February 2017

Evaluation of the Initiative to Reduce Avoidable Hospitalizations among Nursing Facility Residents: Annual Report Project Year 4

Prepared for

Jean Gaines, PhD, RN
Center for Medicare and Medicaid Innovation
Centers for Medicare & Medicaid Services
Mail Stop WB-06-05
7500 Security Boulevard
Baltimore, MD 21244-1850

Prepared by

Melvin J. Ingber, PhD
Zhanlian Feng, PhD
Galina Khatutsky, MS
William Bayliss, BA
Lawren Bercaw, MPP, MA
Nathaniel Breg, BA
Nicole Coomer, PhD
Laurie Coots, MS, MA
Jonathan DiBello, BS
Terry Eng, PhD
Abigail Ferrell, BA
Jessica M. Jones, BA
Yevgeniya Kaganova, PhD
Molly Knowles, MPP
Catherine Ormond, MS
Kristie Porter, MPH
Christopher Saur, BS
Micah Segelman, PhD
Anushi Shah, MPH
Caroline B. Husick, MPH
Trini Thach, BS
Alison Vadnais, MHS
Emily Vreeland, BA
Joyce M. Wang, MPH
Samantha Zepeda, BA, BS
Nan Tracy Zheng, PhD
Patti Zoromski, RN, BSN, MBA
RTI International
307 Waverley Oaks Road, Suite 101
Waltham, MA 02452-8403

RTI Project Number 0212790.006

RTI INTERNATIONAL

[This page intentionally left blank.]

EVALUATION OF THE INITIATIVE TO REDUCE AVOIDABLE HOSPITALIZATIONS AMONG NURSING FACILITY RESIDENTS: ANNUAL REPORT PROJECT YEAR 4

Government Task Lead: Jean Gaines, PhD, RN

RTI International

CMS Contract No. HHSM-500-2010-00021I (HHSM-500-T0006)

February 2017

This project was funded by the Centers for Medicare & Medicaid Services under contract no. HHSM-500-2010-00021I. The statements contained in this report are solely those of the authors and do not necessarily reflect the views or policies of the Centers for Medicare & Medicaid Services. RTI assumes responsibility for the accuracy and completeness of the information contained in this report.

[This page intentionally left blank.]

CONTENTS

List of Figures

List of Tables

EXECUTIVE SUMMARY

E.1 Overview

This report details analyses and findings from the fourth year of the Evaluation of the Initiative to Reduce Avoidable Hospitalizations among Nursing Home Residents (hereafter referred to as the Initiative). The quantitative analysis results in this report were produced using Medicare data from the baseline and the first 3 years of the Initiative, 2012 to 2015. In this report, we focus on the impact in the third year of the Initiative, 2015. For the first time, some limited descriptive statistics on Medicaid expenditures are presented for residents in Alabama over 2011 to 2013; analyses of Medicaid data for other states and years are not included because they are in progress and results are not available at this time. We also include a brief summary of our primary data collection activities, including 2016 site visit and telephone interview findings, as well as 2015 survey results. A full set of site visit and phone interview findings will be included in the narrative ECCP annual reports submitted to CMS separately.

Compared to data from the second Initiative year, 2014, data from 2015 continue to show evidence that the Initiative has produced measurable effects on many of the outcome measures under evaluation, including some more consistent patterns of effects on utilization and spending at a few of the Enhanced Care and Coordination Providers (ECCPs). These patterns are present in the ECCPs in Missouri, Indiana, and Alabama. Alabama shows a stronger and more consistent pattern of ECCP intervention effects in 2015 than in 2014. Other ECCPs, in New York and Pennsylvania, indicate mostly consistent indications of reductions, but few measures are statistically strong. Although in New York, the pattern and strength of the effects remain largely the same in 2015 as in 2014, in Pennsylvania, the effect estimates on utilization measures are weaker in 2015 relative to 2014. Similar to the pattern observed in 2014, the ECCP effects in Nebraska and Nevada were mixed in 2015. Thus far, the Nebraska ECCP has shown the weakest pattern of intervention effects on key utilization and expenditure outcomes, relative to all other ECCPs. The 2015 data for Nevada revealed somewhat stronger Initiative effects on reducing all-cause hospitalizations and several expenditure measures, as compared to 2014, but these results should be interpreted with caution given the use of a "convenience" comparison group (see ***Section E.5.5***, and ***Sections 2.4*** and ***2.11.5*** for more discussion regarding the comparison group for Nevada's ECCP).

As in the previous year, the Minimum Data Set (MDS)-based quality measures in 2015 do not show any pattern of change related to the Initiative. If the Initiative's focus is more on quality improvement related to avoiding hospitalizations and emergency department (ED) use related to changes in condition among the residents, than it is on improving other measures of quality, the effects of the interventions on the broad range of MDS-based quality measures may be limited.

E.2 Introduction

This report presents the status of the Centers for Medicare & Medicaid Services (CMS) Initiative to Reduce Avoidable Hospitalizations among Nursing Facility Residents (the Initiative) from the point of view of the 2015 evaluation. The Initiative is designed to affect hospitalization rates by directly changing practices at the nursing facility level. The Initiative tests a series of clinical interventions or educational models aimed at improving the health and health care of

long-stay nursing facility residents, with the goals of reducing avoidable inpatient hospital admissions, improving MDS quality metrics, and decreasing the total cost of health care spending for the Medicare-Medicaid enrollees participating in the Initiative. The rate of avoidable hospitalizations itself is a quality measure as well as a utilization measure because disruptions of residents' routines and exposure to potential infection have been shown to be deleterious to patients' quality of life.

The Initiative involves seven Enhanced Care and Coordination Providers (ECCPs) consisting of academic institutions, quality improvement organizations (QIOs), a health care provider network, and a hospital association. For most of 2015, these ECCPs have partnered with 144 nursing facilities in seven states to implement strategies aimed at reducing hospitalizations and improving care for fee-for-service, long-stay nursing facility residents whose care is funded through Medicare, Medicaid, or the Veterans Administration. One of the 144 nursing facilities dropped out of the demonstration in early October. Each ECCP designed its own interventions within the Initiative, under CMS guidance. Each of the interventions is described briefly in ***Section 1.1*** of the main report. Two of the ECCPs, in Alabama and New York, implement the Initiative through ECCP staff educating facility staff rather than implementing a clinical care component. The other ECCPs include direct patient oversight by ECCP staff as well. Aside from ECCP hands-on care by nurses and advanced practice nurses, generally the interventions include introducing tools for facility staff to recognize a change of condition of a resident, to report resident condition to a physician, and to monitor pharmacy use. Other elements, specific to particular ECCPs, distinguish the interventions, as do the methods of implementation.

After CMS approved the preliminary protocols, including communication plans, readiness reviews, and operations manuals, the ECCPs began implementing the Initiative in their partnering nursing facilities in February 2013. All ECCPs have staggered implementation in multiple cohorts of facilities; the last cohort began in September 2013. In addition to implementation occurring in facilities at different times, the rollout of Initiative components has been staggered over time. The facility residents eligible for the Initiative are those who have been in the facility for at least 101 days and those who have MDS assessments indicating that there is no active discharge plan in place, irrespective of length of stay in the facility.

In this executive summary, we present results of the quantitative data analysis from the third Initiative year, 2015, covering the effects of each ECCP intervention on utilization, spending, and MDS-based quality outcomes. This analysis includes data for the entire calendar year 2015 for all participating facilities irrespective of their degree of implementation of the Initiative. For each ECCP, we put the quantitative results into context by describing the findings of our site visits, interviews, and surveys for 2015 and the follow-up in 2016. In ***Section E.3,*** we give a brief overview of the evaluation methods. A more detailed technical description is in ***Section 2*** of the main report. A comparison of summary utilization and spending measures between the intervention and comparison groups and across the ECCP states is presented in ***Section E.4*** showing how the patterns of these measures vary.

The main evaluation analysis results are presented in ***Section E.5***, separately for each ECCP in Alabama, Indiana, Missouri, Nebraska, Nevada, New York, and Pennsylvania. The analytical method yields estimates of changes over time and distinguishes the ECCP-related changes from general changes shared by comparison groups. As can be seen in this report, the implementations and challenges differ by state. Also reported in this section are ECCP-wide

estimated reductions or increases in Medicare spending, both in total and separately for all-cause hospitalizations and for potentially avoidable hospitalizations, as well as estimates of the net savings or costs of the Initiative when the payments associated with the grants to the ECCPs are accounted for.

Preliminary qualitative analysis results and status of implementation of the Initiative as determined by primary data collection are described in ***Section E.6***. ***Section E.7*** provides an overall summary discussion of the results.

E.3 Methods

The evaluation is designed to assess ECCP interventions as they unfold, measuring both process and outcome elements. The evaluation assesses the effectiveness of the overall Initiative as well as components of each ECCP intervention. A combination of quantitative and qualitative methods is used to evaluate the seven ECCP interventions, customizing the overarching evaluation design to (1) capture each ECCP's unique features and (2) develop an in-depth understanding of the transformative processes that may occur throughout the Initiative's implementation. This approach allows us to directly link structural and process changes to outcomes.

A principal desired outcome of the Initiative is the reduction of avoidable hospitalizations. These admissions are identified by matching the principal diagnosis on acute hospital admissions to a list of conditions deemed potentially avoidable. RTI International uses the definition of potentially avoidable hospitalizations developed by Walsh et al. (2010) in their study of high-cost dually eligible populations. Since this publication, a few conditions were added or deleted based on subject matter expert input. The updated list of potentially avoidable hospitalization conditions reflects International Classification of Diseases, Tenth Revision (ICD-10) codes since October 2015.

Quantitative methods are used to evaluate the impact of ECCP interventions on outcomes, using a matched comparison group of non-ECCP facilities to determine the effect of interventions. A comparison group of non-ECCP facilities with characteristics similar to ECCP facilities was identified within each state. RTI uses multivariate analyses to evaluate key utilization, expenditure, and MDS-based quality outcomes in a difference-in-differences regression model framework. The models control for many characteristics of the resident population, clinical and demographic, as well as some facility characteristics. The main predictor variable that we focus on for the Initiative effect indicates the magnitude of the difference in the change in the measured outcome between the ECCP intervention group and the comparison group. This method accounts for baseline differences between the groups, allows for changes over time common to both groups to be accounted for, and enables us to measure differences between the groups related to the Initiative. Greater technical detail is given in ***Section 2*** of the main report.

The qualitative design focuses on primary data analyses using information collected from the ECCPs and their partnering facilities directly. Formal site visit protocols and telephone interviews are used to ensure standardized primary data are collected. A web-based survey is also used to collect data from Initiative facilities beyond the interviews. Additionally, a one-time web-based survey of comparison facilities was conducted to collect data about specific

interventions and quality improvement initiatives related to reducing hospitalizations that are being implemented outside of the ECCP interventions.

The primary data complement the quantitative secondary data analyses, providing critical context to interpret evaluation findings. In addition to informing secondary data analyses, the primary data analyses provide a better understanding of the ECCPs and the processes of implementing various models of the Initiative in participating facilities. This in-depth qualitative approach allows us to assess the fidelity to the original Initiative design and to gather necessary information to describe the Initiative's successes and barriers to implementation. In addition to describing the situation in 2015 related to the quantitative results, we report preliminary findings from the primary data collection for the Initiative in 2016.

E.4 Descriptive Findings

This section presents a brief overview of the results from descriptive analyses of key evaluation outcomes. The complete descriptive results are presented in ***Section 2.10*** of the main report. All statistics are reported for Initiative-eligible residents.

E.4.1 Medicare Utilization

The 2015 data show that in each of the seven states in both the ECCP and comparison groups, approximately 25 to 30 percent of all residents experienced at least one hospitalization, and roughly 10 to 15 percent experienced at least one potentially avoidable hospitalization. Similarly, the mean count of hospitalizations per 1,000 person-days ranged from 1.5 to slightly over 2.0; mean count of potentially avoidable hospitalizations per 1,000 person-days ranged from 0.5 to just under 1.0. These results suggest that between one third and half of hospitalizations experienced by this population of nursing home residents in 2015 were potentially avoidable. There is greater inter-state variation in the percentages of residents who visited the ED at least once in 2015, from roughly 15 percent to 25 percent. In general, the differences between the ECCP and comparison groups in the percentages of residents with any hospitalization or ED visit are smaller than the differences observed across states.

The descriptive analyses also reveal some trends in utilization across the 5-year reporting period. For example, among ECCP groups and comparison groups in most states, there was an overall decrease in the percentage of residents ever hospitalized and those who were ever hospitalized for a potentially avoidable condition in a given year as well as in the mean count of these events per 1,000 person-days. However, in many comparison groups, most notably in Missouri and Indiana, the magnitude of the reduction was less than that in the respective ECCP group. In addition, while hospital outpatient observation stays are relatively uncommon in our study population, there was a steady increase in the use of observation stays over the 5-year period in virtually all states and all groups. A complete summary of the descriptive utilization outcomes for years 2011 through 2015 is available in this report in ***Section 2.10.1.***

E.4.2 Medicare Expenditure per Resident

Average expenditures for ECCP facility residents are generally similar to those in the comparison group within each state; more variation is seen in spending across the states. Total expenditure per resident in 2015, on average, ranged from approximately $20,000 to $30,000. Total Medicare expenditures from 2012 (the Base Year used in the multivariate analysis) to 2015

were fairly stable in Alabama, with only small fluctuation in the years in between. It increased in the comparison facilities in Indiana, Nebraska, and in the comparison facilities in Nevada. The total Medicare expenditure decreased in the ECCP facilities in Missouri and in Pennsylvania.

Inter-state variation also was seen in Medicare expenditures for hospitalizations and potentially avoidable hospitalizations. In 2015, average Medicare expenditure per beneficiary for all-cause hospitalizations ranged from approximately $3,600 to just under $9,000. Average Medicare expenditure per beneficiary for potentially avoidable hospitalizations ranged from approximately $1,000 to $1,900. These numbers suggest that a significant proportion of total hospitalization expenditures are for potentially avoidable hospitalizations. A complete summary of the descriptive expenditure outcomes for 2011 through 2015 is available in ***Section 2.10.2.***

E.4.3 MDS-Based Quality Outcomes

The MDS-based quality measure scores are summarized for each state by ECCP and comparison facilities. A complete summary of the descriptive MDS-based quality measures for years 2011 through 2015 is available in ***Section 2.10.4*** of this report. From 2011 to 2015, some measures, such as use of physical restraints and antipsychotic medications, showed overall quality improvement in both the ECCP and the comparison facilities in all the states with minimal fluctuations. Other measures increased in some states, declined in some, and fluctuated in others. The scores for most measures varied substantially across states. We also observed variations in quality between the ECCP and comparison groups; however, in general, there were greater variations across states than within states.

E.5 ECCP-Specific Multivariate Regression Results and Qualitative Context

In determining the effects of the Initiative, we analyzed the data for each ECCP implementation separately. Although there are commonalities in the interventions, major differences exist. There are also differences in the regulatory environments and utilization patterns in the states that make pooling undesirable. In this summary, for each state, we describe the multivariate analysis results on key utilization, expenditure, and MDS-based quality outcomes. In multivariate regression analyses, we are primarily interested in estimating the effect of ECCP intervention on a given outcome for residents in intervention facilities, relative to the outcome for residents in comparison facilities during an Initiative year, accounting for Base Year differences. Statistical estimation of the strength of the effects of the predictors is made using a set of observations that characterize each resident in the study. Some of the predictors are risk adjusters, such as medical conditions of the residents and some facility characteristics. Other predictor variables account for the year of the observation, whether the resident is in one of the ECCP facilities, and whether the observation is for a resident who is in an ECCP facility in an Initiative year. This last variable captures the ECCP effect of interest: the change in the outcome not shared with the comparisons after accounting both for Base Year outcome differences between ECCP facilities and comparisons and for changes that apply to all facilities over time.

The evaluation assessed differences between each ECCP group and the matched comparison group on selected Medicare utilization, expenditure, and MDS-based quality outcomes in an Initiative year relative to the Base Year, 2012. In this report, we focus on the effect of ECCP intervention in 2015, the third year of the Initiative during which most of the interventions were expected to be fully implemented in all seven ECCP participating states. In the summary below, we highlight results regarding the ECCP effects on four utilization

outcomes—count of all-cause hospitalizations, count of potentially avoidable hospitalizations, count of all-cause ED visits, and count of potentially avoidable ED visits—and on five types of expenditure outcomes—total Medicare expenditure, expenditure for all-cause hospitalizations, expenditure for potentially avoidable hospitalizations, expenditure for all-cause ED visits, and expenditure for potentially avoidable ED visits. A reduction in avoidable hospitalizations improves the quality of life for the residents.

We report marginal effect estimates in meaningful units, such as counts or dollars, instead of raw regression coefficients. Effect estimates with a negative sign signify reductions, which are desired for the outcomes measured in this analysis. The term "statistically significant," where cited in the summary, refers to a *p* value of 0.10 or lower (better) for an estimated effect. A *p* value of 0.10 means a 10 percent probability of observing an estimate of at least that magnitude by chance. When many estimates are generated and tested, the probability of observing some estimates this large by chance is greater than 10 percent.

A summary of quantitative findings for the Initiative in each state is provided below. Within each state, we begin with some contextual information from the qualitative findings through Project Year 3 (2015), which helps with the interpretation of quantitative results. The primary qualitative findings from Project Year 4 (2016) are presented in ***Section E.6***. The dollar values of the effects are the actual model estimates. Percent estimates were computed using the 2015 mean values as the basis of the changes to give a sense of their relative size.

E.5.1 Summary of Findings: Alabama

The Alabama Quality Assurance Foundation's (AQAF) Nursing Facility Initiative (NFI) is an education-only model in which registered nurses (RNs) provide training and support to staff within 23 participating nursing facilities. Primary training components include INTERACT tools, morning huddles, medication management, consistent staffing, and quality assurance and performance improvement (QAPI). Though the basic components are continuing through 2015, AQAF-NFI focused largely on building relationships and trust with facility staff and leadership, which was said to be a critical first step in rolling out various components of the Initiative. In particular, AQAF-NFI has recognized the importance of buy-in from nursing facility administrators and has developed a series of executive leadership trainings aimed towards providing support and encouragement for administrators. Another focus has been the development of teams of staff within the facility that meet regularly to discuss important Initiative components. Under the umbrella of a QAPI steering committee helmed by facility leadership with formal authority (e.g., administrator, director of nursing [DON]), teams focus on hospitalizations/INTERACT, medication safety, and staff stability. There is some facility variation in how developed these teams are, but overall, progress has been made since 2014. AQAF-NFI nurses continue to train staff in the use of INTERACT tools, which have been introduced in most facilities, but with some facility-level variation in actual use. Both AQAF-NFI leadership and facility staff indicated that the model remains promising toward the goal of reducing avoidable hospitalizations, but acknowledged the slow initial roll-out of the Initiative, which may have delayed buy-in from key facility staff.

In Alabama, the multivariate regression estimates of the marginal effect of the ECCP intervention on the count of utilization outcomes in 2015 are summarized in ***Table ES-1***. The negative intervention effects for all the outcomes suggest that the ECCP intervention worked in the desired direction of reducing utilization. There are statistically significant reductions (at the

0.10 significance level) for all utilization measures, except all-cause hospitalizations. The ECCP intervention was associated with 0.027 fewer potentially avoidable hospitalizations on average per resident, which represents the difference between the ECCP and comparison groups after accounting for the Base Year difference in 2012. This is a reduction of 14.8 percent compared to the average 2015 count per resident (in ECCP and comparison groups) of 0.185 potentially avoidable hospitalizations. For the count of all-cause ED visits per resident, the ECCP intervention was associated with 0.108 fewer visits on average, or a 29.8 percent reduction from the average count per resident (in ECCP and comparison groups) in 2015 of 0.362. For the count of potentially avoidable ED visits, the ECCP intervention resulted in 0.034 fewer visits per resident, on average, or a 30.4 percent decrease from the average count per resident (in ECCP and comparison groups) in 2015 of 0.110. Compared to the 2014 results, reductions in potentially avoidable hospitalizations are now statistically significant in 2015.

The results for the estimated effect of ECCP intervention on Medicare expenditures are also reported in ***Table ES-1***. All estimates have negative signs, suggesting a reduction in all types of expenditures. However, the effect is statistically significant only for all-cause ED visit expenditures, where the ECCP intervention is associated with an estimated $40 reduction in spending per resident in 2015, on average, which represents the difference between the ECCP and comparison groups after accounting for the Base Year difference in 2012. This is a 25.0 percent reduction from the average (in ECCP and comparison groups) 2015 all-cause ED expenditure of $160. These findings are similar to the 2014 results.

Table ES-1
Summary of ECCP intervention effects on utilization and expenditure outcomes, Alabama

Outcome	Mean, 2015	Effect, 2015	Effect (% of mean)
Medicare utilization (count of events per resident)			
All-cause hospitalizations	0.454	-0.039	-8.7%
Potentially avoidable hospitalizations	0.185	-0.027*	-14.8%
All-cause ED visits	0.362	-0.108***	-29.8%
Potentially avoidable ED visits	0.110	-0.034**	-30.4%
Medicare expenditure (dollars per resident)			
Total	20,297	-548	-2.7%
All-cause hospitalizations	3,984	-60	-1.5%
Potentially avoidable hospitalizations	1,321	-98	-7.4%
All-cause ED visits	160	-40**	-25.0%
Potentially avoidable ED visits	50	-11	-22.0%

NOTE: The 2015 mean indicates the overall mean of each outcome among all ECCP and comparison residents in that year. Effect is the marginal effect of the ECCP intervention in 2015 relative to the difference between ECCP and comparison in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean used in last year's report.

ECCP = Enhanced Care and Coordination Providers; ED = emergency department.

Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, else not significant ($p \geq 0.10$).

SOURCE: RTI analysis of Medicare claims data (RTI program ms03; ms_03_count_util).

SOURCE: RTI analysis of Medicare claims data (RTI program ms04; ms04_glm_exp; ms04_tpm_exp).

Overall, these results suggest a reduction in utilization from 2012 to 2015 in Alabama attributable to the ECCP intervention, and some evidence, although largely not statistically significant, for a reduction in expenditure outcomes. Only the reduction for all-cause ED visits was significant for both count and expenditure.

The ECCP intervention demonstrates no definitive effect on MDS-based quality outcomes in Alabama, with the directions of the intervention effects indicating both improving and worsening quality; no measure is statistically significant at a 0.10 level of confidence (see detailed results in ***Section 2.11.1***). In 2014, the reduction in having one or more falls with injury was statistically significant, but this finding was in the opposite although nonsignificant direction in 2015. The direction of one other measure (urinary tract infection) also changed since 2014. With no systematic trends observed at this point, we consider the effect of the ECCP intervention on these MDS-based quality measures ambiguous in direction and too small to be measured at this stage.

E.5.2 Summary of Findings: Indiana

Indiana University (IU) Geriatrics Department's Optimizing Patient Transfers, Impacting Medical Quality, and Improving Symptoms: Transforming Institutional Care (OPTIMISTIC) operates in 19 facilities. The project places highly trained RNs in each facility to provide direct clinical support, education, and training to nursing facility staff. Eight OPTIMISTIC nurse practitioners (NPs) support the OPTIMISTIC RNs and provide evaluation and care needs. In 2015, the role of the OPTIMISTIC RNs was unchanged; however, the efforts of the OPTIMISTIC NPs were shifted to focus more on evaluation of residents transitioning back to the facility after an acute care stay and on issues related to polypharmacy, and less on the collaborative care reviews that targeted the more stable long-term residents. The strong presence of primary care physicians and physician extenders in the facilities, with most facilities reporting on-site visits three to five times per week, lessened the need for the OPTIMISTIC NP intervention in acute changes in resident condition. The degree of implementation of the model in facilities was impacted by facility staff turnover. This turnover continued to be a challenge requiring continual rebuilding of relationships and re-education of front-line staff, impacting consistent use of tools such as the Stop and Watch, SBAR (Situation, Background, Assessment, and Recommendation), and Care Pathways across facilities. The role of the OPTIMISTIC RN and NP in end-of-life discussions and completion of Physician Orders for Scope of Treatment (POST) forms were most frequently identified as the most valuable intervention in the model and was identified as having the most impact on reducing potentially avoidable hospitalizations. Improvements in OPTIMISTIC data collection methods, including timely identification and correction of data entry errors, resulted in less OPTIMISTIC staff resource consumption; however, the change process resulted in a halt in reports being sent to facilities.

Multivariate regression estimates of the effect of the Indiana ECCP intervention on the count of select utilization outcomes in 2015 are summarized in ***Table ES-2***. The estimated effect of the ECCP intervention is negative for all four outcomes, suggesting that the intervention worked in the desired direction, reducing the count of events per resident for all-cause and potentially avoidable hospitalizations, and for any all-cause and potentially avoidable ED visit. However, the estimated effect of the intervention was statistically significantly different (at the 0.10 significance level) from zero for only two of the four utilization outcomes: all-cause

hospitalizations and potentially avoidable hospitalizations. Specifically, the intervention was associated with 0.095 fewer all-cause hospitalizations per resident and 0.055 fewer potentially avoidable hospitalizations per resident on average, which represent the difference between the ECCP and comparison groups after accounting for the Base Year difference in 2012. These represent 24.8 percent and 39.5 percent reductions from the overall mean counts of all-cause and potentially avoidable hospitalizations per resident (in ECCP and comparison groups) in 2015, which were 0.384 and 0.140, respectively. ECCP effect estimates for all-cause and potentially avoidable ED visits were in the desired direction but not statistically significant. Overall, these findings are similar to the results in 2014.

The results for the estimated effect of ECCP intervention on total Medicare expenditures as well as Medicare expenditures for select services, are also reported in ***Table ES-2***. Effect estimates for all expenditures, including total Medicare expenditure, were negative, indicating a reduction in spending. This reduction was statistically significant for total expenditure as well as expenditure for three of the four selected services (all except expenditure for all-cause ED visits).

Table ES-2
Summary of ECCP intervention effects on utilization and expenditure outcomes, Indiana

Outcome	Mean, 2015	Effect, 2015	Effect (% of mean)
Medicare utilization (count of events per resident)			
All-cause hospitalizations	0.384	-0.095**	-24.8%
Potentially avoidable hospitalizations	0.140	-0.055***	-39.5%
All-cause ED visits	0.279	-0.028	-10.0%
Potentially avoidable ED visits	0.078	-0.026	-33.6%
Medicare expenditure (dollars per resident)			
Total	23,394	-2,875***	-12.3%
All-cause hospitalizations	4,074	-1,007***	-24.7%
Potentially avoidable hospitalizations	1,223	-408**	-33.3%
All-cause ED visits	158	-16	-10.0%
Potentially avoidable ED visits	47	-21***	-43.6%

NOTE: The 2015 mean indicates the overall mean of each outcome among all ECCP and comparison residents in that year. Effect is the marginal effect of the ECCP intervention in 2015 relative to the difference between ECCP and comparison in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean used in last year's report.

ECCP = Enhanced Care and Coordination Providers; ED = emergency department.

Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, else not significant ($p \geq 0.10$).

SOURCE: RTI analysis of Medicare claims data (RTI program ms03; ms_03_count_util).

SOURCE: RTI analysis of Medicare claims data (RTI program ms04; ms04_glm_exp; ms04_tpm_exp).

The effect of the ECCP intervention on total Medicare expenditure was an estimated decrease of $2,875 per resident, on average, which represents the difference between the ECCP and comparison groups after accounting for the Base Year difference in 2012. This is a 12.3 percent reduction as compared to the overall average expenditure per resident (in ECCP and comparison group) in 2015 of $23,394. Expenditures on all-cause hospitalizations were reduced

by an estimated $1,007 per resident in 2015, on average, which is a 24.7 percent reduction in the overall 2015 average expenditure of $4,074 per resident (in ECCP and comparison groups) for this service. The ECCP intervention effect on expenditure for potentially avoidable hospitalizations was an estimated reduction of 33.3 percent ($408 per resident), as compared to the overall average expenditure per resident (in ECCP and comparison groups) of $1,223 in 2015. The ECCP intervention was also statistically significantly associated with reduced expenditures on potentially avoidable ED visits, which were 43.6 percent lower ($21 per resident) than the overall average (in ECCP and comparison groups) of $47 per resident.

Overall, in 2015 the estimated effect of the Indiana ECCP intervention was in the desired direction for all utilization and expenditure outcomes measured, with consistently statistically significant effects on all-cause and potentially avoidable hospitalizations. Compared with the estimated effect of the Indiana ECCP intervention in 2014, in general, the effect of the ECCP on utilization and expenditure for all-cause and potentially avoidable hospitalization increased in magnitude, in the desired direction, and was more highly significant. Taken together, these results suggest that the Indiana ECCP intervention is associated with reduced utilization and expenditures on all-cause and potentially avoidable hospitalizations and that these effects have strengthened over time.

We observed no overall pattern for effect of the ECCP intervention on MDS-based quality outcomes in Indiana (see detailed results in ***Section 2.11.2***). The direction of estimated effect signs were both positive and negative, indicating both worsening and improvement of quality and none of effects were statistically significant. Only one measure, antipsychotic medication use, was approaching statistical significance; the estimated effect on this quality measure was in the desired direction. Specifically, the estimated effect on antipsychotic medication use was associated with a decrease of 2.3 percentage points ($p = 0.188$) in the average percent of observed quarters per resident of antipsychotic medication use.

E.5.3 Summary of Findings: Missouri

In 2015, all 16 of the Missouri Quality Initiative (MOQI) facilities remained in the Initiative. Project staff remained stable in Project Year 3. The ECCP maintained overall fidelity to the model and most components were implemented as originally planned. There were intensified efforts in providing individual coaching to the advanced practice registered nurses (APRNs), developing quality improvement strategies, obtaining advance directives (ADs), and implementing health information technology (HIT) components. Staff at nearly all of the facilities reported anecdotal evidence that the MOQI project is reducing some of their hospitalizations. They attributed this success to both the consistent presence of the APRN and to more consistent use of the INTERACT tools, especially SBAR (Situation, Background, Assessment, and Recommendation). APRNs identified goals for educating staff on clinical preventive measures (hydration, urinary continence, and mobility) to reduce risks for hospitalization and continued to focus on obtaining advance directives. In addition, APRNs continued to focus on root cause analysis and met, as needed, with the Project Coordinator or Project Supervisor to review each facility transfer. The APRNs created customized resident transfer reports which were entered into the project's Qualtrics database. This information was used to address clinical staff education needs and inform the work of facility quality improvement committees. The MOQI ECCP staff established a coalition composed of state

nursing organizations and consumers working with the Missouri legislature to enact legislation that would enable APRNs to establish collaborative practice agreements with their physician colleagues. Family and physician demands for hospital transfers had decreased but remained a barrier to reducing hospitalizations in some nursing facilities. Data available from the MOQI reports and interviews indicated that the Initiative components have gained a foothold in most facilities despite HIT challenges and facility staff turnover.

In Missouri, the multivariate regression estimates of the marginal effect of the ECCP intervention on the utilization count outcomes in 2015 are summarized in ***Table ES-3***. The intervention effects for all four of the outcomes are negative and statistically significant, suggesting that the ECCP intervention worked in the desired direction of reducing utilization of hospitalizations and ED visits. The ECCP intervention was associated with a decrease in the count of all-cause hospitalizations by 0.172 per resident, on average, which represents the difference between the ECCP and comparison groups after accounting for the Base Year difference in 2012. This is a 40 percent reduction in the average count per resident (in ECCP and comparison groups) in 2015, which was 0.429. For the count of potentially avoidable hospitalizations, the ECCP intervention was associated with 0.093 fewer visits per resident, on average, or a 57.7 percent decrease from the average count per resident (in ECCP and comparison groups) in 2015, which was 0.161. The ECCP intervention was also associated with a decrease in the count of all-cause ED visits by 0.161 per resident, on average, or a 54.1 percent reduction in the average count per resident (in ECCP and comparison groups) in 2015, which was 0.297. For the count of potentially avoidable ED visits, the ECCP intervention was associated with 0.056 fewer visits per resident, on average, or a 65.3 percent reduction in the average count per resident (in ECCP and comparison groups) in 2015, which was 0.086. Compared with the results in 2014, the ECCP effect estimates in Missouri on all the utilization outcomes are larger in magnitude and statistically more significant in 2015.

The results for the estimated effect of ECCP intervention on Medicare expenditures are also reported in ***Table ES-3***. All of the estimates have a negative sign, meaning a reduction in spending, and are statistically significant. The ECCP intervention was associated with decreased total spending by an estimated $2,066 per resident, on average, which represents the difference between the ECCP and comparison groups after accounting for the Base Year difference in 2012. This amounts to a reduction of 10.4 percent from the average expenditures (in ECCP and comparison groups) of $19,831 in 2015. Expenditures on all-cause hospitalizations were reduced by an estimated $1,369 per resident in 2015, on average, which is about a 33.6 percent reduction in the average expenditure (in ECCP and comparison groups) of $4,081 in 2015. The effect on potentially avoidable hospitalizations was smaller in magnitude at $577 per resident, on average, a reduction of about 45.2 percent of the average (in ECCP and comparison groups) expenditure of $1,277 in 2015. The ECCP intervention similarly was associated with reduced expenditures on all-cause and potentially avoidable ED visits. Expenditures on all-cause ED visits were about 50.2 percent or $86 lower, on average, in 2015 than the average (in ECCP and comparison groups) of $171; expenditures on potentially avoidable ED visits were about 59.7 percent or $29 lower, on average, in 2015 than the average (in ECCP and comparison groups) of $49.

Table ES-3
Summary of ECCP intervention effects on utilization and expenditure outcomes, Missouri

Outcome	Mean, 2015	Effect, 2015	Effect (% of mean)
Medicare utilization (count of events per resident)			
All-cause hospitalizations	0.429	-0.172***	-40.0%
Potentially avoidable hospitalizations	0.161	-0.093***	-57.7%
All-cause ED visits	0.297	-0.161***	-54.1%
Potentially avoidable ED visits	0.086	-0.056***	-65.3%
Medicare expenditure (dollars per resident)			
Total	19,831	-2,066**	-10.4%
All-cause hospitalizations	4,081	-1,369***	-33.6%
Potentially avoidable hospitalizations	1,277	-577***	-45.2%
All-cause ED visits	171	-86***	-50.2%
Potentially avoidable ED visits	49	-29***	-59.7%

NOTE: The 2015 mean indicates the overall mean of each outcome among all ECCP and comparison residents in that year. Effect is the marginal effect of the ECCP intervention in 2015 relative to the difference between ECCP and comparison in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ECCP = Enhanced Care and Coordination Providers; ED = emergency department.

Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, else not significant ($p \geq 0.10$).

SOURCE: RTI analysis of Medicare claims data (RTI program ms03; ms_03_count_util).

SOURCE: RTI analysis of Medicare claims data (RTI program ms04; ms04_glm_exp; ms04_tpm_exp).

Overall, these results suggest that reduced utilization and expenditures in Missouri in 2015 are associated with the ECCP intervention. Almost all of the effect estimates are stronger in 2015 than in 2014. The effect estimates are consistently significant across outcome types, for both count utilization and expenditures, for all measures of hospitalizations and ED visits, which are among the major drivers for Medicare spending among nursing facility residents.

We observed no overall pattern for effect of the ECCP intervention on MDS-based quality outcomes in Missouri (see detailed results in ***Section 2.11.3***). As with other states, the estimated effects in Missouri indicated both improving and worsening quality. The only significant estimated effect was a decrease in pressure ulcers stage II or higher. As only one quality outcome had a statistically significant effect at the 0.10 significance level, it cannot be definitively attributed to the ECCP intervention.

E.5.4 Summary of Findings: Nebraska

The Alegent ECCP placed six NPs in 14 nursing facilities in 2015, after one facility left the Initiative in September 2014. This ECCP employed five major components: integration of NPs into participating facilities, dental hygiene, medication management, improved communication, and education. In 2015, the ECCP continued to expand each of these interventions, although their primary focus was on placing NPs in participating facilities and empowering those NPs to act in the best interest of residents. The ECCP delivered in-service

trainings on proper use of urinalyses for urinary tract infections (UTIs) and oral hygiene, although the focus of the ECCP's educational model continued to be the informal mentorship provided to facility staff by the ECCP NPs. Participating facilities increasingly used the ECCP's 24-hour call service in 2015, which allowed NPs to manage emergent conditions that arose when they were not physically present in a participating facility. However, only some facilities chose to take advantage of this service, and primary care physicians continued to send their own residents to the emergency room when they were called to manage an emergent condition. The ECCP continued to gain more trust and support of these physicians. Compared with the first two years, physicians increasingly allowed the ECCP NP to write orders for their patients who were enrolled in the Initiative. Finally, implementation of the ECCP's dental hygiene and medication management programs remained consistent in 2015. The ECCP's two dental hygienists continued to assess all enrolled residents every six months, conduct cleanings on residents with teeth, and provide twice-yearly trainings on oral hygiene to facility nurses and CNAs. The consulting pharmacist continued to help the NPs with their regular medication reviews. The consulting pharmacist also had a large role in developing the ECCP's in-service training on UTIs.

The multivariate regression estimates of the effect of Nebraska's ECCP on the utilization count outcomes in 2015 are summarized in ***Table ES-4***. Our findings indicate that the ECCP intervention had no effect on the utilization count outcomes that was statistically significantly different from zero (at the 0.10 significance level) in 2015. Despite the lack of statistical significance, the effect estimates for both all-cause and potentially avoidable hospitalizations and all-cause ED visits are negative. This suggests that the ECCP intervention may have worked in the desired direction for those outcomes, reducing utilization. In contrast, the effect estimate was positive for potentially avoidable ED visits, indicating that being in the ECCP intervention may have caused increased utilization of such services.

The results for the estimated effect of ECCP intervention on Medicare expenditures are also reported in ***Table ES-4***. The effect estimates for total Medicare spending, and expenditures for all-cause hospitalizations and potentially avoidable hospitalizations, were in the desired direction. The effect estimates on two of these expenditure outcomes, all-cause hospitalizations and potentially avoidable hospitalizations, were statistically significant in 2014; they were not statistically significant in 2015. The effect estimates for both all-cause ED visits and potentially avoidable ED visits were in the undesirable direction; only the estimate for increased all-cause ED visits was statistically significant, though the increase in potentially avoidable ED visits was on the borderline of statistical significance.

Table ES-4
Summary of ECCP intervention effects on utilization and expenditure outcomes, Nebraska

Outcome	Mean, 2015	Effect, 2015	Effect (% of mean)
Medicare utilization (count of events per resident)			
All-cause hospitalizations	0.382	-0.013	-3.4%
Potentially avoidable hospitalizations	0.135	-0.008	-5.7%
All-cause ED visits	0.354	-0.009	-2.5%
Potentially avoidable ED visits	0.098	0.013	12.9%
Medicare expenditure (dollars per resident)			
Total	20,201	-2,010	-9.9%
All-cause hospitalizations	3,919	-550	-14.0%
Potentially avoidable hospitalizations	1,180	-115	-9.7%
All-cause ED visits	202	97*	48.1%
Potentially avoidable ED visits	64	48	75.2%

NOTE: The 2015 mean indicates the overall mean of each outcome among all ECCP and comparison residents in that year. Effect is the marginal effect of the ECCP intervention in 2015 relative to the difference between ECCP and comparison in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ECCP = Enhanced Care and Coordination Providers; ED = emergency department.

Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, else not significant ($p \geq 0.10$).

Overall, despite a lack of statistical significance in all utilization and expenditure outcomes except for the expenditure for all-cause ED visits, the negative effect estimates for both all-cause and potentially avoidable hospitalizations indicate that there may be a trend of reduced utilization and expenditure for those two types of services associated with the Nebraska ECCP intervention in 2015. In contrast, the effects of the intervention on both all-cause and potentially avoidable ED visits indicated that the ECCP intervention may have resulted in increased spending and utilization on those services. Particularly for all-cause ED visits, although the ECCP effect on the utilization outcomes were in the desired direction but not statistically significant, the effect on the expenditures was statistically significant in the undesirable direction. We will continue to monitor these patterns in the remaining year of the Initiative.

The results of the ECCP intervention on MDS-based quality outcomes in Nebraska suggest no overall meaningful effect on quality (see detailed results in ***Section 2.11.4***). The mixture of positive and negative estimated effects indicated both quality decline and improvement. The only statistically significant effect was an adverse increase in the depressive symptoms. Overall, the signs for the effect for five MDS-based outcomes (all but falls with injury, decline in ADLs and antipsychotic medication use) changed directions from 2014 to 2015. Given that there were no other significant effects and the random changes in the signs, the ECCP intervention did not demonstrate an overall impact on MDS-based quality outcomes in Nebraska.

E.5.5 Summary of Findings: Nevada

Nevada's Admissions and Transitions Optimization Program (ATOP) provides clinical support, training, and education to 24 participating facilities. ECCP facility-based staffing challenges persisted in 2015. Consequently, instead of one APRN or physician assistant and two RNs rotating among four to five nursing facilities in each of five pods (groups of facilities), as was their model, ECCP clinical staff rotated among five to nine facilities. Only one of the five pods has been consistently staffed since the beginning of the Initiative. The ECCP continued training and promoting the use of INTERACT tools and focused on the SBAR, Stop and Watch, and quality improvement tools. Adoption varied widely, depending upon support of facility leadership, facility-staff turnover, the facility's own corporate systems, and integration of ECCP clinical staff. In facilities in which they were fully integrated, ECCP staff were involved in quality improvement and QAPI meetings as well as residents' care conferences. To improve integration, ECCP staff offered trainings tailored to the needs of each facility; for example, some facilities requested assistance with documentation methods and medication administration in preparation for their upcoming surveys. Others received dementia training, skills trainings, such as IV insertion, and condition-specific trainings, such as recognition of dehydration, pneumonia, chronic obstructive pulmonary disease (COPD), sepsis, and UTIs. Other trainings, conducted by the ECCP, were open to both participating and non-participating facilities. The ECCP, which is a QIO, believes in improving quality of care in all facilities in the state and, therefore, invites all facilities to its group trainings. Topics of these include INTERACT tools, the Physician Orders for Life-Sustaining Treatment (POLST), and recognition of catheter acquired urinary tract infections (CAUTI).

The state of Nevada has fewer non-ECCP facilities than ECCP facilities, so no comparison facility matching was done. The comparison group is every non-ECCP long-term care nursing facility in the state. This does not preclude finding Initiative effects in Nevada, but the weakness of the comparison group should be recognized and the regression based estimates of the intervention effects should be interpreted with caution.

The multivariate regression estimates of the marginal effect of the ECCP intervention on the utilization count outcomes and Medicare expenditures in 2015 are summarized in ***Table ES-5***. The intervention effects on the all-cause and potentially avoidable hospitalizations were negative, while the intervention effects on all-cause and potentially avoidable ED visits were positive. However, only the effect on the count of all-cause hospitalizations was statistically significant. The intervention was associated with a decrease in the count of all-cause hospitalizations by 0.151 per resident, on average, which represents the difference between the ECCP and comparison groups after accounting for the Base Year difference in 2012. This is a 36.1 percent reduction in the average count per resident (in ECCP and comparison groups) in 2015 of 0.417.

The Initiative was associated with a statistically significant (at the 0.1 significance level) reduction in total spending, as well as statistically significant reductions in spending on all-cause and potentially avoidable hospitalizations. The intervention was associated with decreased total spending by an estimated $5,086 per resident, on average, which represents the difference between the ECCP and comparison groups after accounting for the Base Year difference in 2012. This amounts to a 21.7 percent reduction from the average (in ECCP and comparison groups)

total expenditures of $23,467 in 2015. Expenditures on all-cause hospitalizations were reduced by an estimated $2,248 per resident in 2015, or a reduction of 37.5 percent in relation to the average (in ECCP and comparison groups) expenditure of $6,002 in 2015. Expenditures on potentially avoidable hospitalizations were reduced by an estimated $533 per resident in 2015, or 42.5 percent of the average (in ECCP and comparison groups) expenditure of $1,256 in 2015. The intervention was associated with an increase in expenditures on all-cause and potentially avoidable ED visits, but this effect was only statistically significant for all-cause ED visits. The intervention was associated with a $93 increase in all-cause ED spending per resident in 2015, or 39.7 more than the average (in ECCP and comparison groups) expenditure in 2015 ($235). The hospitalization reductions here would also be related to increases occurring in the comparison facilities.

Table ES-5
Summary of ECCP intervention effects on utilization and expenditure outcomes, Nevada

Outcome	Mean, 2015	Effect, 2015	Effect (% of mean)
Medicare utilization (count of events per resident)			
All-cause hospitalizations	0.417	-0.151***	-36.1%
Potentially avoidable hospitalizations	0.119	-0.027	-23.0%
All-cause ED visits	0.298	0.010	3.5%
Potentially avoidable ED visits	0.090	0.003	2.9%
Medicare expenditure (dollars per resident)			
Total	23,467	-5,086**	-21.7%
All-cause hospitalizations	6,002	-2,248***	-37.5%
Potentially avoidable hospitalizations	1,256	-533**	-42.5%
All-cause ED visits	235	93*	39.7%
Potentially avoidable ED visits	66	45	69.0%

NOTE: The 2015 mean indicates the overall mean of each outcome among all ECCP and comparison residents in that year. Effect is the marginal effect of the ECCP intervention in 2015 relative to the difference between ECCP and comparison in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ECCP = Enhanced Care and Coordination Providers; ED = emergency department.

Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, else not significant ($p \geq 0.10$).

SOURCE: RTI analysis of Medicare claims data (RTI program ms03; ms_03_count_util).

SOURCE: RTI analysis of Medicare claims data (RTI program ms04; ms04_glm_exp; ms04_tpm_exp).

Overall, compared with the findings in 2014, in Nevada the 2015 data showed a stronger reduction in both all-cause hospitalizations and potentially avoidable hospitalizations among residents in the ECCP group relative to those in the comparison group. There were also larger reductions in expenditure associated with utilization of such services than observed in 2014. The utilization of and expenditures for all-cause and potentially avoidable ED visits in the Nevada ECCP group continued an upward trend as seen before. Again, these results should be interpreted with caution given the unavoidable use of a small and nonmatched comparison group in Nevada. (Other states had about twice as many matched comparisons as Initiative facilities.)

We observed no overall pattern for effect of the ECCP intervention on MDS-based quality outcomes in Nevada (see detailed results in ***Section 2.11.5***). As with other states, the estimated effects in Nevada indicated both improving and worsening quality. Only two of the MDS-based quality outcomes were statistically significant in Nevada in 2015: one or more falls with injury, for which the intervention was associated with a 4.3 percentage point increase, and antipsychotic medication use, for which the intervention was associated with a 3.9 percentage point increase. Thus, there are indications of an adverse trend in quality for ECCP facility residents relative to those in the comparison group.

E.5.6 Summary of Findings: New York

This ECCP is education focused. The RN Care Coordinators (RNCCs) in the New York Reducing Avoidable Hospitalizations (NY-RAH) Initiative do not provide clinical care to residents but focus as consultants on increasing each facility's capacity to (1) identify root causes for potentially avoidable hospitalizations and (2) review and modify its policies or procedures to prevent such hospitalizations. In 2015, the ECCP continued re-educating staff primarily on the INTERACT Tools, including the Stop and Watch and SBAR, serving as liaisons for questions about the Medical Order for Life Sustaining Treatment (MOLST) form, and assisting with changes to facility's palliative care policies. To encourage the sustainability of the Quality Improvement (QI) process, the ECCP set a goal for all facilities to adopt any QI tool by the end of Project Year 4; at the time of our site visit almost two-thirds of facilities had adopted one. RNCCs continue to review hospitalization data, provided in quarterly reports by the ECCP, and conduct chart reviews to identify hospitalizations patterns. Many facilities reported using this information to inform their performance improvement projects. The electronic transfer of patient discharge summary information from the hospital to the nursing facility (i.e., direct messaging) continues to also be a focus of the ECCP. All but two facilities now have the software installed however, the use of this information in nursing facilities is still in its infancy.

In New York, the multivariate regression estimates of the effect of the ECCP intervention on the count of utilization events per person in 2015 are summarized in ***Table ES-6***. The intervention effects for all four outcomes were estimated to be in the negative direction, suggesting that the ECCP intervention worked in the desired direction of reducing the count of utilization events. However, the effect sizes were relatively small, and only statistically significant (at the 0.10 significance level) for the count of potentially avoidable hospitalizations. The intervention was associated with a 0.025 lower count of potentially avoidable hospitalizations per resident, on average, which represents the difference between the ECCP and comparison groups after accounting for the Base Year difference in 2012. This is a 20 percent reduction from the average count per resident (in ECCP and comparison group) in 2015, which was 0.127.

The results for the estimated effect of ECCP intervention on Medicare expenditures in 2015 are reported in ***Table ES-6***. The results are mixed with total spending estimated to have increased while spending on each of the four categories listed, including hospitalizations and potentially avoidable hospitalizations, was estimated to have decreased. None of the effects were statistically significant (at the 0.10 significance level).

Table ES-6
Summary of ECCP intervention effects on utilization and expenditure outcomes, New York

Outcome	Mean, 2015	Effect, 2015	Effect (% of mean)
Medicare utilization (count of events per resident)			
All-cause hospitalizations	0.421	-0.039	-9.4%
Potentially avoidable hospitalizations	0.127	-0.025*	-20.0%
All-cause ED visits	0.203	-0.014	-6.6%
Potentially avoidable ED visits	0.055	-0.005	-8.8%
Medicare expenditure (dollars per resident)			
Total	28,362	452	1.6%
All-cause hospitalizations	8,260	-216	-2.6%
Potentially avoidable hospitalizations	1,850	-212	-11.5%
All-cause ED visits	121	-7	-5.5%
Potentially avoidable ED visits	38	-4	-10.0%

NOTE: The 2015 mean indicates the overall mean of each outcome among all ECCP and comparison residents in that year. Effect is the marginal effect of the ECCP intervention in 2015 relative to the difference between ECCP and comparison in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ECCP = Enhanced Care and Coordination Providers; ED = emergency department.

Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, else not significant ($p \geq 0.10$).

SOURCE: RTI analysis of Medicare claims data (RTI program ms03; ms_03_count_util).

SOURCE: RTI analysis of Medicare claims data (RTI program ms04; ms04_glm_exp; ms04_tpm_exp).

These results suggest an overall trend of reduced utilization from 2012 to 2015 attributable to the ECCP intervention in New York. However, the results are not consistently statistically significant. There was no consistent impact on expenditures.

The impact of the ECCP intervention on five out of the eight MDS-based quality outcomes was estimated to be negative, which is in the desired direction (see detailed results in ***Section 2.11.6***). The intervention was associated with a statistically significant 1 percentage point reduction in self-reported moderate to severe pain, and a 0.8 percentage point reduction in whether a catheter was inserted and left in bladder.

E.5.7 Summary of Findings: Pennsylvania

The University of Pittsburgh Medical Center (UPMC) Community Provider Services Program to Reduce Avoidable Hospitalizations using Evidence-based Interventions for Nursing Facilities (UPMC-RAVEN) is anchored around Certified Registered Nurse Practitioners (CRNPs) providing resident care in the facilities; these CRNPs are very popular, and their work is appreciated. During Project Year 3, all participating UPMC-RAVEN facilities reported being committed to the Initiative and perceived that the Initiative has had an impact on facility culture, including facilities that experienced turnover in facility leadership staff. UPMC-RAVEN CRNPs can assess, write orders, and provide clinical care under a collaborative practice agreement (CPA) in all facilities; CPAs also provide on-call support for telemedicine. One exception to the

general NP model is that in some facilities that experienced challenges placing an NP in their facility, the NP was replaced by an Enhanced Care RN (ECRN) who does not have the full scope of practice as CRNP. Facility location, especially if remote and rural, posed some recruitment and retention as well as long-distance travel challenges to UPMC-RAVEN staff, altering the role of some lead NPs into visiting and supporting facilities where facility-based NPs could not be hired. Facilities reported using Stop and Watch and SBAR, with several facilities modifying the tools to better suit their needs or to correct perceived tool defects. However, the uptake of INTERACT tools varied widely across facilities and largely depended on the administration's commitment and willingness to enforce their use, as well as pre-existing practices in the facilities. Telemedicine has been fully implemented but it has experienced multiple challenges related to connectivity, limiting facilities' use of the telemedicine carts. In Project Year 3, telemedicine is still reported as an underutilized component of the Initiative but the number of telemedicine consults has increased, especially the use of telephone-only consults.

In Pennsylvania, the multivariate regression estimates of the effect of the ECCP intervention on the count of utilization events per resident in 2015 are summarized in ***Table ES-7***. All of the estimated intervention effects have negative signs, but none were statistically significant (at the 0.1 significance level). Although statistically significant effects were not found for the utilization outcomes, beneficial and mostly statistically significant effects of the ECCP intervention were found on expenditure outcomes. All effect estimates were negative, suggesting a reduction in spending associated with the ECCP intervention, and were statistically significant for all outcomes except potentially avoidable hospitalizations. The ECCP intervention decreased total Medicare expenditure by $2,372 per resident in 2015, on average, which represents the difference between the ECCP and comparison groups after accounting for the Base Year difference in 2012. This is a reduction of 11.7 percent from the average (in ECCP and comparison groups) total expenditure of $20,190 in 2015. The intervention effect on all-cause hospitalizations was an estimated reduction by $857, or a reduction of about 22.8 percent, relative to the 2015 average (in ECCP and comparison groups) expenditure per resident of $3,767. For all-cause ED visits, the effect estimate was a $35 reduction on average, or a 21.8 percent decrease relative to the 2015 average (in ECCP and comparison groups) of $159. For potentially avoidable ED visits, the effect was an estimated $18 reduction, which amounted to a 39.9 percent decrease relative to the 2015 average (in ECCP and comparison groups) of $44.

Table ES-7
Summary of ECCP intervention effects on utilization and expenditure outcomes, Pennsylvania

Outcome	Mean, 2015	Effect, 2015	Effect (% of mean)
Medicare utilization (count of events per resident)			
All-cause hospitalizations	0.356	-0.034	-9.5%
Potentially avoidable hospitalizations	0.122	-0.026	-21.7%
All-cause ED visits	0.281	-0.009	-3.3%
Potentially avoidable ED visits	0.078	-0.014	-17.5%
Medicare expenditure (dollars per resident)			
Total	20,190	-2,372**	-11.7%
All-cause hospitalizations	3,767	-857***	-22.8%
Potentially avoidable hospitalizations	1,051	-210	-20.0%
All-cause ED visits	159	-35**	-21.8%
Potentially avoidable ED visits	44	-18***	-39.9%

NOTE: The 2015 mean indicates the overall mean of each outcome among all ECCP and comparison residents in that year. Effect is the marginal effect of the ECCP intervention in 2015 relative to the difference between ECCP and comparison in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ECCP = Enhanced Care and Coordination Providers; ED = emergency department.

Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, else not significant ($p \geq 0.10$).

SOURCE: RTI analysis of Medicare claims data (RTI program ms03; ms_03_count_util).

SOURCE: RTI analysis of Medicare claims data (RTI program ms04; ms04_glm_exp; ms04_tpm_exp).

In 2014, there was strong evidence for the beneficial effect of the ECCP intervention across most utilization and expenditure outcomes in Pennsylvania, but those statistically significant results did not persist in 2015 for utilization outcomes. It is possible that this is less because of a change in the performance of the ECCP facilities in 2015 and more because of a change in the performance of the comparison facilities, as explained in more detail in ***Section 2.11.7***. Our results suggest an overall trend of reduced utilization from 2012 to 2015 as a result of ECCP intervention in Pennsylvania but none of the reduction estimates are statistically significant. The ECCP intervention does continue to show an effect on reducing expenditures in Pennsylvania, although the estimated amount of reduction in most expenditure measures is smaller in 2015 than in 2014.

Results of the effect of the ECCP intervention on MDS-based quality outcomes in Pennsylvania indicates an overall lack of definitive effect (see detailed results in ***Section 2.11.7***). The signs of the estimated effect indicated both quality improvement and decline, with only one statistically significant effect signaling a reduction in falls with injury. Overall, with the mixed signs of effect estimates and only one of them being significant and in the desired direction in 2015, we consider the overall effect of the intervention on these MDS-based quality measures sporadic and inconsistent, similar to results in 2014.

E.5.8 ECCP-Wide Estimated Reductions or Increases in Medicare Spending

Below, we present the effects of the Initiative on the entire ECCP eligible population in each state on Medicare spending in total, for all-cause hospitalizations, and for potentially avoidable hospitalizations. We also compute estimates of the net savings or costs of the Initiative when the payments associated with the grants to the ECCPs are accounted for. Additional analyses on aggregate estimates of spending and utilization counts are included in ***Appendix E***.

In order to aggregate reductions or increases in spending, we multiply the individual-level average marginal effect of ECCP intervention and its 90% confidence interval (CI) values by the number of ECCP participants in each state. This produces the ECCP population estimate of the intervention-associated total reduction or increase in spending, aggregated over all resident participants in each ECCP in 2015.

For total Medicare spending, we also incorporate the total grant for Initiative implementation for each ECCP, which is combined with the estimated total intervention effect (reduction or increase) on spending to produce the estimated total Initiative *net* savings or costs, as reported in ***Table ES-8***. This estimate and 90% CI values are presented in the last three columns of the table. In the table, reductions or savings are expressed as negative numbers (indicated by parentheses), and increases or costs are shown as positive numbers.

We must note that differences in the total effects across the ECCPs are a reflection of both the strength of average marginal effect for each ECCP and the number of people in each ECCP group. A small effect at the individual level over a large group of people can result in a large total that is not statistically significant. This must be considered in drawing conclusions from the aggregate estimates reported here.

As shown in ***Table ES-8***, six out of seven states (all except New York) show an average ECCP effect on spending in the desired direction, a reduction, while four states have a statistically significant effect at the participant level: Indiana, Missouri, Nevada, and Pennsylvania. After accounting for the grant amount, the Initiative is still estimated to have produced net savings in five out of the seven states (all except Alabama and New York). Nevada is the only state with a 90% confidence interval that includes only estimates of net cost reduction. (The limitations of the Nevada comparison group should be kept in mind.) The overall Initiative net, as a sum of all the states' Initiative net estimates, is a savings of $11,224,248, with a confidence interval ranging from loss to savings. Including only the four states with statistically significant ECCP effects on the individual level, the estimated Initiative net savings are $19,956,235, with a confidence interval indicating a range of net savings.

Table ES-8
Total Medicare expenditure: ECCP-wide total estimates of intervention-associated reduction/increase, 2015
(Reductions in spending are indicated by negative quantities in parentheses)

ECCP	Number of ECCP Participants, 2015	Average ECCP Effect on Spending: (Reduction)/Increase per Participant, 2015			Total ECCP Effect on Spending: (Reduction)/Increase, 2015			Total Grant for Initiative, 2015 $	Total Initiative Net (Savings)/Costs, 2015[a]		
		Estimate $	90% CI		Estimate $	90% CI			Estimate $	90% CI	
AL	3,266	(548)	(2,281)	1,185	(1,788,703)	(7,448,437)	3,871,031	3,701,206	1,912,503	(3,747,231)	7,572,237
IN***	2,790	(2,875)	(4,490)	(1,261)	(8,022,199)	(12,525,975)	(3,518,423)	3,580,893	(4,441,306)	(8,945,082)	62,470
MO**	2,296	(2,066)	(3,668)	(464)	(4,743,593)	(8,421,543)	(1,065,644)	3,955,699	(787,894)	(4,465,844)	2,890,055
NE	1,224	(2,010)	(4,063)	44	(2,459,940)	(4,973,556)	53,676	1,166,994	(1,292,946)	(3,806,562)	1,220,670
NV**	3,273	(5,086)	(8,611)	(1,562)	(16,647,502)	(28,184,121)	(5,110,884)	3,360,440	(13,287,062)	(24,823,681)	(1,750,444)
NY	6,790	452	(2,196)	3,099	3,065,902	(14,911,511)	21,043,315	5,046,528	8,112,430	(9,864,983)	26,089,843
PA**	2,540	(2,372)	(4,036)	(708)	(6,024,258)	(10,250,433)	(1,798,083)	4,584,285	(1,439,973)	(5,666,148)	2,786,202
TOTAL/ AVERAGE (All) [b]	**22,179**	**(1,651)**	**(2,705)**	**(597)**	**(36,620,293)**	**(59,993,433)**	**(13,247,153)**	**25,396,045**	**(11,224,248)**	**(34,597,388)**	**12,148,892**
TOTAL/ AVERAGE (statistically significant only: IN, MO, NV, PA) [b]	**10,899**	**(3,251)**	**(4,499)**	**(2,004)**	**(35,437,552)**	**(49,030,397)**	**(21,844,707)**	**15,481,317**	**(19,956,235)**	**(33,549,080)**	**(6,363,390)**

NOTES:

[a] Total Initiative Net (Savings)/Costs are the net balance between [Total ECCP Effect on Spending: (Reduction)/Increase] and [Total Grant for Initiative].

[b] The estimated effects shown in this row are weighted averages based on the number of ECCP participants. The standard error for the average effect is calculated based on the assumption that the covariance for the different state effects is 0.

Statistical significance (for average ECCP effect on spending per participant): * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, else not significant ($p \geq 0.10$).

SOURCES: RTI program ms04; coeff_table_ms04_tpm_exp_jw.xlsx

Table ES-9 delineates the ECCP-wide total estimates of the intervention on reductions or increases in Medicare expenditure for all-cause hospitalizations. All states show estimates of the ECCP effect on spending for all-cause hospitalizations in the desired direction. Four states show an intervention-associated statistically significant reduction in all-cause hospitalization expenditures: Indiana, Missouri, Nevada, and Pennsylvania. The total for all states is a reduction of $17,829,054 with an estimated total reduction for statistically significant states only of $15,490,543.

Table ES-9
Medicare expenditure for all-cause hospitalizations: ECCP-wide total estimates of intervention-associated reduction/increase, 2015
(Reductions in spending are indicated by negative quantities in parentheses)

ECCP	Number of ECCP Participants, 2015	Average ECCP Effect on Spending: (Reduction)/Increase per Participant, 2015			Total ECCP Effect on Spending: (Reduction)/Increase, 2015		
		Estimate $	90% CI		Estimate $	90% CI	
AL	3,266	(60)	(535)	416	(194,810)	(1,747,442)	1,357,821
IN***	2,790	(1,007)	(1,624)	(391)	(2,810,571)	(4,531,543)	(1,089,600)
MO***	2,296	(1,369)	(1,795)	(944)	(3,144,215)	(4,120,311)	(2,168,120)
NE	1,224	(550)	(1,139)	38	(673,719)	(1,394,029)	46,590
NV***	3,273	(2,248)	(3,298)	(1,199)	(7,358,803)	(10,793,105)	(3,924,500)
NY	6,790	(216)	(1,221)	788	(1,469,981)	(8,293,114)	5,353,152
PA***	2,540	(857)	(1,388)	(326)	(2,176,954)	(3,525,103)	(828,805)
TOTAL/AVERAGE (All) [a]	**22,179**	**(804)**	**(1,173)**	**(435)**	**(17,829,054)**	**(26,015,085)**	**(9,643,023)**
TOTAL/AVERAGE (statistically significant only: IN, MO, NV, PA) [a]	**10,899**	**(1,421)**	**(1,805)**	**(1,037)**	**(15,490,543)**	**(19,677,003)**	**(11,304,083)**

NOTES:

[a] The estimated effects shown in this row are weighted averages based on the number of ECCP participants. The standard error for the average effect is calculated based on the assumption that the covariance for the different state effects is 0.Statistical significance (for average ECCP effect on spending per participant): * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, or else not significant ($p \geq 0.10$).

SOURCES: RTI program ms04; coeff_table_ms04_tpm_exp_jw.xlsx

In ***Table ES-10***, we report the ECCP-wide aggregate estimates of intervention-associated reductions or increases in Medicare expenditure for potentially avoidable hospitalizations. For all states, the ECCP effect on spending is estimated in the desired direction, a reduction, and that in three states this effect is statistically significant: Indiana, Missouri, and Nevada. These three states also had statistically significant intervention-associated reductions for all-cause hospitalizations. Aggregated across all ECCPs, the total of estimated intervention-associated reductions in Medicare expenditure for potentially avoidable hospitalizations is $6,639,969. The total for statistically significant ECCPs only is a reduction of $4,206,360.

Table ES-10
Medicare expenditure for potentially avoidable hospitalizations: ECCP-wide total estimates of intervention-associated reduction/increase, 2015
(Reductions in spending are indicated by negative quantities in parentheses)

ECCP	Number of ECCP Residents, 2015	Average ECCP Effect on Spending: (Reduction)/Increase per Participant, 2015			TOTAL ECCP Effect on Spending: (Reduction)/Increase, 2015		
		Estimate $	90% CI		Estimate $	90% CI	
AL	3,266	(98)	(309)	113	(319,079)	(1,008,719)	370,561
IN**	2,790	(408)	(674)	(141)	(1,137,175)	(1,880,767)	(393,584)
MO***	2,296	(577)	(787)	(366)	(1,324,082)	(1,807,646)	(840,519)
NE	1,224	(115)	(466)	237	(140,307)	(570,353)	289,739
NV**	3,273	(533)	(891)	(175)	(1,745,102)	(2,916,575)	(573,630)
NY	6,790	(212)	(555)	131	(1,441,166)	(3,769,508)	887,176
PA	2,540	(210)	(512)	92	(533,057)	(1,299,358)	233,244
TOTAL/AVERAGE (All)[a]	**22,179**	**(299)**	**(433)**	**(165)**	**(6,639,969)**	**(9,611,172)**	**(3,668,766)**
TOTAL/AVERAGE (statistically significant only: IN, MO, NV)[a]	**8,359**	**(503)**	**(679)**	**(327)**	**(4,206,360)**	**(5,675,751)**	**(2,736,969)**

NOTES:

[a] The estimated effects shown in this row are weighted averages based on the number of ECCP participants. The standard error for the average effect is calculated based on the assumption that the covariance for the different state effects is 0.

Statistical significance (for average ECCP effect on spending per participant): * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, else not significant ($p \geq 0.10$).

SOURCES: RTI program ms04; coeff_table_ms04_tpm_exp_jw.xlsx.

E.6 Overall Summary and Preliminary Findings from Primary Data Collection

To understand the specific components of each ECCP model and how those models function within participating facilities, primary data collection included four specific components: (1) in-person site visits conducted annually with ECCP leadership and a rotating selection of four purposely selected participating facilities within each state; (2) annual telephone interviews with one or more facility staff members in all facilities not visited in person; (3) a web-based survey of all participating facility administrators; and (4) a web-based survey of comparison group facilities.

For 2016 site visits and telephone interviews, the interview protocols remained similar to prior years, although the focus shifted slightly to cover topics from the perspective of continued progress and any changes implemented. All Project Year 4 site visits were completed by late July 2016. Each site visit lasted 5 business days and included a visit and interviews with key ECCP leadership and other staff, as well as a visit to four participating facilities to interview facility

staff and, when available, the facility's ECCP Nurse. Key interview top topics included project progress and any changes that have been made since Project Year 3, as well as developments or expansions, challenges encountered to date, facility-specific concerns, and long-range sustainability and lessons learned from the prior years of the project. The 2016 telephone interviews were conducted following a shortened interview guide that touched on the main domains covered in the site visit interviews. The type of facility staff interviewed by telephone included, but was not limited to, DON, charge nurse, nursing facility administrator (NFA), and the ECCP RN or NP. All site visit and telephone interview data were coded using NVivo qualitative analysis software to identify common themes within and across ECCPs.

For the survey results included in this report, we selected key questions from waves 1-3 of the Nursing Facility Administrator Survey and the Comparison Facility Survey. For the Nursing Facility Administrator survey, we included trends over time, notable findings from wave 3, and comparisons between the total sample and each state-specific ECCP. Then we evaluated the extent to which nursing facilities in the comparison group were implementing practices to reduce avoidable hospitalizations of the long-stay population similar to those in the Initiative. We compared these responses to ECCP's, measuring the extent of PAH reduction activities unrelated to the Initiative that were occurring simultaneously in ECCP facilities. We examined these practices across all respondents in the ECCP and comparison groups, as well as within each ECCP's state. Among respondents who had introduced any such practice, we compared the use of specific policies or procedures to reduce PAHs.

Sections E.6.1.-E.6.7 summarize early data findings and preliminary conclusions drawn from Project Year 4 site visits and early phone interviews, longitudinal analysis of the Project Years 1 through 3 web-based survey findings of participating facilities, and Project Year 3 web-based survey findings of comparison facilities. We integrate these findings together for each ECCP.

E.6.1 Alabama Quality Assurance Foundation Nursing Facility Initiative (AQAF-NFI)

Site Visit and Telephone Interviews

Continuing through 2016 (Project Year 4), the AQAF-NFI team is implementing the majority of features described in the original operations manual. All facilities report use of at least some INTERACT tools, such as SBAR, Stop and Watch, Care Pathways, Transfer Forms, or the quality improvement tool. However, the 23 facilities vary in frequency of use and preference for these tools, with some facilities reporting highest use of SBAR, others preferring Stop and Watch, and still others indicating that the Transfer Forms are used most frequently. Participating facilities have implemented a morning huddle format to discuss patient needs and change of condition. Many facilities also have implemented special quality improvement/Quality Assurance and Performance Improvement (QAPI) teams to address key concerns such as staff stability, medication management, and reducing hospitalizations. The AQAF-NFI nurse on site in each facility continues to assist with these special teams, while also encouraging use of INTERACT tools and related staff training, as needed. Because this model focuses on AQAF-NFI–to-staff knowledge transfer, rather than direct care of residents, the AQAF-NFI leadership continues to describe this Initiative as being very cost-effective and sustainable.

Over time, the AQAF-NFI leadership team has determined that a top-down approach could be more effective to deploying large-scale efforts that require facility culture change. Continuing the 2015 focus on buy-in from facility leadership, they have introduced monthly executive leadership training opportunities for administrators to learn new methods for addressing key concerns (e.g., staff stability), while also working together with other administrators who may face similar challenges. A number of facility interviewees shared positive feedback about the trainings, citing them as an improvement from prior years, and reporting a high level of attendance. AQAF-NFI team members indicated a belief that once the infrastructure is in place for culture change and has had time to become routine and stable, reductions in hospitalizations will follow. Overall, most facility interviewees indicated that the Initiative has made at least some impact on hospitalization rates, with nearly all respondents saying that the number of patients who are sent to the hospital seems to have decreased or leveled off since this Initiative started 4 years ago.

Web-Based Survey Results

Compared to other ECCPs, AQAF-NFI facilities reported slower implementation of the Initiative components. AQAF-NFI facilities were slow to support the Initiative in the beginning, although this support grew in subsequent years. Although staff turnover was a major initial barrier to implementation of the Initiative in AQAF-NFI facilities, it appears that the staff retention improved with time, ceasing to be an implementation barrier by the third year of the Initiative. The attitudes toward AQAF-NFI nurses were somewhat inconsistent in the first two years, but improved by year 3 of the Initiative. The findings also indicate that the majority of responding comparison facilities in Alabama (78 percent) had introduced practices similar to the Initiative, with SBAR being the most frequently reported practice. However, Alabama was the state that reported the lowest proportion of the facilities reporting such efforts. Results from the ECCP facilities demonstrate a similar pattern, with 53 percent of AQAF-NFI facilities introducing non-Initiative related practices relation to PAH reductions, markedly less than among all ECCPs (80 percent) combined, but still indicating a high level of concurrent practices.

E.6.2 Indiana University (IU) Geriatrics Department, Optimizing Patient Transfers, Impacting Medical Quality, and Improving Symptoms: Transforming Institutional Care (OPTIMISTIC)

Site Visit and Telephone Interviews

In 2016 (Project Year 4), the OPTIMISTIC team continued efforts to improve medical and palliative care, with on-site OPTIMISTIC clinical staff performing various activities, including reviews performed at the time of acute change in resident condition; the collaborative care review (CCR) process to reduce polypharmacy; advance care planning discussions with residents and families; training of facility staff on various clinical skills; and use of INTERACT tools and completion of the POST form. Facility-based ECCP staff includes seven NPs with a total of six full-time employees (FTEs) (one FTE currently vacant) and 18 RNs (17.5 FTEs) providing coverage to 19 facilities (16 full-time RNs each have their own facility [16 FTEs], one full-time RN splits time between two facilities [1 FTE], one small facility has a half-time RN [.5 FTE]). In addition to facility-based RNs, there is a full-time program administrator who manages

the facility-based RNs, and another full-time RN who works part time managing facility-based RNs (.25 FTE) and part time as palliative care coach (.75FTE).

In Project Year 4, there were several changes in the OPTIMISTIC leadership staff. The medical director position has been split between a new medical director and an assistant medical director. The assistant medical director position was filled by the transitions core lead and a new transitions core lead was hired. There was also turnover in the research coordinator position. Finally, an additional position was added in information systems. OPTMISTIC also piloted several programs, including efforts to provide a more intense NP visit schedule to residents with frequent rehospitalizations and to improve ECCP RNs' skills in analysis and interpretation of quality improvement (QI) data, but these measures were not adapted throughout all facilities. OPTIMISTIC continues to focus on Advance Care Planning (ACP) activities, creating an RN palliative care position with specific monthly goals for ACP discussions and completion of POST forms. POST-form completion rose from around 20 percent of OPTIMISTIC residents in April 2015 to 80 percent at the time of our most recent site visit (August 2016). In general, facility engagement and use of the model is high and facilities report, anecdotally, that potentially avoidable hospitalizations have been reduced through use of the model.

Web-Based Survey Results

Almost two thirds of OPTIMISTIC facilities reported fully implementing the Initiative by Project Year 3, with most facility respondents indicating that financial resources were not a barrier to implementing the Initiative. OPTIMISTIC respondents generally rated the helpfulness of their ECCP nurse higher than respondents overall and reported increasing levels of personal support for the Initiative. Both comparison facilities and ECCP facilities in Indiana reported exceptionally high rates of implementing PAH efforts unrelated to the Initiative, with 100 percent of respondents indicating that non-Initiative PAH-related policies or procedures had been introduced in their facilities. Comparison facilities reported implementing hospitalization rate tracking and Stop and Watch mostly frequently, while ECCP facilities reported hospitalization rate tracking and root cause analysis mostly frequently.

E.6.3 The University of Missouri, Sinclair School of Nursing Missouri Quality Initiative for Nursing Homes (MOQI)

Site Visit and Telephone Interviews

In 2016, ECCP and facility staff reported many successes in the MOQI Project; in their view, it is moving in the right direction. The APRNs are well established in all facilities and, according to the interviews, hospitalization rates have continued to decrease or remain stable in most facilities. Staff reported that family and physician demands for hospitalizations have decreased, quality improvement projects have continued with new emphasis on reducing facility acquired infections, and there has been major progress in increasing the number of residents with ADs. The ECCP reported that HIT initiatives are gaining momentum and use in more facilities; however, nursing facility staff remained ambivalent about CareMail and CareView. Instead, staff in most facilities reported using Mediprocity, a Health Insurance Portability and Accountability Act (HIPAA)-compliant texting application, and Epic, an electronic health record (EHR) used by local hospitals, for secure health information exchange. The ECCP provided training on

Mediprocity and provided guidance on Epic in their monthly updates. ECCP nurses reported that licensed practical nurses (LPNs) and RNs have increased their knowledge and skills, and improved communication with other providers, resulting in increased confidence in their clinical practice overall.

When reflecting back on the 4 years of implementation, ECCP and facility staff reported several challenges. Recognizing the difficulty of implementing the Initiative and having the proper dose of the interventions was an overall challenge in Phase I. Facility staff turnover, particularly among certified nursing assistants (CNAs), is viewed as one of the greatest challenges in sustaining the accomplishments of Phase 1 and a concern going into Phase 2 of the Initiative. In addition, more RN hours to care for increasingly acutely ill residents will be needed in Phase 2, and recruitment will be difficult. The challenges of recruiting and retaining staff will be compounded by the necessity of educating nursing staff in the care of the targeted clinical conditions to reduce hospitalizations. This will require additional staffing as well as additional operating and capital resources to safely care for nursing home residents. The MOQI project participants are enthusiastic about Phase 2, particularly the retention of the ECCP nurse. There is a strong sentiment that 4 more years will enhance sustainability and that nursing facility leadership support is an essential component of continued progress and success.

Web-Based Survey Results

More than half of MOQI respondents reported that they had fully implemented the Initiative by wave 3. The overall staff support for the Initiative was generally high but had dipped somewhat in wave 2. MOQI respondents reported a high level of enthusiasm for the helpfulness of their ECCP nurse and also indicated high levels of personal support by wave 3. Staff turnover seems to have been a particularly strong barrier to implementation in later years of the Initiative. The MOQI ECCP respondents reported implementing non-Initiative PAH-related policies or procedures less frequently than either all ECCPs or their in-state comparison facilities. However, all comparison facilities in Missouri reported implementing PAH-related efforts, with SBAR and hospitalization rate tracking being the most common.

E.6.4 Nebraska Alegent + Creighton Health Program (Alegent + Creighton)

Site Visit and Telephone Interviews

In 2016, the Alegent ECCP sustained the program that it had built in participating facilities during the first 3 years of implementation. Most components still are being administered with fidelity to the original plan, although Alegent's education program for facility staff continues to evolve. Components of the Alegent ECCP include direct care, medication management, dental assessments and cleanings, improved communication, and education. Apart from the dental assessment and cleanings, all components are administered by NPs, who spend an average of 1 to 2 days per week in each participating facility. The ECCP continues to focus primarily on the medication management and clinical care components of the Initiative, with the NPs taking an active role in the management of enrolled residents' care.

Alegent continues to evolve the formal education that it provides to facilities. After discontinuing its original plan to develop and provide regular in-service trainings in 2015,

Alegent provided participating facilities with access to the NICHE (Nurses Improving Care for Healthsystem Elders) online learning system. However, only a few facilities decided to have their staff take this training. Of the facilities whose staff did complete NICHE training, no facilities reported having a plan for systematically integrating the content of the course into their facility operations. Several aspects of Alegent's education did remain constant through 2016, and these typically were praised by facilities. The NPs continue to provide ad hoc training and mentorship to nurses in all participating facilities. Floor staff often approach the NPs with clinical questions, and facility leadership sometimes request that the NPs repeat previous in-service trainings in INTERACT tools and urinary tract infections. The ECCP dental hygienists continue to provide twice yearly in-service trainings on oral hygiene to CNAs. Although all facilities appreciate these trainings, only some report that they impact the behavior of CNAs in the facility. All other aspects of ECCP operations remain consistent with what was observed in 2015. ECCP NPs regularly conduct medication reviews, attend care planning meetings, attend quality improvement meetings, and respond to residents' emergent conditions. The NPs are deeply integrated into most participating facilities, who view the ECCP NPS as important components of their residents' care team.

Web-Based Survey Results

Alegent facilities had a faster implementation timeline in waves 1 and 2, which slowed by wave 3. A lack of sufficient staffing was a particular barrier to implementation. Compared to all facilities, Alegent facilities responding to the survey indicated higher levels of satisfaction with the training provided by ECCP and with the helpfulness of ECCP nurses, as well as consistently high levels of personal support of the Initiative across years. Uniquely, 100 percent of Alegent ECCP facilities had incorporated efforts unrelated to the Initiative to reduce PAHs, which was a higher percentage than the comparison respondents in Nebraska (91 percent). The most frequently reported procedures included hospitalization rate tracking, SBAR, and Stop and Watch.

E.6.5 HealthInsight Nevada Admissions and Transitions Optimization Program (ATOP)

Site Visit and Telephone Interviews

HealthInsight, a QIO, continues to promote the ATOP initiative, including the use of INTERACT tools and educational support to 24 facilities in Nevada. The model of one APRN and two RNs per pod of five facilities has been adjusted because of continued ECCP facility-based staff turnover; seven nurses left the ECCP in 2015 and five were replaced. Another pod (five facilities) has not had an APRN for the past 2 years. A part-time RN who had been hired for a small remote facility has left and that position was eliminated; other staff are visiting this facility every 6 weeks for 2 days. Other staffing changes included adjustments of ECCP nurse schedules; rather than all three nurses in a pod visiting one facility at the same time, each nurse is now generally assigned to visit two facilities per week, depending upon the number of ATOP enrollment per facility.

During some of the 2016 site visits, the facility leadership was very positive about ATOP training and activities that promoted early recognition of changes in condition, improved

communication about changes, and ECCP nurse support in care planning discussions with residents. In those facilities the Stop and Watch and SBAR were considered part of their facility culture; facility leadership believed these activities would continue without the ECCP's involvement. One of these facilities promoted the POLST (Physician Orders for Life Sustaining Treatment); however, facility leadership noted that the time ECCP nurses spent with residents discussing their options would not be afforded in their facilities, should the Initiative end. In other facilities, the ATOP interventions had not been integrated. ECCP nurses were constrained in their ability to train or promote INTERACT tools or promote usage of these tools by facility staff. A high rate of turnover of facility leadership appeared to be a factor in the lack of engagement in some facilities, along with lack of support by corporate leadership.

Web-Based Survey Results

Despite ATOP's initially strong implementation progress in year 1, this progress stagnated by wave 3, with no new facilities fully implementing the Initiative: only one third of all participated facilities in both year 2 and year 3 reported having fully implanted all components of the Initiative. ATOP respondents also reported staff turnover as a barrier to implementation. Notably, ATOP respondents were particularly disappointed in the training provided by the ECCP in wave 3, also rating the ECCP nurses as less helpful with each subsequent wave. However, personally, compared to all respondents, ATOP respondents indicated similar levels of support for the Initiative overall. As indicated by respondents, a lower percentage of ATOP facilities had introduced non-Initiative interventions to reduce hospitalizations compared to Nevada comparison facilities, but their overall rates were still quite high (just over 70 and 100 percent, respectively).

E.6.6 New York Reducing Avoidable Hospitalizations (NY-RAH) Project of Greater New York Hospital Association (GNYHA) Foundation

Site Visit and Telephone Interviews

The GNYHA Foundation continues to manage and support the NY-RAH project in 2016. The main feature of the NY-RAH model is the placement of RNCCs in 29 participating facilities to provide education and mentoring to facility staff. In the last year of the project, ECCP leadership remained stable and very little RNCC turnover occurred. Project Year 4 represents the highest level of integration of the RNCCs in the facilities since the Initiative has started. RNCCs are well known in facilities and continue to re-educate facility staff on intervention tools as needed either in group sessions or during one-on-one check-ins on the floor. The NY-RAH model is fully implemented and Project Year 4 has seen the continued use of tools that focus on identifying changes in condition, including the Stop and Watch and SBAR. Both the ECCP and facility leadership and staff consider the use of the Stop and Watch and SBAR tools as highly sustainable. End-of-life planning, including completion of the Medical Order for Life-Sustaining Treatment (MOLST) forms, increasing the number of residents with advance directives and changes to facility palliative care policies all continue to be an ongoing focus in Project Year 4. Advance directive (AD) completion rates have increased across most facilities and the MOLST form is used more. Direct Messaging also continues to be a primary focus of the ECCP in Project Year 4, although facilities report it is still in its infancy. Facility adoption of a QI Tool has been a major goal of NY-RAH in the last year of the project.

New York State continues to have several competing initiatives that focus on reducing hospitalizations. The Delivery System Reform Incentive Payment (DSRIP) program is currently in its second year and has the primary goal of reducing avoidable hospital use by 25 percent over 5 years. The state has designated a series of 25 Performing Provider Systems (PPSs) across the state, which are responsible for leading a variety of DSRIP projects in their region. Two of the DSRIP projects that a PPS can lead overlap with the interventions implemented under NY-RAH, including implementation of the INTERACT project and integration of palliative care in nursing facilities. Three PPSs that include 12 facilities participating in NY-RAH are implementing the INTERACT project for nursing facilities, including all NY-RAH facilities in Suffolk County and some in Nassau and Queens counties. Although no NY-RAH facility is participating in a PPS that focuses on the DSRIP project to integrate palliative care in nursing facilities specifically, there may be some overlap with the NY-RAH palliative and end-of-life care activities in these facilities because of the additional focus on the INTERACT advanced care planning and palliative care tools. The DSRIP overlap with NY-RAH facilities and potential comparison facilities is most notable in Suffolk where all nursing facilities in the county are participating in DSRIP (n=46), which includes eight NY-RAH facilities. The DSRIP program was mentioned both by ECCP and facility leadership as a vehicle for sustaining the NY-RAH interventions, particularly in terms of the continued use of the INTERACT Stop and Watch and SBAR tools. We did not hear anything specific related to the palliative care or advanced care planning tools. The Fully Integrated Duals Advantage (FIDA) program has not had as much effect on NY-RAH or its goals because of low enrollment in FIDA-participating health plans. The increasing enrollment in Medicare Advantage health plans, however, has become more of an issue for determining eligible residents for the NY-RAH initiative. We heard of significant drops in NY-RAH eligible beneficiaries because of increased enrollment in Medicare Advantage in a few, smaller facilities but little to no effect on NY-RAH eligibility in very large facilities.

Web-Based Survey Results

Overall, NY-RAH respondents indicated slower implementation progress compared to all ECCP respondents, as well as less staff support and less positive attitudes about the helpfulness of the ECCP nurse in NY-RAH facilities. However, personal levels of support for the Initiative from administrators who responded to the survey increased slightly with each subsequent survey year. Both NY-RAH ECCP facilities and New York comparison facilities reported a high percentage of PAH-related non-Initiative practices.

E.6.7 University of Pittsburgh Medical Center (UPMC) Community Provider Services Program to Reduce Avoidable Hospitalizations using Evidence-based Interventions for Nursing Facilities (UPMC-RAVEN)

Site Visit and Telephone Interviews

During the fourth year of data collection, the UPMC-RAVEN model continues to develop and support all components originally planned for implementation, demonstrating strong fidelity to the original model design. As in prior years, the facility staff's recognition and acceptance of the UPMC-RAVEN Initiative continues, including reports of increased physician buy-in and support. The most valuable component of UPMC-RAVEN is consistently cited to be the clinical care provided by the UPMC-RAVEN nurses. The Initiative uses both NPs and RNs

in facilities. Of the facilities visited, two were staffed by RNs and two by NPs. Overall, the UPMC-RAVEN nurses are heavily involved in QI/QAPI process, end-of-life care planning, medication management, and informal staff training. Specifically, UPMC-RAVEN nurses continue to complete root cause analyses for all hospitalizations. UPMC-RAVEN nurses maintain their role in end-of-life care by reviewing and advising residents and families on advance directives and reviewing POLST or other facility specific care planning forms. Building on the work from the prior year, UPMC-RAVEN also introduced Interdisciplinary Pharmacy Review Teams (IDT teams) into two additional facilities bringing the total number of facilities with IDT teams to five. INTERACT tools are used in all facilities but use remains inconsistent across staff types.

Telemedicine equipment is operational in all facilities. However, connectivity issues prevent consistent use of the technology. As in prior years, a majority of facility staff report that telemedicine would be a valuable tool but the use of telemedicine consultations is still low—averaging approximately four telemedicine consults a month across all facilities between June 2015 and June 2016. However, the use of after-hours phone consults by telemedicine NPs has increased substantially. To increase use of telemedicine, the telemedicine team travels to facilities to retrain staff on telemedicine use. Over the past year, the UPMC-RAVEN telemedicine team has attempted to boost connectivity in facilities by purchasing and installing routers on telemedicine carts. A major barrier to improving connectivity in some for-profit facilities is the corporate network security policies. Facility staff report that corporate leadership would not allow telemedicine carts to be connected to facility high-speed internet because of worries about network security and HIPAA regulations.

Web-Based Survey Results

Overall, relative to all ECCPs, UPMC-RAVEN reported a faster implementation timeline for the Initiative, a higher level of training support from ECCP, and more positive attitudes about the helpfulness of ECCP nurses. By Project Year 3, 100 percent of UPMC-RAVEN respondents supported the Initiative. The percentage of respondent facilities reporting sufficient financial resources to implement the Initiative lagged in wave 1 but caught up by Project Year 3. Pennsylvania comparison facilities and UPMC-RAVEN facilities also reported a particularly high level of PAH-related non-Initiative practices, with identical patterns of frequently reported practices (notably, 100 percent for hospitalization rate tracking).

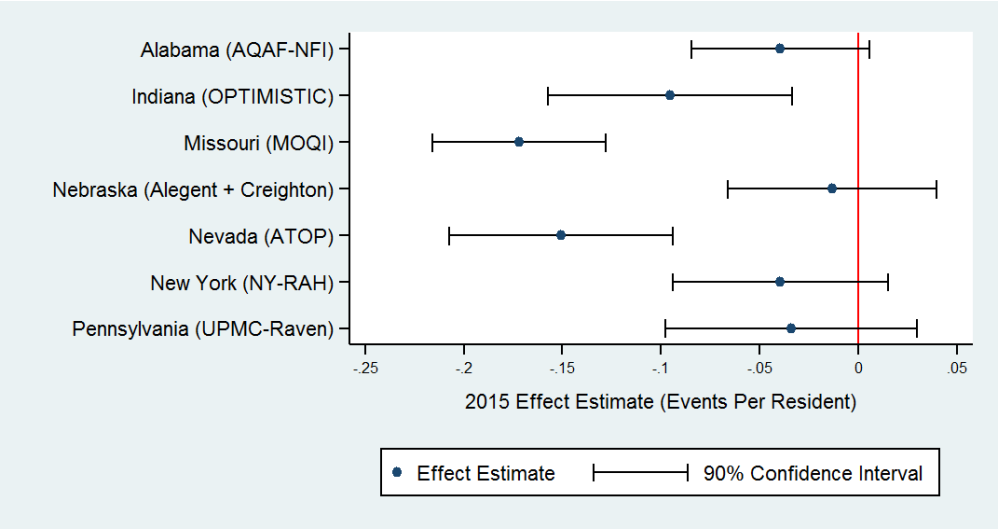
In summary, the support for the Initiative is strong in Pennsylvania. The surveys complement the site visit and phone interview findings and confirm that implementation of the Initiative has evolved over time and extended well into the third project year. The findings also indicate that though general support for the Initiative is high, not all facilities found ECCP nurses helpful and ECCP support matching their needs and expectations. It also became apparent that a lot of PAH-related activities unconnected to the Initiative are happening not only in comparison group facilities, but are still present in ECCP facilities, although to a lesser extent than in some states.

