	CHOICES
		Number enrolled in Medicaid/KidCare by CHWs	CHOICES
		Number/percentage of enrolled participants receiving CHW services	CHOICES, CHEERS
		Number/percentage of enrolled participants receiving dental services	CHOICES, CHEERS
		Number/percentage of enrolled participants receiving telehealth services	CHEERS, resident logs
	Dose	Number of telehealth encounters by specialty (dermatology, nutrition, mental health) per participant	CHEERS, resident logs
		Number of household visits	CHOICES
		Number of counseling sessions for parents or caregivers	CHOICES
		Number of CHW encounters and number per participant	CHOICES
		Number of social history audits by CHWs	CHOICES

CHW = community health worker; ED = emergency department; HMO = health maintenance organization.

1.2.1 Process

The implementation process has been the initial focus of the evaluation. RTI defines implementation process as including execution of implementation, organizational capacity, engagement of key staff and partners, and client recruitment and enrollment. The implementation process is best evaluated through a combination of data variables, including execution of implementation that conforms to operational plans and capacity for implementing the innovation in a timely and effective manner. This innovation has a number of components, so there are a number of subdomains of interest. We focused on the implementation process during the awardee site visit and asked evaluation questions such as the following:

- What is the overall execution of the innovation implementation (e.g., the actual rate of expenditures relative to the projected rate)?
- What accomplishments are specific to hiring or training staff so that the organization can build its capacity to implement the innovation effectively?
- What is the implementation effectiveness, including fidelity, reach, and dose of the innovation thus far?

Execution of Implementation

Execution is the extent to which the innovation has been implemented according to plan. We use a number of data variables to assess execution, including the extent to which the innovation has encountered delays in implementation, the effectiveness with which the awardee is able to allocate staffing and resources to support the innovation, and the organizational capacity for implementation. The following outlines overall impressions of execution as well as execution of individual components. Several of the components have been implemented, while others are in progress. There have been some difficulties in execution, which are described as follows.

RTI visited U-Miami in April 2014 to learn about its implementation progress. Because several interrelated components make up U-Miami's intervention, RTI focused on the progress of implementation for each component by interviewing people in a variety of roles. All expressed enthusiasm for the goals of expanding services and providing health care to children and their families. However, participants expressed concern about integrating administrative and clinical aspects of the innovation and sustainability going forward.

Day-to-day procedures, data collection, and data reporting vary by location, creating incoherence across the nine SBHCs. Not all encounters are captured in the school-based system, CHEERS, the CHW system, CHOICES, or the electronic health record, Epic. Adult clients of the CHWs are referred to CHS for care. However, it is not possible to track ED visits outside the U-Miami system, so it is difficult to determine whether clinic visits have resulted in ED diversion. Encounters deemed to be minor by the school nurse (e.g., a student receiving an adhesive bandage) are entered into a local log kept by the clinic, not into the tracking system. Therefore, according to the site visit, the paper-based logs reflect more patients seen than are officially reported to CMS.

CHWs

CHWs are in place and appear to have gone through training per the quarterly reports. Although CHWs cited that they found the training valuable during the site visit, they appear to need more guidance in providing services. There is no established protocol for CHW duties and functions and, until recently, there was no dedicated administrator to supervise their work. Lack of support and organization were mentioned several times during CHW interviews.

CHWs cited that their role might vary daily based on the age of the students and the needs of the population they are serving. Although CHWs appreciate the value of the social services they provide and understand the positive impact of these services on health outcomes, they also feel that their scope of work should be narrowed to be effective. A number of times, interviewers were reminded that "you can't be everything to everyone."

Dental Services Expansion

A delay in contracting with a dental partner affected delivery of dental services. The contract with the original partner never came to fruition. Nova Southeastern University was in the process of signing on to be the dental care provider during the site visit. This was toward the end of the school year, which means that the opportunity to provide services to second graders last year has passed.

During the site visit, we learned that consent forms for all dental services are not delivered to parents with beginning-of-the-year paperwork in the way that SBHC consent forms are. The consent for fluoride varnishes is included in the SBHC consent form. The dental sealant form goes home separately, after presentations are made in the classrooms and at open house or Parent-Teacher Association meetings.

Telemedicine

Telemedicine and mental health services are in place and seem to be used often. However, a significant issue for the evaluability of this innovation is the difficulty in tracking and reporting data related to clinic encounters and outcomes due to the number of disparate documentation systems and processes. For example, teleservice providers maintain their own logs of service, and their count of encounters was higher than what was documented in the quarterly reports. Specialists send a consultation note to the SBHC for inclusion in their records. In addition, teleservice providers do not write prescriptions. Instead, they indicate the prescriptions they would like written, and the provider at the SBHC writes the prescription. These factors mean that extra steps are needed for documentation. The number of patients that providers reported seeing and had in their own logs was greater than what was reported in the awardee's quarterly report. U-Miami does not have a process in place to validate the number of encounters reported by telemedicine providers each month.

ED Diversion Clinic

Because of the difficulty tracking legal documentation status and ED visits outside the U-Miami system, it is difficult to determine whether visits to the clinic have resulted in ED diversion. U-Miami is experimenting with using infrastructure at existing SBHCs to provide after-hours care for families of students. One project goal has been to obtain a patient-centered medical home designation with the HCIA grant funding. During the site visit, we learned that the awardee had completed most requirements on the assessment list and was planning to begin evening and weekend clinic access in May 2014 to meet the final requirement.

New Payment Mechanism

Engaging payers to establish a new billing and payment mechanism has been the most challenging component of this innovation. At the site visit, progress appeared to be slow, but U-Miami is making a concerted effort to establish agreements with Medicaid MCOs. We learned that the newly hired HMO consultant, foundation funder, and others help market the SBHC program to Medicaid MCOs by conducting tours of the facilities, followed by a presentation about the program. Although responses have been very positive, MCOs prefer to contract with each school as its own entity rather than with U-Miami as a university system. This presents a barrier to establishing contracts; each SBHC would need its own Tax Identification Number, but U-Miami will only contract as a cohesive unit through the university system. To date, U-Miami has reported three payer partners and planned a number of upcoming MCO visits. The awardee seemed positive that with the Statewide Medicaid Managed Care program in place by July 1, it would be able to establish agreements with many more MCOs as payer partners. In September 2014, U-Miami reported that the number of partners has increased to seven.

Finally, the rate at which awardees expend funds and enroll patients, compared with projection, provides useful information to assess the innovation's status. If expenditure or enrollment rates are low (because of an inability to hire staff, or from lack of information regarding a group of people eligible for enrollment), these variables help assess the awardee's readiness to implement the innovation at the start and the extent to which it can spend all funding and meet its overall goals by the end of the innovation (e.g., can they effectively use the funds provided?). U-Miami's current rate of spending for Year 2 is 31.2%, which is 20%–40% below the projected rate as reported in Q7. Changes are expected as the dental services provider and new telepsychiatry providers begin to deliver services. In addition, all of the subcontracts have not been fully executed. When they are, subcontractors will be reimbursed retroactively for all project-related expenses incurred since July 1, 2013. Payments will also be made to temporary staff for the evening clinic recruited in the past quarter.

To assess the overall achievement of the stated goals, RTI is working with the awardee to obtain patient identifiers for claims analysis and other administrative data with plans to analyze data specific to the innovation goals, as described in ***Tables 5*** and ***10***.

Organizational Capacity and Leadership

SBHCs are operationalized through U-Miami's Office of Community Health Affairs. The associate dean of the department provides overall guidance and advice, and the project director (PD) serves a dual role as the lead physician serving the students and as the project administrator. The original PD retired soon after the grant was awarded, and the current PD maintained her initial role as medical director and assumed oversight of the entire project in the PD position. Participants cited the PD as a dedicated clinical leader but noted that administrative leadership was lacking. Until very recently, there was no program manager or other administrator. During our site visit, we met with the new program manager, a midlevel administrator whose time is fully dedicated to this project and CHW supervision. Part-time staff include a research administrator, administrative assistant, budget administrator, and billing administrator. The innovation recently engaged with a faculty member in U-Miami's economics department to provide evaluation services. At the time of the site visit, this work was still in the planning phase. As the new program manager becomes acclimated and her role becomes more defined, workforce development may be affected. It is not clear if her role will help address the tracking and reporting or Medicaid managed care contracting issues described previously.

Since the innovation's launch, U-Miami has encountered difficulty securing or maintaining contracts with two partners (the University of Florida and CHS), indicating inadequate contracting infrastructure and personnel capacity. The replacement of the University of Florida with Nova Southeastern University was facilitated by a prior partnership to provide dental services for students in the target schools, so this was an expansion of that partnership.

Despite difficulties in contracting with U-Miami that stakeholders described during the site visit, some partnerships are in place. A number of service providers work as contractors to U-Miami to provide telehealth, psychiatry, dental, vision, and screening services. Currently, there are several funders of this program, including CMS. The original funder of the School Health Initiative was the Dr. John T. Macdonald Foundation, which still remains a strong partner. The Children's Trust of Miami-Dade County began funding the program about 5 years ago and pays for clinical staff time and operations.

1.2.2 Workforce Development

Recruiting and training CHWs to help patients access and use SBHCs is critical to the success of this innovation.

Hiring and Retention

An overall objective of HCIA Community Resource Planning, Prevention, and Monitoring awards is to identify paraprofessional roles and functions that could be part of reimbursement models that improve patient care and reduce the overall costs of care. U-Miami is using CHWs for this purpose. According to the Q7 report, there are 10 CHWs, who are identified as nonlicensed clinical staff. There is 1 nurse practitioner, 3 physicians, 5 management/administrative staff, 1 nutritionist, 1 economist, and 1 data coordinator. There is only 1 HCIA-funded practitioner authorized to prescribe medications, 3 non-HCIA-funded prescribing providers, and 3 non-HCIA-funded nonprescribing providers. There was 1 staff separation and 1 hire in the last quarter. In September 2014, the site reported that 2 CHWs resigned, and 6 were not offered continuing employment because of poor performance.

A large number of staff are dispersed across multiple sites. During our site visit, we found that although the SBHCs have common goals, each operates slightly differently. Professional and paraprofessional staff alike mentioned that given the tremendous needs of the community, it was not possible to focus on everything. Thus, they focused on areas that they perceived had the greatest need or areas of interest to them. Because each school operated differently, expectations for staff were not necessarily consistent throughout the schools. CHWs share information in a daily meeting but perceived a great deal of variability in carrying out their day-to-day responsibilities. CHWs indicated that the workload and expectations were high, so they focused on making an impact in the best way they could.

CHWs were originally employed by CHS, in part to reduce administrative burden. CHS is transitioning toward solely becoming a site for the ED diversion clinic providing services to family members and away from employing CHWs. The role of CHS as an ED diversion clinic is not expected to be impacted by this transition. However, there have been administrative difficulties with CHS staff transitioning to become U-Miami employees with U-Miami benefits. During our site visit, it was evident that CHWs love their work and understand the value it brings to the community. However, the lack of administrative and operative support and stability were mentioned and could lead to low morale and burnout. The status of the CHW change from CHS to U-Miami and any impact of that change should be monitored going forward. Monitoring was in progress during the site visit.

Training

The CHW role is new and has been evolving. Because of the lack of licensing and variability in backgrounds of CHWs, training is necessary to facilitate the success of the innovation and meet objectives. In Q7, three training courses were conducted for U-Miami clinical and nonclinical innovation staff. A total of 11 trainees participated in cultural competency training, 11 trainees participated in the CHOICES data tracking system for CHWs, and 10 trainees participated in Medicaid update training. During our site visit, we learned that CHWs are in the process of becoming certified care coordinators.

Participants were positive about the training they received. Those who interact with CHWs also were positive about the training CHWs received. Based on our observations during the site visits, there was not widespread training for those who work with CHWs about the CHW role or an established protocol for CHW functions. Many participants described the CHW role as an extension of the social worker role, helping enroll participants in insurance programs and assisting with social and coordination needs.

The new program manager indicated that she would like to expand the training program and make training available to staff other than CHWs. She would also like to standardize processes and streamline the work of nurses, social workers, and CHWs so that they work as a cohesive team. It is not clear whether she has the organizational authority to do so, but if more training, support, and oversight are provided to CHWs, nurses, and other innovation staff, then the service delivery tracking system and reporting could improve.

1.2.3 Effectiveness

Effectiveness can be evaluated in several ways. Fidelity involves the extent to which the innovation is being implemented as planned. Reach is the extent to which the target population is being served by the innovation. Dose is the appropriateness of the reach. As follows, we discuss how U-Miami is addressing these aspects of effectiveness.

Fidelity

As of Q7, changes from the original plan included changes in providers (e.g., dental care provider), realignment of roles (e.g., CHWs), and addition of providers (e.g., telemedicine providers). The implications for the evaluation are the delays in providing services and in getting new providers up and running.

The CHW role has changed from what was originally conceived. Because it was a new role, the functions were constantly evolving, and services provided differed depending on the needs and age of the children. Although much of their focus has been on Medicaid enrollment, we learned that the CHW role is largely viewed as an extension of the social worker role. The balance of CHWs' time is spent coordinating social services, with only nominal time on patient education and outreach. CHWs often provide social services, and students and families depend on them to provide support and access to resources.

As indicated previously, CHWs were first employed through CHS rather than U-Miami because CHS was thought to have streamlined administrative processes. However, there were challenges in paying employees on time and transferring grant funding. As of the site visit, employment was being shifted to U-Miami, which was seen as an improvement by respondents.

CHS is also the site for the ED diversion clinic, but this was not as successful as hoped. Tracking is difficult because of disparate electronic health records (EHRs) and the inability to track ED visits outside the U-Miami setting. This component is extremely important to managed care contracting, as some partners require that U-Miami provide care to families. During the site visit, we learned of plans to experiment with using SBHCs to provide care to families. Participants thought this might be more successful because of the familiar setting and for the convenience of caring for the entire family in one location.

Reach

Enrollment status is an indicator of how effectively the awardee is reaching its intended population. According to the Q7 report, a substantial proportion (11,063 students) of the target population at the schools is identified as being direct participants of SBHCs. However, based on the reporting problems indicated previously, it is clear that only a portion of SBHC patients receive HCIA-funded services. The patient identifier data obtained to date from U-Miami do not support the direct participant reports, so we cannot provide an independent estimate of the total number of students and families who have received HCIA-funded services. Based on a meeting among CMS, RTI, and U-Miami, we expect patient-level data to be provided to RTI starting in fall 2014 through January 2015. The estimates in ***Tables 6*** and ***7*** will be provided in subsequent reports as the data are available.

A key component of reach—enrollment into Medicaid—is lagging. One reason for this may be that the site is not a Medicaid enrollment site and thus is better able to track assistance with the Medicaid enrollment and package and not enrollment itself. Another reason could be due to the negotiation process between U-Miami and Medicaid MCOs as well as the immigration status of many families served by the SBHCs. CHWs encourage parents to register their U.S.-born children, but many parents are hesitant because of their own undocumented status. Partnerships with the MCOs at the time of the site visit had stalled because U-Miami was unwilling to give SBCHs their own Tax Identification Numbers, which would allow SBHCs to enter into negotiations with MCOs independently of U-Miami. This area of contention will challenge U-Miami in meeting sustainability goals and will affect the evaluation if U-Miami is not able to meet enrollment numbers. These items and their payment impacts will be monitored. RTI will continue to work with the site to identify data available to track Medicaid enrollment.

An additional barrier to enrollment affects dental services. Consent for dental care was not integrated into the global consent forms sent out in the beginning of the 2013–2014 school year. Thus, a separate consent procedure had to be instituted before the school year ended. Once the new school year starts and we work with the site to ascertain what data are available for dental encounters, we will work with the awardee to determine the best way to track dental services.

Table 6. Patient Enrollment and Reach for Each Quarter Since Project Launch

Quarter	Target Population (Denominator)	Number of Unduplicated Patients Enrolled and Receiving CHW Services	Total Reach per Quarter (Column C Divided by B)	Percentage Change from Previous Quarter
September 2012 (Q1)	—	—	—	—
December 2012 (Q2)	—	—	—	—
March 2013 (Q3)	—	—	—	—
June 2013 (Q4)	—	—	—	—
September 2013 (Q5)	—	—	—	—
December 2013 (Q6)	—	—	—	—
March 2014 (Q7)	—	—	—	—
Total enrolled as of March 30, 2014	—	—	—	—

Source: Will be updated with patient-level data provided to RTI by U-Miami when available.
CHW = community health worker; Q = quarter.
— Data not yet available.

Table 7. Participant Contacts for Telemedicine for Each Quarter Since Project Launch

Quarter	Target Population (Denominator Identified as Eligible)	Number of Unduplicated Participants with at Least 1 Telemedicine Encounter	Total Reach per Quarter (Column C Divided by B)	Percentage Change from Previous Quarter
September 2012 (Q1)	—	—	—	—
December 2012 (Q2)	—	—	—	—
March 2013 (Q3)	—	—	—	—
June 2013 (Q4)	—	—	—	—
September 2013 (Q5)	—	—	—	—
December 2013 (Q6)	—	—	—	—
March 2014 (Q7)	—	—	—	—

Source: Will be updated with patient-level data provided to RTI by U-Miami when available.
— Data not yet available.

Dose

Tracking and reporting exposure to the innovation is necessary to measure effectiveness. However, U-Miami uses several tracking systems, including some manual processes, none of which are integrated. The systems are CHEERS for school-based data, CHOICES for CHW data, and Epic for encounter data. During the site visit, we learned of mechanisms for entering and tracking data that were not apparent previously. These mechanisms include logs kept by the school health clinic to track encounters and independent logs kept by partners to track volumes. In addition, the volumes described by telemedicine providers that they document using their own local mechanisms are not consistent with the reported volumes in the self-monitoring reports. If available, we plan to track the number of counseling sessions and the number of home visits and CHW encounters per participant. We are still working with the awardee to determine whether these data will be available.

Table 8 provides a list of services being provided to students and their families. Once we receive these data from U-Miami, we will fill in the table.

Table 8. Number of Patients Receiving Specific Services

Services Provided to Patients	Number of Patients Served
Number of household visits	—
Number of counseling sessions for parents or caregivers	—
Number of CHW encounters and number per participant	—
Number of household visits	—
Total	—

Source: Will be updated with patient-level data provided to RTI by U-Miami when available.
CHW = community health worker.
— Data not yet available.

One of U-Miami's more innovative aspects is telemedicine. Because telemedicine is not traditionally reimbursed, the arrangement is that telemedicine is treated like a consult, and the referring provider is responsible for documenting the encounter, writing any prescriptions, and so forth. This means that the telemedicine provider may have his or her own log, which reflects the patients seen and does not correspond with the numbers. The discussions we had about volumes during the site visit corroborate those findings because the numbers described and tracked using local logs did not appear to match site reporting.

RTI will work with the awardee to address and resolve these discrepancies.

Table 9 shows the number of telehealth encounters by specialty per patient.

Table 9. Average Number of Encounters per Patient by Telehealth Specialty

Telehealth Specialty	Average Number of Encounters per Patient
Dermatology	—
Mental health	—
Nutrition	—
Total	—

Source: Will be updated with patient-level data provided to RTI by U-Miami when available.
— Data not yet available.

1.3 Evaluation Outcomes

RTI will use two types of quantitative data from awardees to assess the impact of the awardee's innovation on key outcomes. These include claims data for Medicare and/or Medicaid beneficiaries, depending on who the awardee serves, and administrative or utilization data the awardee is collecting (which we have categorized as "other awardee-specific data," reflecting the variability of the types of data elements available across awardees). We are in the process of finalizing our assessment of all the available data sources and requesting data directly from each awardee. As those data are received, we will incorporate the findings into our quarterly/annual reports. The following sections present descriptive findings from the quantitative outcome data provided to RTI as of September 11, 2014.

1.3.1 Measures for Evaluation

After the site visit, the data management and site visit teams met to review each of the measures listed in the awardee's self-monitoring measurement plan. The measures listed in ***Tables 5*** and ***10*** reflect the measures determined as most relevant for our evaluation of U-Miami's innovation.

Table 10. Outcome Measures Requested from U-Miami

Key Evaluation Domains	Subdomains	Measures	Data Source
Clinical effectiveness	Asthma	Percentage of children with asthma who were dispensed appropriate medications	EHR (Epic), CHOICES
	Diabetes	Percentage of children with diabetes who received a hemoglobin A1c and lipid profile assessment	EHR (Epic), CHEERS, CHOICES

(continued)

Table 10. Outcome Measures Requested from U-Miami (continued)

Key Evaluation Domains	Subdomains	Measures	Data Source
Clinical effectiveness (continued)	Diabetes (continued)	Percentage of parents/caregivers of pediatric patients with diabetes who received nutrition counseling during the measurement year	EHR, CHOICES
		Percentage of children with diabetes who received an eye screening for diabetic retinal disease	EHR (Epic)
	Mental health	Percentage of children with a confirmed diagnosis of depression after referral for psychiatric evaluation	EHR, CHOICES, social workers, Larkin Community Hospital data reporting
	Oral health	Percentage of children aged 5–11 years enrolled in the school health dental program who received an oral health screening	Nova Southeastern University dental program
	Weight management	Percentage of children who are overweight (BMI 25.0–29.9) or obese (BMI >30)	
Health outcomes	Asthma	Percentage of children with asthma who have FEV1 ≥80%	ED data, EHR (Epic), CHOICES
Health care outcomes	Utilization	ED visit rate	Claims data
		Asthma: Percentage of patients who have had a visit to an ED/urgent care office for asthma in the past 6 months	ED data, EHR (Epic), CHEERS, CHOICES
		All-cause admission rate	Claims data
		Readmission rate	Claims data
	Cost	Spending per patient	Claims data
		Cost savings	Claims data

BMI = body mass index; ED = emergency department; EHR = electronic health record; FEV1 = forced expiratory volume

1.3.2 Claims Data

As part of a broad assessment of health care innovations, the Center for Medicare & Medicaid Innovation (CMMI) is assessing the impact of its programs, including those funded specifically by HCIAs, on four core measures. The four core measures are as follows:

- health care spending per patient,
- hospital inpatient admissions,
- hospital unplanned readmissions, and
- ED visits.

Collectively, it is anticipated that CMMI programs will slow the increase in health care spending, reduce hospital admissions, reduce avoidable hospital readmissions, and prevent unnecessary ED visits. We are reporting these measures for all HCIA Community Resource Planning awardees so that the collective impact of the awards can be assessed. Discussed as follows, some awardees' innovations may not be focused on these measures. Other awardees' innovations target specific conditions (e.g., imaging, diabetes) and may have significant impacts on spending, admissions, readmissions, and ED visits for the targeted conditions but not have a statistically detectable impact on the measures at the aggregate level because the targeted conditions represent only a small fraction of total spending, inpatient admissions, and ED visits.

The measures are calculated through analysis of Medicare and Medicaid fee-for-service claims. Because of differences between Medicare and Medicaid patients in age, other demographic variables, and disease status, we report the Medicare and Medicaid results separately as follows. Currently, complete Medicare claims are available through the end of 2013. Medicaid claims for U-Miami are only available through the third quarter of 2011. The U-Miami innovation began enrolling patients in July 2012.

- **Health Care Spending per Patient.** For Medicare beneficiaries, health care spending per patient includes Part A and Part B Medicare expenditures for persons enrolled in the Part A and Part B fee-for-service program. The variable focuses on Medicare fee-for-service spending, so Medicare managed care (Part C) services are excluded, as are beneficiary copayments. Medicare Part D prescription spending is also excluded. Spending is reported on a per-person per-quarter basis. If a beneficiary is not enrolled for every month in a quarter, spending (except for hospital inpatient spending) is prorated to a quarterly basis based on the number of days enrolled during the quarter. Because hospital inpatient admissions are both rare and expensive, spending is not prorated for hospital inpatient spending. Prorating is also not performed for beneficiaries who die during a quarter.

  For Medicaid beneficiaries, health care spending per patient is reported for fee-for-service beneficiaries. Beneficiaries are only included in the analysis for spending (and the other measures) during periods when they are enrolled in Medicaid.

