Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring, Annual Report 2015

Awardee-Level Findings:
YMCA of the USA

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March 2016

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RTI Project Number 0212790.010.001.004
Contract HHSM-500-2010-00021I
Order HHS-500-T0010

RTI INTERNATIONAL

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 responsible for 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). The evaluation methods vary by awardee innovation and are tailored to the type of innovation and availability of data. RTI's annual reporting includes a review, coding, and analysis of each awardee's *Narrative Progress Reports* and the *Quarterly Awardee Performance Reports*. In addition, RTI collected qualitative data through virtual site visits and end-of-year interviews in the 11th and 12th quarters of operations. Each awardee's report incorporates this knowledge.

RTI presents claims-based data analyses for those awardees that provide patient identifiers for enrolled participants who are Medicare and/or Medicaid beneficiaries. To date, RTI obtained patient or provider identifiers for 23 of the 24 awardees. This report also presents secondary data received directly from awardees that quantify the impact of the innovation on clinical effectiveness and health outcomes. ***Table 1*** presents the reporting periods for each of the data sources.

Table 1. Reporting Periods for Second Annual Report

Data Source	Period Covered
Awardee Narrative Progress Report	Q8–Q10 (June–December 2014)
Quarterly Awardee Performance Report	Q8–Q10 (June–December 2014)
Key informant interviews	February–June 2015
Medicare	Launch date–December 2014
Medicaid	Launch date–December 2014
Awardee-specific data	Launch date–March 2015

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 to expand a prevention program for prediabetic beneficiaries n 17 participating YMCAs across the nation. Y-USA began enrolling participants on February 15, 2013. The innovation seeks to achieve the following HCIA goals:

1. **Smarter spending.** Reduce health care expenditures by $1.8 million by June 2015. This goal was revised from a previous target of $4.2 million.

2. **Better care.** Improve care through diabetes-related preventive services in at least 500 community- and primary care-based settings by offering a diabetes prevention program (DPP) in community or clinical settings.

3. **Healthier people.** Achieve better health through changes in nutrition and physical activity, resulting in at least 5 percent weight loss, and reduced risks for diabetes, hypertension, and hypercholesterolemia for at least 50 percent of the 10,000 expected Medicare participants.

Table 2 provides a summary of changes that occurred with Y-USA during the third year of operations. These updates are based on a review of the Q8 to Q10 *Narrative Progress Reports, Quarterly Awardee Performance Reports*; secondary data submitted by Y-USA through March 31, 2015; and key informant interviews with Y-USA's leaders and staff conducted on June 8, 2015.

Table 2 Summary of Updates through June 2015

Evaluation Domains and Subdomains	Updated Information through 6/2015
Innovation Components	Implemented diverse recruitment strategies to increase participant enrollment.
Program Participant Characteristics	Majority (66.7%) of participants were from 65 to 74 years of age; 61.0% were female and 100% were covered by Medicare.
Implementation Process	
Execution	Expended 31.3% of budget by the end of Q10, which is below target.
	Implemented final "surge" of recruitment efforts. Some of these efforts were not fully implemented because of administrative delays in obtaining approval of carry-forward funds.
	Launched One Million More campaign in November to encourage 1 million people in the United States to complete a diabetes risk test. The campaign was a Y-USA campaign that was not funded by the HCIA project; however, the hope was that enrollment in the initiative would increase due to the campaign.

(continued)

Table 2 Summary of Updates through June 2015 (continued)

Evaluation Domains and Subdomains	Updated Information through 6/2015
Implementation Process (continued)	
Leadership	Y-USA leadership remains committed to the innovation.
Organizational capacity	Networking by Y-USA leadership with partner organizations vested in this area of work resulted in Y-USA's involvement in a study of competencies needed by CHWs.
Innovation adoption and workflow	Applied for CPT code to facilitate sustainability of the innovation.
Workforce Development	
Hiring/retention	No new hires or separations occurred between Q8 and Q10.
	In Q9, 1.5 FTE reduction from Q8, representing 0.5 FTE short of full staffing. As of Q10, at projection with 2.85 FTEs, 0.35 higher than Q9.
Training	Between Q8 and Q10, innovation had 1,726 new trainees, for a cumulative total of 2,992 (since inception).
Implementation Effectiveness	
Reach	1,968 new participants enrolled (5,696 cumulative total enrolled); 82.9% of participants recruited enrolled.
Dose	37.5% of participants completed between 9 and 16 sessions, 25.4% completed 17 or more sessions, and 37% completed fewer than 9 sessions.

Source: Q8-*Q10 Narrative Progress Report*.
Q8-*Q10 Quarterly Awardee Performance Report*.
Patient-level data provided to RTI by Y-USA.
Key informant interviews conducted Feb–June 2015.
CPT = current procedural terminology; CHW = community health worker; FTE = full-time equivalent.

1.1.1 Innovation Components

The HCIA innovation at Y-USA implements the national Diabetes Prevention Program Lifestyle intervention [also referred to as the Diabetes Prevention Program (DPP)] in 17 YMCA facilities across the country. For HCIA, the innovation expands the DPP to prediabetic Medicare beneficiaries. 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 overarching goals of Y-USA's HCIA innovation are to get participants to lose 5 percent or more of their body weight and gradually increase their physical activity to 150 minutes per week.

No changes were made to these components since their initial presentation in the first annual report.[1] However, Y-USA took significant steps to increase recruitment of participants into the innovation. We describe these efforts in detail in ***Section 1.2.1***. The partners for this innovation have remained unchanged and include the Diabetes Prevention and Control Alliance (a subsidiary of United Health Group's Optum Solutions), seven national nonprofits, and 17 local YMCAs.

[1] Rojas Smith, L., Holden, D. J., Hoerger, T., et al.: Evaluation of the Health Care Innovation Awards: Community Resource Planning, Prevention, and Monitoring Annual Report. 2014, October. Center for Medicare & Medicaid Innovation, Centers for Medicare & Medicaid Services. Available from: http://downloads.cms.gov/files/cmmi/HCIA-CommunityRPPM-FirstEvalRpt_4_9_15.pdf

1.1.2 Program Participant Characteristics

Table 3 provides the demographic characteristics of all participants ever enrolled in the innovation. We first reported patient demographic characteristics in the Q6 report, based on data through Q10. The distribution of patient characteristics is similar to that in the Q6 report. More specifically, the majority of participants (66.7%) were between 65 and 74 years of age at enrollment, and more than half (61.0%) were female. Less than half of participants (41.4%) were white, 7.6 percent were black, 1.8 percent were Hispanic, 48.5 percent were missing race/ethnicity, and the remaining 0.7 percent were Asian, American Indian/Alaska Native, or Native Hawaiian or other Pacific Islander. One hundred percent of enrollees were covered by either Medicare or Medicare Advantage.

Table 3. Characteristics of All Participants Ever Enrolled in the Innovation through March 2015

Characteristic	Number of Participants	Percentage of Participants
Total	5,696	100
Age		
< 18	0	0.0
19–24	1	0.0
25–44	9	0.2
45–64	171	3.0
65–74	3,799	66.7
75–84	831	14.6
85+	885	15.5
Missing	0	0.0
Sex		
Female	3,478	61.0
Male	1,399	24.6
Missing	819	14.4
Race/ethnicity		
White	2,361	41.4
Black	432	7.6
Hispanic	101	1.8
Asian	20	0.4
American Indian or Alaska Native	12	0.2
Native Hawaiian or Other Pacific Islander	5	0.1
Other	0	0.0
Missing/refused	2,765	48.5
Payer category		
Dual	0	0.0
Medicaid	0	0.0
Medicare[1]	5,696	100.0
Medicare Advantage	0	0.0
Other	0	0.0
Uninsured	0	0.0
Missing	0	0.0

Source: Patient-level data provided to RTI by Y-USA.
[1] Also includes Medicare Advantage beneficiaries; however, we are unable to distinguish Medicare fee-for-service from Medicare Advantage beneficiaries based on the data provided by Y-USA.

1.2 Implementation Progress

The first annual report (2014) described Y-USA's implementation process, workforce development, and progress toward effectiveness, and detailed the quantifiable measures to assess each area. ***Table 4*** lists these measures and their status as of May 31, 2015. This annual report includes the results of analyses for all of these measures.

This section presents Y-USA's process measures and a qualitative analysis of the factors that determined Y-USA's implementation progress. This analysis draws on patient-level data that Y-USA provided to RTI as of May 31, 2015, performance documents, and key informant interviews conducted in the 11th and 12th quarters of operations.

Table 4. Quantitative Explanatory Measures

Evaluation Domains	Subdomains	Measures	Status
Implementation effectiveness	Reach	Number/percentage of participants recruited (i.e., attended at least one core session)	Data received from Y-USA
		Number/percentage of participants who enrolled in the DPP (i.e., completed at least four core sessions)	Data received from Y-USA
	Dose	Number of sessions attended by each participant	Data received from Y-USA

DPP = diabetes prevention program; Y-USA = YMCA of the USA.

1.2.1 Implementation Process

The evaluation focuses on the components of implementation process—execution, organizational capacity, and leadership. RTI evaluates these components through Y-USA's *Narrative Progress Reports, Quarterly Awardee Performance Reports,* and qualitative interviews with key staff that provide additional context and detail. The findings presented here include Y-USA's reports from Q8 through Q10 and an interview conducted on June 8, 2015.

Evaluation Questions

- What is the overall execution of the innovation award in terms of the overall rate of expenditures relative to the projected rate?
- Does the awardee have sufficient overall organizational capacity and leadership to implement the innovation effectively?

Execution of Implementation

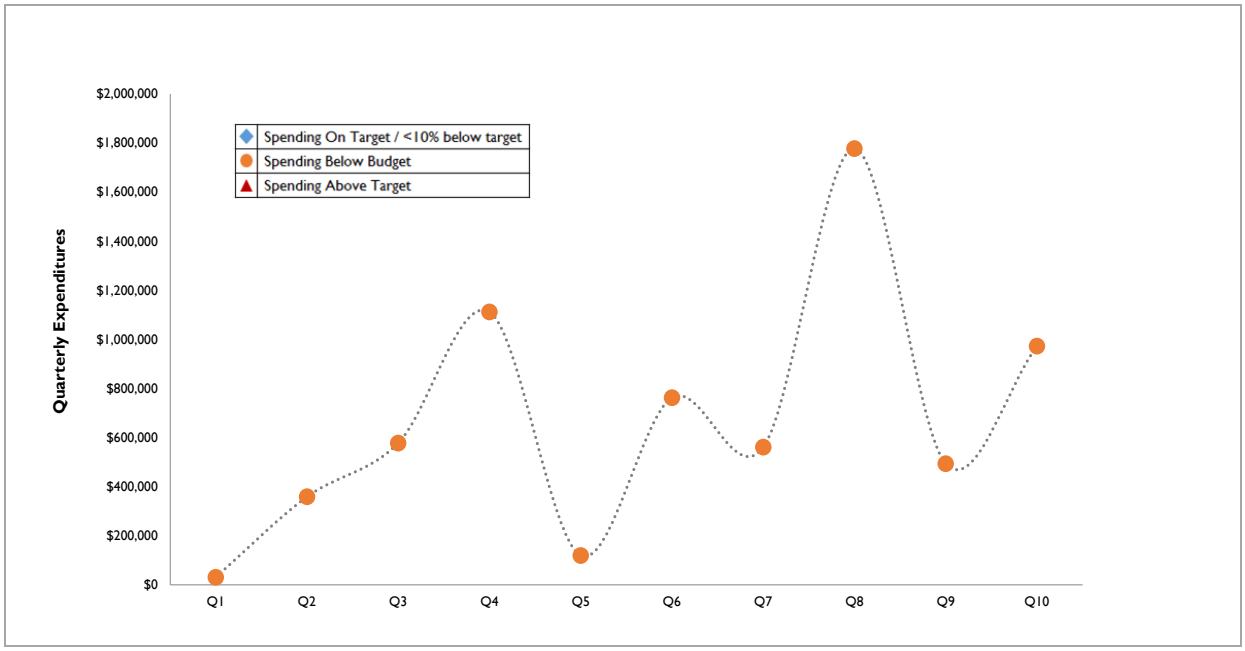
The annual report highlights the significance of Y-USA's expenditure rates on implementation. As of December 2014 (Q10), Y-USA spent 31.3 percent of its Year 3 budget, which was below projection. Although an improvement from Q9, when Y-USA's spending rates were more than 40 percent below projection, it is still critical at 20 to 40 percent below projection. According to the Q9 *Quarterly Awardee Performance Report*, Y-USA explained that routine project spending was on target and that the low spending rates reflected lower overall enrollment and timing of participant reimbursement for the DPP

through its partner, the Diabetes Prevention and Control Alliance (DPCA). Y-USA filed for, and received, an extension for funding allowing them to continue program efforts for the next 12 months.