E.7 Discussion

The results presented above from multivariate regression analysis of the 2015 data indicate evidence of continuous ECCP intervention effects on reducing hospitalizations, ED visits, and related Medicare expenditures in most of the seven Initiative states. Overall, these results continue an earlier trend from our analyses of 2013 and 2014 data showing a positive Initiative impact on key utilization and expenditure outcomes. However, on most outcomes the effect estimates vary greatly across the states. Even when nominally similar interventions were present there were differences in the way they were implemented, in the degree they were accepted by facilities, and the intensity of the implementation of the components. Below, we discuss the pattern of effect estimates in 2015 across all ECCPs on each of four utilization outcomes, including the count of all-cause hospitalizations, count of potentially avoidable hospitalizations, count of all-cause ED visits, and count of potentially avoidable ED visits, per resident. This is followed by a discussion of effect estimates on Medicare expenditure for each of the four types of service utilization as well as on total Medicare expenditure.

Figure ES-1 summarizes the estimated effect of ECCP intervention on the count of all-cause hospitalizations, per resident, in 2015. For each state, the dot represents the estimated intervention effect (i.e., marginal effect), expressed as the reduction (negative value) or increase (positive value) in the average count of all-cause hospitalizations per resident. The horizontal bars represent each effect estimate's associated 90% confidence interval. The red vertical line at 0 represents a null effect, indicating no decrease or increase in the count of all-cause hospitalizations that is attributable to the ECCP intervention. The farther apart the estimate (dot) and confidence interval (bar) are from the red zero line, the stronger the evidence for an intervention-attributable decrease or increase in the count of utilization events. A confidence interval (bar) that crosses the red vertical line at 0 indicates that the effect estimate (dot) is statistically not different from zero (at the $p < 0.10$ significant level).

Figure ES-1
Effect of ECCP intervention on the count of all-cause hospitalizations, 2015



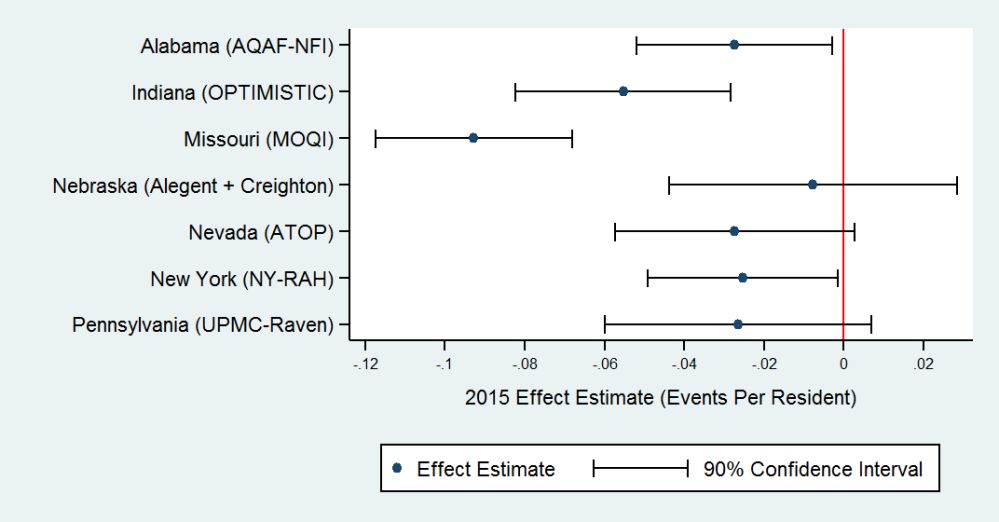
NOTE: ECCP = Enhanced Care and Coordination Provider.

SOURCE: RTI analysis of Medicare claims data (RTI program ms03; ms_03_count_util).

Figure ES-1 shows a strong and statistically significant effect of the ECCP intervention on the count of all-cause hospitalizations per resident in three states, Indiana, Missouri, and Nevada, where the 90% confidence intervals are contained entirely below zero, providing strong evidence of an intervention-associated reduction. In the remaining four states, Alabama, Nebraska, New York, and Pennsylvania, the point estimates of the intervention effect (dot) are all below zero, suggesting that the Initiative is associated with a desired direction of effect of a reduction in utilization, although none of the estimates are statistically significant.

Figure ES-2 shows a strong and statistically significant effect of the ECCP intervention on reducing the count of potentially avoidable hospitalizations in four states, including Alabama, Indiana, Missouri, and New York. In all the remaining three states, Nebraska, Nevada, and Pennsylvania, the point estimates of the ECCP effect are below zero, suggesting an intervention-associated reduction, although none of the estimates are statistically significant.

Figure ES-2
Effect of ECCP intervention on the count of potentially avoidable hospitalizations, 2015

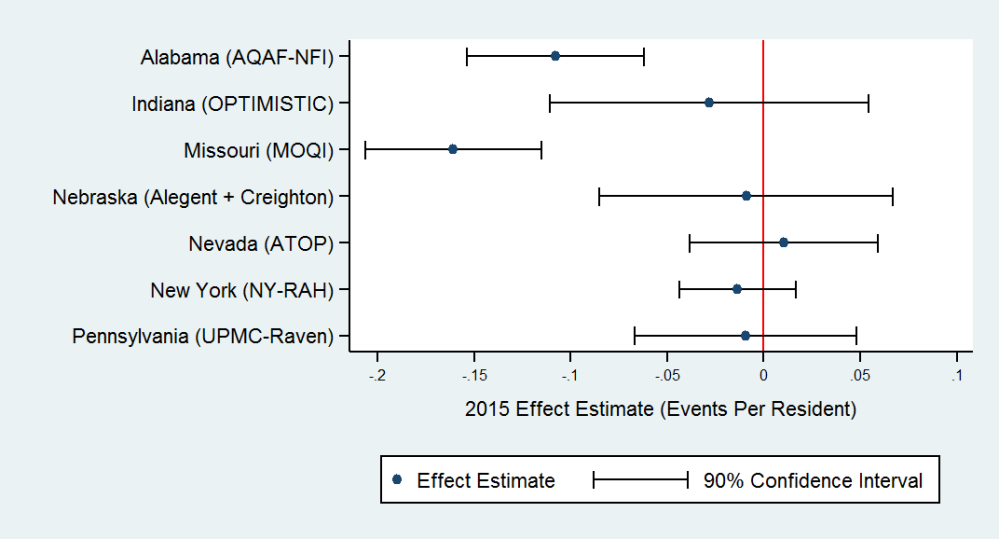


NOTE: ECCP = Enhanced Care and Coordination Provider.

SOURCE: RTI analysis of Medicare claims data (RTI program ms03; ms_03_count_util).

Figure ES-3 reveals evidence of a statistically significant effect of the ECCP intervention on reducing the count of all-cause ED visits in only two states, including Alabama and Missouri. In all but one of the remaining five states, the point estimates of the ECCP effect are below zero, suggesting an intervention-associated reduction, though not statistically significant. In Nevada, the point estimate is greater than zero, suggesting an intervention-associated increase in utilization, although statistically it is not significantly different from zero.

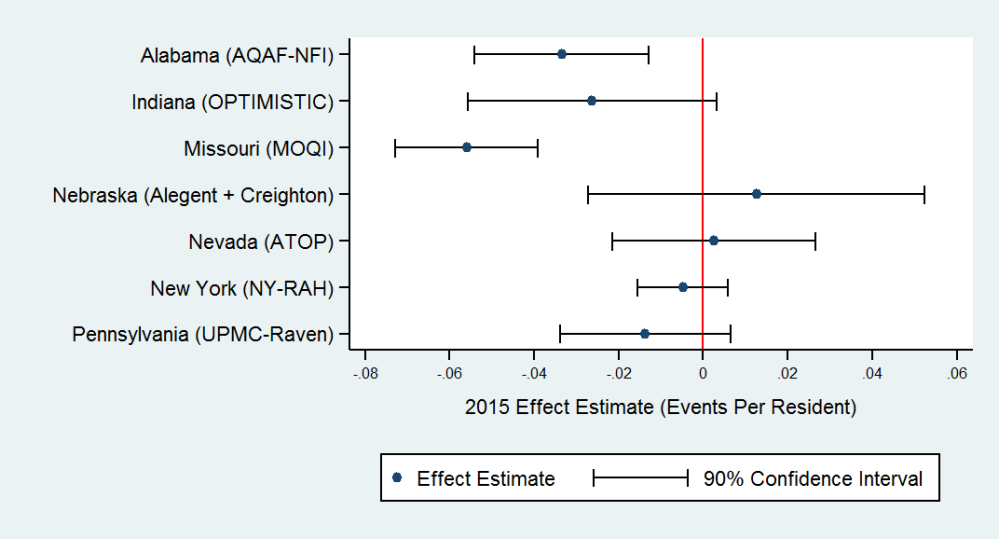
Figure ES-3
Effect of ECCP intervention on the count of all-cause ED visits, 2015



NOTE: ECCP = Enhanced Care and Coordination Provider; ED = Emergency Department.
SOURCE: RTI analysis of Medicare claims data (RTI program ms03; ms_03_count_util).

Similarly, ***Figure ES-4*** shows a strong and statistically significant ECCP intervention effect on lowering the count of potentially avoidable ED visits in only two states: Alabama and Missouri. In three of the remaining five states, Indiana, New York, and Pennsylvania, the point estimates of the ECCP effect are below zero (desirable), and in two of them, Nebraska and Nevada, the point estimates are greater than zero (undesirable), although none of these estimates are statistically significant.

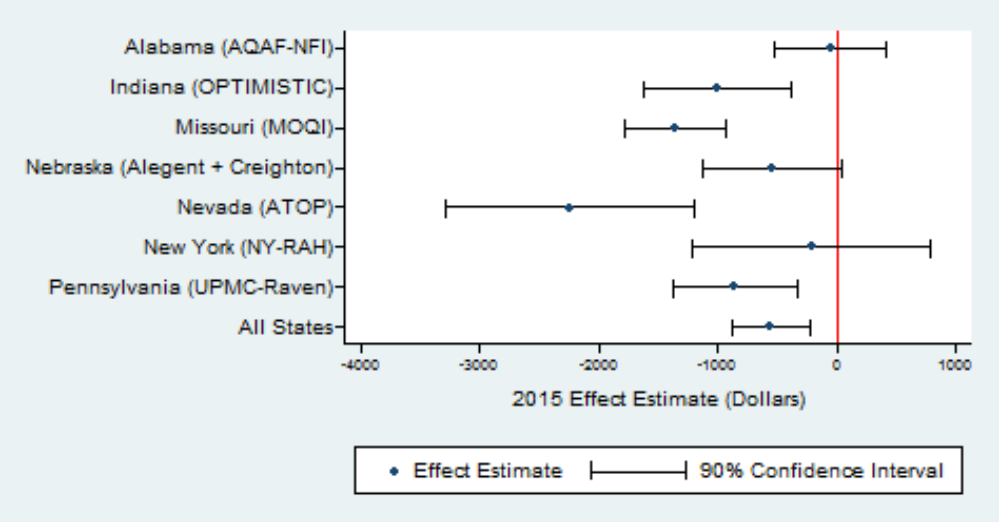
Figure ES-4
Effect of ECCP intervention on the count of potentially avoidable ED visits, 2015



NOTE: ECCP = Enhanced Care and Coordination Provider; ED = Emergency Department.
SOURCE: RTI analysis of Medicare claims data (RTI program ms03; ms_03_count_util).

Turning to expenditure outcomes, ***Figure ES-5*** shows a strong and statistically significant ECCP intervention effect on reducing Medicare expenditure for all-cause hospitalizations in four states: Indiana, Missouri, Nevada, and Pennsylvania. In all the remaining three states, the point estimates are below zero (desirable) but statistically not significant. With all states aggregated together, there was a statistically significant reduction in all-cause hospitalization expenditures.

Figure ES-5
Effect of ECCP intervention on Medicare expenditure for all-cause hospitalizations, per resident, 2015

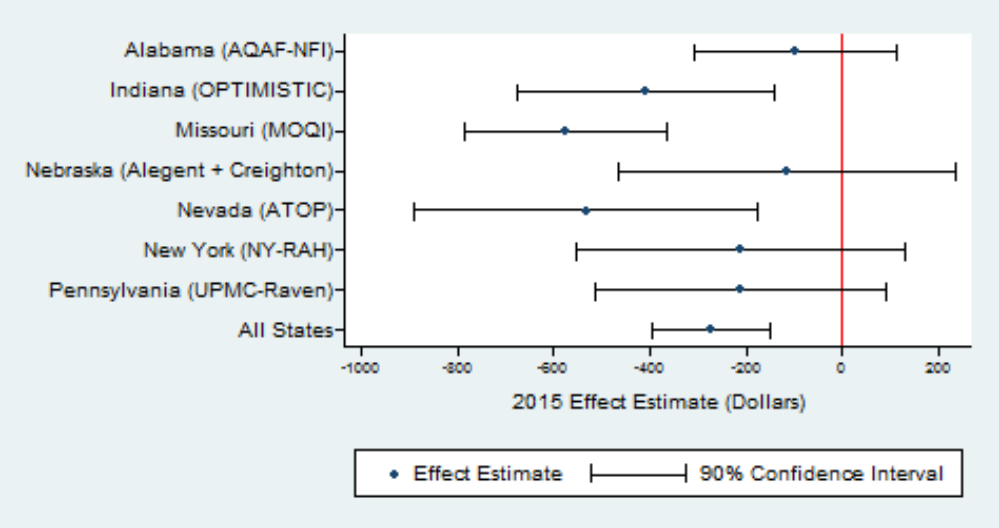


NOTE: ECCP = Enhanced Care and Coordination Provider. All states represents the effect of the ECCP interventions estimated over all states' ECCP and comparison groups combined.

SOURCE: RTI analysis of Medicare claims data (RTI program ms04; ms04_glm_exp; ms04_tpm_exp).

Figure ES-6 shows a strong and statistically significant effect of ECCP intervention on the reduction in Medicare expenditure for potentially avoidable hospitalizations in three states: Indiana, Missouri, and Nevada. In all the remaining four states, the point estimates are below zero (desirable) but statistically insignificant. With all states aggregated together, there was a statistically significant reduction in potentially avoidable hospitalization expenditures.

Figure ES-6
Effect of ECCP intervention on Medicare expenditure for potentially avoidable hospitalizations, per resident, 2015

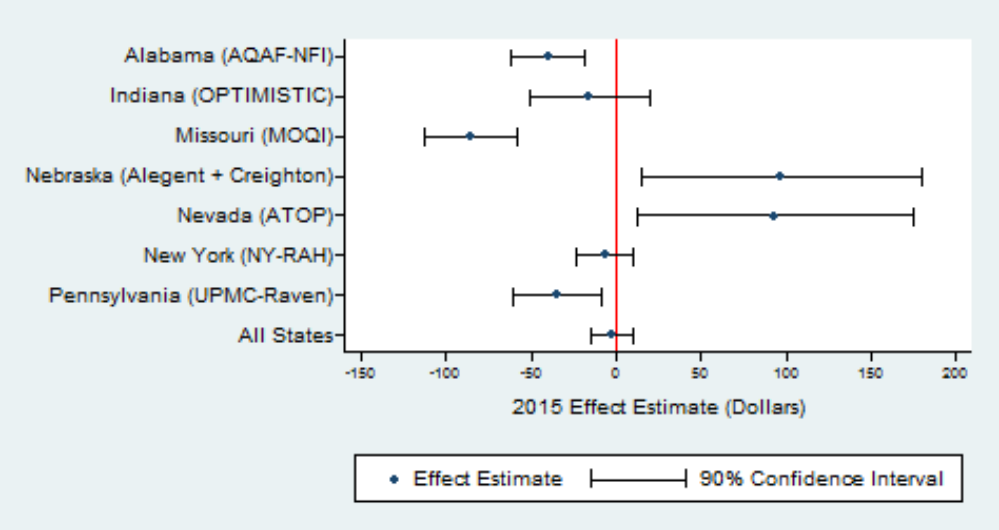


NOTE: ECCP = Enhanced Care and Coordination Provider. All states represents the effect of the ECCP interventions estimated over all states' ECCP and comparison groups combined.

SOURCE: RTI analysis of Medicare claims data (RTI program ms04; ms04_glm_exp; ms04_tpm_exp).

Figure ES-7 indicates a strong and statistically significant effect of ECCP intervention on the reduction of Medicare expenditure for all-cause ED visits in three states: Alabama, Missouri, and Pennsylvania. In two of the remaining four states, Indiana and New York, the point estimates are below zero (desirable) but statistically not significant. However, in Nebraska and Nevada, the effect estimates are greater than zero and statistically significant, suggesting relative increases in expenditure.

Figure ES-7
Effect of ECCP intervention on Medicare expenditure for all-cause ED visits, per resident, 2015

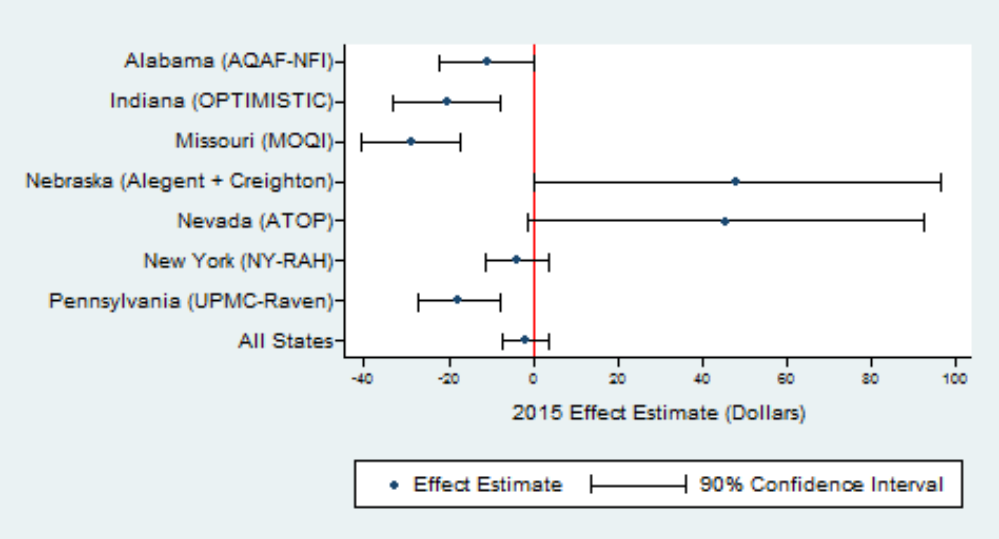


NOTE: ECCP = Enhanced Care and Coordination Provider; ED = Emergency Department. All states represents the effect of the ECCP interventions estimated over all states' ECCP and comparison groups combined.

SOURCE: RTI analysis of Medicare claims data (RTI program ms04; ms04_glm_exp; ms04_tpm_exp).

Regarding the effect estimates on Medicare expenditure for potentially avoidable ED visits, ***Figure ES-8*** shows strong and statistically significant reductions in expenditure in three states: Indiana, Missouri, and Pennsylvania. In two of the remaining states, Alabama and New York, the effect estimates are below zero but statistically not significant. In Nebraska and Nevada, again, the effect estimates are greater than zero but not statistically significant.

Figure ES-8
Effect of ECCP intervention on Medicare expenditure for potentially avoidable ED visits, per resident, 2015

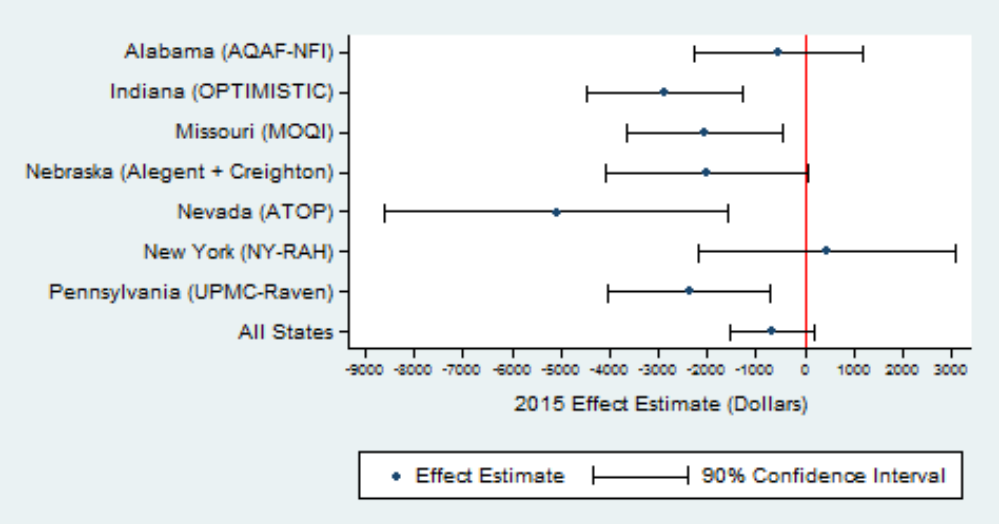


NOTE: ECCP = Enhanced Care and Coordination Provider; ED = Emergency Department. All states represents the effect of the ECCP interventions estimated over all states' ECCP and comparison groups combined.

SOURCE: RTI analysis of Medicare claims data (RTI program ms04; ms04_glm_exp; ms04_tpm_exp).

We also display the effect estimates on total Medicare expenditures in ***Figure ES-9***, which shows strong and statistically significant reductions in four states, including Indiana, Missouri, Nevada, and Pennsylvania. In two of the remaining three states, Alabama and Nebraska, the effect estimates are below zero, but in New York, the estimate is greater than zero; however, none of these estimates are statistically significant.

Figure ES-9
Effect of ECCP intervention on total Medicare expenditure, per resident, 2015



NOTE: ECCP = Enhanced Care and Coordination Provider. All states represents the effect of the ECCP interventions estimated over all states' ECCP and comparison groups combined.

SOURCE: RTI analysis of Medicare claims data (RTI program ms04; ms04_glm_exp; ms04_tpm_exp).

In summary, the 2015 data continue to indicate desired Initiative effects on many of the utilization and expenditure measures and some more consistent patterns of effects for a few of the ECCPs. In Missouri, Indiana, and Alabama, there are strong patterns indicating intervention effects reducing utilization and expenditures. Most utilization and expenditures outcomes in these states show statistically significant results. Alabama saw a more consistent and stronger pattern of ECCP intervention effects in 2015 than in 2014. Other ECCPs, in New York, and Pennsylvania, show mostly consistent indications of reductions, but relatively few measures are statistically strong. The ECCP effects in Nebraska and Nevada are mixed in sign. Inconsistencies in directions of effects weaken the evidence. Nevada showed stronger intervention effects on reductions in several expenditure outcomes and in all-cause hospitalization in 2015 as compared to 2014, but all results for Nevada should be interpreted with caution because of the small comparison group and the uneven implementation noted above.

It is important to note that statistical significance refers to the probability that an effect could be observed by chance. As statistical estimates are made in large numbers, we observe more chance occurrences of large effects. A pattern of substantive estimated effects is stronger evidence for a causal relationship than sporadic findings.

In 2015, the MDS-based quality measures do not show a clear pattern of change related to the Initiative, similar to findings in 2014. If the concentration is more on avoiding

hospitalizations and ED use related to resident changes in condition, the effects of the interventions on the broad range of MDS-based quality measures may be limited. There were a few statistically significant effects of the ECCP intervention on MDS-based quality outcomes which, however, showed mixed signs indicating relative improvement or worsening in quality.

The quantitative analysis results based on the 2015 data indicate evidence of continuous ECCP intervention effects on reducing hospitalizations, ED visits, and related Medicare expenditures in most of the seven Initiative states. The reductions in avoidable hospitalizations are indications of improvement in quality because of the distress created for residents related to a hospitalization. Overall, these results continue an earlier trend from the first two Initiative years, 2013 and 2014, showing a positive Initiative impact on key utilization and expenditure outcomes. However, on most outcomes the effect estimates vary greatly across the states. Our primary data collection indicates that there are components of the interventions, their implementation, and other factors, varying across ECCPs and facilities, which account for variation in the Initiative effects as well.

Continuing from 2014, the 2015 site visits and telephone interviews also demonstrated varied progress across the ECCPs. While most ECCPs have implemented all or nearly all of their model components, some ECCPs are still in the midst of implementation. Despite varied degrees of implementation, the response to the ECCP RNs and NPs generally has been very positive across all ECCPs. Facilities report a strong appreciation for extra staff on-site, particularly nurses who provide clinical support. Participating facilities also report appreciation for the education provided by the ECCPs. Although the existing quantitative data indicate various degrees of success in reducing hospitalizations thus far, the majority of interviewees viewed the Initiative as positive and potentially beneficial for residents.

Of particular note, relationships remain critically important for success within all ECCPs and across all levels. The "fit" of the ECCP nurses with the facility staff is pivotal in affecting culture change and developing new best practices within facilities (e.g., consistent use of INTERACT tools). Likewise, the relationships between staff and facility leadership, as well as corporate ownership, were said by interviewees to affect the overall potential success of the ECCP Initiatives and greatly influence the consistency of INTERACT tool use. Early engagement across all levels of staff, leadership, and ownership was said by interviewees to be critical in successful deployment of any intervention to nursing facilities. In terms of challenges, qualitative findings pointed to difficulty with implementing new technology, lack of consistent buy-in among specific physicians, pressure from families, and lack of facility leadership support as the main barriers to implementation of the Initiative. Staff turnover in the ECCPs and facilities, as well as staff retention difficulties, further complicated the implementation.

Thinking forward to the final year of the Initiative in its current form, many facilities reported a greater focus on sustainability. Some INTERACT tools, medication review with the focus on reducing antipsychotic medications, quality improvement/QAPI efforts to reduce avoidable admissions, and advance care planning were the Initiative components most likely to remain in place after the end of the project. Beyond these specific components of the Initiative, several interviewees across ECCPs indicated that the project has opened their eyes to more opportunities to improve care for residents, while also potentially reducing hospitalizations and resultant costs. Even if the data are inconclusive or inconsistent in demonstrating reductions in

hospitalization rates across all ECCPs, this anecdotal evidence suggests a potential mindset shift in facilities that may result in better care and fewer hospitalizations over time.

In August 2015, CMS announced a solicitation for ECCP participation in a second phase of the Initiative to start in October 2016. In this phase, payments to facilities would be made for patients with particular conditions who are treated on-site in the nursing facilities rather than admitted to hospitals. The expectation is that the extra payment to the facilities and to their partnering practitioners will serve as an added incentive to invest in facility infrastructure and care capacity that further reduces unnecessary hospitalizations and ED visits. Hopefully, this continuation will also help address staff retention concerns at participating ECCPs. It is also possible that the new opportunity occupied some of the attention of ECCP leadership during the last quarter of 2015; although, as of the end of the quantitative evaluation period covered in this report, the ECCPs did not know if they were selected for inclusion in the second phase.

In the context of the qualitative findings from our site visits, phone interviews, and surveys in the summer of 2015, we know that the interventions were certainly more developed than in 2014, but in most ECCPs they were still being refined, and certain components were being rolled out throughout the year. This protracted implementation of individual components of the Initiative across ECCPs makes it difficult to ultimately tease out what individual interventions are working well. Meanwhile, some new components, not planned in the original design, were being introduced in several ECCPs. However, the results from multivariate analyses are pointing in the desired direction and savings. If these trends are maintained in the final year of data analysis for 2016, there would be a stronger evidence base to make positive conclusions about the overall effect of the Initiative. However, it remains difficult to attribute these positive results to the specific interventions that are part of each individual ECCP model, given the challenges in quantifying those specific intervention components and the fact that the Initiative is constantly evolving with some new features being experimented with in several ECCPs in the last year of the Initiative.

An additional consideration identified during site visits and phone interviews is the possibility that there is some degree of parallel change in practice in the comparison group. A web-based survey of comparison facilities in 2015 indicated that 95 percent of comparison facilities that responded reported that their facility has introduced policies or procedures designed specifically to reduce avoidable hospitalizations of long-stay residents since January 2011. The direction of the changes in the comparison group would be to reduce the observed Initiative effect. However, the intensity of the training and the presence of clinical staff that the ECCPs bring to the facilities seems to make a difference beyond just introducing new tools, as may be occurring in the comparison facilities. Also of note, according to wave 3 of the Nursing Facility Administrator survey conducted in 2015, 80 percent of the ECCP facilities that responded indicated that they had also introduced policies and procedures to reduce potentially avoidable hospitalizations that were unrelated to the Initiative. It will be challenging to disentangle potential contamination caused by co-occurring initiatives in the comparison group and possibly in ECCP facilities as well. We plan to investigate this further in the final project year.

[This page intentionally left blank.]

SECTION 1
OVERVIEW

1.1 The Initiative to Reduce Avoidable Hospitalizations among Nursing Facility Residents

This report details the project's fourth year evaluation findings regarding the Centers for Medicare & Medicaid Services (CMS) Initiative to Reduce Avoidable Hospitalizations among Nursing Facility Residents (hereafter referred to as the Initiative). The Initiative is designed to affect hospitalization rates by directly changing practices at the facility level. The Initiative tests a series of clinical interventions or care models aimed at improving the health and health care of long-stay nursing facility residents, with the goal of reducing avoidable inpatient hospital admissions, improving other quality metrics, and decreasing the total cost of health care spending for the Medicare-Medicaid enrollees participating in the Initiative. The rate of avoidable hospitalizations is itself a quality metric because such events are particularly stressful for residents and expose them to potential hospital acquired infections. The Initiative seeks to identify the clinical intervention models that are the most promising to inform future policy development.

The Initiative involves seven Enhanced Care and Coordination Providers (ECCPs) with varied characteristics. They include academic institutions, quality improvement organizations (QIOs), a health care provider network, and a hospital association. The seven ECCPs, each initially partnering with 15 to 30 nursing facilities, implemented interventions with the following objectives:

- Reduce the frequency of avoidable hospital admissions and readmissions.
- Improve resident health outcomes.
- Improve the process of transitions between inpatient hospitals and nursing facilities.
- Reduce overall health care spending without restricting access to care or choice of providers.

Although CMS does not require ECCPs to implement a pre-specified intervention in their partner facilities, all interventions must be evidence based, replicable, and sustainable and include the following key activities:

- Hire staff who partner with nursing facility staff to improve recognition, assessment, and management of conditions that are often a cause of avoidable hospitalizations.
- Work in cooperation with existing providers, including residents' primary care providers, nursing facility staff, and families.
- Focus on quality improvement practices related to avoidable hospitalizations while working in cooperation with existing providers.

- Facilitate residents' transitions to and from inpatient hospitals and nursing facilities and facilitate timely and complete exchange of health information.

- Provide support for improved communication and coordination among hospital staff, including attending physicians, nursing facility staff, residents' primary care providers and other specialists, and pharmacy staff.

- Coordinate and improve management and monitoring of prescription drugs to reduce polypharmacy, adverse drug events, and inappropriate use of psychotropic drugs.

As of the time covered by this Project Year 4 report the ECCPs partnered with 144 nursing facilities (see ***Appendix A*****;** one of the 144 facilities dropped out of the demonstration in early October 2015; data from this facility for Q1 through Q3 of 2015 [i.e., before dropping out] was included in our analyses) to implement strategies aimed at reducing hospitalizations and improving care for fee-for-service (FFS), long-stay nursing facility residents whose care is funded through Medicare, Medicaid, or the Veterans' Administration. The seven ECCP organizations, including a brief overview of the original design, are:

- Alabama Quality Assurance Foundation Nursing Facility Initiative (AQAF-NFI), Initiative to Reduce Avoidable Hospitalizations among Nursing Facility Residents (a quality improvement organization [QIO]): 23 facilities

  The AQAF-NFI model design continues to operate in 23 nursing facilities in central and north-central Alabama. AQAF-NFI leadership has trained Registered Nurse (RN) Care Pathways Coaches (Coaches) in long-term care and placed them in partner nursing facilities to effect procedural changes in existing facility practices. Coaches do not provide clinical care; instead they improve staff education and processes through the use of INTERACT III (Interventions to Reduce Acute Care Transfers) tools, Advancing Excellence in America's Nursing Homes tools, Hand-in-Hand dementia training, consistent assignment of staff, staff development training, advance care planning, and creation of Quality Assurance/Performance Improvement (QAPI) teams. They also use Care Pathways teams to conduct root cause analyses and employ other quality measures toward reducing hospitalizations. In addition, pharmacy partners are working with Coaches to conduct medication reviews within all facilities and provide recommendations for improving medication management. Data collection remains a central focus of the AQAF-NFI, including both potentially avoidable hospitalization–specific data and AQAF-required data that relate to specific aspects of the model.

- Indiana University (IU) Geriatrics Department, Optimizing Patient Transfers, Impacting Medical Quality, and Improving Symptoms: Transforming Institutional Care (OPTIMISTIC): 19 facilities

  Indiana University Geriatrics Department's OPTIMISTIC design remains largely unchanged in Project Year 4. The project places highly trained RNs in each facility to provide direct clinical support, education, and training to nursing facility staff; eight

nurse practitioners (NPs) support the OPTIMISTIC RN and provide urgent evaluation and care needs. OPTIMISTIC uses a suite of tools (American Medical Directors Association [AMDA], INTERACT, and their own) and methods to improve medical care, palliative care, and transitional care. OPTIMISTIC RNs and NPs conduct intensive clinical reviews of residents in response to resident transitions or acute change in condition and through the collaborative care review (CCR) process.[1] The CCR process has been modified to emphasize the current status of the resident with less focus on past health history. The ECCP nurse practitioners review diagnoses, medications, activities of daily living, quality of life, plan of care, advance care plan, resident's and family's concerns, and so on. The CCRs are reviewed by IU geriatricians whose recommendations are conveyed by the ECCP NP to the resident's physician. Finally, OPTIMISTIC facility staff facilitate the roll out of the Physician Orders for Scope of Treatment (POST) form, educating families, residents and nursing home staff on advanced directives.

- The University of Missouri, Sinclair School of Nursing Missouri Quality Initiative for Nursing Homes (MOQI): 16 facilities

  Administered through the Sinclair School of Nursing at the University of Missouri, the Missouri Quality Initiative for Nursing Homes (MOQI) design remains unchanged—to reduce rates of avoidable hospitalizations and readmissions, improve health outcomes and transitions between hospitals and nursing facilities, and reduce health care costs through (1) implementation of INTERACT III tools and processes in 16 nursing facilities and with associated hospitals; (2) placement of a full-time Advanced Practice Registered Nurse (APRN) in each nursing facility to provide direct services, coaching, education, and mentoring to facility staff; and (3) development of electronic medical records (EMR) and information technology (IT) connections between nursing facilities and hospitals, and Surface tablets for the APRNs. The MOQI leadership team is composed of nursing, medical, social work, IT, and data management professionals, and the model is based upon the team's experience in the Quality Improvement Program for Missouri (QIPMO) and long-term care research experience. The team specifically targeted nursing facilities with good nursing quality and survey ratings and high hospitalization rates and those who work with hospitals with high readmission rates.

- Nebraska Alegent + Creighton Health Program (Alegent + Creighton) (a hospital and health care network): 14 facilities

  Alegent + Creighton Health operates in 14 nursing facilities in Omaha and the surrounding area. Alegent + Creighton continues to implement with fidelity to its original design, although the educational component of the program continues to evolve. Members of a team of six NPs are assigned to several nursing facilities. NPs provide clinical services to residents in their assigned facilities and also facilitate

[1] Previously called "Comprehensive Care Reviews" in original OPTIMISTIC Project Operations Manual (November 29, 2012).

training among facility staff. Services that they provide include life issue reviews, medication review using the Long Term Care Medication Outcome Monitor (LTC-MOM) tool, history and physical assessment (H&P) exams, and guidance in using INTERACT III tools. In addition to the NPs, the ECCP also provides dental and pharmacy support to participating facilities through a Dental Hygienist, Dentist, and Pharmacist that are part of the ECCP team. The Dental Hygienists provide assessments and cleanings for participating residents.

- HealthInsight Nevada Admissions and Transitions Optimization Program (ATOP) (a QIO): 24 facilities

  The ATOP model has not changed in Project Year 4. Teams of one APRN and two RNs provide direct clinical support, training, and education to four to five nursing facilities clustered in pods. HealthInsight aims to improve care and reduce avoidable hospitalizations by a "rapid response team" to address changes in conditions identified by using INTERACT and modified-INTERACT tools. The Resident Registry, populated by ECCP RNs, captures all relevant clinical data and is designed to provide (1) a risk assessment for each resident's plan of care; (2) web-based data sharing of resident reports for ECCP staff; (3) targeted queries as needed (e.g., for medication reviews); and (4) progress reports to nursing facilities; and (5) CMS reporting requirements.

- New York Reducing Avoidable Hospitalizations (NY-RAH) Project of Greater New York Hospital Association (GNYHA) Foundation: 29 facilities

  GNYHA Foundation and its partner organizations continue to implement NY-RAH with very little change to the project design other than the implementation process and schedule (e.g., management of the project) and changing the medication management intervention stage. The project's goals continue to focus on (1) reducing avoidable hospitalizations from nursing facilities, (2) improving transitions between nursing facilities and hospitals, and (3) improving palliative care provided to nursing facility residents. To achieve these goals, NY-RAH is using RN Care Coordinators (RNCCs) working in nursing facilities to identify areas needing improvement and implementing interventions to address them.

  The RNCCs do not provide direct clinical care to residents but focus on increasing each facility's capacity to identify root causes for potentially avoidable hospitalizations and review and modify its policies and procedures to prevent such hospitalizations. They also focus on developing or modifying policies and procedures to improve transitions and ensure that all residents have the opportunity to engage in advance care planning and receive palliative care when desired. The GNYHA Foundation will also help to facilitate the implementation of electronic solutions to improve unavoidable transitions to the hospital and back to the nursing facility.

  The GNYHA Foundation believes that the focus on education and training and systems change will lead to improvements in policies and procedures that will sustain

improved practices without the need for additional resources when the grant period ends.

- University of Pittsburgh Medical Center (UPMC) Community Provider Services Program to **R**educe **Av**oidable Hospitalizations using **E**vidence-based Interventions for **N**ursing Facilities (UPMC-RAVEN): 18 facilities[2]

  In the third year, the UPMC-RAVEN Initiative continued to operate in18 of its original 19 nursing facilities in western Pennsylvania with no change in the project design. One facility dropped out of the demonstration in early October 2015. An important design focus is the hands-on care provided by UPMC-RAVEN NPs in the facilities. UPMC-based UPMC-RAVEN leadership has trained enhanced care NPs and RNs in geriatric/palliative care and has placed them in partner nursing facilities. In addition to clinical care for UPMC-RAVEN eligible residents, these NPs work together with Pharmacist partners to provide medication management and with educational partners to provide individualized learning plans and tailored education components for training in each facility. INTERACT tools, namely SBAR (Situation, Background, Assessment, and Recommendation) and Stop and Watch, are used for early warning and condition monitoring, and the Pennsylvania Physician Orders for End of Life Treatment (POLST) form is used for advance care planning. Telemedicine carts have been introduced to each facility, allowing on-call ECCP NP to assist in the diagnosis and treatment of acute changes in condition and other medical emergencies occurring off hours.

After CMS approved the preliminary materials, including communications plans, readiness reviews, and operations manuals, the ECCPs began implementing their initiatives in their partner nursing facilities in February 2013. All organizations staggered implementation in one, two, or three cohorts; the last cohort began in September 2013. Components of the implementations have been phasing in and evolving over time.

ECCPs continued to participate in a CMS Learning Community led by CMS's operations support contractor, Deloitte Consulting, LLP (Deloitte), who is also responsible for certain day-to-day monitoring tasks for the Initiative. The Learning Community component is intended to disseminate information, best practices, and lessons learned rapidly across ECCPs to facilitate rapid-cycle learning.

1.2 Overview of Evaluation Methods

RTI International, partnering with its two subcontractors—the RAND Corporation, and Qualidigm—and two consultants—David Grabowski, PhD, and Mary Naylor, PhD—continues to conduct a formative evaluation of the Initiative to improve care for residents in nursing facilities by reducing potentially avoidable hospitalizations. The evaluation is designed to evaluate the ECCP interventions as they unfold. The evaluation assesses the effectiveness of the

[2] The Pennsylvania ECCP has operated in 19 facilities until October 2015, when one of the facilities (The Caring Place) dropped out of the Initiative, reducing the number of active ECCP facilities to 18.

overall Initiative as well as components of each ECCP intervention. The evaluation aims to assess both the process and outcomes addressing the key issues below.

Process:

- What changes did the ECCP implement?
- How did the Learning Community activities and other rapid-cycle activities affect what the nursing facilities and ECCPs did?
- What were the barriers/enablers associated with intervention implementation?
- Does the intervention improve transitions to and from hospitals?
- What were the unintended consequences associated with intervention implementation?

Outcomes:

- Does the intervention affect rates of hospitalization, avoidable hospitalization, emergency department (ED) visits, avoidable ED visits, and observation stays among long-stay nursing facility residents?
- Does the intervention affect the quality of care, health outcomes, and functional status for long-stay nursing facility residents?
- Does the intervention reduce Medicare, Medicaid, and total combined Medicare-Medicaid costs?

RTI continues to apply a mix of quantitative and qualitative methods to evaluate the seven ECCP initiatives, customizing the overarching evaluation design to (1) capture each ECCP's unique features and (2) develop an in-depth understanding of the transformative processes that may occur throughout the Initiative's implementation. This approach allows us to directly link structural and process changes to outcomes.

Quantitative methods are used to evaluate the impact of ECCP interventions and components on outcomes, using a matched comparison group of non-ECCP facilities to determine the net effect of interventions. RTI uses multivariate analyses to evaluate key quality, utilization, and expenditure outcomes in a difference-in-differences regression model framework. RTI has identified a comparison group of non-ECCP facilities with characteristics similar to ECCP facilities within each state. We initially considered using a two-stage matching process to first select comparison facilities and then residents from those facilities. Propensity score models were developed for the final comparison facility group. However, it was determined the residents in the comparison facilities were similar enough to the ECCP residents in each state that propensity scores were not needed at that stage. Propensity scores are intended to substitute for matching groups on a large number of combinations of characteristics.

The qualitative design focuses on primary data analyses using data collected from the ECCPs and the participating facilities directly. Formal site visit protocols and telephone interviews are used to ensure standardized primary data are collected. The primary data complement secondary data analyses, providing critical context to interpret evaluation findings. In addition to informing secondary data analyses, the primary data analyses provide a better understanding of the ECCPs and processes of implementing various models of the Initiative in participating facilities. This in-depth qualitative approach allows us to assess the fidelity to the original Initiative design, and gather necessary information to describe the barriers for implementation. Our primary data collection and analytic activities are organized by four key conceptual domains: (1) care model description; (2) early start-up and implementation experience; (3) program impact and possible spillover effect; and (4) early experience with Learning Community activities.

1.3 Organization of Annual Report

This report details Project Year 4 findings regarding the Initiative and includes analyses of nursing facilities at various operational stages through August 2016. ***Section 2*** of the report presents Project Year 4 findings using a quantitative analysis approach. The claims data analyzed in this report are from calendar year 2015; the data submissions for this period approached completion during 2016. Analytic methods discussed include identifying ECCP facility comparison groups, aligning data sources, creating analytic files and variables, and specifying statistical models. Results from both descriptive and multivariate regression analyses are also presented and discussed in Section 2. ***Section 3*** presents findings based on qualitative analyses of primary data collected by RTI for the period of July 1, 2015, through August 1, 2016. Note that the primary data collection cycle does not match the annual reporting cycle. As a result, this report includes findings from Project Year 3 (analysis from survey waves 1, 2, and 3) and the beginning of Project Year 4 (i.e., site visits and telephone interviews).

To the extent possible, in both Section 2 and Section 3 we comment on Initiative accomplishments; challenges encountered during intervention implementation; recommendations for potential changes where applicable; and lessons learned. The appendices (submitted in a separate volume) include tables delineating current ECCP participating facilities (***Appendix A***), characteristics of Initiative-eligible residents and nursing facilities included in the multivariate analyses (***Appendix B***), facility staffing and inspection deficiencies (***Appendix C***), selected multivariate regression model results (***Appendix D***), and estimates of ECCP-wide reductions or increases in Medicare spending and utilization counts (***Appendix E***). Appendices for state maps illustrating the geographic locations of ECCP and matched comparison facilities; conditions defined as potentially avoidable hospitalizations; detailed measure specifications; and primary data collection protocols are available upon request.