- **Hospital Inpatient Admissions.** This variable measures hospitalization, the single most expensive component of health care spending. Patients kept overnight in observation beds are excluded from this measure. Inclusion criteria for the analysis are the same as for spending. Hospital inpatient admissions are not prorated based on the number of days eligible during the quarter. All-cause inpatient admissions and ACSC admissions are reported separately, under the assumption that a greater share of ACSC admissions can be prevented by appropriate ambulatory care. The mean quarterly admission rate per 1,000 patients is reported.

- **Hospital Readmissions.** Hospital readmission rates serve a dual purpose in evaluating HCIA impacts. Readmissions add to the costs of a prior hospitalization, and they often reflect a problem in the care provided during the first admission. All-cause readmissions are defined as a follow-up admission to any short-term acute general or long-term care hospital within 30 days of a discharge from another hospital of the same type. We ignore multiple admissions within 1 day of an initial admission because these often represent transfers between hospitals. We define index hospitalizations that begin during the quarter and follow each index admission for 30 days, even when the follow-up period extends beyond the end of the quarter. Inclusion criteria for the analysis are the same as for spending. We also calculate readmissions for persons with ACSC. The person's ACSC status is defined by his or her first hospitalization during the quarter. The readmission rate equals the number of readmissions divided by the number of index hospitalizations during the quarter. Planned readmissions are excluded from the calculation of the numerator. Quarterly mean readmission and ACSC readmission rates per 1,000 admissions are reported.

- **ED Visits.** ED visits are sometimes viewed as a symptom of the inability of the community's health care system to provide adequate preventive and ambulatory care visits. We report an all-cause ED visit rate that excludes ED visits resulting in an inpatient admission (which presumably represent unavoidable visits) and includes overnight ED visits without an inpatient admission. Inclusion criteria for the analysis are the same as for spending, and ED visits are also subject to the same prorating formula as for spending. The mean quarterly ED visit rate per 1,000 patients is reported.

Medicare Claims Analysis

We do not expect to include Medicare claims analyses because U-Miami's innovation includes school-aged children not eligible for Medicare.

Medicaid Claims Analysis

The Medicaid data analysis will use data from the CMS Alpha-Medicaid Analytic eXtract (MAX) data files. Currently, Medicaid claims for U-Miami are only available in Alpha-MAX through the third quarter of 2011. Because U-Miami's innovation was launched in July 2012, we are not presenting measures for Medicaid patients in this report. We will provide Medicaid analyses in subsequent reports as more data become available.

Appendix A shows the claims analyses tables that we plan to present for Medicaid. In addition to the tabular format, we will present figures showing each measure as a function of time. Values in quarters before the innovation's launch in July 2012 will be shown in one color, and values for quarters during and after launch will be shown in another color. The figures will include a trend line based on a linear regression of prelaunch values.

Discussion of Claims Analysis

The claims measures will provide descriptive data on patients enrolled in U-Miami's innovation before, during, and after the launch of the innovation. Although it is necessary to report these measures to support CMS's broader assessment of its full portfolio of innovation projects, the measures may not provide a complete evaluation picture of the innovation. There are several reasons for this. First, only 5% of the patients served overall by U-Miami have Medicaid, although one of the innovation's components includes assisting families with their Medicaid or CHIP application. Of these 369 participants, about 20% have been approved for either Medicaid (13.8%) or CHIP (5.9%), and another one-third of applications are pending (30.1%). In addition, U-Miami is not focused on all-cause hospital admissions or readmissions.

Development of Comparison Groups

In addition to comparing U-Miami's patients before and after implementation of the innovation, we are constructing a comparison group of Medicaid fee-for-service patients in Miami. This comparison group will control for external, noninnovation factors affecting both innovation participants and nonparticipants. The comparison area will be limited to children in similar zip codes. We are using propensity score matching to identify patients with similar characteristics as U-Miami patients, such as age, chronic conditions, gender, and insurance status. Results for the comparison group will be included in later reports.

1.3.3 Other Awardee-Specific Data

In mid-June 2014, after the data review meeting, RTI met with U-Miami to request the raw patient- and CHW-level data that were used to generate each of the measures in ***Tables 5*** and ***11*** for each quarter.

Overview of Data Requested and Received

During the meeting with U-Miami, its staff indicated that providing other awardee-specific data will be a challenge for the following reasons: (1) the EHR has been in place for about a year, so anything before that is paper-based and in individual patient files; (2) all but two clinics are closed for the summer for school vacation, the main sites remain open, and others are open on a rotating basis; (3) data are not easy to link across multiple data sources; and (4) the data person is only 10% covered under the HCIA project. We have continued to be in touch with them to check on the status of providing data to us. On July 23, 2014, U-Miami uploaded aggregate-level demographic information. We advised its staff that we are requesting raw patient-level data rather than aggregate-level data. On July 24, 2014, U-Miami uploaded patient-level data reflecting clinic visits by type between July 1, 2012, and June 30, 2014, as well as a five-item asthma control scale by school. The clinic visit data were provided in PDF format, so we have requested that U-Miami provide it in Microsoft Excel. We understand that U-Miami is receiving technical assistance (TA) from the TA provider on how to retrieve and provide its patient-level data. On September 22, 2014, CMS, RTI, and U-Miami met to discuss the data availability and to clarify the data RTI has requested. During that meeting, U-Miami noted that not all of its data are currently available because it is continuing to transfer hard-copy data into its EHR system. U-Miami has hired an additional staff person to facilitate the transfer of information and expect to be able to provide all the data requested by January 2015.

Health Outcomes

Once we receive the raw patient-level data requested from U-Miami, we will have a better understanding of what type of results we will provide. The following table shells (***Tables 11*** and ***12***) reflect examples of findings we anticipate presenting.

Table 11. Health Outcomes Over Time

Measure	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Asthma							
Percentage of children identified as having persistent asthma and dispensed appropriate medications	—	—	—	—	—	—	—
Percentage of children with asthma who have FEV1≥80%	—	—	—	—	—	—	—
Percent of patients who have had a visit to an ED/urgent care office for asthma	—	—	—	—	—	—	—
Diabetes							
Percentage of children with diabetes who received a hemoglobin A1c and lipid profile assessment during the measurement year	—	—	—	—	—	—	—
Percentage of parents/caregivers of pediatric patients with diabetes I and II who received nutrition counseling during the measurement year	—	—	—	—	—	—	—
Percentage of children with diabetes I and II who received an eye exam	—	—	—	—	—	—	—
Body Mass Index							
Percentage of children overweight (BMI between 25.0 and 29.9)	—	—	—	—	—	—	—
Percentage of children obese (BMI >30)	—	—	—	—	—	—	—
Mental Health							
Percentage of children with a confirmed diagnosis of depression after referral for psychiatric evaluation	—	—	—	—	—	—	—

(continued)

Table 11. Health Outcomes Over Time (continued)

Measure	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Oral Health							
Percentage of children aged 5–11 years enrolled in the school health dental program who received an oral health screening	—	—	—	—	—	—	—

Source: Will be updated with patient-level data provided to RTI by U-Miami when available.
BMI = body mass index; ED = emergency department; FEV1 = forced expiratory volume; Q = quarter.
— Data not yet available.

Table 12. Health Indicator Outcomes for Priority Populations

	Priority Populations	
Measure	**Black**	**Hispanic**
Asthma		
Percentage of children identified as having persistent asthma and dispensed appropriate medications	—	—
Percentage of children with asthma who have FEV1≥80%	—	—
Percent of patients who have had a visit to an ED/urgent care office for asthma	—	—
Diabetes		
Percentage of children with diabetes who received a hemoglobin A1c and lipid profile assessment during the measurement year	—	—
Percentage of parents/caregivers of pediatric patients with diabetes I and II who received nutrition counseling during the measurement year	—	—
Percentage of children with diabetes I and II who received an eye exam	—	—
Body Mass Index		
Percentage of children overweight (BMI between 25.0 and 29.9)	—	—
Percentage of children obese (BMI >30)	—	—
Mental Health		
Percentage of children with a confirmed diagnosis of depression after referral for psychiatric evaluation	—	—
Oral Health		
Percentage of children 5–11 years enrolled in the school health dental program who received an oral health screening	—	—

Source: Will be updated with patient-level data provided to RTI by U-Miami when available.
BMI = body mass index; ED = emergency department; FEV1 = forced expiratory volume.
— Data not yet available.

Discussion of Other Awardee-Specific Findings

Once we receive data from U-Miami, we will review, clean, merge, and begin conducting descriptive analyses to fill in the aforementioned table shells. At that point, we will be in a better position to discuss findings related to the other awardee-specific data.

1.4 Overall Program Effectiveness to Date

U-Miami is a complex innovation with several components across multiple sites. Respondents during the site visit were enthusiastic about the services provided to children and their families and the promise of the innovation. However, there are some challenges including changes in leadership, the role of the CHW, partnership changes, and inconsistent processes including tracking and reporting.

The innovation lacks consistent, dedicated leadership. The previous medical director is now both medical director and PD. The number of components, the number of sites, and the complexity of the innovation require dedicated leadership, which does not appear to be in place at U-Miami.

The CHW is a key component of the innovation. The CHWs do not have clear direction or a consistent set of expectations. In addition, they are not functioning as was originally planned for U-Miami. We learned in the site visit that each CHW views the role slightly differently and focuses on a different aspect of it. The new administrator had plans to provide additional training and standardization of CHW functions. The administrator started shortly before our site visit in April, so the impact of her arrival and role remains to be seen.

Partnership challenges are another factor impacting success of the evaluation. The partnership with CHS has not gone as planned. CHS was supposed to have a larger role in the ED diversion clinic and with the CHWs and social workers. This was not as successful as we had hoped. The ED diversion clinic volumes were not as high as we hoped, and the administrative processes did not work. Similarly, partnership discussions with the University of Florida fell through, so the dental partner changed midstream. During the site visit, we learned that U-Miami has a reputation for being difficult to deal with contractually. This may contribute to the managed care partners' reluctance to partner with the SBHCs if they are associated with U-Miami versus if they stood alone. Since the site visit, the site Principal Investigator has reported that contracts were in place with eight managed care partners.

Inconsistent processes including tracking and reporting across components and sites make evaluating the innovation challenging. Much of the reporting is based on three different systems, and they are not integrated. Further, there are additional manual tracking systems that differ across sites, which are not necessarily included in reporting. It is difficult to identify the appropriate population-based metrics to assess innovation effectiveness when the reporting is so inconsistent. U-Miami has recently engaged an economist on its faculty to assist with evaluation, which is a positive step. RTI will continue to work with the site to better understand its processes and obtain relevant data.

Although U-Miami seems to be providing important services to students and families, evaluating these efforts requires better tracking and reporting of data. Organizational factors such as leadership, ease of tracking and monitoring, and facilitating contract processing can help identify new payment models and improve the utility of CHWs. Addressing these areas will allow U-Miami to more fully demonstrate the impact of the innovation.

APPENDIX A

Table A-1. Baseline and Intervention Trends in Health Care Spending per Patient

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—

Savings per Patient

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Spending rate: total quarter (i.e., quarterized) payments/number of unique patients. Savings per patient: difference in comparison minus the intervention’s average spending rates.
— Data not yet available.

Table A-2. Baseline and Intervention Trends in Admissions per 1,000 Patients

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Admit rate: total unquarterized admissions/number of unique patients.
— Data not yet available.

Table A-3. Baseline and Intervention Trends in Readmissions per 1,000 Admissions

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total admissions	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total Admissions	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Readmit rate: sum of all readmissions to eligible hospital within 30 days/all admissions in the quarter. Total admissions: all eligible admissions in the quarter.
— Data not yet available.

Table A-4. Baseline and Intervention Trends in ED Visits per 1,000 Patients

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: ED rate: total quarterized ED visits and observation stays/number of unique patients.
— Data not yet available.

October 2014

Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring

Annual and Site Visit Report

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OVERALL EVALUATION SUMMARY

RTI International was selected to lead an independent evaluation of the 24 Health Care Innovation Award (HCIA) awardees categorized as Community Resource Planning, Prevention, and Monitoring (Community Resource). In this role, RTI is conducting an in-depth evaluation of each innovation, as well as a cross-site evaluation that includes similar innovations targeting the same priority outcomes (e.g., emergency department [ED] visits). For each of the 24 awardees, this report presents findings from the first year of the evaluation (beginning September 23, 2013, and including data obtained by RTI as of September 11, 2014). The report is based on multiple data sources, including operational reports, self-monitoring plans, site visits, and quantitative data analysis.

The evaluation methods vary by awardee innovation, based on the type of innovation and availability of data. RTI has reviewed and coded all existing documents from the awardees through December 31, 2013, and incorporated that knowledge into each awardee's overview. Our review included the awardees' original applications for funding, original and current operational and self-monitoring plans, and quarterly narrative and monitoring reports. For this annual report, we incorporated activities reported through the awardee's seventh quarterly report (i.e., through March 31, 2014).

Between April and August 2014, teams of at least two staff from the RTI team visited all 24 awardees for 2 to 4 days, depending on the number of interviews conducted. Teams included a subject matter expert, with training and experience specific to the awardee's innovation, and a master's- or bachelor's-level colleague to take notes. Before each visit, the teams reviewed all available documentation from the awardee to learn about the innovation's goals, objectives, and status. The purpose of the site visits was to clarify our understanding of the innovation, obtain detailed information on the implementation process, and review awardee-specific data to determine which elements to incorporate into the evaluation. By August 13, 2014, all 24 awardees had been visited and a thorough description of our findings included in each of the 24 awardee sections.

In addition to the site visits, we report quantitative data from two possible sources for several awardees. First, we present findings from claims analysis for awardees in this report if they both provided us with patient identifiers and reported enrolling participants who are Medicare and/or Medicaid beneficiaries. RTI has obtained patient identifiers from most of the 24 awardees to conduct claims analysis. Second, we present data RTI obtained directly from awardees to quantify their work in addressing health care costs, quality, and patient outcomes. Data from additional awardees will be analyzed and presented in future reports, as data become available and awardees enroll sufficient participants. An update on the availability of Medicare/Medicaid claims and other awardee-specific data, analysis of data available to us and cleaned as of September 11, 2014, a summary of the comparison groups, and a list of draft evaluation measures are included in each awardee section.

1. HCIA COMMUNITY RESOURCE AWARDEE: WOMEN & INFANTS HOSPITAL OF RHODE ISLAND

1.1 Introduction

The Women & Infants Hospital of Rhode Island (W&I) is a nonprofit acute care hospital in Providence, Rhode Island. The W&I Neonatal Intensive Care Unit (NICU) provides state-of-the-art tertiary care to more than 1,200 high-risk infants annually. W&I received an award of $3,261,494 to implement its innovation, Partnering with Parents, the Medical Home and Community Providers to Improve Transition Services for High-Risk Preterm Infants in Rhode Island. Partnering with Parents was expanded in August 2013 to include high-risk full-term infants and again in Q7 to include infants in Connecticut and Massachusetts. The innovation is designed to achieve the following goals:

1. **Reduce health care costs** for families of high-risk preterm and full-term infants in Rhode Island by 25%.
2. **Improve care** for a diverse population of high-risk preterm and full-term infants and families by ensuring that more than 90% receive enhanced transition care education and support in the NICU, during a postdischarge home visit, and in the follow-up clinic and that more than 90% express satisfaction with the innovation.
3. **Improve health outcomes** for more than 90% of high-risk preterm and full-term infants and their mothers by decreasing the need for 30-day hospitalization by 10%, 3-month rehospitalization by 25%, and 30-day ED visits by 25%.

RTI is conducting an in-depth case study for this innovation. As part of that case study, three RTI team members conducted a site visit in early July 2014; before and after the visit, our team reviewed all documentation on the innovation. We are working to obtain data directly from the awardee to assess many of the variables we discuss. This report describes findings from RTI's site visit, document reviews, follow-up calls, and analysis of data obtained and cleaned by RTI through September 11, 2014. We start by describing the innovation's components and the patients targeted by the awardee.

1.1.1 Innovation Components

Partnering with Parents is an expansion of the Transition Home Plus (THP) program, offering support to newborns who spend 5 or more days in the NICU and their families. This innovation includes an infant and family intervention consisting of four components: 1) peer support, 2) social worker support, 3) clinical support, and 4) patient navigation. The innovation also includes community education and engagement efforts that consist of periodic educational workshops with broad stakeholder participation and a health information technology partnership. The innovation has the following objectives and relies on the partners presented in ***Table 1***:

- Enroll all eligible infants and families into the innovation.

- Provide education, assessments, home visits, and other peer and social support services to enrollees.
- Establish, expand, and maintain partnerships with insurance providers and the statewide health information exchange system; parents of NICU patients; pediatric primary care providers; and community organizations, including Rhode Island Parent Information Network (RIPIN), visiting nurses, First Connections, Early Head Start, and Early Intervention.
- Use family resource specialists and social workers to identify maternal demographics, psychosocial factors, and infant biologic factors that are associated with parental competency, stress, and depression and infant health, ED use, and rehospitalization rates.

Table 1. HCIA Partners, Role, and Location

Partner Name	Role in HCIA Project[1]	Location
Rhode Island Parent Information Network	Employs and provides training and support to family resource specialists	Cranston, RI
Kent Hospital	Hospital partner; only other NICU in Rhode Island	Warwick, RI
Rhode Island Department of Health: First Connections	Supplies data on maternal depression for women enrolled in the program. Data are collected via independently conducted home visits to pregnant women and families statewide with young children who meet department criteria, which includes any baby with a NICU stay of 5 days or longer.	Providence, RI
Rhode Island Quality Institute/Current Care	Health information exchange system with data about ED visits and hospitalizations	Providence, RI

[1] RIPIN is the only partner reported in the Lewin database; the other partners are included in progress reports from the awardee. During the site visit, RTI will confirm the role and location of each partner.

ED = emergency department; HCIA = Health Care Innovation Award; NICU = neonatal intensive care unit.

Several other organizations are listed in the progress reports as partners; however, Table 1 includes only those partners whose specific roles were articulated in program documents and during the site visit. Additional partners are engaged through the educational workshops and are working toward the same overarching goals for the pediatric population in Rhode Island, but no specific roles on the HCIA innovation were identified. Given the complexity of this innovation, we first provide a detailed description of the overall program followed by specific information on each of the four program components.

Overview of Partnering with Parents

During hospitalization, infants and their families receive care and support from NICU staff, including doctors, nurses, specialists, case managers, and NICU social workers. However, in the absence of transition-home programs, the support provided to families in the NICU typically ends when infants are discharged. Caring for vulnerable infants postdischarge is challenging for many families, particularly those facing social and economic hardships. Partnering with Parents provides home-based support and education for families of infants with NICU stays of 5 days or longer.

The HCIA innovation expands on an existing program, W&I's THP program. THP was developed in 2007 with funding from the CVS Caremark Charitable Trust, and program services are now covered by Medicaid in the state of Rhode Island. Under THP, families of the most vulnerable premature infants (born at ≤33.6 weeks with a birth weight of less than 1,500 grams and a NICU hospitalization of more than 5 days) receive support services tailored to their individual needs for up to 7 months "corrected age" of the enrolled infant. Corrected age is the appropriate measure for assessing premature infants' development and is calculated by subtracting the number of weeks the baby was preterm from the number of weeks since the date of birth. Infants may be dually enrolled in THP and the HCIA innovation Partnering with Parents.

Partnering with Parents expands the THP model by providing support and education services to families of early/moderate preterm (≤33.6 weeks); late preterm (34 to 36.6 weeks); and, as of August 2013, full-term (37+ weeks) infants. Partnering with Parents' enrollment was initially limited to Rhode Island residents but was expanded to include residents of Connecticut and Massachusetts in April 2014. Enrolled Connecticut and Massachusetts infants may be early/moderate preterm, late preterm, or full term. As with THP, a NICU stay of at least 5 days is required for enrollment; however, unlike THP, Partnering with Parents is not limited to Medicaid recipients.

Teams of family resource specialists (FRSs), lay parents who have had preterm infants and are trained in peer support, provide social support services to the different groups of infants targeted by the program (i.e., early/moderate, late preterm, full term, and non-Rhode Island residents). Each team is led by a licensed independent clinical social worker (LICSW), who manages the team's most complex cases. FRSs are employees of the Rhode Island Parent Information Network (RIPIN). They receive general peer support-related trainings from RIPIN, as well as training on hospital and Partnering with Parents systems and processes from W&I. ***Table 2*** lists services provided to enrolled families by infant group. In addition to the services outlined in the table, FRSs have multiple "relationship-building" contacts with parents of eligible infants during their NICU stay to facilitate enrollment.

Table 2. Specific Support Services by Group

Service Provider	Services	Early and Moderate PT: RI	Late PT and Full Term: RI	Early and Moderate PT: MA and CT	Late PT and Full Term: MA and CT
FRS or LICSW	*Predischarge education for families of high-risk infants.* Includes providing basic infant care, safety, and follow-up information; encourages attendance at discharge classes and CPR classes; encourages use of 24-7 on-call phone support; provides an individualized information binder with support and educational information.	Yes	Yes	Yes	Yes
Nurse practitioner	*Predischarge home visit for families with infants at highest risk for respiratory admissions (bronchopulmonary dysplasia [BPD] or social risk factors)*	Yes—if they have BPD or other social risk factors	Yes—if they have BPD or other social risk factors	No	No
FRS or LICSW	*Assessment and services for parents.* Parents are surveyed during infants' NICU stay to assess the impact of their high-risk infant on the family and are screened with the Fragile Infant Parental Readiness Evaluation™ (FIPRE). Team members work to ensure appropriate connections in the community to address issues such as homelessness, domestic violence, mental health, and substance abuse. FRSs provide peer support.	Yes	Yes	Yes	Yes
FRS or LICSW	*Postdischarge phone calls.* Contacts the family by phone on the day(s) after discharge to troubleshoot and addresses any concerns; continues to provide educational information for families as needed.	Yes	Yes	Yes	Yes

(continued)

Table 2. Specific Support Services by Group (continued)

Service Provider	Services	Early and Moderate PT: RI	Late PT and Full Term: RI	Early and Moderate PT: MA and CT	Late PT and Full Term: MA and CT
FRS or LICSW[1]	*Coordination, communication, and education for primary care providers.* Primary care providers are informed in writing that an infant has been enrolled and are provided with a description of the study's services. The results of each encounter are sent or faxed to the primary care provider. The program offers a 24-7 telephone consultation to primary care providers about medical treatment for high-risk infants.	Yes	Yes	Yes	Yes
FRS or LICSW	*Office visits by a multidisciplinary team.* A multidisciplinary team of physicians, nurse practitioners, social workers, nutritionists, occupational therapists, and bilingual staff works with each family.	Yes	No	Yes	No
Nurse practitioner	*Home visits.* A home visit within 1–2 weeks of discharge for a complete physical exam for the infant as well as a parent education session.	Yes	No	No	No
PI and Co-PI	24-7 on-call phone support for enrolled families with urgent medical needs.	Yes	Yes	Yes	Yes
FRS or LICSW	Coordinates with First Connections Visiting Nurses; obtains results of the Edinburgh Postnatal Depression Scale from First Connections.	Yes	Yes	Yes	Yes
NICU Follow-Up Clinic providers	Conduct 1-month visits with baby and parent in the Neonatal Follow-Up Clinic within 3–4 weeks of discharge for assessment, support, and education. During the clinic visit, Edinburgh Postnatal Depression Scale administered and referrals were made as needed. Collect data on ED visits and hospitalizations.	Yes	No[2]	Yes	No[2]

(continued)

Table 2. Specific Support Services by Group (continued)

Service Provider	Services	Early and Moderate PT: RI	Late PT and Full Term: RI	Early and Moderate PT: MA and CT	Late PT and Full Term: MA and CT
First Connections or FRS or LICSW	Conducts 1-month phone call to the families of those who are not seen in the follow-up clinic. Edinburgh Postnatal Depression Scale administered and referrals made as needed. Collects data on ED visits and hospitalizations.	No	Yes	Yes	Yes
FRS or LICSW	Collects data on ED visits and hospitalizations. For infants enrolled in Current Care, analyst enters health information exchange alerts into program database. For those not enrolled, data collected at the 1- and 3-month visits/phone calls.	Yes	Yes	Yes	Yes
NICU Follow-Up Clinic providers	3-month visit in the NICU Follow-Up Clinic: conducts a comprehensive assessment of the infant; collects data on ED visits and hospitalizations; administers NICU FITS; referrals made as needed. Family and agency surveys completed.	Yes	No[2]	Yes	No[2]
FRS or LICSW	3-month phone call.	No	Yes	No	Yes
FRS or LICSW	3 months: NICU FITS sent in mail with return envelope or by phone. Referrals made as needed. Family and agency surveys completed by mail.	No	Yes	No	Yes

Source: Adapted from W&I's updated Institutional Review Board (IRB) protocol based on information gathered during site visit interviews.