The Q9 and Q10 *Narrative Progress Reports* suggest that Y-USA is very optimistic about reaching the triple-aim objectives, even with the enrollment challenges it faced. Although Y-USA's enrollment greatly benefited from the decision to accept Medicare Advantage beneficiaries into the program at the end of Q6, recruitment remained a challenge in the last quarter of 2014 (Q10), partly because of the holiday season. Y-USA planned to continue enrolling participants through first quarter 2015, and to help build demand, Y-USA and its partners launched the "One Million More" education campaign in November 2014 (during National Diabetes Awareness Month), which will continue until Diabetes Alert Day in late March. The campaign is designed to promote diabetes screening tests that are required for enrollment in a DPP.

During the key informant interviews, we learned that the approach to enrollment also changed: each YMCA now holds monthly orientation sessions for all those referred to the program. Through the sessions, potential participants learn about the program and sign a release form if they are interested in taking part. This process helped the YMCAs better explain the program and what it entails, and answer questions for people who did not understand why they were referred to the program.

Figure 1. Spend Rate from Q1 (July 1, 2012) to Q10 (December 31, 2014)



Leadership

In the first annual report, we detailed the commitment of the Y-USA organizational leadership to the HCIA innovation, which they designated as the first "signature program" in their Healthy Living initiative. We further discussed the leadership structure and the efforts of the Y-USA chief executive officer (CEO) to meet with each of the CEOs at the 17 innovation sites and develop strategic plans for

revising recruitment efforts when the YMCAs were struggling with the process. Initially, recruitment focused only on fee-for-service covered beneficiaries, which led to confusion among consumers about the Medicare Advantage Plan. Y-USA changed its criteria to include Medicare Advantage beneficiaries, which greatly aided enrollment.

During the key informant interviews, respondents reiterated that this project remains a high priority for Y-USA, and the accountability is shared throughout all levels of leadership. The HCIA project focus and outcomes are reported up to the national board, as it is tied to all of the leadership performance goals (CEO, chief operating officer, president, and technical advisor). The project director is involved in all aspects of communication, leads calls with the project officer and partner organizations, attends the calls with Y-USA, and reports to the vice president of innovation and strategy, who reviews all reports.

Organizational Capacity

As mentioned in the first annual report, Y-USA had strong organizational capacity to implement the DPP, given that 75 YMCAs already had experience implementing the evidence-based DPP model through other funding and with a different priority population. Y-USA continues to build organizational capacity to recruit and provide services to the Medicare population. New training strategies are described in ***Section 1.2.2.***

Furthermore, the organizational capacity of Y-USA depends largely on its partnerships and ability to leverage various resources. During the key informant interviews, Y-USA reported the need for additional support and resources to increase capacity. Gaining buy-in from all partners, which includes organizations like the American Medical Association (AMA), American Diabetes Association and the American Heart Association (AHA), was not an easy process; although they all agreed to support the program, it took time to build shared communication strategies and determine the best way to share information with the partner's local affiliates. Some partners could require involvement of local affiliates, while others could not and were limited to only national-level communication strategies. These efforts to engage the partners and their affiliates led to supplementary blood pressure monitoring projects with the AMA and AHA. The strategy of building these partnerships began with building trust and then demonstrating the value of the project through local affiliate testimony. This work helped to motivate additional changes and build buy-in.

Y-USA helped the local YMCA affiliates develop their capacity by linking them to the communities in a sustainable way. The initial plan to partner with physician champions was not sufficient to meet the recruitment demands and volume of the HCIA innovation. One respondent reported that, "we needed to partner with health system[s] to get more impact, which is a slow growing process." Each health care system added a layer of complexity because of the need to navigate numerous medical records systems and different processes required to reach and recruit patients. Some health care systems identified participants and asked that YMCA staff contact patients directly; however, local YMCA staff did not have this capacity. One respondent reported that while the AMA was a facilitator in bridging the clinic-to-community gap, some challenges remain in getting health systems engaged.

Innovation Adoption and Workflow Integration

As already discussed, the HCIA innovation was adopted and well integrated into the workflow of the YMCA sites that implemented it. This program is part of Y-USA's strategic plan with strong organizational support for sustaining it in the future. At a local level, all 17 participating YMCAs implemented the DPP program prior to the launch of the innovation, but with a different population. For HCIA, the innovation expanded the intervention to recruit and enroll prediabetic Medicare beneficiaries. Innovation adoption and workflow integration occurred at both the national and local levels. Because implementation takes place at local YMCAs, the lifestyle coaches at the local level were key to successful implementation. For example, during our Year 1 site visit at the YMCA of Central Ohio (Columbus), a team member noted that some of the most successful lifestyle coaches were established YMCA employees because they understand the mission of the YMCA, their neighborhood population, and how to engage people. These lifestyle coaches are mostly part-time employees who also worked at this site in other roles, including reception staff, wellness coaches, and chronic disease coordinators.

1.2.2 Workforce Development

The HCIA innovations seek to improve the quality of care by ensuring that a workforce of sufficient size, capacity, and skill is in place to carry out new and enhanced models of care. RTI examined these workforce factors to better understand their role in innovation implementation.

Evaluation Question

- What accomplishments specific to hiring or training staff improved the organization's capacity to implement the innovation effectively?

Hiring and Retention

At the end of Q10 (December 2014), the innovation was fully staffed with 2.85 full-time equivalent (FTE) staff members. This number does not include the lifestyle coaches that lead the innovation activities at each YMCA affiliate. Between Q8 (June, 2014) and Q10, no new hires or separations took place and staffing changes were minimal. At of the end of Q9 (September 2014), the innovation was 0.5 FTE short of planned staffing levels. Changes in staff FTEs resulted because the workforce development manager was not included in the project budget for Year 3 and the communications coordinator role shifted from a staff to a consultant role.

Skills, Knowledge, and Training

Between Q8 and Q10, Y-USA provided 14,080 hours of training to 1,726 HCIA administrative and community-based nonclinical personnel. Training topics included:

- Lifestyle Coach Curriculum
- Facilitating Change in Small Groups

- Medical Community Partnerships
- HIPAA Privacy and Security

In addition, to help build local YMCA capacity to obtain earned media as a strategy to advertise the local DPP programs to their target population, Y-USA held a media training on June 11, 2014. Participation was high and staff from all but one partner YMCA attended. A senior public relations manager at Y-USA and an outside public relations agency led the training and sought to provide YMCA staff with the skills needed to "communicate key messages related to the YMCA's DPP and the Center for Medicare & Medicaid Innovation (CMMI) project across all media platforms and in various situations."

1.2.3 Effectiveness

A major focus of the evaluation is to assess the effectiveness of the implementation effort because the evaluation cannot make conclusive assessments about the innovation's impact without first determining if the innovation was implemented with sufficient rigor to effect a change in outcomes. Effectiveness is measured as the extent to which: (1) the innovation reached the number of targeted patients or participants (reach); and (2) patients or participants were exposed to the services provided (dose). To better understand the role of implementation effectiveness, the evaluation addresses the following question.

Evaluation Question

- What is the implementation effectiveness, including reach, and dose of the innovation thus far?

Reach

Figure 2 shows reach by quarter since the launch of the innovation. Reach is calculated as the number of participants who enrolled (i.e., attended at least four core sessions) as a percentage of the number of participants recruited (i.e., attended at least one core session). Therefore, the number of participants recruited does not necessarily mean those participants will enroll in the program and take part in at least four core sessions. We first reported reach in the Q5 report, based on data through Q9. In Q7 Y-USA reported great improvements in enrollment since they began allowing Medicare Advantage beneficiaries to enroll and the key informant interview expounded on this matter stating, "there was a lot of confusion among our consumers about the Medicare Advantage Plan and we are now able to enroll from both fee for service and the advantage plan, which helped with recruitment, though roughly 2/3 of our participants remain fee for service." Since that time, Y-USA enrolled an additional 1,968 people, increasing enrollment from 3,728 to 5,696. The overall total reach is 82.9 percent. Reach dropped slightly over time, ranging from 95.7 percent in Q3 to 82.9 percent in Q11.

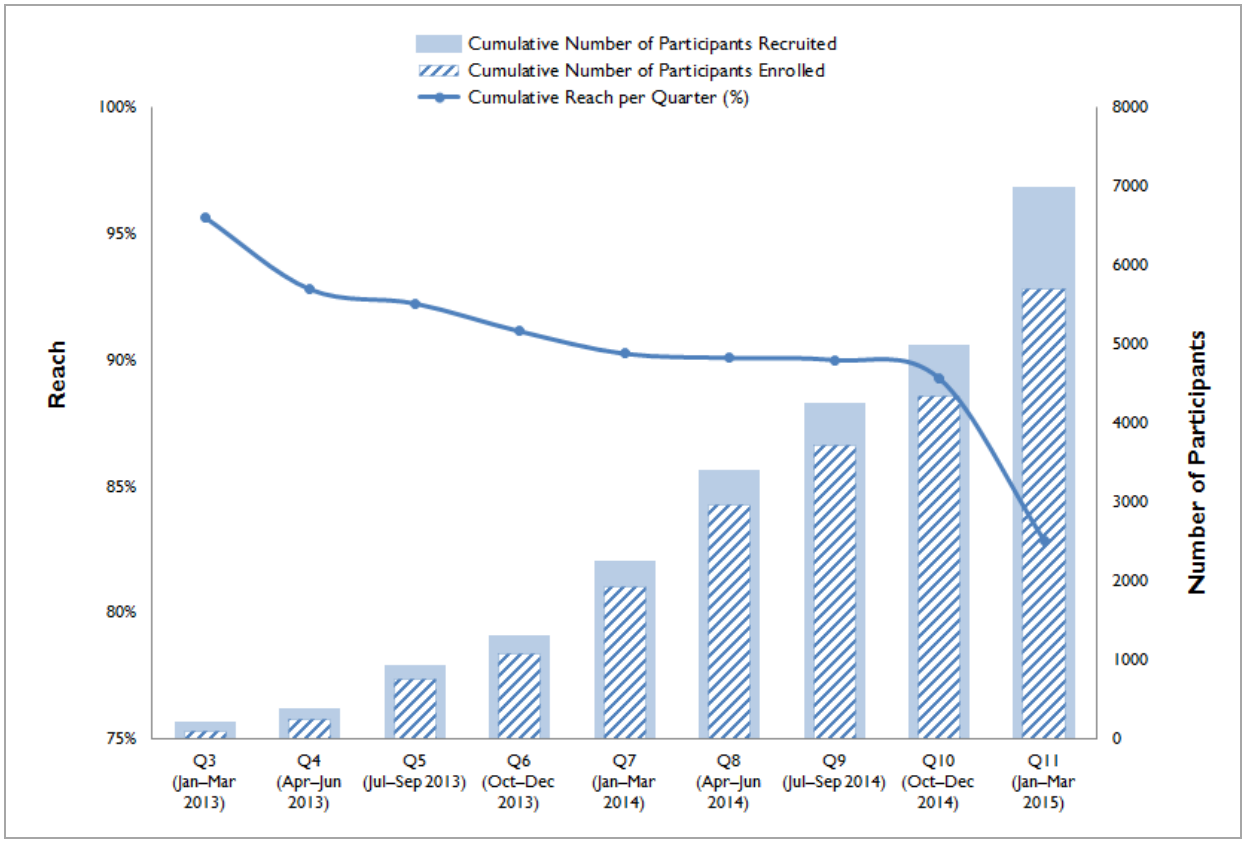
Y-USA focused much of its efforts on recruiting participants into the innovation—recruitment was one of the most significant challenges they faced. The drop in calculated reach may reflect the increased efforts to enroll anyone who qualifies and may benefit from the innovation. Because reach is calculated using a percentage of those enrolled (i.e., attending at least four core sessions) relative to the number

recruited, one would expect the number of people recruited to increase—however, the number enrolled has not increased at the same rate. The Y-USA team focused much of its recent efforts on identifying new ways to recruit participants into the DPP innovation. As previously described, during Q10, the local YMCA affiliates implemented a final recruitment effort "surge" to increase the number of eligible participants enrolled in the innovation and reported that "a total of 524 participants attended their first class in January, compared to 663 in the entire first quarter of 2014." They also held orientation meeting to help answer questions posed by those referred to the innovation. This recruitment push successfully enrolled new participants, but because the YMCA used a rolling enrollment process, the number of participants that participated in at least four core sessions (the criterion for enrollment) will be uncertain until the innovation ends. One key informant interview said, "We have had a huge increase from 197 people in Year 1 to almost 7,000 enrolled. YMCAs have utilized different recruitment strategies; they sought other health care partners, looked within their own membership, and identified ways to get health systems to search through their medical records for our at-risk population." Therefore, we anticipate that the reach number may increase as we enter the final phases of the innovation and the recruitment effort ends.

