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Medicare Health Care Quality (MHCQ) Demonstration Evaluation Meridian Health System

Final Evaluation Report

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MEDICARE HEALTH CARE QUALITY (MHCQ) DEMONSTRATION EVALUATION: MERIDIAN HEALTH SYSTEM

FINAL EVALUATION REPORT

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EXECUTIVE SUMMARY

E.1 Introduction

The Medicare Health Care Quality (MHCQ) demonstration was developed to address concerns about the U.S. health care system, which typically fragments care while also encouraging both omissions in and duplication of care. To rectify this situation, Congress directed the Centers for Medicare & Medicaid Services (CMS) to test major changes to the health care delivery and payment systems to improve the quality of care while also increasing efficiency across the health care system.

Four sites participated in the MHCQ demonstration at various periods (see **Table ES-1**). Because each MHCQ demonstration site had a different and self-defined plan for its intervention, the evaluation of each site is presented in a separate report. This report presents the evaluation results for the Meridian Health System (MHS) MHCQ demonstration, implemented through the Meridian Care Journey (MCJ) program.

Table ES-1
Medicare Health Care Quality Demonstration Sites

Participating site	Focus of the demonstration	Date of implementation	End date
Indiana Health Information Exchange	Quality Health First program	July 1, 2009	January 31, 2013
North Carolina Community Care Networks	Medical home for dually eligible Medicare–Medicaid enrollees	January 1, 2010	December 31, 2012
Gundersen Health System	Advanced Disease Coordination program	February 1, 2010	April 30, 2014
Meridian Health System	Meridian Care Journey program	July 1, 2012	June 30, 2016

SOURCE: RTI International.

This report for MHS, the final annual evaluation report for this MHCQ demonstration site, reviews both quantitative and qualitative evaluation data regarding its interventions, structure, goals, and performance. Quantitative information includes descriptive statistical profiles and multivariate statistical analysis of the MHS demonstration's impacts on cost, quality, and utilization outcomes. The quantitative analysis included beneficiaries enrolled in the first three years of the MHS demonstration, from July 2012 through June 2015, and Medicare claims data for those enrollees through December 2015.

Qualitative information includes RTI's interviews with MHS staff and affiliated physicians during site visits to MHS in February 2013, November 2015, and December 2015, and telephone interviews with MHS staff in May 2014 and June 2015. It also includes MHS' reports to CMS for its MHCQ implementation contract and MHS' internal site-specific analyses and reports on demonstration and related implementation and performance assessment efforts.

E.2 Interventions and Administration

MHS, an integrated, not-for-profit health care system serving Ocean and Monmouth Counties in New Jersey, was founded in January 1997 when Jersey Shore University Medical Center (JSUMC), Ocean Medical Center (OMC), and Riverview Medical Center (RMC) were joined. Southern Ocean Medical Center (SOMC) in Manahawkin and Bayshore Community Hospital (BCH) in Holmdel were later integrated into the system in January and September 2010, respectively. MHS payers include private health insurance plans, Medicare, and Medicaid.

MHS implemented the Meridian Care Journey (MCJ) program under the MHCQ demonstration at three hospitals—JSUMC, OMC, and RMC. The MHS MHCQ demonstration was a late-life, outpatient palliative care and chronic disease management program that supplemented MHS inpatient, outpatient, and facility-based palliative care services with residential (home or non-acute facilities) and telephonic follow-up services. The demonstration aimed to build a coordinated care system for patients with advanced diseases through the palliative care services and additional services provided by the demonstration.

MHS indicated four main objectives for its MHCQ demonstration. They were to:

- Improve quality of life of patients and families
- Provide aggressive management of physical symptoms and psychosocial stressors
- Provide patients and families with the education and emotional support needed to make informed decisions relative to end of life care
- Coordinate care among physicians, facilities, services, family, and community outside hospital walls

The in-person and telephonic encounters offered through the MHCQ demonstration were not provided by the MHS outpatient palliative care department or by any of the other palliative care services offered in the other settings by MHS. Inpatient palliative care departments provided comprehensive care because they included all members of a health care team, including doctors, nurses, and social workers. Under the MHCQ demonstration program, Meridian brought this team-based care to patients in residential settings, although without some of the hospital-based resources available to inpatient palliative care departments.

Staff members and providers affiliated with the MHCQ demonstration defined palliative care as services to coordinate care, assess patient needs, and respond to those needs through clinical or nonclinical referrals or direct assistance. These services included advance care planning and documenting patients' preferences related to life-saving treatment. All MHS staff members interviewed referred to the MHCQ demonstration as providing people with what they needed earlier than they otherwise or typically would get it.

When the MHCQ demonstration began, demonstration staff members met with resistance from patients, families, and physicians during recruitment because of misconceptions surrounding the definition of palliative care. Palliative care was viewed as "pre-hospice" care by

many patients and providers; this perception seemed less true by the fourth year of the demonstration in late 2015 than previously, but remained among a portion of both providers and patients. Palliative care physicians reported that they were seeing patients who were well versed in the differences between palliative care and hospice, and that this reflected the change in perceptions in the community.

In the third and fourth years of the demonstration, the total demonstration staff comprised about 20 people. The clinical staff members included social workers, registered nurses (RNs), and nurse practitioners (NPs), all led by the demonstration's medical director. The demonstration staff also included administrative staff members who did not see patients, including a program director, program manager, and others.

Every demonstration participant had a primary staff member assigned to him or her. Case managers could be social workers, NPs, or RNs, depending on the needs of the patient. On a typical day, staff members reviewed notes for the six to eight patients who were scheduled to be seen in-person and for other patients who would be contacted by telephone between the scheduled in-person visits. This was how the monthly touches required for the demonstration were completed. Case managers also checked to see whether any of their patients had been admitted to or discharged from a facility and often scheduled visits or calls with those patients to take place over the following couple of days. MHS staff members reported that they saw about five to six patients per day in-person and carried an overall case load of about 125 to 130 demonstration participants.

E.3 Health Information Technology

MHS had several information technology (IT) systems that supported the MHCQ demonstration program in different ways. When the demonstration started, Meridian decided to use the WebChart electronic health record (HER) system. The system was designed to have customized data entry and reporting capabilities, as well as the capability to interact with other systems at MHS. The system included structured data fields that the demonstration needed for both operations and reporting to CMS. All of the forms used in patient encounters were developed by the demonstration team and incorporated in the WebChart system. The system also handled scheduling of patients and tracking and reporting on patient encounters.

Staff indicated that WebChart interfaced with MHS's IT system on a weekly basis to provide information about patient admissions and discharges. This system helped to manage and track physician and patient enrollment and services provided to enrolled patients. It held all of a patient's demographic information, the severity of illness stratification level for the MCJ program, and other assessments. The system also included a secure patient portal for personal health records, a feature designed to encourage patients' engagement in their care and in the program.

E.4 Provider Participation

In December 2015 the demonstration staff reported that about 250 physicians were actively referring patients to the demonstration, indicating that the demonstration was well

known and established. MHS staff reported that about 60% of the eligible physicians agreed to participate when contacted about the demonstration.

About 10% of the physicians participating in the demonstration were in Meridian-owned practices, while the other 90% were community physicians with their own practices. The physician community at Meridian consisted of mostly community physicians who were voluntary hospital staff with admitting and other privileges. As the demonstration had grown, several doctors had more than 25 patients in the demonstration. One physician had 74 active patients in 2015. On average, each physician was reported to have about eight patients enrolled.

While referrals to the demonstration and to palliative care services had increased among many physicians, some barriers to recruitment persisted in 2015. One was a continuing misunderstanding of the demonstration program and a general mischaracterization of palliative care among some physicians. Staff members and providers interviewed said that some physicians continued to view palliative care as hospice or strictly end-of-life care. These physicians sometimes decided not to participate in the demonstration because they did not want their patients to think that their doctors were "giving up on them."

Another barrier (and some staff members said this was the biggest barrier) was how health care was changing in the MHS catchment area, including the growth of MHS by purchasing physician practices and hospitals. Some physicians were concerned that the demonstration was a means for Meridian to take patients away from their practices.

Most of the primary care physicians (PCPs) who authorized patient enrollment were actively working with demonstration staff members. The demonstration staff routinely updated physicians about the health of their patients via e-mail, fax, or phone after they visited with patients. One participating physician said this team approach was what had been missing from outpatient health care services all along and noted that it was why the new outpatient palliative care department could not substitute for the demonstration. Others affiliated with palliative care at MHS said the outpatient department had a team-based approach as well, but they did not offer home visits and could not assess patients' living conditions. Another physician viewed the demonstration team as allowing busy physicians to do other work for patients because assessments were made in advance for them.

The demonstration program had three physician champions, one at each of the three participating hospitals (RMC, OMC, and JSUMC), as part of the program's outreach and recruitment efforts. These physicians received a modest stipend to promote the demonstration program and to work with the demonstration's medical director to conduct outreach and educational activities in their respective hospitals. All the physician champions worked in an inpatient setting and were part of the inpatient palliative care team at their respective hospitals. Physician champions themselves had many patients who were enrolled in the demonstration and had a higher portion of their patients in the demonstration program than other physicians.

Physician champions in MHS were instrumental in breaking down the negative connotation that had historically been associated with palliative care.

According to demonstration staff, the physician champions were instrumental in breaking down the negative connotation that was associated with palliative care services. In collaboration with the demonstration's medical director, the champions ran educational sessions and provided written resources.

E.5 Beneficiary Participation

In 2015 demonstration staff reported that the patient recruitment process had remained the same as in previous years. Every Monday the demonstration staff received data automatically from Meridian's data warehouse. The enrollment criteria were programmed into the software so that eligible patients could be identified. The data resulted in a list of all patients who were eligible for the demonstration**.** The data feed included a treating physician for each beneficiary on the list, but often the named physician was not the patient's PCP. If the named physician was already participating in the demonstration, then he or she would be contacted (usually by facsimile) to approve or disapprove the patient for enrollment in the demonstration. The main reason physicians did not approve patients for enrollment was because they were not the patients' PCPs despite being named on the data feeds. In this case the demonstration staff members attempted to identify the actual PCP.

Once patients' PCPs approved enrollment, the demonstration program staff contacted the patients. The demonstration team first sent letters, signed by the physicians and addressed to the patients who were found to be appropriate for the demonstration, which explained the demonstration and notified them that demonstration staff members would be contacting them. The team then called the patients to describe the services offered. If patients consented to enrollment, the staff arranged for the initial visits.

The overall enrollment rate for patients who were identified for demonstration recruitment was reported by demonstration staff to be 66%, including a 14% refusal rate from patients once approved by their physicians, and the remainder not gaining physician approval or later found ineligible once patient contact was initiated.

Demonstration staff reported that participants in the demonstration rarely left the demonstration unless they died or transitioned to hospice. Some patients left the demonstration because they were transitioning to a Medicare Advantage plan.

According to MHS staff, the demonstration program did not have a cap on enrollment and hired new clinical staff members when needed to treat additional enrollees. The ratio of the number of enrolled patients to clinicians within the demonstration program had historically been between 100:1 and 125:1. When the ratio, or caseload, became higher than 125:1, Meridian hired a new clinical staff member. MHS administrative data indicated the total number of beneficiaries enrolled in the demonstration totaled 3,095 in the first three years of MHS demonstration operations (July 2012-June 2015). These data are the focus of this final evaluation report.

E.6 Quantitative Analysis Methods

Since the MHS demonstration was a late-life palliative care intervention, there are increased concerns regarding methodological issues for outcome evaluation in comparison to the

primary care-oriented interventions applied in other sites in the MHCQ demonstration and in other CMS demonstrations. The design features of the MHS demonstration also posed methodological challenges for the quantitative evaluation, including four particular threats to validity:

- Rolling demonstration enrollment, with new enrollees entering the demonstration every month
- Clinical and disease severity heterogeneity among the demonstration enrollees resulting from the broad demonstration enrollment criteria that included 35 diagnosis-related groups (DRGs) and 191 International Classification of Diseases, Ninth Revision (ICD-9) codes for identifying hospital discharges for patients with any of seven severe chronic diseases (cancer, dementia, stroke, chronic obstructive pulmonary disease [COPD], heart failure, liver disease, or end-stage renal disease [ESRD])
- Risk of selection bias from beneficiary and demonstration staff and affiliated physicians decisions about demonstration enrollment, following assessment of the formal quantitative demonstration enrollment criteria
- High death rate of demonstration enrollees, with 23% of the intervention group dying within 12 months of enrollment

The evaluation applied several methods to address these challenges. First, since randomization was not a feature of this demonstration, a quasi-experimental evaluation design was used to control for the potential selection bias. This included four steps: 1) selecting a set of candidate comparison group (CG) beneficiaries with the same observed characteristics required for the intervention group (IG) beneficiaries to be eligible for the MHS demonstration; 2) matching the characteristics of non-MHS hospitals providing inpatient care to candidate CG beneficiaries to the characteristics of MHS hospitals, because an inpatient stay in an MHS hospital was required for enrollment in the MHS demonstration; 3) matching a set of final CG beneficiaries to the IG beneficiaries across a set of available observed variables; and 4) evaluating the MHS demonstration's impacts on outcomes using a multivariate difference in differences (DID) regression model that isolates the demonstration's impact on IG outcomes in comparison to CG outcomes while also controlling for potential confounding variables.

Key Acronyms: IG (Intervention Group) and CG (Control Group).
IG patients are a subset of MHS served patients used in the quantitative analysis. These are the Meridian patients we were able to match to suitable comparison beneficiaries in the CG. Matching allowed us to assess the impact of the program versus usual care.

To address the rolling demonstration enrollment feature, IG and CG beneficiaries were matched in monthly cohorts for the MHS evaluation rather than in yearly cohorts as is typical for primary care program evaluations. This improved evaluation controls for the rolling demonstration enrollment process and also for the high rate of attrition among enrollees due to the high death

rate. The shorter monthly time period for defining each cohort enabled the start date of beneficiary participation and the likelihood of attrition to be better matched for the IG and CG. The cohorts also had a 12-month base year (BY) and 12-month performance year (PY) defined separately for each monthly cohort. This enabled the baseline beneficiaries to be the same as the performance period beneficiaries for both the IG and CG for each cohort.

To control for the clinical and disease severity heterogeneity, IG beneficiaries were matched to CG beneficiaries using two steps. This included first exact matching of IG to CG beneficiaries using 14 higher-volume diagnosis-related groups (DRGs) and 4 demonstration target and higher-volume major diagnostic categories (MDCs) for demonstration qualifying hospital discharges and on the month of the discharge. It also included propensity score matching to define a final set of CG beneficiaries.

Since both the IG and CG beneficiaries had to be living in the BY period, we could not control for mortality in the PY. To do so would have meant selecting the CG based on the date of death. Consequently, a rigid specification of the clinical and disease severity controls (the 14 DRGs and 4 MDCs) was applied to help address the risk of death in the PY, but it could not completely eliminate this threat.

Applying these evaluation methods to address the methodological challenges meant that some of the MHS enrolled beneficiaries were excluded from the quantitative analysis of demonstration outcomes. Of the 3,095 beneficiaries enrolled in the first three years of the MHS demonstration, 2,023 (65%) were included in the IG used for the statistical analysis of MHS demonstration outcomes. The other 1,072 enrolled beneficiaries were excluded from the IG for several reasons, including inability to verify an MHS qualifying discharge in Medicare claims data, lack of a qualifying discharge within 12 months of enrollment, lack of at least 6 BY months and 1 PY month with Medicare fee-for-service (FFS) to provide adequate claims data for the DID regressions, lack of a qualifying discharge in one of the 14 higher volume DRGs or 4 higher volume MDCs for the matching process to address clinical and disease severity heterogeneity, or lack of finding an eligible CG beneficiary with a qualifying discharge matched by DRG/MDC and month. These reasons for exclusion were not mutually exclusive, so some MHS enrolled beneficiaries had multiple reasons for exclusion from the IG.

The quantitative analysis included beneficiaries enrolled in the first three years of the MHS demonstration, from July 2012 through June 2015. The Medicare claims data for those enrollees consisted of claims during the three year enrollment period plus 6 months (though December 2015) and one year of claims prior to enrollment (base year). Descriptive statistics for the 2,023 beneficiaries included in the IG showed that for the most part the IG was similar to the CG. Relative to the CG, the IG had similar proportions of PY mortality (beneficiaries dying within 12 months of demonstration enrollment), beneficiaries eligible for Medicare because of age, gender, Medicaid patients, and beneficiaries who were aged <65 or 65-74. The IG and CG were also similar in terms of the proportion of beneficiaries with most of the target diseases and with discharges in the 14 higher volume DRGs. Mean annualized Medicare expenditures per beneficiary declined slightly for the IG from the BY and PY, from about $42,500 to about $48,600 per year, and a similar pattern was found for the CG. However, there were a few differences. The CG had slight lower percentages of who were aged 75-84 and who had ESRD, and slightly higher percentage of beneficiaries who were aged 85+ and who had COPD. The

similar PY mortality rates in both groups suggests that the quantitative criteria and modeling process was able to identify a CG that was similar to the IG in terms of clinical severity.

E.7 Cost Outcome Analysis Results

Using the evaluation design discussed above and 4.5 years of claims data, the results of the multivariate DID statistical analysis of the impact of the MHS MHCQ demonstration intervention on the cost outcome measure showed no statistically significant effect, i.e., no Medicare cost savings resulted from the demonstration in the MHS population for whom a comparison group could be identified. The point estimate of the cost impact using a multivariate regression analysis was for a cost increase of $457 per beneficiary per year before considering the PBPM fee payments. The range in intervention savings using a 95% statistical confidence interval from the multivariate regression analysis was from a cost increase of $3,053 to a cost decrease (Medicare savings) of $2,139 per beneficiary per year. This wide range reflects the fact that the intervention effect was not statistically significant.

The impact of the demonstration on Medicare net costs was also analyzed. This is relevant for the MHS demonstration because it received up-front per beneficiary per month (PBPM) fees from Medicare to provide enhanced beneficiary services for its late-life care intervention. Adding the PBPM fees paid by CMS to MHS for conducting the demonstration increases the point estimate of the cost increase per beneficiary per year to $2,221 and changes the range in net costs to be from a cost increase of $4,817 to a cost decrease of $375. Because the range in the statistical confidence includes both cost increases and cost decreases, so that the statistical confidence interval crosses the $0 cost impact threshold, the cost impact cannot statistically be viewed as different from $0. As a result, the MHS demonstration did not show a statistically significant impact on Medicare costs.