[This page intentionally left blank.]

SECTION 2
PROJECT YEAR 4 FINDINGS: QUANTITATIVE ANALYSES

2.1 Introduction

Quantitative evaluation analyses in the annual reports are intended to present results from risk-adjusted, multivariate regression models to estimate the effect of ECCP interventions on participating nursing facilities, relative to the matched comparison group, on selected resident-level outcomes, including utilization of Medicare and Medicaid covered services and related expenditures as well as indicators of quality outcomes. This annual report covers a 5-year period from 2011 to 2015. Data for 2011 and 2012 are used as the baseline to trend evaluation outcomes in each of the subsequent Initiative years, starting from 2013. The final report will include data up to 2016. It is important to note that ECCP participating facilities implemented the Initiative at different rates throughout 2013 depending on their go-live dates and the extent to which the new ECCP protocols were developed and followed. Since 2013 was the first year of transition to the Initiative, we found a limited impact of ECCP interventions on most of the outcome measures in 2013, as presented in RTI's final annual report for Project Year 2. RTI's final annual report for Project Year 3 showed evidence of a greater degree of impact which reflects the fact that by 2014, most facilities had the Initiative more fully implemented for at least a year. In this year's report, based on data for 2015, we anticipate that this impact will continue to be substantive and even to increase as the Initiative matures. Our qualitative findings are that the interventions are continuing to evolve during the study period; in many facilities, the interventions matured and garnered increasing support from leadership and staff, as well as more buy-in from providers. In other facilities, this maturation was hindered by major staff turnover, lack of support from individual providers, and IT challenges.

In the remainder of this section, we first provide an overview of our quantitative approach to annual evaluation analyses (***Section 2.2***) and a brief description of secondary data sources used in all quantitative analyses performed to date or planned for the future (***Section 2.3***). Following a brief description of the method and process used to identify the comparison group of facilities within each ECCP participating state (***Section 2.4***) and our definition of potentially avoidable hospitalizations (***Section 2.5***), we document our approach to identifying the population of Initiative-eligible nursing facility residents in each year who are included in the evaluation analyses (***Section 2.6***). Subsequent sections describe in detail how the outcome measures for evaluation are operationalized annually (***Section 2.7***), the selection of covariates (i.e., independent or control variables) associated with the outcome measures (***Section 2.8***), and the specification of statistical models used to carry out multivariate regression analyses (***Section 2.9***). We then present and discuss results from both descriptive analyses (***Section 2.10***) and multivariate regression models (***Section 2.11***). We conclude this section with a brief summary of major quantitative findings thus far across outcome domains and ECCP participating states (***Section 2.12***).

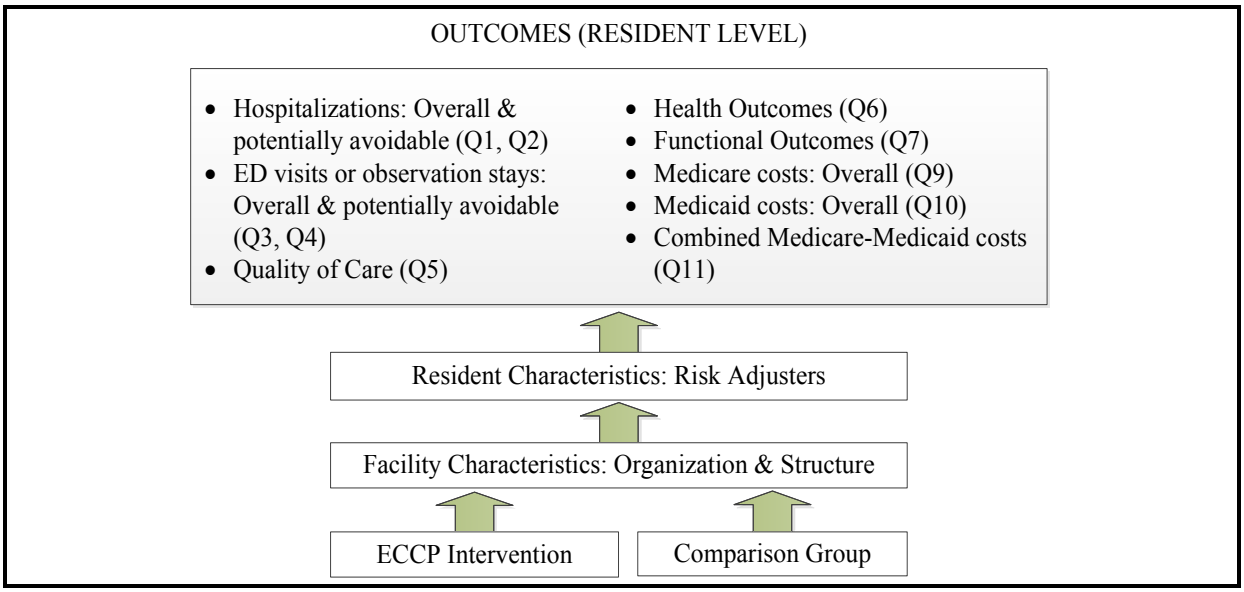
2.2 Analytic Approach to Annual Evaluation: Overview

A regression-based model is used to test quantitative effects of the ECCP interventions (see Section 2.9, for specifications). This model provides the general framework for the evaluation of all outcome measures defined at the resident level. They fall into the following broad categories: service utilization, including hospitalizations (overall and those potentially

avoidable) and ED visits or observation stays (overall and those potentially avoidable); Medicare or Medicaid expenditures; and MDS-based quality outcomes. All utilization- and expenditure-related outcomes are defined using Medicare or Medicaid claims. Resident-level quality outcomes are defined using the nursing home resident assessment Minimum Data Set, Version 3.0 (hereinafter referred to as MDS-based quality outcomes).

The general regression model follows a difference-in-differences design with multiple annual observation periods both before the intervention (2011 and 2012) and periodically after (2013 and onward). The model includes variables for a facility being in the intervention (ECCP) or comparison group for periods during the intervention and marks those same facilities during the Base Year 2012. It also factors in variables characterizing the residents and their facilities, which are predictive of the outcome variables, as illustrated in ***Figure 2-1.*** A listing of outcome variables, including their definitions, units of analysis, and data sources, is provided in ***Table 2-1***. Further details on the outcome variables, especially those included in multivariate regression analyses, are elaborated in Section 2.7.

Figure 2-1
Analytic framework for assessing the effects of ECCP intervention on resident outcomes



Compared to the last annual report, we made several changes to the analytic approaches, as highlighted below:

- We added 3 years of Alabama Medicaid data to the descriptive analyses, for 2011 to 2013. This is the first time we have been able to report on Medicaid data.

- Our final annual report for Project Year 3 included a series of multivariate analyses to test whether the ECCP intervention might have a differential effect on certain subgroups of residents, including those who are younger than age 65, those who have mental illness, and those who have dementia. In the current report these analyses were removed because we previously observed no consistent pattern for the

subgroups and there was no a priori reason to believe that the effect of the intervention should be different for these subgroups.

- We no longer separately report descriptive statistics on utilization outcomes for critical access hospitals because these outcomes are infrequent.

- We now report on facility-level staffing and inspection survey-based quality indicators in ***Appendix C*** instead of in the main report.

- To highlight the effects of the Initiative on select key outcomes, we used forest plots to show the estimated effect sizes and 90% confidence intervals to visualize findings across the states and to aid in discussions (see ***Section 4***).

A number of caveats should also be noted on the quantitative analyses presented in the current report:

- Only FFS Medicare enrollees who are eligible for participation in the Initiative are included in the multivariate analyses (see Section 2.6 for detailed criteria and procedures used to identify Initiative-eligible residents). The majority of them are dually eligible for Medicare and Medicaid. Initiative-eligible residents with only Medicaid eligibility (relatively few in number) are not included in the multivariate analyses. They are included in descriptive analyses for Alabama for 2011-2013; Medicaid analyses for additional states and years are planned to be included in the future (see Section 2.3 for an update on Medicaid data).

- Relatedly, only Medicare utilization and expenditures are analyzed and reported in the multivariate analyses. Medicaid expenditures are included for Alabama from 2011 to 2013 and analyses for additional states and years are underway and will be added in future reports once available (see Section 2.3 for an update on Medicaid data). Because the measures of interest are mainly reflected in Medicare claims, the limitation is not substantive.

- For several MDS-based and non-MDS-based outcome variables, we choose to report only summary statistics from descriptive analyses, because multivariate regression analyses are not feasible or desirable in these cases (as marked in the last column of Table 2-1). Some of them have either extremely high prevalence (e.g., receipt of influenza vaccine or pneumococcal vaccine) or extremely low prevalence (e.g., physical restraints, observation stays), which present challenges for statistical modelling due to potential "ceiling effect" or "floor effect." In other cases, the variables are not quality measures *per se* (e.g., hospice enrollment, dental problems, swallowing disorder) or are not well established or widely used quality measures (e.g., bowel or bladder incontinence, weight loss). Several other measures, including direct-care staffing levels and health-related inspection survey deficiencies, are measured at the facility level, making it difficult to run robust multivariate analyses because of small sample sizes.

Table 2-1
Measures of service utilization, expenditure, and quality outcomes

Measure	Definition	Variable type	Unit of analysis	Data source	Multivariate analysis
Service utilization – Count measures					
Hospitalization, all cause	Total count of inpatient admissions.	Count	Resident	Medicare claims	Yes
Hospitalization, potentially avoidable	Total count of inpatient admissions for any of the conditions defined as potentially avoidable.	Count	Resident	Medicare Part A claims	Yes
ED visit, all cause	Total count of outpatient ED visits that did not lead to inpatient admission, identified as RCC = (045X or 0981) or HCPCS classification code = (99281-99285).	Count	Resident	Medicare outpatient (institutional) claims	Yes
ED visit, potentially avoidable	Total count of outpatient ED visits (as identified above) for any of the same conditions as used to define potentially avoidable hospitalizations.	Count	Resident	Medicare outpatient (institutional) claims	Yes
Observation stay, all cause	Total count of observation stays that did not lead to inpatient admission, identified as RCC = (0760 or 0762) and HCPCS = (G0378 or G0379).	Count	Resident	Medicare outpatient (institutional) claims	No
Observation stay, potentially avoidable	Total count of observation stays (as identified above) for any of the same conditions as used to define potentially avoidable hospitalizations.	Count	Resident	Medicare outpatient (institutional) claims	No
ED visit or observation stay (combined)	Total count of observation stays and ED visits (as defined above) combined.	Count	Resident	Medicare outpatient (institutional) claims	No
ED visit or observation stay (combined), potentially avoidable	Total count of observation stays and ED visits combined (as identified above) for any of the same conditions as used to define potentially avoidable hospitalizations.	Count	Resident	Medicare outpatient (institutional) claims	No

(continued)

Table 2-1 (continued)
Measures of service utilization, expenditure, and quality outcomes

Measure	Definition	Variable type	Unit of analysis	Data source	Multivariate analysis
Service utilization – Dichotomous (1/0) measures					
Any hospitalization, all cause	Whether a resident had an inpatient admission.	Dichotomous	Resident	Medicare Part A claims	Yes
Any hospitalization, potentially avoidable	Whether a resident had an inpatient admission for any of the conditions defined as potentially avoidable.	Dichotomous	Resident	Medicare Part A claims	Yes
Any ED visit, all cause	Whether a resident had an outpatient ED visit that did not lead to inpatient admission, identified as RCC = (045X or 0981) or HCPCS classification code = (99281-99285).	Dichotomous	Resident	Medicare outpatient (institutional) claims	Yes
Any ED visit, potentially avoidable	Whether a resident had an outpatient ED visit (as identified above) for any of the same conditions as used to define potentially avoidable hospitalizations.	Dichotomous	Resident	Medicare outpatient (institutional) claims	Yes
Any observation stay, all cause	Whether a resident had an observation stay that did not lead to inpatient admission, identified as RCC = (0760 or 0762) and HCPCS = (G0378 or G0379).	Dichotomous	Resident	Medicare outpatient (institutional) claims	No
Any observation stay, potentially avoidable	Whether a resident had an observation stay (as identified above) for any of the same conditions as used to define potentially avoidable hospitalizations.	Dichotomous	Resident	Medicare outpatient (institutional) claims	No
Any ED visit or observation stay (combined)	Whether a resident had an ED visit or observation stay (as defined above).	Dichotomous	Resident	Medicare outpatient (institutional) claims	No
Any ED visit or observation stay (combined), potentially avoidable	Whether a resident had an ED visit or observation stay (as identified above) for any of the same conditions as used to define potentially avoidable hospitalizations.	Dichotomous	Resident	Medicare outpatient (institutional) claims	No

(continued)

Table 2-1 (continued)
Measures of service utilization, expenditure, and quality outcomes

Measure	Definition	Variable type	Unit of analysis	Data source	Multivariate analysis
	Program expenditures*				
Medicare-Medicaid payments, combined	Total combined Medicare and Medicaid payments (as specified below) per beneficiary.	Continuous	Resident	Medicare Parts A/B/D and Medicaid claims	*
Medicaid payment, overall	Total Medicaid payment per beneficiary for long-stay nursing facility care, and Medicaid cost sharing of Medicare payments for all covered services.	Continuous	Resident	Medicaid claims	*
Medicare payment, overall	Total Medicare payment per beneficiary for all covered services, including inpatient, outpatient, SNF, carrier file services, hospice, home health, durable medical equipment, and prescription drugs.	Continuous	Resident	Medicare Parts A/B/D claims	Yes
Medicare payment, by subcategory below:					
All-cause hospitalizations	Total Medicare payment per beneficiary for all-cause inpatient admissions.	Continuous	Resident	Medicare Part A claims	Yes
Potentially avoidable hospitalizations	Total Medicare payment per beneficiary for inpatient admissions for any of the conditions defined as potentially avoidable.	Continuous	Resident	Medicare Part A claims	Yes
All-cause ED visits	Total Medicare payment per beneficiary for all-cause ED visits that did not lead to inpatient admission, identified as RCC = (045X or 0981) or HCPCS classification code = (99281-99285).	Continuous	Resident	Medicare outpatient (institutional) claims	Yes
Potentially avoidable ED visits	Total Medicare payment per beneficiary for ED visits (as identified above) for any of the same conditions as used to define potentially avoidable hospitalizations.	Continuous	Resident	Medicare outpatient (institutional) claims	Yes

(continued)

Table 2-1 (continued)
Measures of service utilization, expenditure, and quality outcomes

Measure	Definition	Variable type	Unit of analysis	Data source	Multivariate analysis
All observation stays	Total Medicare payment per beneficiary for observation stays that did not lead to inpatient admission, identified as RCC = (0760 or 0762) and HCPCS = (G0378 or G0379).	Continuous	Resident	Medicare outpatient (institutional) claims	No
Potentially avoidable observation stays	Total Medicare payment per beneficiary for observation stays (as identified above) for any of the same conditions as used to define potentially avoidable hospitalizations.	Continuous	Resident	Medicare outpatient (institutional) claims	No
All-cause ED visits and observation stays combined	Total Medicare payment per beneficiary for all-cause ED visits and observation stays (as defined above) combined.	Continuous	Resident	Medicare outpatient (institutional) claims	No
Potentially avoidable ED visits and observation stays combined	Total Medicare payment per beneficiary for observation stays and ED visits (as defined above) combined for any of the same conditions as used to define potentially avoidable hospitalizations.	Continuous	Resident	Medicare outpatient (institutional) claims	No
SNF services	Total Medicare payment per beneficiary for SNF services.	Continuous	Resident	Medicare Part A claims	Yes
Hospice services	Total Medicare payment per beneficiary for hospice services.	Continuous	Resident	Medicare Part A claims	No
Carrier file services	Total Medicare payment per beneficiary for carrier file services.	Continuous	Resident	Medicare Part B claims	No
Physician services	Total Medicare payment per beneficiary for physician services.	Continuous	Resident	Medicare Part B claims	Yes
Durable medical equipment	Total Medicare payment per beneficiary for durable medical equipment.	Continuous	Resident	Medicare Part B claims	No
Part D prescription drugs	Total Medicare payment per beneficiary for Part D prescription drugs.	Continuous	Resident	Medicare Part D claims	No

(continued)

Table 2-1 (continued)
Measures of service utilization, expenditure, and quality outcomes

Measure	Definition	Variable type	Unit of analysis	Data source	Multivariate analysis
	MDS-based quality outcomes				
Assessed and appropriately given the seasonal influenza vaccine	Whether a resident is appropriately given the influenza vaccination during the current or most recent influenza season.	Dichotomous	Resident	MDS 3.0	No
Assessed and appropriately given the pneumococcal vaccine	Whether a resident's PPV status is up to date.	Dichotomous	Resident	MDS 3.0	No
Catheter inserted and left in bladder	Presence/absence of indwelling catheters.	Dichotomous	Resident	MDS 3.0	Yes[1]
Physically restrained	Presence/absence of daily physical restraints (trunk restraint used in bed, limb restraint used in bed, trunk restraint used in chair or out of bed, limb restraint used in chair or out of bed, and chair prevents rising used in chair or out of bed).	Dichotomous	Resident	MDS 3.0	No
Antipsychotic medication use	Whether a resident received an antipsychotic medication.	Dichotomous	Resident	MDS 3.0	Yes [1]
One or more falls with major injury[2]	Presence/absence of one or more look-back scan assessments that indicate one or more falls that resulted in major injury.[2]	Dichotomous	Resident	MDS 3.0	Yes [1]
Self-report moderate to severe pain	Presence/absence of either (1) almost constant or frequent moderate to severe pain in the last 5 days or (2) any very severe/horrible pain in the last 5 days.	Dichotomous	Resident	MDS 3.0	Yes[1]
Pressure ulcers Stage II or higher	Presence/absence of Stage II–IV pressure ulcers.	Dichotomous	Resident	MDS 3.0	Yes[1]
Decline in ADLs	Whether a resident's need for help with late-loss ADLs has increased. An increase is defined as an increase in two or more coding points in one late-loss ADL item or one point increase in coding points in two or more late-loss ADL items.	Dichotomous	Resident	MDS 3.0	Yes[1]

(continued)

Table 2-1 (continued)
Measures of service utilization, expenditure, and quality outcomes

Measure	Definition	Variable type	Unit of analysis	Data source	Multivariate analysis
Urinary tract infection	Presence/absence of urinary tract infection within the last 30 days.	Dichotomous	Resident	MDS 3.0	Yes[1]
Depressive symptoms	Presence/absence of depressive symptoms within the last 2 weeks measured by PHQ-9 or PHQ-9-OV.	Dichotomous	Resident	MDS 3.0	Yes[1]
Hospice enrollment	Whether a resident received hospice care within the last 14 days.	Dichotomous	Resident	MDS 3.0	No
Bowels or bladder incontinence	Whether a resident frequently or always loses control of the bowel or bladder.	Dichotomous	Resident	MDS 3.0	No
Weight loss	Whether a resident has a weight loss of 5 percent or more in the last month or 10 percent or more in the last 6 months and was not on a physician prescribed weight-loss regimen.	Dichotomous	Resident	MDS 3.0	No
Dental problems	Presence/absence of oral or dental problems.	Dichotomous	Resident	MDS 3.0	No
Swallowing disorder	Presence/absence of symptoms indicating difficulty swallowing.	Dichotomous	Resident	MDS 3.0	No
RN staffing per resident day	RN hours (F41 on the CMS-671 form) divided by resident census (F78 of the CMS-672 form).	Continuous	Facility	CASPER	No
LPN staffing per resident day	Total licensed nursing hours (RN hours [F41 on the CMS-671 form] plus licensed practical nurse hours [F42]) divided by resident census (F78 of the CMS-672 form).	Continuous	Facility	CASPER	No
CNA staffing per resident day	CNA hours (F43, F44 and F45 of the CMS-671 form) divided by resident census (F78 of the CMS-672 form).	Continuous	Facility	CASPER	No
Health inspection score	Score based on the number, scope, and severity of deficiencies identified during each annual inspection survey. All deficiency counts are weighted by scope and severity.	Continuous	Facility	CASPER	No

(continued)

Table 2-1 (continued)
Measures of service utilization, expenditure, and quality outcomes

Measure	Definition	Variable type	Unit of analysis	Data source	Multivariate analysis
	Facility-level staffing and quality indicators				
Health inspection score for quality of care deficiency citations	Only quality of care related deficiency citations (F tags F309 - F334) are considered for this measure. Score based on the number, scope, and severity of deficiencies identified during each annual inspection survey. All deficiency counts are weighted by scope and severity.	Continuous	Facility	CASPER	No
Health inspection score for quality of life deficiency citations	Only quality of life related deficiency citations (F tags F240 - F258) are considered for this measure. Score based on the number, scope, and severity of deficiencies identified during each annual inspection survey. All deficiency findings are weighted by scope and severity.	Continuous	Facility	CASPER	No
Any severe (Grade G+) deficiency	Whether a facility received a severe type of deficiency (which causes actual or immediate jeopardy to resident health or safety), defined as any deficiency citation with a grade of G or above.	Dichotomous	Facility	CASPER	No

NOTES:

MDS 3.0 = Nursing Home Minimum Data Set resident assessment data; ADLs = Activities of Daily Living; CNA = Certified Nurse Aide; CASPER = Certification and Survey Provider Enhanced Reporting; ED = Emergency Department; HCPCS = Healthcare Common Procedure Coding System; LPN = Licensed Practical Nurse; RCC = Revenue Center Code; PHQ-9 = Patient Health Questionnaire-9; PHQ-9-OV = PHQ- 9 Observational Version; PPV = Pneumococcal Polysaccharide Vaccine; RN = Registered Nurse; SNF = Skilled Nursing Facility; * = Medicaid data are currently reported in descriptive statistics for Alabama, for the years 2011-2013 only, and are not included in any multivariate analyses; carrier file services are Part B services such as Physician and laboratory that are submitted as noninstitutional claims; durable medical equipment is in a separate file.

[1] The dependent variable used in the multivariate analysis is expressed as the proportion of observed quarters (which could have multiple assessments) indicating the presence of each outcome per resident in a given year.

[2] These specifications are consistent with Nursing Home Compare and are used in RTI's quarterly reports. In the annual analyses, we expand the measure to include falls with any injury (J1900B = [1, 2] or J1900C = [1, 2])

2.3 Secondary Data Used in Quantitative Analyses

RTI obtains Medicare secondary data (eligibility, claims, and assessments) from CMS and Medicaid secondary data (eligibility and claims) directly from each state. Medicare data come from several sources, including the Denominator File, the Enrollment Database (EDB), prior years of CMS Claims History Files, the Integrated Data Repository (IDR), and the MDS. The following paragraphs briefly describe these files and their use in our analyses.

2.3.1 Resident Assessment Data—Minimum Data Set 3.0

All Medicare- and Medicaid-certified nursing facilities are required to collect and report MDS data to CMS for every resident in a certified bed (regardless of payment sources) on admission, quarterly and annually, as well as upon a significant change in resident status, and to submit any significant corrections to prior comprehensive or quarterly assessments. In addition, providers must complete assessments for payment under the Medicare Part A benefit for beneficiaries who receive post-acute care in a skilled nursing facility (SNF). These assessments are completed at 5, 14, 30, 60, and 90 days of the Medicare Part A stay and upon readmission or return to the facility. The MDS assessment was implemented nationally in 1990, updated in 1995 and 1998, and enhanced in 2010 (MDS 3.0). With the implementation of the MDS 3.0, clinical information is also being collected at discharge from the facility.

MDS items measure each resident's demographics, physical health (e.g., chronic diseases, infections, and skin conditions), mental health (e.g., cognitive performance and mood), and functional status (e.g., Activities of Daily Living [ADL]). MDS 3.0 has excellent to very good reliability, or reproducibility of measurement, when assessments by research nurses are compared to assessments by facility nurses; it has more valid prompts for measuring health conditions than MDS 2.0 (Saliba and Buchanan, 2008).

The MDS 3.0 is RTI's data source for measures of resident-level MDS-based quality outcomes as well as some characteristics associated with these outcomes. (Other medical characteristics are measured by claims-based Hierarchical Condition Categories [HCC], described below in Section 2.3.2.). To accommodate delays in submitting MDS assessments by facilities, we use 6-week run-out time for MDS data. That is, we request MDS data for the target quarter about 6 weeks after the end of the quarter so that almost all data for the target quarter have been submitted.

2.3.2 Medicare Claims and Eligibility

Medicare claims are the source for data on service utilization events (e.g., hospitalizations, ED visits), diagnoses, and spending. RTI obtains Medicare enrollment, eligibility, and claims data through the IDR system. We prefer using data from IDR over other CMS data systems such as the Standard Analytic Files (SAFs) from the Data Extract System (DESY) and the Chronic Condition Warehouse (CCW) Enclave, which have longer data lags than IDR. With data updated on a weekly (or at least monthly) basis, the IDR provides more timely and complete data that better meet CMS's needs for rapid-cycle reporting (through RTI's ongoing quarterly reports). In addition, Medicare enrollment data from IDR matches with MDS finder files slightly better than enrollment data from DESY. The IDR also provides up-to-date

monthly indicators for dual eligible status, which we use to identify dual eligible residents in our analyses. Thus, the IDR is overall better suited to this project.

In creating the Medicare utilization and expenditure measures per beneficiary in each calendar year, we allow 3 months for claims runout from the end of the calendar year. A longer runout period (e.g., 6 months) may be desirable, which allows more time for late submissions or adjustments. This could be done for years prior to 2015 without any issues. For claims from 2015, however, using a 6-month runout period would leave us little time (2 weeks or less) for processing and analyzing those claims for the current annual report. For consistency, we used 3 months for claims runout for all years of data analyzed and reported in the current report.

Some resident-level, medical characteristics are Medicare HCCs. HCCs are clinically meaningful groupings of ICD-9 diagnosis codes maintained by CMS for the purpose of risk adjusting capitation payments to Medicare Advantage (MA) insurance plans. HCCs are binary variables: a given Medicare beneficiary is designated as having or not having a condition or diagnosis contained in a given HCC cluster. These resident-level HCC data are updated by CMS annually and are derived from ICD-9-CM codes—and, starting October 2015, ICD-10-ICM codes—on principal hospital inpatient, secondary hospital inpatient, hospital outpatient, physician, and clinically trained nonphysician practitioner claims. CMS implemented the RTI-designed HCC model for capitation in 2004. HCC data for beneficiaries for a given year represent information from claims made during the prior year. In some cases we combined two or three HCCs into one larger cluster that represents having at least one of the corresponding conditions or diagnoses.

2.3.3 Nursing Facility Data

We use data from the CMS Certification and Survey Provider Enhanced Reporting (CASPER) system for facility characteristics used for selecting comparison groups, direct-care staffing, inspection survey-based measures of quality as well as covariates included in multivariate analyses of individual-level outcomes. CASPER (formerly known as OSCAR, or Online Survey Certification and Reporting) is a data system maintained by CMS in cooperation with the state long-term care survey agencies. It includes a compilation of data collected by surveyors during the on-site inspection surveys conducted at nursing facilities for the purpose of certification for and continued participation in the Medicare and Medicaid programs.

CASPER is the most comprehensive source of facility-level information on the operations, patient census, and regulatory compliance of nursing facilities. Most information in the CASPER system is typically collected during on-site evaluations conducted by state survey agencies. The evaluations occur at least once during a 15-month period (with a 12-month statewide average), with additional surveys occurring as a result of a complaint being investigated. Thus, although the time lag for facility data should be small compared to other data sources (e.g., Medicaid claims), the information may not reflect the most current status.

2.3.4 Medicaid Data

RTI is working with individual states to obtain Medicaid data directly because of the significant lag in Medicaid data availability. The current time lag for Medicaid claims data is

considerable and varies by state. RTI will incorporate Medicaid data in each report as they become available. For states that do have complete data accepted by the Medicaid Statistical Information System (MSIS), RTI will consider using such data, provided they have a shorter lag than would be the case if requested directly from the states.

We began our data collection efforts with CMS's Memorandum of Understanding with each state of a participating ECCP to identify the state contact. As of July 2016, we have contacted all seven ECCP states as shown in ***Table 2-2***. Once the appropriate contact was identified for a state we reached out with an introductory e-mail describing the Initiative and evaluation and requested a time for a phone call. We also provided the state with a list of questions regarding their Medicaid data and sent them a list of variables being requested, based on MSIS data elements. The data that we request from the states include all the Medicaid file types to recognize Medicaid-covered events, costs, and the enrollment and eligibility information. Historical data were requested for calendar years 2011 and 2012 to serve as the baseline and for calendar year 2013 and forward on a quarterly basis. We also request that the states provide us with data dictionaries and codebooks for the data if they are available.

Table 2-2 also presents our progress in obtaining data from the ECCP states through July 2016. We have established data sharing agreements (such as data use agreements) with five states. These five states have provided us with some form of a data dictionary and codebook. We have begun to receive data from Alabama, Missouri, Nebraska, Nevada, and New York. Two states, Indiana and Pennsylvania will not provide data to RTI and we will use MSIS data for these states. Alabama has recently transitioned to sending T-MSIS files to RTI and we anticipate needing to access T-MSIS files for Indiana and Pennsylvania because the last quarter a state can report to CMS in MSIS is July to September 2015. We will work with CMS to determine the best way to access T-MSIS data for these states.

Although we structure our requests to align with the MSIS variables to assist the states in identifying the appropriate data elements, our data requests are state dependent. Because of the large size of some state data systems and state personnel availability, in some states we limited our request to only beneficiaries that received nursing facility care during any given year. To match the Medicaid claims to the Medicare claims for analysis we request a Medicare Health Insurance Claim (HIC) number as well as a Social Security Number (SSN), if they are available in the state Medicaid files. Each state has provided us with either a HIC or SSN and our matching algorithm also uses gender and date of birth. For a match to occur, we require that a person identifier (HIC, SSN, or Medicaid ID) match as well as gender.

Our Medicaid data analysis to date has started for each state. For Nevada, Nebraska, Missouri, and New York we are currently working on the baseline periods (2011 and 2012) to identify nursing facility residents, match the data to the MDS file identifying Initiative-eligible residents, account for adjustment claims, and assign Medicare-like claim types to each claim. This process differs for each state as the data received from each state differ. We have encountered several issues in the data that involve follow-up with the states and significant investigation resulting in delays in our data processing. We have completed analysis through 2013 for Alabama and are working on analysis of 2011 to 2014 for Pennsylvania and 2011 to 2013 for Indiana. We continue to be proactive in seeking information and assistance from the states and are making progress in our work.

Table 2-2
Medicaid data acquisition progress (through July 2016)

State	Contact made	Data sharing agreement established	Codebook received	Data dictionary received	Data received
Alabama	Yes	Yes	MSIS/T-MSIS	MSIS/T-MSIS	January 2011 to November 2015
Indiana	Yes	No	No	No	MSIS data available for analysis through December 2013[1]
Missouri	Yes	Yes	Yes	Yes	January 2011 to December 2011[2]
Nebraska	Yes	Yes	Yes	Yes	January 2011 to March 2015
Nevada	Yes	Yes	Yes	Yes	January 2011 to June 2015
New York	Yes	Yes	Yes	Yes	January 2011 to June 2014
Pennsylvania	Yes	No	No	No	MSIS data available for analysis through December 2014[1]

NOTES:

1. Data used in analysis requires a 3-month runout.
2. Due to errors in the data files initially received, Missouri is correcting and resending all years.

2.4 Identification of Comparison Groups

Using propensity score models, RTI selected a group of comparison facilities within the same state as the ECCP facilities based on observed facility characteristics in 2012. The propensity matching helps to ensure that comparison facilities have characteristics that are similar to those in the ECCP group. This is important given that the intervention focuses on facilities and their operations. We matched two comparison facilities to each ECCP facility in all states except Nevada, where there are fewer non-ECCP facilities than ECCP facilities to begin with. (Thus no matching was done in Nevada, and all Medicare and Medicaid certified Nevada nursing facilities are included in the evaluation). A more detailed technical documentation on the methodology and process of comparison group selection is provided in our first two quarterly reports (August 2013 and November 2013) and last updated evaluation design report (May 2016).

In 2014, two facilities dropped out of the ECCP participant groups, and three comparison facilities were dropped from our analysis. VillageCare's Rivington House, an ECCP facility in New York, was an AIDS facility but closed because of a lack of perceived demand for that specialization. Montclair Nursing and Rehabilitation Center in Omaha was dropped from the Initiative by the Nebraska ECCP because of a perception that the facility cannot devote the necessary time and energy to continue as part of the Initiative. Because those two facilities dropped out of the intervention so late in the year, they remain in our 2014 data for analysis for the period they were active. Three comparison facilities either closed or ceased to provide MDS data and were dropped from our analysis: Lutheran Home (Nebraska), Kindred – Flamingo (Nevada), and Caremeridian (Nevada). In 2015, the ECCP facility The Caring Place, in Pennsylvania, dropped out of the Initiative (in October); thus, for Initiative-eligible residents in this facility, we kept their data through the end of September 2015 in the annual analytic file. The count of active ECCP and matched comparison facilities, as of December 2015, is provided in ***Table 2-3***.

Table 2-3
Number of active ECCP and matched comparison facilities (as of December 2015)

	ECCP facilities	Comparison facilities	Total
Alabama	23	46	69
Indiana	19	38	57
Missouri	16	32	48
Nebraska	14	29	43
Nevada	24	19	43
New York	29	60	89
Pennsylvania	18	38	56
Total	143	262	405

RTI's policy is not to revise the propensity score matching after 2013, despite facility dropouts, to the extent possible. Our results are still valid without rematching facilities, because our regressions that estimate Initiative impact reduce selection bias by controlling for many resident- and facility-level characteristics that could be related to outcomes. A dropout from either group will not be a major problem unless the proportion of the facilities dropping is very large (which has not occurred). In addition, any rematching over time would result in matching comparisons after intervention changes have occurred and thereby the estimated cumulative intervention effect would possibly be diluted or hidden.

It should be noted that the propensity matching is not intended to be used to analyze the relationships of individual facilities; rather, it is a group match whereby the intervention and nonintervention groups are matched overall with intervention and comparison facilities having an overlapping range of propensity scores.

RTI's original evaluation design considered additional propensity score matching at the resident level. The initial concern was that the resident characteristics selected as covariates in multivariate regression models might be overly "unbalanced" between residents in ECCP facilities and those in comparison facilities, thereby potentially confounding the estimated impact of ECCP intervention on outcomes. However, we compared selected resident-level covariates included in multivariate regression models and found little systematic difference between the two groups in each year (see sample descriptive statistics in ***Appendix B***). Additional analyses confirmed that relative differences in the means of resident-level covariates between the two groups were similar with and without propensity weighting. We concluded that additional propensity score matching at the resident level is unnecessary as the potential gains from this exercise are minimal. Therefore, in multivariate analyses no propensity weighting at the resident level is applied.

2.5 Definition of Potentially Avoidable Hospitalizations

RTI is using the definition of potentially avoidable hospitalizations as developed by Walsh et al. (2010) in their study of high-cost dually eligible populations. Since this publication, a few conditions were added or deleted based on subject matter expert input. (Appendix C of the

2014 annual report provides a list of potentially avoidable hospitalization conditions updated through 2012 ICD-9 code changes. RTI recently updated the list of potentially avoidable hospitalization diagnosis codes from ICD-9 to ICD-10, following the transition from ICD-9 to ICD-10 effective October 1, 2015. The full list of PAH ICD-10 codes can be provided upon request.

2.6 Identification of Initiative-Eligible Residents for Annual Evaluation

A resident's eligibility for inclusion in our annual analytic files is primarily determined using MDS assessments. This allows a uniform approach to determining resident eligibility in comparison facilities and Initiative facilities. The basic criteria have been set out in the guidelines for the Initiative; we have operationalized the criteria to meet the needs of the analysis.[3] Below, we describe our approach using the diagram in ***Figure 2-2***. The diagram shows a hypothetical resident's nursing facility use during an observation period. For each calendar year, which is our target period for outcome measures in the annual analyses, we use MDS data submitted to CMS approximately 16 months prior to the end of the year through 2-and-a-half months after the end of the year to identify nursing facility stays; however, the actual time window of data coverage (the observation period) may vary slightly from person to person and from year to year. Elements of the diagram are defined below:

- ST = Stay. A stay is a period of time between a resident's entry (either admission or reentry) into a facility and either (1) a discharge (with or without anticipation of return) or death, or (2) the end of the target period (i.e., the end of the year), whichever comes first.

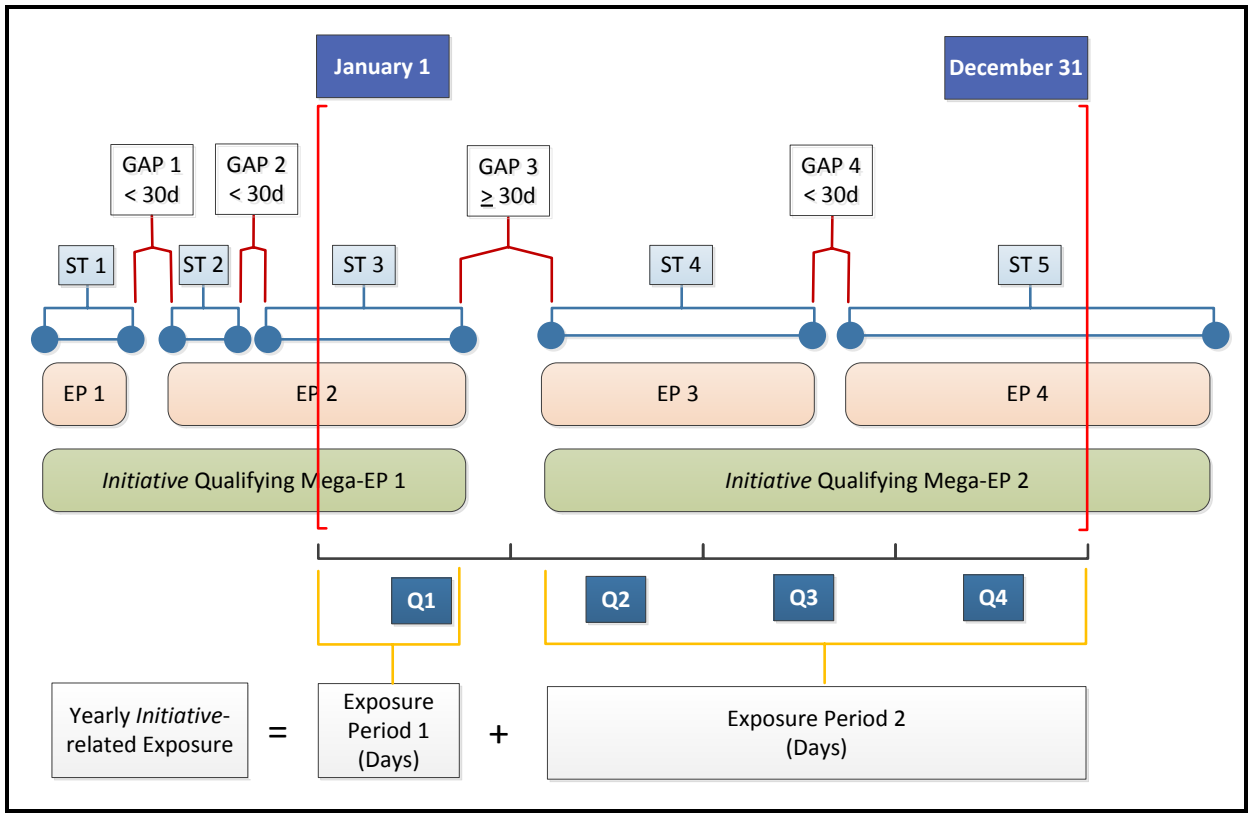
- EP = Episode. An episode of care is a period of time spanning one or more stays. An episode of care begins with an admission and ends with either (1) a discharge or (2) the end of the target period (i.e., the end of the year), whichever comes first. Not every stay discharge ends an episode. The discharge that ends an episode of care is either (1) a discharge assessment with return not anticipated, (2) a discharge assessment with return anticipated but the resident does not return within 30 days (i.e., the gap between the two stays is greater than 30 days), or (3) death. If a resident has a discharge assessment with return anticipated and returns within 30 days, then there is no interruption to the same episode of care, although the return/reentry will start a new stay (as illustrated by ST 2 and ST 3, which belong to the same episode, EP 2).

- Mega-EP = Mega-episode. A mega-episode is a period of time spanning one or more episodes. A mega-episode of care begins with an admission and ends with either: (1) a discharge (regardless of anticipation of return) and the resident did not return within 30 days, or (2) death. In other words, a mega-episode of care may consist of multiple episodes of care if the gap between two adjacent episodes is less than 30 days. The mega-episode ignores relatively short breaks in nursing facility care and constitutes

[3] The basic criteria are that the resident has been present in the facility for at least 101 days or that their assessments indicate that there is no active discharge plan in place.

an Initiative-related exposure period if the Initiative eligibility criteria are met during that period. A mega-episode may span multiple years and is used to determine whether the 101 day criterion is met for eligibility. However, for any analysis year only the portions of eligible mega-episodes within that period constitute the exposure days for that year. This is shown at the bottom of Figure 2-2. The remaining portions of eligible mega-episodes that are not considered the exposure days for that year constitute the exposure days for the prior or following year, depending on which year each remaining portion of eligible mega-episodes overlaps with.

Figure 2-2
A hypothetical resident's nursing facility use during an observation period



NOTE: Characteristics of stays: ST 1 has a discharge *without* anticipation of return; ST 2 has a discharge *with* anticipation of return; ST 3 has a discharge, regardless of anticipation of return; and ST 4 has a discharge *without* anticipation of return.

The hypothetical resident is eligible for inclusion in the annual analysis if she/he has at least one Initiative-qualifying mega-episode that overlaps with the target year of interest (e.g., 2013). An Initiative-qualifying mega-episode (e.g., mega-EP 1 or mega-EP 2) has to meet *either* of the following criteria:

- During the mega-episode, the resident's cumulative days in facility (CDIF, not counting days in a hospital or otherwise outside the facility) have reached 101 days or more; or

- The mega-episode overlaps with an episode of care in any quarter of the year where the target assessment[4] indicates no active discharge plan (MDS Q0400A = 0).

A resident may have Initiative-related exposure periods with more than one nursing facility in a year. In rare cases, Initiative-related exposure periods in different facilities overlap, which is mostly caused by the facilities not submitting discharge assessments or not submitting them in time. These cases were dropped.

For each resident included in the annual analytic files, the Initiative-related nursing facility exposure is the total number of nursing facility days during which the resident is eligible for ECCP intervention (or would be eligible for intervention for residents in comparison facilities) during a calendar year. We use MDS and the mega-episode concept introduced above to determine Initiative-related exposure time annually for each resident. Specifically, for each resident eligible for the annual analysis, the Initiative-related exposure is the sum of days over all qualifying mega-episodes (including constituent stays and brief gaps [less than 30 days] between them) that overlap with the calendar year. For example, in the hypothetical scenario illustrated in Figure 2-2, the resident's total Initiative-related exposure time during the calendar year of interest is the sum of days spanning exposure period 1 and days covering exposure period 2.

We then identify these Initiative-eligible residents in Medicare enrollment data and determine their managed care and FFS status. Initiative-eligible residents with Medicare FFS status for at least 1 month during the calendar year of interest (through December 31 *or* the end of the person's last Initiative-qualifying mega-episode, whichever comes first) form the Medicare analytic sample for that year. Utilization of Medicare-covered services, events, and spending in each year are counted and included for annual analyses *only if* they occur during a person's Initiative-related exposure period within that year. When a resident transfers from one facility directly to another (i.e., both the end of the Initiative-related exposure period in the first facility and the start of the Initiative-related exposure period in the second facility fall on the day of transfer), we count utilization, events, and spending starting on the day of transfer toward the first facility as it is more likely to be responsible for these occurrences. This would include the entire cost of a hospital stay with an admission on that day.

We also identify the Initiative-eligible residents in the Medicaid eligibility files and Medicaid claims for analysis of Medicaid expenditure. Please see Section 2.7.3 for our methodology for processing Medicaid data.

2.7 Defining Annual Outcome Measures

All the outcome variables under evaluation are defined annually. Below, we describe in further detail how they are defined and coded in our annual analytic files. We focus on those resident-level outcome variables that are included in multivariate regression analyses while briefly discussing those outcome variables used for descriptive analyses only.

[4] The target assessment is generally the last qualifying MDS assessment in a quarter.