The other challenge with increasing enrollment and, therefore reach, involves understanding the participants' motivation to enroll and to remain involved with the multisession innovation. One interview respondent indicated that while the YMCA started with engagement strategies that successfully recruited a working-age population, they found these strategies were not as effective in recruiting and engaging the older population targeted by the HCIA project. YMCA staff learned that it was critical to build on the connection between Medicare patients and their physicians by engaging physicians in the referral process, and then ensuring that providers had the right information to share with their patients about prediabetes and the importance of addressing it. This respondent further reported that ensuring that doctors were actively involved in and aware of the innovation added a step to the recruitment process that was not previously required.

As noted in previous reports, the number of participants reported in the *Quarterly Awardee Performance Reports* was consistent with the number of participants reported in the RTI quarterly and annual reports.

Figure 2. Participant Enrollment and Reach for Each Quarter since Project Launch



	Quarter	Q3 (Jan–Mar 2013)	Q4 (Apr–Jun 2013)	Q5 (Jul–Sep 2013)	Q6 (Oct–Dec 2013)	Q7 (Jan–Mar 2014)	Q8 (Apr–Jun 2014)	Q9 (Jul–Sep 2014)	Q10 (Oct–Dec 2014)	Q11 (Jan–Mar 2015)
●	Cumulative reach per quarter (%)	95.7	92.8	92.%	91.1	90.3	90.1	90.0	89.3	82.9
	Cumulative number of participants recruited	92	264	812	1,185	2,134	3,289	4,142	4,867	6,874
	Cumulative number of participants enrolled	88	245	749	1,080	1,926	2,963	3,728	4,345	5,696

Source: Patient-level data provided to RTI by Y-USA.
[1] Participants recruited attended at least one core session.
[2] Participants enrolled completed at least four core sessions.

Dose

Participants received varying doses of the program, depending on the number of sessions attended. The maximum dose is 24 1-hour sessions (16 weekly sessions plus 8 monthly maintenance sessions). Dose is defined as attending between 1 and 3 sessions, completing at least 4 but fewer than 9 sessions, completing at least 9 of the 16 core sessions, and completing at least 1 post-core session (at least 17 sessions in total). ***Table 5*** provides the number of sessions attended by participants. We first reported dose in the Q5 report, based on data through Q9. As expected, the number of participants attending sessions more than doubled—from 3,296 in Q9 to 6,874 in Q11.

As shown in the table, 37.5 percent of recruited participants completed 9 to 16 sessions, whereas almost 20 percent (19.9%) completed 4 to 8 sessions and 25.4 percent completed 17 or more sessions. Less than 20 percent (17.2%) completed only 1 to 3 sessions. Programs that are able to engage participants in 9 or more sessions meet the Centers for Disease Control and Prevention criteria for quality providers of diabetes prevention programs. As such, these data show that Y-USA effectively kept participants engaged with the innovation. Because this innovation uses rolling enrollment, tracking those individuals who participated in fewer than 8 sessions will be helpful to determine if they attend more than 8 sessions by the end of the innovation.

Table 5. Number and Types of Services Provided to Participants

Number of Sessions	Number of Participants	Percentage of Total Recruited Participants[1] (n=6,874)
1–3 sessions	1,178	17.2
4–8 sessions	1,370	19.9
9–16 sessions	2,578	37.5
17+ sessions	1,748	25.4
Total	6,874	100.0

[1] Recruited participants include those who have attended at least one session.

One interview respondent reported that having access to the group process and collective learning that occurs through the innovation kept many participants enrolled and engaged. This may help to explain why more than 62 percent of those enrolled in the innovation attended 9 or more sessions. The respondents also reported that participants wanted the group to continue to meet without their lifestyle coaches after the innovation ends.

Sustainability

The DPP innovation has been a longstanding priority for Y-USA, which demonstrated a clear commitment to sustaining the innovation after the award ends, with a focus on this population. Y-USA already developed a sustainability plan that will guide future scaling and dissemination activities through 2017. This focus on sustainability includes developing a community profile for the 17 markets it serves, to document information on the key partners engaged (including health care partners) and recruitment activities used. Y-USA hopes that this information will facilitate the work of other YMCA affiliates who want to implement this innovation in their community. Y-USA plans to add guidance to existing program materials about engaging a more senior population. The Y-USA also leveraged its experience with the HCIA effort to obtain funding from the John A. Hartford Association, which is interested in Medicaid and diabetes prevention, and is exploring the potential to communicate lessons learned for specific topics like electronic medical records (EMR) integration.

To address the priority of providing patients free or inexpensive access to prediabetes resources like the DPP, the Y-USA applied for a CPT code that would allow reimbursement for participation in the DPP innovation and for sustaining the innovation. The CPT code would help Y-USA overcome one challenge of recruiting new participants because it would eliminate any out-of-pocket expenses for

participation. Having a CPT code would also make the program more financially viable and sustainable for Y-USA.

1.3 Evaluation Outcomes

RTI uses two possible types of quantitative data to assess the impact of Y-USAs innovation on key outcomes. The first type includes claims data for Medicare and/or Medicaid beneficiaries, depending on the innovation's participants. The second type includes patient-level administrative and utilization data Y-USA collects and submits to RTI (which we labeled "other awardee-specific data"). Both sets of data capture health care, clinical effectiveness, and health outcome measures that RTI considers essential to the evaluation of Y-USA's innovation. RTI selected these measures based on the goals of the innovation and the availability of sufficient and robust data. Consequently, the number and diversity of measures reported varies by awardee.

As the data are received, we incorporate the findings into quarterly/annual reports. The following sections present the findings for quantitative data through March 2015.

1.3.1 Claims-Based Measures for Evaluation

Table 6 lists the claims-based outcome measures determined by CMMI as most relevant for the HCIA evaluation, with an indication of whether the payer-specific data are presented in this annual report.

Table 6. Claims-Based Outcome Measures

Evaluation Domain	Subdomains	Measure	Medicare Reported in Annual Report	Medicaid Reported in Annual Report
Health care outcomes	Utilization	All-cause inpatient admissions rate	Yes	No
		Hospital unplanned readmissions rate	Yes	No
		ED visit rate	Yes	No
	Cost	Spending per patient	Yes	No
		Estimated cost savings	Yes	No

ED = emergency department.

1.3.2 Claims Data

This section describes the innovation's impact on health care spending per patient, hospital inpatient admissions, hospital unplanned readmissions, and ED visits that do not lead to a hospitalization. These measures are described in more detail in ***Appendix B.1***. A key concern of the evaluation is to address the following cost and utilization questions.

Evaluation Questions

- Has the innovation reduced inpatient admissions, ED visits, or unplanned readmissions?
- Has the innovation reduced spending per patient?
- Does compliance to the program affect the spending pattern of participants?

Medicare Claims Analysis

We include patients who were enrolled prior to December 31, 2014, and we present Medicare claims data through December 31, 2014. The analysis uses data from the CMS Chronic Conditions Data Warehouse. The treatment group includes 1,702 participants who were enrolled for at least one quarter in Medicare fee-for-service parts A and B. Measures are presented for these beneficiaries in the quarters before and after enrolling in the innovation.

Comparison Groups

Comparison beneficiaries must have been enrolled in fee-for-service Medicare for at least 1 month since the innovation began enrolling beneficiaries. We excluded from the potential sample individuals who had ever been classified as having diabetes. Furthermore, we only included individuals who met the requirement criteria for enrollment in the DPP: at least 65 years of age and diagnosed with prediabetes. To identify prediabetes patients, we used the following ICD-9 codes: 790.29 (abnormal glucose); 277.7 (metabolic syndrome); 790.21 (impaired fasting glucose levels, but not yet diagnosed with diabetes); and 790.22 (failed glucose tolerance test, but still not diagnosed with diabetes).

We used propensity score matching (PSM) to identify comparison group members with similar characteristics to the treatment group. ***Table 7*** describes the mean values and absolute standardized differences of the variables of interest that are included in the propensity score model before and after matching. Ideally, PSM will improve (i.e., lower) the absolute standardized difference between the treatment and comparison group. Standardized differences less than 0.10 are generally accepted as an adequate threshold of balance.[2] The balancing table includes two variables not included in the propensity score model: percentage with diabetes ever and percentage with less than 1 year on Medicare. Surprisingly, a large share of the treatment group (34%) had the diabetes ever variable equal to one (an exclusion criteria for the comparison group). A small number of comparison group beneficiaries was enrolled in Medicare for less than 1 year. Researchers also point out that critical variables in determining selection into treatment (e.g., those with significant effects in the propensity score equation) should have greater balance, while indicators with minor importance in determining treatment selection do not require optimal balance. The results in ***Table 7*** show that matching reduced the absolute standardized differences for all variables except ED visits in the calendar quarter prior to enrollment. All variables included in matching achieved adequate balance.

Figure 3 shows the distribution of the propensity scores for both the comparison and intervention groups. The two distributions overlap substantially, indicating that the propensity scores for the matched comparison beneficiaries are similar to those of the treatment beneficiaries. ***Appendix B.2*** provides technical details on the propensity score methodology. Twenty-three treatment beneficiaries were dropped from the subsequent analyses due to the lack of an appropriately matched comparison beneficiary.

[2] Austin, P.A.: Balance diagnostics for comparing the distribution of baseline covariates between treatment groups in propensity-score matched samples. Statist. Med. 28:3083-3107, 2009.

Table 7. Mean Values and Standardized Differences of Variables in Propensity Score Model: Y-USA

Variable	Before Matching					After Matching				
	Treatment Group		Comparison Group		Standardized Difference	Treatment Group		Comparison Group		Standardized Difference
	Mean	SD	Mean	SD		Mean	SD	Mean	SD	
Payments in calendar quarter prior to enrollment	$1,302	$3,192	$1,913	$5,825	0.13	$1,289	$3,181	$1,383	$2,057	0.04
Total payments in second, third, fourth, and fifth calendar quarters prior to enrollment	$5,704	$10,090	$6,888	$13,915	0.10	$5,660	$10,029	$6,059	$6,771	0.05
Number of ED visits in calendar quarter prior to enrollment	0.08	0.38	0.07	0.32	0.03	0.07	0.29	0.10	0.46	0.08
Number of inpatient stays in calendar quarter prior to enrollment	0.02	0.17	0.05	0.26	0.13	0.02	0.16	0.02	0.10	0.01
Age	69.96	6.27	74.87	7.48	0.71	70.29	5.57	70.20	3.14	0.02
Percentage male	27.38	44.60	41.65	49.30	0.43	27.52	44.67	28.27	26.35	0.02
Percentage white	81.37	38.94	86.86	33.79	0.21	81.89	38.52	79.97	23.42	0.07
Percentage ESRD	0.18	4.20	0.21	4.60	0.01	0.18	4.22	0.17	2.44	0.00
Number of chronic conditions	6.07	3.04	6.59	3.27	0.16	6.08	3.04	6.30	1.90	0.08
Percentage with diabetes ever	33.78	47.31	—	—	1.43	33.89	47.35	—	—	1.43
Number of dual eligible months in the previous calendar year	0.70	2.75	0.97	3.23	0.09	0.64	2.63	0.72	1.64	0.04
Percentage less than 1 year on Medicare	5.52	22.85	3.99	19.56	0.10	5.54	22.88	7.45	15.36	0.11
Number of beneficiaries	1,702	—	1,776,402	—	—	1,679	—	5,021	—	—
Number of unique beneficiaries[1]	1,702	—	242,962	—	—	1,679	—	4,969	—	—
Number of weighted beneficiaries	—	—	—	—	—	1,679	—	1,679	—	—