The multivariate DID analysis was also conducted for cost components. This analysis showed some statistically significant cost increases per beneficiary per year resulting from the demonstration for three of nine components analyzed. Outpatient/other total costs showed an increase of $1,229. Within outpatient/other total, Part B physician/supplier costs increased by $589 and home health costs increased by $274. However, the Part B physician/supplier effect was only weakly significant at the 10% level. However, the other six cost components showed no statistically significant effects for the demonstration, including inpatient total, inpatient hospital and other, inpatient skilled nursing facility, outpatient institutional (hospital), durable medical equipment, and hospice.

E.8 Quality Process and Outcomes Analysis Results

> There were no Medicare cost savings observed in the MHS populations for whom a comparison group could be identified.

The MHS demonstration staff collected data on 10 internal processes of care quality measures to assess its performance. These quality measures assessed advance care planning discussions, quality of palliative care services, patient management and family satisfaction, and support during bereavement. MHS set the targets for performance for each of these 10 internal quality measures at 90%. During the

first 30 months of the demonstration, MHS met that target for all 10 quality measures. However, the method used to set the target of 90% performance was not based on external benchmarks, and these MHS internal quality performance scores were not assessed in relation to a comparison group, so it is not known what the scores would have been in the absence of the MHS demonstration. The data and results for these internal MHS quality measure results were not independently verified by RTI.

RTI conducted a multivariate statistical analysis of the impact of the MHS demonstration for a quality measure of the percentage of total hospital days that are intensive care unit (ICU) days, in comparison to results for the CG. This is included as a quality measure for MHS because a goal of the MHS MHCQ demonstration was to enable patients and their families to have more options available to them to be able to choose less intensive palliative care, and hence reduce utilization of the more intensive ICU care. However, the results indicated that the effect of the MHS MHCQ demonstration was to increase the percentage of hospital days that were ICU days, and this result was statistically significant. This was an unfavorable effect of the demonstration.

RTI also conducted multivariate regression analysis results for the MHS MHCQ demonstration's impact on quality outcomes for 30-day post-discharge visits, a measure of coordination of care, and the number of ICU days as an alternative to the measure for the percentage of hospitals days that were ICU days. These results showed that the demonstration effect was positive and statistically significant for the overall effect on 30-day post-discharge visits, a favorable effect of the demonstration indicating improved coordination of care in relation to the CG.

However, the results for the number of ICU days showed a statistically significant increase. This was an unfavorable effect of the demonstration.

E.9 Utilization Outcomes Analysis Results

RTI conducted multivariate regression analysis on the MHS MHCQ demonstration's impact on utilization outcomes, in relation to the CG, for measures of hospital admissions, 30-day readmissions, and emergency department (ED) visits. These results showed that the MHS demonstration effects were not statistically significant for the overall effect for any of these three utilization measures.

E.10 Qualitative Analysis Results from Interviews and Focus Group with MHS Demonstration Patients and Family Members

RTI's qualitative evaluation analysis included conducting one focus group and 17 interviews with patients enrolled in the MHS demonstration and their family members in November 2015. A total of 27 individuals participated in these discussions, including 18 demonstration patients and 9 family members who were involved in their care. Discussion questions sought to understand patient and family member experiences with the MHS demonstration services and staff.

This qualitative evaluation from the interviews and focus group with MHS demonstration patients and their families was limited to one point in time and to beneficiaries willing and able to participate. We aimed to include a range of different types of beneficiaries and family members in the interviews and focus group, but the severe nature of the illnesses suffered by the demonstration enrollees, and the often major impacts on their family members as well, may have limited the range of participants included in the interviews and focus group.

Participants reported that the MHS demonstration staff provided services they did not receive from physicians. Most participants reported that regular check-ups provided by demonstration staff at their homes allayed their fears because they knew a trained medical professional would catch anything serious that might be happening with their disease. Participants valued the amount of time that the demonstration staff would spend with them explaining their disease. Many shared that this education allowed them to manage their conditions better and keep them accountable for their own health because they knew the demonstration staff would be stopping by to check on them.

Another demonstration feature valued greatly by participants was that the demonstration staff looked at "the whole picture," including all of their medical and non-medical needs. As one participant noted, "Instead of different doctors, [the social worker] brought one person [the demonstration nurse] to address everything (…)" Participants observed that such a holistic approach focused on all their needs and improved their overall well-being, making them feel healthy and optimistic about the future.

Participants described many ways the MHS demonstration staff helped them with their medications. Some shared that the staff connected them with a pharmacy that prepackaged their pills into individual time-stamped rolls so they didn't have to sort their pills into pill boxes themselves. Many participants described that medication reconciliation improved the quality and possibly duration of their, or their loved ones, lives.

Trusting relationships with the demonstration staff allowed patients and family members to share issues they had dealt with for a long time and were not comfortable describing to other providers, many of which had resulted in identification of missed or mismanaged diagnoses in the past. Many participants shared that the demonstration improved their mental health.

Interviewed participants felt that the MHS holistic approach improved their overall well-being, making them feel healthy and optimistic about the future.

Family members of demonstration participants reported similar experiences and effects of demonstration on their mental well-being. They shared that demonstration staff advised them of many resources, including mental exercises, stress coping techniques, and suggestions for family member support groups to help them take better care of themselves and take care of their loved ones. Many shared that these resources helped family members feel "less guilty" about taking time to recharge.

Participants described multiple ways the staff coordinated their care with PCPs, specialists, hospitals and nursing homes. They shared that their social worker and NP would reach out to them during and after hospitalizations to discuss their case with hospital staff. Most

participants indicated that the demonstration staff were automatically alerted if the participant visited the emergency room.

Participants placed a great value on many community resources and services the demonstration staff helped them realize. Participants shared that staff taught them about services they did not know were available, helped them to navigate the labyrinths of Medicare and Medicaid eligibility, coverage, and requirements, helped to make arrangements with transportation services, and affordable food programs, identified respite programs for family members, as well as medical equipment programs, prescription drugs programs, and financial assistance services and enabled access to affordable cell phones. Participants viewed such services as crucial to their quality of life.

Several participants noted that the program staff helped them to live independently by assuring safety at home. Many participants shared that the demonstration staff assessed their homes to assure that everything was safe and suggested enhancements such as installing bars and shower chairs in the bathrooms to prevent falls.

Demonstration staff also helped participants with documenting their end of life preferences. Participants described this process as valuable, yet daunting and distressing due to the magnitude these decisions would have on their life and the lives of their loved ones. Participants shared that the demonstration staff aided them through this process and calmed their anxieties in helping to navigate end-of-life paperwork such as living wills and Practitioner Orders for Life Sustaining Treatment (POLST) forms. All participants indicated that having such documentation and knowing that their families would not have to make these decisions on their behalf made them feel more secure and relieved.

All participants described having trusting relationships and clear communication with demonstration staff. They reported that the staff understood their needs, what they were going through, and answered any questions that they had about their needs.

E.11 Lessons Learned

Several lessons learned can be gleaned from the results of the MHS MHCQ demonstration that is the focus of this report. These lessons are drawn from the quantitative results of the multivariate statistical analyses of the MHS demonstration's impacts on cost, quality, and utilization outcomes and from the results of the qualitative assessments regarding the processes and impacts of the demonstration interventions. The main lessons learned are as follows:

- The cost outcome analysis results for the MHS demonstration showed no statistically significant impact. As a result, the demonstration did not have a significant impact in reducing Medicare costs.

- MHS' internal quality measure results were favorable, as they met targets set for all 10 internal quality measures. However, the methods used to set the targets were not based on external benchmarks, and the results were not assessed against a matched

comparison group, so it is not possible to determine if the results would have occurred in the absence of the demonstration.

- The results for the claims-based quality measures were less directly focused on the demonstration's interventions but were assessed against the matched comparison group established for this evaluation. They showed statistically significant but unfavorable effects for two measures on ICU days. However, a favorable but weakly statistically significant effect was found for the measure of 30-day post discharge visits.

- The utilization outcome analysis results showed no statistically significant impact for the overall effects for any of the three utilization measures evaluated. As a result, the demonstration did not have a significant impact in either reducing or increasing utilization for those measures.

- The qualitative results from the patient and family interviews and focus group showed positive impacts of the MHS demonstration. Demonstration components that led to high levels of participant satisfaction with the demonstration were integration of social and spiritual services, diversity of demonstration provider teams, frequency of visits, continuity of personnel, longevity of services, integration of family members, and ability to meet the unique needs of the patients. Services provided by the demonstration were found to fill gaps that existed in care due to the fragmentation in our health care and social care systems. These services improved the MHS demonstration participants' well-being, self-care behaviors, understanding of their disease processes, and social and emotional support.

- In summary, the MHS MHCQ demonstration showed some positive effects in terms of qualitative assessments of the impacts on patients and families and internal MHS quality measures. However, no strongly statistically significant and favorable effects were found in the more rigorous quantitative evaluations of cost, quality, and utilization outcomes in relation to a matched comparison group.

- Future demonstrations might consider ways to expand the range of outcomes included in the more rigorous quantitative evaluations, to include additional types of outcomes that were also an emphasis for this palliative care demonstration, such as patient and family quality of life and coordination of care, and to measure those additional outcomes for both the intervention and comparison groups.

E.12 Limitations of the Evaluation

The MHS Evaluation had three main limitations. First, the quantitative results of the evaluation are based on the matched population not on the entirety of the served population. The quantitative evaluation included an IG of 2,023 out of 3,095 MHS enrollees; 1,072 MHS enrollees were excluded for a range of different types of reasons related to the evaluation methods needed to respond to the challenges posed by the demonstration design and its threats to the validity of the evaluation. There were trade-offs made between applying the evaluation methods needed to respond to the evaluation challenges posed by the rolling enrollment, clinical

and disease severity heterogeneity, risk of selection bias, and high death rate of enrollees against the goal of including as many MHS enrollees in the IG as possible.

The quantitative results are related to the population examined and generalizations of the results of the quantitative outcome analyses conducted for the 2,023 IG beneficiaries to the entire population of 3,095 MHS-enrolled beneficiaries should be treated with caution. We cannot be certain how those additional beneficiaries might have affected the results if they could have been included in the IG and successfully matched to the CG beneficiaries.

Second, the quantitative evaluation included the MHS beneficiaries enrolled in the first three years of the demonstration's operations, from July 2012 to June 2015, but did not include enrollees from the fourth year of the demonstration, from July 2015 to June 2016. We cannot be certain how that additional year of MHS demonstration experience could have affected the results of the analysis.

Third, the qualitative evaluation from the interviews and focus group with the MHS demonstration patients and their families was limited to one point in time and to beneficiaries who were willing and able to participate. We aimed to include a range of different types of beneficiaries and family members in the interviews and focus group, but the severe nature of the illnesses suffered by the demonstration enrollees, and the often major impacts on their family members as well, may have limited the range of participants included in the interviews and focus group.

SECTION 1
INTRODUCTION

The Medicare Health Care Quality (MHCQ) demonstration was developed to address concerns about the U.S. health care system, which typically fragments care while also encouraging both omissions in and duplication of care. To rectify this situation, Congress directed the Centers for Medicare & Medicaid Services (CMS) to test major changes to the health care delivery and payment systems to improve the quality of care while also increasing efficiency across the health care system. This goal could be achieved through several types of interventions: adoption and use of information technology (IT) and decision support tools by physicians and their patients, such as evidence-based medicine guidelines, best practice guidelines, and shared decision-making programs; reform of payment methodologies; improved coordination of care among payers and providers serving defined communities; measurement of outcomes; and enhanced cultural competence in the delivery of care.

Section 1866C of the Social Security Act, as amended by Section 646 of the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 (P.L. 108-173, Section 1866C[b]), requires the Secretary of the Department of Health and Human Services to establish a 5-year demonstration under which the Secretary may approve demonstration projects that examine health delivery factors that encourage improved quality in patient care. This section also authorizes the Secretary to waive compliance with such requirements of Titles XI and XVIII of the Social Security Act (42 U.S.C. 1395 et seq.) as may be necessary for the purposes of carrying out the demonstration project.

Three types of health care groups were eligible to participate in the MHCQ demonstration: (1) groups of physicians, (2) integrated health care delivery systems, and (3) organizations representing regional coalitions of groups or systems. The MHCQ demonstration was designed to examine the extent to which major, multifaceted changes to traditional Medicare's health delivery and financing systems lead to improvements in the quality of care provided to Medicare beneficiaries without increasing total program expenditures.

Four sites participated in the MHCQ demonstration at various periods, as shown in **Table 1**. Because each MHCQ demonstration site had a different and self-defined plan for its intervention, the evaluation of each site is presented in a separate report. This report presents the final evaluation results for Meridian Health System's (MHS's) MHCQ demonstration, implemented through its Meridian Care Journey (MCJ) program. Evaluation reports for the other sites are available on the CMS Web site.

Table 1
Medicare Health Care Quality Demonstration Sites

Participating site	Focus of the demonstration	Date of implementation	End date
Indiana Health Information Exchange	Quality Health First program	July 1, 2009	January 31, 2013
North Carolina Community Care Networks	Medical home for dually eligible Medicare–Medicaid enrollees	January 1, 2010	December 31, 2012
Gundersen Health System	Advanced Disease Coordination program	February 1, 2010	April 30, 2014
Meridian Health System	Meridian Care Journey program	July 1, 2012	June 30, 2016

SOURCE: RTI International.

This final evaluation report for the MHS MHCQ demonstration reviews both quantitative and qualitative evaluation data regarding its interventions, structure, goals, and performance. Quantitative information includes descriptive statistical profiles and multivariate statistical analysis of the MHS demonstration's impacts on cost, quality, and utilization outcomes. The quantitative analysis included beneficiaries enrolled in the first three years of the MHS demonstration, from July 2012 through June 2015, and Medicare claims data for those enrollees through December 2015. Qualitative information includes RTI's interviews with MHS staff and affiliated physicians during site visits and by telephone. It also includes MHS demonstration reports.

Section 2 of this report includes the detailed evaluation of the MHS MHCQ demonstration using qualitative and quantitative data and analysis. The qualitative analysis describes the interventions, goals, and administration of the demonstration, as well as the barriers and challenges that MHS experienced in implementing its demonstration. The focus of the quantitative analysis is on the descriptive and multivariate statistical analysis of the impacts of the MHS demonstration on cost, quality, and utilization outcomes. **Section 3** includes lessons learned. **Section 4** includes the limitations of the evaluation.

SECTION 2
ANALYSIS

2.1 Qualitative Analysis Methods for Meridian Health System (MHS) Staff and Affiliated Physician Interviews

For this final evaluation report, the focus of the qualitative analysis of interviews with MHS staff and affiliated physicians was to document the MHS demonstration's interventions, goals, and administration. This included qualitative data collected during RTI's site visits to MHS in February 2013, November 2015, and December 2015. It also included RTI's telephone interviews with MHS staff in May 2014 and June 2015, MHS's reports to the Centers for Medicare & Medicaid Services (CMS) for its Medicare Health Care Quality (MHCQ) implementation contract, and internal site-specific analysis and reports on demonstration and related implementation and performance assessment efforts.

RTI conducted telephone interviews with MHS staff and affiliated physicians in May 2014 and June 2015, as well as in-person interviews in February 2013 and December 2015. Interviewees included:

- Demonstration program staff members (clinical and administrative)
- Meridian management and financial staff members
- Physician champions and physician palliative care specialists
- Community primary care physicians
- Meridian hospice program representatives
- Meridian home care services representative
- Physicians and nurses who provide palliative care services at Meridian rehabilitation facilities, hospitals, and nursing homes
- Staff members affiliated with the Meridian Accountable Care Organization

The MHS staff interviews were conducted by teams of two or three RTI staff members. CMS staff members also participated in some of the interviews. The interviews were guided by unique protocols tailored to the specific types of interviewees. The focus of the interviews was to obtain updated information about the demonstration interventions, goals, and administration.

2.2 Demonstration Interventions, Goals and Administration

MHS, an integrated, not-for-profit health care system serving Ocean and Monmouth Counties in New Jersey, was founded in January 1997 when Jersey Shore University Medical Center (JSUMC), Ocean Medical Center (OMC), and Riverview Medical Center (RMC) were joined. Southern Ocean Medical Center (SOMC) in Manahawkin and Bayshore Community

Hospital (BCH) in Holmdel were later integrated into the system in January and September 2010, respectively. MHS payers include private plans, Medicare, and Medicaid.

MHS implemented the Meridian Care Journey (MCJ) program under the MHCQ demonstration at three hospitals: JSUMC, OMC, and RMC. The MHC MHCQ demonstration is a late-life, outpatient palliative care and chronic disease management program that supplements the MHS inpatient, outpatient, and facility-based palliative care services with residential (home or non-acute facilities) and telephonic follow-up services. The demonstration aims to build a coordinated care system for patients with advanced diseases through the palliative care services and additional services provided by the demonstration.

MHS indicated four main objectives for its MHCQ demonstration (MHS, 2016). They were to:

- Improve the quality of life of patients and families
- Provide aggressive management of physical symptoms and psychosocial stressors
- Provide patients and families with the education and emotional support needed to make informed decisions relative to end of life care
- Coordinate care among the physicians, facilities, services, family, and community outside of hospital walls

The community served by MHS includes a number of transient retiree residents in addition to its permanent population. According to 2012 U.S. Census figures (U.S. Census Bureau, 2013), the racial makeup of Monmouth County was 85.1%white, 7.7% African American, and 5.3% Asian, with 10.0% of the population of any race reporting that they identify as Hispanic or Latino. The racial makeup of Ocean County was 93.1% white, 3.4% African American, and 1.9% Asian, with 8.7% of the population of any race reporting that they identify as Hispanic or Latino). Per capita income (in the previous 12 months, 2007–2011) in Monmouth and Ocean counties was $42,234 and $30,257, respectively. Whereas, the per capita income was $35,678 for New Jersey and $27,915 nationally.

2.2.1 Palliative Care at MHS

In addition to running the MHCQ demonstration, MHS increased and developed palliative care services in other settings as part of its overall effort to improve care and improve the coordination of care among all services offered within its system. One provider said that the objectives of the inpatient palliative care services, the outpatient palliative care services, the palliative care services offered in non-acute facilities, and the service offered through the demonstration were the same. Each focused on improving quality of life, and on psychological and social support. Palliative care services in different settings at MHS are briefly described below.

Inpatient Palliative Care. The inpatient palliative care department at JSUMC was staffed by two nurse practitioners (NPs), a social worker, and a physician chief, who supervised

the staff members and the palliative care residency program. As a consult service that saw patients and followed-up with patients referred from other departments, they offered palliative care services that included, among other things, pain management and advance care planning. Staff members reported that the number of consults had doubled in recent years from about 800 to 900 annually in 2015. At OMC consults had also doubled from about 250 to 500 annually. The JSUMC department that started out with just one nurse was now growing. The perception of palliative care among physicians was also changing. As described by an MHS interviewee to the RTI evaluation team:

> *Before the demonstration began, referring physicians would say things like, "Please talk with this patient, but don't talk to him or her about that negative stuff." The department's staff members were questioned constantly—"What do we need you for?" Now there are very few physicians who say these things; instead most physicians see the value-added benefits of the palliative care department.*

Palliative Care in MHS's Sub-Acute Facilities. Meridian offered palliative care services in its rehabilitation hospitals, and MHS interviewees reported that most other rehabilitation hospitals generally did not offer these services. The nurse practitioner interviewed reported that she worked with patients during their typical stays of about 2-3 weeks. This was generally more time to work with patients than in the inpatient palliative services (unless hospital stays were long) and much less time to work with patients than the services offered through the demonstration. If demonstration participants were admitted to one of those facilities, the demonstration clinical team would see the patient instead of the non-demonstration palliative care nurse.