2.7.1 Medicare Utilization

We track and analyze the utilization of Medicare-covered services for individuals who are enrolled in FFS Medicare for at least 1 month during their Initiative-related nursing facility exposure period in each calendar year. For multivariate regression analyses, we define a series of utilization measures two ways, as either a probability or a count. For the probability model, dichotomous variables (1/0) indicate whether a resident experienced each of the following events over her/his Initiative-eligible period annually: (1) at least one hospitalization (all cause), (2) at least one potentially avoidable hospitalization, (3) at least one outpatient ED visit (that did not result in inpatient admission), and (4) at least one potentially avoidable outpatient ED visit. For the count model, we use a total count of each type of utilization events. We use the same set of conditions and diagnosis codes in defining potentially avoidable hospitalizations to identify ED visits that are potentially avoidable.

Each observation in the multivariate data is a description of a resident eligible in the analysis year. The variables indicate the person's risk factors for having an event during the year. In the probability model, the dependent variable for the observation has a value of 1 if at least one tracked event occurred in the year, while in the count model, the dependent variable corresponds to the number of events. The probability of any event and the count of events are usually related and increase/decrease together. Results from both sets of models are presented in this year's annual report and methods for modelling utilization outcomes are explained in detail in Section 2.9.

For descriptive analyses, the occurrence of multiple events is described in group-level summary measures for utilization rates, expressed as the total number of events of a given type per 1,000 person days. It should be noted that these rates are aggregated to the ECCP or comparison group level, where the numerator is the total number of events and the denominator is the sum of Initiative-eligible exposure days over all individuals in each group. These measures are reported in tables of descriptive statistics that are not adjusted for resident characteristics. We create similar utilization measures for several additional types of events or services, such as observation stays (the majority of which overlap with outpatient ED visits). We report aggregate utilization rates for these events but do not include them in multivariate regression analyses, because these are relatively rare events among residents in our sample.

2.7.2 Medicare Expenditure

We calculate and analyze expenditure measures of Medicare payments for various services for each beneficiary. Total payment is the sum of Medicare paid amounts over all types of Medicare claims with service dates that fall within that person Initiative-eligible exposure period during each calendar year. In this total, we count all Medicare payment amounts for all services included in the following types of Medicare claims: inpatient, outpatient (institutional), SNF, hospice, home health, durable medical equipment, carrier file services, and total payments for Part D drugs.

We estimate the effects of the ECCP intervention on total Medicare expenditure as well as on expenditures for certain subcategories of service utilization, including expenditures associated with all-cause hospitalizations, potentially avoidable hospitalizations, all-cause ED

visits, potentially avoidable ED visits, physician services, and SNF services. Methods for modelling expenditure outcomes are detailed in Section 2.9.

2.7.3 Medicaid Expenditure

Processing Medicaid data obtained either from states or through MSIS is complicated due to the differences in state data systems and data quality. Throughout the entire process RTI performs quality assurance checks to ensure the data are processed correctly. These checks include, but are not limited to, programming code review, comparison of within state trends for each measure, and comparison of measures and trends between states.

RTI currently processes and analyzes annual data allowing for a three month run-out period. To process the Medicaid data we perform several steps:

1. Identify nursing facility residents using the Medicaid eligibility files and Medicaid claims (individuals with at least one claim of the "long-term care nursing facility" type).

2. Match these residents to the annual finder file of Initiative-eligible residents identified from the MDS.

3. Select and pull all Medicaid claims for the residents in the ECCP and comparison facilities with a start date falling within each resident's Initiative-eligible period during each year.

4. Account for adjustment claims

5. Assign the Medicaid claims to categories analogous to the claim types used for Medicare claims.

6. Generate the count of Medicaid covered services and mean Medicaid expenditures for those services over each resident's Initiative-eligible period during each year.

7. Merge the resulting measures with the Medicare utilization and expenditure data for each resident as contained in the annual analytic file of Initiative-eligible residents who are also FFS Medicare beneficiaries.

For this report, we conducted descriptive analyses of Medicaid and Medicare expenditures on select services for Initiative-eligible residents with Medicaid coverage in Alabama during each year from 2011 to 2013. We present descriptive measures expressed as the average expenditure per beneficiary per month (PBPM) calculated from Medicaid claims, Medicare claims, and combined Medicare and Medicaid claims on select services. More details on these measures and descriptive results are provided in Section 2.10.3.

2.7.4 MDS-Based Quality Outcomes

The measures for quality outcomes fall under the overarching theme of quality measurement in health care settings. RTI selected quality outcomes using Donabedian's Structure/Process/Outcome model (1966)—the classic and most commonly used theoretical framework to evaluate health care quality. The structure, process, and outcome model suggests

three groups of indicators of the quality of care in health care settings: (1) the professional and organizational resources associated with the provision of care in care delivery settings (structure); (2) the treatments and care provided to patients (process); and (3) the patients' outcomes resulting from medical care, such as pain, infection, and functional ability (outcome).

Using this framework, RTI identifies measures both at the resident level and the facility level. These measures are listed in Table 2-1. (The detailed specifications of these measures are provided in Appendix D of RTI's final annual report for Project Year 2). This subsection focuses on resident-level MDS-based quality outcomes, and the next subsection focuses on facility-level outcomes. These measures are selected based on two major criteria: (1) whether the measure is clinically relevant to the ECCP's intervention components and the risk of potentially avoidable hospitalization, and (2) whether the measure is aligned with other CMS initiatives (e.g., Nursing Home Compare, the Nursing Home Value-Based Purchasing Demonstration [NHVBPD], and the Five-Star Quality Rating System) or initiatives in which CMS is a partner (e.g., Advancing Excellence in America's Nursing Homes).

Although we report and monitor all MDS-based measures, we include only selected measures in multivariate analyses (as indicated in the last column of Table 2-1) based on clinical relevance and feasibility for statistical modelling.

Outcome Measurement Points, Quarterly Measures, and Annual Measures. For all resident-level MDS-based quality outcomes, RTI first creates quarterly measures, which are reported in the quarterly reports, and then combines them into annual measures for the annual report. Each quarterly measure indicates whether the resident has the MDS-based outcome (e.g., pain or falls with injury) in the quarter.

In a given year, the number of quarterly measures for each outcome for each resident reflects the number of quarters observed (up to four) for the outcome for the resident. In annual analyses, our approach is to calculate the proportion of these observed quarters indicating the presence of each outcome. For example, the annual measure of pain is the proportion of quarters for each resident we observed that indicate pain. A value of 1 indicates that the resident has pain the entire year (or the fraction of the year if a resident is not a full-year resident); a value of 0 indicates no pain at any time. The same resident would be included again in the next year if he or she survived into the next year and had at least one MDS target assessment eligible for calculating quarterly measures.

We construct the annual scores for two outcomes in a different way to accommodate the way the items are reported. The MDS items used to identify oral/dental problems are active on comprehensive MDS assessments only. A resident typically has one comprehensive assessment per year and the timing of the comprehensive assessment varies by resident. Therefore, we construct the measure as with oral/dental problems on the last observable MDS assessment that has the information needed to determine oral/dental problems. For the swallowing problem, the annual measure is whether the resident has any swallowing problem on any of the observed target assessments. Swallowing problems may not be easily reversible and an annual measure specified this way avoids duplicated flagging of the same problems.

Because each resident can have between one and four observed quarters in a given year (depending on the length of resident's Initiative-related nursing facility exposure), we weight

each annual measure by the number of observed quarters divided by four (the yearly maximum number of observed quarters possible). Oral/dental problems and swallowing problems are not weighted as they have different specifications from the others (see above). The weighted annual measures are used for two purposes on the basis of two slightly different sets of residents. First, for descriptive measures, we aggregate each weighted annual score for residents who meet the MDS-based quality measure denominator criteria and do not meet the exclusion criteria (consistent with the criteria used for Nursing Home Compare), reporting them at the ECCP or comparison group level. Second, the weighted annual scores are used as dependent variables for multivariate models to estimate the effects of the ECCP intervention on MDS-based quality outcomes. When estimating the multivariate model for each outcome, we do not exclude residents who meet the exclusion criteria for that MDS-based quality outcome (i.e., those who would be excluded from descriptive measures are included in the multivariate analyses). These residents are typically excluded from the MDS-based quality measure denominators (and thus MDS-based quality measure scores) as a way of risk adjustment. Our multivariate analyses use a comprehensive list of risk adjusters for each outcome and therefore allow for inclusion of these residents.

2.7.5 Facility Staffing and Inspection Deficiency Measures

Measured approximately annually, all facility-level variables are based on periodic nursing facility inspection surveys as maintained in the CASPER system. Most facilities have at least one inspection survey in each calendar year. Some may not have a survey shown in a given year but reappear in early next year (depending on their inspection and recertification survey schedule, which is within an interval between 8 and 15 months). In such cases, we use an adjacent survey for the same facility from either the preceding or subsequent year, whichever has a survey date that is closest to July 1 of the year without a survey.

From year to year, we monitor and report total direct-care staffing levels for RNs, Licensed Practical Nurses (LPNs), and Certified Nurse Aides (CNAs), each measured in hours per resident per day. We also track several health-related deficiency citations from annual inspection surveys, including citations related to quality of care and those pertaining to quality of life as well as the total count of citations. For each, we compute a summary score per facility that reflects a weighted count of deficiency citations using a weighting scheme that is also applied in the Nursing Home Compare quality metrics. The weights are specific to the scope and severity of each deficiency type. (Specific F-tags for quality-of-care– and quality-of-life–related deficiencies and associated scope-severity weights are available in Appendix D in RTI's final annual report for Project Year 2). In addition, we compute an indicator for whether a facility received a severe type of deficiency (which causes actual or immediate jeopardy to resident health or safety) in each annual survey, defined as any deficiency citation with a grade of G or above.

As noted earlier, these measures are for descriptive analyses only and are included in ***Appendix C***. At the ECCP or comparison group level, we compute and report the average of each measure annually across all facilities in each group.

2.8 Independent Variables

The selection of covariates (i.e., independent or control variables) as risk adjusters in our final regression models is guided by literature review and is also shaped by limitations of the

administrative data used in our analyses. State-specific descriptive statistics on the final set of model covariates, including percentages for categorical variables and means and standard deviations for continuous variables, are summarized in ***Appendix B***.

Resident-level Characteristics. Selected covariates at the individual level include residents' demographic characteristics, clinical diagnoses from the MDS, and comorbidities derived from Medicare claims. Age and sex are combined to create groupings mostly by 5-year age brackets (except for the under 65 group and 95 or older group) for both sexes, with females age 65 to 69 used as the reference group. Resident's race/ethnicity is coded in three categories, including non-Hispanic White (reference category), non-Hispanic Black, and all other racial/ethnic groups.

Comorbidities are included as clustered by the CMS HCCs used in modeling Medicare costs for the MA program. These groups are clinically and cost homogeneous. They have been used to predict readmissions and mortality in the Medicare hospital quality models used for Hospital Compare. They are also being used in the CMS readmissions models for SNFs, inpatient rehabilitation facilities (IRFs), and long-term care hospitals (LTCHs). Because the number of parameters increases rapidly with the number of adjusters, we aggregate some of the HCC groups that are clinically related. For example, HCCs numbered 7 (metastatic cancer and acute leukemia), 8 (lung, upper digestive tract, and other severe cancers), 9 (lymphatic, head and neck, brain, and other major cancers), and 10 (breast, prostate, colorectal, and other cancers and tumors) are combined into a single category because all of them indicate cancers and our preliminary analysis showed that their effects on Medicare utilization and expenditures are similar. We exclude variables in a model if the number of residents with the characteristic is 0 or very small and aggregation with another variable is not appropriate.

We include two additional diagnoses documented in the MDS, for anemia (which is one of the potentially avoidable conditions for hospitalization) and dementia (Alzheimer's or other types). It should be noted that the descriptive tables in RTI's ongoing quarterly reports, we use a broad definition of dementia (or possible dementia), which includes resident with a dementia diagnosis *or* cognitive impairment based on the Brief Interview for Mental Status (BIMS) score; in that context, our intention is to be more inclusive. We discussed the pros and cons of these alternative definitions with one of our consultants on this project, Dr. Debra Saliba. According to Dr. Saliba, dementia is under-recognized and diagnoses typically under-represent the prevalence. On the other hand, an individual may have cognitive impairment, but not have dementia. Other factors could cause cognitive impairment, such as delirium, sensory deprivation, and insufficient sleep. Thus, cognitive impairment may over-represent true dementia. Dr. Saliba noted that the choice depends on the kinds of research questions or hypotheses under investigation. In the multivariate regression analyses, given our primary interest in revealing whether nursing facilities are less (or more) likely to hospitalize residents with dementia, it is appropriate to use the diagnosis as recognized dementia (which is also relatively "cleaner" than a broad measure of cognitive impairment). By this diagnosis-based definition of dementia, between just under 35 percent of residents in Nevada and close to 60 percent of residents in Alabama in our annual samples are identified with dementia (see ***Appendix B***). Also from the MDS, a summary score (range 0 to 28) measuring the degree of ADL dependence or limitations and the Body Mass Index (BMI) are included as risk adjusters.

It is important to note that all HCCs are defined using diagnoses documented in Medicare claims from the *previous* year. Thus, the HCC variables for each resident included in the 2015 annual analytic file reflect HCC values measured during 2014. Similarly, all resident-level covariates from the MDS are based on a *prior* MDS assessment roughly 90 days *before* each resident's Initiative-eligible episode began in each year. This way, we use lagged individual-level risk factors to predict current outcome variables in each year, thereby mitigating potential endogeneity in the relationship between them.

Additional individual-level characteristics as control variables in all models include the number of Initiative-eligible exposure days, an indicator for Medicare-Medicaid dual eligible status (any episode month), and an indicator for enrollment in a MA plan (any episode month). The percentage of residents with periods of dual eligibility in our data ranges from around 65 percent in Nevada to over 80 percent in New York and Pennsylvania (see ***Appendix B***). Although relatively few residents have ever enrolled in a MA plan over their Initiative-eligible exposure period, the proportion of those who have has increased over the 5-year period (consistent with national trends in the growth of Medicare-managed care penetration over time).[5] In 2015, the proportion of residents in the Initiative who have ever enrolled in a MA plan ranged from 1.2 percent in comparison facilities in Nebraska (2.4 percent in Nebraska ECCP facilities) to 16.2 percent in comparison facilities in New York (14.4 percent in New York ECCP facilities).

In the regression model, we also control for whether people are eligible for the Initiative because they have no discharge plan (MDS item Q0400A = 0). Many of the residents included in our annual samples solely by this criterion are likely short-stay residents receiving Medicare covered post-acute care in SNF following a prior hospitalization. The total Initiative-related exposure period in any given year is substantially shorter for these individuals than for other "true" long-stay residents.[6] Hence, these likely short-stay residents are observed for a substantially shorter period of time in our data relative to the rest of the residents who qualify for the Initiative by accumulating 101 or more nursing facility days. We would expect to observe a relatively lower prevalence of hospitalization among the former (likely short-stay residents) than among the latter ("true" long stayers), because individuals in the former group are at risk of hospitalization for a significantly shorter period in any given year. Unobserved case-mix differences may also exist between the two groups of residents. Therefore, it is important to control for this indicator in the regression model.

Lastly, we include an indicator for any hospice use in the 2 months *before* the start of a person's Initiative-related exposure period in each calendar year. Hospice use is identified by having any hospice claim over the specified 2-month period. Because patients who opt to receive hospice services typically forgo "curative care" rendered in acute-care settings (as required by

---

[5] In the future, we plan to run sensitivity analyses by dropping the small number of residents who are ever in an MA plan and see whether there is any significant difference in our results (little impact is expected).

[6] In 2015, for example, the average number of Initiative-eligible exposure days for residents who qualify for the Initiative because of no discharge plan was 42 days, compared with an average of 276 days for the rest of the residents who have stayed in the facility for at least 101 cumulative days. These are overall averages of all residents in each group across all seven states. SOURCE: RTI Analysis of Medicare claims data (RTI Program AV11/nhpah260).

Medicare policy), we would expect much lower hospital use among hospice patients than among others in our data.

Facility-level Characteristics. In addition to resident-level risk factors specified above, we further control for a number of facility level variables that may have an impact on hospital use and the quality of care provided nursing facility residents. Variables related to staffing include an indicator for whether the facility has a physician assistant or NP available (either on-staff or contract); total direct-care RN staffing hours per resident day (HPRD); total LPN staffing HPRD; and total CNA staffing HPRD. Variables concerning facility ownership include for-profit status and chain membership. The payer mix of residents in each facility is measured by the percentage of residents whose primary support is Medicaid and the percentage of residents whose primary support is Medicare. We also include the percentage of residents with advance directives in each facility, which is likely to influence the facility's decision to hospitalize its residents. (Controlling for the percentage does not mask the effect of the Initiative on the content of the directives, which is often *pro forma* and not resident specific). In addition, we control for whether a facility has an Alzheimer's special care unit, which is indicative of the facility's on-site capacity in managing the care for residents with dementia, which could influence hospital use by and quality of care for their residents.

A review of the summary statistics on both resident-level and facility-level variables as presented in ***Appendix B*** reveal two overarching patterns that are noteworthy. First, there are considerable differences in some of these variables between the seven states. Second, there are remarkable similarities in most of these variables between residents and facilities in the ECCP group and those in the comparison group within each state. Because we are conducting evaluation analyses within each state, these patterns reinforce our decision not to apply additional propensity score weighting at the resident level.

2.9 Statistical Methods for Multivariate Analyses

A regression-based model is used to assess the quantitative effects of the ECCP interventions. This model provides the framework for all of the secondary data analyses. The main outcome variables of interest include hospitalizations, ED visits, MDS-based quality outcomes, and Medicare expenditures.[7] All the data analyzed and presented in this report, including outcome measures and covariates, are for Initiative-eligible residents with Medicare Part A/B coverage in each analysis year. We first present the most general form of the model, followed by specifications suitable for each type of outcome variables. It is a difference-in-differences design with multiple observation periods both before the intervention period (2011 and 2012) and after (2013, 2014, 2015, as of this report).

As in our last annual report for Project Year 3, in the current report we use 2012 as the Base Year, which was the immediate pre-Initiative year and was the year of data used to match the comparison group.

[7] As noted earlier, Medicaid expenditures are not included in the multivariate models. Also, only Initiative-eligible residents with Medicare coverage are included in regression analyses.

2.9.1 Multivariate Regression Model: General Specification

We use the following equation to estimate the effect of ECCP intervention on a particular resident-level quantitative outcome Y_{ijt} (e.g., a hospital admission, Medicare spending, or MDS-based quality measure), for the i^{th} resident, in the intervention or comparison facility, *j*, during the calendar year period, t:

$$Y_{ijt} = \beta_0 + \beta_e*ECCP + \beta_x*X_{ij} + \beta_z*Z_j + \Sigma_t\beta_t*YEAR_t + \Sigma_t\beta_{et}*(ECCP*YEAR_t) + \Sigma_t\beta_{xt}*(X_{ijt}*YEAR_t) + \Sigma_t \beta_{zt}*(Z_{jt}*YEAR_t) + \varepsilon_{ijt} \quad (1)$$

The mathematical form of this equation varies according to the type of dependent variables being measured (further specified below). Using Medicare spending as an example dependent variable, we assume that spending levels and trends in each period are influenced by the nursing facility's intervention status (ECCP = 0, if comparison facility; ECCP = 1, if ECCP facility). A marker for YEAR2013 represents the first year of the intervention period, a marker for YEAR2014 indicates the second year of the intervention period, and so on. Observations in the Base Year 2012 are set as the reference category, so that the effect of ECCP intervention in each subsequent Initiative year (e.g., 2015) is assessed relative to the baseline difference between the ECCP and comparison groups in 2012. In this report, we focus on the Initiative effects in 2015 rather than the effects measured in 2013 or 2014, which were discussed in prior annual reports.

We are primarily interested in the magnitude of the effect of ECCP intervention as it reaches a high degree of implementation, by 2015. A coefficient indicating a comparative reduction in utilization and spending and increase in quality over time would be a positive finding for the Initiative. Using the standard error of the estimate of the β's, we conduct statistical tests of the null hypothesis that $\beta = 0$ versus the alternative hypothesis that $\beta \neq 0$.

The equation's intercept (β_0) is for all observations in the Base Year 2012. The general effect of time on the dependent variable is estimated by β_t*YEAR_t, which captures unobserved policy changes, payment changes, and other changes in the environment common to all providers (i.e., the effects of all other factors than the intervention itself). The term β_e*ECCP is the difference between the ECCP and comparison groups in the Base Year 2012. This difference is not attributable to the intervention. The effect of the ECCP intervention on residents is captured by $\beta_{e,t}*(ECCP*YEAR_t)$. This term indicates, as of a particular Initiative year, the difference between residents in the intervention group and residents in the comparison group after subtracting out the baseline difference between the two groups. If spending was growing at a slower (or faster) pace for residents in ECCP facilities relative to those in comparison facilities, then the term $\beta_{e,t}$ would be negative (or positive).

Resident- and facility-level characteristics that may influence the outcome are contained in the vector X_{ijt} and Z_{jt}. Included in X_{ijt} are resident characteristics, such as age, sex, and clinical characteristics. Z_{jt} are selected facility characteristics derived from data reported in CASPER (e.g., RN staffing levels, CNA staffing levels, and presence of a dementia unit). We include a common set of resident- and facility-level covariates (as described in Section 2.8) to risk adjust all the outcome measures in regression models. All these covariates are fully interacted with time, which is specified by 4 calendar year dummies for 2011, 2013, 2014, and 2015 (with year 2012 serving as the base reference period). As such, the model allows the possibility that the

effect of any risk adjuster on the outcome could vary over time. The last term ε_{ijt} in the equation is a residual term that represents error in the prediction for each individual.

The variable measuring the intervention effect could be a set of markers for the ECCPs, a set of markers for facilities, or a set of markers for intervention characteristics. However, similar markers for intervention characteristics are not available for the comparison facilities. The model would compute the effect of the interventions compared to the average of practice in the comparisons. For example, in some interventions there is special attention paid to dental care. We do not know whether any of the comparison facilities are doing the same. The average prevalence of this intervention is likely low or the ECCP would not have made a point of this. A marker for dental care would indicate the effectiveness of dental care against the average care. Another intervention characteristic is the use of the INTERACT tools or some variant thereof. Except for a list of facilities participating in a study conducted by Dr. Joseph Ouslander, we do not know how prevalent such tools are in the comparison group.[8] Such an indicator would show the effect of using the tools compared to the average practice. The challenge is the determination of the actual intervention in practice. It requires continual primary data collection over time to determine how the intervention is applied to each facility as opposed to how the intervention was planned. This question can only be answered properly after the intervention has stabilized. Within each state the effect of each intervention component cannot be separated from the effects of other components; they are applied as a whole. For these practical reasons, in our current regression models, we use the dummy variable for whether a resident resides in an ECCP participating facility or a comparison facility as a "catch-all" measure for intervention features that distinguish the ECCP facilities from comparison facilities.

Because there are correlations among observations from each facility, we correct for the "clustering" effect by accounting for the correlations in the modeling. This corrects the standard errors of the coefficients in the models and in some cases impacts the parameter estimates themselves. Furthermore, in all regression models we control for the total number of Initiative-related exposure days for each resident during each year, to account for differences across individuals in the length of time for which they are eligible for the Initiative and their outcome measures are defined.

2.9.2 Utilization Probability Models

For discrete events, such as inpatient admissions or ED visits, we use the general equation above to fit a logistic regression model that predicts the probability of the event. We employ a Generalized Estimating Equation (GEE) model approach, which is suitable for cross-sectional time series data like the data used in our analyses. Given a dichotomous outcome (0/1), the binomial distribution and the logit link function are specified. An exchangeable working correlation structure is further specified, which allows us to obtain parameter estimates and

[8] A one-time survey of comparison facilities RTI conducted in 2015 revealed that as many as 95 percent of the responding facilities reported having introduced policies or procedures intended to reduce potentially avoidable hospitalizations of long-stay residents since January 2011. The most frequently reported specific policies include hospitalization rate tracking or review (93 percent), SBAR and other forms that standardize communication (79 percent), and Stop and Watch or other tools to improve recognition of changes in condition (71 percent). The extent to which these reported programs were actually implemented is unknown. More information can be found in ***Section 3.6*** Preliminary Findings from Site Visits, Telephone Interviews, and Surveys.

standard errors that account for within-facility correlation of observations. Robust standard errors are estimated, which are valid even if the correlation structure is not exactly as specified.

Using this type of model, we estimate the effect of ECCP intervention on each of four utilization probability outcomes, namely, the probability of a resident utilizing at least one of the following events: all-cause hospitalization, potentially avoidable hospitalization, all-cause ED visit (that did not result in inpatient admission), and potentially avoidable ED visit.

2.9.3 Utilization Count Models

To account for the fact that some residents used a given type of service more than once during their Initiative-eligible period in a year, we also estimate a parallel set of models whereby the dependent variable is defined as the count of utilization events. Preliminary analysis suggested that the simple Poisson models are inadequate, given the overdispersion of the data, where counts were clustered around 0 and had limited positive spread. We use the GEE method to fit a negative binomial regression model, which is a less restrictive and more appropriate method to fit the utilization count data as it incorporates the dispersion parameter and accounts for within-facility correction. An exchangeable working correlation structure is specified, and robust standard errors are estimated, which are valid even if the correlation structure is not exactly as specified.

Using this type of model, we examine the effect of ECCP intervention on each of four utilization count outcomes, namely, the count of all-cause hospitalizations, potentially avoidable hospitalizations, all-cause ED visits (that did not result in inpatient admissions), and potentially avoidable ED visits.

2.9.4 Medicare Expenditure Models

For total Medicare expenditures, the values exceed zero in virtually all cases. To predict total Medicare spending, we employ a Generalized Linear Model (GLM) with the log link function and Gamma distribution specified, which is a widely used approach to modelling expenditure data that tend to be highly skewed. We also adjust the standard errors to account for facility-level clustering.

In addition to total Medicare spending, we also examine Medicare expenditures associated with each of the following six subcategories of service utilization: all-cause hospitalizations, potentially avoidable hospitalizations, all-cause ED visits, potentially avoidable ED visits, physician services, and SNF services. Because many residents have zero utilization and expenditure for these services, a simple GLM model is inappropriate. To overcome this issue, we employ a two-part model. The first part predicts the probability of service utilization, whereby the outcome equals 1 if a resident has any positive expenditure and 0 otherwise. The second part is conditional on having any positive expenditure and incorporates a GLM model (log link function and Gamma distribution) for service users only that predicts their expected spending. For both parts of the model, we adjust the standard errors to account for facility-level clustering. Then, using predicted values obtained from these two models, the predicted expenditure per resident is calculated by multiplying the probability of having any positive expenditure (from the part-one model) by the expected amount of expenditure (from the part-two model). At the end of this process, the two-part model yields a predicted amount of spending for all residents included in the first part of the model, including both actual users and nonusers.

We obtain and report the marginal effect (see Section 2.9.6 for details) of the ECCP intervention on each expenditure outcome in a given Initiative year (e.g., 2015), which is the difference in expected expenditures between including and not including the ECCP*(Initiative year) interaction effect in the model. This marginal effect, if negative and statistically significant, can be interpreted as the savings in expenditure achieved because of the ECCP intervention in that year. Because we expect that ECCPs have little effect on expenditures during the time the resident is hospitalized or sent to the ED, their principal savings will come from avoiding hospitalizations and ED use in the first place.

2.9.5 Models Specific to MDS-Based Quality Outcomes

The multivariate models for MDS-based quality outcomes follow the general specification of the regression model described above. These annual outcomes are created as proportion variables with values ranging from 0 to 1 (see Section 2.7.4), which can be conceptualized as a sequence of Bernoulli trials (a resident can have up to four target assessments each of which indicates presence [1] or absence [0] of each outcome). Therefore, we use a GLM model with a logit link function and the binomial distribution for these outcomes. In addition, we account for facility clustering to allow for intra-facility correlation among residents within the same facilities.

2.9.6 Estimation of Marginal Effects of ECCP Intervention

For presentation of multivariate regression model results, we calculate and report the marginal effects of ECCP intervention on each outcome in meaningful units, such as dollars or percentage points. (The estimated values of coefficients in the models are often not in understandable units.) Conceptually, the marginal effect is the effect of a change in a given predictor variable on the conditional mean of the dependent variable. In a simple linear regression model, the marginal effect for a given covariate equals the slope coefficient for that covariate (or an incremental change if a binary 1/0 variable is used). For nonlinear models, such as those in our analyses, it is not as straightforward to obtain the marginal effects in useful units; this form of an effect can be different for each observed case. Various methods exist to calculate the average marginal effects. We follow a widely adopted method to derive the average marginal effects by first computing the marginal effect for each observation with respect to a predictor variable of primary interest (which in our case is the ECCP*YR2015 interaction) and then to average it over the entire estimation sample.

Specifically, after estimating the multivariate regression model for each outcome, we generate the marginal effect for our key variable of interest: ECCP*YR2015. Using Medicare spending as an example outcome, the algorithm for calculating the marginal effect involves the following steps. First, for each observation, force the term ECCP*YR2015 to equal 1 regardless of its actual value, leave the values for all other independent variables as is, and use the inverse link function to compute the predicted amount of spending for that observation. Second, for the same observation, repeat everything in the first step except resetting ECCP*YR2015 to 0, to compute the predicted amount of spending. The difference in the two predicted spending amounts is the marginal effect for that observation. Third, repeat the two steps above for all observations in the estimation sample. As a last step, compute the average of all the marginal effects, which is the average marginal effect with respect to ECCP*YR2015. Essentially, it is comparing two populations that have exactly the same values on all the independent variables in the model except ECCP*YR2015. Because the only difference between them is being assigned

to the ECCP group in the Initiative year of 2015, the difference in their expected expenditure amounts is attributed to the effect of ECCP intervention in 2015.

Thus, the marginal effect for the interaction term ECCP*YR2015 indicates the effect of the ECCP intervention in 2015 relative to the baseline, estimated over the entire population in both the ECCP and comparison groups, after adjusting for all other covariates in the model. For a dichotomous utilization outcome, the marginal effect is the difference in the predicted probabilities of the outcome event. For a utilization count outcome, the marginal effect is the difference in the predicted counts of the outcome event. For a MDS-based quality outcome as defined above, the marginal effect is the difference in the predicted proportions of observed quarters that indicate the presence of an adverse outcome. As such, the marginal effects have more intuitive appeals than regression coefficients in illustrating the impact of ECCP intervention.

For the presentation of multivariate regression results, we report the average marginal effect of ECCP intervention on each outcome as well as its 90% confidence interval and the p-value (obtained using the delta method). Furthermore, we divide the average marginal effect for each outcome by its overall mean value over the entire population in 2015 such that the magnitude of the effect can be interpreted as a percent change from the mean value, which also facilitates comparison of effect sizes across outcomes and states.

2.10 Descriptive Analysis Results

In this section, we present summary results from descriptive analyses of key evaluation outcomes for Medicare utilization and expenditure, Medicaid expenditure, and quality measures (MDS-based and non-MDS-based). These results are aggregated to the ECCP group and comparison group level within each state, separately for each year. Descriptive statistics cannot be taken as results of an intervention. The observed trends must be understood within the context of possible changes in ECCP resident characteristics as well as each state's comparison group. The findings and trends for individual states are explored in detail using multivariate analysis which controls for resident and facility characteristics. These results are presented in Section 2.11, Multivariate Regression Results.

2.10.1 Medicare Utilization

In ***Table 2-4*** (Alabama) through ***Table 2-10*** (Pennsylvania), we report the percentage of Initiative-eligible residents who were hospitalized, visited the ED, or had an observation stay in each year—both overall and for a potentially avoidable condition. In ***Table 2-11*** (Alabama) through ***Table 2-17*** (Pennsylvania), we present the rates of utilization, expressed as the total number of events per 1,000 person-days.

Among ECCP facilities, the percent of residents who experienced at least one hospitalization ranged from 23.7 percent in Indiana to 29.3 percent in Alabama, in 2015. The percent of residents who experienced at least one potentially avoidable hospitalization ranged from 9.5 percent in Indiana to 13.1 percent in Alabama. In the same year, the mean count of hospitalizations per 1000 person-days among ECCP residents ranged from 1.5 in Pennsylvania to 2.0 in Nevada. Mean count of potentially avoidable hospitalizations per 1000 person-days ranged from 0.5 in three states (Indiana, New York and Pennsylvania) to 0.7 in Alabama.

Among comparison facilities, the percent of residents who experienced at least one hospitalization ranged from 23.7 percent in Pennsylvania to 31.3 percent in Nevada. The percent of residents who experienced at least one potentially avoidable hospitalization ranged from 10.0 percent in Pennsylvania to 15.7 percent in Alabama. Mean count of hospitalizations per 1000 person-days among comparison facility residents ranged from 1.5 in Pennsylvania to 2.3 in Nevada. Mean count of potentially avoidable hospitalizations ranged from 0.5 in Pennsylvania to 0.9 in Alabama.

These findings suggest that variation across states was greater in magnitude than the within state differences between ECCP and comparison facilities. Compared to hospitalizations, however, there was greater inter-state variation in the percentages of residents who visited the ED, which ranged from 14.8 percent in New York to 23.8 percent in Nebraska among ECCP facilities, and from 14.2 percent in New York to 25.1 percent in Alabama, among comparison facilities. In addition, the results presented above suggest that between one third and half of hospitalizations among this population of nursing home residents were potentially avoidable.

Furthermore, the descriptive analyses suggest an overall decrease over the five year observation period (2011-2015), among both ECCP and comparison facilities, in the percentage of residents who were ever hospitalized, the percentage who were ever hospitalized for a potentially avoidable condition, and the respective counts for these two outcomes. Of central importance to this evaluation of the Initiative is that in many ECCP groups, the magnitude of the reduction was greater than that in the respective comparison group. This pattern was especially clear in Indiana and Missouri. In Missouri (***Table 2-6***), the ECCP group of facilities, chosen for having high admission rates, started in 2011 with a higher percentage of residents who were hospitalized (36.1 percent overall and 20.3 percent with a potentially avoidable hospitalization) than did the comparison group (30.1 percent overall and 15.6 percent potentially avoidable). In 2015, the percentages of ECCP residents with any hospitalization and with any potentially avoidable hospitalization decreased 10.1 points and 9.2 points, to 26.0 percent and 11.1 percent, respectively. In the comparison group, corresponding percentages changed by +0.8 and by -0.6, to 30.9 percent and 15.0 percent, respectively. A similar pattern can be observed with respect to the counts of hospitalization and potentially avoidable hospitalization. The pattern of greater change in the ECCP versus the comparison group, observed in Missouri, was almost as strong in Indiana (***Table 2-5***). This pattern of the ECCP group experiencing larger reductions in these outcomes compared to the comparison group existed to varying degrees in other states as well, but to smaller degrees than was observed in Indiana and Missouri.

Finally, we note that while relatively few residents had a hospital outpatient observation stay in any given year, there is a steady increase in the use of observation stays over the 5-year period in virtually all states and all groups. In 2015, between 1.6 percent (New York) and 4.7 percent (Nevada) of ECCP residents had an observation stay; the corresponding percentages of comparison group residents ranged from 1.0 percent (New York) to 4.4 percent (Nevada). In all cases, except with respect to the ECCP facilities in Alabama and Pennsylvania, the percent of residents with an observation stay increased between 2011 and 2015. Some states saw fluctuation in the use of observation stays. For example, the percent of residents with an observation stay in the Missouri ECCP group increased from 2.5 percent in 2011 to 3.9 percent in 2012, but started decreasing afterwards.

Table 2-4
Medicare utilization: Annual percentage of residents who used each type of service, Alabama

Event	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Any hospitalization (all cause)	34.4	33.9	31.3	30.5	29.3	32.6	33.0	30.5	30.6	30.5
Any potentially avoidable hospitalization	*17.7*	*17.2*	*14.5*	*13.6*	*13.1*	*17.8*	*17.1*	*15.8*	*15.0*	*15.7*
Any ED visit (all cause)	28.7	27.2	23.6	23.4	23.7	23.7	24.0	22.8	23.5	25.1
Any potentially avoidable ED visit	*10.4*	*10.1*	*9.0*	*8.1*	*8.8*	*8.7*	*9.2*	*8.4*	*8.9*	*9.6*
Any observation stay	4.2	3.4	4.0	4.1	3.4	2.6	2.9	3.3	3.2	3.5
Any potentially avoidable observation stay	*1.3*	*1.2*	*1.3*	*1.4*	*1.3*	*0.8*	*1.0*	*1.1*	*0.9*	*1.1*
Any ED visit or observation stay (combined)	29.0	27.6	23.9	24.0	23.9	24.0	24.3	23.1	23.7	25.3
Any potentially avoidable ED visit or observation stay (combined)	*10.6*	*10.4*	*9.1*	*8.4*	*8.9*	*8.8*	*9.4*	*8.6*	*9.0*	*9.8*
N (Residents)	3,500	3,579	3,332	3,288	3,282	7,130	7,168	7,059	7,038	6,979

NOTES: ECCP = Enhanced Care and Coordination Providers; ED = Emergency Department.

SOURCE: RTI analysis of Medicare claims data (RTI program: av08/nhpah252).

Table 2-5
Medicare utilization: Annual percentage of residents who used each type of service, Indiana

Event	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Any hospitalization (all cause)	27.8	28.6	27.3	25.2	23.7	30.2	27.8	27.6	27.8	27.8
Any potentially avoidable hospitalization	*13.3*	*13.7*	*12.1*	*10.2*	*9.5*	*15.7*	*13.5*	*12.9*	*12.6*	*13.1*
Any ED visit (all cause)	21.6	19.1	18.7	18.7	17.5	24.5	23.3	22.5	23.0	20.9
Any potentially avoidable ED visit	*7.6*	*6.9*	*7.0*	*7.7*	*5.8*	*8.8*	*7.8*	*7.8*	*7.6*	*7.4*
Any observation stay	1.6	2.0	2.4	2.5	2.2	2.6	3.3	3.7	4.1	3.7
Any potentially avoidable observation stay	*0.4*	*0.5*	*0.6*	*0.7*	*0.5*	*0.9*	*0.9*	*1.2*	*1.3*	*1.1*
Any ED visit or observation stay (combined)	22.0	19.3	18.8	18.9	17.8	24.9	23.8	22.9	23.4	21.4
Any potentially avoidable ED visit or observation stay (combined)	*7.7*	*6.9*	*7.0*	*7.7*	*5.8*	*9.0*	*8.1*	*8.0*	*7.9*	*7.6*
N (Residents)	2,810	2,970	3,064	2,949	2,809	5,718	5,656	5,430	5,335	5,196

NOTES: ECCP = Enhanced Care and Coordination Providers; ED = Emergency Department.

SOURCE: RTI analysis of Medicare claims data (RTI program: av08/nhpah252).

Table 2-6
Medicare utilization: Annual percentage of residents who used each type of service, Missouri

Event	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Any hospitalization (all cause)	36.1	34.7	30.7	29.8	26.0	30.1	30.1	30.0	29.9	30.9
Any potentially avoidable hospitalization	*20.3*	*19.0*	*14.7*	*13.9*	*11.1*	*15.6*	*15.1*	*14.5*	*14.5*	*15.0*
Any ED visit (all cause)	22.7	23.7	23.3	19.9	15.4	22.6	24.4	24.7	23.3	24.5
Any potentially avoidable ED visit	*8.0*	*8.6*	*8.3*	*6.8*	*5.2*	*8.6*	*9.3*	*9.5*	*8.0*	*8.9*
Any observation stay	2.5	3.9	3.7	3.3	2.9	2.4	3.5	3.6	4.2	4.3
Any potentially avoidable observation stay	*0.6*	*1.5*	*0.9*	*0.9*	*1.1*	*0.7*	*1.1*	*1.0*	*1.3*	*1.1*
Any ED visit or observation stay (combined)	22.8	23.8	23.4	20.1	15.5	22.8	24.5	24.9	23.5	24.7
Any potentially avoidable ED visit or observation stay (combined)	*8.1*	*8.7*	*8.4*	*6.9*	*5.2*	*8.6*	*9.3*	*9.6*	*8.2*	*8.9*
N (Residents)	2,438	2,316	2,329	2,302	2,317	4,828	4,585	4,421	4,380	4,248

NOTES: ECCP = Enhanced Care and Coordination Providers; ED = Emergency Department.

SOURCE: RTI analysis of Medicare claims data (RTI program: av08/nhpah252).

Table 2-7
Medicare utilization: Annual percentage of residents who used each type of service, Nebraska

Event	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Any hospitalization (all cause)	31.9	30.9	26.7	27.4	27.8	27.6	27.3	28.0	26.7	25.6
Any potentially avoidable hospitalization	*19.0*	*15.6*	*12.7*	*11.4*	*10.9*	*15.6*	*14.9*	*13.6*	*13.4*	*11.7*
Any ED visit (all cause)	25.0	23.7	21.2	23.4	23.8	22.9	25.1	24.4	24.3	24.3
Any potentially avoidable ED visit	*8.9*	*8.1*	*7.3*	*7.8*	*8.3*	*8.4*	*8.8*	*9.2*	*8.7*	*8.7*
Any observation stay	2.1	2.2	2.3	3.0	2.6	3.2	4.4	4.2	5.1	4.2
Any potentially avoidable observation stay	*0.9*	*0.5*	*0.7*	*0.5*	*0.8*	*1.0*	*1.3*	*1.4*	*1.8*	*1.5*
Any ED visit or observation stay (combined)	25.2	23.8	21.6	23.6	24.1	23.3	25.6	24.8	24.8	24.8
Any potentially avoidable ED visit or observation stay (combined)	*9.2*	*8.1*	*7.4*	*7.9*	*8.4*	*8.8*	*9.0*	*9.3*	*9.0*	*8.9*
N (Residents)	1,637	1,594	1,555	1,478	1,238	3,610	3,375	3,309	3,211	3,186

NOTES: ECCP = Enhanced Care and Coordination Providers; ED = Emergency Department.

SOURCE: RTI analysis of Medicare claims data (RTI program: av08/nhpah252).

Table 2-8
Medicare utilization: Annual percentage of residents who used each type of service, Nevada

Event	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Any hospitalization (all cause)	28.0	29.1	28.1	27.2	27.2	31.7	30.9	28.1	28.7	31.3
Any potentially avoidable hospitalization	*12.6*	*12.5*	*11.0*	*11.3*	*9.9*	*14.5*	*14.0*	*11.6*	*11.6*	*10.8*
Any ED visit (all cause)	17.8	17.8	16.0	19.2	20.3	19.9	17.5	19.0	20.2	20.2
Any potentially avoidable ED visit	*6.2*	*6.2*	*6.2*	*7.1*	*7.7*	*8.2*	*5.7*	*7.0*	*7.0*	*7.3*
Any observation stay	2.9	3.1	3.1	3.8	4.7	3.2	4.3	4.9	5.3	4.4
Any potentially avoidable observation stay	*0.7*	*0.7*	*1.0*	*0.9*	*1.7*	*1.3*	*1.3*	*1.3*	*1.4*	*1.1*
Any ED visit or observation stay (combined)	18.0	18.1	16.2	19.4	20.5	19.9	17.7	19.1	20.6	20.3
Any potentially avoidable ED visit or observation stay (combined)	*6.3*	*6.2*	*6.2*	*7.2*	*7.8*	*8.2*	*5.8*	*7.0*	*7.1*	*7.3*
N (Residents)	3,800	3,889	3,820	3,463	3,354	2,075	2,079	2,035	1,955	1,796

NOTES: ECCP = Enhanced Care and Coordination Providers; ED = Emergency Department.

SOURCE: RTI analysis of Medicare claims data (RTI program: av08/nhpah252).

Table 2-9
Medicare utilization: Annual percentage of residents who used each type of service, New York

Event	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Any hospitalization (all cause)	34.2	32.7	30.9	28.6	27.4	32.9	30.9	29.9	28.5	27.8
Any potentially avoidable hospitalization	*15.2*	*14.1*	*12.9*	*10.6*	*10.1*	*14.5*	*13.3*	*12.4*	*11.0*	*10.8*
Any ED visit (all cause)	15.4	15.6	16.4	15.4	14.8	14.5	15.0	15.4	15.4	14.2
Any potentially avoidable ED visit	*4.8*	*4.9*	*5.2*	*4.8*	*4.9*	*4.6*	*4.6*	*5.2*	*4.9*	*4.8*
Any observation stay	0.1	0.3	0.6	1.3	1.6	0.2	0.3	0.6	0.8	1.0
Any potentially avoidable observation stay	*0.0*	*0.1*	*0.2*	*0.4*	*0.6*	*0.1*	*0.1*	*0.2*	*0.3*	*0.4*
Any ED visit or observation stay (combined)	15.4	15.6	16.4	15.5	14.8	14.5	15.0	15.4	15.4	14.2
Any potentially avoidable ED visit or observation stay (combined)	*4.8*	*4.9*	*5.2*	*4.8*	*4.9*	*4.6*	*4.6*	*5.2*	*4.9*	*4.8*
N (Residents)	8,552	7,909	7,643	7,033	6,859	13,330	12,895	12,684	11,932	11,701

NOTES: ECCP = Enhanced Care and Coordination Providers; ED = Emergency Department.