[1] PI and Co-PI provide telephone consultation.

[2] Based on clinical criteria established for the W&I Follow-Up Clinic, some late preterm and full-term infants may receive this service.

BPD = bronchopulmonary dysplasia; CPR = cardiopulmonary resuscitation; CT = Connecticut; ED = emergency department; FIPRE = Fragile Infant Parent Readiness Evaluation; FITS = Fragile Infant Transition Summary; FRS = family resource specialist; HCIA = Health Care Innovation Award; IRB = Institutional Review Board; LICSW = licensed independent clinical social worker; MA = Massachusetts; NICU = neonatal intensive care unit; PT = preterm; W&I = Women & Infants Hospital of Rhode Island.

Based on information gathered during the site visit, we describe the innovation as four synergistic program components: peer support, social worker support, clinical support, and patient navigation. In addition to these four components, which are described in detail below, the FRS/social workers are responsible for recruiting families in the NICU, enrolling families and obtaining their consent to participate in the study, and collecting data (the Neonatal Intensive Care Unit Fragile Infant Transition Summary [NICU FITS], the Edinburgh Postnatal Depression Scale, and the Fragile Infant Parent Readiness Evaluation [FIPRE]).

Component 1: Peer Support

Peer support is considered to be a central aspect of the Partnering with Parents program. FRSs have had experience as a NICU parent, and they engage the families while they are in the NICU to provide peer support and advocacy. After enrolled infants are discharged, FRSs follow the families providing as-needed assistance for 3 months of corrected age of the infant. FRSs are part-time employees of RIPIN, a 501c3 nonprofit that provides the direct linkages for parents and children with special health care needs in Rhode Island to obtain the critical health care and education services and supports needed.[1] RIPIN trains and provides parent consultants to multiple programs in Rhode Island, including the Early Intervention program. FRSs engage the family while the infant is in the NICU to better understand their unique needs and identify potential issues they may face upon discharge. Following discharge, FRSs make themselves available to the family via phone to offer support, advice, and tangible items of need (e.g., diapers, pack and play, air purifiers). The provision of tangible items is made possible through an anonymous donation to the Partnering with Parents program. Based on the families' needs, FRSs may also make home visits.

Several FRSs work together as a team under the oversight of an LICSW. Each team is assigned to one of the targeted infant groups. A new team has been formed for the Connecticut/Massachusetts infants. The FRS role is similar to the LICSW role in that they are responsible for 1) enrollment of families into the research study and all consent paperwork, 2) the 1- to 2-day phone call, 3) the 1- and 3-month phone call and all data collection taking place on these calls, and 4) any interim follow-up or support requested. The extent to which the FRSs proactively reach out to provide peer support to families outside of these required contacts is unclear and not captured in HCIA reports. However, it was reported during the site visit that all contacts with Partnering with Parents families are documented in the program's database. ***Table 3*** displays the qualifications, functions, and training for the FRSs.

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[1] Rhode Island Parent Information Network. N.p., n.d. Web. 16 July 2014. <www.ripin.org>.

Table 3. HCIA Care Coordinator Functions and Training for W&I Innovation

Characteristic Type	Family Resource Specialist Role
Title	Family resource specialists
Minimal qualifications	High school diploma/GED Have been a parent of a NICU baby
Functions	Health education Informal counseling Outreach and recruitment Patient advocacy Patient monitoring and follow-up Service coordination Community linkages Other instrumental support (arranging transportation, child care, translators)
Established continuing education	Periodic trainings provided by RIPIN, but no formal established program.

GED = general educational development; HCIA = Health Care Innovation Award; NICU = neonatal intensive care unit; RIPIN = Rhode Island Parent Information Network; W&I = Women & Infants.

Component 2: Social Work Support

It is standard practice in the W&I NICU for a NICU social worker to screen all families to assess insurance eligibility and other needs. Based on an assessment of the family’s needs, a subset of the infants in the Partnering with Parents program is assigned not to an FRS but to an LICSW, who coordinates with the NICU social worker and assumes their care when they are discharged. Partnering with Parents LICSWs are more capable of handling the highest risk families who struggle with significant social and emotional issues and barriers to successfully caring for a medically fragile infant. Interviewees discussed that the Partnering with Parents LICSWs and staff were unfamiliar visitors to the NICU at first, but now the NICU social worker and other staff understand that the FRSs and the Partnering with Parents staff can assist them in their responsibilities. The extent to which duplication or overlap is understood or addressed, however, was not clear on the site visit. The site visit team was also unable to explore the nature of the LICSW role for infants being followed in the Follow-Up Clinic versus those receiving phone calls only, but presumably the former are receiving more comprehensive services.

Component 3: Clinical Support

Infants who are seen in the Follow-Up Clinic, either because of their preterm status or other clinical criteria, receive comprehensive and integrated care from a team of physicians, nurse practitioners, social workers, nutritionists, occupational therapists, and bilingual staff. The social worker or FRS assigned to the family is able to see them in clinic and coordinate care with other team members. Infants in the Partnering with Parents program are seen at 1 and 3 months (if not more often) for clinical care and for data collection. The Partnering with

Parents program has one nurse practitioner who works solely for the program 2 days a week and conducts home visits as indicated in Table 2. NICU nurse practitioners also conduct home visits if the Partnering with Parents nurse practitioner cannot fit them into her schedule. The nurse practitioners conduct a developmental assessment of the infants, as well as an assessment of the home conditions, focusing on any conditions that could negatively affect a medically fragile infant (specifically respiratory triggers like smoking in the home). Another major area of focus of the home visit is parent education, where issues about feeding (mixing formula) and treating constipation are discussed with the parent, and the nurse practitioner ensures parents are educated about these issues.

In addition to the clinical components of this intervention, infants may be receiving clinical care from a variety of other sources, such as the First Connections home visit by a state nurse, primary care providers (PCPs), specialists, and home health nurses (as ordered by a physician). Care coordination in the follow-up clinic includes audiologists, developmental experts, and the sharing of this information with the infant's PCP. Regarding infants not seen at the Follow-Up Clinic, it is unclear how the awardee coordinates care provided by Partnering with Parents staff (i.e., social workers, FRSs, and nurse practitioner) with clinical care and support services provided outside of the program.

Component 4: Patient Navigation

For infants enrolled in the program, patient navigation services vary based on the needs of each family. Details regarding social work and FRS contact with families are captured in W&I's Partnering with Parents database; however, these services are not detailed in the HCIA reports. The site visit team learned that the Partnering with Parents staff may inquire on the phone calls or during follow-up visits about recent appointments with PCPs or other specialists, if any appointments were missed or if the family needs help rescheduling. Infants may not be discharged from the NICU without a primary care appointment, so the social workers and FRS do not need to help identify a PCP for the infants.

Supporting Efforts: Community Education/Engagement Initiative

Beyond the patient intervention, the Partnering with Parents program is engaging a wide variety of stakeholders through educational workshops. To date, W&I has conducted six workshops with an average of 66 participants attending each of the first three workshops (participant numbers were unavailable for the final three workshops). Partnering with Parents program updates are provided during the workshops. Presentations to date included Maternal and Infant Health Issues; Medical, Legal, and Ethical Issues (as they pertain to the special populations served by the grant); Bringing the Pieces Together for Preemies in Rhode Island; and Dads and Families—Struggles, Triumphs, and Supports of the NICU Dad. W&I administers satisfaction surveys to evaluate the workshops, and survey findings are highlighted in the progress reports.

Supporting Efforts: Health Information Technology

Although W&I has not developed health information technology as part of its innovation, W&I has partnered with Current Care, Rhode Island's health information exchange. Current Care is run by the Rhode Island Quality Institute and is free for participants. Current Care is an opt-in service, and those who enroll in the Partnering with Parents innovation are given the opportunity to enroll in Current Care. The system gives authorized medical professionals access to the patient's up-to-date health information. When an infant enrolled in Partnering with Parents goes to the ED or is admitted into the hospital, a notification is sent from Current Care to the data administrators in the Partnering with Parents program. The data administrators then provide the information to that participant's assigned FRS or social worker, who follows up with the family. Overall, 61%[2] of infants enrolled in Partnering with Parents are also enrolled in Current Care. Because W&I and Hasbro Children's Hospital—where many Partnering with Parents infants would be seen for emergency care or be hospitalized—belong to different health systems, ED and hospital admission data for infants not enrolled in Current Care were obtained through self-report.

1.1.2 Program Participant Characteristics

The W&I innovation's target population is high-risk preterm and full-term infants with a NICU stay of 5 days or longer and their parents. W&I is targeting this population because these infants are at increased risk of postdischarge morbidity, ED visits, and rehospitalizations, and they would benefit from specialized therapeutic support and their parents would benefit from education on relevant health issues. As of Quarter (Q) 7, enrolled infants can be residents of Rhode Island, Connecticut, or Massachusetts. Partnering with Parents is a statewide innovation in Rhode Island; it is implemented in the only two hospitals in the state that provide specialized care to preterm infants. Once we are able to review, clean, and analyze the data provided to us by W&I, we will complete ***Table 4*** to reflect the demographic characteristics of the infants enrolled in the program.

Table 4. Characteristics of All Patients Ever Enrolled in the Innovation through Q7

Characteristic	Number of Patients	Percentage of Patients
Sex		
Female	—	—
Male	—	—
Missing	—	—

(continued)

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[2] W&I Q7 Progress Report

Table 4. Characteristics of All Patients Ever Enrolled in the Innovation through Q7 (continued)

Characteristic	Number of Patients	Percentage of Patients
Race/ethnicity		
White	—	—
Black	—	—
Hispanic	—	—
Asian	—	—
American Indian or Alaska Native	—	—
Other	—	—
Missing/refused	—	—
Payer Category		
Dual	—	—
Medicaid	—	—
Medicare	—	—
Medicare Advantage	—	—

Source: Patient-level data provided to RTI by W&I.
— Data not yet available.

The data provided by W&I will also be used to complete ***Table 5***, which will show the numbers of infants and families within each category of prematurity who are eligible for the program (i.e., denominator data).

Table 5. Infants with 5 or More Days in the NICU; Rhode Island, Connecticut, and Massachusetts Residents,[1] by Preterm Level

Patient Type	Data Source	Current Count
Early preterm infants with >5 days in the NICU; Rhode Island, Connecticut, and Massachusetts residents	Patient-level data provided to RTI	—
Moderate preterm infants with >5 days in the NICU; Rhode Island, Connecticut, and Massachusetts residents	Patient-level data provided to RTI	—
Late preterm infants with >5 days in the NICU; Rhode Island, Connecticut, and Massachusetts residents	Patient-level data provided to RTI	—
Full-term infants with >5 days in the NICU; Rhode Island, Connecticut, and Massachusetts residents	Patient-level data provided to RTI	—

[1] Data obtained from W&I Q7 Progress Report, which does not distinguish between state of residence. RTI has requested residency data and will include that in future reports.
NICU = neonatal intensive care unit.
— Data not yet available.

1.2 Implementation Progress

The extent to which each awardee is able to implement its innovation as planned and reach a sufficient number of patients will be critical to assessing its impact on the triple aim. ***Table 6*** provides details on first the implementation process and then the effectiveness and also lists the measures RTI plans to use in assessing each.

Table 6. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for W&I

Key Evaluation Domains	Subdomains	Measures	Data Source
Implementation process	Care coordination	Number of mothers of enrolled infants screened for clinical depression	Study database
Implementation effectiveness	Reach	Number/percentage of live births with gestational age <32 weeks eligible for study participation	Electronic health records, eligibility data set
		Number/percentage of live births eligible for study participation by gestational age	Electronic health records, eligibility data set
		Number/percentage of eligible early, moderate, and late preterm infants enrolled in the study	Electronic health records, eligibility data set
		Number/percentage of eligible full-term infants who enrolled in the study	Electronic health records, eligibility data set
		Number/percentage of families who received a postdischarge phone call within 24 hours of infant's discharge	Study database
	Dose	Number of nurse practitioner home visits	Study database
		Number of 1-month follow-up clinic visit	Study database
		Number of 3-month follow-up clinic visit	Study database
		Number of calls with enrolled families during first month after discharge	Study database
		Number of calls with enrolled families during first 3 months after discharge	Study database
		Number of families who received a postdischarge phone call within 24 hours of infant's discharge	Study database, Current Care data

1.2.1 Process

The implementation process has been the initial focus of the evaluation. RTI defines implementation process as including execution of implementation, organizational capacity, key staff and partners engagement, and client recruitment and enrollment. The implementation process is best evaluated through a combination of data variables, including execution of implementation that conforms with operational plans, and capacity for implementing the innovation in a timely and effective manner. We focused on the implementation process during the awardee site visits (June 30 and July 1) and asked such evaluation questions as the following:

- What is the overall execution of the innovation implementation (e.g., actual rate of expenditures relative to the projected rate, rate of enrollment relative to projection)? What are the lessons learned?
- What accomplishments are specific to hiring or training staff so that the organization can build its capacity to implement the innovation effectively?

Execution of Implementation

The Partnering with Parents innovation is a moderately complex innovation that has mostly been implemented as planned. Staff at W&I Hospital expanded on the original model in the THP program to include all infants who spent 5 or more days in the NICU, regardless of preterm status or birth weight. Once funded, W&I staff hired LICSWs and worked with RIPIN to advertise, interview, and hire the first group of FRSs. RIPIN provided training for FRSs to prepare them to work in the NICU (e.g., Institutional Review Board [IRB], Health Insurance Portability and Accountability Act [HIPAA]).

Initially, the Partnering with Parents program staff experienced some push back from NICU staff (nurses and social workers), who did not understand why Partnering with Parents staff were engaging NICU families. Through internal communication and education about the innovation and FRS roles, the Partnering with Parents program established trust with the NICU staff, who grew to support the program and encourage NICU families to participate.

Recruitment of participants into the program by the FRS requires a delicate balance of understanding, compassion, and education, because the recruited families are experiencing the stressful reality of having a medically fragile newborn. Depending on the level of preterm (early/moderate preterm: ≤33.6 weeks; late preterm: 34 to 36.6 weeks; and full term: 37+ weeks), infants may be in the NICU for an extended period of time with a significant number of medical issues or for just the minimum eligibility period of 5 days. FRSs monitor electronic health records to determine which NICU infants are eligible for the program (5 or more days in the NICU; resident of Rhode Island, Massachusetts, or Connecticut). For infants who were early or moderately preterm, their stay in the NICU will generally be longer than 5 days, and FRSs will take this time to establish a relationship with the family and introduce them slowly to the program. FRS build relationships with families so that by the time the infant is about to be discharged, families know the FRS and are excited for the opportunity to participate in the program. Infants who are late preterm and full term generally have a shorter stay in the NICU, and it is important for FRSs to introduce the program as soon as they meet the eligibility criterion of a 5-day stay in the NICU, because it is possible they will be discharged soon after. One barrier to reaching 100% of enrollment is the declining census at W&I Hospital. There are fewer multiple births because the fertility practice at W&I Hospital no longer implants more than two embryos, which decreases the likelihood of preterm births. This practice was not standard at the time W&I's grant proposal was written, so the awardee estimated higher numbers of preterm births. Another barrier is that, as a research hospital, W&I implements multiple studies simultaneously, so these projects are competing for a limited population. Based on information gathered during the site visit, families may be recruited for multiple research studies while they are in the NICU.

Upon enrollment in the Partnering with Parents program, participants are given the option to sign up for the Current Care system (Rhode Island's health information exchange), which will send a notification directly to the Partnering with Parents program if an infant visits an ED or is admitted to the hospital (both of which are outcome measures for this innovation). For those participants who choose not to enroll in Current Care, self-report is currently the only method to obtain this data.

Following enrollment in the Partnering with Parents, families receive a binder with educational materials and resources focused on caring for a medically fragile infant. The FRS or LICSW will go through the binder with the family, explain the information and resources, and answer any questions the family might have. Following discharge from the NICU, each infant will receive a postdischarge phone call from her assigned FRS (or LICSW if the family is higher risk). Early and moderate preterm infants who are enrolled will receive a home visit from a Partnering with Parents nurse practitioner within 1 to 2 weeks of discharge, and all infants enrolled (within the state of Rhode Island) will receive a home visit from a First Connections visiting nurse as part of a Rhode Island Department of Health Program (for all infants who have spent time in the NICU). The assigned FRS or LICSW will coordinate with First Connections to see if any issues need to be addressed. All participants in the program are also given a 24-7 hotline number to use in case of emergency, as part of the Partnering with Parents effort to keep the infants out of the ED if at all possible. Based on site visit interviews, the most common calls have been about constipation, but the doctors staffing the hotline have also had to deal with much more serious issues, like respiration and ventilator use.

Following these first few weeks, the FRS or LICSW will then be in contact with the participating families at 1 month after discharge (during a visit at the Follow-Up Clinic for those infants in the early to moderate preterm category and through a phone call for those infants in the late preterm and full-term category). During this 1-month visit or call, the

Edinburgh Postnatal Depression Scale is administered to the mothers (if not done so by First Connections), data are collected on ED visits and hospitalizations, and the family's needs are assessed. At the 3-month visit or call, data are collected on ED visits and hospitalizations, the family's needs are assessed, and the NICU FITS is administered (mailed to those receiving the phone call). The receipt of the NICU FITS signifies the end of enrollment in the program.

Participants receive the innovation's prescribed interactions (described above). FRS and LICSW are available as needed to provide peer and social support to the participants, but the amount and content of the interactions are driven by the participants and their needs. This is addressed further in the dose section.

The Partnering with Parents innovation also targets mothers of enrolled infants with mental disorders related to pregnancy or birth. Every mother of an enrolled infant is administered the Edinburgh Postnatal Depression Scale at the 1-month visit or during the 1-month phone call (or by the First Connection nurses during their home visit). If a mother scores above a 10 on the instrument, the LICSW supervisor talks with the mother to determine if she needs to be referred to mental health services. This is a subjective judgment call. The Edinburgh Postnatal Depression Scale is merely a tool to indicate a current level of depression a mother is feeling, but it does not take into account the baseline level of depression or whether mothers are already under the care of a health professional. If a mother is threatening harm to herself or others, she is immediately referred to mental health services, regardless of the score on the instrument.

Organizational Capacity and Leadership

The Partnering with Parents program is being implemented in a hospital that is affiliated with an academic institution. The leadership and staff have extensive experience implementing different innovations and projects. Thus, this innovation has a high level of leadership support at all levels and the leaders understand the innovation well. The Partnering with Parents program has a clearly designated leader, and it is evident that there are clear lines of communication within the innovation and with staff and leadership outside of the Partnering with Parents innovation.

1.2.2 Workforce Development

W&I uses in-hospital staff, social workers, and FRSs to implement the Partnering with Parents program. Community partners also play a complementary role.

Hiring and Retention

This innovation required the hiring of social workers and FRSs. The social work supervisor was promoted internally, and one of the social workers transferred from a position as a

NICU social worker to a social worker for the innovation and the THP program. Other social workers were hired from outside of the hospital.

The FRSs are employed by RIPIN. RIPIN is contracted by the hospital to advertise and interview for the positions. RIPIN specializes in hiring parents to provide mentoring and peer support for other parents with whom they share a similar experience. Thus, for the Partnering with Parents innovation, RIPIN has identified seven women who had a child who spent time in the NICU. During the site visit, W&I reported that RIPIN has done an excellent job of identifying appropriate individuals for the FRS positions; they are engaged and competent workers, and there has been no turnover.

Staff who attend to the medical needs of the participating infants were already employed in the hospital and Follow-Up Clinic, and additional staff did not need to be hired. The nurse practitioners who conduct home visits are employed or have previously been employed in the NICU (and thus have the clinical knowledge necessary to assess the infants).

Training

FRS training is developed and conducted by RIPIN. The trainings include IRB, HIPAA, and specialized training tailored to the innovation. Trainings are staggered by RIPIN so that they can fit into any work schedule. In addition to RIPIN trainings, the awardee trains FRS on Partnering with Parents and W&I systems (e.g., innovation database) and practices.

The awardee also conducts workshops for partner organizations that work with medically fragile infants and their families. These workshops provide continuing education credits to those who attend and are a chance for the W&I staff to connect and build relationships with community stakeholders.

1.2.3 Effectiveness

Fidelity

The Partnering with Parents program expands the THP program that has been implemented at W&I since 2007. Nearly all of the innovation components are being implemented as planned in the W&I application. Support services are being provided to the initial target population (i.e., preterm infants in Rhode Island) as intended. W&I expanded their target population to include full-term infants and Massachusetts and Connecticut residents. As indicated in Table 2, prescribed support services vary slightly by infant group. Late preterm and full-term Rhode Island infants and out-of-state infants do not receive the nurse practitioner home visit component of the Transition Home model.

A new component has recently been added to the model, a prehome visit (prior to discharge from the NICU) for infants in any preterm category with bronchopulmonary dysplasia (BPD), or other social risk factors (e.g., smoking in the home). These infants will get a prehome visit by a nurse practitioner (who may be accompanied by an FRS based on schedule and availability) to identify any potential respiratory triggers and develop a plan to avoid those.

Reach

Recruitment and enrollment for this innovation take place in the hospital setting, where there is a high likelihood of strong in-person interaction with families. This program is offered to nearly every single family that is eligible (a potential exception to this is late preterm and full-term infants who are discharged from the hospital on their 5th day in the NICU, and the FRS or social workers were unable to make contact with the family). Overall, Partnering with Parents has a high level of enrollment for eligible infants and, as of March 31, 2014, had a 79% enrollment rate.[3] One method the FRS uses to encourage recruitment is to assure families this innovation does not involve any medical testing of their infant (outside of normal follow-up), and the FRS explains that the program provides the family with support in their transition from the NICU to home.

Table 7 summarizes the number of eligible and enrolled early and moderate preterm infants and the late and full-term infants among those in the NICU for at least 5 days.

Table 7. Number of Eligible and Enrolled Infants Among those in the NICU for 5 or More Days

	Number of Early and Moderate Preterm Infants Eligible	Number of Early and Moderate Preterm Infants Enrolled	Number of Late Preterm and Full-Term Infants Eligible	Number of Late Preterm and Full-Term Infants Enrolled
Infants in the NICU for 5 or more days	—	—	—	—

— Data not yet available.

Dose

The Partnering with Parents innovation involves assessments, education sessions, phone calls, home visits, and follow-up visits. The awardee is collecting data on the number of in-person and phone contacts the program has with participants. As shown in ***Table 8***, contacts with all of the participants happen on a specific timeline, but whether home visits occur or whether a family receives a phone call to check in or the check-in occurs during a Follow-Up Clinic visit varies by infant group. At a minimum following enrollment, families are offered the opportunity to enroll in Current Care; receive an informational binder and education; and receive a postdischarge phone call, a 1-month phone call or visit (1-month assessment), and a 3-month phone call or visit (3-month assessment). In addition, typically early and moderate preterm infants receive a home visit from a Partnering with Parents

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[3] W&I Q7 Lewin Report.

nurse practitioner. Families/mothers are asked to complete three instruments: the FIPRE, the Edinburgh Postnatal Depression Scale, and the NICU FITS.

Table 8, developed by W&I and included in their Q7 progress report, summarizes these services received by infants in each intervention group. On the whole, 647 total infants were enrolled in the program through March 2014, 390 enrolled in Current Care, 628 of those infants received the binder of educational materials, 605 completed the FIPRE survey, 621 received a postdischarge phone call, 253 received a nurse practitioner home visit, 417 mothers completed the Edinburgh Postnatal Depression Scale survey, 503 infants completed the 1-month assessment, 391 infants completed the 3-month assessment, and 324 completed the NICU FITS.