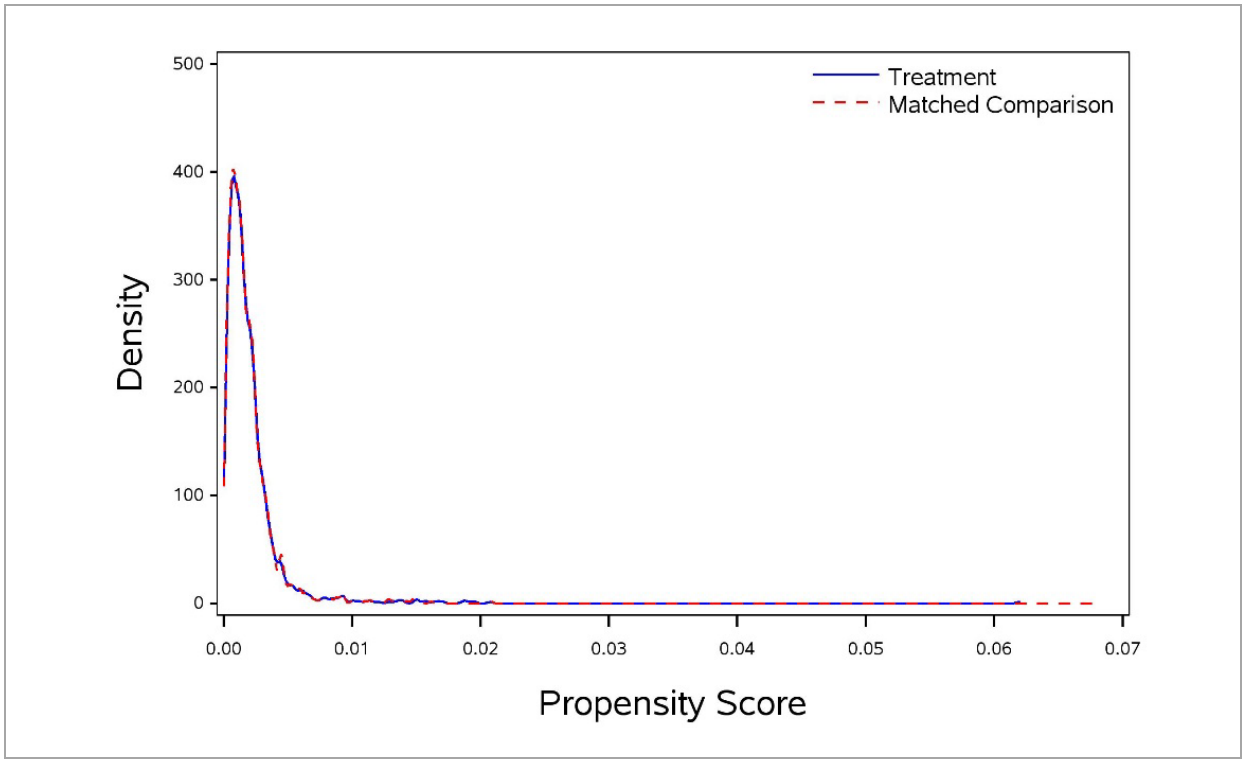
Source: RTI analysis of Chronic Conditions Data Warehouse Medicare fee-for-service claims.

[1] Before matching, differences in the number of beneficiaries and the number of unique beneficiaries in the comparison group are due to multiple observations of each comparison beneficiary (clones). After matching, differences in the number of beneficiaries and the number of unique beneficiaries are due to weighting (see Appendix B for discussion of weights).

ED = emergency department; ESRD = end-stage renal disease; SD = standard deviation.

— Data not available.

Figure 3. Distribution of Propensity Scores for Comparison and Intervention Groups: Y-USA



Source: RTI analysis of Chronic Conditions Data Warehouse Medicare fee-for-service claims.
Y-USA = YMCA of the USA.

Descriptive Analysis

This report includes claims through December 31, 2014. ***Table 8*** reports Medicare spending per patient in the eight quarters before and the eight quarters after enrolling in the innovation. Savings per patient reflect the spending differential between the matched comparison group and the intervention group, not controlling for other factors.

Table 8. Medicare Spending per Patient: Y-USA

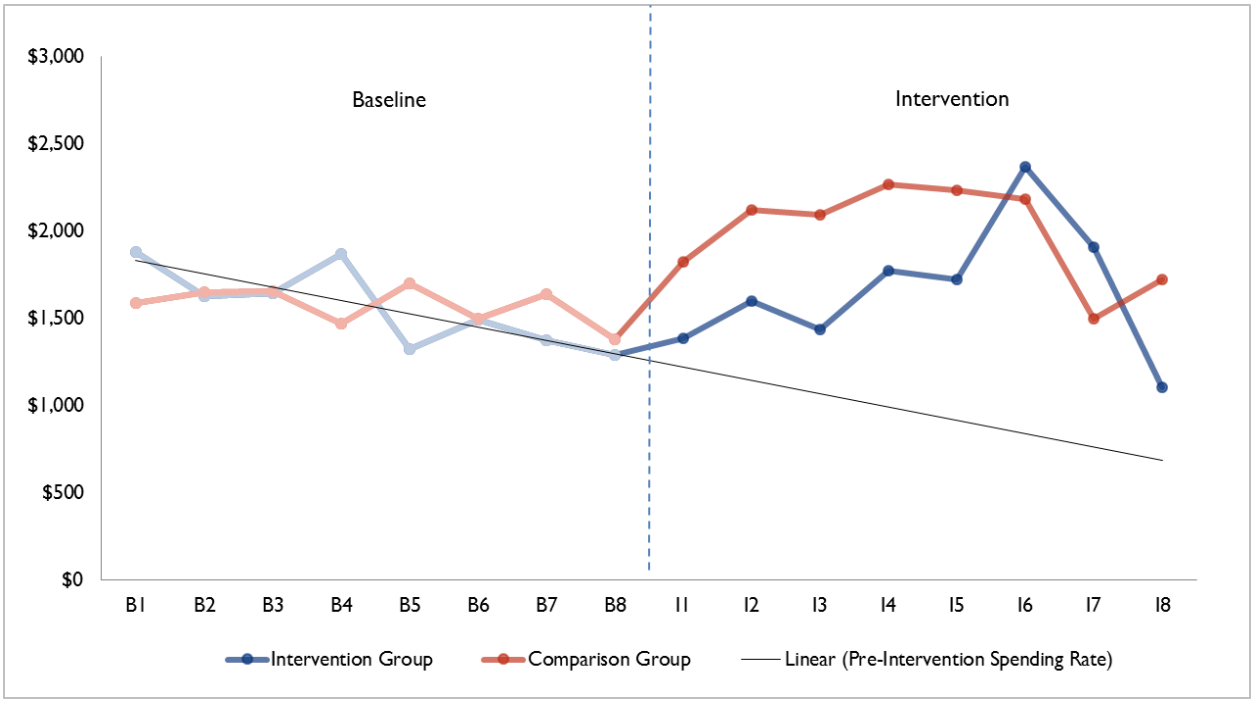
Evaluation Group: RTI International (Community Resource Planning)
Payer Group: Medicare

Awardee Number	Description	Baseline Quarters								Intervention Quarters							
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4	I5	I6	I7	I8
Intervention Group																	
1C1CMS 330965	Y-USA																
	Spending rate	$1,881	$1,631	$1,647	$1,872	$1,327	$1,495	$1,374	$1,289	$1,384	$1,601	$1,435	$1,777	$1,723	$2,369	$1,907	$1,104
	Std dev	$5,819	$4,810	$4,094	$5,518	$3,218	$4,210	$3,244	$3,180	$3,815	$4,463	$3,656	$5,189	$4,370	$5,596	$4,154	$1,414
	Unique patients	1,344	1,400	1,448	1,496	1,549	1,601	1,641	1,679	1,679	1,429	1,136	765	515	362	138	57
Comparison Group																	
1C1CMS 330965	Y-USA																
	Spending rate	$1,591	$1,651	$1,655	$1,472	$1,701	$1,497	$1,637	$1,380	$1,827	$2,125	$2,095	$2,271	$2,238	$2,184	$1,497	$1,726
	Std dev	$4,571	$4,508	$4,734	$3,969	$4,864	$4,225	$4,787	$3,548	$5,343	$7,746	$6,370	$8,419	$7,515	$6,079	$3,578	$4,682
	Unique patients	1,379	1,430	1,475	1,524	1,570	1,615	1,654	1,678	1,678	1,427	1,133	764	519	365	135	56
Savings per Patient		−$291	$21	$8	−$400	$374	$2	$263	$92	$443	$524	$660	$494	$515	−$185	−$410	$621

Source: RTI analysis of Chronic Conditions Data Warehouse Medicare fee-for-service claims.
Notes:
Spending rate: Total quarterized payments/number of unique patients.
Savings per patient: Difference in comparison minus intervention average spending rates. Savings may not add up exactly due to rounding.
I1 = Intervention Q1; B1 = Baseline Q1.

Figure 4 illustrates the Medicare spending per beneficiary in Table 8 for innovation and comparison group beneficiaries. The blue line represents values for beneficiaries enrolled in the innovation and is darker in post-innovation quarters. The red line represents values for comparison group beneficiaries and is darker in post-innovation quarters. The graph includes a trend line for innovation beneficiaries based on linear regression for pre-innovation quarters. In this case, the trend line suggests decreased spending pre-intervention. Spending is higher than the trend line in all post-intervention quarters. Comparison beneficiaries have higher spending than participants in six of the eight post-intervention quarters. Because of high variability, these differences are not statistically different from zero. The number of participants declines noticeably in the last five quarters post-intervention; this decline represents the lower recruitment in the first quarters of the program than in subsequent quarters.

Figure 4. Medicare Spending per Patient: Y-USA



Source: RTI analysis of Chronic Conditions Data Warehouse Medicare fee-for-service claims.
Y-USA = YMCA of the USA.

The all-cause inpatient admissions rate per 1,000 participants is shown in ***Table 9*** and ***Figure 5***. The comparison groups has slightly higher inpatient admission rates than the controls, this difference widens during the first year post-intervention and disappears subsequently.

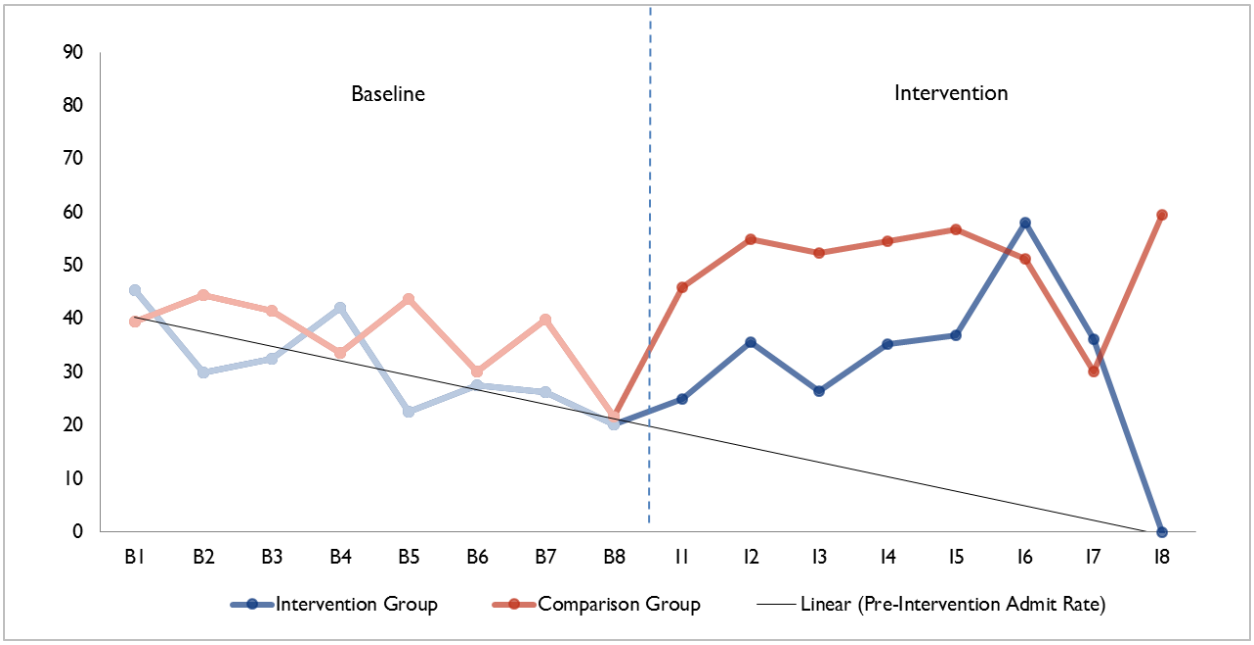
Table 9. All-Cause Inpatient Admissions Rate per 1,000 Enrollees: Y-USA

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

Awardee Number	Description	Baseline Quarters								Intervention Quarters							
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4	I5	I6	I7	I8
Intervention Group																	
1C1CMS 330965	Y-USA																
	Admit rate	45	30	32	42	23	27	26	20	25	36	26	35	37	58	36	0
	Std dev	247	190	185	214	153	171	174	157	164	189	171	211	208	256	187	0
	Unique patients	1,344	1,400	1,448	1,496	1,549	1,601	1,641	1,679	1,679	1,429	1,136	765	515	362	138	57
Comparison Group																	
1C1CMS 330965	Y-USA																
	Admit rate	39	44	41	34	44	30	40	22	46	55	52	55	57	51	30	60
	Std dev	238	231	231	204	246	194	241	164	239	289	269	272	290	254	169	282
	Unique patients	1,379	1,430	1,475	1,524	1,570	1,615	1,654	1,678	1,678	1,427	1,133	764	519	365	135	56
Intervention − Comparison Rate		6	−14	−9	8	−21	−3	−14	−1	−21	−19	−26	−19	−20	7	6	−60

Source: RTI analysis of Chronic Conditions Data Warehouse Medicare fee-for-service claims.
Notes:
Admit rate: (Total unquarterized admissions /unique patients)*1,000.
Intervention – comparison rate may not add up exactly due to rounding.
I1 = Intervention Q1; B1 = Baseline Q1.