Outpatient Palliative Care. As part of the changing culture surrounding palliative care and its use, Meridian started a new outpatient palliative care practice in the third year of the MHCQ demonstration. This department offered services that were similar but not identical to both the services provided as part of the demonstration and as part of the inpatient palliative care departments, but it did so on an outpatient basis. However, according to the program staff and providers, however, the outpatient palliative care department was not a substitute for the services provided under the demonstration.

Meridian at Home. Meridian at Home was MHS's home care service that provided the standard Medicare post-acute skilled nursing service. Unlike most home care services, Meridian at Home had a nurse dedicated to palliative care. The palliative care nurse complemented the skilled nursing offered as part of the traditional home care benefit. If a patient was being seen by a wound care nurse and had a lot of pain, for example, the palliative care nurse could address the pain. There was only one palliative care nurse in each of Ocean and Monmouth counties.

The MHCQ Demonstration. The in-person and telephonic encounters offered through the MHCQ demonstration were not provided by the new outpatient palliative care department or by any of the other palliative care services offered in the other settings described earlier. Contemporary medical care for persons with advanced diseases was team-based care with continuous monitoring and assessments of symptoms, health status, risks, and functioning. Inpatient palliative care departments provided this comprehensive care because they comprised all members of a health care team, including (among others) doctors, nurses, and social workers.

They also had other hospital resources, such as specialists. Under the MHCQ demonstration program, Meridian had brought this team-based care to patients in residential settings, although without some of the hospital-based resources available to inpatient palliative care departments. This included the various clinical staff members who were part of the MHCQ demonstration as well as the participants' PCPs with whom the clinical staff members were in close contact. Interviewees indicated that demonstration participants were not likely to use the outpatient palliative care practice while they were enrolled in the demonstration.

2.2.2 Changing Perceptions of Palliative Care

The MHCQ demonstration program was described as a "palliative care" demonstration program. In practice and as the demonstration was implemented in its third and fourth years, the "palliative care" label implied a broader definition than was often used previously. Staff members affiliated with the various MHS palliative care services and the MHCQ demonstration sometimes described the demonstration as a "chronic illness care program with palliative care components" as opposed to simply a "palliative care program." One provider said that Meridian never should have referred to the demonstration as a "palliative care" demonstration in the first place, in part because a sizeable portion of providers did not understand palliative care and viewed it as a set of services that were delivered right before hospice. One provider said that as a society we chose the wrong word when we picked "palliative care" and instead should have simply used, "chronic disease management." Another physician referred to the demonstration as an "all-encompassing palliative care program/chronic care hybrid."

Some of the clinical staff members interviewed by the RTI evaluation team said that, "palliative care" and "chronic illness care" were "one in the same." According to them, both addressed physical, emotional, psycho-social, and spiritual needs. These staff members emphasized that people with chronic illnesses had multiple needs outside of physical needs. They viewed palliative care as an attempt to offer a better quality of life to patients. Part of achieving this meant seeing patients in their homes so providers could get a broader perspective on patients and the variables affecting their health. Assessing living conditions provided a better understanding of patients' needs related to their illnesses than traditional medical care, which did not consistently consider or assess living conditions. One staff member described these issues as follows:

> *Often, physical health isn't the only issue these patients face. Some patients may need social work help or counselling services. Some patients may have low health literacy, so staff members use education to better reinforce quality health practices, such as weighing yourself every day. Having staff check up on patients helps keep them out of the hospital because they are more apt to do the right thing when staff does so.*

The MHCQ demonstration staff members provided a definition of palliative care from the Center to Advance Palliative Care:

> *Palliative care is specialized medical care for people with serious illnesses. This type of care is focused on providing patients with relief from the symptoms, pain, and stress of a serious illness—whatever the diagnosis. The goal is to improve*

quality of life for both the patient and the family. Palliative care is provided by a team of doctors, nurses, and other specialists who work with a patient's other doctors to provide an extra layer of support. Palliative care is appropriate at any age and at any stage in a serious illness and can be provided together with curative treatment. (Center to Advance Palliative Care, 2011).

Staff members and providers affiliated with the MHCQ demonstration defined palliative care as services to coordinate care, assess patient needs, and respond to those needs through clinical or nonclinical referrals or direct assistance. These services included advance care planning and documenting patients' preferences related to life-saving treatment. All MHS staff members interviewed referred to the MHCQ demonstration as providing people with what they needed earlier than they otherwise or typically would get it.

Both the providers and program staff members reported that, in their opinions, and based on their interactions with patients and other providers, perceptions about palliative care among physicians and patients had changed somewhat over the previous 3 to 4 years. When the MHCQ demonstration began, demonstration staff members met with resistance from patients, families, and physicians during recruitment because of misconceptions surrounding the definition of palliative care. Palliative care was viewed as "prehospice" care by many patients and providers. This perception seemed less true by the fourth year of the demonstration in late 2015 than previously, but remained among a portion of both providers and patients. Palliative care physicians reported that they were seeing patients who were well versed in the differences between palliative care and hospice and that this reflected the change in perceptions in the community.

2.2.3 Demonstration Staffing

As noted, the MHCQ demonstration program was unique among the MHS palliative care services because services were provided on an ongoing basis in homes, by telephone, or at a facility where the participants lived or were admitted. Demonstration services provided at facilities were provided by the demonstration staff in coordination with the facilities' staffs.

In the third and fourth years of the demonstration, the total demonstration staff comprised about 20 people. The clinical staff members included social workers, registered nurses (RNs), and nurse practitioners (NPs)—all led by the demonstration's medical director. The demonstration staff also included administrative staff members who did not see patients, including a program director, program manager, and others.

The MHCQ front-line clinical staff members reported to the demonstration's medical director for clinical issues and to the program director for administrative issues. The front-line clinical staff members who saw demonstration participants worked exclusively on the demonstration and had little overlap with other programs at MHS. Their services sometimes overlapped with the services provided in other settings because some demonstration participants were in Meridian-owned, long-term care or rehabilitation facilities where some similar services were offered. The demonstration staff members coordinated care with the staff members in those facilities.

2.2.4 Role of Social Workers

There were five social workers on the MHCQ demonstration staff at the time of the RTI interviews in December 2015. This was an increase over previous years because of enrollment growth and because the demonstration leadership recognized the need to offer more social work services to patients and to make the team more interdisciplinary. Social workers spent most of their time seeing participants in person. They focused on psycho-social and counseling needs that were outside of the medical needs addressed by the RNs and NPs on the team. When visiting patients, they spent a significant amount of time counseling participants who were struggling with their diseases and the associated functional impairments or limitations. These counseling sessions aimed to help patients understand they could contribute and function in their familial and social interactions and did not have to be overwhelmed by their disease. Other functions included:

- Connecting patients with other programs (e.g., Medicaid) and resources
- Assisting with housing needs or arranging for alternative housing
- Discussing the goals of care
- Assessing bereavement
- Providing support for caregivers and family counseling

Community Resources. A portion of the demonstration, participants could benefit from other community (e.g., Meals on Wheels), state (e.g., Medicaid) or federal (e.g., Medicare home health care) programs and did not participate in those without assistance and prompting from the demonstration staff members—most often social workers. The social workers assessed participants' needs and connected them to other programs and resources for which they were eligible. One physician noted that social workers had been a "tremendous benefit" to the demonstration because patients' services were set up quickly and because they helped to coordinate patients' care. Demonstration social workers often completed application forms for demonstration participants for various programs and services.

Some demonstration enrollees resided in nursing homes where medical needs were addressed. As part of the demonstration, a social worker was assigned as the lead demonstration team member to follow those patients because patients in nursing homes usually did not have access to social workers and the services they provided.

2.2.5 Roles of Registered Nurses

Six RNs were on the MHCQ demonstration staff as of December, 2015. Like the social workers, they also spent most of their time visiting patients in-person. They split their assigned patients by the two counties in the Meridian catchment area to minimize travel times between visits. Their main duties included:

- Conducting physical health assessments
- Creating health history documents
- Identifying new or exacerbating symptoms and addressing them, assisting with making medical appointments if needed, and calling NPs to help with difficult clinical cases
- Referring patients to social workers for emotional or social issues
- Reconciling medications and monitoring adherence
- Educating patients about their diseases
- Helping patients transition to hospice
- Providing physical health therapies
- Contacting NPs if patients wanted to fill out a Practitioner Orders for Live-Saving Treatment (POLST) form

Nurses' primary foci were to manage symptoms associated with chronic illnesses. Other priorities included identifying depressive symptoms or other conditions that could be addressed with a patient's physician or care team. Nurses also spent a lot of time assessing the use of prescribed medications. This included medication adherence – and whether it was related to affordability, side effects, or other aspects of the participant – and medication reconciliation. Nurses also addressed patient preferences, particularly for those whose diseases were at advanced stages. Sometimes these participants requested conversations with clergy and the nurses facilitated those.

2.2.6 Roles of Nurse Practitioners

The nurse practitioners (NPs) on the team had roles similar to the RNs. Their additional skills were also used for patients who could benefit from them. For example, one NP had a cardiology background. She was able to check and monitor medications such as ACE inhibitors or anticoagulants for patients with heart failure, cardiovascular disease, or related illnesses. NPs also identified when patients were not taking their medications, the needs for new prescriptions, and when medications needed to change. These assessments were made proactively and, because they were monitoring medications in patients' homes, any problems they discovered would not have been detected otherwise.

The NPs on the demonstration team were legally authorized to complete the POLST form with patients. The social workers and RNs could not sign a POLST form, but they could determine whether a patient needed or wanted one, and then call someone who could sign them. The NPs interviewed by the RTI evaluation team reported that it took a long time—up to a year—for patients to be ready to complete a POLST or living will. Advance care planning conversations and documents could be intimidating to patients and families, and NPs reported that they generally did not occur until a trusting relationship was established.

2.2.7 Roles of Demonstration Staff Compared with Staff in Other Settings

In comparison to MHCQ demonstration staff, the MHS social workers and nurses in other settings such as hospitals, nursing homes, post-acute care facilities, and home care services were constrained to offer services in line with the care processes of that facility or service. In addition, social workers and nurses who worked in those settings had limited encounters with patients, because patients' use of those services were almost always short-term (nursing homes being the exception). In nursing homes, social workers generally did not have close relationships with patients and did not conduct counseling sessions or offer psychosocial support. Longevity of both care and relationships distinguished the MHCQ demonstration social workers and nurses from their peers in other medical care settings. In addition, the demonstration clinical staff could address living situations in the home whereas facility-based social workers could not. Home care staff members could assess living conditions for the short time they saw patients.

When social workers or nurses in other settings made referrals as part of discharge planning, they did not know whether patients followed through with them or not. In contrast, the social workers and nurses on the demonstration's clinical team monitored referrals and actively worked with patients to make sure they took place. Another difference was that the demonstration's social workers addressed a spectrum of psychosocial needs whereas social workers in other settings typically did not. In addition, social workers in other settings did not work with patients' caregivers or assess the need for counseling.

MHS staff members reported that MHS operated differently than similar medical centers in that they had social workers in rehabilitation facilities and as part of home care services. Social workers and nurses on the demonstration clinical teams collaborated with their peers in other MHS settings by informing each other about the status of demonstration patients. If a demonstration patient was admitted to a Meridian facility, the social workers and nurses at the facility were notified. Whereas, if a demonstration patient was admitted to a non-Meridian facility, they were not notified.

Differences with Home Health Care. Interviewees reported that home care services followed-up with patients within 24 hours of discharge and required that patients be home bound. If there was a referral to home care after a hospitalization, it was up to the patient to follow-up; home care services did not persist with enrolling patients in the service. For patients who were in the demonstration and were referred to home care post discharge, the demonstration team followed up with them. Whereas, facility-based staff members did not do so after making referrals to home care and did not know whether the referral was fulfilled. In addition, home care services did not include discussions about the goals of care as was done by demonstration staff. Demonstration staff members reported a case where a home care staff member had left a phone message for a referred patient, but the patient did not understand the purpose of the message. In cases like these, the demonstration staff members often engaged patients who needed home care services.

In addition, home care was contingent on patients being homebound; whereas, the demonstration staff members encouraged patients to get out in the community when possible. If patients were not improving, home care was temporary regardless of ongoing needs. The demonstration did not have that restriction.

The demonstration team cited numerous examples where they arranged for home care when patients were not taking advantage of it. One demonstration staff members reported that the mechanism for increased home care would most likely be related to arranging for a second round of home care post discharge. For example, a patient could have home care to address an acute need. Then, 2 to 3 months later, the need could re-emerge and be detected by the demonstration clinical team, where it would not have been detected otherwise.

2.2.8 Caseloads, Staffing Ratios, and Training

Case Management Assignments. Every demonstration participant had a primary staff member assigned to him or her. Case managers could be social workers, NPs, or RNs, depending on the needs of the patient. On a typical day, staff members reviewed notes for the 6 to 8 patients who were scheduled to be seen in-person and for other patients who would be contacted by telephone between the scheduled in-person visits. This was how the monthly touches required for the demonstration were completed. Case managers also checked to see whether any of their patients had been admitted to or discharged from a facility and often scheduled visits or calls with those patients to take place over the following couple of days.

MHS staff members reported that they saw about 5 to 6 patients per day in-person and carried an overall case load of about 125 to 130 demonstration participants. This ratio had been consistent throughout the demonstration. When the numbers of patients enrolled increased, MHS hired new clinicians. Staff members received rosters of patients to whom they had been assigned monthly and were required to make contact with each of their assigned participants monthly. Contacts could be a phone call or in-person visit. Staff members sometimes would find the end of the month challenging because they fell behind in making the needed contacts. This was commonly due to unexpected patient needs. For example, a patient was admitted to the hospital or ER, or had an immediate social need. When this occurred, another member of the clinical team was asked to help.

Team Processes. The MHCQ team held weekly meetings where members discussed clinical or administrative problems that they encountered with their patients. Weekly meetings included discussions about patients who had left the program, patients who had transferred to hospice, and discussions about challenging patients. Staff members also discussed advance care planning and the associated processes and documentation such living wills, the POLST form, and transitioning to hospice. The hospice liaison attended the demonstrations clinical meetings twice monthly.

Staff members described how they collaborated with each other on individual cases and communicated with each other via e-mail and telephone about different cases. According to the staff, when they began to work with participants on an immediate need, they usually found an additional problem or multiple additional problems to address. When this happened, other team members were consulted as needed.

Training. The medical director for the demonstration encouraged the clinical staff members to obtain certification in hospice and palliative care. The clinical team received training in stress management because their jobs could be demanding, in part because they addressed and

witnessed a wide range of crises, including death and dying. Staff members reported that Meridian was dedicated to teaching self-care strategies to staff members in addition to patients.

2.2.9 Care Coordination and Advance Care Planning

Palliative Care Orientation. The demonstration's clinical team reported that they had taught many of their peers (social workers, RNs and NPs) in other settings about palliative care. As with the physician community, these medical professionals in other settings often questioned why patients were participating in a palliative care demonstration when they were not close to needing hospice. Since the demonstration had been running for more than three years at the time of the RTI interviews in December 2015, staff members in other settings (e.g., dialysis centers) were then contacting the demonstration clinical team when they identified patients who could benefit from the demonstration.

Advance Care Planning. All Meridian facilities asked patients about the existence of living wills on admission; however, they rarely facilitated the completion of living wills, the POLST form, or related documents. The demonstration clinical team helped patients to complete these documents. All clinical staff members (RN's, social, workers, and NPs) had conversations about advance care planning with demonstration participants. It often took a long time for patients to decide to complete a POLST. An interviewee shared some examples:

> *The language in the POLST can be scary for some people; or patients do not understand what the documents says. Patients often think that completing living wills or the POLST means that nothing will be done with them. One patient took a year before she would complete a POLST. Once the patient finally signed it, she felt much better because she knew her wishes would be followed and because she felt relieved after thinking about the difficult issues related to end-of-life. Often patients thank the demonstration teams for helping them with these forms and end-of-life issues.*

The demonstration staff members noted that completion of advance care planning documents often "get missed" in hospitals. They also noted that physicians rarely completed them with their patients. When demonstration patients completed advance care planning documents with the assistance from the demonstration staff, "more than 95% of doctors" were pleased that living wills and POLST forms were completed by the demonstration for their patients.

> *One patient said that he/she wanted the physician to compete the POLST with him/her. The physician agreed to complete it with the patient, but simply put it in front of the patient and said, "Here, sign it." In this case the form was incomplete as the patient either did not fully understand the form or chose not to complete all of the items.*

Case Example. Meridian staff members provided examples of how the demonstration staff members had arranged for other available services to meet the immediate needs of patients who were at risk.

A participant had been discharged from the hospital and was at high risk for falls. For some reason the participant did not accept home health care services while at the hospital, most likely because two grandsons lived with her/him. Once he/she came home, he/she realized that his/her grandsons would not help with bathing or shopping. The demonstration staff arranged for home health care through MHS' Meridian at Home so a physical therapist could help with bathing and a nurse could follow up with post-discharge medical needs. In addition to arranging for a home care nurse and physical therapist through home health care, the demonstration nurse reviewed the medications and worked with a cardiologist to adjust them. The staff members also arranged for Meals on Wheels for the patient and arranged for a demonstration social worker to follow-up.

2.2.10 Collaboration with Physicians

The demonstration staff members' experiences with doctors had been mixed, even in the third and fourth years of the MHCQ demonstration. Staff members reported having difficulty getting some of the patient's doctors to agree with their recommendations at times. Staff members believed that better communication and interaction with these doctors would result in better care.

Most doctors were interested in working with the demonstration staff members assigned to their patients. Some doctors were unreceptive to discussions about their patients; however, demonstration staff members reported that these were few in number. Most physicians were more than willing for their patients to receive the extra benefits provided by the demonstration.