Table 8. Study Progress through March 2014 by Preterm Group, All Participants

	Early Preterm	**Moderate Preterm**	**Late Preterm**	**Full Term**
Enrolled	177	114	269	87
Enrolled in Current Care	114	61	153	62
Received binder education	172/144 infants/ #families	111/91 infants/ #families	262/222 infants/ #families	83/82 infants/ #families
Completed FIPRE	165	107	252	81
Received postdischarge phone call	166	108	263	84
Received nurse practitioner home visit	148	98	*7*[1]	*N/A*
Completed Edinburgh Postnatal Depression Scale (mothers)	114	73	170	60
Completed 1-month assessment	142	92	216	53
Completed 3-month assessment	119	71	165	36
Completed NICU FITS	108	70	119	27

Source: W&I 7QR Progress Report.
[1] Nurse practitioner home visits are not part of usual protocol for late preterm and full-term infants.
FIPRE = Fragile Infant Parent Readiness Evaluation; FITS = Fragile Infant Transition Summary; NICU = neonatal intensive care unit.

Beyond the prescribed contacts listed in Table 8, the FRS or LICSW responds to families' support requests. Families with more social and emotional needs may contact the FRS frequently for various reasons. W&I documents all contact with participants in their program database. Following the receipt of data, RTI will work with the awardee to ascertain the level of dose per patient and display that information in ***Table 9***.

Table 9. Average Number of Additional Calls with Participants

	Early Preterm	Moderate Preterm	Late Preterm	Full Term
Average number of additional calls with participants during first month after discharge	—	—	—	—
Average number of additional calls with participants during 3 months after discharge	—	—	—	—

Source: RTI will use patient-level data to fill in this table once it is provided by W&I.
— Data not yet available.

1.3 Evaluation Outcomes

Awardees have two possible types of quantitative data that RTI will use in assessing the impact of the awardee's innovation on key outcomes. These include claims data for Medicare and/or Medicaid beneficiaries, depending on who the awardee serves, and administrative or utilization data the awardee is collecting (which we have categorized as "other awardee-specific data," reflecting the variability of the types of data elements available across awardees). We are in the process of finalizing our assessment of all the available data sources and requesting data directly from each awardee. As those data are received, we will incorporate the findings into our quarterly/annual reports. The following sections present descriptive findings from the quantitative outcome data provided to RTI as of September 11, 2014.

1.3.1 Measures for Evaluation

Following the site visit, the data management and site visit teams met to review each of the measures listed in the awardee's self-monitoring measurement plan. The measures listed in ***Tables 5*** (above) and ***10*** (below) reflect the measures determined as most relevant for our evaluation of W&I's innovation.

Table 10. Outcome Measures Requested from W&I

Key Evaluation Domains	Subdomains	Measures	Data Source
Health outcomes	Mortality	Participant all-cause mortality rate	Electronic health records
Health care outcomes	Utilization	ED visit rate	Partnering with Parents database, Claims data
		Readmission rate	Partnering with Parents database, Current Care data
	Cost	Spending per patient	Claims data
		Cost savings	Claims data

1.3.2 Claims Data

As part of a broad assessment of health care innovations, the Center for Medicare & Medicaid Innovation (CMMI) is assessing the impact of its programs, including those funded specifically by HCIAs, on four core measures. The four core measures are

- health care spending per patient,
- hospital inpatient admissions,
- hospital unplanned readmissions, and
- ED visits

Collectively, it is anticipated that CMMI programs will slow the increase in health care spending, reduce hospital admissions, reduce avoidable hospital readmissions, and prevent unnecessary ED visits. We are reporting these measures for all HCIA Community Resource Planning awardees so that the collective impact of the awards can be assessed. Some awardees' innovations may not be focused on these measures, however. Other awardees' innovations target specific conditions (e.g., imaging, diabetes) and may have significant impacts on spending, admissions, readmissions, and ED visits for the targeted conditions but not have a statistically detectable impact on the measures at the aggregate level because the targeted conditions represent only a small fraction of total spending, inpatient admissions, and ED visits.

The measures are calculated through analysis of Medicare and Medicaid fee-for-service claims. Because of differences between Medicare and Medicaid patients in age, other demographic variables, and disease status, we report the Medicare and Medicaid results separately below. Currently, complete Medicare claims are available through the end of 2013. Alpha-MAX Medicaid claims for W&I are available for the first quarter of 2011. The W&I innovation was launched on October 15, 2012. This means that through Chronic Conditions Data Warehouse (CCW) we will have two quarters of baseline data available.

- **Health Care Spending per Patient.** For Medicare beneficiaries, health care spending per patient includes Part A and Part B Medicare expenditures for persons enrolled in the Part A and Part B fee-for-service program. The variable focuses on Medicare fee-for-service spending, so Medicare managed care (Part C) services are excluded, as are beneficiary copayments. Medicare Part D prescription spending is also excluded. Spending is reported on a per-person per-quarter basis. If a beneficiary is not enrolled for every month in a quarter, spending (except for hospital inpatient spending) is prorated to a quarterly basis based on the number of days enrolled during the quarter. Because hospital inpatient admissions are both rare and expensive, spending is not prorated for hospital inpatient spending. Prorating is also not performed for beneficiaries who die during a quarter.

  For Medicaid beneficiaries, health care spending per patient is reported for fee-for-service beneficiaries. Beneficiaries are only included in the analysis for spending (and the other measures) during periods when they are enrolled in Medicaid.

- **Hospital Inpatient Admissions.** This variable measures hospitalization, the single most expensive component of health care spending. Patients kept overnight in observation beds are excluded from this measure. Inclusion criteria for the analysis are the same as for spending. Hospital inpatient admissions are not prorated based on the number of days eligible during the quarter. All-cause inpatient admissions and ACSC admissions are reported separately, under the assumption that a greater share of ACSC admissions can be prevented by appropriate ambulatory care. The mean quarterly admission rate per 1,000 patients is reported.

- **Hospital Readmissions.** Hospital readmission rates serve a dual purpose in evaluating HCIA impacts. Readmissions add to the costs of a prior hospitalization, and they often reflect a problem in the care provided during the first admission. All-cause readmissions are defined as a follow-up admission to any short-term acute general or long-term care hospital within 30 days of a discharge from another hospital of the same type. We ignore multiple admissions within 1 day of an initial admission because these often represent transfers between hospitals. We define index hospitalizations that begin during the quarter and follow each index admission for 30 days, even when the follow-up period extends beyond the end of the quarter. Inclusion criteria for the analysis are the same as for spending. We also calculate readmissions for persons with ACSC. The person’s ACSC status is defined by their first hospitalization during the quarter. The readmission rate equals the number of readmissions divided by the number of index hospitalizations during the quarter. Planned readmissions are excluded from the calculation of the numerator. Quarterly mean readmission and ACSC readmission rates per 1,000 admissions are reported.

- **ED Visits.** ED visits are sometimes viewed as a symptom of the inability of the community’s health care system to provide adequate preventive and ambulatory care visits. We report an all-cause ED visit rate that excludes ED visits resulting in an inpatient admission (which presumably represent unavoidable visits) and includes overnight ED visits without an inpatient admission. Inclusion criteria for the analysis are the same as for spending, and ED visits are also subject to the same prorating formula as for spending. The mean quarterly ED visit rate per 1,000 patients is reported.

Medicare Claims Analysis

W&I provides services to high-risk newborns. Because Medicare rarely covers newborns, we do not expect to perform Medicare claims analyses.

Medicaid Claims Analysis

Most Medicaid data analyses for the project will use data from the Centers for Medicare & Medicaid Services (CMS) Alpha-MAX data files. In October 2014, Medicaid claims for Rhode Island are available in Alpha-MAX for the first quarter of 2011. Because claims data are not yet available for the period after the innovation was launched, we are not presenting measures for Medicaid patients in this report. We will provide Medicaid analyses in subsequent reports as data become available. If Alpha-MAX data do not become available for Rhode Island throughout the intervention period, we will seek access to Medicaid claims directly from the state. Data from the state are currently available up to June 2013. Most of the participants in this innovation, however, are expected to be in managed care plans, and these plans may not report costs for individual claims; this means that payment amounts would have to be imputed as if beneficiaries were fee-for-service eligible. We are also exploring a third avenue: to use data provided directly from the awardee. In September, we received data on ED and hospitalization counts from W&I.

Measures will be presented for W&I beneficiaries in the quarters after the innovation was launched on October 15, 2012. ***Appendix A*** shows the claims analyses tables that will be presented for Medicaid. In addition to the tabular format, we will present figures showing each measure as a function of time. Values in quarters prior to the innovation's launch on October 15, 2012, will be shown in one color, and values for quarters during and after launch will be shown in another color. The figures will include a trend line based on a linear regression of prelaunch values for a comparison group.

Discussion of Claims Analysis

The claims measures will provide descriptive data on Medicaid patients enrolled in the W&I innovation after the launch of the innovation. Although it is necessary to report these measures to support CMS's broader assessment of its full portfolio of innovation projects, the measures may not provide a complete evaluation picture of the W&I innovation. There are a couple of reasons for this. First, Medicaid fee-for-service beneficiaries represent only 56% of the patients served by W&I. We do not have access to claims covered by other payers. Second, there is clearly no "before" innovation period to compare to newborns' experiences after they enter the innovation shortly after birth. We will need to identify a comparison group of newborns prior to the enrollment date for W&I.

Development of Comparison Groups

Once we have Medicaid data, we will construct a comparison group of infants covered by Medicaid (most participants are covered by the Neighborhood Health Plan of Rhode Island) and treated at W&I prior to the launch of the innovation who have similar characteristics as the infants participating in the W&I innovation after the launch. We will use propensity score matching to identify infants with similar characteristics as W&I participants. We will perform the matching using variables that are available in claims data and are associated with eligibility, such as length of stay in the NICU.

Developing additional comparison groups for W&I is challenging because the participating hospitals provide treatment for most high-risk infants in the state. Thus, there is no option of comparing outcomes between W&I and other state hospitals in the period after W&I launched its innovation. We could compare outcomes for W&I participants to outcomes for similar infants from the surrounding states of Massachusetts and Connecticut, but such a comparison would be obscured by interstate differences in Medicaid coverage and benefits.

1.3.3 Other Awardee-Specific Data

In mid-July 2014, following the data review meeting, RTI met with W&I to request the raw patient-level data that will be used to generate each of the measures from data sources other than claims data in ***Tables 5*** and ***9*** for each quarter.

Overview of Data Received

W&I provided RTI the requested data in mid-August 2014.

Health Outcomes

Once we have reviewed, cleaned, and analyzed the patient-level data provided by W&I, we will have a better understanding of what type of results we will provide. The following table shells (***Tables 11*** and ***12***) reflect examples of findings we anticipate presenting.

Table 11. Health Outcomes over Time

Measure	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Mortality							
Participant all-cause mortality rate	—	—	—	—	—	—	—
Utilization							
Hospital-wide all-cause unplanned readmission rate	—	—	—	—	—	—	—
Hospital ED visit rate	—	—	—	—	—	—	—

ED = emergency department.
— Data not yet available.

Table 12. Health Outcomes by Enrollment Group

	Enrollment Group			
Measure	Early and Moderate Preterm: RI	Late Preterm and Full Term: RI	Early and Moderate Preterm: MA and CT	Late Preterm and Full Term: MA and CT
Mortality				
Participant all-cause mortality rate	—	—	—	—
Utilization				
Hospital-wide all-cause unplanned readmission rate	—	—	—	—
Hospital ED visit rate	—	—	—	—

ED = emergency department.
— Data not yet available.

Discussion of Other Awardee-Specific Findings

We have received data from W&I and have begun to review, clean, merge, and conduct analyses. We will report the initial findings from this data in subsequent reports.

Limitations

The primary limitation of the data provided by W&I is the limited availability of health outcome data. As we continue to review and analyze the data, we will update any additional limitations we encounter with the data.

1.4 Overall Program Effectiveness to Date

The Partnering with Parents innovation provides enhanced transition care education and support to medically fragile infants and their families. We have described the innovation as four synergistic components: peer support, social worker support, clinical support, and patient navigation. Several implementation strengths are summarized in this report:

- W&I has clearly identified the set of core services, including Current Care recruitment, binder education, and follow-up phone calls, to be provided to each infant group (i.e., early and moderate preterm, late preterm, full term, and out of state).
- Staff, including seven FRSs supervised by four LICSWs and a nurse practitioner, are in place to provide core services as planned and additional ad hoc support based on the unique needs of each enrolled family.
- All contacts with enrolled families are documented in the program database.
- As of Q7, the program has enrolled approximately 80% of eligible infants.
- W&I uses the state health information exchange, Current Care, to obtain data on ED visits and hospital admissions as they occur in real time.

Despite these strengths, as of Q7, W&I has enrolled 620 (36%) of their targeted 1,726 infants. Reported enrollment barriers include changes in fertility treatment practices that help decrease the likelihood of preterm births and competing research studies. In an effort to improve enrollment, W&I expanded the initial Partnering with Parents eligibility criteria to include medically fragile full-term infants and Massachusetts and Connecticut residents.

W&I is using NICU FITS and FIPRE to help assess patient satisfaction with innovation services. RTI has requested survey data and will assess whether it is appropriate to include them in the evaluation. Once all requested patient-level data have been received from W&I, we will explore the innovation’s impact on the outcome measures.

APPENDIX A

Table A-1. Baseline and Intervention Trends in Health Care Spending per Patient

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—

Savings per Patient

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Spending rate: total quarter (i.e., quarterized) payments/number of unique patients. Savings per patient: difference in comparison minus the intervention's average spending rates.
— Data not yet available.

Table A-2. Baseline and Intervention Trends in Admissions per 1,000 Patients

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Admit rate: total unquarterized admissions/number of unique patients.
— Data not yet available.

Table A-3. Baseline and Intervention Trends in Readmissions per 1,000 Admissions

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare
Admissions Measure: All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total admissions	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total Admissions	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Readmit rate: sum of all readmissions to eligible hospital within 30 days/all admissions in the quarter. Total admissions: all eligible admissions in the quarter.
— Data not yet available.

Table A-4. Baseline and Intervention Trends in ED Visits per 1,000 Patients

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: ED rate: total quarterized ED visits and observation stays/number of unique patients.
— Data not yet available.

October 2014

Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring

Annual and Site Visit Report
YMCA of the USA (Y-USA)

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OVERALL EVALUATION SUMMARY

RTI International was selected to lead an independent evaluation of the 24 Health Care Innovation Award (HCIA) awardees categorized as Community Resource Planning, Prevention, and Monitoring (Community Resource). In this role, RTI is conducting an in-depth evaluation of each innovation, as well as a cross-site evaluation that includes similar innovations targeting the same priority outcomes (e.g., emergency department [ED] visits). For each of the 24 awardees, this report presents findings from the first year of the evaluation (beginning September 23, 2013, and including data obtained by RTI as of September 11, 2014). The report is based on multiple data sources, including operational reports, self-monitoring plans, site visits, and quantitative data analysis.

The evaluation methods vary by awardee innovation, based on the type of innovation and availability of data. RTI has reviewed and coded all existing documents from the awardees through December 31, 2013, and incorporated that knowledge into each awardee's overview. Our review included the awardees' original applications for funding, original and current operational and self-monitoring plans, and quarterly narrative and monitoring reports. For this annual report, we incorporated activities reported through the awardee's seventh quarterly report (i.e., through March 31, 2014).

Between April and August 2014, teams of at least two staff from the RTI team visited all 24 awardees for 2 to 4 days, depending on the number of interviews conducted. Teams included a subject matter expert, with training and experience specific to the awardee's innovation, and a master's- or bachelor's-level colleague to take notes. Before each visit, the teams reviewed all available documentation from the awardee to learn about the innovation's goals, objectives, and status. The purpose of the site visits was to clarify our understanding of the innovation, obtain detailed information on the implementation process, and review awardee-specific data to determine which elements to incorporate into the evaluation. By August 13, 2014, all 24 awardees had been visited and a thorough description of our findings included in each of the 24 awardee sections.

In addition to the site visits, we report quantitative data from two possible sources for several awardees. First, we present findings from claims analysis for awardees in this annual report if they both provided us with patient identifiers and reported enrolling participants who were Medicare and/or Medicaid beneficiaries. RTI obtained patient identifiers from most of the 24 awardees to conduct claims analysis. Second, we present data RTI obtained directly from awardees to quantify their work in addressing health care costs, quality, and patient outcomes. Data from additional awardees will be analyzed and presented in future reports, as data become available and awardees enroll sufficient participants. An update on the availability of Medicare/Medicaid claims and other awardee-specific data, analysis of data available to us and cleaned as of September 11, 2014, a summary of the comparison groups, and a list of evaluation measures are included in each awardee section.

1. HCIA COMMUNITY RESOURCE AWARDEE: YMCA OF THE USA (Y-USA)

1.1 Introduction

The YMCA of the USA (Y-USA), a nonprofit community-based organization headquartered in Chicago, received an award of $11,885,134 and began enrolling participants on February 15, 2013. They proposed to achieve the following goals:

1. **Improve the delivery, utilization, and quality** of diabetes-related preventive services in at least 500 community- and primary care–based settings by offering diabetes prevention programs in community or clinical settings by June 2015.

2. **Produce intended health outcomes** (i.e., nutrition and physical activity–related behavior changes; at least 5% weight loss; and reduced risks for diabetes, hypertension, and hypercholesterolemia) for at least 50% of the 10,000 expected Medicare participants by June 2015.

3. **Reduce observed short-term** (i.e., 3-year) total cost of care by $4.2 million by June 2015.

RTI is in the process of conducting an in-depth case study for this innovation. As part of that case study, two RTI team members conducted a site visit in June 2014; both before and after the visit, our team reviewed all documentation on this innovation. Because Y-USA's innovation involves multiple sites, our team visited both the main office in Chicago to meet with those who are implementing the innovation across all sites and one local program, the YMCA of Central Ohio located in Columbus, Ohio. For the purposes of this report, when we refer to "Y-USA," we are referring to the YMCA of the USA, which is the national office of the YMCA and the grantee for this innovation. When we refer to "YMCAs," we are referring to local, community-based YMCA organizations that have one or more YMCA branches and deliver the innovation components.

This report describes findings from the site visit, document reviews, follow-up telephone calls, and analysis of data obtained and cleaned by RTI through September 11, 2014. We are actively working now to obtain data directly from the awardee that will help assess many of the variables we discuss in this report. In the next section, we detail the innovation components and the patients targeted by the awardee.

1.1.1 Innovation Components

The HCIA innovation at Y-USA is an innovation to implement an evidence-based diabetes prevention program. This evidence-based curriculum was adapted from two curricula (*Plan Forward*[1] and *Group Life Balance*[2]) that were both based on curriculum developed by the

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[1] Indiana University adapted the Diabetes Prevention Program to create *Plan Forward.*
[2] The University of Pittsburgh adapted the Diabetes Prevention Program to create *Group Life Balance.*

University of Pittsburgh.[3] Prior to receiving funding for the HCIA innovation, Y-USA had been scaling up the national Diabetes Prevention Program Lifestyle intervention [also referred to as the Diabetes Prevention Program (DPP)] that was being implemented in YMCA facilities across the country. All 17 YMCAs that are participating in this HCIA innovation had already implemented the existing program prior to the launch of the innovation. For HCIA, the innovation is expanding the proven intervention to prediabetic Medicare beneficiaries to participate in and complete the program.

The Y-USA innovation includes two program components: hiring and training YMCA lifestyle coaches to teach the program's curricula, and conducting community based trainings among eligible participants. The innovation has the following objective:

- Scale the Y-USA DPP within 6 months to enable program delivery to 10,000 Medicare beneficiaries by the end of Year 3.

The overarching goals of Y-USA's HCIA innovation are to get participants to lose 5% or more of their body weight and gradually increase their physical activity to 150 minutes per week.[4] To implement the innovation and target this new group of participants, Y-USA is partnering with the Diabetes Prevention and Control Alliance (a subsidiary of United Health Group's Optum Solutions), seven national nonprofits, and 17 local YMCAs. ***Table 1*** provides a list of these partners and their roles in implementing the innovation.

Table 1. HCIA Partners, Role, and Location

Partner Name	Role in HCIA Project	Location
Diabetes Prevention Control Alliance	Project management/administration, health IT	Minnetonka, MN
American Diabetes Association	Tool/communication development	Alexandria, VA
American Heart Association	Tool/communication development	Dallas, TX
American Medical Association	Tool/communication development	Chicago, IL
National Council on Aging	Tool/communication development	Washington, DC
National Council of La Raza	Tool/communication development	Washington, DC
National Association of County and City Health Officials	Tool/communication development	Washington, DC
South County Family YMCA	Implementation of the community-based prevention program	Venice, FL
Tampa Metropolitan Area YMCA	Implementation of the community-based prevention program	Tampa, FL

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[3] Supported by the National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Disease, developed by the University of Pittsburgh under the Cooperative Agreement U01-DK48489 by the U.S. Department of Health and Human Services.

[4] Y-USA application.

Table 1. HCIA Partners, Role, and Location (continued)

Partner Name	Role in HCIA Project	Location
Valley of the Sun YMCA	Implementation of the community-based prevention program	Phoenix, AZ
YMCA of Arlington	Implementation of the community-based prevention program	Arlington, TX
YMCA of Central Ohio	Implementation of the community-based prevention program	Columbus, OH
YMCA of Delaware	Implementation of the community-based prevention program	Wilmington, DE
YMCA of Greater Cincinnati	Implementation of the community-based prevention program	Cincinnati, OH
YMCA of Greater Cleveland	Implementation of the community-based prevention program	Cleveland, OH
YMCA of Greater Dayton	Implementation of the community-based prevention program	Dayton, OH
YMCA of Greater Indianapolis	Implementation of the community-based prevention program	Indianapolis, IN
YMCA of Greater New York	Implementation of the community-based prevention program	New York, NY
YMCA of Greater St. Petersburg	Implementation of the community-based prevention program	St. Petersburg, FL
YMCA of Metropolitan Dallas	Implementation of the community-based prevention program	Dallas, TX
YMCA of Metropolitan Fort Worth	Implementation of the community-based prevention program	Fort Worth, TX
YMCA of Southern Arizona	Implementation of the community-based prevention program	Tucson, AZ
YMCA of the Greater Twin Cities	Implementation of the community-based prevention program	Minneapolis, MN
YMCA of the Suncoast	Implementation of the community-based prevention program	Clearwater, FL

Source: The Lewin Group, 2012–2013.
HCIA = Health Care Innovation Award; IT= information technology.

Component 1: Lifestyle Coaches

The 17 YMCAs participating in the HCIA innovation employ lifestyle coaches to implement the DPP intervention among enrollees. The coaches facilitate the DPP educational sessions with program participants and enter data into the Mynetico system. At each DPP session, the coaches collect weight, exercise, and food journal data to monitor how participants are doing. They also help other YMCA's staff and community partners with enrolling participants.

Y-USA provides participating YMCAs with a sample lifestyle coach job description and sample interview questions to use when hiring potential lifestyle coaches. Lifestyle coaches must have, at minimum, a high school diploma, but almost all of the YMCA of Central Ohio's lifestyle coaches have a bachelor's degree, and several have advanced degrees, such as a master's in public health. Y-USA requires lifestyle coaches to complete a 16-hour *Lifestyle Coach Curriculum Training* course, and at the time of our site visit, Y-USA was rolling out a new 12-hour *Facilitation Change in Small Groups* course that will be required of all lifestyle coaches. The interview questions focus on an individual's experience as a facilitator, ability to engage people, and general knowledge and understanding of diabetes prevention. Lifestyle coaches focus on primary prevention and generally do not play a role in linking program participants to primary care providers or other health care–related services.

Leadership at the YMCA of Central Ohio explained that they aim to recruit lifestyle coaches who know how to engage people, have excellent facilitation skills (as opposed to teaching skills), can relate to diverse groups of people, and have the availability to work in the evenings when most of the classes are scheduled. At least one of their lifestyle coaches was recruited because she was a successful participant in the program. A team member relayed to the site visit team that some of the most successful lifestyle coaches have been established YMCA employees, because they understand the mission of the YMCA, their neighborhood population, and how to engage people. Their functions and training are summarized in ***Table 2***.