Figure 5. All-Cause Inpatient Admissions Rate per 1,000 Enrollees: Y-USA



Source: RTI analysis of Chronic Conditions Data Warehouse Medicare fee-for-service claims.
Y-USA = YMCA of the USA.

Hospital unplanned readmissions rates per 1,000 admissions are shown in ***Table 10*** and ***Figure 6***. Because of the low number of index admissions (the denominator in the readmissions measure), the unplanned readmissions rate is highly variable. As more beneficiaries enroll in the innovation and more claims data become available, the sample size will increase and the unplanned readmissions measure may be reported with more precision.

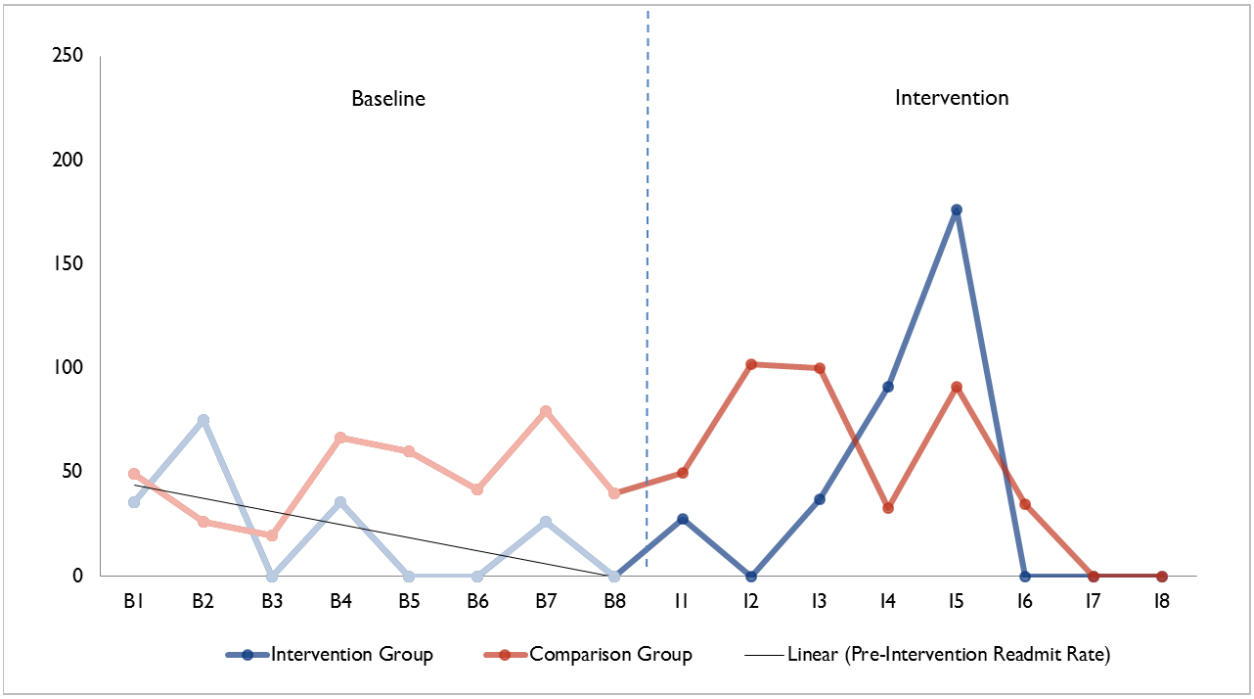
Table10. Hospital Unplanned Readmissions Rates per 1,000 Admissions: Y-USA

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

Awardee Number	Description	Baseline Quarters								Intervention Quarters							
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4	I5	I6	I7	I8
Intervention Group																	
1C1CMS 330965	Y-USA																
	Readmit rate	36	75	0	36	0	0	26	0	28	0	37	91	176	0	0	0
	Std dev	186	263	0	186	0	0	160	0	164	0	189	288	381	0	0	0
	Total admissions	56	40	42	56	30	39	38	31	36	39	27	22	17	12	3	0
Comparison Group																	
1C1CMS 330965	Y-USA																
	Readmit rate	49	26	20	67	60	42	80	40	50	102	100	33	91	34	0	0
	Std dev	216	160	138	249	237	200	271	195	218	303	300	179	288	183	0	0
	Total admissions	41	51	51	45	56	40	59	34	67	65	42	30	22	10	3	2
Intervention − Comparison Rate		−13	49	−20	−31	−60	−42	−53	−40	−22	−102	−63	58	86	−34	0	0

Source: RTI analysis of Chronic Conditions Data Warehouse Medicare fee-for-service claims.
Notes:
Readmission rate: (Sum all eligible readmits to eligible hospital within 30 days/all eligible admissions in quarter)*1,000.
Total admissions: All eligible admissions in quarter.
Intervention – comparison rate may not add up exactly due to rounding.
I1 = Intervention Q1; B1 = Baseline Q1.

Figure 6. Hospital Unplanned Readmissions Rates per 1,000 Admissions: Y-USA



Source: RTI analysis of Chronic Conditions Data Warehouse Medicare fee-for-service claims.
Y-USA = YMCA of the USA.

ED visits per 1,000 participants are shown in ***Table 11*** and ***Figure 7***. Throughout the pre-intervention and the first four post-intervention periods, the ED visit rate is similar in the treatment and comparison groups. In I5 through I8, ED visit rates are higher in the treatment group than in the comparison group.

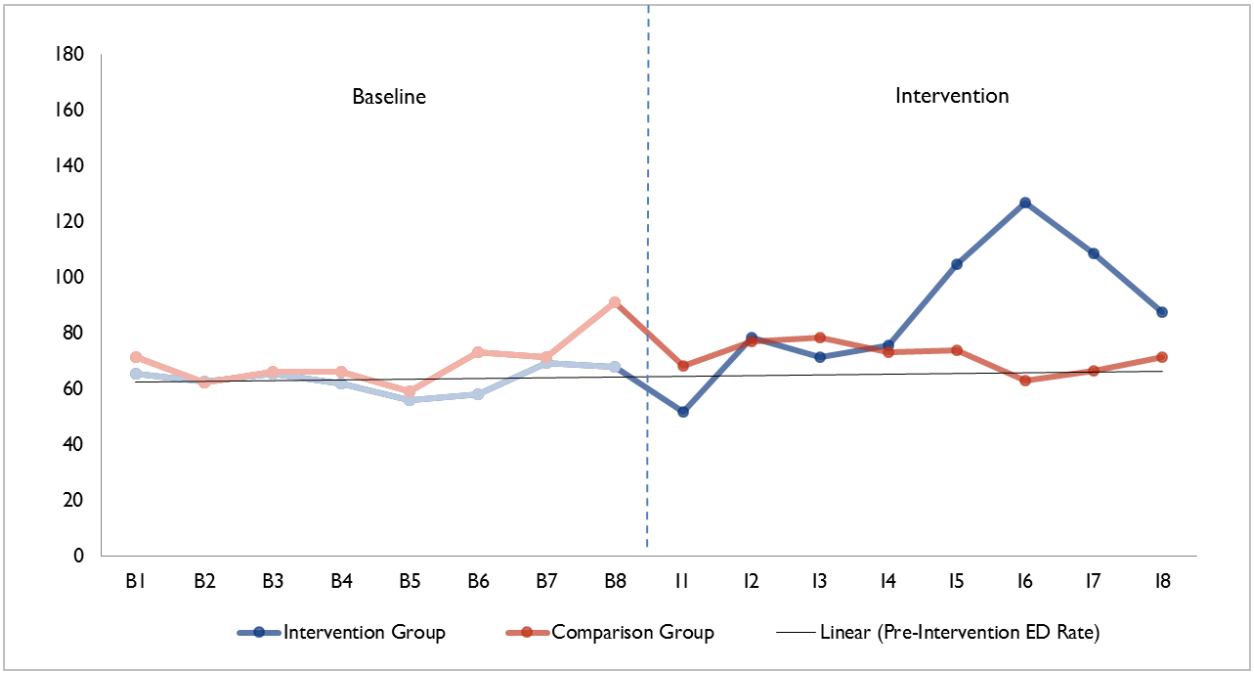
Table 11. ED Visits per 1,000 Participants: Y-USA

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

Awardee Number	Description	Baseline Quarters								Intervention Quarters							
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4	I5	I6	I7	I8
Intervention Group																	
1C1CMS 330965	Y-USA																
	ED rate	65	63	66	62	56	58	69	68	52	78	71	76	105	127	109	88
	Std dev	271	286	282	282	262	262	303	283	245	332	290	319	337	435	395	342
	Unique patients	1,344	1,400	1,448	1,496	1,549	1,601	1,641	1,679	1,679	1,429	1,136	765	515	362	138	57
Comparison Group																	
1C1CMS 330965	Y-USA																
	ED rate	72	62	66	66	59	73	72	91	68	77	79	73	74	63	67	71
	Std dev	196	165	172	171	169	251	225	331	173	208	183	193	186	158	167	174
	Unique patients	1,379	1,430	1,475	1,524	1,570	1,615	1,654	1,678	1,678	1,427	1,133	764	519	365	135	56
Intervention − Comparison Rate		−6	1	−1	−4	−3	−15	−2	−23	−17	1	−7	2	31	64	42	16

Source: RTI analysis of Chronic Conditions Data Warehouse Medicare fee-for-service claims.
Notes:
ED rate: (Total quarterized ED visits and observation stays /unique patients)*1,000.
Intervention – comparison rate may not add up exactly due to rounding.
I1 = Intervention Q1; B1 = Baseline Q1; ED = emergency department.

Figure 7. ED Visits per 1,000 Participants: Y-USA



Source: RTI analysis of Chronic Conditions Data Warehouse Medicare fee-for-service claims.
Y-USA = YMCA of the USA.

Regression Analysis

We completed regression analyses to determine the impact of the innovation on spending, the likelihood that a patient was hospitalized, and the likelihood that a patient had an ED visit. All regressions include an indicator variable for the treatment group, an indicator variable for each quarter, and quarterly indicators that interacted with the treatment group variable in the post-intervention period. We control for age, gender, race, disability, end-stage renal disease, dual eligibility, number of months of dual eligibility status during the calendar year prior to the intervention, and the number of chronic conditions. The regression specification assumes the same quarterly fixed effect for treatment and comparison individuals in the pre-innovation period and allows for a separate quarterly effect for treatment individuals after enrolling in the innovation.

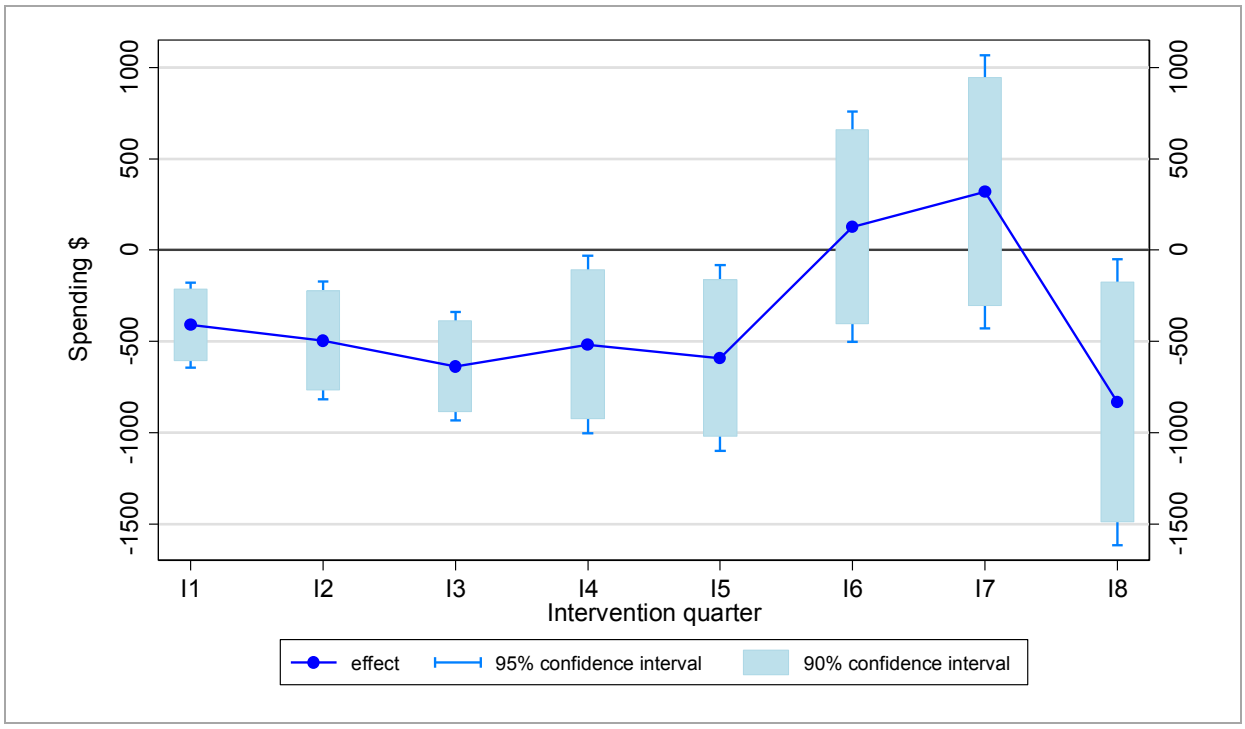
Table 12 presents the results of an ordinary least squares (OLS) regression with quarterly spending as the dependent variable. The coefficients represent the difference in quarterly spending in post-intervention quarters between the treatment and comparison groups. We find statistically significant differences in spending in the first five quarters of the innovation. These savings become insignificant in subsequent quarters, with the exception of I8. ***Figure 8*** illustrates these quarterly difference-in-differences estimates.