2.3 Information Technology

MHS staff reported that they had several IT systems that supported the MHCQ demonstration in different ways. Following up with patients when they were admitted to a health care facility was one way that the MHCQ demonstration team used IT to coordinate care for patients. Meridian had a health IT platform that notified the demonstration staff members when demonstration patients were admitted to the hospital, visited the emergency department (ED), or entered hospice. For admitted patients, demonstration staff members could see them in the hospital to assist other providers who work with the patients. Generally, the demonstration staff member would call the hospital staff to make them aware of advance care planning documents or POLST forms and also to notify them if they intended to see the patient. Interviewees reported that the exchange of information was essential for care coordination efforts.

WebChart Electronic Health Record (EHR). When the demonstration started, Meridian decided to use the WebChart EHR system. The system was designed to have customized data entry and reporting capabilities, as well as the capability to interact with other systems at MHS. The system included structured data fields that the demonstration needed for both operations for reporting to CMS. All of the forms used in patient encounters were developed by the demonstration team and incorporated in the WebChart system. The system also handled scheduling of patients and tracking and reporting on patient encounters.

Staff indicated that WebChart interfaced with MHS's IT system on a weekly basis to provide information about patient admissions and discharges. This Web-based system was available throughout MHS hospitals, outpatient facilities, and in patients' homes. This system helped to manage and track physician and patient enrollment and services provided to enrolled patients. It held all of a patient's demographic information, the severity of illness stratification level for the MCJ program, and other assessments. The system also included a secure patient portal for personal health records, a feature designed to encourage patients' engagement in their care and in the program.

MHS staff members described this Web-based tool as a customer relationship and management application that all demonstration team members used. They also explained to the evaluation team that the system was needed because the main MHS EHR system had no palliative care-specific modules.

2.4 Provider Participation

As of December 2015 the demonstration staff reported that about 250 physicians were actively participating in the demonstration, indicating that the demonstration was well known and established. MHS staff reported that about 60% of the eligible physicians agreed to participate when contacted about the demonstration. Most of the physicians who declined had relatively few patients who would have been eligible.

About 10% of the physicians in the demonstration were in Meridian-owned practices and the other 90% were community physicians with their own practices. The physician community at Meridian consisted of mostly community physicians who were voluntary hospital staff with admitting and other privileges.

As of December 2015, the way demonstration staff recruited physicians had not changed since the demonstration's inception. Recruiting physicians to participate in the demonstration was reportedly easier by then than in the first year because the demonstration was well known among the physician community by 2015 and was perceived by many to be an effective program. Despite physician recruitment being easier, there was a slower increase in the total number of physicians who agreed to participate in the demonstration in the third and fourth years, so the overall total number of participating physicians remained about the same over those years. This was reported as due to the demonstration staff members having already engaged the majority of physicians who were both willing to participate and had demonstration-eligible patients.

As the demonstration had grown, several doctors had more than 25 patients in the demonstration. One physicians had 74 active patients in 2015. On average, each physician was reported to have about 8 patients enrolled. As physicians had come to see the benefits of the program they were referring patients sooner. That is, before the demonstration, treating physicians usually referred patients to facility-based palliative care services (the only settings in which palliative care was available) when their diseases had progressed to advanced stages. With the demonstration, physicians referred patients to the demonstration when they met the enrollment criteria and to facility-based palliative care when they did not.

Barriers to Recruiting Physicians. While referrals to the demonstration and to palliative care services had increased among many physicians, some barriers to recruitment persisted in 2015. One was a continuing misunderstanding of the demonstration program and a general mischaracterization of palliative care among some physicians. Staff members and providers interviewed said that some physicians continued to view palliative care as hospice or strictly end-of-life care. These physicians sometimes decided not to participate in the demonstration, because they did not want their patients to think that their doctors were "giving up on them."

Another barrier (and some staff members said this was the biggest barrier) was how health care was changing in the MHS catchment area, including the growth of MHS by purchasing physician practices and hospitals. Some physicians were concerned that the demonstration was a means for Meridian to take patients away from their practices.

Interaction between Demonstration Staff and Participants' Primary Physicians. Most of the PCPs who authorized patient enrollment were actively working with demonstration staff members. The demonstration staff routinely updated physicians about the health of their patients via e-mail, fax, or phone after they visited with patients.

One participating physician said that this team approach was what had been missing from outpatient health care services all along and noted that it was why the new outpatient palliative care department could not substitute for the demonstration. Others affiliated with palliative care at MHS said that the outpatient department had a team-based approach as well, but did not offer home visits and could not assess patients' living conditions. Another physician viewed the demonstration team as allowing busy physicians to do other work for patients because assessments were made in advance for them. In the absence of the demonstration, assessments would only take place when the patient made an appointment, was hospitalized, or had some type of home care service. One physician noted the demonstration program could follow the patients wherever they went and consequently was beneficial to patients. A similar comment was made by another physician who said that the demonstration team was, "There whenever patients need them, while the doctors are not always available when patients need them."

Physician Champions. The demonstration program had three physician champions, one at each of the three participating hospitals (RMC, OMC, and JSUMC), as part of the program's outreach and recruitment efforts. These physicians received a modest stipend to promote the demonstration program and to work with the demonstration's medical director to conduct outreach and educational activities in their respective hospitals.

All the physician champions worked in an inpatient setting and were part of the inpatient palliative care team at their respective hospitals. Physician champions had many patients who were enrolled in the demonstration and had a higher portion of their patients in the demonstration program than other physicians. They also worked with many specialists inside and outside of MHS's palliative care services and were reported to be partially responsible for the increase in the number of specialists participating in the demonstration.

In the first year of the demonstration, MHS relied heavily on physician champions because they were well-respected members of the physician community and helped spread the word about the demonstration. Over time their roles had changed because the demonstration was

more widely viewed as being beneficial to patients and because of the changes in the prevailing attitudes about palliative care services. By 2015, the demonstration was less dependent on the physician champions to encourage physician recruitment.

According to demonstration staff, the physician champions had been instrumental in breaking down the negative connotation associated with palliative care services. In collaboration with the demonstration's medical director, the champions ran educational sessions and provided written resources.

According to the physician champions interviewed, the job became easier in the third and fourth years because the demonstration staff became more reputable among Meridian-affiliated physicians. During the first year, it was harder to get physician acceptance and buy-in because doctors did not understand the difference between palliative care and hospice. The champions reported that opinions about palliative care and the culture among providers had changed dramatically in the past 3 to 4 years.

Specialists. One change by the third and fourth years of the demonstration was the expanded recruitment of specialists. Earlier on, recruitment had focused on PCPs. Staff members reported that physician specialists tended to be supportive of the program. In the third and fourth years the number of participating specialists—particularly cardiologists— had increased significantly. According to the demonstration staff, by June 2015 about:

- 68 percent of participating physicians were PCPs
- 19 percent were cardiologists
- 6 percent were oncologists
- 5 percent were pulmonologists

Physician Billing for Advance Care Planning. CMS's 2016 Medicare Physician Fee Schedule included two new Current Procedural Terminology (CPT) codes to reimburse for advance care planning. According to the demonstration staff members familiar with the new codes, the state contractor (third-party administrator) would decide on (1) the reimbursement amount and (2) how many follow-up visits could occur. MHS staff members believed that the payment amount would be similar to a Level 4 or Level 5 evaluation and management visit (about $100 for an initial visit and $60 for a follow-up visits). They also said that the visit needed to be longer than 30 minutes and could be conducted at the same time as an evaluation and management visit.

MHS believed that some portion of physicians would use these codes and conduct advance care planning with their patients. However, physicians who were not palliative care specialists were often neither comfortable with having advance care conversations nor trained to have such conversations. The new CPT codes were viewed as allowing for greater reimbursement for those physicians who were having those advance care conversations already.

2.5 Beneficiary Participation

Recruitment Process. In 2015, demonstration staff reported that the patient recruitment process had remained the same as in previous years. Every Monday the demonstration staff received data automatically from Meridian's data warehouse. The enrollment criteria were programmed into the software so that eligible patients could be identified. The data resulted in a list of all patients who were eligible for the demonstration. Some patients on the list were in the process of being enrolled already and appeared on prior lists, and processing for others had not yet begun.

The data feed included a treating physician for each beneficiary on the list, but often the named physician was not the patient's PCP. If the named physician was already participating in the demonstration, then he or she would be contacted (usually by facsimile) to approve or disapprove the patient for enrollment in the demonstration. The contact letter sent to physicians did not ask for permission from the doctor for a patient to be in the program; rather, it asked whether the doctor had a reason a patient should not participate in the program. Participating physicians generally approved of enrollment for their patients once they were identified by the demonstration staff members.

The main reason physicians did not approve patients for enrollment was reported to be because they were not the patients' PCPs despite being named on the data feeds. In this case the demonstration staff members attempted to identify the actual PCP. Sometimes the named physicians were the correct PCPs but were not participating in the demonstration. Other times PCPs did not want to be part of the demonstration and did not approve enrollment for their patients.

Once patients' PCPs approved enrollment, the demonstration program staff contacted the patients. This part of the process had not changed over the years. The demonstration team first sent letters, signed by the physicians and addressed to the patients who were found to be appropriate for the demonstration, which explained the demonstration and notified them that demonstration staff members would be contacting them. The team then called the patients to describe the services offered. If patients consented to enrollment, the staff arranged for the initial visits. Often patients would reach out to the demonstration staff after receiving the letter because the demonstration contact information appeared on it. Sometimes people contacted the demonstration staff because they knew another demonstration participant, had learned about the program, and wanted to participate.

Refusals and Termination of Enrollment. The overall enrollment rate for patients who were identified for demonstration recruitment was reported by demonstration staff to be 66%, including a 14% refusal rate from patients once approved by their physicians, and the remainder not gaining physician approval or later found not eligible once patient contact was initiated. Some patients had died and others were in hospice at the time of recruitment; others had some personal reasons they did not want to enroll. Some patients were confused about the differences between palliative care and hospice care. Patients who viewed them as closely related or synonymous were more likely to refuse participation in the demonstration. Some patients also

did not want home visits for several reasons. For example, some patients who were receiving home health care or other home-based services did not want additional home-based services. Some patients did not understand the demonstration. Some patients believed they were healthy (enough) and did not need it.

Demonstration staff reported that participants rarely left the demonstration unless they died or transitioned to hospice. Some patients left the demonstration because they were transitioning to a Medicare Advantage plan.

Stratification Levels and Encounters. In 2015 the demonstration staff continued to use a scale, or stratification level, ranging from 1 to 3, to gauge enrolled patients' symptom severity and to estimate the attention needed. Level 1 indicated lower severity or need and Level 3 represented high severity or need. Patients whose diseases were progressing quickly or whose symptoms had exacerbated generally required more staff time and were assigned to Level 3. The levels also determined the frequency of in-person visits. Level 1 patients were seen in-person once every three months; Level 2 patients were seen every two months; and Level 3 patients were seen every month. Each patient in the demonstration received at least one phone call per month and, on average, patients received about four phone calls each month. If a patient was not contacted in a month then Meridian did not report any contacts—or touches—for that patient in the monthly report to CMS and no monthly payment was issued.

Patients were assessed monthly during the telephonic or in-person encounters. The assessment of a patient's physical or mental health might change the level assigned to a patient. Demonstration enrollees typically changed stratification levels at some points during their tenure in the demonstration. Some patients changed levels often, particularly those who were in the demonstration for extended periods. For example, demonstration staff members described a patient who was at Level 3 and received a home visit every month, but who then stabilized to a lower level:

> *The patient was falling a lot. Demonstration staff, after many attempts, finally arranged for around-the-clock care after a family meeting. When the staff subsequently saw her/him, things were going very well; all the problems that occurred prior to the new caregiver service had ended. As of the four months following, the patient had not needed a hospitalization. Staff members attribute this as to their focusing on the patient's needs and arranging for the things that would make it safe for her/him at home. An aid coming in every few hours was not sufficient for this patient; he/she needed continuous (24-hour) monitoring of medications, meals, and activities of daily living. With the new service in place the patient could remain at home. Staff members now see the patient in-person about every three months. They report that he/she is happy, feels better, and is at a much lower risk of falling or having a different adverse event leading to a hospitalization.*

Staff members reported that the use of stratification levels was better for patients compared with disenrolling participants whose needs had subsided. They reported how most participants sometimes had new needs that surfaced and symptoms that re-emerged or were new.

When a cancer patient goes into remission, we don't want to say, "You're in remission, I'll see you in 6 months"; it is preferable to remain in the demonstration at a lower stratification level.

Changes in Enrollee Characteristics. The interval between when a patient initially met the enrollment criteria (or index qualification) and their enrolling in the demonstration was reported to be much shorter in 2015 than it was in the first year of the demonstration back in 2012. The initial group of enrollees were selected after a review of hospitalization records for period of one-year before July 2012, when the demonstration began. This meant that patients could have met the demonstration enrollment hospital discharge criterion as early as July 2011. The lag between discharge and enrollment affected the characteristics of the initial cohort of enrollees when compared to new enrollees in the third and fourth years. The initial enrollees tended to join after their diseases had progressed further following the initial qualifying hospitalization. By December 2015, the demonstration was getting patients much earlier in their disease processes because the intervals between their demonstration qualifying hospitalizations and enrollment was much shorter than they were initially.

The lag in identifying eligible patients in the first year was also reflected in the stratification levels of the enrollees over time. According to MHS staff by twelve months into the program the demonstration had about 46% of enrolled patients at stratification Level 1, 21% at Level 2, and 33 percent at Level 3. The distribution of levels among enrollees had since changed. By June 2015 the program had seen a growth in participants classified as Level 2 to 36%, and a smaller proportion of participants at both Level 1 (35%), and Level 3 (29%).

Long-Tenured Demonstration Participants. The average tenure in the program grew over time, according to demonstration program staff. After the first year of the program, the average tenure was 141 days; at the end of the second year it was 246 days; and as of June 2015, the average tenure was 294 days. Staff members and affiliated providers viewed this as a success because they believed patients were having higher quality of life for substantial periods.

Staff reported that patients who had been in the demonstration program longer tended to transition to hospice care earlier than enrollees who had been in for shorter periods. According to demonstration staff members, it often took months to build relationships with patients such that hospice care and other sensitive discussions related to end-of-life could be discussed.

Limits to Enrollment. According to MHS staff, the demonstration program did not have a cap on enrollment and hired new clinical staff members when needed to treat additional enrollees. The ratio of the number of enrolled patients to clinicians within the demonstration program had historically been between 100:1 and 125:1. However, the ratio became somewhat higher (130:1) by 2015, when the program had been operating for more than three years. When the ratio, or caseload, became higher than 125:1, Meridian hired a new clinical staff member. The clinical staff members did not have responsibilities that were administrative or otherwise non-clinical, allowing them to carry relatively high caseloads.

2.6 Quantitative Analysis Methods

2.6.1 Methodological Challenges for the MHS Demonstration Evaluation

Since the MHS demonstration was a late-life, palliative care intervention, there are increased concerns regarding methodological issues for outcome evaluation in comparison to the primary care-oriented interventions applied in other sites in the MHCQ demonstration and in other CMS demonstrations. The design features of the MHS demonstration also posed methodological challenges for the quantitative evaluation, including four particular threats to validity:

- Rolling demonstration enrollment, with new enrollees entering the demonstration every month
- Clinical and disease severity heterogeneity among the demonstration enrollees resulting from the broad demonstration enrollment criteria that included 35 diagnosis-related groups (DRGs) and 191 International Classification of Diseases, Ninth Revision (ICD-9) codes for identifying hospital discharges for patients with any of seven severe chronic diseases (cancer, dementia, stroke, chronic obstructive pulmonary disease [COPD], heart failure, liver disease, or end-stage renal disease [ESRD])
- Risk of selection bias from beneficiary and demonstration staff and affiliated physicians decisions about demonstration enrollment, following assessment of the formal quantitative demonstration enrollment criteria
- High death rate of demonstration enrollees, with 23% of the intervention group dying within 12 months of enrollment

The evaluation applied several methods to address these challenges. First, because randomization was not a feature of this demonstration, a quasi-experimental evaluation design was used to control for the potential selection bias. This included four steps: 1) selecting a set of candidate comparison group (CG) beneficiaries with the same observed characteristics required for the intervention group (IG) beneficiaries to be eligible for the MHS demonstration; 2) matching the characteristics of non-MHS hospitals providing inpatient care to candidate CG beneficiaries to the characteristics of MHS hospitals, as an inpatient stay in an MHS hospital was required for enrollment in the MHS demonstration; 3) matching a set of final CG beneficiaries to the IG beneficiaries across a set of available observed variables; and 4) evaluating the MHS demonstration's impacts on outcomes using a multivariate difference in differences (DID) regression model that isolates the demonstration's impact on IG outcomes in comparison to CG outcomes while also controlling for potential confounding variables.

To address the rolling demonstration enrollment feature, IG and CG beneficiaries were matched in monthly cohorts for the MHS evaluation rather than in yearly cohorts as is typical for primary care program evaluations. This improved evaluation controls for the rolling demonstration enrollment process and also for the high rate of attrition among enrollees due to the high death rate. The shorter monthly time period for defining each cohort enabled the start

date of beneficiary participation and the likelihood of attrition to be better matched for the IG and CG. The cohorts also had a 12-month base year (BY) and 12-month performance year (PY) defined separately for each monthly cohort. This enabled the baseline beneficiaries to be the same as the performance period beneficiaries for both the IG and CG for each cohort.

To control for the clinical and disease severity heterogeneity, IG beneficiaries were matched to CG beneficiaries using two steps. This included first exact matching of IG to CG beneficiaries using 14 higher-volume diagnosis-related groups (DRGs) and 4 demonstration target and higher-volume major diagnostic categories (MDCs) for demonstration qualifying hospital discharges and on the month of the discharge, and then also propensity score matching to define a final set of CG beneficiaries.

Since both the IG and CG beneficiaries had to be living in the BY period, we could not control for mortality in the PY. To do so would have meant selecting the CG based on the date of death. Consequently, a rigid specification of the clinical and disease severity controls (the 14 DRGs and 4 MDCs) was applied to help address the risk of death in the PY, but it could not completely eliminate this threat.

2.6.2 Constructing the Intervention Group

All of the beneficiaries enrolled in the MHS MHCQ demonstration were required to satisfy the following demonstration enrollment criteria:

1. The beneficiary must have had either:

    a. A discharge from one of the three participating MHS hospitals with 1 of 35 qualifying hospital discharge Medicare Severity Diagnosis-Related Groups (MS-DRGs); OR

    b. A discharge from one of the three participating MHS hospitals with 1 of 191 qualifying ICD-9 diagnosis codes AND 3 or more of 20 comorbidities, such as congestive heart failure (CHF), COPD, cancer, stroke, advanced dementia, ESRD, or end-stage liver disease.