SOURCE: RTI analysis of Medicare claims data (RTI program: av08/nhpah252).

Table 2-10
Medicare utilization: Annual percentage of residents who used each type of service, Pennsylvania

Event	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Any hospitalization (all cause)	32.1	32.0	26.4	24.1	24.6	31.0	30.2	27.4	26.0	23.7
Any potentially avoidable hospitalization	*17.3*	*15.9*	*12.7*	*10.6*	*10.7*	*15.2*	*14.7*	*12.1*	*11.5*	*10.0*
Any ED visit (all cause)	24.1	22.6	19.6	20.3	20.5	22.0	21.9	21.6	20.8	19.7
Any potentially avoidable ED visit	*9.5*	*8.7*	*7.6*	*6.2*	*7.4*	*8.0*	*7.0*	*7.9*	*7.3*	*6.8*
Any observation stay	3.6	3.8	3.5	3.2	3.6	2.6	3.1	3.5	3.5	3.4
Any potentially avoidable observation stay	*1.3*	*1.3*	*1.2*	*0.8*	*1.0*	*0.6*	*0.6*	*1.0*	*1.0*	*0.9*
Any ED visit or observation stay (combined)	24.3	22.9	19.6	20.4	20.6	22.2	22.1	21.6	20.9	19.8
Any potentially avoidable ED visit or observation stay (combined)	*9.5*	*8.7*	*7.6*	*6.3*	*7.4*	*8.1*	*7.1*	*7.9*	*7.4*	*6.9*
N (Residents)	2,782	2,721	2,659	2,731	2,583	6,336	6,228	6,191	6,240	6,088

NOTES: ECCP = Enhanced Care and Coordination Providers; ED = Emergency Department.

SOURCE: RTI analysis of Medicare claims data (RTI program: av08/nhpah252).

Table 2-11
Medicare utilization rate: Number of events per 1,000 person-days, Alabama

Events	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
All-cause hospitalizations	2.2	2.2	2.0	1.8	1.8	2.1	2.2	2.0	1.9	2.0
Potentially avoidable hospitalizations	*0.9*	*0.9*	*0.7*	*0.6*	*0.7*	*0.9*	*0.9*	*0.9*	*0.8*	*0.9*
All-cause ED visits	1.8	1.8	1.5	1.3	1.4	1.4	1.5	1.4	1.4	1.6
Potentially avoidable ED visits	*0.5*	*0.5*	*0.4*	*0.4*	*0.4*	*0.4*	*0.4*	*0.4*	*0.4*	*0.5*
Observation stays	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.2
Potentially avoidable observation stays	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*
ED visits or observation stays (combined)	1.8	1.8	1.5	1.3	1.4	1.5	1.5	1.4	1.5	1.7
Potentially avoidable ED visits or observation stays (combined)	*0.5*	*0.5*	*0.4*	*0.4*	*0.4*	*0.4*	*0.5*	*0.4*	*0.4*	*0.5*
N (Residents)	3,500	3,579	3,332	3,288	3,282	7,130	7,168	7,059	7,038	6,979

NOTES: ECCP = Enhanced Care and Coordination Providers; ED = Emergency Department.

SOURCE: RTI analysis of Medicare claims data (RTI program: av08/nhpah252).

Table 2-12
Medicare utilization rate: Number of events per 1,000 person-days, Indiana

Events	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
All-cause hospitalizations	2.0	2.0	1.9	1.6	1.6	2.1	1.9	1.8	1.9	1.8
Potentially avoidable hospitalizations	*0.8*	*0.8*	*0.7*	*0.5*	*0.5*	*0.9*	*0.8*	*0.7*	*0.7*	*0.7*
All-cause ED visits	1.4	1.3	1.3	1.2	1.1	1.6	1.5	1.5	1.5	1.3
Potentially avoidable ED visits	*0.4*	*0.4*	*0.4*	*0.4*	*0.3*	*0.4*	*0.4*	*0.4*	*0.4*	*0.4*
Observation stays	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
Potentially avoidable observation stays	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.1*	*0.0*
ED visits or observation stays (combined)	1.4	1.3	1.3	1.2	1.2	1.6	1.5	1.5	1.5	1.4
Potentially avoidable ED visits or observation stays (combined)	*0.4*	*0.4*	*0.4*	*0.4*	*0.3*	*0.5*	*0.4*	*0.4*	*0.4*	*0.4*
N (Residents)	2,810	2,970	3,064	2,949	2,809	5,718	5,656	5,430	5,335	5,196

NOTES: ECCP = Enhanced Care and Coordination Providers; ED = Emergency Department.

SOURCE: RTI analysis of Medicare claims data (RTI program: av08/nhpah252).

Table 2-13
Medicare utilization rate: Number of events per 1,000 person-days, Missouri

Events	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
All-cause hospitalizations	2.8	2.5	2.1	1.9	1.7	2.1	2.0	2.0	2.0	2.1
Potentially avoidable hospitalizations	*1.2*	*1.1*	*0.8*	*0.7*	*0.6*	*0.9*	*0.8*	*0.8*	*0.8*	*0.8*
All-cause ED visits	1.5	1.5	1.4	1.1	0.9	1.5	1.5	1.6	1.4	1.6
Potentially avoidable ED visits	*0.4*	*0.5*	*0.4*	*0.3*	*0.2*	*0.5*	*0.5*	*0.5*	*0.4*	*0.5*
Observation stays	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2
Potentially avoidable observation stays	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.1*
ED visits or observation stays (combined)	1.5	1.5	1.4	1.1	0.9	1.5	1.5	1.6	1.5	1.6
Potentially avoidable ED visits or observation stays (combined)	*0.4*	*0.5*	*0.4*	*0.3*	*0.2*	*0.5*	*0.5*	*0.5*	*0.4*	*0.5*
N (Residents)	2,438	2,316	2,329	2,302	2,317	4,828	4,585	4,421	4,380	4,248

NOTES: ECCP = Enhanced Care and Coordination Providers; ED = Emergency Department.

SOURCE: RTI analysis of Medicare claims data (RTI program: av08/nhpah252).

Table 2-14
Medicare utilization rate: Number of events per 1,000 person-days, Nebraska

Events	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
All-cause hospitalizations	2.4	2.2	1.8	1.7	1.8	1.8	1.8	1.8	1.6	1.6
Potentially avoidable hospitalizations	*1.1*	*0.9*	*0.7*	*0.6*	*0.6*	*0.9*	*0.8*	*0.8*	*0.7*	*0.6*
All-cause ED visits	1.7	1.6	1.5	1.6	1.5	1.5	1.6	1.5	1.5	1.5
Potentially avoidable ED visits	*0.5*	*0.4*	*0.4*	*0.4*	*0.4*	*0.4*	*0.4*	*0.5*	*0.4*	*0.4*
Observation stays	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
Potentially avoidable observation stays	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.1*	*0.1*	*0.1*
ED visits or observation stays (combined)	1.8	1.6	1.5	1.6	1.5	1.5	1.6	1.6	1.5	1.6
Potentially avoidable ED visits or observation stays (combined)	*0.5*	*0.4*	*0.4*	*0.4*	*0.4*	*0.5*	*0.4*	*0.5*	*0.5*	*0.4*
N (Residents)	1,637	1,594	1,555	1,478	1,238	3,610	3,375	3,309	3,211	3,186

NOTES: ECCP = Enhanced Care and Coordination Providers; ED = Emergency Department.

SOURCE: RTI analysis of Medicare claims data (RTI program: av08/nhpah252).

Table 2-15
Medicare utilization rate: Number of events per 1,000 person-days, Nevada

Events	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
All-cause hospitalizations	2.2	2.3	2.2	2.1	2.0	2.4	2.4	2.1	2.1	2.3
Potentially avoidable hospitalizations	*0.9*	*0.8*	*0.7*	*0.7*	*0.6*	*0.9*	*0.9*	*0.7*	*0.7*	*0.6*
All-cause ED visits	1.4	1.4	1.3	1.5	1.6	1.4	1.3	1.3	1.4	1.4
Potentially avoidable ED visits	*0.4*	*0.4*	*0.4*	*0.5*	*0.5*	*0.5*	*0.4*	*0.4*	*0.4*	*0.4*
Observation stays	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.2
Potentially avoidable observation stays	*0.0*	*0.0*	*0.1*	*0.0*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
ED visits or observation stays (combined)	1.4	1.5	1.3	1.5	1.6	1.4	1.3	1.3	1.4	1.4
Potentially avoidable ED visits or observation stays (combined)	*0.4*	*0.4*	*0.4*	*0.5*	*0.5*	*0.5*	*0.4*	*0.4*	*0.4*	*0.4*
N (Residents)	3,800	3,889	3,820	3,463	3,354	2,075	2,079	2,035	1,955	1,796

NOTES: ECCP = Enhanced Care and Coordination Providers; ED = Emergency Department.

SOURCE: RTI analysis of Medicare claims data (RTI program: av08/nhpah252).

Table 2-16
Medicare utilization rate: Number of events per 1,000 person-days, New York

	ECCP					Comparison				
Events	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
All-cause hospitalizations	2.4	2.2	2.2	1.9	1.8	2.3	2.0	1.9	1.8	1.8
Potentially avoidable hospitalizations	*0.8*	*0.8*	*0.7*	*0.5*	*0.5*	*0.8*	*0.7*	*0.6*	*0.6*	*0.6*
All-cause ED visits	0.9	1.0	1.1	0.9	0.9	0.8	0.8	0.9	0.9	0.9
Potentially avoidable ED visits	*0.2*	*0.2*	*0.3*	*0.2*	*0.3*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*
Observation stays	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Potentially avoidable observation stays	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
ED visits or observation stays (combined)	0.9	1.0	1.1	0.9	0.9	0.8	0.8	0.9	0.9	0.9
Potentially avoidable ED visits or observation stays (combined)	*0.2*	*0.2*	*0.3*	*0.2*	*0.3*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*
N (Residents)	8,552	7,909	7,643	7,033	6,859	13,330	12,895	12,684	11,932	11,701

NOTES: ECCP = Enhanced Care and Coordination Providers; ED = Emergency Department.

SOURCE: RTI analysis of Medicare claims data (RTI program: av08/nhpah252).

Table 2-17
Medicare utilization rate: Number of events per 1,000 person-days, Pennsylvania

Events	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
All-cause hospitalizations	2.1	2.1	1.6	1.4	1.5	2.0	1.9	1.7	1.6	1.5
Potentially avoidable hospitalizations	*0.9*	*0.9*	*0.6*	*0.5*	*0.5*	*0.8*	*0.8*	*0.6*	*0.6*	*0.5*
All-cause ED visits	1.4	1.3	1.2	1.2	1.1	1.3	1.3	1.3	1.2	1.2
Potentially avoidable ED visits	*0.4*	*0.4*	*0.4*	*0.3*	*0.3*	*0.4*	*0.3*	*0.4*	*0.4*	*0.3*
Observation stays	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2
Potentially avoidable observation stays	*0.1*	*0.1*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
ED visits or observation stays (combined)	1.5	1.3	1.2	1.2	1.2	1.3	1.3	1.3	1.2	1.2
Potentially avoidable ED visits or observation stays (combined)	*0.5*	*0.4*	*0.4*	*0.3*	*0.3*	*0.4*	*0.3*	*0.4*	*0.4*	*0.3*
N (Residents)	2,782	2,721	2,659	2,731	2,583	6,336	6,228	6,191	6,240	6,088

NOTES: ECCP = Enhanced Care and Coordination Providers; ED = Emergency Department.

SOURCE: RTI analysis of Medicare claims data (RTI program: av08/nhpah252).

2.10.2 Medicare Expenditure

In ***Table 2-18*** (Alabama) through ***Table 2-24*** (Pennsylvania), we report the average Medicare expenditures incurred per beneficiary, both in total and for select subcategories of services, for the ECCP group and the comparison group. Averages are across all residents within each group, whether or not they used a service (with the exception of those with zero Medicare expenditures in a particular year; these individuals were excluded from our analyses in that year). Substantial variation in spending was seen across the states. Residents in New York had the highest levels of total Medicare expenditures in 2015 ($29,986 in the ECCP group and $27,855 in the comparison group). In 2015, total Medicare expenditures among the ECCP groups were as low as $19,858 in Missouri and in the comparison group as low as $19,615 in Nebraska. Total Medicare expenditure from 2012 (the Base Year used in the multivariate analysis) to 2015 was fairly stable in Alabama, increased in the comparison facilities in Indiana, decreased in the ECCP facilities in Missouri, increased in Nebraska, increased in the comparison facilities in Nevada, increased in New York, and decreased in Pennsylvania.

Inter-state variation also was seen in Medicare expenditures for hospitalizations and potentially avoidable hospitalizations. In 2015, average Medicare expenditure per beneficiary for all-cause hospitalizations ranged from $3,906 in Alabama to $8,628 in New York in the ECCP group, and from $3,685 in Nebraska to $8,174 in New York in the comparison group. Average Medicare expenditure per beneficiary for potentially avoidable hospitalizations ranged from $1,070 in Indiana to $1,847 in New York in the ECCP group, and from $1,023 in Pennsylvania to $1,882 in New York in the comparison group. These numbers indicate that a significant proportion of total hospitalization expenditures are for potentially avoidable hospitalizations.

Medicare expenditures for all institutional outpatient services varied across states but there seemed to be a general upward trend in all states. New York, in particular, saw an increase from $1,878 per beneficiary in 2014 to $ 2,159 in 2015 for the ECCP group, and from $ 1,542 to $1,705 for the comparison group. We note that some NY-RAH nursing facilities are changing their transfer patterns and increasingly using outpatient clinics and hospital outpatient services to deal with issues that would have been addressed as hospital inpatient services before, such as transfusions and feeding tube replacement. These new patterns of care, with the intention of reducing hospitalizations, result in an increase in Medicare expenditures for all institutional outpatient services.

In 2015, we continued to observe high levels of Medicare expenditure on SNF services. Expenditure on SNF services also varied substantially among the states, ranging from an average of $4,155 for SNF services per ECCP facility resident in Missouri to $10,003 per ECCP facility resident in New York, and from $4,898 for SNF services per comparison facility resident in Missouri to $10,054 per comparison facility resident in New York.

It is noteworthy that all states had higher average expenditure on SNF services than for average all-cause hospitalizations. It is likely that much of the SNF-related expenditure we observed is incurred by those residents who were eligible for the Initiative because of no discharge plan. As noted earlier, these are most likely short-stay residents receiving Medicare-covered SNF services.

Table 2-18
Medicare expenditure (in dollars) per beneficiary: Means (standard deviations), Alabama

Category	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Total Medicare payments	22,319	20,378	19,707	20,139	21,007	20,111	19,711	19,424	19,707	20,147
	(22,691)	(20,610)	(20,254)	(20,199)	(21,674)	(20,833)	(20,209)	(20,208)	(19,640)	(20,619)
All-cause hospitalizations	4,718	4,345	4,049	3,863	3,906	4,115	4,272	4,140	4,020	4,057
	(10,767)	(9,337)	(9,079)	(8,347)	(8,763)	(9,301)	(9,328)	(9,490)	(8,854)	(9,371)
Potentially avoidable hospitalizations	*1,551*	*1,548*	*1,236*	*1,118*	*1,196*	*1,551*	*1,577*	*1,454*	*1,339*	*1,391*
	(4,502)	(4,595)	(3,759)	(3,452)	(4,141)	(4,456)	(4,626)	(4,469)	(4,091)	(4,207)
All institutional outpatient services	1,917	1,908	1,961	2,092	2,245	1,539	1,582	1,598	1,768	1,849
	(3,953)	(4,064)	(4,564)	(4,637)	(4,273)	(3,567)	(3,632)	(3,734)	(3,832)	(3,920)
All-cause ED visits	186	178	155	151	160	135	146	141	155	162
	(422)	(446)	(408)	(398)	(461)	(344)	(368)	(381)	(419)	(432)
Potentially avoidable ED visits	*56*	*54*	*47*	*50*	*49*	*43*	*47*	*44*	*49*	*51*
	(202)	(205)	(188)	(246)	(218)	(173)	(192)	(183)	(211)	(208)
All observation stays	44	40	47	67	56	29	33	43	42	49
	(240)	(323)	(305)	(442)	(393)	(200)	(241)	(350)	(262)	(338)
Potentially avoidable observation stays	*12*	*12*	*12*	*22*	*20*	*9*	*12*	*12*	*12*	*14*
	(117)	(121)	(115)	(217)	(252)	(106)	(126)	(121)	(134)	(148)

(continued)

Table 2-18 (continued)
Medicare expenditure (in dollars) per beneficiary: Means (standard deviations), Alabama

Category	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
ED visits and observation stays combined	191	186	163	177	171	139	152	150	160	173
	(431)	(491)	(440)	(546)	(539)	(354)	(398)	(466)	(435)	(499)
Potentially avoidable ED visits and obs. stays	*57*	*56*	*49*	*55*	*54*	*44*	*49*	*46*	*50*	*54*
	(204)	(210)	(192)	(270)	(295)	(175)	(199)	(188)	(214)	(227)
SNF services	7,467	6,306	5,462	5,368	5,575	7,115	6,216	5,968	5,924	6,105
	(11,376)	(9,537)	(8,687)	(8,906)	(9,456)	(10,921)	(9,559)	(9,297)	(9,205)	(9,528)
Hospice services	1,612	1,618	1,827	2,037	2,241	1,563	1,972	1,903	1,805	1,720
	(6,443)	(6,580)	(6,960)	(7,470)	(7,933)	(6,329)	(7,559)	(7,242)	(7,238)	(6,861)
Carrier file services	2,491	2,455	2,361	2,417	2,583	2,144	2,248	2,246	2,343	2,477
	(4,814)	(4,798)	(4,673)	(4,074)	(4,660)	(4,756)	(4,437)	(3,923)	(4,111)	(4,213)
Physician services	1,223	1,182	1,125	1,228	1,278	1,171	1,200	1,170	1,179	1,190
	(1,851)	(1,947)	(1,579)	(1,915)	(2,075)	(2,886)	(2,325)	(1,740)	(1,843)	(1,786)
Durable medical equipment	251	209	210	203	193	298	259	210	191	196
	(1,074)	(972)	(992)	(1,049)	(1,083)	(1,316)	(1,250)	(1,009)	(960)	(1,000)
Part D prescription drugs	3,694	3,506	3,816	4,131	4,247	3,272	3,138	3,341	3,631	3,716
	(4,989)	(5,316)	(5,892)	(6,928)	(7,355)	(4,467)	(4,549)	(4,992)	(5,575)	(6,053)
N (Residents)	3,482	3,557	3,308	3,273	3,266	7,096	7,132	7,026	6,989	6,932

NOTES: Numbers in parentheses are standard deviations; ECCP = Enhanced Care and Coordination Providers; ED = Emergency Department; SNF = Skilled Nursing Facility; carrier file services are Part B services such as Physician and laboratory that are submitted as noninstitutional claims; durable medical equipment is in a separate file.
SOURCE: RTI analysis of Medicare claims data (RTI program: av08/nhpah252).

Table 2-19
Medicare expenditure (in dollars) per beneficiary: Means (standard deviations), Indiana

Category	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Total Medicare payments	24,590	23,811	22,987	24,754	24,611	23,038	21,407	21,462	22,688	22,995
	(25,171)	(24,680)	(23,811)	(25,448)	(25,429)	(23,651)	(22,934)	(23,037)	(23,457)	(24,146)
All-cause hospitalizations	4,332	4,721	4,340	4,306	3,988	4,092	3,917	3,971	4,121	4,165
	(11,332)	(11,860)	(11,256)	(10,740)	(10,344)	(10,031)	(9,752)	(10,279)	(9,979)	(10,070)
Potentially avoidable hospitalizations	*1,380*	*1,616*	*1,223*	*1,235*	*1,070*	*1,461*	*1,329*	*1,195*	*1,262*	*1,319*
	(5,263)	(5,561)	(4,153)	(4,718)	(4,389)	(4,705)	(4,618)	(3,986)	(4,380)	(4,228)
All institutional outpatient services	2,798	2,962	2,754	3,313	3,471	2,430	2,732	2,446	2,846	3,092
	(4,808)	(4,959)	(4,840)	(5,529)	(5,416)	(4,323)	(4,615)	(4,572)	(4,994)	(4,998)
All-cause ED visits	125	121	132	159	140	154	165	169	200	170
	(396)	(354)	(393)	(551)	(464)	(386)	(446)	(476)	(597)	(477)
Potentially avoidable ED visits	*35*	*38*	*44*	*53*	*34*	*48*	*45*	*48*	*57*	*54*
	(138)	(172)	(213)	(250)	(164)	(189)	(193)	(200)	(282)	(252)
All observation stays	27	29	44	49	49	39	61	74	87	68
	(308)	(249)	(377)	(362)	(435)	(510)	(625)	(691)	(679)	(474)
Potentially avoidable observation stays	*4*	*7*	*11*	*14*	*6*	*8*	*11*	*15*	*26*	*18*
	(62)	(95)	(149)	(193)	(88)	(99)	(122)	(158)	(477)	(261)

(continued)

Table 2-19 (continued)
Medicare expenditure (in dollars) per beneficiary: Means (standard deviations), Indiana

Category	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
ED visits and observation stays combined	138	123	145	165	156	168	194	198	225	189
	(471)	(367)	(517)	(571)	(545)	(610)	(739)	(793)	(803)	(606)
Potentially avoidable ED visits and obs. stays	*35*	*38*	*46*	*55*	*34*	*50*	*48*	*51*	*68*	*58*
	(139)	(172)	(225)	(272)	(165)	(196)	(203)	(221)	(519)	(322)
SNF services	10,431	9,330	9,122	9,149	9,270	9,085	7,547	7,397	7,571	7,351
	(14,777)	(13,118)	(12,876)	(13,708)	(14,063)	(13,383)	(11,684)	(11,745)	(12,162)	(11,793)
Hospice services	1,338	1,318	1,253	1,556	1,568	1,605	1,686	1,845	1,869	1,908
	(6,091)	(6,167)	(5,857)	(6,788)	(6,626)	(6,728)	(6,946)	(7,089)	(7,090)	(7,499)
Carrier file services	2,456	2,527	2,357	2,613	2,486	2,344	2,367	2,404	2,545	2,540
	(4,778)	(5,038)	(3,842)	(4,797)	(4,038)	(4,811)	(5,110)	(5,018)	(4,978)	(4,901)
Physician services	1,155	1,117	1,072	1,169	1,063	1,193	1,175	1,186	1,254	1,264
	(1,738)	(1,522)	(1,525)	(2,279)	(1,533)	(1,845)	(1,939)	(1,857)	(1,838)	(2,027)
Durable medical equipment	214	204	159	135	164	198	191	134	126	177
	(1,028)	(1,272)	(815)	(834)	(1,003)	(1,052)	(1,083)	(768)	(718)	(1,097)
Part D prescription drugs	2,968	2,720	2,964	3,652	3,645	3,253	2,944	3,234	3,589	3,739
	(4,584)	(4,565)	(5,273)	(6,864)	(6,916)	(4,565)	(4,232)	(4,830)	(6,344)	(7,269)
N (Residents)	2,790	2,951	3,046	2,927	2,790	5,685	5,629	5,399	5,295	5,158

NOTES: Numbers in parentheses are standard deviations; ECCP = Enhanced Care and Coordination Providers; ED = Emergency Department; SNF = Skilled Nursing Facility; carrier file services are Part B services such as Physician and laboratory that are submitted as noninstitutional claims; durable medical equipment is in a separate file.
SOURCE: RTI analysis of Medicare claims data (RTI program: av08/nhpah252).

Table 2-20
Medicare expenditure (in dollars) per beneficiary: Means (standard deviations), Missouri

Category	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Total Medicare payments	21,498	21,208	19,887	20,533	19,858	20,527	20,148	19,847	19,877	20,051
	(23,109)	(23,614)	(20,792)	(22,488)	(21,588)	(20,150)	(21,023)	(20,966)	(21,317)	(20,451)
All-cause hospitalizations	5,336	5,538	4,173	4,384	3,942	3,823	4,035	4,184	4,145	4,205
	(12,494)	(13,684)	(9,809)	(11,025)	(9,842)	(8,845)	(10,183)	(9,976)	(9,870)	(9,701)
Potentially avoidable hospitalizations	*1,955*	*1,925*	*1,403*	*1,384*	*1,162*	*1,412*	*1,436*	*1,447*	*1,392*	*1,354*
	(6,269)	(5,313)	(4,136)	(4,424)	(4,057)	(4,305)	(5,032)	(4,943)	(4,473)	(4,129)
All institutional outpatient services	1,798	1,963	1,837	2,335	2,400	2,029	2,060	1,911	2,013	2,264
	(3,961)	(4,367)	(4,932)	(7,227)	(4,902)	(4,097)	(4,080)	(4,125)	(4,338)	(4,867)
All-cause ED visits	138	156	152	142	113	151	184	196	188	204
	(358)	(400)	(411)	(422)	(381)	(404)	(483)	(577)	(528)	(590)
Potentially avoidable ED visits	*38*	*47*	*44*	*42*	*31*	*49*	*59*	*62*	*56*	*59*
	(151)	(187)	(185)	(202)	(165)	(200)	(235)	(249)	(249)	(246)
All observation stays	38	49	51	55	57	35	50	60	67	93
	(353)	(274)	(309)	(369)	(497)	(325)	(324)	(450)	(407)	(730)
Potentially avoidable observation stays	*6*	*14*	*11*	*13*	*14*	*7*	*12*	*13*	*19*	*19*
	(84)	(125)	(125)	(153)	(132)	(92)	(125)	(155)	(184)	(269)

(continued)

Table 2-20 (continued)
Medicare expenditure (in dollars) per beneficiary: Means (standard deviations), Missouri

Category	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
ED visits and observation stays combined	146	162	157	154	131	161	192	205	196	234
	(455)	(421)	(428)	(504)	(574)	(483)	(527)	(619)	(559)	(853)
Potentially avoidable ED visits and obs. stays	*39*	*48*	*44*	*42*	*32*	*49*	*60*	*63*	*57*	*63*
	(154)	(188)	(187)	(202)	(166)	(201)	(235)	(251)	(252)	(336)
SNF services	6,541	5,351	5,072	4,505	4,155	6,435	5,408	4,914	4,972	4,898
	(9,748)	(8,433)	(8,627)	(8,399)	(8,165)	(10,340)	(9,143)	(8,860)	(8,892)	(8,526)
Hospice services	2,038	2,507	2,702	2,497	2,616	3,203	3,444	3,255	2,950	2,809
	(7,481)	(8,048)	(8,209)	(7,832)	(8,165)	(9,695)	(9,934)	(9,645)	(9,120)	(8,821)
Carrier file services	2,381	2,436	2,253	2,504	2,334	1,783	1,890	1,939	1,943	1,970
	(2,967)	(3,264)	(2,658)	(2,960)	(2,870)	(2,360)	(2,509)	(2,918)	(2,508)	(2,673)
Physician services	1,459	1,466	1,264	1,374	1,316	1,061	1,100	1,154	1,139	1,157
	(2,097)	(2,518)	(1,790)	(1,977)	(2,053)	(1,687)	(1,730)	(2,377)	(1,786)	(2,015)
Durable medical equipment	150	153	103	117	84	137	146	119	120	134
	(1,052)	(1,005)	(653)	(725)	(571)	(772)	(753)	(740)	(732)	(708)
Part D prescription drugs	3,162	3,221	3,715	4,175	4,308	3,059	3,140	3,472	3,682	3,738
	(5,320)	(6,175)	(6,714)	(7,543)	(8,027)	(4,736)	(5,168)	(5,927)	(7,014)	(6,688)
N (Residents)	2,413	2,291	2,308	2,282	2,296	4,787	4,557	4,387	4,342	4,219

NOTES: Numbers in parentheses are standard deviations; ECCP = Enhanced Care and Coordination Providers; ED = Emergency Department; SNF = Skilled Nursing Facility; carrier file services are Part B services such as Physician and laboratory that are submitted as noninstitutional claims; durable medical equipment is in a separate file.
SOURCE: RTI analysis of Medicare claims data (RTI program: av08/nhpah252).

Table 2-21
Medicare expenditure (in dollars) per beneficiary: Means (standard deviations), Nebraska

Category	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Total Medicare payments	22,247	21,130	21,001	21,257	22,695	18,049	17,813	18,890	19,082	19,615
	(24,402)	(23,242)	(24,744)	(22,830)	(23,193)	(20,458)	(19,842)	(21,059)	(21,449)	(21,887)
All-cause hospitalizations	4,856	4,757	4,382	4,116	4,710	3,827	3,676	4,017	3,783	3,685
	(11,469)	(11,063)	(12,742)	(10,233)	(11,517)	(10,154)	(9,046)	(9,532)	(9,826)	(8,952)
Potentially avoidable hospitalizations	*1,993*	*1,580*	*1,213*	*1,165*	*1,320*	*1,532*	*1,348*	*1,409*	*1,339*	*1,148*
	(5,998)	(4,830)	(4,428)	(4,284)	(5,201)	(4,731)	(4,050)	(4,691)	(4,748)	(3,999)
All institutional outpatient services	2,285	2,354	2,322	2,848	2,729	1,693	2,053	2,091	2,252	2,478
	(4,511)	(4,637)	(4,851)	(5,721)	(4,910)	(3,807)	(4,449)	(4,600)	(4,654)	(5,184)
All-cause ED visits	169	153	177	213	183	175	225	224	231	213
	(465)	(436)	(575)	(678)	(520)	(568)	(642)	(637)	(648)	(572)
Potentially avoidable ED visits	*53*	*44*	*61*	*67*	*58*	*56*	*73*	*74*	*79*	*68*
	(228)	(210)	(373)	(395)	(269)	(278)	(363)	(340)	(359)	(298)
All observation stays	30	28	30	47	33	47	66	72	79	70
	(259)	(222)	(229)	(317)	(252)	(334)	(397)	(467)	(398)	(386)
Potentially avoidable observation stays	*9*	*5*	*9*	*9*	*9*	*12*	*23*	*22*	*27*	*19*
	(112)	(80)	(116)	(145)	(122)	(141)	(259)	(218)	(219)	(166)

(continued)

Table 2-21 (continued)
Medicare expenditure (in dollars) per beneficiary: Means (standard deviations), Nebraska

Category	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
ED visits and observation stays combined	173	156	180	217	185	185	238	239	242	227
	(478)	(443)	(578)	(687)	(524)	(589)	(675)	(708)	(672)	(612)
Potentially avoidable ED visits and obs. stays	*55*	*45*	*61*	*67*	*58*	*60*	*76*	*77*	*82*	*69*
	(233)	(214)	(374)	(395)	(269)	(288)	(372)	(356)	(364)	(301)
SNF services	7,741	6,792	6,430	6,607	6,473	5,574	4,587	4,974	4,840	5,040
	(12,911)	(11,070)	(10,732)	(11,121)	(10,881)	(10,068)	(8,596)	(9,247)	(9,163)	(9,443)
Hospice services	2,044	2,050	2,457	2,138	2,571	1,549	2,014	2,116	2,199	2,137
	(7,330)	(7,020)	(8,457)	(7,272)	(8,282)	(5,685)	(6,750)	(7,137)	(7,540)	(7,256)
Carrier file services	1,873	1,844	1,794	1,793	1,999	1,418	1,519	1,580	1,596	1,624
	(3,025)	(2,995)	(3,795)	(2,369)	(2,749)	(2,151)	(2,100)	(2,361)	(2,266)	(2,602)
Physician services	1,182	1,199	1,192	1,170	1,254	941	1,012	1,059	1,055	1,040
	(2,516)	(2,582)	(3,304)	(1,830)	(2,155)	(1,570)	(1,559)	(1,822)	(1,631)	(2,048)
Durable medical equipment	227	202	147	144	156	244	249	168	146	113
	(1,045)	(1,065)	(778)	(961)	(1,165)	(3,067)	(2,825)	(2,321)	(2,131)	(1,051)
Part D prescription drugs	3,199	3,099	3,440	3,580	4,025	3,719	3,697	3,928	4,255	4,525
	(4,781)	(5,382)	(6,647)	(6,054)	(7,415)	(6,152)	(6,603)	(7,502)	(8,371)	(10,384)
N (Residents)	1,622	1,572	1,535	1,458	1,224	3,565	3,335	3,262	3,172	3,140

NOTES: Numbers in parentheses are standard deviations; ECCP = Enhanced Care and Coordination Providers; ED = Emergency Department; SNF = Skilled Nursing Facility; carrier file services are Part B services such as Physician and laboratory that are submitted as noninstitutional claims; durable medical equipment is in a separate file.
SOURCE: RTI analysis of Medicare claims data (RTI program: av08/nhpah252).

Table 2-22
Medicare expenditure (in dollars) per beneficiary: Means (standard deviations), Nevada

Category	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Total Medicare payments	23,879	23,432	22,931	23,857	23,777	25,872	22,603	21,684	22,279	24,592
	(25,260)	(24,233)	(23,907)	(25,835)	(25,412)	(30,191)	(27,155)	(25,779)	(26,758)	(31,397)
All-cause hospitalizations	4,895	5,540	5,248	5,303	5,397	6,166	6,086	5,783	5,780	7,570
	(12,233)	(13,584)	(12,507)	(12,523)	(13,041)	(14,946)	(15,555)	(14,546)	(14,218)	(20,029)
Potentially avoidable hospitalizations	*1,470*	*1,588*	*1,286*	*1,401*	*1,227*	*2,006*	*1,567*	*1,332*	*1,371*	*1,401*
	(4,940)	(5,790)	(4,812)	(5,002)	(4,846)	(7,564)	(5,327)	(4,580)	(4,778)	(5,179)
All institutional outpatient services	1,263	1,419	1,213	1,564	1,574	1,367	1,569	1,505	1,620	1,589
	(3,273)	(3,508)	(3,421)	(4,039)	(4,104)	(3,416)	(4,082)	(3,991)	(3,959)	(4,324)
All-cause ED visits	140	146	160	222	234	172	196	232	265	252
	(438)	(488)	(526)	(703)	(698)	(501)	(696)	(735)	(777)	(857)
Potentially avoidable ED visits	*40*	*43*	*54*	*67*	*69*	*64*	*62*	*80*	*77*	*66*
	(218)	(244)	(288)	(334)	(333)	(298)	(350)	(407)	(378)	(313)
All observation stays	56	56	60	87	102	52	91	114	126	106
	(561)	(446)	(483)	(550)	(624)	(330)	(522)	(616)	(608)	(642)
Potentially avoidable observation stays	*9*	*11*	*16*	*17*	*25*	*21*	*26*	*29*	*32*	*22*
	(109)	(171)	(170)	(209)	(233)	(220)	(264)	(279)	(291)	(224)

(continued)

Table 2-22 (continued)
Medicare expenditure (in dollars) per beneficiary: Means (standard deviations), Nevada

Category	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
ED visits and observation stays combined	155	156	172	237	249	172	202	241	272	257
	(652)	(573)	(645)	(784)	(809)	(501)	(716)	(779)	(790)	(866)
Potentially avoidable ED visits and obs. stays	*41*	*43*	*55*	*70*	*69*	*64*	*62*	*81*	*78*	*66*
	(218)	(245)	(289)	(354)	(333)	(298)	(350)	(409)	(381)	(313)
SNF services	10,996	9,888	9,905	9,717	9,359	11,572	8,650	7,951	8,359	8,623
	(15,773)	(13,649)	(13,891)	(14,310)	(14,108)	(18,680)	(14,341)	(13,677)	(14,290)	(14,807)
Hospice services	2,032	1,898	1,689	1,588	1,263	1,648	1,602	1,737	1,287	1,043
	(8,540)	(8,290)	(7,499)	(7,070)	(6,371)	(7,530)	(7,555)	(7,935)	(6,548)	(5,391)
Carrier file services	2,229	2,387	2,449	2,789	2,940	2,551	2,488	2,503	2,707	2,974
	(2,994)	(3,408)	(2,938)	(3,601)	(3,699)	(3,402)	(3,318)	(3,354)	(3,345)	(3,755)
Physician services	1,581	1,684	1,692	1,879	1,893	1,786	1,749	1,712	1,827	1,980
	(2,439)	(2,774)	(2,307)	(2,723)	(2,694)	(2,735)	(2,582)	(2,549)	(2,487)	(2,788)
Durable medical equipment	322	255	191	166	207	374	278	208	151	193
	(1,788)	(1,306)	(1,040)	(1,221)	(935)	(1,599)	(1,210)	(1,028)	(780)	(1,010)
Part D prescription drugs	2,039	2,004	2,190	2,681	3,001	2,094	1,895	1,966	2,311	2,575
	(3,613)	(4,003)	(4,474)	(5,679)	(6,862)	(3,668)	(3,436)	(3,847)	(4,663)	(4,790)
N (Residents)	3,718	3,783	3,733	3,387	3,273	2,031	2,027	1,989	1,884	1,750

NOTES: Numbers in parentheses are standard deviations; ECCP = Enhanced Care and Coordination Providers; ED = Emergency Department; SNF = Skilled Nursing Facility; carrier file services are Part B services such as Physician and laboratory that are submitted as noninstitutional claims; durable medical equipment is in a separate file.
SOURCE: RTI analysis of Medicare claims data (RTI program: av08/nhpah252).

Table 2-23
Medicare expenditure (in dollars) per beneficiary: Means (standard deviations), New York

Category	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Total Medicare payments	29,003	28,128	29,555	29,652	29,986	27,462	25,646	26,651	26,781	27,855
	(36,338)	(36,704)	(37,401)	(36,250)	(37,753)	(35,259)	(33,770)	(33,870)	(33,473)	(34,673)
All-cause hospitalizations	10,082	9,697	9,833	8,644	8,628	9,593	8,685	8,693	8,254	8,174
	(24,064)	(24,244)	(24,154)	(21,701)	(22,497)	(24,282)	(22,046)	(21,828)	(20,577)	(20,519)
Potentially avoidable hospitalizations	*2,551*	*2,468*	*2,289*	*1,831*	*1,847*	*2,457*	*2,139*	*2,124*	*1,852*	*1,882*
	(9,251)	(8,517)	(8,609)	(6,841)	(7,448)	(9,503)	(7,878)	(8,129)	(6,777)	(7,361)
All institutional outpatient services	1,293	1,522	1,505	1,878	2,159	1,243	1,447	1,425	1,542	1,705
	(3,992)	(4,309)	(4,583)	(5,104)	(5,557)	(4,079)	(4,337)	(4,603)	(4,384)	(4,679)
All-cause ED visits	87	103	117	124	130	83	91	99	119	118
	(281)	(349)	(375)	(418)	(504)	(274)	(309)	(313)	(411)	(449)
Potentially avoidable ED visits	*25*	*31*	*35*	*36*	*43*	*23*	*25*	*30*	*34*	*35*
	(137)	(176)	(191)	(186)	(296)	(131)	(135)	(156)	(187)	(213)
All observation stays	1	3	9	22	34	2	6	11	14	22
	(25)	(70)	(129)	(206)	(317)	(57)	(130)	(232)	(172)	(243)
Potentially avoidable observation stays	*0*	*1*	*3*	*7*	*13*	*1*	*1*	*3*	*4*	*8*
	(17)	(44)	(75)	(108)	(186)	(29)	(40)	(62)	(86)	(152)

(continued)

Table 2-23 (continued)
Medicare expenditure (in dollars) per beneficiary: Means (standard deviations), New York

Category	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
ED visits and observation stays combined	87	103	117	125	130	83	92	102	119	119
	(281)	(349)	(375)	(419)	(504)	(274)	(311)	(372)	(411)	(452)
Potentially avoidable ED visits and obs. stays	*25*	*31*	*35*	*36*	*43*	*23*	*25*	*30*	*34*	*35*
	(137)	(176)	(191)	(186)	(296)	(131)	(135)	(156)	(187)	(219)
SNF services	9,048	8,506	9,505	9,920	10,003	8,998	8,010	8,910	9,191	10,054
	(15,563)	(15,380)	(16,310)	(16,683)	(16,438)	(14,930)	(13,822)	(15,040)	(15,527)	(16,371)
Hospice services	1,028	1,136	1,200	1,268	1,110	580	696	741	687	575
	(5,979)	(6,208)	(6,060)	(6,759)	(6,219)	(4,386)	(4,842)	(5,016)	(5,026)	(4,362)
Carrier file services	3,592	3,470	3,592	3,712	3,729	3,637	3,592	3,539	3,624	3,669
	(5,220)	(4,787)	(4,541)	(4,761)	(5,768)	(5,371)	(5,133)	(4,768)	(4,474)	(4,893)
Physician services	2,506	2,382	2,432	2,551	2,528	2,473	2,432	2,391	2,397	2,408
	(4,178)	(3,564)	(3,284)	(3,441)	(3,611)	(3,937)	(3,806)	(3,463)	(3,030)	(3,231)
Durable medical equipment	423	393	303	251	280	395	366	267	229	215
	(1,617)	(1,595)	(1,241)	(1,122)	(1,232)	(1,591)	(1,492)	(1,084)	(1,024)	(975)
Part D prescription drugs	3,292	3,329	3,589	3,955	4,047	2,949	2,801	3,012	3,226	3,438
	(5,863)	(6,708)	(6,896)	(9,099)	(9,617)	(4,870)	(4,912)	(5,449)	(6,745)	(8,314)
N (Residents)	8,457	7,844	7,571	6,964	6,790	13,224	12,789	12,583	11,837	11,588

NOTES: Numbers in parentheses are standard deviations; ECCP = Enhanced Care and Coordination Providers; ED = Emergency Department; SNF = Skilled Nursing Facility; carrier file services are Part B services such as Physician and laboratory that are submitted as noninstitutional claims; durable medical equipment is in a separate file. SOURCE: RTI analysis of Medicare claims data (RTI program: av08/nhpah252).

Table 2-24
Medicare expenditure (in dollars) per beneficiary: Means (standard deviations), Pennsylvania

Category	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Total Medicare payments	22,681	22,301	20,459	20,709	20,874	23,123	21,768	21,115	21,073	20,240
	(22,914)	(23,361)	(22,460)	(21,819)	(21,775)	(24,010)	(22,543)	(22,437)	(23,148)	(23,206)
All-cause hospitalizations	4,471	4,982	4,037	3,782	3,929	4,737	4,478	4,268	4,226	3,762
	(10,782)	(11,975)	(11,618)	(10,829)	(10,922)	(11,233)	(10,501)	(10,787)	(11,231)	(10,491)
Potentially avoidable hospitalizations	*1,549*	*1,784*	*1,323*	*1,027*	*1,160*	*1,556*	*1,480*	*1,280*	*1,156*	*1,023*
	(4,820)	(6,515)	(5,068)	(3,923)	(4,750)	(5,055)	(4,686)	(4,880)	(4,214)	(4,107)
All institutional outpatient services	2,940	3,156	2,781	3,052	3,537	2,601	2,867	2,554	2,879	3,023
	(4,425)	(4,942)	(4,536)	(4,514)	(5,097)	(4,252)	(4,524)	(4,158)	(4,606)	(4,713)
All-cause ED visits	165	158	159	163	159	154	170	169	169	162
	(424)	(410)	(479)	(502)	(443)	(423)	(509)	(472)	(500)	(482)
Potentially avoidable ED visits	*58*	*51*	*57*	*42*	*47*	*50*	*46*	*50*	*50*	*43*
	(255)	(209)	(249)	(204)	(217)	(220)	(243)	(219)	(234)	(202)
All observation stays	45	54	58	54	54	33	42	54	56	57
	(279)	(563)	(371)	(342)	(302)	(234)	(290)	(331)	(347)	(358)
Potentially avoidable observation stays	*19*	*15*	*19*	*12*	*15*	*8*	*9*	*13*	*16*	*14*
	(199)	(147)	(177)	(143)	(156)	(102)	(121)	(150)	(170)	(166)

(continued)

Table 2-24 (continued)
Medicare expenditure (in dollars) per beneficiary: Means (standard deviations), Pennsylvania

Category	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
ED visits and observation stays combined	170	170	165	169	165	160	173	172	175	172
	(442)	(650)	(521)	(521)	(460)	(445)	(513)	(487)	(522)	(528)
Potentially avoidable ED visits and obs. stays	*61*	*52*	*57*	*44*	*48*	*51*	*47*	*52*	*52*	*47*
	(280)	(210)	(249)	(214)	(222)	(222)	(246)	(229)	(246)	(234)
SNF services	6,932	6,049	5,475	5,584	4,837	7,469	6,270	6,186	5,961	5,502
	(11,230)	(9,908)	(9,356)	(9,883)	(9,308)	(11,952)	(10,229)	(9,891)	(9,967)	(9,556)
Hospice services	1,243	1,234	1,253	1,186	1,270	1,545	1,595	1,517	1,305	1,225
	(5,756)	(5,653)	(5,824)	(5,423)	(5,780)	(6,386)	(6,267)	(6,263)	(5,773)	(5,719)
Carrier file services	2,570	2,588	2,449	2,390	2,411	2,368	2,347	2,287	2,311	2,094
	(4,466)	(4,621)	(4,621)	(3,594)	(3,064)	(4,150)	(3,795)	(3,621)	(3,477)	(2,689)
Physician services	1,628	1,606	1,538	1,514	1,519	1,466	1,426	1,406	1,419	1,303
	(2,269)	(2,030)	(2,226)	(2,107)	(2,006)	(2,404)	(1,941)	(1,974)	(2,066)	(1,896)
Durable medical equipment	230	221	168	160	166	185	203	166	139	180
	(1,020)	(948)	(776)	(791)	(1,354)	(931)	(1,173)	(895)	(764)	(959)
Part D prescription drugs	4,262	4,057	4,282	4,538	4,713	4,188	3,989	4,120	4,235	4,440
	(5,859)	(6,176)	(6,852)	(7,531)	(7,592)	(6,734)	(7,024)	(7,850)	(8,834)	(10,390)
N (Residents)	2,752	2,694	2,630	2,704	2,540	6,286	6,190	6,144	6,189	6,030

NOTES: Numbers in parentheses are standard deviations; ECCP = Enhanced Care and Coordination Providers; ED = Emergency Department; SNF = Skilled Nursing Facility; carrier file services are Part B services such as Physician and laboratory that are submitted as noninstitutional claims; durable medical equipment is in a separate file.
SOURCE: RTI analysis of Medicare claims data (RTI program: av08/nhpah252)

The proportion of such Initiative-eligible residents varies considerably by state (see ***Appendix B***). For example, Nevada facilities had the highest proportion of residents who were eligible for the Initiative because of no discharge plan in 2015 (33.0 percent in ECCP facilities and 27.1 percent in comparison facilities). Nebraska had the lowest (14.4 percent) among ECCP facilities while Pennsylvania had the lowest (17.9 percent) among comparison facilities. The relative proportions of residents who are eligible for the Initiative because of no discharge plan may help explain the high level of SNF spending in Nevada and the low level of SNF spending in Pennsylvania.