Table 2. Y-USA Lifestyle Coach Functions and Training

Characteristic Type	YMCA Lifestyle Coach Role
Title	Lifestyle coach
Minimal qualifications	High school diploma
Functions	Health education (facilitate group classes) Informal counselling, individualized goal setting Outreach and recruitment Participant weight, food, and activity monitoring Enter data into Mynetico system
Established continuing education program	None[1]

Source: RTI site visit, June 2014.
[1] Y-USA plans on establishing a continuing education program in the third fiscal year.
HCIA = Health Care Innovation Award.

It should be noted that lifestyle coaches may vary somewhat by YMCA site, and the information reported here reflects data gathered from the YMCA of Central Ohio. Given the requirements for lifestyle coaches laid out in the DPP and the Y-USA's emphasis on fidelity, we would expect lifestyle coaches to be similar across the other 16 participating YMCA sites.

Component 2: Community-based Training

The curriculum for the first 16 core sessions covers the following topics: overview of the DPP; healthy eating strategies, including understanding fat and calories, eating less fat and fewer calories, eating foods high in nutritional value, and healthy ways to eat out; increasing physical exercise, including incorporating exercise as part of one's lifestyle; making and achieving exercise goals; changing one's environment to help facilitate weight loss; using positive thinking; instilling lifestyle change; handling social pressure that threatens healthy behaviors; managing stress; and, staying motivated.[5] The DPP curriculum is designed to be delivered over 10 to 12 months to groups of 8 to 15 participants. The first component includes weekly core sessions that are completed within a 16- to 20-week time period. The core sessions are followed by 8 monthly maintenance sessions.

During the core sessions, lifestyle coaches facilitate group discussions of health and behavior changes, challenges, and solutions. Private weigh-ins and collection of participants' Food and Activity trackers at the beginning of each session monitor each participant's progress. Each core session includes a discussion on the group's weekly progress and review of the information from the previous session; a presentation of the current session's content; a facilitated discussion on the topic that gets participants to discuss their knowledge, attitudes, and beliefs about the new content and how they will apply the new information; and a final wrap-up and tasks that are assigned to participants.

The final eight monthly sessions are focused on maintenance of lifestyle changes and continued support. These sessions are less structured and allow participants to continue meeting and discussing strategies to maintain or continue their weight loss.

1.1.2 Program Participant Characteristics

To enroll in Y-USA's HCIA innovation, individuals must be Medicare beneficiaries, have a body mass index (BMI) of 25 or above, and have proof (via blood test records within the last 12 months) that they are at risk for diabetes (i.e., prediabetic). They are at risk of getting diabetes as defined by having a BMI at or above 25, which can be provided by self-report, and a hemoglobin A1c level between 5.7 and 6.4%, or fasting plasma glucose between 100 and 125 mg/dL or a 2-hour oral glucose tolerance test [75 gm of glucola] with plasma glucose between 140 and 199 mg/d. All test results must be documented by a lab test result from within the last 12 months.

Initially, only Medicare fee-for-service beneficiaries were allowed to enroll in the program. But because of enrollment challenges, the Center for Medicare & Medicaid Innovation (CMMI) approved a change in eligibility verification process that allowed Medicare Advantage beneficiaries to enroll in the program as of November 2013. Staff explained that since the protocol change, Y-USA overcame the initial enrollment challenges and participant recruitment has begun to accelerate. Data corroborate the staff's perspectives; program participants who attended at least one session increased by about 56% between Q6 (379)

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[5] National Diabetes Prevention Program Curriculum, Core Sessions 1-16, Lifestyle Coach Facilitation Guide. Accessed: http://www.cdc.gov/diabetes/prevention/pdf/curriculum.pdf.

and Q7 (672).[6] ***Table 3*** displays Y-USA innovation participants by participation status: recruited, enrolled, and completed the program.

Table 3. Y-USA HCIA Innovation Participants (Denominator Data)

Participant Status	Data Source	Current Count of Participants (as of March 2014)
Recruited program participants (i.e., attended at least one session)	Mynetico, Y-USA self-monitoring data	672
Enrolled program participants (i.e., attended at least four sessions)	Mynetico, Y-USA self-monitoring data	603
Program participants who have completed the program (i.e., attended at least nine sessions)	Mynetico, Y-USA self-monitoring data	531

Source: Y-USA Self-Monitoring Data, Q7
HCIA = Health Care Innovation Award; Y-USA = YMCA of the USA.

We will complete ***Table 4*** in future reports with the characteristics of patients enrolled in the innovation once we receive patient-level data from Y-USA.

Table 4. Characteristics of Patients Ever Enrolled in the Innovation

Characteristic	Number of Patients	Percentage of Patients
Age		
0–18	—	—
19–24	—	—
25–44	—	—
45–64	—	—
65–74	—	—
75–84	—	—
85+	—	—
Missing	—	—
Sex		
Female	—	—
Male	—	—
Missing	—	—
Race/ethnicity		
White	—	—
Black	—	—
Hispanic	—	—

(continued)

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[6] Q7 self-monitoring data.

Table 4. Characteristics of Patients Ever Enrolled in the Innovation (continued)

Characteristic	Number of Patients	Percentage of Patients
Race/ethnicity (continued)		
Asian	—	—
American Indian or Alaska Native	—	—
Other	—	—
Missing/refused	—	—
Payer category		
Medicare	—	—
Missing	—	—

Source: Patient-level data to be provided to RTI by Y-USA.

1.2 Implementation Progress

The extent to which each awardee is able to implement its innovation as planned and reach a sufficient number of patients is critical to assessing the impact on the Triple Aim. The following section provides details on first the implementation process and then the effectiveness. ***Table 5*** provides the list of measures RTI plans to use in assessing each.

Table 5. Explanatory Measures Influencing Innovation Outcomes (i.e., Independent Variables) for Y-USA

Key Evaluation Domains	Subdomains	Measures	Data Source
Implementation effectiveness	Reach	Number/percentage of individuals who enrolled in the DPP	Lewin data, information Y-USA provided to RTI
		Number/percentage of participants who completed the course	Self-monitoring plan, information Y-USA provided to RTI (individuals)
	Dose	Number of sessions attended by each participant	Information Y-USA provided to RTI

DPP = Diabetes Prevention Program; Y-USA = YMCA of the USA.

1.2.1 Process

The implementation process has been the initial focus of the evaluation. RTI defines implementation process as including execution of implementation, organizational capacity, key staff and partners’ engagement, and client recruitment and enrollment. The implementation process is best evaluated through a combination of data variables, including execution of implementation that conforms to operational plans and capacity for implementing the innovation in a timely and effective manner. We focused on the implementation process during the awardee site visit (June 5–6) and asked such evaluation questions as the following:

- What is the overall execution of the innovation implementation (e.g., the actual rate of expenditures relative to the projected rate)?
- What accomplishments are specific to hiring or training staff so that the organization can build its capacity to implement the innovation effectively?
- What is the implementation effectiveness, including fidelity, reach, and dose of the innovation thus far?

Execution of Implementation

The rate at which awardees enroll participants or expend funds, compared with projection, provides useful information to assess the innovation's status. If enrollment rates are particularly low (because of such issues as length of time to recruit and train new staff or time to implement their training program and recruit participants), these variables help assess the awardee's readiness to implement the innovation).

Overall, rates of participant recruitment have been much lower than projected and have been the primary challenge for this innovation. Total enrollment and recruitment of participants by quarter are presented and discussed in the Reach section of this report (see ***Table 7*** later in the report). In early communications with Y-USA, RTI learned that the enrollment for each of the 17 implementation sites in eight states ranged from 6 (Arlington, TX) to 182 (Wilmington, DE) and averaged 62 enrollees across the sites (***Table 6***). The total enrollment for the 17 sites as of this list (provided in an email dated 2/14/14) was 1,061 participants. The sites' activity with Diabetes Prevention and Control Alliance (DPCA), Y-USA's third-party administrator, was very similar. However, the data indicated variability in the YMCA's engagement with affiliates of Y-USA's national partner organizations (i.e., American Medical Association [AMA], National Council on Aging [NCOA], the National Association of County and City Health Officials [NACCHO], and Medicare Diabetes Screening Project [MDSP] that partners with the National Association of Area Agencies on Aging [n4a] and Novo Nordisk). For example, only five (of 17, 29%) sites partnered with local AMA chapters. The RTI team selected the YMCA of Central Ohio (Columbus) to visit because of its proximity to Y-USA and its above average enrollment.

Table 6. Total Enrollment of Y-USA Sites, Partners Involvement, and Recruitment Strategies through the Y-USA HCIA Innovation (as of February 14, 2014)

	Partners Involvement with Sites				Recruitment Strategies		
CMMI Sites	**AMA**	**NCOA**	**NACCHO**	**MDSP/ Novo**	**Recruit-ment Strategy***	**YMCA HCIA**	**Total Enrolled**
Phoenix, AZ			X		1, 2, 3, 4, 5, 6	Focus on branch buy-in Hold events at community centers	17
Tucson, AZ					1, 2, 3, 4, 5, 6	Engage Advantage beneficiaries Target 50+ housing and residential communities Participate in large senior-focused community health fair Engage physicians Engage faith-based organizations	16
Fort Worth, TX		x (14 senior centers)		x	1, 2, 3, 4, 5, 6	Train 4 community health workers to serve as promotoras Promotoras host community events to increase program awareness	30
Arlington, TX			x	x	1, 2, 3, 4, 5, 6	Host senior-focused health fair Host physician awareness meetings	6
Dallas, TX		x (1 senior center)	x	x	1, 2, 3, 4, 5, 6	Plan 5 informational sessions at different locations, which will be followed by screening events at those selected locations	28
Minneapolis, MN	x	x (1 senior center)			1, 2, 3, 4, 5	Partner with Walgreens Do direct mailings that target public housing Hold screening events at senior centers and public housing Reach out to physicians	65

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Table 6. Total Enrollment of Y-USA Sites, Partners Involvement, and Recruitment Strategies through the Y-USA HCIA Innovation (as of February 14, 2014) (continued)

	Partners Involvement with Sites				Recruitment Strategies		
CMMI Sites	**AMA**	**NCOA**	**NACCHO**	**MDSP/ Novo**	**Recruit-ment Strategy***	**YMCA HCIA**	**Total Enrolled**
Indianapolis, IN	x				1, 2, 3, 4, 5, 6	Develop computer coding necessary to flag patient records for referral	112
Dayton, OH					1, 2, 3, 4, 5, 6	Do branch outreach and screenings Direct mailings/e-mails Reach out to health care and faith-based communities	40
Cincinnati, OH			x		1, 2, 3, 4, 5, 6	Host recruitment/testing events at YMCA branches	21
Columbus, OH		x (18 senior centers)	x		1, 2, 3, 4, 5, 6	Do direct mailings Hold branch events and screenings	120
Cleveland, OH					1, 2, 3, 4, 5	Conduct mini-speeches at every older adult class in every branch Host 2 information sessions at each of 12 branches Outbound calls	78
Clearwater, FL		x (1 senior center)	x		1, 2, 3, 4, 5, 6	Direct mail to all senior members Use paid advertising	55
Tampa, FL					1, 2, 3, 4, 5, 6	Develop referral system with CVS Engage health care providers Advertise in local newspaper Hold branch screening events Reach out to faith-based communities	19
St. Petersburg, FL	x				1, 2, 3, 4, 5, 6	Do direct to member mailings/e-mails Partner with churches Use paid advertising	83

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Table 6. Total Enrollment of Y-USA Sites, Partners Involvement, and Recruitment Strategies through the Y-USA HCIA Innovation (as of February 14, 2014) (continued)

	Partners Involvement with Sites				**Recruitment Strategies**		
CMMI Sites	**AMA**	**NCOA**	**NACCHO**	**MDSP/ Novo**	**Recruit-ment Strategy***	**YMCA HCIA**	**Total Enrolled**
Venice, FL	x				1, 2, 3, 4, 5	Offer $25 gift card to new enrollees as well as to participants who refer others to the program	143
Wilmington, DE	x	x (1 senior center)			1, 2, 3, 4, 5	Engage health care providers (e.g., lunch and learns) Encourage participant-to-participant referrals Partner with Shoprite pharmacy for referrals Reach out to dieticians	182
New York, NY		x (2 senior centers)			1, 2, 3, 4, 5	Host lunch and learns at 6 senior center collaboratives Do branch outreach including information table and possible screenings	46
Column Totals	**5**	**7 (38 senior centers)**	**6**	**3**	**N/A**	**N/A**	**1,061**

Source: E-mail communications with Y-USA (February 14, 2014).
*Notes:
1 – revised collateral: posters, refer a friend/65+ postcards;
2 – revised/enhanced provider/physician toolkit;
3 – direct mail to YMCA 65+ membership;
4 – e-mail blast campaign: delivering e-mail assets for YMCA’s to deploy to 65+ membership;
5 – establish Kroger individual blood value testing; and,
6 – targeted RX receipt advertisement
AMA = American Medical Association; CMMI = Center for Medicare & Medicaid Innovation; DPCA = Diabetes Prevention and Control Alliance; HCIA = Health Care Innovation Award; MDSP/Novo = Medicare Diabetes Screening Project in partnership with the National Association of Area Agencies on Aging [n4a], Novo Nordisk, and DPCA; NACCHO =National Association of County and City Health Officials; NCOA = National Council on Aging; Y-USA = YMCA of the USA.

Recruitment has been slow for several reasons. First, many Medicare beneficiaries have Medicare Advantage and were not eligible to participate until November 2013. Staff explained that Medicare beneficiaries typically do not know what type of coverage they have (e.g., fee-for-service vs. Advantage), which added to the challenges of recruitment prior to the November protocol change. Also, Y-USA’s typical program recruitment strategies, such as health fairs and mobile prediabetes screenings, did not work well with Medicare beneficiaries. An early lesson learned was that the YMCAs that partnered with the AMA had the most participants (e.g., YMCA of Delaware, South County Florida YMCA, and YMCA of Greater Indianapolis) (Q4 progress report) (***Table 3***). Therefore, Y-USA refined its messaging and engagement tactics and collaborated with its national partners to implement a complementary communications plan (Q5 progress report).

One key lesson specific to recruitment is that Medicare beneficiaries trust their medical providers above all and are not amenable to recruitment into a health-related activity without their physician’s recommendation. The YMCA with the highest rates of participant enrollment, YMCA of Delaware, was already relying on referrals from physicians because Medicare in Delaware does not have third-party payers. Therefore, Y-USA made a concerted effort to train local YMCA staff on outreach to their local medical communities and encouraged them to increase their efforts to engage medical providers in participant recruitment.

Additional strategies include outreach to local faith-based organizations and senior centers, diabetes screening at local YMCA branches, and refer-a-friend programs with incentives for both the person making the referral and new participant. One national partner, the AMA, is also piloting clinic-based tools (e.g., electronic medical record applications that flag eligible patients) in four YMCA sites. During our site visit with YMCA of Central Ohio, we learned that they are using community partners, such as LifeCare Alliance (which has community clinics that serve Medicare beneficiaries) to refer Medicare beneficiaries to the program. They are also connecting with local senior community centers, faith-based organizations, and businesses to do free diabetes screening and make subsequent referrals. Additionally, they are working on recruiting local health care providers to refer qualifying individuals to the program.

We expect Y-USA’s program participant numbers to continue to increase because of the protocol change and efforts by the innovation sites to increase recruitment. Although participant enrollment has been a challenge, participant retention has been successful. Y-USA reported that as of Q7, “enrolled participants” (defined as those participants who attend at least 4 sessions) on average attended 13 sessions.

The rate at which Y-USA expends funds, compared to their projected rate, also provides useful information to assess the innovation’s status. Y-USA’s current rate of spending is 32.4%, which is 10 to 20% below the projected rate reported in Q7.

Organizational Capacity and Leadership

During the site visit, the RTI team learned that the innovation is a high priority for the Y-USA leadership and the organization, which designated it as the first “signature program” in its Healthy Living initiative. That designation translated into a significant investment in the program and a high level of accountability for the 17 YMCAs that responded to the request for proposal and entered the contractual agreement with the Y-USA. The champion and recognized leader for the innovation report directly to the vice president of health strategy and innovation who reports to the chief executive officer (CEO). When the YMCAs struggled with recruitment, Y-USA leadership worked with the Centers for Medicare & Medicaid Services (CMS) to get approval to expand eligibility to include Medicare Advantage beneficiaries. To respond to the recruitment challenge, the Y-USA CEO met with the CEOs of the 17 innovation sites, which are independently governed YMCAs, to communicate the strategic focus of the innovation project. Leadership also encouraged sites to adjust how they recruited participants when their traditional recruitment strategies did not work. Recent mini-grants to the innovation sites focus on documenting what recruitment strategies worked.

Y-USA already had experience implementing the evidence-based DPP model with 75 YMCAs before the launch of the HCIA innovation program. However, many aspects of the innovation, including targeting older adults to enroll in the program, understanding different Medicare plans, and working with health care providers to recruit program participants, were new to Y-USA and most participating YMCAs. YMCAs typically conduct outreach and deliver programs targeted to children and working adults, and only one of the 17 innovation sites had specifically targeted and enrolled older adults into a similar program before the HCIA innovation. YMCA staff were also not accustomed to screening participants' Medicare plans to determine program eligibility. YMCA of Delaware already had established relationships with local health care providers, which facilitated their ability to recruit higher numbers of participants. Other YMCAs are continuing to establish relationships with local health care providers. Y-USA leadership developed the training *Medical Community Partnerships 101* to help local YMCA project coordinators develop partnerships with local health care providers.

1.2.2 Workforce Development

As cited earlier, recruiting, hiring, and training lifestyle coaches to deliver the innovation with fidelity are key components of Y-USA's innovation and are critical to successful implementation.

Hiring and Retention

The 17 participating local YMCAs are responsible for hiring and training the lifestyle coaches according to guidance from Y-USA. During our site visit at the YMCA of Central Ohio (Columbus), we learned that they employ 27 lifestyle coaches to implement their program at all 12 of their branches. These lifestyle coaches are mostly part-time employees who also work for YMCA of Central Ohio in other roles, including reception staff, wellness coaches, and chronic disease coordinators. Lifestyle coaches are hired and supervised by each branch's executive director, although they receive ongoing monitoring and assistance from each branch's chronic disease coordinator. Each branch's chronic disease coordinator is responsible for scheduling classes, making sure lifestyle coaches have all of the materials that they need, observing classes to ensure they are being implemented with high quality and fidelity, and coordinating substitute lifestyle coaches when needed. YMCA Central Ohio's director of chronic disease prevention provides ongoing supervision to the chronic disease coordinators and lifestyle coaches and also observes classes to make sure the program is being implemented well.

Site-specific data on staff hired and retained by the 17 local YMCAs, such as project managers and lifestyle coaches, are not currently available. As of March 2014, Y-USA's innovation program had seven full-time-equivalent (FTE) staff, all serving in a managerial or administrative role at the national office in Chicago. No new FTE staff at the awardee level was hired for the innovation during Q7.

Training

Through Q7, a total of 1,266 individuals—which includes those who attended each session (i.e., could include duplicate counts of the same person)—received training as part of the workforce development to prepare them to implement the innovation effectively (a total of 17,596 training hours). Over the course of the innovation, Y-USA has expanded its training and technical assistance support. To receive certification to teach the DPP curriculum, all lifestyle coaches are required to complete a 16-hour standardized training, which is taught by Y-USA-certified master trainers. Consistent with the Y-USA focus on quality assurance, master trainers cannot train lifestyle coaches for their own organization. Coaches also complete one 12-hour group training session to develop facilitation skills. Y-USA also developed a medical community partnerships training to help program managers at the 17 participating local YMCAs to partner with local health care providers and the medical community to better recruit Medicare beneficiaries as well as an executive and manager operational training. Anyone who has contact with participants in the innovation (e.g., coordinators, coaches) must complete the Health Insurance Portability and Accountability Act training.

1.2.3 Effectiveness

A major aspect of the evaluation will be to assess the effectiveness of the intervention in terms of the extent to which it was implemented as planned (i.e., fidelity) patients have been exposed to the innovation. Their exposure will be measured through reach (i.e., the extent to which the total number of patients are reached that were targeted) and dose (i.e., the degree to which each patient is exposed to services provided via the community health team).

Fidelity

As detailed previously, this evidence-based intervention has a standardized curriculum and measurement. Expanding the protocol to recruit and enroll Medicare Advantage beneficiaries is the only change to the original plan, which limited the target population to Medicare fee-for-service beneficiaries. Implementing the program with fidelity means to get at least half of the target participants (prediabetic Medicare beneficiaries) to complete the program (i.e., defined as completing at least 9 of the 16 core sessions). During the site visits with Y-USA and YMCA of Central Ohio (Columbus), the RTI team learned that Y-USA requires strict fidelity to the model, which is communicated throughout the organization and evidenced by the infrastructure to support that commitment. YMCA is strict about who implements the innovation. If a staff member does not pass the training course (which is always conducted by a master trainer from outside the local YMCA), then the individual cannot be a lifestyle coach. To monitor fidelity, the coordinators who supervise the lifestyle coaches observe them at different intervals (i.e., at least once for seasoned coaches, more frequently for new coaches) to ensure that the lifestyle coaches are implementing the intervention as required. The supervisor completes an observation tool that assesses the coach’s performance in several areas and provides feedback to the coach. Y-USA also conducts fidelity checks during which their staff observe lifestyle coaches as they implement the sessions. Finally, coaches are required to sign a contract that they will implement the program with fidelity and not implement the program outside of the local YMCA. Further, technical assistance providers provide general oversight and monitor the data that the lifestyle coaches enter into the Mynetico system.

Reach

The YMCAs utilize a variety of strategies to reach and inform potential participants. YMCA staff, health care providers, and staff from local partnerships provide information, such as brochures and handouts, on the local DPP program to potential participants. Participants are most commonly recruited through the following means:

- YMCA staff reaches out to regular YMCA members, especially members who already participate in Medicare-funded programs such as “Silver Sneakers.”
- Health care providers refer their Medicare patients who are at risk for diabetes.
- Local partners, such as local chapters of the American Heart Association, refer individuals to the program or work with health care providers to increase provider referrals.
- YMCA DPP program coordinators conduct community outreach to their target population through faith-based organizations, senior centers, and assisted living homes; at community health fairs; and via partnership building with health care providers.

- The YMCA advertises the program through mass mailings, Web-based information, and posters.

To get started, an individual usually contacts the local YMCA and is directed to discuss qualification and enrollment with the local YMCA's DPP program coordinator. The DPP program coordinator verifies that the individual qualifies; explains how the program works, the available program schedule, and where to go for their first meeting; answers any questions; and registers the individual in an online database. To qualify, participants can self-report height and weight (used to determine BMI), but they must have a record of a blood test that documents their risk for diabetes. If he or she has ever been diagnosed with diabetes, the individual cannot enroll in the program.

Table 7 summarizes the number of unique (unduplicated count) program participants that the sites were able to recruit and the percentage of those recruited that completed the program (i.e., attended at least 9 of the 16 core sessions). About 90% of the target population was enrolled, and among those enrolled 80% completed the program.

Table 7 Cumulative Patient Enrollment and Reach for Each Quarter Since Project Launch

Quarter (End Date)	Target Population Recruited (i.e., Attended at Least One Session)	Number of Unduplicated Participants Enrolled (i.e., Completed at Least 4 Sessions)	Number of Participants who Completed the Program (i.e., Completed at Least 9 of 16 Sessions)	Completion Rate among Those Enrolled (%)
Q4 (June 2013)	158	120	12	10.0
Q5 (September 2013)	171	158	136	86.1
Q6 (December 2013)	379	342	302	88.3
Q7 (March 2014)	672	603	531	88.1

Source: Y-USA Self-monitoring data, Q3-Q7.
Q = quarter.