2. Age 65 or older

3. Not in hospice

4. Enrolled in both Medicare Part A and Part B, and not in Medicare Advantage

In addition, RTI applied several other criteria for the MHCQ evaluation to construct the IG, which involved additional restrictions on the beneficiaries included in the statistical analysis of demonstration outcomes. As noted, these restrictions were applied to enable effective matching of IG and CG beneficiaries on clinical severity and to ensure that sufficient BY and PY Medicare claims data were available for the IG beneficiaries for use in the multivariate statistical analysis of the MHCQ demonstration's impacts:

1. Beneficiaries must have had an MHS demonstration qualifying discharge in any 1 of 14 higher volume DRGs or in any 1 of 4 target or higher-volume MDCs.

2. Beneficiaries must have had an MHS demonstration qualifying discharge within the 12 months before demonstration enrollment. Longer time gaps between a qualifying discharge and demonstration enrollment were viewed as likely to bias the evaluation due to differential cost trajectories before enrollment.

3. The MHS qualifying discharge must have been verified in Medicare claims data.

4. Beneficiaries must have been enrolled in the MHS demonstration starting in one of the first 36 months of the demonstration from July 2012 to June 2015.

5. An exact match must have been found for an eligible CG beneficiary with an MHS qualifying discharge matched by DRG/MDC and month.

6. The last 6 months of the BY and the first month of the PY must have been "usable" months to provide sufficient Medicare claims data to conduct the DID regression analyses to assess demonstration impacts on cost, quality, and utilization outcomes. A usable month is a month in which the beneficiary

    a. Is not in Medicare Advantage

    b. Is enrolled in both Medicare Part A and Part B

    c. Is not in Medicare as a secondary payer

    d. Is a U.S. resident

    e. Is at least 65 years old at the beginning of the PY (otherwise the beneficiary is dropped from the analysis)

    f. Is alive on the first day of the month

    g. Is not enrolled in hospice on the first day of the month, if the month is a PY month

    h. Participates in the MHCQ demonstration on the first day of the month, if the month is a PY month. (Note: If a beneficiary is enrolled in the MHCQ demonstration in month T but not in month T+1 according to the MHS service and activity report, and the beneficiary is alive on the first day of month T+1, and also dies in month T+1, then we impute participation in the MHCQ demonstration on the first day of month T+1.)

2.6.3 Constructing the Comparison Group

Creating the CG for the multivariate statistical analysis involved four steps. First, the comparison region for identifying comparison hospitals was identified. The comparison region was defined to include hospitals located in New Jersey.

Second, we matched comparison hospitals in New Jersey to the participating MHS hospitals. The criteria for matching included identifying comparison hospitals where at least 1% of admissions were for beneficiaries residing in Ocean or Monmouth counties, the number of hospital beds were similar to the three MHS demonstration hospitals, an academic medical center was excluded, MHS hospitals not in the demonstration were excluded, and availability of palliative care services were comparable to those of the three participating MHS hospitals. This was done to control for possible differences in medical treatment patterns in different geographic regions. We identified four comparison hospitals, including Community Medical Center, Monmouth Medical Center, Kimball Medical Center, and Centrastate Medical Center.

Third, Medicare beneficiaries were identified that had a hospital discharge at one of the comparison hospitals, met the MHS demonstration enrollment eligibility criteria listed earlier, lived in one of the counties in the comparison region, had no hospital admissions at any of the MHS demonstration hospitals, and were not in the IG. We referred to these beneficiaries as the potential CG.

The requirement for the CG beneficiaries to have a hospital discharge is included in this evaluation to better match the CG beneficiaries with the IG beneficiaries, who are required to have a hospital discharge to join the MHS demonstration. This requirement also helps to prevent bias in the evaluation due to "regression to the mean" that can occur in evaluations if the IG is selected on the basis of particular levels of cost or utilization (i.e.,, hospital utilization) and the CG is not selected on the basis of the same levels of cost or utilization. In that situation the IG beneficiaries are expected to have lower cost or utilization on average in the following performance period due to regression to the mean levels of cost or utilization in future time periods. Thus, if the CG beneficiaries are not selected on the same basis, then IG may appear to have superior performance on the cost outcome analysis and the utilization outcome analysis compared to the CG when that is not actually the case, but rather is due to regression to the mean.

Fourth, an exact matching and propensity score analysis was applied to the potential CG and IG beneficiaries in two steps. As noted, to reduce the potential for clinical heterogeneity between the IG and CG, which could bias the results of the outcome impact analyses, we first exact matched CG beneficiaries with IG beneficiaries with the same DRG/MDC and same month for their MHS qualifying discharge. We then applied a propensity score analysis to select the final CG beneficiaries for each IG beneficiary.

We considered identifying CG beneficiaries only using a propensity model with disease condition indicators, but determined that would not provide sufficient controls for the clinical severity of illness differences that could still exist between the IG and CG that could bias the results of the outcome impact analysis. If this severity is not adequately controlled for in the cost analysis, then IG beneficiaries with lower severity hospitalizations can be matched with CG

beneficiaries with higher severity hospitalizations. The trajectory of Medicare costs after a qualifying hospitalization event is dependent on the hospitalization event. For example, post-acute care (PAC) is much different for a person hospitalized for a hip replacement versus a person discharged for simple pneumonia. If this severity is not recognized in the cost outcome analysis, then IG beneficiaries with lower severity hospitalizations could be matched with CG beneficiaries with higher severity hospitalizations. PAC and readmission trajectories would be erroneously compared in a DID regression model unless the severity of the qualifying discharge is carefully controlled.

An appropriate measure of clinical severity was needed to properly match enrollees. Because one MHS demonstration enrollment criteria is an MS-DRG, and the MS-DRGs are also an accepted measure of clinical severity, the MS-DRGs are a better proxy of severity within the demonstration. The MS-DRGs have an added advantage in that they capture the principal reason for a hospitalization, which is explicit in the demonstration MS-DRG enrollment criteria and implicit in the ICD-9 diagnosis enrollment criteria.

Another issue regards the month of the most recent qualifying discharge. It is important that the IG and CG not have different distributions of the month of most recent demonstration qualifying discharge, which could affect the trajectories of utilization and costs and the results of the cost and utilization impact analysis. As a result, to account for the timing of the most recent qualifying discharge, we decided, when constructing the CG, to match directly on the month of the most recent qualifying discharge.

To enable the matching of each IG beneficiary to one or more CG beneficiaries on both the exact same DRG/MDC AND the exact same month of discharge, we focused the selection of the final set of IG beneficiaries for the evaluation data analysis on those MHS demonstration enrolled beneficiaries in the higher-volume DRGs and MDCs.

The exact IG to CG matching process included four steps: Step 1 included identifying IG and potential CG beneficiaries whose most recent qualifying discharge in the 12-month baseline period is for one of the following 14 high-volume DRGs (using 20 cases in the IG as a threshold for high-volume DRGs):

Intracranial Hemorrhage or Cerebral Infarction with MCC (DRG=64)
Intracranial Hemorrhage or Cerebral Infarction with CC (DRG=65)
Pulmonary Edema and Respiratory Failure (DRG=189)
Chronic Obstructive Pulmonary Disease with MCC (DRG=190)
Chronic Obstructive Pulmonary Disease with CC (DRG=191)
Heart Failure with Shock with MCC (DRG=291)
Heart Failure with Shock with CC (DRG=292)
Renal Failure with MCC (DRG=682)
Renal Failure with CC (DRG=683)
Simple pneumonia & pleurisy w MCC (DRG=193)
Simple pneumonia & pleurisy w CC (DRG=194)
Cardiac arrhythmia & conduction disorders w MCC (DRG=308)
Cardiac arrhythmia & conduction disorders w CC (DRG=309)
Kidney & urinary tract infections w/o MCC (DRG=690)

The 14 DRGs listed above were selected as follows. The first 9 DRGs listed above are the most frequent DRGs out of the 35 MHS demonstration qualifying DRGs found in the IG during the baseline period, accounting for 90.1% of enrollees qualified by the DRG criteria. The last 5 DRGs listed above are derived from the claims of beneficiaries that did not have any of the 35 qualifying DRGs during the baseline period. For those beneficiaries, their most recent discharge with an MHS demonstration qualifying ICD-9 code during the baseline period is identified, and the DRG from this claim is identified. Using this method, additional DRGs which contain at least 20 IG beneficiaries were identified, yielding a total of 5 additional DRGs (i.e. 193, 194, 308, 309, and 690 from the list of DRGs above).

Step 2 included identifying additional MHS enrolled beneficiaries for the IG that were not included in the 14 higher-volume DRGs, using higher-volume and demonstration targeted MDCs. These included the MDCs for nervous (01), respiratory (04), and circulatory (05) conditions that are target conditions for the demonstration, and the digestive conditions MDC (06) that had a high volume of MHS beneficiaries

Step 3 included dropping some beneficiaries (both MHS-enrolled beneficiaries and potential CG beneficiaries) from the analysis where the most recent discharge has a DRG that is both: NOT one of the 14 DRGs in Step 1 AND does not map to one of the 4 MDCs from Step 2. MHS demonstration enrolled beneficiaries were also dropped from the IG for several other reasons, as noted above, including: 1) inability to identify an MHS demonstration qualifying discharge in Medicare claims data within 12 months prior to demonstration enrollment; 2) lack of at least 6 BY months and 1 PY month in Medicare fee for service (FFS), and a lack of finding an eligible CG beneficiary that could match to the IG by both DRG/MDC and month of discharge. To check for potential bias that could be introduced from dropping some of the MHS enrolled beneficiaries from the IG for the outcome impact analysis of the MHS demonstration, we compared the final IG beneficiaries to the MHS-enrolled beneficiaries across a range of demographic and disease status descriptive statistics.

Step 4 included exact matching of IG to CG beneficiaries, using either the DRG used to select the beneficiary from Step 1, or the MDC (along with information about the associated DRG) used to select the beneficiary from Step 2, as follows:

- If enrollee is from Step 1: match on DRG of the most recent qualifying discharge and month of that DRG

- If enrollee is from Step 2 and has a most recent qualifying discharge with a surgical DRG: match on MDC of the most recent qualifying discharge and "surgical type DRG" and month of MDC/DRG

- If enrollee is from Step 2 and has a most recent qualifying discharge with a medical DRG with major complication or comorbidity [MCC]: match on MDC and "Medical type DRG with MCC" and month of MDC/DRG

- If enrollee is from Step 2 and has a most recent qualifying discharge with a medical DRG without MCC: match on MDC and "Medical type DRG without MCC" and month of MDC/DRG

Note that for the matching on MDC, the DRG from the claim maps to the MDC. The DRG itself is either a surgical or a medical DRG. The DRG either has MCC or does not have MCC.

Two examples of this exact matching process are presented below to illustrate its methods, including one direct matching through a DRG and the other direct matching through an MDC:

- Example #1: An intervention group beneficiary in the January 2014 cohort whose most recent qualifying DRG is DRG=291 that occurs in say December 2013, would be matched to a potential comparison group beneficiary from the January 2014 potential comparison group cohort whose most recent qualifying is DRG=291 and this DRG occurred in December 2013.

- Example #2: Consider an intervention group beneficiary in the January 2014 cohort whose most recent qualifying discharge has a DRG of DRG=245 (which corresponds to an MDC=05) that occurs in say December 2013. DRG=245 is a surgical DRG. Therefore, the intervention group beneficiary would be matched to a potential comparison group beneficiary from the January 2014 potential comparison group cohort whose most recent qualifying discharge has a DRG that is **both** a surgical DRG and that also maps to MDC=05 (e.g. DRG=257 is surgical DRG and maps to MDC=5) and this DRG occurred in December 2013.

Following the completion of the exact matching process, we then selected up to two CG beneficiaries (depending on CG beneficiary availability) for every IG beneficiary on the basis of the propensity score analysis including the following beneficiary characteristics measured in the BY: qualifying disease indicators, Medicare expenditures, hospitalizations, hospital days, intensive care unit (ICU) days, ED visits, physician evaluation and management (E&M) visits, Medicaid indicator, risk score, age, gender, and originally disabled indicator. The goal of the propensity score statistical and matching analysis was to generate an IG and CG that were balanced with respect to clinical severity and beneficiary characteristics before conducting the multivariate statistical impact analyses.

2.6.4 MHS Enrolled Beneficiaries Excluded from the Intervention Group

Applying the evaluation methods described above for constructing the IG and CG, to address the methodological challenges of the MHS demonstration, meant that some of the MHS enrolled beneficiaries were excluded from the quantitative analysis of demonstration outcomes.

MHS administrative data indicated the total number of beneficiaries enrolled in the demonstration totaled 3,095 in the first three years of MHS demonstration operations (July 2012-June 2015), which are the focus of this final evaluation report. Of these, a total of 2,023 (65%) were included in the IG used for the statistical analysis of MHS demonstration outcomes. The other 1,072 enrolled beneficiaries were dropped from the IG for several reasons, including inability to verify an MHS-qualifying discharge in Medicare claims data (118 beneficiaries; 11%), lack of a qualifying discharge within 12 months of enrollment (125 beneficiaries; 12%), lack of at least 6 BY months and 1 PY month with Medicare FFS (297 beneficiaries; 28%), lack of a qualifying discharge in one of the 14 higher-volume DRGs or 4 higher volume MDCs (832 beneficiaries; 78%), or lack of finding an eligible CG beneficiary with a qualifying discharge

matched by DRG/MDC and month (87 beneficiaries; 8%). The reasons for dropping beneficiaries were not mutually exclusive, except for the last one, so the percentages add up to more than 100%.

Table 2 presents descriptive statistics comparing the 1,072 MHS enrolled beneficiaries who were dropped from the IG to the 2,023 beneficiaries included in the IG across a range of 15 comparison variables. Six of the comparison variables had similar percentages and had no statistically significant differences, including the percent dying in the 12 months following demonstration enrollment, the percent female, the percent aged 65-74, the percent aged 75-84, the percent aged 85+, and the percent with dementia. Four of the comparison variables had significant differences, but for small percentage differences between the two groups (less than 3 percentage points) including the percent enrolled in hospice, the percent with Medicare eligibility Aged, the percent aged < 65, and the percent with liver disease. Two of the comparison variables had significant differences, but only weakly significant at the 10% level, including the percent with cancer and the percent with stroke. Three of the comparison variables had significant differences for larger percentage differences between the two groups (ranging from 5.9% to 13.6%), including the percent with COPD, percent with heart failure, and the percent with ESRD. To summarize, some differences were found between the two groups, but they were mostly small in magnitude, or only weakly statistically significant.

Table 2
MHS MHCQ Demonstration Beneficiaries by Demographics and Disease Subgroups for the IG and MHS Enrolled Beneficiaries Dropped from the IG

Measure	Intervention group beneficiaries, BY	MHS enrolled Beneficiaries excluded from the intervention group, BY	Statistical Significance Level for Percentage Differences
Beneficiary count, N	2,023	1,072	NA
Percent died within 12 months following enrollment	23.4%	25.2%	NS
Percent enrolled in hospice	0.3%	1.0%	**
Medicare eligibility percent Aged	96.3%	94.8%	**
Percent Female	57.5%	57.1%	NS
Percent Age < 65	1.7%	3.0%	**
Percent Age 65-74	25.1%	25.8%	NS
Percent Age 75-84	42.3%	41.5%	NS
Percent Age 85 +	30.9%	29.7%	NS
Percent Cancer	29.6%	32.7%	*
Percent Dementia	29.2%	29.7%	NS
Percent Stroke	44.1%	40.5%	*
Percent COPD	67.7%	55.5%	****
Percent Heart failure	65.5%	52.0%	****
Percent Liver disease	3.3%	5.8%	***
Percent ESRD	53.5%	47.7%	***

NOTES: NA = Not Applicable; NS = Not Statistically Significant; * = Statistically Significant at the 10% level; ** = Statistically Significant at the 5% level; *** = Statistically Significant at the 1% level; **** = Statistically Significant at the 0.1% level. SOURCE: RTI International

This means that dropping these MHS enrolled beneficiaries from the IG could potentially have a small effect on the overall results. However, as discussed above, the evaluation methods that resulted in some MHS enrollees being dropped from the IG were included in this quantitative evaluation analysis to mitigate other potential sources of bias in the evaluation analysis, such as inadequate controls for heterogeneity in the clinical severity of beneficiaries' diseases between the IG and CG. As a result, there were trade-offs between the need to control for clinical and disease severity heterogeneity in constructing the CG to match closely with the IG and the aim to include as many of the MHS enrolled beneficiaries in the IG as possible.

2.7 Descriptive Statistics for the IG and CG

This section includes descriptive statistical profiles comparing the IG and CG. As noted, the quantitative analysis includes beneficiaries enrolling in the first three years of the MHS demonstration, from July 2012 through June 2015, and Medicare claims data for those enrollees through December 2015. The descriptive statistical profiles provide comparisons of the IG and CG across the base year (BY) and performance year (PY) time periods, as well as data on demographic, Medicare enrollment, disease, service utilization, and cost characteristics.

Table 3 presents descriptive statistics for the 2,023 beneficiaries included in the IG and the 3,880 beneficiaries included in the CG for this evaluation. **Table 3** shows that, for the most part, the IG is similar to the CG. Relative to the CG, the IG has similar proportions of PY decedents, beneficiaries eligible for Medicare because of age, females, Medicaid patients, patients who were ages 75–84 or 85+, and beneficiaries in hospice. Beneficiaries cannot be in hospice and also be enrolled in the MHCQ demonstration, so these data show beneficiaries who were enrolled in the MHCQ demonstration in part of this period and then subsequently entered hospice care. The IG and CG were also similar in terms of the proportion of beneficiaries with a given disease and with discharges in 14 higher-volume DRGs. Relative to the CG, the IG had a somewhat lower proportion of beneficiaries with COPD.

Table 4 presents descriptive statistics on utilization and expenditures for the MHS IG and CG beneficiaries. These include beneficiaries with start dates in the MHS demonstration during the 36 months from July 2012 to June 2015 and Medicare claims data for those beneficiaries through December 2015. Beneficiaries in the IG had about 37 office or other outpatient E&M visits per year, on average, in the BY. This fell to about 33 visits in the PY, and CG beneficiaries had a similar pattern. Hospital admissions fell from an average of about 2.1 in the BY to about 1.4 in the PY for the IG, and the CG gain had a similar pattern. This is equivalent to an average of 1,400–2,100 admissions per 1,000 beneficiaries per year.

Table 4 shows that ED visits declined in the IG from about 2.6 per year in the BY to 2.2 in the PY, and a similar pattern was seen in the CG. Hospital readmissions increased slightly across both the IG and CG between the BY and PY. Both hospital ICU days and total hospital days were lower for the PY for both the IG and the CG. The percentage of hospital days that were ICU days fell from 41% to 39% for the IG between the BY and PY, but fell a bit more from 38% to 33% for the CG.