2.10.3 Medicaid Expenditure

The section presents descriptive analyses of Medicaid and Medicare expenditures on select services for Initiative-eligible residents with Medicaid coverage in Alabama during 2011 (***Table 2-25***), 2012 (***Table 2-26***) and 2013 (***Table 2-27)***. We mapped the Medicaid claims into the same broad utilization categories as with Medicare claims. The mapping is not always straightforward, but we believe the results are reasonable. Expenditure is expressed as the average expenditure per beneficiary per month (PBPM) as calculated from Medicare claims, Medicaid claims and combined Medicare and Medicaid claims on select services. We examine expenditures separately for residents who are eligible for both Medicare and full Medicaid benefits (hereafter referred to as full duals[9]), and residents who are eligible for Medicaid but not for Medicare (hereafter referred to as Medicaid-only); we further subdivide these residents into those who are in the ECCP group and those who are in the Comparison group. For the full dual group, we present Medicare payments, Medicaid payments, and combined Medicare and Medicaid payments. For beneficiaries with Medicaid-only eligibility we report Medicaid payments only.

Expenditure is reported for both total payments and for select services. Total payment includes payments for the following types of services: inpatient, outpatient (institutional), skilled nursing facility (SNF[10]), nursing facility (NF), hospice, home health, durable medical equipment, carrier file services, and prescription drugs. Claims for NF services were paid for exclusively by Medicaid, whereas all other types of claims could be paid for by either Medicare or Medicaid or both. The subtotal of payments represents total payments excluding Medicaid NF payments.

Across all years, the total combined Medicare and Medicaid payments for the full dual group was fairly consistent, ranging from $7,268.03 (2013) to $7,698.10 (2012) in the ECCP group and $7,258.69 (2011) to $7,841.50 (2013) in the comparison group PBPM, on average. Among full duals, in both the comparison and ECCP groups for all years, Medicaid expenditures account for slightly more than half of the total combined Medicare and Medicaid payments. However, when NF claims are excluded from total expenditures, Medicaid claims account for only slightly more than 10 percent of the subtotal of combined Medicare and Medicaid payments for the full duals. The subtotal (the total payments except for NF claims) of combined Medicare and Medicaid payments PBPM on average for full duals ranges from $3,615.85 (2013) to $4,105.52 (2012) in the ECCP group and $3806.87 (2011) to $4,368.24 (2013) in the comparison group, across all years. Following NF services, SNF services and all-cause hospitalizations

---

[9] For full duals, all Medicaid payments reflect the combined total for cross-over claims (i.e., Medicaid payments for cost-sharing of Medicare covered services) and non-cross over claims (i.e., services fully paid by Medicaid).

[10] In the Alabama Medicaid data, there was no indicator for a SNF claim. However, there was an indicator for crossover claims. We therefore defined SNF claims as NF claims that were also crossover claims.

contribute the largest portions of total combined Medicare and Medicaid expenditure. Finally, among full duals, from 2011 to 2013 total and subtotal payments decreased for the ECCP group and increased for the comparison group.

In general, total expenditures were slightly higher for the Medicaid-only group than for the full dual group; total Medicaid expenditures for this group ranged from $7,527.88 (2011) to $9,256.13 (2013) in the ECCP group and $7,151.02 (2012) to $8,611.03 (2013) in the Comparison group, PBPM on average. Similar to the pattern observed in the full dual group, in the Medicaid-only group NF claims contributed a large portion of the total expenditure for both the ECCP and comparison groups. However, NF expenditures generally accounted for a slightly higher percentage of the total expenditure in the Medicaid-only group as compared to full duals, across all groups and years, ranging from just under 60 percent to just under 70 percent of the total Medicaid expenditure whereas in the full dual group NF expenditures as a percentage of total cost ranged from 44 percent to 50 percent. It follows that while total expenditure for the Medicaid-only group was higher than the total expenditure (combined Medicare and Medicaid) for the full dual group in all but one instance, the subtotal of expenditures (which excludes NF claims) tended to be slightly higher for the full dual group. For the Medicaid-only group, following NF expenditures, all-cause hospitalizations, carrier file services and prescription drugs represented the next largest contributors to the total expenditures. Finally, in the Medicaid-only group total and subtotal Medicaid expenditures were higher in the ECCP group than in the Comparison group in each year.

In the full dual group, total combined Medicaid and Medicare expenditures for all-cause hospitalizations range from $1,016.06 (2013) to $1,225.01 (2012) in the ECCP group and $1,002.98 (2011) to $1,592.90 (2013) in the comparison group, PBPM on average. Expenditures for these services follow the same pattern as total combined expenditures; that is the ECCP has slightly higher costs in 2011 and 2012 while the comparison group had higher costs in 2013. Potentially avoidable hospitalizations followed a slightly different pattern with costs for the ECCP group higher in 2012 and higher for the comparison group in the other two years. Total combined expenditure PBPM, on average, for potentially avoidable hospitalizations ranged $322.89 (2011) to $355.58 (2012) in the ECCP group and $335.38 (2012) to $476.73 (2013) in the comparison group. Expenditures for both all-cause and potentially avoidable hospitalizations among the full dual group consisted of overwhelmingly Medicare payments.

While the pattern of Medicaid and Medicare spending among full duals for both all-cause and potentially avoidable hospitalizations across all three years was relatively consistent, there was volatility in Medicaid payments for both all-cause hospitalizations and potentially avoidable hospitalizations among the Medicaid-only group. Among the Medicaid-only group all-cause hospitalization expenditures PBPM on average ranged from $717.73 (2011) to $1,369.69 (2013) in the ECCP group and $398.54 (2012) to $ 1,141.98 (2013) in the comparison group with expenditures higher for the ECCP group in each year. Similarly, expenditures on potentially avoidable hospitalizations ranged from $10.01 (2012) to $545.94 (2013) in the ECCP group and from $13.22 (2011) to $621.33 (2013) in the comparison group, with the ECCP group's expenditure lower than the comparison group's in 2012 and 2013. This instability could result in part from the small sample size in the Medicaid-only group.

Overall, ***Table 2-25*** through ***Table 2-27*** illustrate that the total combined Medicare and Medicaid payments for the full dual group and the total Medicaid payments for the Medicaid-

Table 2-25
Medicaid and Medicare expenditure (in dollars) per beneficiary per month, Full Dual and Medicaid-Only Residents: Means (standard deviations), Alabama 2011

	Full Duals						Medicaid Only	
	Medicare payments, PBPM in dollars, mean (SD)		Medicaid payments, PBPM in dollars, mean (SD)		Total combined Medicare and Medicaid payments, PBPM in dollars, mean (SD)		Medicaid payments, PBPM in dollars, mean (SD)	
Category	ECCP	Comparison	ECCP	Comparison	ECCP	Comparison	ECCP	Comparison
N (Residents)	7,479		7,479		7,479		502	
	2,513	4,966	2,513	4,966	2,513	4,966	173	329
Total payments	3,497.92 (8,139.66)	3,373.33 (7,037.17)	3,966.67 (1,521.51)	3,885.36 (1,603.06)	7,464.59 (8,174.22)	7,258.69 (6,790.81)	7,527.88 (3,929.56)	7,342.30 (6,047.72)
Subtotal of payments (no NF)	3,497.92 (8,139.66)	3,373.33 (7,037.17)	461.90 (936.51)	433.54 (838.54)	3,959.82 (8,565.29)	3,806.87 (7,287.90)	2,673.13 (4,092.79)	2,376.05 (6,103.66)
NF Services	0.00 (0.00)	0.00 (0.00)	3,504.77 (1,619.78)	3,451.82 (1,715.33)	3,504.77 (1,619.78)	3,451.82 (1,715.33)	4,854.76 (1,391.82)	4,966.26 (1,490.71)
SNF services	1,053.01 (2,340.44)	1,142.52 (2,556.09)	196.16 (531.38)	206.97 (551.84)	1,249.17 (2,696.60)	1,349.49 (2,923.84)	0.00 (0.00)	0.00 (0.00)
All-cause hospitalizations	1,059.61 (7,065.60)	952.99 (5,781.69)	55.91 (435.46)	50.00 (289.15)	1,115.52 (7,347.81)	1,002.98 (5,808.38)	717.73 (2,502.18)	657.40 (4,816.49)
Potentially avoidable hospitalizations	319.84 (1,905.46)	370.30 (4,221.58)	3.05 (46.91)	3.65 (51.17)	322.89 (1,906.46)	373.96 (4,224.92)	101.60 (596.04)	13.22 (121.59)
All institutional outpatient services	276.04 (554.57)	231.83 (590.23)	0.59 (4.57)	1.17 (35.48)	276.63 (554.62)	233.00 (591.22)	147.99 (381.96)	111.01 (235.72)
All-cause ED visits	30.56 (166.35)	21.28 (87.77)	0.11 (1.59)	0.10 (2.35)	30.67 (166.41)	21.38 (87.82)	19.83 (67.67)	18.14 (86.02)
Potentially avoidable ED visits	9.18 (56.28)	6.43 (35.61)	0.00 (0.11)	0.01 (0.31)	9.18 (56.28)	6.44 (35.61)	2.09 (8.57)	1.18 (9.78)
All observation stays	5.95 (39.22)	4.69 (49.20)	0.04 (1.13)	0.00 (0.18)	5.99 (39.41)	4.69 (49.20)	0.47 (4.92)	0.79 (9.56)
Potentially avoidable observation stays	2.20 (24.81)	1.59 (24.68)	0.00 (0.00)	0.00 (0.00)	2.20 (24.81)	1.59 (24.68)	0.00 (0.00)	0.00 (0.00)

(continued)

Table 2-25 (continued)
Medicaid and Medicare expenditure (in dollars) per beneficiary per month, Full Dual and Medicaid-Only Residents: Means (standard deviations), Alabama 2011

	Full Duals						Medicaid Only	
	Medicare payments, PBPM in dollars, mean (SD)		Medicaid payments, PBPM in dollars, mean (SD)		Total combined Medicare and Medicaid payments, PBPM in dollars, mean (SD)		Medicaid payments, PBPM in dollars, mean (SD)	
Category	ECCP	Comparison	ECCP	Comparison	ECCP	Comparison	ECCP	Comparison
ED visits and observation stays combined	31.00 (166.52)	22.48 (98.59)	0.12 (1.72)	0.10 (2.35)	31.12 (166.60)	22.58 (98.63)	19.83 (67.67)	18.14 (86.02)
Potentially avoidable ED visits and observation stays	9.31 (56.36)	6.76 (37.35)	0.00 (0.11)	0.01 (0.31)	9.31 (56.36)	6.77 (37.35)	2.09 (8.57)	1.18 (9.78)
Hospice services	226.88 (803.77)	222.67 (951.65)	138.38 (628.06)	102.28 (490.69)	365.26 (1,272.82)	324.95 (1,234.07)	240.15 (1,304.45)	129.63 (743.33)
Carrier file services	364.09 (772.66)	337.15 (707.00)	47.12 (118.01)	44.04 (131.49)	411.21 (810.02)	381.19 (738.24)	549.10 (955.18)	475.76 (1,109.39)
Physician services	168.70 (329.06)	179.09 (417.11)	9.35 (35.75)	8.63 (43.37)	178.04 (345.84)	187.72 (440.48)	252.83 (517.34)	250.39 (764.23)
Durable medical equipment	31.83 (129.56)	38.19 (150.77)	1.76 (21.01)	6.27 (104.26)	33.59 (131.75)	44.46 (182.97)	14.73 (87.97)	55.86 (373.86)
Prescription drugs	483.71 (475.93)	444.62 (422.96)	8.01 (55.26)	7.23 (43.09)	491.71 (479.22)	451.85 (425.66)	598.99 (626.27)	641.22 (1,165.31)

NOTES: SD = standard deviation; NF = nursing facility; ED = emergency department; SNF = skilled nursing facility

SOURCE: RTI analysis of Medicaid claims data (RTI program: av09/nhpah258).

Table 2-26
Medicaid and Medicare expenditure (in dollars) per beneficiary per month, Full Dual and Medicaid-Only Residents: Means (standard deviations), Alabama 2012

	Full Duals						Medicaid Only	
	Medicare payments, PBPM in dollars, mean (SD)		Medicaid payments, PBPM in dollars, mean (SD)		Total combined Medicare and Medicaid payments, PBPM in dollars, mean (SD)		Medicaid payments, PBPM in dollars, mean (SD)	
Category	ECCP	Comparison	ECCP	Comparison	ECCP	Comparison	ECCP	Comparison
N (Residents)	7,588		7,588		7,588		557	
	2,532	5,056	2,532	5,056	2,532	5,056	216	341
Total payments	3,614.60 (9,106.58)	3,480.00 (7,984.41)	4,083.50 (2,217.77)	3,873.04 (1,621.25)	7,698.10 (9,141.09)	7,353.03 (7,755.53)	8,225.55 (6,346.74)	7,151.02 (2,527.06)
Subtotal of payments (no NF)	3,614.60 (9,106.58)	3,480.00 (7,984.41)	490.91 (1,764.79)	467.22 (917.56)	4,105.52 (9,577.25)	3,947.21 (8,238.13)	2,929.96 (6,622.98)	2,207.75 (2,720.13)
NF Services	0.00 (0.00)	0.00 (0.00)	3,592.58 (1,723.19)	3,405.82 (1,722.27)	3,592.58 (1,723.19)	3,405.82 (1,722.27)	5,295.60 (1,292.34)	4,943.27 (1,197.27)
SNF services	965.88 (2,234.89)	1,056.34 (2,332.04)	209.58 (553.30)	214.22 (564.47)	1,175.46 (2,608.92)	1,270.56 (2,709.25)	0.00 (0.00)	0.00 (0.00)
All-cause hospitalizations	1,158.05 (7,724.38)	1,083.00 (6,868.47)	66.96 (583.61)	56.18 (328.50)	1,225.01 (7,865.33)	1,139.18 (6,916.97)	880.75 (5,021.43)	398.54 (1,099.76)
Potentially avoidable hospitalizations	352.12 (2,887.63)	329.70 (1,887.63)	3.47 (42.32)	5.68 (127.17)	355.58 (2,888.83)	335.38 (1,892.88)	10.01 (91.60)	15.63 (119.80)
All institutional outpatient services	283.75 (571.82)	238.56 (522.43)	0.28 (2.32)	0.48 (12.47)	284.03 (571.80)	239.05 (522.98)	134.71 (752.20)	66.34 (379.50)
All-cause ED visits	34.34 (163.47)	25.93 (138.38)	0.02 (0.44)	0.09 (4.50)	34.36 (163.47)	26.03 (138.44)	42.17 (241.28)	19.14 (58.88)
Potentially avoidable ED visits	11.13 (94.60)	9.18 (105.96)	0.00 (0.21)	0.00 (0.08)	11.13 (94.60)	9.19 (105.96)	4.35 (35.94)	5.20 (32.74)
All observation stays	6.32 (69.46)	5.70 (58.20)	0.00 (0.00)	0.06 (4.42)	6.32 (69.46)	5.77 (58.36)	0.74 (8.15)	0.21 (3.80)
Potentially avoidable observation stays	1.34 (13.02)	2.73 (47.67)	0.00 (0.00)	0.00 (0.00)	1.34 (13.02)	2.73 (47.67)	0.00 (0.00)	0.00 (0.00)

(continued)

Table 2-26 (continued)
Medicaid and Medicare expenditure (in dollars) per beneficiary per month, Full Dual and Medicaid-Only Residents: Means (standard deviations), Alabama 2012

	Full Duals						Medicaid Only	
	Medicare payments, PBPM in dollars, mean (SD)		Medicaid payments, PBPM in dollars, mean (SD)		Total combined Medicare and Medicaid payments, PBPM in dollars, mean (SD)		Medicaid payments, PBPM in dollars, mean (SD)	
Category	ECCP	Comparison	ECCP	Comparison	ECCP	Comparison	ECCP	Comparison
ED visits and observation stays combined	35.70 (167.22)	26.59 (139.17)	0.02 (0.44)	0.09 (4.50)	35.72 (167.23)	26.69 (139.23)	42.17 (241.28)	19.14 (58.88)
Potentially avoidable ED visits and observation stays	11.40 (94.86)	9.39 (106.07)	0.00 (0.21)	0.00 (0.08)	11.41 (94.86)	9.39 (106.07)	4.35 (35.94)	5.20 (32.74)
Hospice services	256.19 (914.51)	263.03 (887.42)	118.25 (547.64)	121.35 (547.59)	374.44 (1,258.71)	384.38 (1,251.07)	87.49 (648.62)	234.19 (1,204.37)
Carrier file services	435.48 (1,101.68)	369.01 (756.81)	40.54 (100.62)	40.80 (128.80)	476.01 (1,119.88)	409.81 (789.54)	667.32 (1,290.35)	530.39 (1,010.60)
Physician services	196.47 (464.41)	189.94 (386.65)	7.63 (23.81)	8.41 (47.88)	204.10 (472.97)	198.35 (416.32)	299.78 (600.29)	241.16 (488.03)
Durable medical equipment	29.29 (141.61)	36.77 (182.39)	3.23 (68.24)	4.80 (79.89)	32.52 (157.17)	41.57 (199.60)	56.27 (282.42)	24.83 (215.23)
Prescription drugs	478.97 (564.31)	429.47 (472.77)	6.99 (23.91)	7.32 (43.04)	485.96 (565.69)	436.80 (475.07)	692.68 (932.03)	627.82 (875.53)

NOTES: SD = standard deviation; NF = nursing facility; ED = emergency department; SNF = skilled nursing facility

SOURCE: RTI analysis of Medicaid claims data (RTI program: av09/nhpah258).

Table 2-27
Medicaid and Medicare expenditure (in dollars) per beneficiary per month, Full Dual and Medicaid-Only Residents: Means (standard deviations), Alabama 2013

	Full Duals						Medicaid Only	
	Medicare payments, PBPM in dollars, mean (SD)		Medicaid payments, PBPM in dollars, mean (SD)		Total combined Medicare and Medicaid payments, PBPM in dollars, mean (SD)		Medicaid payments, PBPM in dollars, mean (SD)	
Category	ECCP	Comparison	ECCP	Comparison	ECCP	Comparison	ECCP	Comparison
N (Residents)	7,486		7,486		7,486		641	
	2,437	5,049	2,437	5,049	2,437	5,049	255	386
Total payments	3,128.72 (6,471.65)	3,910.45 (21,799.51)	4,139.31 (1,953.73)	3,931.05 (1,627.13)	7,268.03 (6,626.39)	7,841.50 (21,669.99)	9,256.13 (15,506.20)	8,611.03 (23,777.55)
Subtotal of payments (no NF)	3,128.72 (6,471.65)	3,910.45 (21,799.51)	487.13 (1,347.28)	457.79 (981.59)	3,615.85 (7,003.25)	4,368.24 (21,924.04)	4,012.60 (15,620.80)	3,521.47 (23,897.88)
NF Services	0.00 (0.00)	0.00 (0.00)	3,652.18 (1,811.89)	3,473.26 (1,692.22)	3,652.18 (1,811.89)	3,473.26 (1,692.22)	5,243.53 (1,272.45)	5,089.57 (1,255.92)
SNF services[11]	754.19 (1,753.54)	1,002.15 (2,457.16)	187.69 (516.76)	218.06 (595.25)	941.88 (2,127.54)	1,220.21 (2,836.77)	8.13 (129.75)	0.88 (17.21)
All-cause hospitalizations	919.38 (5,191.49)	1,531.90 (20,625.74)	96.68 (1,045.34)	61.00 (504.45)	1,016.06 (5,484.96)	1,592.90 (20,665.13)	1,369.69 (8,302.74)	1,141.98 (11,774.28)
Potentially avoidable hospitalizations	323.30 (4,156.84)	472.83 (12,868.84)	3.03 (33.07)	3.90 (49.60)	326.33 (4,157.43)	476.73 (12,868.97)	545.94 (7,258.49)	621.33 (11,528.17)
All institutional outpatient services	288.78 (619.15)	245.08 (550.57)	0.18 (2.53)	0.11 (1.50)	288.95 (619.14)	245.19 (550.54)	81.51 (257.19)	81.33 (419.51)

(continued)

[11] In the Alabama Medicaid data, there was no indicator for a SNF claim; we therefore defined SNF claims as NF claims that were also crossover claims. Thus, all SNF claims in the Alabama Medicaid data were crossover claims for dual eligibles and there should be no SNF payments for the Medicaid-only group. However, we see some small average PBPM for SNF services in 2013 for the Medicaid-only group. This is likely due to data error for example, one or more residents may have been dual eligibles whom RTI was unable to identify in our Medicare analytic file or some claims in the Alabama Medicaid data may have been erroneously marked as crossover claims.

Table 2-27 (continued)
Medicaid and Medicare expenditure (in dollars) per beneficiary per month, Full Dual and Medicaid-Only Residents: Means (standard deviations), Alabama 2013

	Full Duals						Medicaid Only	
	Medicare payments, PBPM in dollars, mean (SD)		Medicaid payments, PBPM in dollars, mean (SD)		Total combined Medicare and Medicaid payments, PBPM in dollars, mean (SD)		Medicaid payments, PBPM in dollars, mean (SD)	
Category	ECCP	Comparison	ECCP	Comparison	ECCP	Comparison	ECCP	Comparison
All-cause ED visits	28.82 (222.11)	24.40 (129.36)	0.01 (0.17)	0.00 (0.14)	28.82 (222.11)	24.40 (129.36)	36.05 (199.46)	18.85 (56.95)
Potentially avoidable ED visits	9.94 (183.99)	6.54 (34.94)	0.00 (0.02)	0.00 (0.00)	9.94 (183.99)	6.54 (34.94)	8.72 (102.76)	6.44 (35.96)
All observation stays	5.50 (36.72)	5.21 (42.73)	0.00 (0.00)	0.00 (0.00)	5.50 (36.72)	5.21 (42.73)	2.14 (17.09)	0.30 (3.61)
Potentially avoidable observation stays	1.32 (12.97)	1.40 (18.02)	0.00 (0.00)	0.00 (0.00)	1.32 (12.97)	1.40 (18.02)	0.76 (8.86)	0.19 (2.79)
ED visits and observation stays combined	29.72 (222.68)	25.29 (131.75)	0.01 (0.17)	0.00 (0.14)	29.73 (222.68)	25.29 (131.75)	36.21 (199.44)	18.85 (56.95)
Potentially avoidable ED visits and observation stays	10.07 (184.02)	6.75 (35.47)	0.00 (0.02)	0.00 (0.00)	10.07 (184.02)	6.75 (35.47)	8.77 (102.76)	6.44 (35.96)
Hospice services	265.37 (861.87)	266.51 (879.43)	119.02 (529.67)	99.49 (460.55)	384.38 (1,208.71)	366.01 (1,183.46)	83.00 (754.18)	119.25 (748.41)
Carrier file services	377.41 (849.33)	390.32 (1,144.11)	47.11 (99.38)	45.00 (117.21)	424.52 (891.08)	435.31 (1,168.28)	675.12 (1,111.32)	565.70 (977.90)
Physician services	173.75 (337.05)	206.20 (792.31)	16.17 (42.24)	15.41 (55.05)	189.92 (362.62)	221.61 (811.37)	358.96 (727.90)	293.19 (508.96)
Durable medical equipment	28.65 (134.99)	31.09 (139.65)	3.38 (107.48)	2.62 (31.59)	32.03 (172.64)	33.70 (143.73)	58.44 (295.26)	27.16 (171.88)
Prescription drugs	494.03 (566.07)	441.92 (490.79)	3.64 (35.88)	2.95 (20.91)	497.67 (566.77)	444.87 (491.41)	725.38 (1,235.33)	606.99 (742.39)

NOTES: SD = standard deviation; NF = nursing facility; ED = emergency department; SNF = skilled nursing facility

SOURCE: RTI analysis of Medicaid claims data (RTI program: av09/nhpah258).

only group are largely driven by NF expenditures, which account for a slightly larger percentage of the total costs in the Medicaid-only group than in the full dual group. Total costs were slightly higher for the Medicaid-only group overall, however, when NF claims were excluded subtotal costs were higher among the full dual group. Among full duals, average "total payments" PBPM for all services were primarily driven by Medicare payments with Medicaid paying only a small portion of the service, with the notable exception of NF payments which are exclusively from Medicaid.

2.10.4 MDS-Based Quality Outcomes

The annual measure scores related to MDS-based quality outcomes are summarized for each state, by ECCP and comparison facilities, in ***Table 2-28*** (Alabama) through ***Table 2-34*** (Pennsylvania). As with previous years, the scores for most measures varied substantially across states. For example, in New York in 2015, self-report of moderate to severe pain was indicated in 2.6 percent of observed quarters for residents in the ECCP facilities and 3.0 percent of observed quarters for those in the comparison facilities. The scores were 12.5 percent for the ECCP facilities and 13.3 percent for the comparison facilities in Nebraska. Large inter-state variation was also seen for the depression symptom measure. In 2015, depression symptoms were present in about 1.6 percent of observed quarters for residents in the ECCP facilities in Alabama and about 1.8 percent of observed quarters for residents in the comparison facilities. The scores were 17.5 percent for the ECCP facilities and 10.5 percent for the comparison facilities in Indiana. The inter-state variation may indicate the variation in quality of care, but could also be caused by cross-state differences in recognizing and assessing residents' symptoms.

For many measures, the scores differed across the ECCP and the comparison facilities within the same states. For example, in 2015, the score for "experienced one or more falls with injury" was about 13 percent higher (indicating poorer quality of care) in the comparison facilities than the ECCP facilities in Nebraska. On the other hand, the score was about 38 percent lower (indicating better quality of care) in the comparison facilities than the ECCP facilities in Nevada. These patterns are consistent with those in previous years. The difference in scores between the ECCP and the comparison facilities is somewhat expected because the set of comparison facilities was not matched on every individual measure of quality of care. Our multivariate analysis uses a difference-in-differences design and controls for a comprehensive list of covariates (which addresses the baseline differences between the ECCP and the comparison facilities) and allows for the examination of the effect of the ECCP intervention on MDS-based quality outcomes.

From 2011 to 2015, some measures showed overall quality improvement in both the ECCP and the comparison facilities in all the states with minimal fluctuations, such as use of physical restraints and antipsychotic medications. Other measures increased in some states, declined in some, and fluctuated in others. For example, the measure for receiving hospice care increased (indicating possible quality improvement) in Alabama ECCP facilities, fluctuated (increased from 2011 to 2013, decreased from 2013 to 2014, and increased from 2014 to 2015) in Nebraska, and decreased (indicating possible quality decline) in Nevada facilities. The effect of the ECCP on MDS-based quality outcomes, adjusting for resident and facility characteristics, is examined in detail in Section 2.11, Multivariate Regression Results.

Table 2-28
MDS-based quality outcomes: Percent of observed quarters with each outcome, Alabama

Measure	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Assessed and appropriately given the seasonal flu vaccine	95.0	94.9	95.4	93.3	92.5	91.9	93.3	93.1	92.8	90.9
Assessed and appropriately given the pneumococcal vaccine	97.3	96.7	95.8	93.3	93.5	86.9	89.4	92.8	93.2	91.6
Have/had a catheter inserted and left in bladder	3.3	3.4	3.3	2.6	2.7	3.3	3.1	2.9	2.8	2.7
Were physically restrained	0.6	0.6	0.5	0.4	0.3	1.1	1.1	0.8	0.6	0.5
Received an antipsychotic medication	28.0	25.5	21.8	21.6	19.0	28.9	27.3	23.9	22.9	20.9
Experienced one or more falls with injury	10.3	11.4	11.3	10.9	12.6	10.5	10.9	11.4	11.8	11.9
Self-report moderate to severe pain	10.2	6.6	8.6	7.7	7.0	7.9	7.1	5.8	5.8	6.4
Pressure ulcers of high-risk residents only[1]	3.9	3.7	3.6	4.0	4.6	5.0	4.6	4.8	4.2	4.8
Need for help with Activities of Daily Living has increased	13.6	13.2	14.6	13.4	14.6	15.0	14.0	13.8	13.7	14.2
Urinary tract infection	4.3	4.1	4.5	3.6	4.3	4.7	4.8	4.9	4.6	4.1
With depressive symptoms	3.0	2.3	1.6	1.5	1.6	2.9	2.5	1.8	1.9	1.8
Lost control of bowel or bladder of low-risk residents only[2]	36.9	40.5	42.1	42.3	40.0	36.5	39.8	42.9	42.3	42.2
Lost too much weight	6.6	6.7	8.7	6.7	8.0	7.3	7.8	8.3	8.2	9.2
Receiving hospice care	5.3	5.5	6.5	7.0	7.2	5.1	6.4	6.2	6.1	6.3
With oral/dental problems[3]	14.7	13.5	13.9	17.3	17.9	17.6	16.4	17.8	17.3	16.5
With swallowing disorder[4]	6.4	4.0	3.8	4.5	4.3	9.4	7.3	7.5	7.9	6.3
N (Residents)	3,466	3,533	3,329	3,280	3,275	7,064	7,089	7,049	7,019	6,961

NOTES: The outcomes are reported for residents included in the measure denominators (see ***Appendix D*** of the 2014 annual report for the specifications for denominators and exclusions). The N reflects total number of Initiative-eligible residents in annual analytic samples.

[1] High risk is defined as one or more of the following: impaired bed mobility; impaired transfer function; comatose; or malnutrition or at risk of malnutrition.

[2] Low risk is defined as ALL of the following are absent: severe cognitive impairment; totally dependent in bed mobility; totally dependent in transfer; and totally dependent in locomotion on unit.

[3] With oral/dental problems on the last observable MDS assessment.

[4] With swallowing disorder on at least one observed MDS assessment.

SOURCE: RTI analysis of MDS assessment data (RTI program: jw14/models_5years-qm_means-mv_5years_means_2011_2015).

Table 2-29
MDS-based quality outcomes: Percent of observed quarters with each outcome, Indiana

Measure	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Assessed and appropriately given the seasonal flu vaccine	84.0	80.1	83.9	92.1	93.4	89.6	87.0	86.6	90.8	91.6
Assessed and appropriately given the pneumococcal vaccine	87.8	86.7	88.7	92.6	95.2	87.3	88.4	86.6	88.6	91.8
Have/had a catheter inserted and left in bladder	3.7	4.3	4.3	3.8	3.2	5.4	4.8	3.8	3.4	2.9
Were physically restrained	1.2	0.7	0.6	0.5	0.4	0.7	0.5	0.4	0.5	0.4
Received an antipsychotic medication	21.7	20.7	17.5	15.9	14.9	21.9	20.9	18.3	16.7	15.3
Experienced one or more falls with injury	11.1	12.1	12.2	13.7	15.4	11.5	12.6	13.2	13.8	13.7
Self-report moderate to severe pain	9.1	8.2	7.4	6.1	3.9	8.9	8.8	8.3	7.4	6.1
Pressure ulcers of high-risk residents only[1]	7.2	5.1	5.9	5.7	5.4	6.2	5.6	4.9	4.9	4.8
Need for help with Activities of Daily Living has increased	21.4	18.0	15.5	14.9	12.6	20.4	18.3	15.5	15.6	14.4
Urinary tract infection	4.9	4.2	4.7	3.5	2.8	5.9	5.0	5.4	4.0	3.6
With depressive symptoms	4.1	4.8	7.3	14.7	17.5	5.7	5.4	7.8	9.0	10.5
Lost control of bowel or bladder of low-risk residents only[2]	50.3	53.3	58.4	58.4	61.1	55.8	56.0	58.4	59.3	61.2
Lost too much weight	9.1	7.1	9.6	8.3	8.8	7.3	7.1	7.7	7.2	7.3
Receiving hospice care	4.6	4.2	4.4	5.2	5.5	5.2	5.6	6.2	6.2	5.8
With oral/dental problems[3]	7.2	5.1	7.3	7.9	12.2	5.6	7.4	8.8	9.2	9.3
With swallowing disorder[4]	10.3	5.4	5.5	5.6	5.0	5.7	5.0	3.9	4.1	6.2
N (Residents)	2,742	2,907	3,053	2,938	2,802	5,623	5,560	5,396	5,320	5,182

NOTES: The outcomes are reported for residents included in the measure denominators (see ***Appendix D*** of the 2014 annual report for the specifications for denominators and exclusions). The N reflects total number of Initiative-eligible residents in annual analytic samples.

[1] High risk is defined as one or more of the following: impaired bed mobility; impaired transfer function; comatose; or malnutrition or at risk of malnutrition.

[2] Low risk is defined as ALL of the following are absent: severe cognitive impairment; totally dependent in bed mobility; totally dependent in transfer; and totally dependent in locomotion on unit.

[3] With oral/dental problems on the last observable MDS assessment.

[4] With swallowing disorder on at least one observed MDS assessment.

SOURCE: RTI analysis of MDS assessment data (RTI program: jw14/models_5years-qm_means-mv_5years_means_2011_2015).

Table 2-30
MDS-based quality outcomes: Percent of observed quarters with each outcome, Missouri

Measure	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Assessed and appropriately given the seasonal flu vaccine	86.2	90.7	93.0	95.6	94.3	92.3	91.8	92.5	92.1	91.7
Assessed and appropriately given the pneumococcal vaccine	86.5	83.2	84.4	89.8	89.1	88.7	91.3	90.3	89.6	89.5
Have/had a catheter inserted and left in bladder	4.0	3.0	2.2	2.7	4.1	3.2	3.4	2.4	2.8	3.2
Were physically restrained	2.7	1.7	1.2	0.9	0.5	1.5	0.9	0.6	0.4	0.2
Received an antipsychotic medication	18.5	18.6	17.1	15.2	13.9	24.2	24.1	21.6	19.5	19.0
Experienced one or more falls with injury	13.2	16.5	14.6	16.7	17.1	14.8	15.5	13.9	15.6	16.1
Self-report moderate to severe pain	12.6	11.5	9.7	7.5	6.2	13.5	11.6	11.0	10.9	9.4
Pressure ulcers of high-risk residents only[1]	7.5	6.7	5.2	5.2	4.9	6.9	6.8	6.0	6.0	6.3
Need for help with Activities of Daily Living has increased	13.3	14.2	13.7	13.6	13.3	14.3	14.2	14.6	13.5	15.7
Urinary tract infection	8.4	7.7	7.7	7.4	5.6	8.0	8.5	6.9	6.5	6.3
With depressive symptoms	6.5	4.7	4.0	2.6	1.7	7.0	6.4	4.9	3.2	3.1
Lost control of bowel or bladder of low-risk residents only[2]	38.5	36.1	37.3	36.9	41.9	36.0	36.7	33.9	34.0	35.2
Lost too much weight	6.6	6.3	7.4	6.4	6.7	7.4	7.0	8.0	7.6	7.2
Receiving hospice care	6.5	8.4	8.3	8.1	8.3	11.1	11.5	11.2	10.2	10.2
With oral/dental problems[3]	6.5	5.7	6.7	4.7	3.3	16.1	13.0	13.8	11.5	11.6
With swallowing disorder[4]	9.7	8.7	7.4	7.3	4.7	11.4	10.0	10.0	8.6	8.1
N (Residents)	2,407	2,288	2,320	2,296	2,313	4,765	4,515	4,406	4,366	4,231

NOTES: The outcomes are reported for residents included in the measure denominators (see ***Appendix D*** of the 2014 annual report for the specifications for denominators and exclusions). The N reflects total number of Initiative-eligible residents in annual analytic samples.

[1] High risk is defined as one or more of the following: impaired bed mobility; impaired transfer function; comatose; or malnutrition or at risk of malnutrition.

[2] Low risk is defined as ALL of the following are absent: severe cognitive impairment; totally dependent in bed mobility; totally dependent in transfer; and totally dependent in locomotion on unit.

[3] With oral/dental problems on the last observable MDS assessment.

[4] With swallowing disorder on at least one observed MDS assessment.

SOURCE: RTI analysis of MDS assessment data (RTI program: jw14/models_5years-qm_means-mv_5years_means_2011_2015).

Table 2-31
MDS-based quality outcomes: Percent of observed quarters with each outcome, Nebraska

Measure	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Assessed and appropriately given the seasonal flu vaccine	88.9	92.8	89.5	90.2	91.3	93.6	93.3	92.9	91.1	91.7
Assessed and appropriately given the pneumococcal vaccine	82.7	82.6	82.2	84.7	85.1	92.1	93.6	94.3	93.6	91.6
Have/had a catheter inserted and left in bladder	5.5	5.1	4.2	4.0	3.7	7.1	5.9	5.2	5.5	4.7
Were physically restrained	0.6	0.5	0.1	0.0	0.1	0.9	0.4	0.3	0.1	0.1
Received an antipsychotic medication	20.8	20.9	19.5	20.1	20.1	25.2	24.9	25.7	24.6	23.4
Experienced one or more falls with injury	11.3	10.8	11.4	11.8	12.2	14.6	13.9	13.4	13.3	13.8
Self-report moderate to severe pain	16.5	13.8	12.8	14.3	12.5	16.0	14.5	14.4	13.4	13.3
Pressure ulcers of high-risk residents only[1]	6.0	5.2	5.8	4.6	4.1	4.5	4.3	3.2	4.2	4.4
Need for help with Activities of Daily Living has increased	15.9	16.6	16.7	18.3	17.6	15.4	16.0	15.9	16.1	16.2
Urinary tract infection	7.8	8.0	7.0	6.1	6.2	8.4	7.8	7.0	6.1	5.2
With depressive symptoms	8.5	7.1	6.2	5.3	5.9	9.4	8.0	7.6	7.6	6.8
Lost control of bowel or bladder of low-risk residents only[2]	42.8	51.7	51.4	52.1	53.6	41.9	42.8	42.7	44.7	47.2
Lost too much weight	7.3	6.2	5.8	5.3	6.0	6.3	7.3	6.3	6.4	6.0
Receiving hospice care	7.3	7.6	8.1	7.5	9.7	7.1	8.3	8.4	8.3	8.2
With oral/dental problems[3]	17.6	17.3	16.6	18.4	14.6	15.4	15.8	16.5	13.9	10.7
With swallowing disorder[4]	14.6	10.3	8.5	6.3	6.9	16.6	15.8	12.3	12.8	12.7
N (Residents)	1,602	1,546	1,553	1,477	1,238	3,563	3,322	3,303	3,202	3,181

NOTES: The outcomes are reported for residents included in the measure denominators (see ***Appendix D*** of the 2014 annual report for the specifications for denominators and exclusions). The N reflects total number of Initiative-eligible residents in annual analytic samples.

[1] High risk is defined as one or more of the following: impaired bed mobility; impaired transfer function; comatose; or malnutrition or at risk of malnutrition.

[2] Low risk is defined as ALL of the following are absent: severe cognitive impairment; totally dependent in bed mobility; totally dependent in transfer; and totally dependent in locomotion on unit.

[3] With oral/dental problems on the last observable MDS assessment.

[4] With swallowing disorder on at least one observed MDS assessment.

SOURCE: RTI analysis of MDS assessment data (RTI program: jw14/models_5years-qm_means-mv_5years_means_2011_2015).

Table 2-32
MDS-based quality outcomes: Percent of observed quarters with each outcome, Nevada

Measure	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Assessed and appropriately given the seasonal flu vaccine	82.2	78.9	86.2	84.1	86.7	94.0	90.1	90.9	89.8	88.1
Assessed and appropriately given the pneumococcal vaccine	85.5	82.3	83.0	77.7	80.2	93.5	93.5	94.7	91.9	89.4
Have/had a catheter inserted and left in bladder	6.8	6.2	6.0	5.1	5.3	8.3	8.6	7.5	6.8	6.2
Were physically restrained	0.9	1.4	1.0	0.5	0.7	4.1	1.8	0.9	0.9	0.4
Received an antipsychotic medication	21.7	20.7	19.5	19.0	18.4	22.8	23.9	22.6	19.8	19.4
Experienced one or more falls with injury	10.3	10.0	10.1	11.4	12.4	12.3	9.2	7.2	7.1	7.8
Self-report moderate to severe pain	11.8	12.1	11.6	13.2	13.5	15.2	13.2	12.7	10.2	10.1
Pressure ulcers of high-risk residents only[1]	7.0	6.8	6.0	6.8	6.6	9.2	8.9	7.4	6.5	6.1
Need for help with Activities of Daily Living has increased	18.5	17.1	17.0	16.5	16.4	21.3	18.9	16.9	16.7	18.8
Urinary tract infection	8.5	7.8	6.7	6.0	5.1	9.3	7.5	5.5	5.6	4.6
With depressive symptoms	4.3	4.4	4.4	3.5	2.0	3.6	5.1	4.8	2.8	2.1
Lost control of bowel or bladder of low-risk residents only[2]	54.2	55.2	57.6	61.7	57.1	47.3	48.4	49.9	47.8	48.7
Lost too much weight	7.1	7.3	6.9	6.5	6.9	6.7	6.6	4.9	5.6	4.8
Receiving hospice care	6.5	6.3	5.6	5.1	4.4	5.4	5.5	5.1	3.7	3.4
With oral/dental problems[3]	8.7	10.1	8.5	11.2	10.0	18.3	14.1	13.8	11.3	6.7
With swallowing disorder[4]	10.2	10.8	10.7	11.4	9.5	10.8	6.8	4.7	4.8	4.5
N (Residents)	3,768	3,844	3,791	3,428	3,314	2,075	2,061	2,026	1,949	1,791

NOTES: The outcomes are reported for residents included in the measure denominators (see ***Appendix D*** of the 2014 annual report for the specifications for denominators and exclusions). The N reflects total number of Initiative-eligible residents in annual analytic samples.

[1] High risk is defined as one or more of the following: impaired bed mobility; impaired transfer function; comatose; or malnutrition or at risk of malnutrition.

[2] Low risk is defined as ALL of the following are absent: severe cognitive impairment; totally dependent in bed mobility; totally dependent in transfer; and totally dependent in locomotion on unit.

[3] With oral/dental problems on the last observable MDS assessment.

[4] With swallowing disorder on at least one observed MDS assessment.

SOURCE: RTI analysis of MDS assessment data (RTI program: jw14/models_5years-qm_means-mv_5years_means_2011_2015).