Table 12. Difference-In-Differences OLS Regression Estimates for Quarterly Medicare Spending per Participant: Y-USA

Quarter	Coefficient	Standard Error	P-Values
I1	−411	119	0.001
I2	−495	165	0.003
I3	−636	152	<.0001
I4	−517	248	0.038
I5	−591	260	0.023
I6	128	322	0.691
I7	319	381	0.403
I8	−833	399	0.037

Source: RTI analysis of Chronic Conditions Data Warehouse Medicare fee-for-service claims.
Notes: The regression coefficients are the quarterly difference-in-differences estimates. Besides the intervention quarters, the regression controls for the following variables: age, gender, race, disability, end-stage renal disease, dual eligibility, number of months of dual eligibility status during the calendar year prior to the intervention, and the number of chronic conditions. The difference-in-differences specification also controls for fixed differences between the treatment and control group and for quarterly effects that have the same impact on the treatment and control groups.
Y-USA = YMCA of the USA; OLS = ordinary least squares.

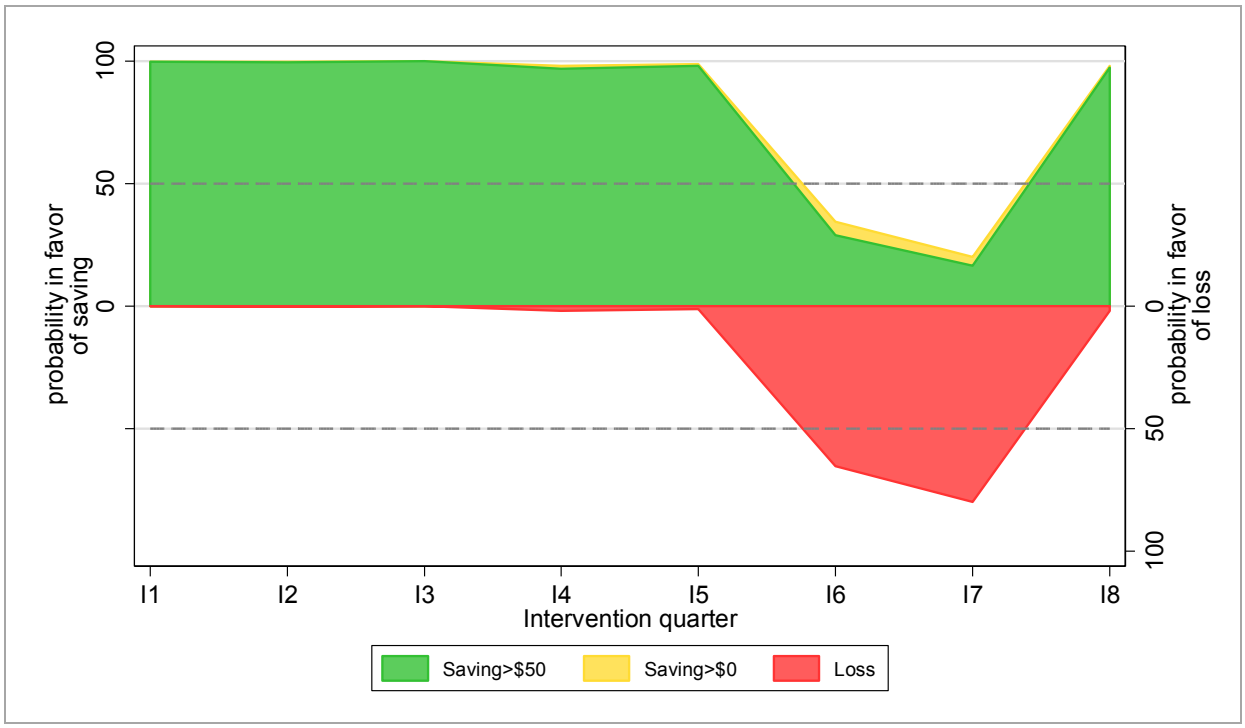
Figure 8. Difference-In-Differences OLS Regression Estimates for Quarterly Medicare Spending per Participant: Y-USA



Source: RTI analysis of Chronic Conditions Data Warehouse Medicare fee-for-service claims.
Y-USA = YMCA of the USA; OLS = ordinary least squares.

Figure 9 presents the strength of evidence in favor of savings or loss. The strength of evidence is quantified by the probability of the observed estimate against the null hypothesis in favor of a one-sided alternative. The larger the probability, the more convincing the evidence is against the null and in favor of the alternative hypothesis. Evidence of savings persist through the initial five quarters post-intervention and in quarter 8. In quarters 6 and 7 losses are not significant at the conventional levels.

Figure 9. Quarterly Strength of Evidence in Favor of Savings/Loss: Y-USA



Source: RTI analysis of Chronic Conditions Data Warehouse Medicare fee-for-service claims.
Y-USA = YMCA of the USA.

We also present the overall weighted average treatment effect per member per quarter during the intervention period for beneficiaries enrolled in the innovation compared with their matched comparison group. The weighted average quarterly spending differential in the post-innovation period, indicating savings, is $455 (90% CI: $299, $612) per member per quarter. This effect is statistically significant. This figure represents the differential spending per quarter in the post-intervention period between individuals enrolled in the innovation and comparison group individuals, on average, weighted by the number of intervention beneficiaries in each quarter. The 90 percent confidence interval is the range in which the true parameter estimate falls, with 90 percent confidence.

We also present linear probability model coefficients for inpatient admissions and outpatient ED visits. Although logistic regression coefficients correctly predict the direction and significance of the effect, a simple transformation of the logistic regression coefficient into probability does not result in the

estimated effect.[3] Linear probability models have the advantage that the magnitude of the coefficients can be directly interpreted, albeit with caution. Despite concerns regarding statistical inferences with linear probability models, linear probability model coefficients have often been empirically demonstrated to be consistent with marginal effects generated from nonlinear models.[4] We present linear probability model coefficients because the goal of this evaluation is to estimate marginal effects (i.e., the impact of the intervention) and not just the direction of the effect.

The innovation has a statistically significant effect on inpatient admissions during four of the eight intervention quarters (***Table 13***). These effects both indicate that innovation participants were 1- to 3-percentage points less likely to be hospitalized than the comparison group. The average quarterly difference-in-differences estimate for inpatient admissions is −1.1 percentage points, indicating that the treatment-control difference is 1.1 percentage points lower during the intervention period. This is the average difference in inpatient admissions probability for all intervention quarters, weighted by the number of beneficiaries in the quarter. The effect is statistically significant (90% CI: −.016, −.005).

Table 13. Difference-In-Differences Linear Probability Model Regression Estimates for Probability that Participant Had Inpatient Hospital Admission: Y-USA

Quarter	Coefficient	Standard Error	P-Values
I1	−0.01	0.00	0.004
I2	−0.01	0.01	0.233
I3	−0.01	0.01	0.017
I4	−0.01	0.01	0.098
I5	−0.01	0.01	0.220
I6	0.01	0.01	0.596
I7	0.01	0.02	0.631
I8	−0.05	0.02	0.003

Source: RTI analysis of Chronic Conditions Data Warehouse Medicare fee-for-service claims.
Notes: The linear probability model regression coefficients are the quarterly difference-in-differences estimates. Besides the intervention quarters, the regression controls for the following variables: age, gender, race, disability, end-stage renal disease, dual eligibility, number of months of dual eligibility status during the calendar year prior to the intervention, and the number of chronic conditions. The difference-in-differences specification also controls for fixed differences between the treatment and control group and for quarterly effects that have the same impact on the treatment and control groups.
Y-USA = YMCA of the USA.

With the exception of the sixth post-intervention quarter, we found no statistically significant differences on ED admission rates (***Table 14***). ED admissions within a short period of time may not be the most accurate outcome measure if one is analyzing an innovation (like a DPP) that lasts up to a year and focuses on long-term health behavior changes such as diet and exercise. The average quarterly

[3]To obtain the correct effect, it is necessary to perform simulations because a nonlinear model such as a logit does not satisfy the identification properties for a difference-in-differences model. Beyond a simple two-period model, a simulation using the results from one logit can take days to run even when not competing with other users for computer resources.
[4]Angrist, J.D., and Pischke J.-S.: Mostly Harmless Econometrics: An Empiricist's Companion. Princeton: Princeton University Press, 2008.

difference-in-differences estimate for ED visits is −0.2 percentage points, indicating that the treatment-control difference is 0.2 percentage points lower during the intervention period. This is the average difference in ED visit probability for all intervention quarters, weighted by the number of beneficiaries in the quarter. The effect is not statistically significant (90% CI: −.010, .006).

Table 14. Difference-In-Differences Linear Probability Model Regression Estimates for Probability that Participant Had ED Visit: Y-USA

Quarter	Coefficient	Standard Error	P-Values
I1	−0.01	0.01	0.212
I2	0.00	0.01	0.957
I3	−0.01	0.01	0.162
I4	−0.01	0.01	0.583
I5	0.01	0.01	0.346
I6	0.04	0.02	0.032
I7	0.01	0.03	0.672
I8	−0.03	0.04	0.480

Source: RTI analysis of Chronic Conditions Data Warehouse Medicare fee-for-service claims.
Notes: The linear probability model regression coefficients are the quarterly difference-in-differences estimates. Besides the intervention quarters, the regression controls for the following variables: age, gender, race, disability, end-stage renal disease, dual eligibility, number of months of dual eligibility status during the calendar year prior to the intervention, and the number of chronic conditions. The difference-in-differences specification also controls for fixed differences between the treatment and control group and for quarterly effects that have the same impact on the treatment and control groups.
Y-USA = YMCA of the USA.

Dose

An important question to answer is whether compliance with the program results in better outcomes for participants than noncompliance. Following the DPP and Y-USA standards, we define completers as participants who finished at least nine sessions of the program. To conduct a fair comparison between completers and noncompleters (individuals with less than nine visits), we considered only people who were in the sample for at least 20 weeks, which reduced the sample from 1,702 to 1,253 participants. Completers correspond to approximately 81 percent of participants. Participation, however, is endogenous to the process in that being a completer might be correlated with other patient-specific characteristics that can affect the outcomes under consideration. For example, healthier individuals may be more likely to complete, and may incur lower costs and have lower utilization rates than less healthy individuals.

Table 15 shows preliminary summary statistics to illustrate the differences in mean spending per quarter for completers and noncompleters. We find that, on average, noncompleters incur overall higher costs than completers. One refinement to the analysis that we will implement in future reports is to use a different set of controls by dose group to account for the possibility that completers and noncompleters might be intrinsically different (see ***Figure 10***). Savings per patient reflect the spending differential between the matched comparison group and the intervention group, not controlling for other factors.