Table 3
MHS MHCQ Demonstration Beneficiaries by Demographics and Disease Subgroups for the BY and PY for the Intervention Group and Comparison Group

Measure	Intervention group BY beneficiaries[1]	Comparison group BY beneficiaries	Intervention group PY beneficiaries[1]	Comparison group PY beneficiaries
Beneficiary count, N	2,023	3,880	2,023	3,880
Total Beneficiaries, %				
Beneficiary deaths	NA	NA	23.4%	25.5%
Beneficiary survived	NA	NA	76.6%	74.5%
Hospice, %				
Enrolled in hospice	0.3%	0.3%	5.6%	5.5%
Not enrolled in hospice	99.7%	99.7%	94.4%	94.5%
Medicare eligibility, %				
Aged	96.3%	95.0%	96.3%	94.7%
Disabled	1.9%	1.4%	0.0%	0.0%
ESRD	1.8%	3.6%	3.7%	5.3%
Original reason for entitlement among current aged, %[2]				
Originally disabled	11.3%	11.7%	12.0%	12.7%
Not originally disabled	88.7%	88.3%	88.0%	87.3%
Medicaid eligibility[3], %				
A least 1 month	9.6%	9.5%	11.5%	11.6%
Not Medicaid eligible	90.4%	90.5%	88.5%	88.4%
Gender, %				
Male	42.5%	43.6%	42.5%	43.6%
Female	57.5%	56.4%	57.5%	56.4%
Age, %				
Age < 65	1.7%	1.6%	0.0%	0.0%
Age 65-74	25.1%	24.9%	23.8%	23.7%
Age 75-84	42.3%	38.8%	41.1%	36.5%
Age 85 +	30.9%	34.7%	35.1%	39.8%

(continued)

Table 3 (continued)
MHS MHCQ Demonstration Beneficiaries by Demographics and Disease Subgroups for the BY and PY for the Intervention Group and Comparison Group

Measure	Intervention group BY beneficiaries[1]	Comparison group BY beneficiaries	Intervention group PY beneficiaries[1]	Comparison group PY beneficiaries
Disease category, %[4]				
Cancer	29.6%	28.3%	25.6%	24.9%
Dementia	29.2%	32.8%	26.1%	26.1%
Stroke	44.1%	45.1%	32.1%	33.2%
COPD	67.7%	74.0%	54.8%	60.3%
Heart failure	65.5%	63.7%	54.6%	54.7%
Liver disease	3.3%	3.6%	3.3%	3.2%
ESRD	53.5%	50.7%	42.4%	43.1%
Diagnosis-Related Group [DRG][5]				
Intracranial Hemorrhage or Cerebral Infarction with MCC (DRG=64)	2.2%	2.2%	1.2%	0.6%
Intracranial Hemorrhage or Cerebral Infarction with CC (DRG=65)	6.7%	6.0%	1.1%	1.0%
Pulmonary Edema and Respiratory Failure (DRG=189)	2.2%	2.0%	2.1%	1.4%
Chronic Obstructive Pulmonary Disease with MCC (DRG=190)	7.8%	8.7%	3.0%	4.5%
Chronic Obstructive Pulmonary Disease with CC (DRG=191)	8.0%	9.4%	2.4%	3.9%
Heart Failure with Shock with MCC (DRG=291)	10.3%	9.0%	6.4%	5.3%
Heart Failure with Shock with CC (DRG=292)	11.7%	11.4%	4.9%	5.0%
Renal Failure with MCC (DRG=682)	4.2%	4.1%	1.9%	2.0%
Renal Failure with CC (DRG=683)	8.6%	8.3%	2.3%	2.1%
Simple pneumonia & pleurisy w MCC (DRG=193)	4.0%	3.8%	2.1%	2.8%
Simple pneumonia & pleurisy w CC (DRG=194)	4.9%	4.8%	2.2%	1.7%

(continued)

Table 3 (continued)
MHS MHCQ Demonstration Beneficiaries by Demographics and Disease Subgroups for the BY and PY for the Intervention Group and Comparison Group

Measure	Intervention group BY beneficiaries[1]	Comparison group BY beneficiaries	Intervention group PY beneficiaries[1]	Comparison group PY beneficiaries
Cardiac arrhythmia & conduction disorders w MCC (DRG=308)	3.1%	2.7%	1.5%	1.0%
Cardiac arrhythmia & conduction disorders w CC (DRG=309)	4.0%	3.8%	1.2%	1.1%
Kidney & urinary tract infections w/o MCC (DRG=690)	3.1%	2.9%	1.5%	2.1%

NOTES: PY = Performance year; BY = Base Year; COPD= chronic obstructive pulmonary disease; ESRD= end-stage renal disease; MHS= Meridian Health System; MHCQ= Medicare Health Care Quality demonstration.

[1]IG beneficiaries with demonstration start dates in the 36-month period July 2012-June 2015 are used in the analysis. The BY (base year) is the 12-month period ending in (and including) their start date in the demonstration, so for each monthly cohort there is a different BY period. Also, the beneficiaries in the BY are the same as those in the PY for the intervention and comparison groups. The performance period for a beneficiary is the 12-month period immediately following their first month of enrollment (i.e. immediately following the baseline period). For example, a beneficiary with a start date of October 2012 has a performance period of November 2012-October 2013. For decedents in the 12-month performance year, the performance year is truncated at the month of death (and includes the month of death). The Medicare claims data analysis is truncated at December 2015 (i.e., claims data with dates of service through December 2015 are used in the analysis). Timing of the determination of beneficiary characteristics varies somewhat depending on the type of characteristic. Beneficiary age is determined at the beginning of the base year and beginning of the performance year. Other characteristics use information from throughout the base year or throughout the performance year (e.g. to determine if a beneficiary has Cancer in the base year we review all of the beneficiary's claims incurred in the entire base year). Some characteristics are determined at the beginning of the performance period and then assumed to be the same in the baseline period (e.g. race is determined at the beginning of the performance period and race in the baseline period is assumed to be the same; that same approach is used for beneficiary characteristics for county of residence and gender).

[2]Original reason for Medicare entitlement among beneficiaries currently entitled to Medicare by age. Includes beneficiaries eligible by both age and ESRD.

[3] A beneficiary is considered to be on Medicaid during a given 12-month period (i.e. BY or PY) if they have at least one month of Medicaid in that 12-month period.

[4]Diseases are defined in the document CMS Demonstration Project White Paper: Enrollment Criteria Expansion Proposal, Meridian Health Care Journey Team (November 2012).

Diseases are defined by MS-DRGs or groupings of ICD-9 codes. These disease categories are not mutually exclusive as beneficiaries may have multiple conditions.

[5] The 14 higher-volume qualifying DRGs are presented.

SOURCE: RTI International analysis of July 2011–December 2015 100% Medicare claims files and enrollment datasets.

Table 4
MHS MHCQ Demonstration Beneficiaries by Utilization and Expenditures

Measure	BY intervention group beneficiaries	PY intervention group beneficiaries	BY comparison group beneficiaries	PY comparison group beneficiaries
Beneficiary Count	2,023	2,023	3,880	3,880
Mean count of office or other evaluation and management [E&M] visits[1]	37.36	32.98	37.27	32.33
Mean count of hospital admissions[2]	2.06	1.43	2.08	1.51
Mean count of emergency department visits	2.58	2.17	2.60	2.09
Mean count of hospital readmissions	0.32	0.35	0.30	0.37
Hospital ICU days[3] per year per beneficiary	5.89	3.48	4.93	3.10
Hospital days[4] per year per beneficiary	15.95	9.48	15.31	9.81
Percentage of total hospital days that are ICU days	41%	39%	38%	33%
Mean capped annualized Medicare expenditures per beneficiary per year[5]	$42,523	$38,589	$42,827	$38,469
Mean capped annualized Medicare expenditures per beneficiary per month[5]	$3,544	$3,216	$3,569	$3,206
Inpatient $>0, %	99%	52%	100%	52%
Mean risk score	4.20	3.61	4.23	3.65

NOTES:

IG beneficiaries with demonstration start dates in the 36-month period July 2012-June 2015 are used in the analysis. The BY (base year) is the 12-month period ending in (and including) their start date in the demonstration, so for each monthly cohort there is a different BY period. Also, the beneficiaries in the BY are the same as those in the PY for the intervention and comparison groups. The performance period for a beneficiary is the 12-month period following their first month of enrollment (i.e. immediately following the baseline period). For example, a beneficiary with a start date of October 2012 has a performance period of November 2012-October 2013. For decedents in the 12-month performance year, the performance year is truncated at the month of death (and includes the month of death). The Medicare claims data analysis is truncated at December 2015 (i.e., claims data with dates of service through December 2015 are used in the analysis). COPD, chronic obstructive pulmonary disease; ESRD = end-stage renal disease; MHS = Meridian Health System; MHCQ = Medicare Health Care Quality demonstration.

[1]Qualified E&M visits are defined as a visit with one of the following HCPCS codes: 9920X, 9921X, 9924X, 9927X, 9938X, 9939X, 9940X, 9942X, 9928X, 9922X, 9923X, and 9925X.

[2]Refers to hospital admissions at any provider.

[3]An ICU visit is defined by a hospital inpatient stay with one of the following revenue center codes: 0200, 0201, 0202, 0203, 0204, 0206, 0207, 0208, 0209, 0210, 0211, 0213, 0214, and 0219.

(continued)

Table 4 (continued)
MHS MHCQ Demonstration Beneficiaries by Utilization and Expenditures

[4]Includes both ICU and non-ICU days.

[5] Annualized Medicare expenditures for a beneficiary are calculated by dividing total expenditures by the beneficiary's "eligibility fraction", where the eligibility fraction is equal to the "number of usable months in the period/12", and usable months is defined in Section 1.2.2. The expenditure value presented in the table is the weighted mean annualized expenditure, where the weight is the eligibility fraction. The expenditures consist of all Medicare Part A and Part B expenditures, which includes hospital inpatient, skilled nursing facility, hospital outpatient, home health, hospice expenditures, physician, and durable-medical equipment expenditures. Note that the expenditures are limited to those incurred during "usable" months (see section 1.2.2), which means that expenditures from performance period hospice months (for both IG and CG beneficiaries), and expenditures from non-demonstration performance period months (applies to IG only) are NOT included in the calculation of mean annualized expenditures. A beneficiary is considered to be in hospice in a given month if he/she was enrolled in hospice on the first day of the month. As a result, it is possible for the expenditures presented here to include some hospice expenditures (e.g. for a beneficiary who enrolls in hospice on say February 15th and leaves hospice on February 23rd, their hospice expenditures would be included in the expenditure calculation). Expenditures are capped at $200,000.

SOURCE: RTI International analysis of July 2011–December 2015 100% Medicare claims files and enrollment datasets.

Table 4 also presents data on mean annualized Medicare expenditures per beneficiary. For this MHS evaluation, Medicare expenditures are expressed as per-beneficiary-per-month (PBPM) and as per-beneficiary-per-year (PBPY) expenditures. Medicare expenditures included all of Part A and Part B FFS claims components (inpatient, skilled nursing, outpatient, physician/supplier, home health, durable medical equipment, and hospice). Medicare Part D expenditures for pharmaceutical expenses were not included, primarily because not all Medicare FFS beneficiaries enroll in Part D. Demonstration fees that CMS paid to MHS for providing demonstration services to intervention beneficiaries were also not included. PBPM expenditures were defined as the sum of Medicare expenditures for the eligible months in that period divided by the beneficiary's number of eligible months in the period, and PBPY expenditures were the PBPM amounts multiplied by 12. Intervention group and comparison group observations were weighted by the beneficiary's fraction of eligible months in the period.

Expenditures declined slightly for the IG from the BY and PY, from about $42,523 to about $38,589 per year, and a similar pattern was seen for the CG.

Note that these are descriptive data intended to provide background information on the IG and CG. The multivariate statistical analysis presented in the following sections evaluates the impact of the MHS MHCQ demonstration on the cost, quality, and utilization outcome measures in comparison with the CG and with statistical controls for a number of other factors that could affect these outcomes.

Table 4 also presents information on the percentage of beneficiaries who had inpatient spending greater than $0. This fell markedly between the BY and PY for both the IG and the CG, as expected, since the IG and CG were selected on the basis of having hospital admissions. Similarly, the mean hierarchical condition category (HCC) risk scores also fell between the BY and PY for both the IG and CG. The IG beneficiaries had about the same risk score in the BY at

about 4.2. These data illustrate how both the IG and CG had significantly higher severity of illness than average for the Medicare population, which is set by the HCC methodology at 1.0.

2.8 Multivariate Statistical Analysis Methods

To determine the impacts of the MHS MHCQ demonstration on cost, quality, and utilization outcomes, the evaluation used a difference-in-differences (DID) multivariate regression model that combined data from the BY as well as the PY. This model compared changes in cost, quality, and utilization variables between the BY and the PY in the IG with changes that occurred in the CG for the same time period, while controlling for other variables that can also affect those outcomes, including demographic (age, sex), enrollment (dually eligible, originally disabled), diagnosis, and health status (risk score) variables.

The DID regression model mitigates the potential bias that can occur from simpler model specifications. For example, a simple difference analysis model of the IG between the baseline and demonstration periods could show significant improvements in outcome measures, but in the absence of a CG it would not be known whether or not these results were due to the demonstration's interventions. Alternatively, a simple difference analysis model of the IG and the CG in the demonstration period could likewise show significant results in outcome measures, but in the absence of a BY, it would not be known whether these results were due to the demonstration intervention or to pre-existing effects. Only with a DID statistical model specification can the impact of the demonstration's intervention on outcomes be identified.

We estimated linear DID regression models for continuous dependent variables such as cost outcome measures. However, for utilization measures and some quality outcome measures that were only experienced by a subset of the beneficiaries each year, such as hospital admissions, we estimated two-part or "hurdle" models. These models include two equations. The first equation is a logit regression on all of the beneficiaries, including those with a measure such as hospital admissions and those without them. This model estimates the impact of the demonstration on which members of the IG experienced hospital admissions and which did not. The second equation is a negative binomial regression that is estimated only on the beneficiaries who experienced a hospital admission. The overall effect of the demonstration on hospital admissions is then calculated by combining information from the logit model and from the negative binomial model.

2.9 Cost Outcome Analysis Results

The demonstration did not show a statistically significant impact on Medicare costs (see **Table 5**). The MHS demonstration's impact on annualized Medicare expenditures for IG beneficiaries was compared with the cost outcome performance of beneficiaries in the CG over the same time period. The multivariate regression analyses are weighted by the beneficiary's eligibility fraction, which is defined as the fraction of the period that the beneficiary is in the demonstration and alive. The statistical analyses also controlled for HCC risk score, age, gender, Medicaid eligibility status, Medicare eligibility status, and whether or not the beneficiary's most recent qualifying discharge was in the last three months of his or her baseline period.

Table 5
MHCQ Demonstration Impact of Meridian Health System on Medicare Expenditures —Multivariate Regression Results for Per Capita Expenditures from Medicare Claims Data through December 2015

Analysis	Number of Observations[b]	Number of Intervention Group Beneficiaries	R^2	Demonstration effect coefficient[c] (positive numbers mean the demonstration increased Medicare costs)	Coefficient standard error	Coefficient statistical significance[d,e]
Cost Outcome Analysis[a]	11,806	2,023	0.259	$457	$1,324	0.730

NOTES:

IG beneficiaries with demonstration start dates in the 36-month period July 2012-June 2015 are used in the analysis. The BY (base year) is the 12-month period ending in (and including) their start date in the demonstration, so for each monthly cohort there is a different BY period. Also, the beneficiaries in the BY are the same as those in the PY for the intervention and comparison groups. The performance year for a beneficiary is the 12-month period following their first month of enrollment (i.e. immediately following the baseline period). For example, a beneficiary with a start date of October 2012 has a performance period of November 2012-October 2013. For decedents in the 12-month performance year, the performance year is truncated at the month of death (and includes the month of death). The Medicare claims data are truncated at December 2015 (i.e., claims data with dates of service through December 2015 are used in the analysis).

The analysis is truncated at December 2015 (i.e. data through December 2015 are used in the analysis).

The dependent variable is Medicare annualized expenditures, which includes inpatient, outpatient, hospice, home health agency, skilled nursing facility, physician, and durable medical equipment claims. The regression is estimated using baseline year and performance year data for intervention and comparison group beneficiaries. Regression is weighted by Medicare eligibility fraction. MHS= Meridian Health System.

[a]The Cost Outcome Analysis has the following ten characteristics:

i. The underlying propensity score model uses 2:1 matching (i.e. two CG beneficiaries are identified for each IG beneficiary).

ii. The propensity score model includes the following variables: age, male indicator, Medicaid indicator, originally disabled indicator, number of emergency department visits, number of hospital admissions, number of E&M visits, risk score, total annualized expenditures, number of hospital days, and number of ICU days.

iii. The propensity score model is calibrated using:

1) December 2013 beneficiaries that meet the qualifications to be in the CG (i.e. the December 2013 CG cohort).

2) The entire IG (i.e. IG beneficiaries with start dates in the 36-month period July 2012-June 2015).

iv. Regression is weighted by the Medicare eligibility fraction.

v. Beneficiaries with start dates in the 36-month period July 2012-June 2015 are used in the analysis.

vi. IME, DSH, and UCC are removed from expenditures. IME = indirect medical education; DSH = disproportionate share hospital; UCC = uncompensated care.

(continued)

Table 5 (continued)
MHCQ Demonstration Impact of Meridian Health System on Medicare Expenditures —Multivariate Regression Results for Per Capita Expenditures from Medicare Claims Data through December 2015

vii. The following comparison hospitals are used: Community Medical Center, Monmouth Medical Center, Kimball Medical Center, and Centrastate Medical Center.

viii. Only performance period demonstration/enrolled months are used (applies to the IG). Hospice months are not used (applies to both the IG and CG).

ix. Comparison group beneficiaries were selected using the method described in Section 1.2.2

x. The difference-in-difference regression model contains the following control variables: age, male indicator, Medicaid indicator, originally disabled indicator, risk score, and a variable indicating if the beneficiary's most recent qualifying discharge is in the last three months of his/her baseline period.

[b] The Number of Observations in the Cost Outcome Analysis is the sum of the number of IG beneficiaries for the BY and PY, which is 2,023 in both time periods, and the number of CG beneficiaries for the BY and PY, which is 3,880 in both time periods. The sum for the Number of Observations is then 2,023 + 2,023 + 3,880 +3,880 = 11,806.

[c] Demonstration impact is estimated by the coefficient of (Post-Demonstration Period)*(Intervention Beneficiary). Negative coefficients indicate savings, and positive coefficients indicate dis-savings, or cost increases.

[d] The p-value for statistical significance of the regression coefficient estimate is presented. For example, a p-value of 0.000 indicates that the coefficient is significantly different from zero at better than the 0.1% level of significance. A p-value of 0.015 indicates a 1.5% level of significance.