To report its self-monitoring data (i.e., participant enrollment, program completion, number of classes attended, and weight loss), Y-USA waits 16 weeks after a participant's recruitment (from date of the first session with the innovation). As previously mentioned, the program includes 16 weekly core sessions, followed by 8 monthly maintenance sessions. Y-USA defines "program enrollment" as the number of participants who attend at least 4 sessions and "program completion" as the number of participants who attend at least 9 sessions (based on the definition of "program completion" used by the original DPP intervention). Some participants might miss some sessions and then come back to complete the program. Others may have been recruited in the last weeks of the quarter and would not have had an opportunity to complete the required number of sessions by end of the quarter. Allowing a full 16-week period from the recruitment date provides a more accurate picture of the proportion of recruited beneficiaries who were enrolled and who completed the program, although it does cause a lag time in data reporting. Without this delayed reporting, the reported reach for the quarter would appear much lower than actual reach if calculated prior to the end of the 16-week time period needed to complete the curriculum.

Dose

Any innovation that involves delivery of direct services to participants needs to assess the extent to which those participants have actually been exposed to the new services. For this innovation, participants receive varying doses of the program, depending on the number of sessions they attend. The maximum dose is 24 one-hour sessions (16 weekly sessions plus 8 monthly maintenance sessions). Dosage is operationally defined at two levels: enrollment (at least 4 but fewer than 9 sessions) and completion of the innovation (at least 9 of the 16 core sessions). As of Q7, 531 participants completed the program (i.e., had completed at least 9 of the 16 core sessions). A large proportion of the participants exceeded the "minimally effective dose" for completing the innovation. Participant attendance has been strong since launch of the innovation with participants attending an average of 13 of the 16 core sessions, which is slightly higher than that of the regular DPP. Y-USA currently does not report the number of maintenance sessions attended.

1.3 Evaluation Outcomes

RTI will use two types of quantitative data from awardees to assess the impact of the awardee's innovation on key outcomes. These include claims data for Medicare and/or Medicaid beneficiaries, depending on who the awardee serves, and other administrative or utilization data that the awardee is collecting (which we have labeled as "other awardee-specific data" reflecting the variability of the types of data elements available across awardees). We are in the process of finalizing our assessment of all the available data sources and requesting data directly from each awardee. As those data are received, we will incorporate the findings into subsequent reports. The following sections present descriptive findings from the quantitative outcome data provided to RTI as of September 11, 2014.

1.3.1 Measures for Evaluation

Following the site visit, the data management and site visit teams met to review each of the measures listed in the awardee's self-monitoring measurement plan (i.e., data review meeting). The measures listed in ***Table 5*** (above) and ***Table 8*** (below) reflect the outcome measures determined as most relevant for our evaluation of Y-USA's innovation.

Table 8. Outcome Measures Requested from Y-USA

Key Evaluation Domains	Subdomains	Measures	Data Source
Clinical effectiveness	Diabetes	Average starting blood sugar levels (HbA1c, fasting glucose, other risk factors)	DPCA MYnetico
	Weight management	Average weight loss for Medicare participants	DPCA MYnetico
		Average weight loss for non-Medicare participants	DPCA MYnetico
		Percent achieving 5% weight loss	DPCA MYnetico
		Individual weight loss	DPCA MYnetico
		Starting BMI	DPCA MYnetico
Health care outcomes	Cost	Spending per patient	Claims
		Cost savings	Claims

DPCA = Diabetes Prevention and Control Alliance.

1.3.2 Claims Data

As part of a broad assessment of health care innovations, CMMI is assessing the impact of its programs, including those funded specifically by HCIA, on four core measures. The four core measures are

- Health care spending per patient,
- hospital inpatient admissions,
- hospital readmissions, and
- ED visits.

Collectively, CMMI programs are anticipated to slow the increase in spending per patient, reduce hospital admissions, reduce avoidable hospital readmissions, and prevent unnecessary ED visits. We are reporting these measures for all HCIA Community Resource awardees so that the collective impact of the awards can be assessed. However, as discussed below, some awardees may not be focused on these measures. Other awardees that target specific conditions (e.g., imaging, diabetes, etc.) may have significant impacts on spending, admissions, readmissions, and ED visits for the targeted conditions. However, it may not have a statistically detectable impact on the measures at the aggregate level because the targeted conditions represent only a small fraction of total spending, inpatient admissions, and ED visits. The measures are calculated through analysis of Medicare and Medicaid fee-for-service claims. Because of differences between Medicare and Medicaid patients in age, other demographic variables, and disease status, we report the Medicare and Medicaid results separately below.

- **Health Care Spending per Patient**. For Medicare beneficiaries, health care spending per patient includes Part A and Part B Medicare expenditures for persons enrolled in the Part A and Part B fee-for-service program. The variable focuses on Medicare fee-for-service spending; so Medicare Advantage (Part C) services are excluded, as are beneficiary copayments. Medicare Part D prescription spending is also excluded. Spending is reported on a per-person per-quarter basis. If a beneficiary is not enrolled for every month in a quarter, spending (except for hospital inpatient spending) is prorated to a quarterly basis based on the number of days enrolled during the quarter. Because hospital inpatient admissions are both rare and expensive, spending is not prorated for hospital inpatient spending. Prorating is also not performed for beneficiaries who die during a quarter.

  For Medicaid beneficiaries, health care spending per patient is reported for fee-for-service beneficiaries. Beneficiaries are only included in the analysis for spending (and the other measures) during periods when they are enrolled in Medicaid.

- **Hospital Inpatient Admissions**. This variable measures hospitalization, the single most expensive component of health care spending. Patients kept overnight in observation beds are excluded from this measure. Inclusion criteria for the analysis are the same as for spending. Hospital inpatient admissions are not prorated based on the number of days eligible during the quarter. All-cause inpatient admissions and ambulatory care sensitive conditions (ACSC) admissions are reported separately, under the assumption that a greater share of ACSC admissions can be prevented by appropriate ambulatory care. The mean quarterly admission rate per 1,000 patients is reported.

- **Hospital Readmissions.** Hospital readmission rates serve a dual purpose in evaluating HCIA impacts. Readmissions add to the costs of a prior hospitalization, and they often reflect a problem in the care provided during the first admission. All-cause readmissions are defined as a follow-up admission to any short-term acute general or long-term care hospital within 30 days of a discharge from the same or another hospital of the same type. We ignore multiple admissions within 1 day of an initial admission because these often represent transfers between hospitals. We define index hospitalizations that begin during the quarter and follow each index admission for 30 days, even when the follow-up period extends beyond the end of the quarter. Inclusion criteria for the analysis are the same as for spending. We also calculate readmissions for persons with ACSC. The person's ACSC status is defined by the first hospitalization during the quarter. The readmission rate equals the number of readmissions divided by the number of index hospitalizations during the quarter. Planned readmissions are excluded from the calculation of the numerator. Quarterly mean readmission and ACSC readmission rates per 1,000 admissions are reported.

- **ED Visits**. ED visits are sometimes viewed as a symptom of the inability of the community's health care system to provide adequate preventive and ambulatory care visits. We report an all-cause ED visit rate that excludes ED visits resulting in an inpatient admission (which presumably represent unavoidable visits) and includes overnight ED visits without an inpatient admission. Inclusion criteria for the analysis are the same as for spending, and ED visits are also subject to the same prorating formula as for spending. The mean quarterly ED visit rate per 1,000 patients is reported.

Medicare Claims Analysis

We expect to include Medicare claims analyses in subsequent reports, but we do not have patient identifiers to support Medicare analysis at this time. The analysis will focus on Medicare beneficiaries enrolled in the Y-USA innovation who were enrolled in fee-for-service Medicare Part A and Part B at some point between 2010 and 2013. The analysis will use data from the CMS Chronic Conditions Data Warehouse (CCW). Measures will be presented for these beneficiaries in the quarters before and after the innovation was launched on February 15, 2013. ***Appendix A*** shows the claims analyses tables that will be presented for Medicare. In addition to the tabular format, we will present figures showing each measure as a function of time. Values in quarters prior to the innovation's launch on February 15, 2013 will be shown in one color and values for quarters during and after launch will be shown in another color. The figures will include a trend line based on a linear regression of pre-launch values.

Medicaid Claims Analysis

Y-USA only targets Medicare beneficiaries. Therefore, we do not plan to perform Medicaid claims analyses.

Discussion of Claims Analysis

The claims measures will provide descriptive data on patients enrolled in the Y-USA innovation before, during, and after the launch of the innovation. Although it is necessary to report these measures to support CMS's broader assessment of its full portfolio of innovation projects, the measures may not provide a complete evaluation picture of the Y-USA innovation for a number of reasons. First, the Y-USA innovation focuses on Medicare-eligible, prediabetic beneficiaries, and beneficiaries who have been diagnosed as diabetic at time of enrollment are ineligible to participate. Although the innovation may have a statistically significant impact on the spending, inpatient admissions, readmissions, or ED visits related to diabetes, it may not have a statistically detectible impact on the variables at the total spending or utilization level, because diabetes accounts for only a small share of total spending or utilization. In later reports, we will provide diabetes-specific spending and utilization data. Second, because the Y-USA innovation is designed to prevent diabetes, it may not have an immediate impact on diabetes-related spending and utilization. The impact of the innovation may only accumulate over time, as new diabetes cases are prevented or delayed and associated spending and utilization are averted. Third, because of its change in enrollment protocol, the Y-USA is now enrolling Medicare Advantage beneficiaries as well as fee-for-service beneficiaries. Our claims analysis will only provide spending and utilization information for Medicare fee-for-service beneficiaries. We plan to estimate the impact of the innovation on total and diabetes-related spending for Medicare fee-for-service beneficiaries and extrapolate any savings to Medicare Advantage based on the relative enrollment of the two groups (with Medicare IDs, we will be able to use the CCW to identify to which group a beneficiary belongs).

Development of Comparison Groups

In addition to comparing Y-USA patients before and after implementation of the innovation, we will construct a comparison group of Medicare fee-for-service patients in states where the Y-USA innovation is being offered. Y-USA is serving Medicare beneficiaries in selected zip codes in selected cities. An ideal comparison group would include similar patients to those targeted by Y-USA who were not exposed to the innovation. We are focusing on Medicare fee-for-service beneficiaries who (a) live in a selected zip code but do not participate in the intervention or (b) live in a nonselected zip code in one of the selected cities. For all analyses, we exclude persons who already have diabetes. We will use propensity score matching to identify patients with similar characteristics as Y-USA patients. One limitation of this approach is that we will not know whether members of the comparison group have prediabetes, a key eligibility requirement for the Y-USA innovation. We may be able to overcome this limitation if Y-USA can provide patient identifiers for eligible beneficiaries who sign up for the DPP but never attend a session of the program. Results for the comparison group will be included in later reports.

1.3.3 Other Awardee-Specific Data

RTI is working with Y-USA to obtain the raw patient-level data that were used to generate the measures in ***Tables 4*** and ***7*** for each quarter.

Overview of Data Received

As of October 2014, we have not received any patient-level data due the pending Data Use Agreement (DUA) and Business Associate Agreement (BAA) with Y-USA. RTI has reviewed and signed the DUA. Once the DUA is in place, we will work on the BAA. We have already provided Y-USA with the list of variables we are requesting to facilitate the process of receiving data. We expect to have data by mid-November 2014.

Health Outcomes

Once we receive the data requested from Y-USA, we will have a better understanding of what type of results we will provide. The following table shells (***Tables 9*** and ***10***) reflect examples of findings we anticipate presenting.

Table 9. Weight and Diabetes Management over Time for Participants

Measure	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Average weight loss for Medicare participants	—	—	—	—	—	—	—
Average weight loss for non-Medicare participants	—	—	—	—	—	—	—
Percent achieving 5% weight loss	—	—	—	—	—	—	—
Individual weight loss	—	—	—	—	—	—	—
Starting BMI	—	—	—	—	—	—	—
Average starting blood sugar levels (HbA1c, fasting glucose, other risk factors)	—	—	—	—	—	—	—

Source: Patient-level data to be provided by Y-USA.
BMI = body mass index.
— Data not yet available.

If feasible, we will present each measure as a run chart with a separate line for each site to demonstrate change over time.

Table 10. Weight and Diabetes Management by YMCA Sites

Measure	Phoenix, AZ	Tucson, AZ	Fort Worth, TX	Arlington, TX	Dallas, TX	Minneapolis, MN
Average weight loss for Medicare participants	—	—	—	—	—	—
Average weight loss for non-Medicare participants	—	—	—	—	—	—
Percent achieving 5% weight loss	—	—	—	—	—	—
Individual weight loss	—	—	—	—	—	—
Starting BMI	—	—	—	—	—	—
Average starting blood sugar levels (HbA1c, fasting glucose, other risk factors)	—	—	—	—	—	—

Source: Patient-level data to be provided by Y-USA.
BMI = body mass index.
— Data not yet available.

Table 10. Weight and Diabetes Management by YMCA Sites (continued)

Measure	Indianapolis, IN	Dayton, OH	Cincinnati, OH	Columbus, OH	Cleveland, OH
Average weight loss for Medicare participants	—	—	—	—	—
Average weight loss for non-Medicare participants	—	—	—	—	—
Percent achieving 5% weight loss	—	—	—	—	—
Individual weight loss	—	—	—	—	—
Starting BMI	—	—	—	—	—
Average starting blood sugar levels (HbA1c, fasting glucose, other risk factors)	—	—	—	—	—

Source: Patient-level data to be provided by Y-USA.
BMI = body mass index.
— Data not yet available.

Table 10. Weight and Diabetes Management by YMCA Sites (continued)

Measure	Clearwater, FL	Tampa, FL	St. Petersburg, FL	Venice, FL	Wilmington, DE	New York, NY
Average weight loss for Medicare participants	—	—	—	—	—	—
Average weight loss for non-Medicare participants	—	—	—	—	—	—
Percent achieving 5% weight loss	—	—	—	—	—	—
Individual weight loss	—	—	—	—	—	—
Starting BMI	—	—	—	—	—	—
Average starting blood sugar levels (HbA1c, fasting glucose, other risk factors)	—	—	—	—	—	—

Source: Patient-level data to be provided by Y-USA.
BMI = body mass index.
— Data not yet available.

Discussion of Other Awardee-specific Findings

Once we receive data from Y-USA, we will begin filling in the table shells above, and begin additional bivariate and multivariate analyses. At that point, we will be in a better position to discuss findings related to the other awardee-specific data.

1.4 Overall Program Effectiveness to Date

Y-USA is the lead agency for this multisite innovation that is based on a successful evidenced-based intervention implemented by Y-USA 3 years prior to HCIA funding. With that prior history, strong leadership, and commitment to the innovation, Y-USA seems to have the necessary and sufficient organizational capacity to implement the innovation. During the site visit, we learned about the Y-USA's priority designation for the innovation as a strategic focus for the organization. Consistent with that commitment, Y-USA leadership has emphasized fidelity and accountability by the grantees; invested in infrastructure, training, and technical assistance to support implementation of the innovation; and, provided performance incentives for the participating local YMCAs. Y-USA leadership effectively responded to the initial challenge of recruiting and enrolling older prediabetic Medicare beneficiaries by engaging key partners (i.e., AMA) and training the local YMCAs on how to partner with these providers. Y-USA has identified effective strategies for reaching the target population as reflected in the increased enrollment and completion of the program. To date, the Y-USA innovation has reached 1,423 of the projected 10,000 Medicare beneficiaries (14.2%), which reflects the total number of unique participants). And, more than a third of these participants (531, 37%) have successfully completed the program (i.e., having completed 9 of the 16 core sessions at 16 weeks from recruitment date). On average, the innovation has exceeded the "minimally effective dose" (achieving an average 13 of the 16 core sessions), which is higher than that of the national DPP intervention.

APPENDIX A

Table A-1. Baseline and Intervention Trends in Health Care Spending per Patient

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Spending rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Unique patients	—	—	—	—	—	—	—	—	—	—	—	—

Savings per Patient

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Spending rate: total quarter (i.e., quarterized) payments/number of unique patients. Savings per patient: difference in comparison minus the intervention's average spending rates.
— Data not yet available.

Table A-2. Baseline and Intervention Trends in Admissions per 1,000 Patients

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
Intervention Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Admit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**I1**	**I2**	**I3**	**I4**
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Admit rate: total unquarterized admissions/number of unique patients.
— Data not yet available.

Table A-3. Baseline and Intervention Trends in Readmissions per 1,000 Admissions

Evaluation Group:	RTI International (Community Resource Planning)
Payer Group:	Medicare
Admissions Measure:	All cause

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total admissions	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	Readmit rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	Total Admissions	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: Readmit rate: sum of all readmissions to eligible hospital within 30 days/all admissions in the quarter. Total admissions: all eligible admissions in the quarter.
— Data not yet available.

Table A-4. Baseline and Intervention Trends in ED Visits per 1,000 Patients

Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								First Intervention Year			
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
Intervention Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—
Comparison Group													
jjjxxx0001	AwardeeName1												
	ED rate	—	—	—	—	—	—	—	—	—	—	—	—
	Std dev	—	—	—	—	—	—	—	—	—	—	—	—
	N. of patients	—	—	—	—	—	—	—	—	—	—	—	—

Intervention—Comparison Rate

Baseline Quarters								First Intervention Year			
B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4
—	—	—	—	—	—	—	—	—	—	—	—

Source: RTI analysis of CCW Medicare claims.
Note: ED rate: total quarterized ED visits and observation stays/number of unique patients.
— Data not yet available.

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APPENDIX A

DEFINITIONS OF EVALUATION PLANNING MATRIX DOMAINS AND SUBDOMAINS

Table A-1. Definitions of Evaluation Planning Matrix Domains and Subdomains, revised: 3.26.2014

Domains	Corresponding Subdomains	Definition	Source(s) (abbreviated, full citation is below in endnotes)
Exogenous Factors	Elements outside/external to the organization or program that may influence implementation and/or related outcomes. Generally, the outer setting includes the economic, political, and social context within which an organization resides and the inner setting includes features of structural, political, and cultural contexts through which the implementation process will proceed.[1]		Rycroft-Malone et al., 2002
	Partnerships/ Networks	Inter-relationships between other organizations (e.g., between outpatient clinics and a community hospital).[2] The degree to which an organization is networked with other external organizations. Organizations that support and promote external boundary-spanning roles of their staff are more likely to implement new practices quickly.[3] Interagency cooperation and support from citizens have also been characterized as community support.[4]	AHRQ, 2013; Greenhalgh, 2004; Mihalic, 2003
	Community Resources and Infrastructure	The extent to which patient needs, as well as barriers and facilitators to meet those needs (outside the organization), are accurately known and prioritized by the organization. The extent to which the innovation characteristics are 'matched' to the readiness to change of patients.[5] This includes built environment, geographic characteristics, and institutional attributes.	Damschroder et al., 2009

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[2] Agency for Healthcare Research and Quality. Developing and Assessing Contextual Frameworks for Research on the Implementation of Complex System Interventions Draft Methods Research Report. 2013.

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Table A-1. Definitions of Evaluation Planning Matrix Domains and Subdomains, revised: 3.26.2014

Domains	Corresponding Subdomains	Definition	Source(s) (abbreviated, full citation is below in endnotes)
	Policy and Political Environment	**General Policy Environment**: External policies or regulations (governmental or other central entity), external mandates, clinical recommendations and guidelines, and public or benchmark reporting.[6] [7] **Existing Payment Models**: Fee For Service, Managed Care, Accountable Care organizations, Bundled Payments, Primary Care Transformation, and Initiatives focused on the Medicaid and CHIP Population, Initiatives focus on Medicare -Medicaid Enrollees, and Other State Federal Initiatives.[8]	Berry et al., 2013; Damschroder et al., 2009; AHRQ, 2013

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Table A-1. Definitions of Evaluation Planning Matrix Domains and Subdomains, revised: 3.26.2014

Domains	Corresponding Subdomains	Definition	Source(s) (abbreviated, full citation is below in endnotes)
	Socio-economic Environment	Social conditions in which people live their daily lives. Interactions with families, friends, co-workers and others that shape everyday experiences in neighborhoods, communities, and institutions (such as schools, the workplace, places of worship, government agencies, etc.). This means that individual and community socioeconomic factors; social norms, social support and community connectedness; employment and working conditions; living conditions; and culture, religion, and ethnicity shape health. The social and economic environment of a community is created by the individual and combined actions of its members and is unique because of social norms and cultural customs.[9] **Social and economic determinants of health**: Social determinants of health are conditions in the environments in which people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks.[10] **Demographics**: the statistical data of a population, especially those showing average age, income, education, etc. Demographic change is the calculable shift in the characteristics of a geographically-defined population. These include changes in population age profile, racial make-up or family structure.[11]	MN Department of Health, http://www.health.state.mn.us/strategies/social.pdf; CDC, 2013; Health Affairs, 2002.
	External Technological Environment	Technological trends and movements and the availability of technology that may affect the intervention and its context.[12]	AHRQ, 2013

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Table A-1. Definitions of Evaluation Planning Matrix Domains and Subdomains, revised: 3.26.2014

Domains	Corresponding Subdomains	Definition	Source(s) (abbreviated, full citation is below in endnotes)
Endogenous Factors	Tangible and intangible manifestation of characteristics of the organizations involved in the intervention, including structural characteristics, networks and communications, culture, climate, and readiness that all interrelate and influence implementation.[13]		AHRQ, 2013
	Structural Characteristics	Size of organization, practice, unit, maturity, mix of occupations, unit organization, employment status of providers and staff, ownership structure, etc. Also refers to the hierarchy of organization (how smaller units are clustered into larger units), degree of vertical integration, and administrative intensity.[14]	Damschroder et al., 2009
	Resources/ Capacity	The extent to which resources are dedicated to implementing the innovation, and the adequacy of those resources. Includes physical space and equipment, health IT and general IT, staff time.[15] The level of resources dedicated for implementation and ongoing operations including money, training, education, physical space, and time.[16]	AHRQ, 2013; Damschroder et al., 2009
	Leadership	Commitment, involvement, and accountability of leaders and managers for the innovation, including middle managers. Directionality of leadership for the innovation (top-down vs. bottoms-up) and a clearly designated implementation leader.[17]	Damschroder et al., 2009)

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[13] Agency for Healthcare Research and Quality. Developing and Assessing Contextual Frameworks for Research on the Implementation of Complex System Interventions Draft Methods Research Report. 2013.

[14] Damschroder, L.J., Aron, D.C., Keith, R.E., Kirsh, S.R., Alexander, J.A., Lowery, J.C. (2009). Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. Implementation Science 4:50 DOI:10.1186/1748-5908-4-50.