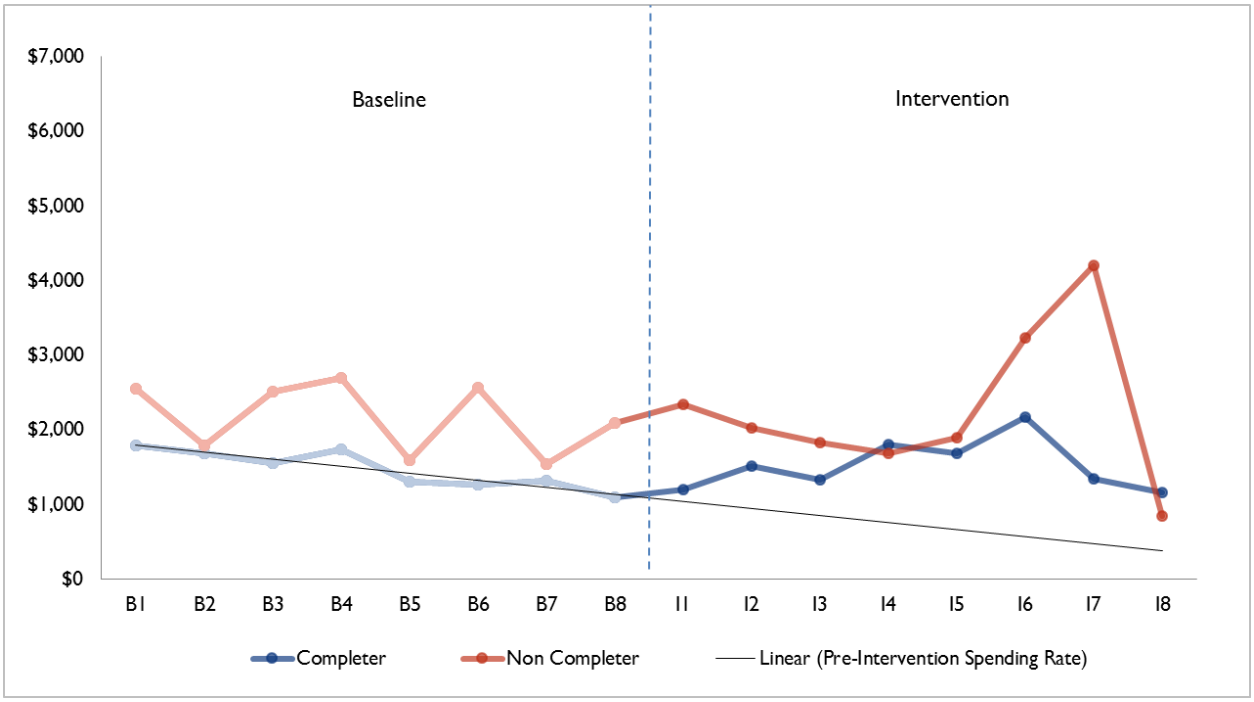
Table 15. Medicare Spending per Patient for Completers and Noncompleters: Y-USA

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

Awardee Number	Description	Baseline Quarters								Intervention Quarters							
		B1	B2	B3	B4	B5	B6	B7	B8	I1	I2	I3	I4	I5	I6	I7	I8
Completers																	
1C1CMS 330965	Y-USA																
	Spending rate	$1,791	$1,682	$1,555	$1,743	$1,307	$1,263	$1,316	$1,101	$1,198	$1,523	$1,338	$1,799	$1,683	$2,176	$1,347	$1,160
	Std dev	$5,405	$4,306	$3,943	$5,365	$3,390	$3,137	$3,002	$2,774	$2,952	$4,627	$3,213	$5,460	$4,579	$5,388	$2,522	$1,520
	Unique patients	816	845	873	902	931	962	984	1,011	1,011	1,008	914	610	420	296	111	47
Non-Completers																	
1C1CMS 330965	Y-USA																
	Spending rate	$2,550	$1,790	$2,520	$2,693	$1,600	$2,564	$1,549	$2,091	$2,340	$2,022	$1,832	$1,691	$1,902	$3,233	$4,208	$844
	Std dev	$7,281	$3,972	$5,575	$7,372	$3,131	$7,412	$3,107	$4,535	$7,196	$4,670	$5,069	$3,944	$3,288	$6,374	$7,449	$672
	Unique patients	201	207	212	218	228	234	239	242	242	241	222	155	95	66	27	10
Savings per Patient		$758	$108	$965	$950	$293	$1,301	$233	$989	$1,142	$499	$494	−$108	$219	$1,057	$2,861	−$316

Source: RTI analysis of Chronic Conditions Data Warehouse Medicare fee-for-service claims.
Notes:
Spending rate: Total quarterized payments/number of unique patients.
Savings per patient: Difference in comparison minus intervention average spending rates. Savings may not add up exactly due to rounding.
I1 = Intervention Q1; B1 = Baseline Q1.

Figure 10. Medicare Spending per Patient for Completers and Noncompleters: Y-USA



Y-USA = YMCA of the USA.

Discussion

Analysis of currently available data shows that the innovation is associated with statistically significant reductions in Medicare spending, inpatient admissions, and ED visits during two and at most three post-innovation periods. For all post-intervention quarters, the weighted average quarterly reduction in spending is $455, the reduction in the probability of having an inpatient admission is 1.1 percentage points, and the reduction in the probability of having an ED visit is 0.2 percentage points. These results are all significant at the 10 percent level.

The evidence in favor of a reduction in spending is strongest in the first three quarters after enrollment. This finding is somewhat surprising because the goal of the innovation is to reduce diabetes onset, which in turn is expected to improve health and reduce expenditures in the long run, but not necessarily immediately. The source of the short-term savings, if they exist, is not clear.

The claims analysis has several limitations. First, in the absence of a randomly assigned comparison group, we cannot be certain that we have a matched comparison group that is similar to the participants receiving the innovation. We used PSM to select a comparison group, and the matched comparison group shows good balance on most of the matching characteristics. However, prediabetes status is not routinely available in claims data, so we had to rely on other diagnostic codes (abnormal glucose, metabolic syndrome, impaired fasting glucose, impaired fasting glucose but not yet diagnosed with diabetes, failed glucose tolerance test but still not diagnosed with diabetes) to select the potential comparison group. Second, we discovered that—unexpectedly—34 percent of the participants in the

innovation had a previous diagnosis of diabetes based on claims data from the Chronic Conditions Data Warehouse (all participants had a recent blood glucose test within the prediabetes range). In contrast, we excluded persons with diagnosed diabetes from the comparison group. We performed an auxiliary analysis (not shown) where we excluded persons with diagnosed diabetes from both the treatment and comparison groups, which reduced the estimated average weighted quarterly savings to $223 (90% confidence interval: $45 to $401). However, the innovation still had a significant effect on reducing inpatient admissions over the course of the innovation.

Third, we cannot measure beneficiary motivation. Participants in the innovation may be especially motivated to avoid diabetes, and this unobserved variable may also affect future Medicare spending. Fourth, the results may not fully represent the overall population served by the innovation. The results presented here are only for Medicare fee-for-service beneficiaries whom we matched with the identifiers provided by the site. Y-USA now also enrolls members of Medicare managed care organizations. Fee-for-service beneficiaries account for approximately 80 percent of the YMCA enrollment. Equally important in considering the validity of the cost savings is the question of why the DPP intervention would affect different aspects of spending.

Finally, results of this preliminary analysis may change as enrollment in the innovation increases and more beneficiaries progress to later post-intervention quarters. This report includes participants enrolled through December 31, 2014. The rate of enrollment in the Y-USA innovation has increased throughout the project, so future reports will include the large number of participants enrolled after December 31, 2014; in addition, more participants will have been enrolled long enough to have data in I5 through I8.

Medicaid Claims Analysis

Y-USA does not serve Medicaid beneficiaries (unless the beneficiary is eligible for both Medicare and Medicaid). Therefore, we do not present Medicaid claims analyses.

1.3.3 Other Awardee-Specific Data

Table 16 lists the awardee-specific outcome measures selected for the innovation's evaluation with an indication of the status of the data requested and whether the data are presented in this annual report. We received patient-level data from Y-USA used to generate each measure listed in Tables 4 and 16 for each quarter through Q11 (March 31, 2015).

Table 16. Quantitative Outcome Measures

Evaluation Domains	Subdomains	Measures	Status
Health outcomes	Diabetes	Blood sugar levels at the onset of the program (HbA1c, fasting glucose, other risk factors)	Data received from Y-USA
	Weight management	Average weight loss for Medicare participants	Data received from Y-USA
		Percentage of patients who are overweight (25<BMI<29.9)	Data received from Y-USA
		Percentage of patients who are obese (BMI>30)	Data received from Y-USA

BMI = body mass index; HbA1c = glycated hemoglobin; Y-USA = YMCA of the USA.

Health Outcomes

Evaluation Questions

- Has the percentage of weight loss increased over time among those enrolled in the innovation as compared to other lifestyle or pharmaceutical diabetes interventions?
- Has the percentage of obese and overweight patients decreased over time among those enrolled in the innovation?

We examined weight loss over time among the HCIA intervention participants and selected other groups participating in diabetes prevention programs, presented in the following run chart and discussed in further detail below. In addition, we examined the percentage of obese and overweight participants over time among HCIA intervention participants.

Apart from the HCIA innovation project, Y-USA provided data to RTI on additional studies examining health outcomes after lifestyle or pharmaceutic intervention. These data were provided so that they could be used as a benchmark for comparison to the Y-USA CMMI participants. Data were provided to RTI on all Y-USA participants 65 years of age and older, as well as participants in lifestyle or pharmaceutic interventions (Metformin, lifestyle, placebo, and Deploy[5] [6]). To the study data provided by Y-USA, RTI added corresponding data on Y-USA CMMI participants 65 years of age and older.

Figure 11 shows changes in body weight over time according to data group based on these study data. The greatest average weight loss observed was in the lifestyle intervention group; the largest change, greater than –6.0 kg, was observed at both 4 to 6 months and 1 year. The average weight loss was –3.32 kg at 4 to 6 months for the CMMI group, which is slightly lower than the Y-USA's 65 years-and-older group, whose average weight loss at 4 to 6 months was –3.84 kg. At 1 year, however, average weight loss among the CMMI participants was –3.39 kg, which is lower than the Y-USA's 65 years-and-older group, whose average weight loss at 1 year was –5.25 kg.

[5] Knowler, W. C., Barrett-Connor, E., Fowler, S. E. et al.: Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. N Engl J Med.; 346(6):393-403, 2002 Feb 7.

[6] Ackermann, R. T., Finch, E. A., Brizendine, E. et al.: Translating the Diabetes Prevention Program into the community. The DEPLOY pilot study. Am J Prev Med. 35(4):357-63. 2008 Oct.

Figure 11. Changes in Body Weight According to Group over Time

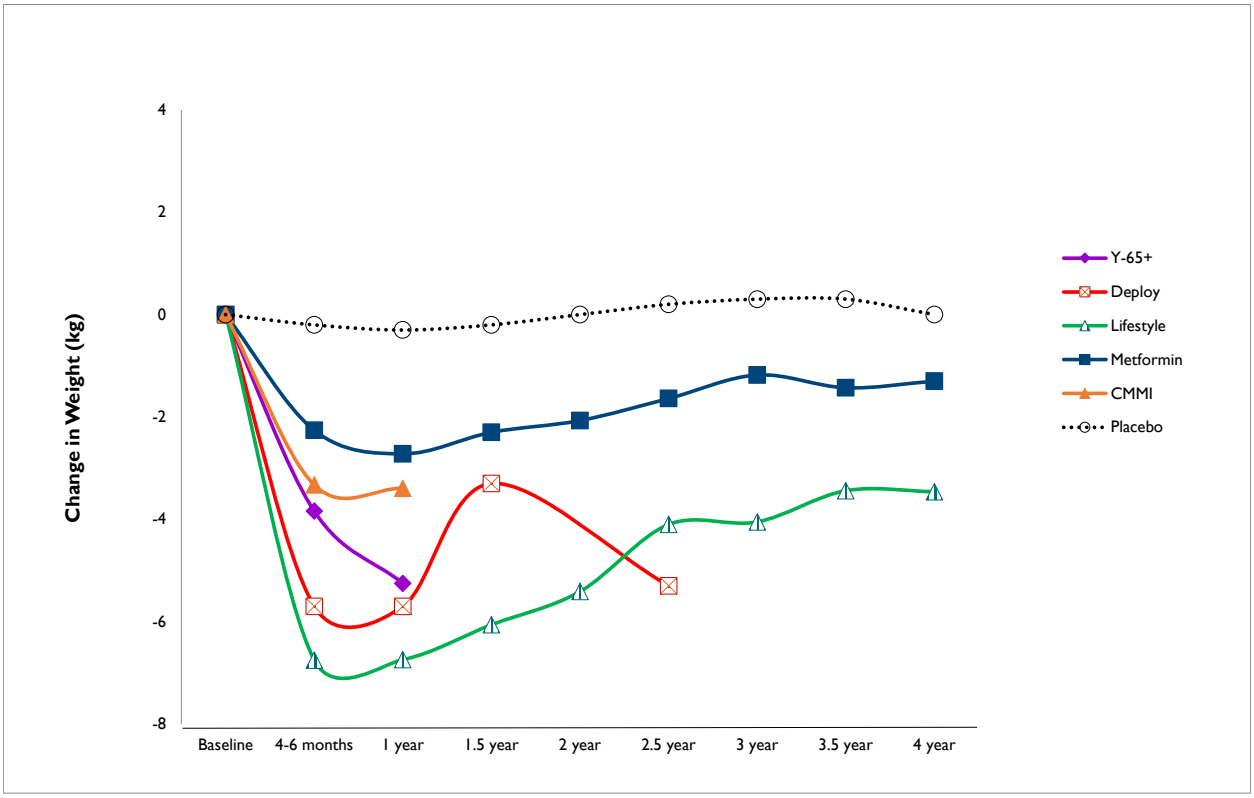


Figure 12 shows changes in body weight over time according to data group from studies examining health outcomes after lifestyle or pharmaceutic intervention, participants in the Y-USA 65 years of age and older, and participants 65 years of age and older in the Y-USA funded by HCIA who have completed the intervention.