[e] The statistical significance level (p-value) and coefficient standard error are adjusted for beneficiary-level clustering.

* Statistically significant at the <10% level.

** Statistically significant at the <5% level.

*** Statistically significant at the <1% level.

SOURCE: RTI International analysis of July 2011-December 2015 100% Medicare claims files and enrollment datasets.

In analyses that included MHS program costs, Medicare net costs were greater than the comparison group, although not statistically significant (see **Table 6**). Net costs are important to consider in the assessment of the impact of the MHS demonstration since this MHCQ demonstration site received up-front PBPM fees from Medicare to provide enhanced beneficiary services for its late-life care intervention. CMS paid MHS negotiated PBPM rates for services rendered each beneficiary enrolled in the MHS

Table 6
MHCQ Demonstration Impact of Meridian Health System on Medicare Net Costs from Medicare Claims Data through December 2015

	Point estimate (positive numbers mean the demonstration increased Medicare costs)	Confidence Interval (95%, two tailed test)	
		Lower bound	Upper bound
Demonstration effect cost impact coefficient per beneficiary per year (from DID Multivariate Regression Analysis, Table 4)	$457	-$2,139	$3,053
Annual PBPM payments from CMS to Meridian ($147 / month * 12)	$1,764	$1,764	$1,764
Net Medicare Cost impact of the MHS demonstration per beneficiary per year	$2,221	-$375	$4,817

Source: RTI International

The assessment of net costs was examined using two metrics: 1) intervention cost impact on Medicare expenditures per beneficiary per year for health care services; and 2) net costs including the intervention cost impact effect adjusted by the PBPM fees for each enrollee that CMS paid to MHS. The results in **Table 6** show the range in intervention cost impact. Using a 95% confidence interval the impact on costs is between savings of $2,139 to a cost increase of $3,053 per beneficiary per year. This range reflects the fact that the intervention coefficient from **Table 5** is not statistically significant, so the confidence interval crosses the $0 level. Adding the PBPM payments from CMS to MHS that are shown in the second row in **Table 6** means the Net Medicare Cost impact from the MHS demonstration range from a cost savings of $375 to cost increases of $4,817, so the confidence interval again crosses the $0 level. As a result, the analyses in **Table 5** and **Table 6** indicate that the MHS demonstration did not show a statistically significant impact on Medicare costs.

Table 7 presents multivariate statistical analysis results for the impact of the MHS demonstration intervention on expenditure components. The statistical methods are the same as those used for the analysis presented in **Table 5**. The results for **Table 7** indicate that when the impact of the demonstration on per capita expenditures was analyzed by expenditure components, only three of the nine components had statistically significant demonstration effects and all were for increases in costs. The effects of the demonstration were to increase outpatient

Table 7
MHCQ Demonstration Impact of Meridian Health System on Medicare Expenditures—Multivariate Regression Results for Service Components for Per Capita Expenditures from Medicare Claims Data through December 2015

Expenditure component	Demonstration effect coefficient	Coefficient standard error	Coefficient statistical significance
Total expenditures	$457	$1,324	0.730
Inpatient total	-$934	$1,140	0.413
Inpatient hospital, LTCH, IRF, and other	-$1,228	$915	0.180
Inpatient skilled nursing facility	$294	$422	0.486
Outpatient / Other total	$1,229**	$547	0.025
Outpatient institutional (hospital)	$298	$300	0.321
Part B physician/supplier	$589*	$355	0.097
Home health Part A and Part B	$274**	$122	0.025
Durable Medical Equipment	$124	$118	0.291
Hospice	-$56	$43	0.194

NOTE: Statistical analysis methods are the same as for Table 5.

* Statistically significant at the <10% level.

** Statistically significant at the <5% level.

*** Statistically significant at the <1% level.

**** Statistically significant at the <0.1% level.

Source: RTI International

total expenditures by $1,229 PBPY. Within the outpatient expenditures, Part B physician supplier expenditures increased by $589 and home health expenditures increased by $274. However, the Part B physician/supplier effect was only weakly statistically significant, at the 10% level. The total expenditures effect is the same as in **Table 5**, an increase of $457, but not statistically significant.

2.10 Quality Process and Outcomes Analysis Results

2.10.1 Internal MHS Quality Measures

The MHCQ demonstration staff used 10 internal process-of-care quality measures to assess its performance. These internal MHS quality measure results were not independently verified by RTI. These quality measures assessed advance care planning discussions, quality of palliative care services, patient management and family satisfaction, and support during

bereavement. Descriptions of these measures, MHS' targets, and the performance rates for the first 30 months of the demonstration, calculated by MHS, are as follows (MHS, 2015):

1. **Advance Care Planning Addressed:** Number of patients who have an advance care plan or surrogate decision maker documented in the medical record OR documentation in the medical record that an advanced care plan was discussed, but the patient did not wish or was not able to name a surrogate decision maker or provide an advance care plan.

   MHS target: 90%
   MHS performance rate: 91%

2. **Pain Assessed:** Number of documented assessment of pain during initial or follow-up nursing visit.

   MHS Target: 90%
   MHS performance rate: 97%

3. **Pain Addressed:** Number of patients with pain followed up within 3 business days after initial or follow-up nursing visit during which severe (≥8 on ESAS) pain was assessed.

   MHS target: 90%
   MHS performance rate: 98%

4. **Shortness of Breath Assessed:** Number of documented assessment of shortness of breath during initial or follow-up nursing visit.

   MHS target: 90%
   MHS performance rate: 97%

5. **Shortness of Breath Addressed:** Number of patients with shortness of breath followed up within 3 business days after initial or follow-up nursing visit during which severe (≥8 on ESAS) shortness of breath was assessed.

   MHS target: 90%
   MHS performance rate: 100%

6. **Nausea Assessed:** Number of documented assessment of nausea during initial or follow-up nursing visit.

   MHS target: 90%
   MHS performance rate: 93%

7. **Nausea Addressed:** Number of patients with nausea followed up within 3 business days after initial or follow-up nursing visit during which severe (≥8 on ESAS) nausea was assessed.

MHS target: 90%
MHS performance rate: 100%

8. **Psychosocial Need Addressed**: Number of patients seen by a social worker after psychosocial need was identified.

   MHS target: 90%
   MHS performance rate: 99%

9. **Patient/Family Satisfaction**: Number of patients/families who are satisfied with the program as demonstrated by a Likert score of 4 or above on question #6, "I am satisfied with the program."

   MHS target: 90%
   MHS performance rate: 93%

10. **Bereavement**: Number of families of active patients to whom bereavement packet was sent within 30 days of the enrolled patient's death.

    MHS target: 90%
    MHS performance rate: 96%

MHS set the targets for performance for each of these 10 internal quality measures at 90%. Over the first 30 months of the demonstration, MHS met the target for all 10 quality measures. However, the method used to select the target of 90% performance was not based on external benchmarks, and these MHS internal quality performance scores were not assessed in relation to a comparison group, so it is not known what the scores would have been in the absence of the MHS demonstration. The data and results using these internal MHS quality measures were not verified by RTI.

2.10.2 Multivariate Analysis of Claims-Based MHS Quality Measures

Table 8 presents the results of the multivariate statistical analysis conducted by RTI of the impact of the MHS demonstration on the IG for a quality measure for the percentage of total hospital days that are ICU days, in comparison to results for the CG. This is included as a quality measure for MHS because a goal of the MHS MHCQ demonstration was to enable patients and their families to have more options available to them to be able to choose less intensive palliative care, which would reduce utilization of the more intensive ICU care.

Recall from the descriptive statistics in Table 4 show that the IG had 41% of total hospital days that were ICU days in the BY, and this fell to 38% in the PY. However, the CG showed an even larger decline from 39% in the BY to 33% in the PY. As a result, the descriptive statistics show better performance on this measure for the CG versus the IG. Including control variables for HCC risk score, age, gender, Medicaid eligibility status, Medicare eligibility status, and a variable indicating if a beneficiary's most recent qualifying discharge was

in the last three months of his or her baseline period in the DID regression analysis can provide a more rigorous test of the descriptive analysis.

The DID regression results presented in **Table 8** include the IG beneficiaries with start dates in the MHS demonstration during the 36 months from July 2012 to June 2015 and Medicare claims data for those beneficiaries through December 2015. The results in **Table 8** indicates that the effect of the MHS MHCQ demonstration was to increase the percentage of hospital days that were ICU days in comparison to the CG, and this result was statistically significant. As a result, this analysis indicates that the MHS demonstration had the opposite effect than was anticipated, but that result is consistent with the evidence from the descriptive statistics, which also showed better performance on this quality indicator for the CG.

Table 8
Meridian Health System Demonstration Impact on Quality Outcomes—Multivariate Regression Results for the Percentage of Hospital Days that are ICU Days

Quality Measure	Coefficient Estimate	Coefficient Standard Error	Coefficient Statistical Significance
Percentage of total hospital days that are ICU days - demonstration effect coefficient	.157***	0.060	0.009

NOTES: The model used for estimation is a generalized linear model with a Logit link and a binomial family.

IG beneficiaries with start dates in the 36-month period July 2012-June 2015 are used in the analysis.

The performance period for a beneficiary is the 12-month period immediately following their first month of enrollment (i.e. immediately following the baseline period). For example, a beneficiary with a start date of October 2012 has a performance period of November 2012-October 2013.

The analysis is truncated at December 2015 (i.e. data through December 2015 are used in the analysis).

The regression is estimated using baseline year and performance year data for intervention and comparison group beneficiaries. Regression is weighted by Medicare eligibility fraction.

Statistical significance levels (p-values) are adjusted for beneficiary-level clustering.

MHS= Meridian Health System; ICU= intensive care unit.

* Statistically significant at the <10% level.

**Statistically significant at the <5% level.

*** Statistically significant at the <1% level.

SOURCE: RTI International analysis of July 2011-December 2015 100% Medicare claims files and enrollment datasets.

It may be that this measure is not focusing directly on the palliative care objectives of the MHS demonstration, that are focused on improving quality of life, managing symptoms, improving coordination of care, and improving advance planning for end-of-life care. These were included in MHS' internal quality measures, but those were not measured in the CG drawn from patients treated at other hospitals, so MHS' performance on those quality measures cannot be analyzed using the more rigorous DID regression analysis methods. Future demonstrations could consider investing in measuring a broader range of quality indicators in the CG population as well as in the IG population, to enable DID regression analysis of demonstration performance on those more late-life care focused quality indicators.

Table 9 presents the multivariate regression analysis results for the MHS MHCQ demonstration's impact on quality outcomes for 30-day post-discharge visits and ICU days. An increase in 30-day post-discharge visits was expected due to the demonstration's goal of improving coordination of care. The results in **Table 9** show that the demonstration effect was

Table 9
MHCQ Demonstration Impacts for Meridian Health System Quality Outcomes—Summary of Effects for ICU Days and 30-Day Post-Discharge Physician Visits

	30-day post discharge visits effects	Statistical significance of effects	ICU Days effects	Statistical significance of effects
Demonstration impacts				
Difference-in-difference effect on the predicted probability of event occurring[1]	0.027	0.312	-0.004	0.798
Difference-in-difference effect on the predicted number of events occurring, given at least one occurrence of the event[2]	0.083	0.227	0.914**	0.038
Difference-in-difference effect on predicted number of events occurring (i.e. overall demonstration effect)[3]	0.121*	0.068	0.846***	0.000
Demonstration impacts expressed as percentage changes				
Percent change in the predicted probability of event occurring	2.91%		-0.57%	
Percent change in predicted number of events occurring, given at least one occurrence of the event	5.18%		14.72%	
Percent change in the predicted probability of event occurring (i.e. overall demonstration effect)	8.23%		16.77%	

NOTES:

IG beneficiaries with start dates in the 36-month period July 2012-June 2015 are used in the analysis. The performance period for a beneficiary is the 12-month period immediately following their first month of enrollment. The analysis is truncated at December 2015 (i.e. data through December 2015 is used in the analysis). The regression is estimated using BY and PY data for intervention and comparison group beneficiaries.

MHS= Meridian Health System; ICU= intensive care unit.

[1.] Logit regression models were used to calculate the predicted probability of binary events.

[2.] Negative binomial regression models were used to predict the number of times an event occurs. These were estimated on beneficiaries who had at least one occurrence of the event.

[3.] Combined hurdle regression models were used to analyze the joint effects of two separate processes, combining the information from the logit models and from the negative binomial models, and calculate the overall effect.

* Statistically significant at the <10% level.

** Statistically significant at the <5% level.

*** Statistically significant at the <1% level.

**** Statistically significant at the <0.1% level.

SOURCE: RTI analysis of July 2011-December 2015 100% Medicare claims files and enrollment datasets.

statistically significant for the overall demonstration effect for 30-day post-discharge visits, although only weakly significant, at the 10% level. Nonetheless, this is a favorable effect of the MHS demonstration.

In addition, a stronger statistically significant effect was found in **Table 9** for increasing the number of ICU days. However, as in **Table 8**, the direction of this effect was the opposite of the effect expected for the MHS demonstration on ICU days. The percentage changes in the bottom half of **Table 9** are associated with the effect coefficients in the top half of the table and translate those coefficients from nonlinear statistical models into estimated percentage effect sizes.

2.11 Utilization Outcomes Analysis Results

Table 10 presents the multivariate regression analysis results for the MHS MHCQ demonstration's impact on utilization outcomes, in relation to the CG, for measures of hospital admissions, 30-day readmissions, and ED visits. The percentage changes in the bottom half of **Table 10** are associated with the effect coefficients in the top half of the table and translate those coefficients from nonlinear statistical models into estimated percentage effect sizes.

Table 10 includes beneficiaries with start dates in the MHS demonstration during the 36 months from July 2012 to June 2015 and Medicare claims data for those beneficiaries through December 2015. These results show that the MHS demonstration effects were not statistically significant for the overall effect for any of these three utilization measures. These results also support the findings of no significant difference in costs shown in **Table 5**, since utilization is the main driver of costs.

2.12 Qualitative Analysis Results from Interviews and Focus Group with MHCQ Demonstration Patients and Family Members

2.12.1 Introduction

As noted, RTI conducted one focus group and 17 interviews with patients enrolled in the MHS demonstration and their family members in November 2015. A total of 27 individuals participated in these discussions, including 18 demonstration patients and 9 family members who were involved in their care. Discussion questions sought to understand patient and family member experiences with the MHS demonstration services and staff.

The qualitative evaluation analysis from the interviews and focus group with MHS demonstration patients and their families was limited to one point in time and to beneficiaries willing and able to participate. We aimed to include a range of different types of beneficiaries and family members in the interviews and focus group, but the severe nature of the illnesses suffered by the demonstration enrollees, and the often major impacts on their family members as well, may have limited the range of participants included in the interviews and focus group.

Table 10
MHCQ Demonstration Impacts for Meridian Health System Utilization Outcomes—Summary of Effects for Hospital Admissions, 30-Day Readmissions, and Emergency Department Visits from Medicare Claims Data through December 2015

Type of analysis	Admissions	Statistical significance of effects	30-day readmissions	Statistical significance of effects	Emergency department visits	Statistical significance of effects
Demonstration impacts						
Difference-in-difference effect on the predicted probability of event occurring[1]	0.009	0.526	-0.007	0.814	0.017	0.237
Difference-in-difference effect on the predicted number of events occurring, given at least one occurrence of the event[2]	-0.119*	0.083	-0.068	0.678	0.012	0.875
Difference-in-difference effect on predicted number of events occurring (i.e. overall demonstration effect)[3]	-0.057	0.276	-0.029	0.585	0.066	0.316
Demonstration impacts expressed as percentage changes						
Percent change in the predicted probability of event occurring	0.93%		-3.21%		1.71%	
Percent change in predicted number of events occurring, given at least one occurrence of the event	-6.28%		-5.29%		0.51%	
Percent change in the predicted probability of event occurring (overall demonstration effect)	-3.01%		-9.48%		2.82%	

NOTES:

IG beneficiaries with start dates in the 36-month period July 2012-June 2015 are used in the analysis. The performance period for a beneficiary is the 12-month period immediately following their first month of enrollment. The analysis is truncated at December 2015 (i.e. data through December 2015 is used in the analysis). The regression is estimated using BY and PY data for IG and CG beneficiaries.

MHS= Meridian Health System; ICU= intensive care unit.

[1.] Logit regression models were used to calculate the predicted probability of binary events.

[2.] Negative binomial regression models were used to predict the number of times an event occurs. These were estimated on beneficiaries who had at least one occurrence of the event.

[3.] Combined hurdle regression models were used to analyze the joint effects of two separate processes, combining the information from the logit models and from the negative binomial models, and calculate the overall effect of the demonstration on the outcomes.

* Statistically significant at the <10% level.

** Statistically significant at the <5% level.

*** Statistically significant at the <1% level.

**** Statistically significant at the <0.1% level.

SOURCE: RTI analysis of July 2011-December 2015 100% Medicare claims files and enrollment datasets.

2.12.2 Joining the Demonstration

Most participants indicated they learned about the demonstration during or shortly after a hospital stay or from their PCP during an appointment. Most shared that they joined the demonstration because it was free and would provide them with additional help at home. A couple who had been taking care of their mother with Alzheimer's at home for ten years shared that they enrolled their mother in the MHS demonstration two years ago because:

> *…we were overwhelmed, couldn't focus, were tired, and couldn't get out (of the house). It was a big blur, and you can't get that way if you are dealing with a sick person. There were so many things we didn't know. We were stuck here.*

Some participants wondered why they were allowed to be in this demonstration while others, whom they thought would greatly benefit, were not. All indicated they would strongly recommend the demonstration to others but were unsure of how to do so.

2.12.3 Medical Services

Demonstration staff provided ongoing monitoring and support to participants' medical conditions. In addition to routine care services, staff also addressed medical needs not identified by other providers by providing medical services or connecting participants to the appropriate resources. In many cases, such services resulted in identification of missed diagnoses, adjustments of inappropriate medication regimens, improved pain management, improved participant compliance, accountability, self-management, and assurance of safe environments at home.

Participants reported that the MHS demonstration staff provided services they did not receive from physicians. Most participants reported that regular check ups provided by demonstration staff at their homes allayed their fears because they knew a trained medical professional would catch anything serious that might be happening with their disease. Participants valued the amount of time the demonstration staff would spend with them explaining their disease. Many shared that this education allowed them to manage their conditions better and kept them accountable for their own health because they knew the demonstration staff would be stopping by to check on them:

> *The [demonstration] staff always tell you to use your mind, to stay active and enjoy life. It is such a comforting situation. It's the spirit of the program to get you up eating, drinking water, staying in touch with the world—just living [long pause]—like any other person.*

Participants also indicated that such interactions helped them to understand their diagnosis and decision-making. The interactions also motivated them to be more compliant with medical orders and recommendations. For example, a spouse of one participant, who was refusing to take his prescriptions and follow his physician's orders, shared that after several discussions with the demonstration nurse, the participant became much more compliant because he understood what was being prescribed to him and why:

When I know someone is checking on me, it makes me want to try harder (…) (My nurse practitioner) explains why I need to do certain things with my medication. I have to be convinced that changing things is worth it. She helps me accept the changes. Now, when I go see my doctor, I generally have an understanding of what he's going to change. It's easier to accept or reject what he's saying now that I meet with (my nurse practitioner).