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Domains	Corresponding Subdomains	Definition	Source(s) (abbreviated, full citation is below in endnotes)
	Organizational Incentives	Extrinsic incentives such as goal-sharing awards, performance reviews, promotions, and raises in salary, as well as less tangible incentives such as increased stature or respect.[18]	Damschroder et al., 2009)
	Quality Improvement Culture	Norms, values, and beliefs within an organization (or subordinate unit) that may affect views of the innovation and its implementation. The competing values framework is one way to measure culture and is aligned along two dimensions: one is the degree to which an organization emphasized central command and control over processes vs. decentralization and flexibility. The second dimension is a trade-off between focus on internal environment and processes vs. the external environment and relationships with outside entities. Four archetypes of organizational culture then include 1) team culture, 2) hierarchical culture, 3) entrepreneurial culture, and 4) rational culture. These are not mutually exclusive. [19]	Damschroder et al., 2009
	History	Experiences with similar interventions within the setting and within the target population. The maturity, breadth, and depth of implementation activities.[20]	AHRQ, 2013

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Table A-1. Definitions of Evaluation Planning Matrix Domains and Subdomains, revised: 3.26.2014

Domains	Corresponding Subdomains	Definition	Source(s) (abbreviated, full citation is below in endnotes)
Innovation Characteristics	Process Redesign Intervention Characteristics: The characteristics of the intervention being implemented into a particular organization, including core components (the essential and indispensable elements of the intervention itself) and an adaptable periphery (adaptable elements, structures, and systems related to the intervention and organization into which it is being implemented). There are intrinsic characteristics of innovations that influence an individual's decision to adopt or reject an innovation.[21]		Rogers, E. M. (1995). *Diffusion of innovations* (4th ed.). New York: Free Press.
	Complexity	The degree to which an innovation is perceived as relatively difficult to understand and use.[22] Stakeholders' perception of the perceived difficulty of implementation, reflected by duration, scope, centrality, and intricacy and number of steps required to implement.[23] One way to determine complexity is by assessing 'length' (the number of sequential sub-processes or steps for using or implementing an intervention) and 'breadth' (number of choices presented at decision points). Complexity is also increased with higher numbers of potential target organizational units (teams, clinics, departments) or types of people (providers, patients, managers) targeted by the intervention, and the degree to which the intervention will alter central work processes.[24]	Rogers, 1995; Damschroder et al., 2009

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Domains	Corresponding Subdomains	Definition	Source(s) (abbreviated, full citation is below in endnotes)
	Compatibility	Stakeholders' perception of alignment of the meaning, values, and norms attached to process redesign with those held by members of the practice or organization. The tangible fit between the intervention and the organizations' mission, goals, and resources; perceived risks and needs; practices; and workflows.[25]	Harwood, 2007
	Adaptability	Stakeholders' perception of the degree to which process redesign strategies, techniques, and practices can be adapted, tailored, refined, or reinvented to meet local needs.[26] The innovation is testable on a small scale in order to retool or modify as needed (or abandon). The innovation is able to be "pilot tested" before full implementation. The innovation can be adapted and tailored or reinvented to meet needs. Adaptability relies on the ability to define the innovations "core" or irreducible elements versus the soft periphery, which can be adapted.[27]	Damschroder et al., 2009

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Table A-1. Definitions of Evaluation Planning Matrix Domains and Subdomains, revised: 3.26.2014

Domains	Corresponding Subdomains	Definition	Source(s) (abbreviated, full citation is below in endnotes)
Workforce Development	Staff education programs and efforts to provide staff with requisite skills for new programs.[28]		AHRQ, 2013
	Education and Training	Assessing staff members' existing knowledge to identify knowledge gaps in order to plan for and support any additional education needs. Use of a training program that has institutional recognition or accreditation. Use of education/training that accommodates the adult learner. Training program provides the appropriate skill sets and prepares staff for new roles and/or responsibilities Includes discipline specific training issues. Inter-professional education occurs when two or more professions (e.g., physicians, nurses, pharmacists, etc.) learn with, from and about each other to improve collaboration and the quality of care.[29] [30]	AHRQ, 2013, Freeth et al., 2005
	Organizational Support	Physical and organizational resources needed to implement workforce development. Provision of resources (i.e. material, spatial, temporal) to support training. Involving partners to provide education/training programs. Having support from upper and middle management, HR department, clinical education department. Policies and practices that enable training programs to success (e.g., replacement/substitute staff for staff in training, staff dedicated to training and development, etc. Refresher trainings/training to keep skills up to date. Services to enable workers to advance in their careers	
	Staff Recruitment	Organization's strategies and approach to identifying candidates to fill new staff positions or expand numbers of existing positions.[31]	AHRQ, 2013

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[28] Agency for Healthcare Research and Quality. Developing and Assessing Contextual Frameworks for Research on the Implementation of Complex System Interventions Draft Methods Research Report. 2013.

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Table A-1. Definitions of Evaluation Planning Matrix Domains and Subdomains, revised: 3.26.2014

Domains	**Corresponding Subdomains**	**Definition**	**Source(s) (abbreviated, full citation is below in endnotes)**
	Staff Satisfaction	Staff satisfaction (or not) with new roles and responsibilities. Includes measures of "burnout" and staff retention. Staff satisfaction (or not) with the innovation. Staff satisfaction (or not) with trainings related to the innovation.[32] The degree to which providers are able to work "at the top of their license".	AHRQ, 2013
	Staff Roles and Responsibilities	Roles and responsibilities define program staff specific involvement and contribution to the program team. Program staff's ability to identify and adhere to roles and responsibilities may facilitate or impede the successful implementation of the program's intervention(s).[33] Care Coordination Activities as part of staff roles and responsibilities involve the deliberate organization of patient care activities that involves the marshalling of personnel and other resources needed to carry out all required patient care activities, and is often managed by the exchange of information among participants responsible for different aspects of care. Activities include: • Establish accountability and negotiate responsibility • Communicate • Facilitate transitions • Assess needs and goals • Create a proactive plan of care • Monitor, follow-up, and respond to change • Support self-management goals • Link to community resources • Align resources with patient and population needs[34] [35]	Kaiser, Scott, 2005; National Coalition on Care Coordination (N3C), 2007; AHRQ, 2010

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[33] Kaiser, Scott, 2005; Healthcare Information and Management Systems Society (HIMSS), Implementation of Clinical Decision Support team, 2011

[34] National Coalition on Care Coordination (N3C), policy brief on Implementing Care Coordination in PPACA; McDonald, 2007.

[35] Agency for Healthcare Research and Quality. Care Coordination Measures Atlas. December 2010, pg. 1-280.

Table A-1. Definitions of Evaluation Planning Matrix Domains and Subdomains, revised: 3.26.2014

Domains	Corresponding Subdomains	Definition	Source(s) (abbreviated, full citation is below in endnotes)
	Roles and Responsibilities - CHW subcode	CHWs are known by a variety of names, including community health worker, community health advisor, outreach worker, community health representative (CHR), promotora/promotores de salud (health promoter/promoters), patient navigator, navigator promotoras (navegadores para pacientes), peer counselor, lay health advisor, peer health advisor, and peer leader. CHWs are frontline public health workers who are trusted members of and/or have an unusually close understanding of the community served. This trusting relationship enables CHWs to serve as a liaison, link, or intermediary between health/social services and the community to facilitate access to services and improve the quality and cultural competence of service delivery. CHWs also build individual and community capacity by increasing health knowledge and self-sufficiency through a range of activities such as outreach, community education, informal counseling, social support, and advocacy.[36]	APHA, 2009
	Workforce Characteristics	Characteristics such as age, training, and practice setting, which are specific to awardee staff who coach and train prospective practitioners for conducting the intervention and practitioners themselves involved in facilitating the intervention.[37]	Damscchroder, 2009

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Implementation Process	A comprehensive set of strategies and steps used by a health care organization when preparing for and executing the adoption of a health care innovation. The format and content of the strategies/steps will vary depending upon the expectations and needs of the organization, but it most usually incorporates information about the innovations' expected time frames, chosen methods of training accompanying the adoption, cost estimates, distribution of labor and responsibilities and workflow changes, among other factors. The goal of the implementation process is to provide a specific and organized plan of attack in order to account for the many decisions and factors that contribute to adoption of a health care innovation.[38] [39] [40]		Berg, 2001; Kilbourne 2007, Mans, 2009
	Stakeholder Engagement	Stakeholder engagement is involving the key players (patients, consumers, caregivers, providers, staff, researchers, policymakers, and community partners) in the implementation process to help focus the program and research on meaningful outcomes and increase the likelihood of stakeholder buy-in and sustainability of the program.[41] [42]	Health Affairs, 2012; AHRQ, Effective Health Care Program, Stakeholder Engagement brief, 2011.

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Table A-1. Definitions of Evaluation Planning Matrix Domains and Subdomains, revised: 3.26.2014

Domains	Corresponding Subdomains	Definition	Source(s) (abbreviated, full citation is below in endnotes)
	Execution	Execution consists of the processes for achieving the program's objectives. The effectiveness of carrying out the tasks of the program may be facilitated or impeded by decision-making processes, organizational arrangements, or implementation planning.[43] [44]	Zuckerman, H&HNmag.com, 2005; Rodak, Creating Accountability in Execution, 2013 (Becker's hospital review)
	Workflow Processes	The tasks and workflows, including interdependencies between them that are the focus of the change strategy or that will be affected by it. The flow or path of the work steps, i.e., the way in which work progresses, including things like order of steps and selection between alternative steps. Like a process, a workflow has inputs and outputs, i.e., resources (mass, energy, information) and the people or things that perform the steps or activity that comprise the work are considered. It is an established business process describing how the tasks are done, by whom, in what order, and how quickly[45].	Carol Cain; Saira Haque, 2008

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Table A-1. Definitions of Evaluation Planning Matrix Domains and Subdomains, revised: 3.26.2014

Domains	Corresponding Subdomains	Definition	Source(s) (abbreviated, full citation is below in endnotes)
	Care Coordination	Care coordination is the conscious effort by two or more health care professionals to facilitate and coordinate the appropriate delivery of health care services for a patient. Care Coordination Approach is a person-centered, assessment-based, interdisciplinary approach to integrating health care and social support services in a cost-effective manner in which an individual's needs and preferences are assessed, a comprehensive care plan is developed, and services are managed and monitored by an evidence-based process which typically involves a designated lead care coordinator. Approaches includes: • Teamwork focused on Coordination • Health care home • Care Management • Medication Management • Health-IT enabled Coordination (i.e. Telemedicine)[46] [47]	National Coalition on Care Coordination (N3C), policy brief on Implementing Care Coordination in PPACA; McDonald, 2007; AHRQ, 2010
	HIT workflow	HIT workflow entails the flow or path of electronic information exchange, and the tasks and steps that comprise that flow and interdependencies among them. It is an established business process describing how the tasks are done, by whom, in what order, and how quickly.[48]	AHRQ. 2013

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[46] National Coalition on Care Coordination (N3C), policy brief on Implementing Care Coordination in PPACA; McDonald, 2007.

[47] Agency for Healthcare Research and Quality. Care Coordination Measures Atlas. December 2010, pg. 1-280.

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Table A-1. Definitions of Evaluation Planning Matrix Domains and Subdomains, revised: 3.26.2014

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	Evaluating and Reflecting	Self-monitoring is a procedure and tracking tool that aims to incentivize participants and improve participation, sustainability, and outcomes in health improvement programs. *The practice of self-monitoring has been shown to increase the accuracy with which direct service providers implement a variety of protocols in health programs.[49] [50]	Healthy incentives, 2009; Plavnick, 2010
	Team Dynamics	Any references to the dynamics around staff interactions with each other and those outside of the practice (e.g., hospitals, mental health providers, other specialists). Statements either positive or negative about a collective sense of team, a shared vision, communication networks, information sharing, and levels of mutual respect and trust among team members (e.g., use of collective problem solving vs. top-down approach, clarity around roles/responsibilities, inclusive approach vs. non-inclusive approach).[51] [52] [53][54]	O'Daniel, 2013; Hughes, 2008; AHRQ, 2013, Damschroder et al., 2009

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<table>
<tr><th>Domains</th><th>Corresponding Subdomains</th><th>Definition</th><th>Source(s) (abbreviated, full citation is below in endnotes)</th></tr>
<tr><td>Participant Characteristics</td><td colspan="2">A set of defining traits, socioeconomic demographics, disease conditions, or risk behaviors belonging to a person prior to participating in the HCIA program. Participants include patients served by the intervention. Characteristics included in this domain include the characteristics that we are not able to abstract from site reports or claims data. The characteristics may include, but are not limited to the following: age, gender, race, country of origin, insurance status, occupation, level of education, comorbidities, access to services, time of follow-up, health literacy, cognitive abilities, participation rates, awareness of condition, empowerment, etc.[55] [56][57]</td><td>Schell, 2013; The Health Communication Unit, 2007; Damschroder, 2009</td></tr>
<tr><td></td><td>Demographics</td><td>Pre-existing, socioeconomic characteristics that relate to race/ethnicity, patient's income level, employment status, and insurance status. [58] [59]</td><td>Cochrane, 2011; Rychetnik, 2002</td></tr>
<tr><td></td><td>Risk-Behaviors</td><td>A behavior or other factor that places a patient at risk for diseases, including such factors as poor nutrition, smoking, alcohol use, etc., which can contribute to leading causes of morbidity and mortality and are often interrelated and preventable.[60] [61]</td><td>CDC, 2011; Gardner, 2013</td></tr>
</table>

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Table A-1. Definitions of Evaluation Planning Matrix Domains and Subdomains, revised: 3.26.2014

Domains	Corresponding Subdomains	Definition	Source(s) (abbreviated, full citation is below in endnotes)
Implementation Effectiveness	the pooled or aggregate consistency and quality of targeted organizational members' use of an innovative technology or practice and targeted organizational members' commitment to consistent and quality use of that technology or practice[62]		Helfrich 2007
	Dosage	Dosage or exposure refers to the amount of an intervention received by participants; in other words, whether the frequency and duration of the intervention is as full as prescribed by its designers.[63]	Carroll et al., 2007
	Fidelity	Fidelity is defined as the degree to which an intervention was implemented as it was prescribed in the original protocol or as it was intended by the program developers. Includes the following components: • Integrity • Consistency • Timeliness of the Intervention[64]	Proctor 2011
	Reach	Reach is an individual-level measure (e.g., patient or employee) of participation. Reach refers to the percentage and risk characteristics of persons who receive or are affected by a policy or program. It is measured by comparing records of program participants and complete sample or "census" Information for a defined population, such as all members in a given clinic, health maintenance organization, or worksite. If accurate records are kept of both the numerator (participants) and the denominator (population), calculation of participation rates is straightforward.[65]	Glasgow 1999

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Table A-1. Definitions of Evaluation Planning Matrix Domains and Subdomains, revised: 3.26.2014

Domains	Corresponding Subdomains	Definition	Source(s) (abbreviated, full citation is below in endnotes)
	Reach with population	Amount (e.g., number of patients, proportion of population) of the population reached by innovation.[66]	AHRQ, 2013
	Reach within organization	The absolute number, proportion, and representativeness of individuals who adopt or participate in the innovation within the organization.[67]	AHRQ, 2013
	Sustainability	Sustainability is defined as the extent to which a newly implemented treatment is maintained or institutionalized within a service setting's ongoing, stable operations.[68]	Proctor 2011
	Formalization of Care Coordinator Role	CHWs are known by a variety of names, including community health worker, community health advisor, outreach worker, community health representative (CHR), promotora/promotores de salud (health promoter/promoters), patient navigator, navigator promotoras (navegadores para pacientes), peer counselor, lay health advisor, peer health advisor, and peer leader.[69]	CDC, 2011
	Replicability	Plans, timing, and/or methods of spread within and beyond the adopting site.[70]	AHRQ, 2013

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Table A-1. Definitions of Evaluation Planning Matrix Domains and Subdomains, revised: 3.26.2014

Domains	Corresponding Subdomains	Definition	Source(s) (abbreviated, full citation is below in endnotes)
Coordinated Care		Coordinated care is outcomes of Care coordination that are NOT tests (e.g. – process is making the appointment, the outcome is keeping the appointment)	
	Efficiency		
	Timeliness of care		
Clinical Effectiveness	Diabetes	Delivery of comprehensive care for Type 2 diabetes (e.g., in 1 year, foot exam, regular hb1ac, LDL and BP checks, eye exam)	
	Asthma		
	Patient/Provider Satisfaction		
Health Care Outcomes	***Appropriateness of Care***	What works best for whom under what circumstances "Clinical effectiveness research (CER) serves as the bridge between the development of innovative treatments and therapies and their productive application to improve human health. Building on efficacy and safety determinations necessary for regulatory approval, the results of these investigations guide the delivery of appropriate care to individual patients. "[71] "Information relevant to guiding decision making in clinical practice requires the assessment of a broad range of research questions (e.g., how, when, for whom, and in what settings are treatments best used?), yet the current research paradigm, based on a hierarchical arrangement of study designs, assigns greater weight or strength to evidence produced from methods higher in the hierarchy, without necessarily considering the appropriateness of the design for the particular question under investigation" [72]	Institute of Medicine (US) Roundtable on Value & Science-Driven Health Care; Institute of Medicine (US) Roundtable on Value & Science-Driven Health Care, 2010

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Table A-1. Definitions of Evaluation Planning Matrix Domains and Subdomains, revised: 3.26.2014

Domains	Corresponding Subdomains	Definition	Source(s) (abbreviated, full citation is below in endnotes)
	Unintended Consequences	Emergent, interim, or longer-term outcomes that were unanticipated and usually not desired[73]	CFIR - Draft Methods Report
	Access	Facilitating access is concerned with helping people to command appropriate health care resources in order to preserve or improve their health. Access is a complex concept and at least four aspects require evaluation. If services are available and there is an adequate supply of services, then the opportunity to obtain health care exists, and a population may 'have access' to services. The extent to which a population 'gains access' also depends on financial, organizational and social or cultural barriers that limit the utilization of services. Thus access measured in terms of utilization is dependent on the affordability, physical accessibility and acceptability of services and not merely adequacy of supply. Services available must be relevant and effective if the population is to 'gain access to satisfactory health outcomes'. The availability of services, and barriers to access, have to be considered in the context of the differing perspectives, health needs and material and cultural settings of diverse groups in society. Equity of access may be measured in terms of the availability, utilization or outcomes of services. Both horizontal and vertical dimensions of equity require consideration.[74] Examples: Availability of medical advice by phone; length of time between making an appointment and the day of visit; length of time spent waiting in the office for the doctor; amount of visit time spent with doctors and staff; hours when the doctor's office is open; convenience of location of the office; ease of seeing the doctor of one's choice; making appointments for care by phone.[75]	Gulliford et al., 2002; ARHQ, 2013

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Table A-1. Definitions of Evaluation Planning Matrix Domains and Subdomains, revised: 3.26.2014

Domains	Corresponding Subdomains	Definition	Source(s) (abbreviated, full citation is below in endnotes)
Health Outcomes	**Mortality**	The death rate often made explicit for a particular characteristic (e.g. Gender, sex, or specific cause of death). Mortality rate contains three essential elements: the number of people in a population exposed to the risk of death (denominator), a time factor, and the number of deaths occurring in the exposed population during a certain time period (numerator).	CMS Glossary
	Morbidity	A diseased state, often used in the context of a "morbidity rate". I common clinical usage, any disease state, including diagnosis and complications.	CMS Glossary
	Comorbidities	Patients that experience simultaneous presence of two chronic diseases or conditions. The comorbid chronic conditions often make the care that a patient receives more complex for the provider to deliver and more costly for the patient and insurance provider.[76] [77]	Piette, 2006; Kelly, 2012
Cost	***Spending per patient***		
	Medicare spending		
	Medicaid spending		
	Cost savings		

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APPENDIX B

DATA SOURCES FOR THE HCIA COMMUNITY RESOURCE EVALUATION

Table B-1. Data Sources for the HCIA Community Resource Evaluation

Data Source	Brief Description and Use in the Evaluation
Self-Monitoring Measurement Plans	Measures selected by awardees to monitor outcomes related to health care quality, health outcomes, and cost savings; as of Q5, awardees must submit self-monitoring plans quarterly **Strengths**: The list of measures is extensive and tied to the goals of the innovation **Limitations**: Availability and quality of the data used for measurement will vary widely by awardee and sites within awardees
Application (Baseline)	The original application that awardees submitted to CMMI when applying for HCIA funding; awardee applications provide a baseline understanding of awardee goals, theory of change, target population, and plans for implementation **Strengths**: Provides the benchmark for fidelity: the innovation as it was intended to be implemented **Limitations:** The details of the innovation, its goals and purposes are not consistently well described
Quarterly Reports (Lewin Data)	An extensive inventory of categorical and numerical data that awardees submit quarterly; includes organizational characteristics (e.g., services provided, location of innovation, number of clinical sites), direct and indirect expenditures, staffing, training, and program participant characteristics **Strengths:** Provides a standard means of collecting data across disparate innovations **Limitations:** Awardees do not apply the definitions consistently; they may also use alternative definitions internally that are more useful for evaluation
Progress Reports	The progress report summarizes the past quarter's activities; describes the project's accomplishments, lessons learned to date, and planned activities; and presents the results of self-monitoring **Strengths:** Provides a narrative description from the awardee of their progress and challenges **Limitations:** Often the details in this narrative report do not align with facts presented in other data sources
Operational Plans	A detailed work-plan used to monitor and track awardee goals and milestones; these goals and milestones are linked to the innovation's driver diagrams (logic model) **Strengths**: Provides an up-to-date overview of what aspects of implementation are on or off track **Limitations:** The consistency of the reporting may vary among awardees- some are more or less detailed; goals and milestones may not map logically to the intended outcomes or fail to capture the full scale and significance of implementation challenges

(continued)

Table B-1. Data Sources for the HCIA Community Resource Evaluation (continued)

Secondary Data Source	Brief Description
Claims Data	The information that providers submit to CMS when a claim is submitted for payment will be obtained from CMS' Chronic Conditions Warehouse (CCW), although more timely Medicaid data may be accessible through some of the states directly; claims data include payer type, diagnosis and procedure codes, cost, admissions, rehospitalization, and ED visits **Strengths:** Standard data that measure the HCIA outcomes: total cost of care, ED visits, hospitalizations, readmissions; allows for the creation of beneficiary comparison groups. Medicare data are relatively timely **Limitations:** Medicaid data are not timely and will not reflect the quarterly reporting period. Medicaid data accessed directly from the state may be more up to date but involve time to establish data use agreements
Awardee Datasets	Data maintained by the awardee or subrecipients that track the client's health care utilization, health status, services received through the innovation, and client characteristics; these may be administrative or case management systems developed by the awardee, and may also include an EHR **Strength:** Data may be highly granular and the single best source for establishing reach, dosage, and clinical outcomes; data are generally very up to date **Limitations**: May require additional data sharing agreements. Time needed to understand the structure and nuances of the data. May not have all the information necessary to assess the quality of the data
Interview Data	Qualitative data collected during site visits using a semistructured guide; interview topics include partnerships, organizational capacity, implementation processes and effectiveness, workforce development, and data sources and characteristics. Individuals interviewed include all key project leaders, partners, and field staff. Site visits are conducted in Year 1 **Strength:** Provides in-depth understanding of the innovation and its implementation that cannot be gleaned from secondary sources; insights into why aspects of the innovation or implementation are going well or failing **Limitations:** Captures a snapshot of a rapidly evolving project; cannot draw inferences on the impact of innovation on outcomes
Provider Survey	Survey of providers from a subset of HCIA awardees who have been affected by the innovation either directly through a new tool or process or providers who have benefited from the innovation (e.g., community health worker). Survey topics will measure the changes in practice, workflow, and burden resulting from the innovation, and barriers to adoption **Strength**: A quantifiable means of measuring the impact of the innovation on provider practices **Limitations**: May not be able to capture a fully representative sample of providers; without adequate incentives, response rate may be low; innovation may be invisible to the provider

(continued)

Table B-1. Data Sources for the HCIA Community Resource Evaluation (continued)

Secondary Data Source	Brief Description
Introductory and Planning Calls with Awardees	Informal communications held with awardee managers to introduce the RTI evaluation team and plan site visits; these communications are documented in notes **Strengths**: These calls often generate worthwhile insights about the innovation or implementation that help the team better prepare for the site visits **Limitations:** The calls are short (generally 30 minutes or less) and their purpose is simply to orient the site visit team, not provide in-depth insights
Data Assessment Questionnaire and Follow-up	A short Web-based questionnaire sent to awardee data managers in March 2013 to gain information on the kinds of data available, steps required to access it, and data-sharing requirements; a follow-up call reviews and clarifies the responses **Strengths**: Provides a standard way of assessing data availability and rapid feedback to CMS on potential data concerns among the awardees **Limitations**: Data are for internal planning purposes only

Source: Updatedss from the Evaluation Design Report submitted January 3, 2014.
CMMI = Center for Medicare and & Medication Innovation; ED = emergency department; EHR = electronic health record; Q = quarter.