For the CMMI participants 65 years of age and older, the analysis was restricted to those, who were in the program for at least 4 months, and who attended at least four core sessions and one post core session. The average weight loss was –5.09 kg at 4 to 6 months for the CMMI group, which is slightly higher than the Y-USA's 65-years-and-older group, whose average weight loss at 4 to 6 months was –5.04 kg. At 1 year, average weight loss among the CMMI participants and Y-USA participants was similar. For the CMMI participants, the average weight loss was –5.31 kg compared with the Y-USA's 65-years-and-older group, whose average weight loss at 1 year was –5.27 kg.

Figure 12. Changes in Body Weight According to Group, Among Completers

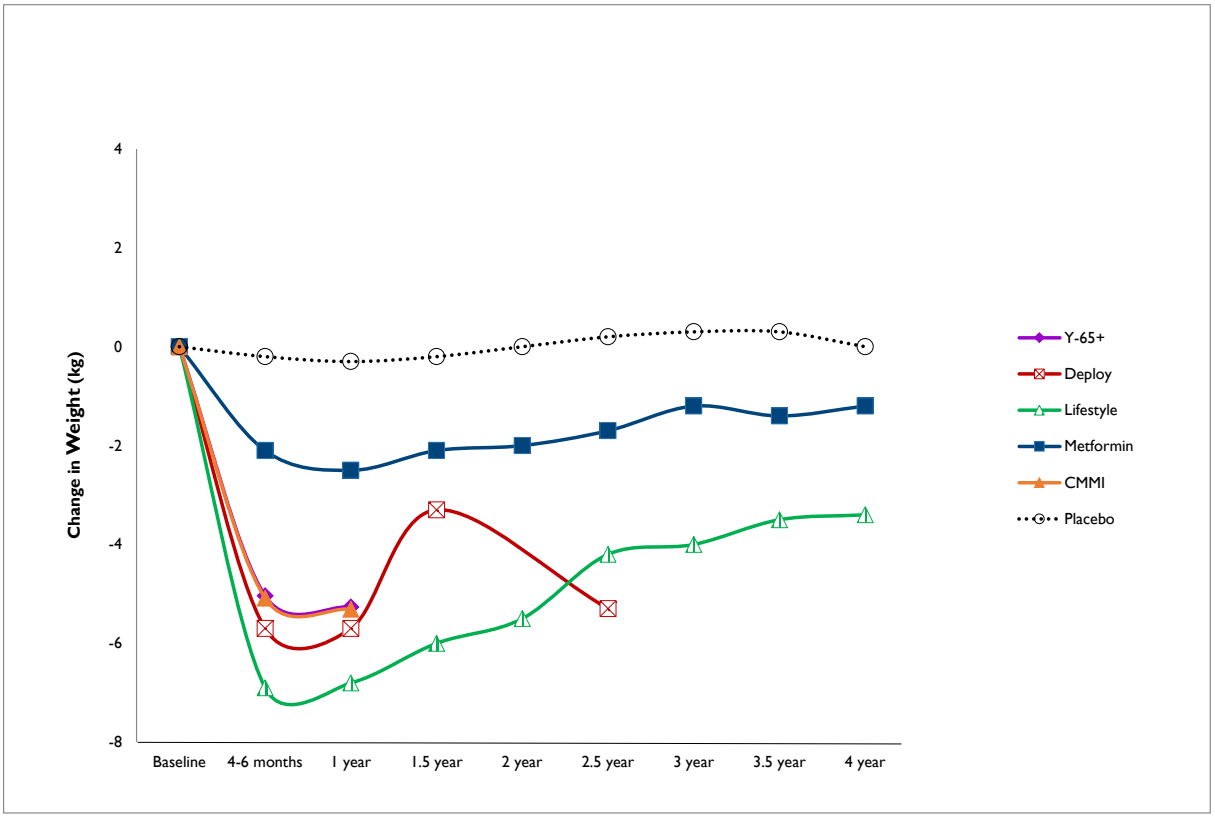


Table 17 provides average starting and ending weight, starting and ending body mass index (BMI), average weight loss, percentages of participants who are obese and overweight, and starting blood glucose values for participants enrolled through Q11. As Table 17 shows, on average, participants recruited lost 7.6 pounds, over the course of the innovation, whereas participants enrolled lost 9.0 pounds on average. In addition, slight differences occurred in the final BMI compared with the starting BMI. The BMI was initially 32.9 for both participants recruited and participants enrolled. The final BMI for those recruited was 31.7, compared with 31.5 for those enrolled. On average, among participants with a glycated hemoglobin (HbA1c) test, levels were 6 percent for both groups, which is in the prediabetic range (5.7% to 6.4 %) according to the American Diabetes Association.[7] The results for the other tests used to identify prediabetes indicate that, on the fasting plasma glucose (FPG) test, participants had an average level of 109.1 mg/dL, which is in the prediabetic range (100 mg/dL to 125 mg/dL).[8] For the oral glucose tolerance test (OGTT), participants recruited had an average level of 159.7 mg/dL, and participants enrolled had an average level of 158.5 mg/dL, which also falls in the prediabetic range (140 mg/dL to 199 mg/dL.[9] These results are not surprising, because the innovation targets prediabetics and encourages weight loss throughout its duration. The Q11 results were very similar to those reported through Q9 in the Q5 report.

[7] American Diabetes Association: Diagnosing Diabetes and Learning about Prediabetes. 2014, September 22. http://www.diabetes.org/diabetes-basics/diagnosis.

[8] Ibid.

[9] Ibid.

Table 17. Average/Frequencies Health Outcomes of all Participants through Q11

Health Outcome[1]	Average (min, max) for Those Recruited (Attending at Least 1 Core Session) (n=6,874)	Frequency (percentage) of Those Attending at Least 1Core Session (n=6,874)	Average (min, max) for Those Enrolled (Attending at Least 4 Core Sessions) (n=5,696)	Frequency (percentage) of Those Attending at Least 4 Core Sessions (n=5,696)
Weight Management[1]				
Starting weight (lbs)	200.7	—	201	—
	(95.4, 463)		(95.4, 463)	
Ending weight (lbs)	193.3	—	192.1	—
	(94.2, 440.4)		(94.2, 449.4)	
Weight loss (lbs)	7.6	—	9	—
	(−23.2, 122.2)		(−23.2, 122.2)	
Starting BMI (kg/m^2)	32.9	—	32.9	—
	(17.8, 72.4)		(14.6, 67.8)	
Ending BMI (kg/m^2)	31.7	—	31.5	—
	(17.8, 72.4)		(17.8, 67.0)	
Obese[2] pre-intervention	—	3,865	—	3,182
		56.2		55.9
Obese[2] post-intervention	—	3,294	—	2,619
		47.9		46
Overweight[3] pre-intervention	—	1,948	—	1,582
		28.3		27.8
Overweight[3] post-intervention	—	2,190	—	1,818
		31.9		31.9
Blood Glucose[4]				
Starting HbA1c	6	—	6	—
	(5.7, 7.1)		(5.7, 7.1)	
Starting FPG	109.1	—	109.2	—
	(100, 131)		(100, 131)	
Starting OGTT	159.7	—	158.5	—
	(140, 197)		(140, 197)	

Source: Patient-level data provided to RTI by Y-USA.
[1] Outcomes reported among those attending at least four core sessions n=5,696
[2] Obesity: body mass index (BMI)=>30.
[3] Overweight: BMI = 25–29.9.
[4] Majority of participants complete either HbA1c test, FPG test, or OGTT to determine prediabetes status.
BMI = body mass index; FPG = fasting plasma glucose; lbs = pounds; OGTT = oral glucose tolerance test.
— Data not available.

Discussion of Other Awardee-Specific Findings

Overall, the Y-USA's lifestyle change program appears to be effective at encouraging weight loss over time. Participants who completed at least four core sessions lost more weight, on average, than those who only enrolled (completed at least one session) in the program. Data on blood glucose levels were available only at the onset of the program and not over time, so we cannot determine effectiveness on the basis of blood glucose; however, the weight loss recorded during the intervention can improve diabetes outcomes in the future.

1.4 Overall Program Effectiveness to Date

This annual report described various implementation challenges and issues facing Y-USA as well as accomplishments to date. In this section, we assess Y-USA's progress in achieving HCIA goals to date.

- **Smarter spending.** The innovation is associated with a statistically significant reduction in Medicare spending for the initial five post-innovation periods. As noted in the discussion of the Medicare claims analysis (at the end of Section 1.3.2), this finding is subject to a number of limitations, and it is possible that the result will change as more data become available and our ongoing evaluation continues.

- **Better care.** The innovation is associated with statistically significant, but small, reductions in hospitalizations in four of the eight post-intervention periods. Given the disease focus, the innovation is unlikely to have an immediate impact on ED admissions. As of Q11, reach is 82.9 percent, a decrease of 9.3 percentage points from 92.2 percent in Q5, with a total of 5,696 new patients enrolled in the innovation through Q11. In addition, Y-USA appears to be keeping participants engaged with the innovation; for example, over a quarter of participants completed at least 1 post-core session and over one-third (37.5%) completed between 9 and 16 core sessions. Reach and dose will change as enrollment of new participants ends and those recruited have an opportunity to engage in four or more sessions (the threshold for enrollment).

- **Healthier people.** The innovation is associated with participants' weight loss: participants recruited (attending at least one session) lost an average of 7.6 pounds over the course of the innovation, whereas participants enrolled (attending at least four sessions) lost an average of 9.0 pounds. This conclusion is supported by analyses of secondary awardee data through Q11 suggesting that participants who enrolled in the innovation lost more weight than those who were recruited. Weight loss is a key indicator of health in prediabetes; however, weight loss can be slow and can change over time. Examination of long-term weight loss in the months or years after participation in the innovation may be a better indicator of long-term improvement in the health of participants.

Y-USA successfully built on a preexisting evidence-based DPP and expanded its capacity and knowledge of how to engage individuals older than 65 years in an innovation designed to address prediabetes. Although the preexisting DPP provided some organizational infrastructure for the innovation, the most significant challenges were identifying the most efficient and effective ways to recruit a senior population. Staff reported quickly learning that the strategies used to engage employers and working-age individuals would not be effective in reaching the target senior population. Y-USA teams worked to identify new recruitment strategies that engaged health care providers as key messengers for recruiting participants. While effective, this approach had challenges, such as allocating necessary time and resources to recruit and educate providers and larger health care organizations about the need to address prediabetes with their patients and how the DPP could serve as a valuable resource. With this new provider-based recruitment approach, the Y-USA and its local affiliates have improved their recruitment numbers in the second year of program funding.

To help move participants from recruitment to participation, staff developed a short orientation so individuals referred to the program by their providers could review the curriculum, understand what it offered to them, and to get answers to their questions. Examination of the program data indicates that the YMCA was very successful in getting participants to complete at least nine DPP classes (62.9% of

participants attended nine or more classes), meeting or exceeding CDC's recommendation for a successful DPP.

Y-USA maintains a strong organizational commitment to the DPP innovation and meeting the needs of a senior, Medicare-enrolled population. Even though Y-USA received a 12-month extension of funding from CMS, it has already begun to think about and look for resources to help it sustain the work started. With a sustainability plan in place that will lead Y-USA through 2017, Y-USA already started to develop community profiles that will serve as a new resource for local affiliates looking to implement the DPP in their communities. Y-USA also plans to update its existing DPP resources and tools with information and lessons learned for local YMCAs to successfully implement the DPP with individuals 65 years of age and older. A multicomponent program (like the DPP) requires financial resources and staffing to ensure that the innovation maintains programmatic fidelity. Y-USA has filed for a CPT code to allow for reimbursement for participation in the DPP innovation, which would help to sustain the innovation while minimizing or reducing the financial burden on participants. The CPT code would help Y-USA overcome the challenge of cost when recruiting new participants.