Similarly, family members described that education and support provided by demonstration staff helped them to achieve better patient compliance and safety:

[The Nurse and Social Worker] back up that I'm not the bad guy. I can now tell [the demonstration participant] to use the walker and she will listen more now because they tell her the same thing.

Several participants observed how monthly check-ups reduced or prevented hospitalizations. One participant shared that most of her mother's hospitalizations were because she was not taking her medications, not drinking water, and not eating right. According to the participant, the mother has not been in the hospital since she joined the demonstration. A wife of another participant shared that her husband had several life-threatening hospitalizations due to aspiration pneumonia because he was not using his nebulizer due to pain and a swollen throat. Realizing that the patient was not compliant with the prescribed regimen, the demonstration nurse engaged the patient in trying to understand the reasons for non-compliance and suggested that he rinse out his mouth after using the nebulizer to wash away residual steroids in his throat that were causing irritation. Since then, the participant was able to use the nebulizer with no discomfort. According to his wife, this intervention not only prevented subsequent hospitalizations, it also saved her husband's life.

Several participants shared that the demonstration staff helped them manage their pain. For example, one participant described her nurse helping with stretches and exercises that reduced the pain in her legs. This enabled her to go outside and talk with her neighbors – something she had not been able to do for several years. Other patients shared that as result of decreased pain, they became more active.

Another demonstration feature valued greatly by participants was that the demonstration staff looked at "the whole picture," including all of their medical and non-medical needs. As one participant noted, "Instead of different doctors, [the social worker] brought one person [the demonstration nurse] to address everything (…)" Participants observed that such a holistic approach focused on all their needs and improved their overall well-being, making them feel healthy and optimistic about the future:

Nobody told you that you could be old and healthy. This program told me that you can be old and healthy. In this way, they have given me the hope and will to live.

Participants described many ways the demonstration staff helped them with their medications. Some shared that the staff connected them with a pharmacy that prepackaged their pills into individual time-stamped rolls so they didn't have to sort their pills into pill boxes

themselves. Many participants described that medication reconciliation improved the quality and possibly the duration of their or their loved ones lives.

For example, the daughter of a 90-year-old mother in a nursing home shared that before joining the demonstration, her mother was on more than 40 medications that had multiple interactions and side effects. Consequently, she was immobile, unresponsive, and unable to communicate: "That's what we used to call her, Zombie mom. She was on pretty heavy [opioid] medicine that she apparently didn't have to be." The demonstration nurse was able to reduce the number of medications to just a few pills a day and make changes to non-opioid medications. At the time of the interview, the mother was actively engaged in our interview, making occasional jokes. Her daughter said that she did not believe her mother would have been alive had the changes by demonstration staff not been made.

Trusting relationships with the demonstration staff allowed patients and family members to share issues they had dealt with for a long time and were not comfortable describing to other providers, many of which resulted in the identification of missed or mismanaged diagnoses in the past. One participant described that he was not comfortable telling his physician about rectal bleeding that he had for a prolonged time but was finally comfortable sharing it with the demonstration staff whom he started to know and trust.

Many participants shared that the demonstration improved their mental health. One participant shared that at the time of joining the demonstration, he was no longer interested in living. Since joining the demonstration, he discovered meaning and joy in his life again and was looking forward to the future. His anxiety, depression, and other medical conditions were adequately addressed and he was comfortable to share his concerns with the demonstration social worker he trusted. He said that the social worker changed his attitude, and he then felt life was worth living and attributed his optimism for living to the demonstration staff:

> *You [are] by yourself and nobody calls. If I didn't get their calls, I would get no calls day after day after day. (…) Now I feel like somebody is available (…) I don't want to give up now. Now that I got started, I want to keep getting better and having a positive attitude. (…) They've helped because they changed my attitude that life is worth living.*

Several other participants also indicated they had been diagnosed with depression since joining the demonstration, as demonstration staff identified the symptoms and coordinated the treatment with participants' primary care providers. All participants observed that their mental health improved because the demonstration staff provided them with the assurance that everything was being looked after.

Family members of demonstration participants reported similar experiences and effects of the demonstration on their mental well-being. They shared that demonstration staff advised them of many resources, including mental exercises, stress coping techniques, and suggestions for family member support groups to help them better take care of themselves and take care of their loved ones. Many shared that these resources helped family members feel "less guilty" about taking time to recharge:

[Caring for the elderly] is a heavy burden. [The social worker] eases my mind. I've been neglecting myself. Now she is helping me find a doctor for myself.

2.12.4 Care Coordination

Participants reported that their health care providers effectively exchanged information about their health, including information exchanged between specialists and primary care doctors, between the MHS demonstration staff and medical providers, and between the MHS hospitals and physicians. Several participants noted that demonstration staff also assured that information was properly communicated to all involved providers and to the participant. In some cases, information exchange with specialists outside of the MHS was limited, because they did not share the same electronic health record system. In those cases, demonstration staff assured that such information was shared with all involved parties.

Participants described multiple ways the staff coordinated their care with PCPs, specialists, hospitals and nursing homes. They shared that their social worker and NP would reach out to them during and after hospitalizations to discuss their case with hospital staff. Most participants indicated that the demonstration staff were automatically alerted if the participant visited the emergency room.

2.12.5 Other Services

Participants placed a great value on many community resources and services the demonstration staff helped them realize. Participants shared that staff taught them about services they did not know were available, helped them to navigate the labyrinths of Medicare and Medicaid eligibility, coverage, and requirements, helped to make arrangements with transportation services, and affordable food programs, identified respite programs for family members, medical equipment programs, prescription drugs programs, and financial assistance services, and enabled access to affordable cell phones. Participants viewed such services as crucial to their quality of life. As one participant summarized, the demonstration staff are there "when we don't know what to do or where to go."

For example, several participants who needed frequent blood drawings shared that their social workers connected them with a service that did the blood drawing at patient homes. This service was extremely helpful because it enabled participants to comply with their doctor's orders, relieved them from having to make transportation arrangements, and reduced the possible risk of falls. Several homebound participants shared that the demonstration staff connected them to a podiatrist who would visit participants in their home. This made it less painful and more feasible for them to receive podiatric care, because they did not need to use their feet or rely on others to get to their appointments.

Several participants noted that the program staff helped them to live independently by assuring safety at home. Many participants shared that the demonstration staff assessed their homes to assure that everything was safe and suggested enhancements such as installing bars and shower chairs in the bathrooms to prevent falls.

2.12.6 Assistance with End-of-Life Decisions

Demonstration staff also helped participants with documenting their end-of-life preferences. Participants described this process as valuable, yet daunting and distressing due to the magnitude these decisions would have on their life and the lives of their loved ones. Participants shared that the demonstration staff aided them through this process and calmed their anxieties in helping to navigate end-of-life paperwork such as living wills and POLST forms.

All participants indicated that having such documentation and knowing that their families would not have to make these decisions on their behalf made them feel more secure and relieved. Several indicated they could not have completed many of these forms without the help of the demonstration staff because they did not always understand what the forms meant. For example, several shared they had preconceived notions that if they filled out the form, they would not be taken to the ED for treatment if they had an acute episode. Participants described how the staff helped them understand the content of the documents and the participants' role with their own medical decisions, whether it meant more or less intensive efforts and indicated that their wishes were respected and supported regardless of their decision. As shared by one participant,

> *They helped me face my mortality, which I was very afraid of. Now, I have all this support and feel so much better. I've made all the decisions for my living will with my two girls and other family members. We're all on the same page now that we've completed my living will. (…) I was able to face it. I'm not afraid anymore. (…) I probably would've put off the living will knowing my nature (...) I was afraid that if they took me in and I didn't want to be resuscitated that (the medical staff) wouldn't help me. (The demonstration) staff assured me that it wouldn't be like that. (…) It helped clear my mind. I found that extremely helpful. I feel they're my advocate.*

While many demonstration participants completed a living will or POLST form, a few shared that they had decided not to complete them. Some of these participants shared they were still confused about what exactly the form meant for them, while others said that they did not want to deal with these decisions at this time. Most of the participants that had not yet completed a living will or POLST form indicated that they planned to complete one in the near future once they felt more prepared.

2.12.7 Spiritual Needs and Services

Many participants indicated that their spiritual needs were as important as their physical and mental health. Several shared they were no longer able to be part of their religious communities and attend the services because of relocations to a new area or inability to drive. As a result, some were grieving a recent loss of a spouse, sibling, or friend and were unable to seek and receive comfort in religious services they relied on throughout their life.

One participant had to relocate from the community where she lived her entire life to an entirely new area due to a hurricane and flood. Shortly after moving to the new neighborhood, she lost her husband of 60 years. The participant did not know her neighbors and did not want to ask her children to take her to church. The only spiritual outlet she had for her grief were the

masses on television. The participant shared that with having the demonstration chaplain visiting her home "I was gaining back what I have lost (…) I am always moving forward."

When we interviewed participants, the demonstration chaplain had just begun providing religious services to participants recently, and several participants described the benefits of having a chaplain as part of demonstration staff. Two participants indicated they were hesitant with the chaplain initially because they did not understand the intent of the service. Once they had a better understanding of the chaplain's role and affiliation with the demonstration, they gradually established a trusting and meaningful relationship. As with other demonstration services, a key to the chaplain's role and effective relationship building was regular visits with the patients and family members.

2.12.8 Communication

Participants valued having timely and effective communication with the demonstration staff. All participants knew how to get in direct contact with the staff and reach them in a timely manner when needed. Ongoing monthly contact helped develop trusting relationships between participants and staff. As one participant indicated, demonstration staff "don't leave you." Family members enjoyed the same level of access and quality of services, regardless of whether they were providing direct care for the patient full time or lived some distance apart.

All participants described having trusting relationships and clear communication with demonstration staff. They reported that the demonstration staff understood their needs, what they were going through, and answered any questions they had about their needs. One participant relied on demonstration staff to read him his lab results and communication with his physician via the patient portal because the portal did not have connectivity with reading software for blind.

Demonstration staff were especially praised for their ability to develop a rapport with the participants. In the words of one patient, "[The nurse] spoke to me like I am here." Several mentioned that the demonstration staff were never late for their appointments and would keep them informed of delays as short as five minutes. This made participants feel respected.

> *Everything is helpful—their kindness, their understanding. They are punctual. When they say they'll be here, they are (...). We have no control over aging, but my family has peace of mind because of this program.*

Often, participants described their experiences with demonstration services in contrast to their experiences with physicians. Most indicated that their doctors were hard to reach and too busy to educate them enough about their disease, provide adequate preventive care techniques, or conduct thorough assessments. Participants characterized their typical communications with physicians as rushed, unclear, and impersonal:

> *I talk to (the demonstration staff) about a lot of things I wouldn't talk to my doctor about because he would just brush it off.*

Doctors tend to gloss over things; the (demonstration) staff explain things in detail. That's what's good about nurses, they explain everything—doctors don't do that. Sometimes the doctors just tells you to Google it.

(...) when (the demonstration staff) are here, we get answers. The doctors are busy. The doctors tell you what's wrong and then they have to leave. When you talk to [demonstration staff], you really have an angel on your shoulder.

[Nurses] explain everything. It gets more personal and it's a good thing. To doctors, you're just a number.

2.12.9 Engagement of Patients and Families

Another unique aspect of the MHS demonstration was its focus on and integration of participants' family members. Participants described having many diverse family situations and arrangements, whether living alone or with their families, having no children or children living great distances apart, or having children and spouses trying to help but not knowing how or not realizing that help was needed. Several participants shared they valued independence and did not want to be a burden to anyone, that that program helped them to achieve that:

My kids are far away and they're all busy. They're willing to help, but I don't want to be a burden. We want to be independent and the program, with the things it offers allows us to pretty much manage on our own. We want to be independent. The program provides those little things that help really do make a big difference.

Participants also shared that demonstration staff would find gentle and effective ways to integrate their families in their care through joint visits, phone calls during the visit, or shared updates by mailing records of the most recent medical visit or the demonstration newsletter. For example, one participant described having several adult children living in the area but was uncomfortable asking anyone for help and was having difficulty with purchasing meals and finding transportation. The demonstration staff and participant called the participant's son together and gently described the situation and needs of the parent. After that call, the entire family became actively involved with their mother's transportation and meals. They frequently joined the monthly meeting between participant and demonstration staff by phone.

Several participants reported that before joining the demonstration, concerns about health and other problems dominated their interactions with their family members. They shared that after joining the demonstration, they could enjoy spending time with their children and grandchildren while not worrying as much about health problems and other concerns.

Demonstration staff empowered family members to be able to take care of their loved ones and themselves. Several family members indicated that they chose to take care of their loved ones because they found nursing homes or other similar long-term care facilities neglectful. Most indicated that demonstration staff helped them to provide such care at home. For example, a husband caring for his wife with Alzheimer's shared that the care she received at the nursing home she was in was neglectful and uncompassionate. He wanted to take care of his wife at home but did not have the necessary skills or knowledge, especially since she used to be

the one taking care of all their household and family needs. Demonstration staff empowered him to take care of his wife at home with minimal contracted help. In his words, **"**It's like a person walking down the street with a cane. You drop your cane, and no one is around. [The demonstration staff] are there; they help you when you drop your cane."

Others shared that the demonstration staff helped them realize that the nursing home was the most appropriate option and aided them in finding a nursing home they were comfortable with. After such a transition, the demonstration staff continued to be involved and provide support:

> *[The demonstration] opened the door of hope. It took us a year to put her [mother] in the nursing home—we couldn't do it—the guilt. Without [the demonstration's] help checking out the nursing home, we couldn't have done it, (…) we weren't getting any sleep. (…) they taught us how to help ourselves (…) Meridian is hiring the right people with big hearts that are open.*

2.12.10 Conclusions

The patient and family interviews and focus group indicated that the MHS demonstration addressed patients' medical, nonmedical, and spiritual needs at the same time, which made the care holistic. Demonstration components that led to high levels of participant satisfaction with the demonstration were the integration of social and spiritual services, diversity of demonstration provider teams, frequency of visits, continuity of personnel, longevity of services, integration of family members, and ability to meet the unique needs of the patients.

Services provided by the demonstration filled gaps that existed in care due to the fragmentation in our health care and social care systems. These services improved the MHS demonstration participants' well-being, self-care behaviors, understanding of the disease processes, and social and emotional support.

SECTION 3
LESSONS LEARNED

Several lessons learned can be gleaned from the results of the MHS MHCQ demonstration that is the focus of this report. These lessons are drawn from the quantitative results of the multivariate statistical analyses of the MHS demonstration's impacts on cost, quality, and utilization outcomes and from the results of the qualitative assessments regarding the processes and impacts of the demonstration interventions. The main lessons learned are as follows:

- The cost outcome analysis results for the MHS demonstration showed no statistically significant impact. As a result, the demonstration did not have a significant impact in reducing Medicare costs.

- MHS' internal quality measure results were favorable, as they met the targets set for all 10 internal quality measures. However, the methods used to set the targets were not based on external benchmarks, and the results were not assessed against a matched comparison group, so it is not possible to determine if the results would have occurred in the absence of the demonstration.

- The results for the claims-based quality measures were less directly focused on the demonstration's interventions but were assessed against the matched comparison group established for this evaluation. They showed statistically significant but unfavorable effects for two measures on ICU days. However, a favorable but weakly statistically significant effect was found for the measure of 30-day post discharge visits.

- The utilization outcome analysis results showed no statistically significant impact for the overall effects for any of the three utilization measures evaluated. As a result, the demonstration did not have a significant impact in either reducing or increasing utilization for those measures.

- The qualitative results from the patient and family interviews and focus group showed positive impacts of the MHS demonstration. Demonstration components that led to high levels of participant satisfaction with the demonstration were integration of social and spiritual services, diversity of demonstration provider teams, frequency of visits, continuity of personnel, longevity of services, integration of family members, and ability to meet the unique needs of the patients. Services provided by the demonstration were found to fill gaps that existed in care due to the fragmentation in our health care and social care systems. These services improved the MHS demonstration participants' well-being, self-care behaviors, understanding of their disease processes, and social and emotional support.

- In summary, the MHS MHCQ demonstration showed some positive effects in terms of qualitative assessments of the impacts on patients and families and internal MHS quality measures. However, no strongly statistically significant and favorable effects were found in the more rigorous quantitative evaluations of cost, quality, and utilization outcomes in relation to a matched comparison group.

- Future demonstrations might consider ways to expand the range of outcomes included in the more rigorous quantitative evaluations, to include additional types of outcomes that were also an emphasis for this palliative care demonstration, such as patient and family quality of life and coordination of care, and to measure those additional outcomes for both the intervention and comparison groups.

SECTION 4
LIMITATIONS OF THE EVALUATION

The MHS Evaluation had three main limitations. First, the quantitative results of the evaluation are based on the matched population not on the entirety of the served population. The quantitative evaluation included an IG of 2,023 out of 3,095 MHS enrollees; 1,072 MHS enrollees were excluded for a range of different types of reasons related to the evaluation methods needed to respond to the challenges posed by the demonstration design and its threats to the validity of the evaluation. There were trade-offs made between applying the evaluation methods needed to respond to the evaluation challenges posed by the rolling enrollment, clinical and disease severity heterogeneity, risk of selection bias, and high death rate of enrollees against the goal of including as many MHS enrollees in the IG as possible.

The quantitative results are related to the population examined and generalizations of the results of the quantitative outcome analyses conducted for the 2,023 IG beneficiaries to the entire population of 3,095 MHS-enrolled beneficiaries should be treated with caution. We cannot be certain how those additional beneficiaries might have affected the results if they could have been included in the IG and successfully matched to the CG beneficiaries.

Second, the quantitative evaluation included MHS beneficiaries enrolled in the first three years of the demonstration's operations, from July 2012 to June 2015, but did not include enrollees from the fourth year of the demonstration, from July 2015 to June 2016. We cannot be certain how that additional year of MHS demonstration experience could have affected the results of the analysis.

Third, the qualitative evaluation from the interviews and focus group with the MHS demonstration patients and their families was limited to one point in time and to those beneficiaries who were willing and able to participate. We aimed to include a range of different types of beneficiaries and family members in the interviews and focus group, but the severe nature of the illnesses suffered by the demonstration enrollees, and the often major impacts on their family members, may have limited the range of participants included in the interviews and focus group.

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