APPENDIX C

CMS PRIORITY AND STANDARD MEASURES COLLECTED BY EACH HCIA-COMMUNITY RESOURCE AWARDEE

Table C-1. CMS Priority and Standard Measures Collected by Each HCIA-Community Resource Awardee

Standard Measures Number (if applicable)	NQF Number (if applicable)	Priority Measure Number (if applicable) and Name	Number of Awardees Used As Is	Awardees Used As Is	Number of Awardees Used Modified	Awardees Used Modified*
6	NQF 0486	1. Adoption of Medication e-Prescribing	4	• Curators • Intermountain • Mineral Regional • U-Miami	0	N/A
8	NQF 0489	2. Ability for Providers with HIT to Receive Laboratory Data Electronically Directly into their Qualified/Certified EHR System as Discrete Searchable Data	2	• Intermountain • U-Miami	0	N/A
10	NQF 0038	3. Childhood Immunization Status	3	• BAHC • Children's Hospital • U-Miami	0	N/A
11	NQF 0041	4. Influenza Vaccination	5	• BAHC • Curators • ECCHC • NHCHC • U-Chicago	0	N/A
12	NQF 0043	5. Pneumonia Vaccination Status for Older Adults	5	• BAHC • Curators • ECCHC • MPHI • NHCHC	0	N/A
13	NQF 0028	6. Measure Pair: (a) Tobacco Use Assessment, (b) Tobacco Cessation Intervention	2	• BAHC • U-Miami	3	• Curators • ECCHC • NHCHC
14	NQF 0034	7. Colorectal Cancer Screening	1	• AACI	2	• Finity • Northeastern
19	NQF 1392	8. Well-Child Visits in the First 15 Months of Life	1	• Children's Hospital	0	N/A
20	NQF 1516	9. Well-Child Visits in the Third, Fourth, Fifth, and Sixth Years of Life	1	• Children's Hospital	0	N/A
17/58	NQF 0024	10. Body Mass Index (BMI) 2 through 18 Years of Age	1	• ECCHC	0	N/A

(continued)

Table C-1. CMS Priority and Standard Measures Collected by Each HCIA-Community Resource Awardee (continued)

Standard Measures Number (if applicable)	NQF Number (if applicable)	Priority Number (if applicable) and Measure Name	Number of Awardees Used As Is	Awardees Used As Is	Number of Awardees Used Modified	Awardees Used Modified*
16	NQF 0421	11. Adult Weight Screening and Follow-Up	4	• BAHC • ECCHC • Intermountain • NHCHC	1	• Curators
115	NQF 0541	12. Proportion of Days Covered: 5 Rates by Therapeutic Category	0	N/A	0	N/A
22	NQF 0055	13. Comprehensive Diabetes Care: Eye Exam	3	• BAHC • MPHI • NHCHC	3	• Finity • SCCHC • U-Miami
23	NQF 0056	14. Diabetes: Foot Exam	4	• BAHC • ECCHC • NHCHC • SCCHC	0	N/A
24	NQF 0062	15. Comprehensive Diabetes Care: Medical Attention for Nephropathy	2	• Curators • SCCHC	2	• Finity • MPHI
26	NQF 0066	16. ACE Inhibitor or ARB Therapy–Diabetes or LVSD	0	N/A	1	• Finity
27	NQF 0067	17. Antiplatelet Therapy	1	• Curators	0	N/A
30	NQF 0070	18. Beta-Blocker Therapy—Prior MI or LVSD	2	• Curators • Intermountain	1	• Finity
29/100	NQF 0074	19. Lipid Control	2	• ECCHC • Intermountain	0	N/A
31	NQF 0083	20. Beta-blocker Therapy for Left Ventricular Systolic Dysfunction	1	• Curators	1	• Finity
	NQF 0068	21. Use of Aspirin or Another Antithrombotic				
101	NQF 0075	22. Complete Lipid Profile and LDL Control <100				
33	NQF 0164	23. Fibrinolytic Therapy Received Within 30 Minutes of Hospital Arrival	0	N/A	0	N/A

(continued)

Table C-1. CMS Priority and Standard Measures Collected by Each HCIA-Community Resource Awardee (continued)

Standard Measures Number (if applicable)	NQF Number (if applicable)	Priority Number (if applicable) and Measure Name	Number of Awardees Used As Is	Awardees Used As Is	Number of Awardees Used Modified	Awardees Used Modified*
34	NQF 0288	24. Fibrinolytic Therapy Received Within 30 Minutes of ED Arrival	0	N/A	0	N/A
35	NQF 0163	25. Primary PCI Received within 90 Minutes of Hospital Arrival	0	N/A	0	N/A
	NQF 0290	26. Median Time to Transfer to Another Facility for Acute Coronary Intervention				
	NQF 0102	27. COPD: Inhaled Bronchodilator Therapy				
	PQRS 64	28. Asthma: Asthma Assessment				
39	NQF 0047	29. Asthma: Pharmacologic Therapy for Persistent Asthma	0	N/A	6	• BAHC • Children's Hospital • Mary's Center • NHCHC • SCCHC • U- Miami
79/87	NQF 0004	30. Initiation and Engagement of Alcohol and Other Drug Dependence Treatment	1	• SCCHC	0	N/A
	NQF 0529	31. Prophylactic Antibiotics Discontinued Within 24 Hours After Surgery End Time				
	NQF 0218	32. Surgery Patients Who Received Appropriate VTE Prophylaxis Within 24 Hours Pre/post-surgery				
44	NQF 0418	33. Screening for Clinical Depression	4	• ECCHC • Mineral Regional • NHCHC • SCCHC	2	• U-Miami • W&I
47/84	NQF 0557	34. Post-Discharge Continuing Care Plan Created	1	• SCCHC	0	N/A
85	NQF 0558	35. Post-Discharge Continuing Plan Transmitted to Next Level of Care Provider Upon Discharge	0	N/A	0	N/A

(continued)

Table C-1. CMS Priority and Standard Measures Collected by Each HCIA-Community Resource Awardee (continued)

Standard Measures Number (if applicable)	NQF Number (if applicable)	Priority Number (if applicable) and Measure Name	Number of Awardees Used As Is	Awardees Used As Is	Number of Awardees Used Modified	Awardees Used Modified*
	NQF 0576	36. Follow-Up After Hospitalization for Mental Illness				
	NQF 1391	37. Frequency of Ongoing Prenatal Care				
80	NQF 0228	38. 3-Item Care Transition Measure	1	• Curators	1	• W&I
81	NQF 0648	39. Care Transition Record Transmitted to Health Care Professional	0	N/A	1	• Mary's Center
82	NQF 0647	40. Transition Record with Specified Elements Received by Discharged Patients	0	N/A	2	• Northeastern • W&I
90	NQF 0097	41. Medication Reconciliation	1	• SCCHC	0	N/A
	NQF 0229, 0230, 1893, 0468	42. 30-Day Mortality Rate, Risk Adjusted	0	N/A	0	N/A
	NQF 0729	43. Optimal Diabetes Care	0	N/A	5	• BAHC • Curators • Mary's Center • NHCHC • Northeastern
99	NQF 0018	44. HTN: Controlling High Blood Pressure				
	NQF 0469	45. Elective Delivery Prior to 39 Completed Weeks Gestation				
	NQF 0471	46. Cesarean Rate for Low-Risk First Birth Women				
113	NQF 0716	47. Healthy Term Newborn	0	N/A	0	N/A
		48. Continuity Assessment Record and Evaluation Tool (CARE Tool)	0	N/A	1	• W&I
		49. CARE-F and CARE-C Assessment Tools for Nursing Facilities, Day Rehabilitation Programs, and Other Ambulatory Settings in the Community	0	N/A	0	N/A

(continued)

Table C-1. CMS Priority and Standard Measures Collected by Each HCIA-Community Resource Awardee (continued)

Standard Measures Number (if applicable)	NQF Number (if applicable)	Priority Number (if applicable) and Measure Name	Number of Awardees Used As Is	Awardees Used As Is	Number of Awardees Used Modified	Awardees Used Modified*
117	NQF 0429, 0430	50. Activity Measure for Post-Acute Care (AM-PAC)-CMS DOTPA Short Form Public Domain Version	0	N/A	0	N/A
	NQF 0531	51. Patient Safety for Selected Indicators	0	N/A	0	N/A
127	NQF 0005-7, 0009, 0517, 0691-0693, 0258	52. CAHPS® surveys	2	• Mineral Regional • SEMHS	4	• Finity • Prosser • U-Miami • W&I
		53. Measurement Principles for Medicare Fee-for-Service Payments	1	• NHCHC	3	• Finity • Imaging Advantage • W&I
		54. Medicare Spending Per Beneficiary, Risk-adjusted and Price Standardized	1	• Curators	0	
	NQF 1789	55. Hospital All-Cause Unplanned Readmissions, Risk Adjusted	0	N/A	3	• Northeastern • REMSA • W&I
141	NQF 0274	56. Diabetes Long-term Complications	0	N/A	1	• Bronx RHIO
141	NQF 0275	57. Chronic Obstructive Pulmonary Disease	0	N/A	0	N/A
141	NQF 0277	58. Congestive Heart Failure Admission Rate	0	N/A	0	N/A
141	NQF 0279	59. Bacterial Pneumonia	0	N/A	0	N/A
141	NQF 0281	60. Urinary Tract Infection Admission Rate	0	N/A	0	N/A
141	NQF 0283	61. Adult Asthma	0	N/A	2	• Bronx RHIO • Mary’s Center

(continued)

Table C-1. CMS Priority and Standard Measures Collected by Each HCIA-Community Resource Awardee (continued)

Standard Measures Number (if applicable)	NQF Number (if applicable)	Priority Number (if applicable) and Measure Name	Number of Awardees Used As Is	Awardees Used As Is	Number of Awardees Used Modified	Awardees Used Modified*
		62. Hospital ED Visit Rate That Did Not Result in Hospital Admission, by Condition	0	N/A	6	• BAHC • Curators • Finity • Intermountain • NHCHC • W&I
1		TeamSTEPPS Questionnaires	2	• Mineral Regional • Northeastern	0	N/A
2		Single-Item Provider Satisfaction Question	1	• Mineral Regional	0	N/A
3		Minimizing Errors/Maximizing Outcomes (MEMO) Provider Survey	1	• Curators	0	N/A
4		Employee Retention and Turnover	3	• Curators • Y-USA • SEMHS	1	• MPHI
5		Burnout	2	• Children's Hospital • Y-USA	0	N/A
9		PCMH Certification	1	• AACI	0	N/A
15		Cervical Cancer Screening	2	• AACI • NHCHC	1	• Finity
18		Screening for Future Fall Risk	1	• Curators	0	N/A
		Frequency of Ongoing Prenatal Care	0	N/A	1	• ECCHC
25		Diabetic lipid and Hemoglobin A1c profile	7	• Bronx RHIO • Children's Hospital • Curators • Finity • Intermountain • MPHI • NHCHC	2	• ECCHC • U-Miami
28		Use of Aspirin or Another Antithrombotic	0	N/A	0	N/A

(continued)

Table C-1. CMS Priority and Standard Measures Collected by Each HCIA-Community Resource Awardee (continued)

Standard Measures Number (if applicable)	NQF Number (if applicable)	Priority Number (if applicable) and Measure Name	Number of Awardees Used As Is	Awardees Used As Is	Number of Awardees Used Modified	Awardees Used Modified*
32		Left ventricular ejection fraction assessment (inpatient/outpatient)	1	• Intermountain	0	N/A
		Lipid Management for patients with acute cardiovascular events	2	• Intermountain • MPHI	0	N/A
37		Use of Appropriate Medications for Asthma	2	• Children’s Hospital • U-Miami	0	N/A
38		Medication Management for People With Asthma	2	• NHCHC • SCCHC	3	• ECCHC • Mary’s Center • U-Miami
41		COPD: Spirometry evaluation	1	• Curators	0	N/A
42		COPD: Inhaled bronchodilator therapy	0	N/A	0	N/A
43		Hyperlipidemia (Primary Prevention) - Lifestyle Changes or Lipid Lowering Therapy	0	N/A	1	• NHCHC
45		Antidepressant Medication Management	3	• Intermountain • NHCHC • SCCHC	0	N/A
46		Depression Screening by 18 years of age	2	• Mineral Regional • SCCHC	1	• U-Miami
		Follow-up After Hospitalization for Mental Illness	1	• NHCHC	0	N/A
49		Adherence to Antipsychotic Medications for Individuals with Schizophrenia	1	• SCCHC	0	N/A
50		Diabetes screening for people with schizophrenia or bipolar disorder who are prescribed antipsychotic medications (SSD)	2	• NHCHC • SCCHC	0	N/A
51		Cardiovascular health screening for people with schizophrenia or bipolar disorder who are prescribed antipsychotic medications	0	N/A	0	N/A

(continued)

Table C-1. CMS Priority and Standard Measures Collected by Each HCIA-Community Resource Awardee (continued)

Standard Measures Number (if applicable)	NQF Number (if applicable)	Priority Number (if applicable) and Measure Name	Number of Awardees Used As Is	Awardees Used As Is	Number of Awardees Used Modified	Awardees Used Modified*
52		Cardiovascular health monitoring for people with cardiovascular disease and schizophrenia (SMC)	1	• NHCHC	0	N/A
53		Diabetes monitoring for people with diabetes and schizophrenia	2	• NHCHC • SCCHC	0	N/A
54		Follow-Up After Hospitalization for Schizophrenia (7- and 30-day)	0	N/A	1	• NHCHC
55		Annual Dental Visit	1	• SCCHC	1	• U-Miami
59		Combination chemotherapy is considered or administered within 4 months (120 days) of diagnosis for women under 70 with AJCC T1c, or Stage II or III hormone receptor negative breast cancer	0	N/A	0	N/A
60		Adjuvant chemotherapy is considered or administered within 4 months (120 days) of surgery to patients under the age of 80 with AJCC III (lymph node positive) colon cancer	0	N/A	0	N/A
61		Proportion receiving chemotherapy in the last 14 days of life	0	N/A	0	N/A
62		Oncology: Plan of Care for Pain – Medical Oncology and Radiation Oncology	0	N/A	0	N/A
63		Oncology: Pain Intensity Quantified – Medical Oncology and Radiation Oncology	0	N/A	0	N/A
64		Oncology: Cancer Stage Documented				
65		Comfortable Dying: Pain Brought to a Comfortable Level Within 48 Hours of Initial Assessment				
66		Self-Reporting of Pain	0	N/A	0	N/A
67		Self-Reported Measure of Severe Pain	0	N/A	0	N/A

(continued)

Table C-1. CMS Priority and Standard Measures Collected by Each HCIA-Community Resource Awardee (continued)

Standard Measures Number (if applicable)	NQF Number (if applicable)	Priority Number (if applicable) and Measure Name	Number of Awardees Used As Is	Awardees Used As Is	Number of Awardees Used Modified	Awardees Used Modified*
68		Patients treated with opioid given a bowel regimen				
69		Venous Thromboembolism Prophylaxis	0	N/A	0	N/A
		Antithrombotic Therapy by End of Hospital Day Two	0	N/A	0	N/A
71		Assessed for Rehabilitation	0	N/A	0	N/A
72		Discharged on Antithrombotic Therapy	0	N/A	0	N/A
73		Anticoagulant Therapy Prescribed for Atrial Fibrillation at Discharge	0	N/A	0	N/A
74		Discharged on Statin Medication	0	N/A	2	• ECCHC • Intermountain
75		Head CT or MRI Scan Results for Acute Ischemic Stroke or Hemorrhagic Stroke Patients who Received Head CT or MRI Scan Interpretation Within 45 minutes of ED Arrival	0	N/A	0	N/A
76		Screening for Dysphagia	0	N/A	0	N/A
77		Pressure Ulcer Prevention Plans Implemented	0	N/A	0	N/A
78		Therapeutic monitoring: Annual monitoring for patients on persistent medications	0	N/A	0	N/A
83		Advanced Care Plan	0	N/A	0	N/A
88		Follow-Up After Hospitalization	1	• NHCHC	0	N/A
89		Documentation of known adverse drug reactions (ADRs): percentage of patients whose known ADRs are documented on the current medication chart	0	N/A	0	N/A
91		Medication Reconciliation Post-Discharge	0	N/A	1	• SCCHC

(continued)

Table C-1. CMS Priority and Standard Measures Collected by Each HCIA-Community Resource Awardee (continued)

Standard Measures Number (if applicable)	NQF Number (if applicable)	Priority Number (if applicable) and Measure Name	Number of Awardees Used As Is	Awardees Used As Is	Number of Awardees Used Modified	Awardees Used Modified*
92		Participant All-Cause Mortality Rate	3	• Curators • NHCHC • W&I	0	N/A
93		Comprehensive Diabetes Care	2	• NHCHC • SCCHC	0	N/A
94		Hemoglobin A1c Poor Control	9	• BAHC • Bronx RHIO • ECCHC • Intermountain • Mary's Center • MPHI • NHCHC • SCCHC • U-Chicago	2	• AACI • Curators
95		Blood Pressure Management	3	• MPHI • NHCHC • SCCHC	2	• Intermountain • Mary's Center
96		Low Density Lipoprotein (LDL) Management and Control	2	• Bronx RHIO • MPHI	0	N/A
141		Congestive Heart Failure Admission Rate	0	N/A	0	N/A
98		Hospital 30-day, all-cause, risk-standardized readmission rate following heart failure hospitalization for patients 18 and older	0	N/A	2	• Mineral Regional • Northeastern
99		Controlling High Blood Pressure	6	• BAHC • ECCHC • Intermountain • NHCHC • SCCHC • U-Chicago	1	• Curators

(continued)

Table C-1. CMS Priority and Standard Measures Collected by Each HCIA-Community Resource Awardee (continued)

Standard Measures Number (if applicable)	NQF Number (if applicable)	Priority Number (if applicable) and Measure Name	Number of Awardees Used As Is	Awardees Used As Is	Number of Awardees Used Modified	Awardees Used Modified*
100		CAD: Lipid Control	2	• ECCHC • Intermountain	2	• Curators • Finity
101		IVD: Lipid Control	2	• Curators • Intermountain	0	N/A
102		Asthma: Percent of patients who have had a visit to an Emergency Department/Urgent Care office for asthma in the past 6 months	4	• BAHC • Bronx RHIO • NHCHC • U-Miami	0	N/A
103		Asthma Emergency Department Visits	2	• Bronx RHIO • NHCHC	0	N/A
104		Well-controlled asthma: FEV1	2	• Curators • U-Miami	0	N/A
105		Body Mass Index (BMI)	6	• Curators • ECCHC • Intermountain • Y-USA • U-Chicago • U-Miami	0	N/A
106		Depression Remission at 12 Months	1	• SCCHC	0	N/A
107		Depression Remission at 6 Months	1	• SCCHC	0	N/A
108		Pneumonia readmission rate	0	N/A	0	N/A
109		Postoperative Sepsis	0	N/A	0	N/A
110		Pressure Ulcers	0	N/A	0	N/A
111		Patient fall rate, inpatient	0	N/A	0	N/A
112		Low birth weight	1	• ECCHC	0	N/A
114		Percentage with an adverse drug events	1	• NHCHC	0	N/A
116a		VR-12	1	• SEMHS	1	• Prosser
118		PROMIS				

(continued)

Table C-1. CMS Priority and Standard Measures Collected by Each HCIA-Community Resource Awardee (continued)

Standard Measures Number (if applicable)	NQF Number (if applicable)	Priority Number (if applicable) and Measure Name	Number of Awardees Used As Is	Awardees Used As Is	Number of Awardees Used Modified	Awardees Used Modified*
119		Mental Health Status	3	• Intermountain • Mary's Center • SCCHC	0	N/A
120		BRFSS Questions	1	• Curators	0	N/A
121		Median Time from ED Arrival to ED Departure for Discharged ED Patients	0	N/A	0	N/A
122		Admit Decision Time to ED Departure Time for Admitted Patients	0	N/A	0	N/A
123		CAHPS	1	• Mineral Regional	1	• AACI
124		Availability of same-day appointments	1	• Mary's Center	0	N/A
125		Availability of extended office hours	0	N/A	0	N/A
126		Availability of after-hours access	0	N/A	0	N/A
128		CG CAHPS	2	• AACI • Northeastern	0	N/A
129		H CAHPS	2	• Intermountain • Mineral Regional	0	N/A
130		CAHPS- ECHO				
131		CAHPS Health Literacy	0	N/A	0	N/A
132		CAHPS Child Survey	1	• U-Miami	0	N/A
133		CAHPS PCMH				
134		FS-ICU				
135		NICU-FITS	1	• W&I	0	N/A
136		FIPRE: Fragile Infant Parent Readiness Evaluation	1	• W&I	0	N/A
137		Patient Activation Measure (PAM) 13 item measure	4	• Children's Hospital • Curators • ECCHC • Mineral Regional	0	N/A
138		Caregiver Quality of Life				

(continued)

Table C-1. CMS Priority and Standard Measures Collected by Each HCIA-Community Resource Awardee (continued)

Standard Measures Number (if applicable)	NQF Number (if applicable)	Priority Number (if applicable) and Measure Name	Number of Awardees Used As Is	Awardees Used As Is	Number of Awardees Used Modified	Awardees Used Modified*
139		National Caregiving Alliance Survey				
140		All cause inpatient admission rate	1	• SEMHS	4	• Bronx RHIO • Finity • MPHI • REMSA
141		Ambulatory Care Sensitive Condition Admission Rates	1	• Intermountain	3	• Bronx RHIO • Mary’s Center • MPHI
142		Hospital-Wide All-Cause Unplanned Readmission Measure (HWR)	1	• W&I	3	• Mineral Regional • Northeastern • REMSA
143		ED Visit Rate	12	• BAHC • Bronx RHIO • ECCHC • Finity • Intermountain • Mary’s Center • MPHI • NHCHC • Prosser • REMSA • SCCHC • W&I	2	• SEMHS • U-Chicago
144		Proportion not admitted to hospice	0	N/A	0	N/A
61		Proportion receiving chemotherapy in the last 14 days of life	0	N/A	0	N/A
146		Proportion with more than one emergency room visit in the last days of life	0	N/A	0	N/A
147		Proportion admitted to the ICU in the last 30 days of life	0	N/A	0	N/A

(continued)

Table C-1. CMS Priority and Standard Measures Collected by Each HCIA-Community Resource Awardee (continued)

Standard Measures Number (if applicable)	NQF Number (if applicable)	Priority Number (if applicable) and Measure Name	Number of Awardees Used As Is	Awardees Used As Is	Number of Awardees Used Modified	Awardees Used Modified*
148		Proportion admitted to hospice for less than 3 days	0	N/A	0	N/A
149		Total Cost of Care Population-based PMPM Index	10	• AACI • BAHC • Bronx RHIO • Intermountain • Mary's Center • MPHI • Mineral Regional • SCCHC • SEMHS • W&I	0	N/A
		Total Medicare Part A and B Cost Calculation	2	• Bronx RHIO • SCCHC	0	N/A

* Awardees did not provide justification for modifying measures.

Note: AACI = Asian Americans for Community Involvement. ARB = angiotensin II receptor blockers. COPD = chronic obstructive pulmonary disease. ED = emergency department. EHR = electronic health record. HIT = health information technology. HTN = hypertension. LVSD = left ventricular systolic dysfunction. MI = myocardial infarction. NHCHC = National Health Care for the Homeless Council. PCI = percutaneous coronary intervention. PMPM = per member per month. REMSA = Regional Emergency Medical Services Authority. RHIO = Regional Health Information Organization.

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APPENDIX D

DEFINITION OF INNOVATION COMPONENTS

Table D-1. Definition of Innovation Components

Innovation Component	Definition
Care Coordination	The deliberate organization of patient care activities between two or more participants (including the patient) involved in a patient's care to facilitate the appropriate delivery of health care services. Organizing care involves the marshalling of personnel and other resources needed to carry out all required patient care activities, and is often managed by the exchange of information among participants responsible for different aspects of care. (Source: McDonald, 2007) Include case management as part of care coordination.
Medical Home	A model or organization of primary care that delivers the core functions of primary health care and encompasses five functions and attributes: comprehensive care, patient-centered care, coordinated care, accessible services, quality and safety.
Home care	Professional and/or community health worker outreach, education, evaluation, environmental assessment and medical care provided to patients within their home (or caregiver's home) as needed to further treatment goals.
Direct care/Dental care	Medical or dental care provided by a licensed healthcare professional.
Workflow or process redesign	Revisions of clinical processes, procedures, protocols and practices both formal and informal.
HIT	The development, deployment, and enhancement of health information technology, specifically: electronic health records, personal health records, health and information exchange capabilities. Also includes Innovations related to the further development or infrastructure of health information and regional health information organizations
Decision support	Person-specific information, intelligently filtered or presented at appropriate times, to enhance health care decision making by patients or providers. Information is presented in tools-paper or electronic 'decision aids', computerized alerts and reminders through personal health records, and contextually relevant reference information.
Workforce Training	Education programs and efforts to provide staff with requisite skills for new programs. Training can be developed and delivered externally or internally.
Provider payment reform	The use of new payment models as a lever for change in health care delivery infrastructure or processes. May include participation in an Accountable Care Organization, Bundled Care/Episodic Payment, per member per month payments for care coordination or case management, or other innovations in the way providers are reimbursed for health care.