Table 2-33
MDS-based quality outcomes: Percent of observed quarters with each outcome, New York

Measure	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Assessed and appropriately given the seasonal flu vaccine	89.6	92.4	93.0	95.1	94.3	94.1	94.1	92.9	94.7	93.8
Assessed and appropriately given the pneumococcal vaccine	96.6	95.8	95.0	94.3	93.8	96.6	96.6	96.7	96.6	94.4
Have/had a catheter inserted and left in bladder	3.2	3.4	3.4	3.5	3.0	2.8	2.8	2.6	2.7	3.2
Were physically restrained	1.4	1.4	1.2	1.2	0.8	1.4	1.3	1.1	1.0	0.8
Received an antipsychotic medication	20.8	19.2	16.5	15.7	14.1	21.8	21.0	18.3	17.6	15.4
Experienced one or more falls with injury	8.1	7.9	7.6	7.7	8.3	6.4	6.3	6.8	6.3	6.8
Self-report moderate to severe pain	4.8	3.8	4.0	3.2	2.6	4.9	3.7	3.3	3.1	3.0
Pressure ulcers of high-risk residents only[1]	8.8	8.2	8.7	8.7	8.0	8.7	7.9	8.1	7.6	7.6
Need for help with Activities of Daily Living has increased	12.3	12.6	12.1	11.9	10.6	13.9	13.8	13.2	12.9	12.0
Urinary tract infection	5.5	4.7	4.5	4.3	3.6	5.1	5.4	5.0	5.1	4.4
With depressive symptoms	6.2	10.0	8.2	8.6	10.5	8.1	13.4	13.7	11.3	11.1
Lost control of bowel or bladder of low-risk residents only[2]	43.1	43.0	49.3	55.1	58.6	38.9	38.5	41.0	42.1	44.5
Lost too much weight	6.4	6.7	6.9	6.8	5.8	5.9	5.6	6.3	5.9	5.7
Receiving hospice care	2.6	3.0	3.0	3.4	2.8	1.5	1.8	2.0	1.9	1.7
With oral/dental problems[3]	10.4	8.7	9.4	7.6	11.3	16.1	17.3	15.7	15.3	15.1
With swallowing disorder[4]	8.3	7.5	5.7	4.4	3.2	6.4	4.5	4.0	3.8	3.4
N (Residents)	8,460	7,784	7,593	6,986	6,776	13,152	12,729	12,602	11,845	11,588

NOTES: The outcomes are reported for residents included in the measure denominators (see ***Appendix D*** of the 2014 annual report for the specifications for denominators and exclusions). The N reflects total number of Initiative-eligible residents in annual analytic samples.

[1] High risk is defined as one or more of the following: impaired bed mobility; impaired transfer function; comatose; or malnutrition or at risk of malnutrition.

[2] Low risk is defined as ALL of the following are absent: severe cognitive impairment; totally dependent in bed mobility; totally dependent in transfer; and totally dependent in locomotion on unit.

[3] With oral/dental problems on the last observable MDS assessment.

[4] With swallowing disorder on at least one observed MDS assessment.

SOURCE: RTI analysis of MDS assessment data (RTI program: jw14/models_5years-qm_means-mv_5years_means_2011_2015).

Table 2-34
MDS-based quality outcomes: Percent of observed quarters with each outcome, Pennsylvania

Measure	ECCP					Comparison				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Assessed and appropriately given the seasonal flu vaccine	88.4	90.8	88.0	90.4	91.0	89.9	94.5	94.4	94.7	93.0
Assessed and appropriately given the pneumococcal vaccine	96.7	96.1	95.9	92.6	89.9	93.9	94.6	94.5	91.5	91.9
Have/had a catheter inserted and left in bladder	5.0	4.5	3.6	3.8	3.1	3.9	3.9	3.9	4.1	3.8
Were physically restrained	2.5	1.8	1.4	1.2	0.7	3.0	2.6	2.2	2.0	1.6
Received an antipsychotic medication	25.9	24.5	23.8	21.5	20.2	27.4	26.9	24.9	22.3	21.1
Experienced one or more falls with injury	12.3	12.8	13.3	12.0	11.7	10.1	9.9	11.4	10.9	11.9
Self-report moderate to severe pain	13.9	12.3	12.0	12.0	11.2	12.1	12.0	11.2	10.5	10.5
Pressure ulcers of high-risk residents only[1]	7.4	5.9	6.0	6.3	5.5	5.5	5.3	5.0	4.8	4.7
Need for help with Activities of Daily Living has increased	20.1	18.9	16.7	16.9	17.6	19.3	18.7	18.5	18.9	17.0
Urinary tract infection	6.8	5.5	5.8	5.5	4.5	4.9	5.2	5.1	4.2	3.7
With depressive symptoms	6.7	4.9	3.9	4.8	5.6	5.0	5.3	5.2	5.6	5.3
Lost control of bowel or bladder of low-risk residents only[2]	59.5	62.4	58.5	61.4	57.9	56.4	56.2	55.4	55.1	53.7
Lost too much weight	7.5	7.3	8.3	7.2	7.2	6.9	6.4	6.1	5.9	6.0
Receiving hospice care	4.0	4.2	4.5	4.0	4.0	4.6	5.1	4.9	4.4	4.3
With oral/dental problems[3]	13.9	15.0	16.7	13.0	14.9	13.8	13.3	14.9	14.1	12.6
With swallowing disorder[4]	15.1	12.7	11.5	12.0	9.2	10.3	8.1	6.7	6.1	5.1
N (Residents)	2,723	2,667	2,636	2,718	2,576	6,240	6,134	6,154	6,208	6,068

NOTES: The outcomes are reported for residents included in the measure denominators (see ***Appendix D*** of the 2014 annual report for the specifications for denominators and exclusions). The N reflects total number of Initiative-eligible residents in annual analytic samples.

[1] High risk is defined as one or more of the following: impaired bed mobility; impaired transfer function; comatose; or malnutrition or at risk of malnutrition.

[2] Low risk is defined as ALL of the following are absent: severe cognitive impairment; totally dependent in bed mobility; totally dependent in transfer; and totally dependent in locomotion on unit.

[3] With oral/dental problems on the last observable MDS assessment.

[4] With swallowing disorder on at least one observed MDS assessment.

SOURCE: RTI analysis of MDS assessment data (RTI program: jw14mv_5years/models_5years-qm_means-mv_5years_means_2011_2015).

2.11 Multivariate Regression Results

In determining the effects of the Initiative we analyzed the data for each ECCP implementation separately. Although there are commonalities in the interventions, major differences exist. There are also differences in the regulatory environment and utilization patterns in the states that make pooling undesirable. In this section, for each state, we describe the multivariate analysis results on key utilization, spending, and MDS-based quality outcomes. In multivariate regression analyses, we are primarily interested in estimating the effect of the ECCP interventions on a given outcome for residents in intervention facilities, relative to the outcome for residents in comparison facilities during an Initiative year accounting for Base Year differences. Statistical estimation of the strength of the effects of the predictors are made using a set of observations that characterize each resident in the study. Some of the predictors are risk adjusters, such as medical conditions of the residents and some are facility characteristics. Other predictor variables account for the year of the observation, whether the resident is in one of the ECCP facilities and whether the observation is for a resident who is in an ECCP facility in a particular Initiative year. This last variable captures the ECCP effect of interest: the change in the outcome not shared with the comparisons after accounting for Base Year outcome differences between ECCP facilities and comparisons and for changes that apply to all facilities over time.

The evaluation assessed differences between each ECCP and their matched comparison group on selected Medicare utilization, expenditure, and MDS-based quality outcomes in an Initiative year relative to the Base Year 2012. In this report, we focus on the effect of the ECCP intervention in 2015, the second year during which the Initiative was at least mostly, if not fully, implemented in all seven ECCP participating states. We report marginal effect estimates in meaningful units instead of raw regression coefficients. The term "statistically significant," where cited in the summary, refers to a p value of 0.10 or lower (better) for an estimated effect. This p value means a 10 percent probability of observing an estimate of at least that magnitude by chance. When many estimates are generated and tested, the probability of observing some estimates this large by chance is greater than 10 percent.

A detailed description of the findings for the Initiative in each state is provided below. Within each state, results are presented and summarized for outcomes in the following order: utilization probabilities, utilization counts, Medicare expenditures, and MDS-based quality outcomes. In each table, effect estimates that are statistically significant ($p < 0.10$) are bolded. Effect estimates with a negative sign signal reductions, which are desired for the outcomes measured in this analysis. The estimates reported are the intervention effects in 2015 using 2012 as the Base Year.

Although the primary qualitative findings for this report include some updates from Project Year 4, or 2016 (presented in Section 3), the multivariate quantitative results concern the intervention effects in 2015. Thus, some contextual information from the qualitative findings in Project Year 3, or 2015, are also included before each state's quantitative results.

We present the state-by-state narrative of main analysis results in Section 2.11.1 through Section 2.11.7. We conclude the entire section by a brief summary and discussion of major quantitative analysis findings regarding the impact of ECCP intervention thus far, in Section 2.12.

2.11.1 Summary of Findings: Alabama

The Alabama Quality Assurance Foundation's (AQAF) Nursing Facility Initiative (NFI) is an education-only model in which RNs provide training and support to staff within 23 participating nursing facilities. Primary training components include INTERACT tools, morning huddles, medication management, consistent staffing, and quality assurance and performance improvement (QAPI). Though the basic components are continuing, through 2015, AQAF-NFI focused largely on building relationships and trust with facility staff and leadership, which was said to be a critical first step in rolling out various components of the Initiative. In particular, AQAF-NFI has recognized the importance of buy-in from nursing facility administrators (NFAs) and has developed a series of executive leadership trainings aimed towards providing support and encouragement for administrators. Another focus has been developing teams of staff within the facility that meet regularly to discuss important Initiative components. Under the umbrella of a QAPI steering committee helmed by facility leadership with formal authority (e.g., administrator, DON), teams focus on hospitalizations/INTERACT, medication safety, and staff stability. There is some facility variation in how developed these teams are, but overall, progress has been made since 2014. AQAF-NFI nurses continue to train staff in the use of INTERACT tools, which have been introduced in most facilities, but with some facility-level variation in actual use. Both AQAF-NFI leadership and facility staff indicated that the model remains promising toward the goal of reducing avoidable hospitalizations, but acknowledged the slow initial rollout of the Initiative, which may have delayed buy-in from key facility staff.

In Alabama, there was strong evidence for the beneficial effect of the ECCP intervention across multiple utilization outcomes, with less evidence for beneficial expenditure and quality outcomes. The multivariate regression estimates of the effect of the ECCP intervention on the probability of having a given type of utilization outcome in 2015 are summarized in ***Table 2-35***. All intervention effects were negative and statistically significant (at the 0.10 significance level), suggesting that the ECCP intervention worked in the desired direction of reducing utilization. Specifically, the ECCP intervention was associated with the following reductions in the probability of various outcomes: a 2.4 percentage point decrease in the probability of an all-cause hospitalization, on average, which is the net difference between the ECCP and comparison groups after accounting for the Base Year difference in 2012, and represents an 8.0 percent reduction in the overall probability (in ECCP and comparison groups) of 30.1 percent in 2015; a 2.4 percentage point reduction in the probability of a potentially avoidable hospitalization, a 16.2 percent reduction in the overall probability (in ECCP and comparison groups) of 14.9 percent in 2015; a 5.7 percentage point decrease in the probability of having any ED visit, on average, which represents a 23.2 percent reduction in the overall probability (in ECCP and comparison groups) of 24.6 percent in 2015; and finally, a 2.4 percentage point reduction in the probability of having any potentially avoidable ED visit, or a 25.3 percent reduction from the overall probability (in ECCP and comparison groups) of 9.4 percent in 2015. Compared to the 2014 results, both types of effects on hospitalization are now statistically significant in 2015.

Table 2-35
Effect of ECCP intervention on probability of any utilization outcome: Multivariate regression results, 2015, Alabama

Probability of having at least one:	Mean, 2015 (percent)	Effect (percentage points)	90% CI		*p*-value	Effect (% of mean)
All-cause hospitalization	**30.1**	**-2.4**	**-4.8**	**-0.1**	**0.088**	**-8.0%**
Potentially avoidable hospitalization	**14.9**	**-2.4**	**-3.9**	**-0.9**	**0.009**	**-16.2%**
All-cause ED visit	**24.6**	**-5.7**	**-8.2**	**-3.2**	**< 0.001**	**-23.2%**
Potentially avoidable ED visit	**9.4**	**-2.4**	**-4.1**	**-0.7**	**0.023**	**-25.3%**

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect (percentage points) is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ED = Emergency Department; ECCP = Enhanced Care and Coordination Provider.

SOURCE: RTI analysis of Medicare claims data (RTI program ms01; mc01_dich_util).

The effect patterns are similar for the utilization count outcomes, as summarized in ***Table 2-36***, with statistically significant reductions in utilization for all measures except all-cause hospitalizations. The ECCP intervention was associated with 0.027 fewer potentially avoidable hospitalizations per resident on average, a reduction of 14.8 percent compared to the average 2015 count per resident (in ECCP and comparison groups) of 0.185. For the count of all-cause ED visits per residents, the ECCP intervention was associated with 0.108 fewer visits on average, or a 29.8 percent reduction from the average count per resident (in ECCP and comparison groups) of 0.362 in 2015. For the count of potentially avoidable ED visits, the ECCP intervention resulted in 0.034 fewer visits per resident, on average, or a 30.4 percent decrease from the average count per resident in 2015 (in ECCP and comparison groups) of 0.110. Compared to the 2014 results, the effect on potentially avoidable hospitalizations is now statistically significant in 2015.

Table 2-36
Effect of ECCP intervention on count of utilization outcomes: Multivariate regression results, 2015, Alabama

Count of events per resident	Mean, 2015	Effect	90% CI		*p*-value	Effect (% of mean)
All-cause hospitalizations	0.454	-0.039	-0.084	0.006	0.150	-8.7%
Potentially avoidable hospitalizations	**0.185**	**-0.027**	**-0.052**	**-0.003**	**0.065**	**-14.8%**
All-cause ED visits	**0.362**	**-0.108**	**-0.154**	**-0.062**	**< 0.001**	**-29.8%**
Potentially avoidable ED visits	**0.110**	**-0.034**	**-0.054**	**-0.013**	**0.007**	**-30.4%**

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ED = Emergency Department; ECCP = Enhanced Care and Coordination Provider.

SOURCE: RTI analysis of Medicare claims data (RTI program ms03; ms_03_count_util).

The results for the estimated effect of ECCP intervention on Medicare expenditures are reported in ***Table 2-37.*** All estimates have negative signs, suggesting a reduction in spending for all types of expenditures. However, the effect is statistically significant only for all-cause ED visit expenditures, where the ECCP intervention is associated with an estimated $40 reduction in spending per resident in 2015, on average, which amounts to a 25.0 percent reduction from the average (in ECCP and comparison groups) 2015 all-cause ED expenditure of $160. These findings are similar to the 2014 results.

Table 2-37
Effect of ECCP intervention on expenditure outcomes: Multivariate regression results, 2015, Alabama

Medicare expenditure	Mean, 2015 ($)	Effect ($)	90% CI		*p*-value	Effect (% of mean)
Total	20,297	-548	-2,281	1,185	0.603	-2.7%
All-cause hospitalizations	3,984	-60	-535	416	0.837	-1.5%
Potentially avoidable hospitalizations	1,321	-98	-309	113	0.447	-7.4%
All-cause ED visits	**160**	**-40**	**-62**	**-18**	**0.002**	**-25.0%**
Potentially avoidable ED visits	50	-11	-22	0	0.103	-22.0%
Physician services	1,211	-8	-132	117	0.921	-0.6%
SNF services	5,899	-131	-926	663	0.786	-2.2%

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect ($) is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ECCP = Enhanced Care and Coordination Provider; ED = Emergency Department.

SOURCE: RTI analysis of Medicare claims data (RTI program ms04; ms04_glm_exp; ms04_tpm_exp).

Overall, these results suggest a reduction in utilization from 2012 to 2015 in Alabama attributable to the ECCP intervention, and some evidence, although largely not statistically significant, for a reduction in expenditure outcomes. Only the reduction for all-cause ED visits was significant for both types of utilization and expenditure, although the ECCP intervention was also significantly associated with reductions in potentially avoidable hospitalizations and ED visits, for both types of utilization. The statistical significance of the change in the probability, count, and spending may not be the same, although the direction of the change should be. The units of what is being measured, the magnitude of the base rates or amounts, and the magnitude of the changes may combine to produce statistical significance for one of the measures and not the others. Depending on the size of payments for particular events avoided, the spending avoided could be of larger or smaller magnitude and statistical significance.

Table 2-38 summarizes the effect of the ECCP intervention on MDS-based quality outcomes in Alabama. The intervention demonstrates no definitive effect, with signs of the intervention effect indicating both improvement and worsening of quality; no measure is statistically significant at a 0.10 level of confidence. In 2014, one or more falls with injury was statistically significant in the desired direction (a reduction in falls), but this finding was in the opposite although nonsignificant direction in 2015. The direction of one other measure (urinary tract infection) also changed since 2014. With no systematic trends observed at this point, we

consider the effect of the ECCP intervention on these MDS-based quality measures ambiguous in direction and too small to be measured at this stage.

Table 2-38
Effect of ECCP intervention on MDS-based quality outcomes (percent of observed quarters per resident with event): Multivariate regression results, 2015, Alabama

MDS-based quality outcomes	Mean, 2015 (percent)	Effect (percentage points)	90% CI		*p*-value	Effect (% of mean)
One or more falls with injury	12.1	0.1	-1.5	1.8	0.885	1.2%
Self-report moderate to severe pain	7.1	1.0	-2.7	4.7	0.668	13.7%
Urinary tract infection	4.8	1.1	-0.6	2.7	0.278	22.5%
Decline in ADLs	14.3	1.5	-1.9	4.9	0.462	10.6%
Depressive symptoms	1.7	0.5	-1.2	2.2	0.609	30.2%
Antipsychotic medication use	24.2	-1.4	-4.5	1.8	0.479	-5.6%
Pressure ulcers Stage II or higher	4.4	-0.1	-1.1	0.9	0.884	-2.0%
Catheter inserted and left in bladder	4.4	-0.6	-1.3	0.1	0.163	-13.9%

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect (percentage points) is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ADL = Activities of Daily Living; ECCP = Enhanced Care and Coordination Provider.

SOURCE: RTI analysis of MDS assessments data (RTI program jw12; models_5years\qm).

2.11.2 Summary of Findings: Indiana

Indiana University (IU) Geriatrics Department's Optimizing Patient Transfers, Impacting Medical Quality, and Improving Symptoms: Transforming Institutional Care (OPTIMISTIC) operates in 19 facilities. The project places highly trained RNs in each facility to provide direct clinical support, education, and training to nursing facility staff. Eight OPTIMISTIC NPs support the OPTIMISTIC RN and provide evaluation and care needs. In 2015, the role of the OPTIMISTIC RN was unchanged; however, the efforts of the OPTIMISTIC NPs were shifted to focus more on evaluation of residents transitioning back to the facility after an acute care stay and on issues related to polypharmacy and less on the collaborative care reviews that targeted the more stable long term residents. The strong presence of physicians and physician extenders in the facilities, with most facilities reporting on-site visits three to five times per week, lessened the need for the OPTIMISTIC NP intervention in acute changes in resident condition. The degree of implementation of the model in facilities was impacted by facility staff turnover. This turnover continued to be a challenge requiring continual rebuilding of relationships and re-education of front-line staff, impacting consistent use of tools such as the Stop and Watch, SBAR (Situation, Background, Assessment, and Recommendation), and Care Pathways across facilities. The role of the OPTIMISTIC RN and NP in end of life discussions and completion of Physician Orders for Scope of Treatment (POST) forms were most frequently identified as the most valuable intervention in the model and was identified as having the most impact on reducing potentially avoidable hospitalizations. Improvements in OPTIMISTIC data collection methods, including timely identification and correction of data entry errors, resulted in less

OPTIMISTIC staff resource consumption; however, the change process resulted in a halt in reports being sent to facilities.

Multivariate regression estimates of the effect of the Indiana ECCP intervention on the probability of having a given type of utilization outcome in 2015 are summarized in ***Table 2-39***. The marginal effects for all four utilization outcomes presented in ***Table 2-39*** are negative, suggesting that the intervention worked in the desired direction, reducing the probability of experiencing any all-cause or potentially avoidable hospitalization and any all-cause or potentially avoidable ED visit. However, the estimated effect of the intervention was statistically significantly different from zero (at the 0.10 significance level) for only two of the four utilization outcomes: all-cause hospitalizations and potentially avoidable hospitalizations. Specifically, the ECCP intervention was associated with a 5.2 percentage point lower probability of having at least one all-cause hospitalization and a 4.0 percentage point lower probability of having at least one potentially avoidable hospitalization. These represent the net difference between the ECCP and comparison groups after accounting for the Base Year difference in 2012. Expressed another way, the intervention was associated with a 19.8 percent decrease in the probability of being hospitalized at least once as compared to the overall mean probability (in ECCP and comparison groups) of experiencing any hospitalization in 2015, which was 26.4 percent. Similarly, the intervention was associated with a 33.6 percent reduction in the probability of having at least one potentially avoidable hospitalization relative to the mean overall probability (in ECCP and comparison groups) of experiencing this event in 2015, which was 11.8 percent. Although changes associated with the ECCP intervention in the probability of experiencing any all-cause or potentially avoidable ED visit were in the desired direction, the effect estimates were not statistically significant, although the reduction in the probability of experiencing any potentially avoidable ED visit was less significant (p=0.160). In comparison with the results in 2014, the estimated effect of the intervention on the probability of having an all-cause hospitalization became statistically significant in 2015. The effect estimate on the probability of having any potentially avoidable ED visit moved in the desired direction, from a slight but nonsignificant positive in 2014 to a near significant negative in 2015.

Table 2-39
Effect of ECCP intervention on probability of any utilization outcome: Multivariate regression results, 2015, Indiana

Probability of having at least one:	Mean, 2015 (percent)	Effect (percentage points)	90% CI		*p*-value	Effect (% of mean)
All-cause hospitalization	**26.4**	**-5.2**	**-9.2**	**-1.3**	**0.030**	**-19.8%**
Potentially avoidable hospitalization	**11.8**	**-4.0**	**-6.2**	**-1.7**	**0.004**	**-33.6%**
All-cause ED visit	19.7	-1.5	-6.0	3.0	0.588	-7.6%
Potentially avoidable ED visit	6.9	-2.2	-4.7	0.4	0.160	-31.5%

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect (percentage points) is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ED = Emergency Department; ECCP = Enhanced Care and Coordination Provider.

SOURCE: RTI analysis of Medicare claims data (RTI program ms01; mc01_dich_util).

Table 2-40, below shows the estimated effect of the Indiana ECCP intervention on the count of select utilization outcomes in 2015. The effect patterns for utilization count outcomes follow a similar pattern as those observed for the probability of any utilization. The estimated effect of the ECCP intervention is negative for all four outcomes, suggesting a decrease in the count of events for each of these utilization types. These estimated reductions in the number of utilization events per resident are statistically significant (at the 0.10 significance level) for only all-cause and potentially avoidable hospitalizations. Specifically, the intervention was associated with 0.095 fewer all-cause hospitalizations per resident and 0.055 fewer potentially avoidable hospitalizations per resident on average. These represent 24.8 percent and 39.5 percent reductions in the overall mean counts (in ECCP and comparison groups) of all-cause and potentially avoidable hospitalizations per resident in 2015, which were 0.384 and 0.140, respectively. ECCP effect estimates for all-cause and potentially avoidable ED visits were in the desired direction but not statistically significant, although the ECCP effect on potentially avoidable ED visits was approaching significance ($p = 0.143$). Overall, these findings are similar to the results in 2014.

Table 2-40
Effect of ECCP intervention on count of utilization outcomes: Multivariate regression results, 2015, Indiana

Count of events per resident	Mean, 2015	Effect	90% CI		*p*-value	Effect (% of mean)
All-cause hospitalizations	**0.384**	**-0.095**	**-0.157**	**-0.033**	**0.012**	**-24.8%**
Potentially avoidable hospitalizations	**0.140**	**-0.055**	**-0.082**	**-0.028**	**0.001**	**-39.5%**
All-cause ED visits	0.279	-0.028	-0.111	0.055	0.576	-10.0%
Potentially avoidable ED visits	0.078	-0.026	-0.056	0.003	0.143	-33.6%

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ED = Emergency Department; ECCP = Enhanced Care and Coordination Provider.

SOURCE: RTI analysis of Medicare claims data (RTI program ms03; ms_03_count_util).

The results for the estimated effect of ECCP intervention on total Medicare expenditures as well as Medicare expenditures for select services, are reported in ***Table 2-41***. Effect estimates for all expenditures, including total Medicare expenditure, were negative, indicating a reduction in spending. This reduction was statistically significant (at the 0.10 significance level) for total expenditure as well as expenditure for five of the seven selected services. The ECCP intervention did not have a statistically significant effect on expenditure for all-cause ED visits or SNF services.

In 2015, the effect of the ECCP intervention on total Medicare expenditure was an estimated decrease of $2,875 per resident, on average, which is a 12.3 percent reduction as compared to the overall (in ECCP and comparison groups) average expenditure per resident ($23,394). Expenditures on all-cause hospitalizations were reduced by an estimated $1,007 per resident in 2015, on average, which is a 24.7 percent reduction in the overall (in ECCP and comparison groups) average expenditure per resident for this service ($4,074). The ECCP intervention effect on expenditure for potentially avoidable hospitalizations was an estimated

reduction of 33.3 percent ($408 per resident), as compared to the overall (in ECCP and comparison groups) average expenditure per resident of $1,223 in 2015. The ECCP intervention was also statistically significantly associated with reduced expenditures on potentially avoidable ED visits, which were 43.6 percent lower ($21 per resident) than the overall (in ECCP and comparison groups) average of $47 per resident. Finally, the Initiative was associated with a reduction in expenditures on physician services by 19.5 percent, or $231 per resident, on average, as compared to the overall (in ECCP and comparison groups) 2015 mean ($1,185).

In summary, in 2015 the estimated effect of the Indiana ECCP intervention was in the desired direction for all utilization and expenditure outcomes measured, with consistently statistically significant effects on all-cause and potentially avoidable hospitalizations. Compared with the estimated effect of the Indiana ECCP intervention in 2014, in general, the effect of the ECCP on utilization and expenditure for all-cause and potentially avoidable hospitalization remained in the desired direction and increased in magnitude and significance. Similarly, for potentially avoidable ED visits, the effect estimates on utilization and expenditure outcomes moved in the desired direction (in the case of probability of any utilization moving from a positive to negative effect estimate) and improved in statistical significance from 2014 to 2015. However, for all-cause EDs we saw a slight weakening of the intervention effects from 2014 to 2015. Descriptive statistics (see ***Section 2.10.1, Table 2-5***) show that both the ECCP group and the comparison group were able to reduce the percentage of residents who had an ED visit in 2015; however, the reduction in the comparison group was larger. The effect of the Indiana ECCP intervention on all-cause and potentially avoidable ED visits is mixed.

Taken together, these results suggest that the Indiana ECCP intervention is associated with reduced utilization and expenditures on all-cause and potentially avoidable hospitalizations and that these effects have strengthened over time.

Table 2-41
Effect of ECCP intervention on expenditure outcomes: Multivariate regression results, 2015, Indiana

Medicare expenditure	Mean, 2015 ($)	Effect ($)	90% CI		*p*-value	Effect (% of mean)
Total	**23,394**	**-2,875**	**-4,490**	**-1,261**	**0.003**	**-12.3%**
All-cause hospitalizations	**4,074**	**-1,007**	**-1,624**	**-391**	**0.007**	**-24.7%**
Potentially avoidable hospitalizations	**1,223**	**-408**	**-674**	**-141**	**0.012**	**-33.3%**
All-cause ED visits	158	-16	-51	19	0.457	-10.0%
Potentially avoidable ED visits	**47**	**-21**	**-33**	**-8**	**0.009**	**-43.6%**
Physician services	**1,185**	**-231**	**-385**	**-77**	**0.014**	**-19.5%**
SNF services	7,967	-416	-1,483	651	0.522	-5.2%

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect ($) is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ECCP = Enhanced Care and Coordination Provider; ED = Emergency Department.

SOURCE: RTI analysis of Medicare claims data (RTI program ms04; ms04_glm_exp; ms04_tpm_exp).

Table 2-42 summarizes the effect of the ECCP intervention on MDS-based quality outcomes in Indiana, indicating no definitive effect. The direction of estimated effect signs were both positive and negative, indicating both worsening and improvement of quality and none of effects were statistically significant (at the 0.10 significance level). Only one measure, antipsychotic medication use, was approaching statistical significance; the estimated effect on this quality measure was in the desired direction. Specifically, the estimated effect on antipsychotic medication use was associated with a decrease of 2.3 percentage points ($p = 0.188$) in the average percent of observed quarters per resident of antipsychotic medication use.

Table 2-42
Effect of ECCP intervention on MDS-based quality outcomes (percent of observed quarters per resident with event): Multivariate regression results, 2015, Indiana

MDS-based quality outcomes	Mean, 2015 (percent)	Effect (percentage points)	90% CI		*p*-value	Effect (% of mean)
One or more falls with injury	14.2	1.5	-1.9	5.0	0.466	10.8%
Self-report moderate to severe pain	5.9	-1.5	-5.1	2.1	0.502	-25.2%
Urinary tract infection	3.8	0.4	-2.3	3.1	0.800	10.9%
Decline in ADLs	13.8	0.3	-3.7	4.3	0.908	2.0%
Depressive symptoms	12.9	1.3	-3.8	6.3	0.679	9.8%
Antipsychotic medication use	17.8	-2.3	-5.2	0.6	0.188	-13.0%
Pressure ulcers Stage II or higher	5.1	0.2	-1.0	1.3	0.830	3.0%
Catheter inserted and left in bladder	5.7	0.9	-0.9	2.6	0.406	15.6%

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect (percentage points) is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ADL = Activities of Daily Living; ECCP = Enhanced Care and Coordination Provider.

SOURCE: RTI analysis of MDS assessments data (RTI program jw12; models_5years\qm).

2.11.3 Summary of Findings: Missouri

In 2015, all 16 of the MOQI facilities remained in the Initiative. Project staff remained stable in Project Year 3. The ECCP maintained overall fidelity to the model and most components were implemented as originally planned. There were intensified efforts in providing individual coaching to the APRNs, developing quality improvement strategies, obtaining advance directives, and implementing health information technology (HIT) components. Staff at nearly all of the facilities reported anecdotal evidence that the MOQI project is reducing some of their hospitalizations. They attributed this success to both the consistent presence of the APRN and to more consistent use of the INTERACT tools, especially SBAR. APRNs identified goals for educating staff on clinical preventive measures (hydration, urinary continence, and mobility) to reduce risks for hospitalization and continued to focus on obtaining advance directives. In addition, APRNs continued to focus on root cause analysis and met, as needed, with the Project Coordinator or Project Supervisor to review each facility transfer. The APRNs created customized resident transfer reports that were entered into the project's Qualtrics database. This information was used to address clinical staff education needs and inform the work of facility quality improvement committees. The MOQI ECCP staff established a coalition composed of

state nursing organizations and consumers working with the Missouri legislature to enact legislation that would enable APRNs to establish collaborative practice agreements with their physician colleagues. Family and physician demands for hospital transfers had decreased but remained a barrier to reducing hospitalizations in some nursing facilities. Data available from the MOQI reports and interviews indicated that the Initiative components have gained a foothold in most facilities despite HIT challenges and facility staff turnover.

In Missouri, the multivariate regression estimates of the effect of the ECCP intervention on the probability of having a given type of utilization outcome in 2015 are summarized in ***Table 2-43***. There are negative signs on the intervention effects for all four of the outcomes. This suggests that the ECCP intervention worked in the desired direction of reducing utilization of hospitalizations and ED visits. The effect size is moderate to large and statistically significant (at 0.10 significance level), for all four measures. Specifically, the ECCP intervention was associated with a 9.3 percentage point decrease in the probability of having an all-cause hospitalization, on average, which is the net difference between the ECCP and comparison groups after accounting for the Base Year difference in 2012. This represents a 31.9 percent reduction in the overall percentage of residents (in ECCP and comparison groups) who had a hospitalization in 2015, which was 29.2 percent. There was also a 7.2 percentage point reduced probability of having a potentially avoidable hospitalization, or a 52.5 percent less than the overall probability (in ECCP and comparison groups) in 2015 of 13.6 percent. The ECCP intervention was further associated with decreased probability of having any ED visit of 9.2 percentage points, on average, which represents a 43.3 percent reduction in the overall percentage of residents (in ECCP and comparison groups) who had any ED visits in 2015 (21.3 percent), and a 4.1 percentage point reduction in the probability of having any potentially avoidable ED visit, on average, or a 53.5 percent reduction in the overall probability (in ECCP and comparison groups) in 2015 (7.6 percent).

Table 2-43
Effect of ECCP intervention on probability of any utilization outcome: Multivariate regression results, 2015, Missouri

Probability of having at least one:	Mean, 2015 (percent)	Effect (percentage points)	90% CI		*p*-value	Effect (% of mean)
All-cause hospitalization	**29.2**	**-9.3**	**-12.0**	**-6.6**	**< 0.001**	**-31.9%**
Potentially avoidable hospitalization	**13.6**	**-7.2**	**-9.1**	**-5.2**	**< 0.001**	**-52.5%**
All-cause ED visit	**21.3**	**-9.2**	**-12.5**	**-5.9**	**< 0.001**	**-43.3%**
Potentially avoidable ED visit	**7.6**	**-4.1**	**-5.8**	**-2.3**	**< 0.001**	**-53.5%**

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect (percentage points) is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ED = Emergency Department; ECCP = Enhanced Care and Coordination Provider.

SOURCE: RTI analysis of Medicare claims data (RTI program ms01; mc01_dich_util).

In Missouri, the admission rates and spending on hospitalizations in the ECCP group were noticeably higher in the base period than in the comparison group. The comparison group

was matched on facility characteristics, not outcomes. However, the selection criteria for ECCP participants in Missouri were based on particularly poor performance on such outcomes, according to MOQI. If so, it is possible that an intervention could reduce a large performance gap significantly, while the effects of the intervention on groups that were less extreme might be harder to discern.

The effect patterns were similar for the utilization count outcomes, as summarized in ***Table 2-44***. The effect size was greater than that seen for probability of any utilization and significant for each outcome (at 0.10 significance level). The ECCP intervention was associated with a decrease in the count of all-cause hospitalizations by 0.172 per resident, on average, or a 40 percent reduction in the average count per resident (both ECCP and comparison residents) in 2015, which was 0.429. For the count of potentially avoidable hospitalizations, the ECCP intervention was significantly associated with 0.093 fewer visits per resident, on average, or a 57.7 percent decrease from the average count per resident (in ECCP and comparison groups) in 2015, which was 0.161. The ECCP intervention was also associated with a decrease in the count of all-cause ED visits by 0.161 per resident, on average, or a 54.1 percent reduction in the average count per resident (in ECCP and comparison groups) in 2015, which was 0.297. For the count of potentially avoidable ED visits, the ECCP intervention effect was 0.056 fewer visits per resident, on average, or a 65.3 percent reduction in the average count per resident (in ECCP and comparison groups) in 2015, which was 0.086.

Compared with the results in 2014, the ECCP effect estimates in Missouri on all the utilization outcomes are larger in magnitudes and statistically more significant in 2015.

Table 2-44
Effect of ECCP intervention on count of utilization outcomes: Multivariate regression results, 2015, Missouri

Count of events per resident	Mean, 2015	Effect	90% CI		*p*-value	Effect (% of mean)
All-cause hospitalizations	**0.429**	**-0.172**	**-0.216**	**-0.128**	**< 0.001**	**-40.0%**
Potentially avoidable hospitalizations	**0.161**	**-0.093**	**-0.117**	**-0.068**	**< 0.001**	**-57.7%**
All-cause ED visits	**0.297**	**-0.161**	**-0.206**	**-0.115**	**< 0.001**	**-54.1%**
Potentially avoidable ED visits	**0.086**	**-0.056**	**-0.073**	**-0.039**	**< 0.001**	**-65.3%**

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ED = Emergency Department; ECCP = Enhanced Care and Coordination Provider.

SOURCE: RTI analysis of Medicare claims data (RTI program ms03; ms_03_count_util).

The results for the estimated effect of ECCP intervention on Medicare expenditures are reported in ***Table 2-45***. All of the estimates, with the exception for SNF expenditure, have a negative sign, meaning a reduction in spending. The effect is not statistically significant for SNF services. It is significant for the other five types of expenditures and for total expenditures. The ECCP intervention was associated with decreased total spending by an estimated $2,066 per resident, on average, which amounts to a reduction of 10.4 percent from the average expenditure

(in ECCP and comparison groups) of $19,831 in 2015. Expenditures on all-cause hospitalizations were reduced by an estimated $1,369 per resident in 2015, on average, which is about a 33.6 percent reduction in the average expenditure of $4,081 (in ECCP and comparison groups) in 2015. The effect on potentially avoidable hospitalizations was smaller in magnitude at $577 per resident, on average; the result was about 45.2 percent less than the average expenditure (in ECCP and comparison groups) of $1,277 in 2015. The ECCP intervention similarly was associated with reduced expenditures on all-cause and potentially avoidable ED visits. Expenditures on all-cause ED visits were about 50.2 percent or $86 lower, on average, in 2015 than the average (in ECCP and comparison groups) of $171 while expenditures on potentially avoidable ED visits were about 59.7 percent or $29 lower, on average, in 2015 than the average (in ECCP and comparison groups) of $49. Expenditures on physician services were also reduced by $172 per resident, on average, or 14.3 percent less than the average (in ECCP and comparison groups) expenditures per resident in 2015, which was $1,204.

Table 2-45
Effect of ECCP intervention on expenditure outcomes: Multivariate regression results, 2015, Missouri

Medicare expenditure	Mean, 2015 ($)	Effect ($)	90% CI		*p*-value	Effect (% of mean)
Total	**19,831**	**-2,066**	**-3,668**	**-464**	**0.034**	**-10.4%**
All-cause hospitalizations	**4,081**	**-1,369**	**-1,795**	**-944**	**< 0.001**	**-33.6%**
Potentially avoidable hospitalizations	**1,277**	**-577**	**-787**	**-366**	**< 0.001**	**-45.2%**
All-cause ED visits	**171**	**-86**	**-113**	**-58**	**< 0.001**	**-50.2%**
Potentially avoidable ED visits	**49**	**-29**	**-41**	**-17**	**< 0.001**	**-59.7%**
Physician services	**1,204**	**-172**	**-309**	**-35**	**0.039**	**-14.3%**
SNF services	4,601	285	-599	1,168	0.596	6.2%

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect ($) is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ECCP = Enhanced Care and Coordination Provider; ED = Emergency Department.

SOURCE: RTI analysis of Medicare claims data (RTI program ms04; ms04_glm_exp; ms04_tpm_exp).

Overall, these results suggest reduced utilization and expenditures in Missouri in 2015 are associated with the ECCP intervention. Almost all of the effect estimates are stronger in 2015 than in 2014. All but one of the effect estimates in 2015 are statistically significant, specifically for all measures of hospitalizations and ED visits, which are among the major drivers for Medicare spending among nursing facility residents.

Table 2-46 summarizes the effect of the ECCP intervention on MDS-based quality outcomes in Missouri, for which we observed no overall pattern. As with other states, the estimated effects in Missouri indicated both improvement and worsening of quality.

Table 2-46
Effect of ECCP intervention on MDS-based quality outcomes (percent of observed quarters per resident with event): Multivariate regression results, 2015, Missouri

MDS-based quality outcomes	Mean, 2015 (percent)	Effect (percentage points)	90% CI		*p*-value	Effect (% of mean)
One or more falls with injury	16.4	0.4	-3.7	4.5	0.871	2.5%
Self-report moderate to severe pain	9.8	1.0	-2.6	4.7	0.650	10.3%
Urinary tract infection	6.5	0.2	-2.4	2.8	0.898	3.1%
Decline in ADLs	15.0	-3.6	-7.5	0.3	0.127	-24.1%
Depressive symptoms	2.6	0.5	-2.4	3.4	0.780	19.2%
Antipsychotic medication use	21.7	-0.2	-4.3	3.9	0.928	-1.0%
Pressure ulcers Stage II or higher	**4.6**	**-1.0**	**-2.0**	**0.0**	**0.089**	**-22.4%**
Catheter inserted and left in bladder	5.3	1.3	-0.6	3.1	0.267	24.0%

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect (percentage points) is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ADL = Activities of Daily Living; ECCP = Enhanced Care and Coordination Provider.

SOURCE: RTI analysis of MDS assessments data (RTI program jw12; models_5years\qm).

The only significant estimated effect in Missouri in 2015 was on pressure ulcers stage II or higher, which indicated that the ECCP intervention was associated with a decrease of 1.0 percentage point in the average percent of observed quarters per resident with stage II or higher pressure ulcers. This percentage point decrease corresponds to a decrease of 22.4 percent of the 2015 mean rate (in ECCP and comparison groups), which was 4.6 percent. As only one MDS-based quality outcome had a statistically significant effect at the 0.10 significance level, it cannot be definitively attributed to the ECCP intervention.

2.11.4 Summary of Findings: Nebraska

The Alegent ECCP placed six NPs in 14 nursing facilities in 2015, after one facility left the Initiative in September 2014. This ECCP has five major components: integration of NPs into participating facilities, dental hygiene, medication management, improved communication, and education. In 2015, the ECCP continued to expand each of these interventions, although their primary focus was on placing NPs in participating facilities and empowering those NPs to act in the best interest of residents. The ECCP delivered in-service trainings on proper use of urinalyses for urinary tract infections (UTIs) and oral hygiene, although the focus of the ECCP's educational model continued to be the informal mentorship provided to facility staff by the ECCP NPs. Participating facilities increasingly used the ECCP's 24-hour call service in 2015, which allowed NPs to manage emergent conditions that arose when they were not physically present in a participating facility. However, only some facilities chose to take advantage of this service, and primary care physicians continued to send their own residents to the ED when they were called to manage an emergent condition. The ECCP continued to gain more trust and support of these physicians. Compared with the first 2 years, physicians increasingly allowed the ECCP NP to write orders for their patients who were enrolled in the Initiative. Finally, implementation of the ECCP's dental hygiene and medication management programs remained

consistent in 2015. The ECCP's two dental hygienists continued to assess all enrolled residents every 6 months, conduct cleanings on residents with teeth, and provide twice-yearly trainings on oral hygiene to facility nurses and CNAs. The consulting pharmacist continued to help the NPs with their regular medication reviews. The consulting pharmacist also had a large role in developing the ECCP's in-service training on UTIs.

The multivariate regression estimates of the effect of Nebraska's ECCP on the probability of having a given type of utilization outcome in 2015 are summarized in ***Table 2-47***. Our findings indicate that the ECCP intervention had no effect on the probability of having a given type of utilization outcome that was statistically significantly different from zero (at the 0.10 significance level) in 2015. Despite the lack of statistical significance, we provide comment on the directionality of these effects. As illustrated in ***Table 2-47***, the effect estimates for both all-cause and potentially avoidable hospitalizations have negative signs. This suggests that the ECCP intervention may have worked in the desired direction for those two utilization outcomes, reducing utilization. In contrast, the effect estimates had positive signs for both the probability of having an all-cause ED visit and having a potentially avoidable ED visit, indicating that being in the ECCP intervention may have caused increased utilization. The signs and statistical significance for the effect estimates are similar to the 2014 results.

Table 2-47
Effect of ECCP intervention on probability of any utilization outcome: Multivariate regression results, 2015, Nebraska

Probability of having at least one:	Mean, 2015 (percent)	Effect (percentage points)	90% CI		*p*-value	Effect (% of mean)
All-cause hospitalization	26.2	-2.4	-5.2	0.4	0.159	-9.0%
Potentially avoidable hospitalization	11.5	-1.4	-3.9	1.1	0.352	-12.4%
All-cause ED visit	24.2	0.8	-3.9	5.5	0.787	3.2%
Potentially avoidable ED visit	8.6	1.7	-1.7	5.2	0.415	20.0%

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect (percentage points) is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ED = Emergency Department; ECCP = Enhanced Care and Coordination Provider.

SOURCE: RTI analysis of Medicare claims data (RTI program ms01; mc01_dich_util).

The effect patterns are similar for the utilization count outcomes with the exception of all-cause ED visits, as summarized in ***Table 2-48***. The effect of the ECCP intervention was in the desired direction for both all-cause and potentially avoidable hospitalizations and in the undesirable direction for potentially avoidable ED visits. Unlike the effect of the ECCP intervention on the probability of having any all-cause visit (discussed above), the effect was in the desired direction for the count of all-cause ED visits. However, neither effect was statistically significant and the magnitude was close to zero. Overall, there was no statistically significant effect of Nebraska's ECCP intervention on the count per resident of all-cause hospitalizations, potentially avoidable hospitalizations, all-cause ED visits, or potentially avoidable ED visits.

Table 2-48
Effect of ECCP intervention on count of utilization outcomes: Multivariate regression results, 2015, Nebraska

Count of events per resident	Mean, 2015	Effect	90% CI		*p*-value	Effect (% of mean)
All-cause hospitalizations	0.382	-0.013	-0.066	0.040	0.686	-3.4%
Potentially avoidable hospitalizations	0.135	-0.008	-0.044	0.028	0.723	-5.7%
All-cause ED visits	0.354	-0.009	-0.085	0.067	0.846	-2.5%
Potentially avoidable ED visits	0.098	0.013	-0.027	0.052	0.601	12.9%

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ED = Emergency Department; ECCP = Enhanced Care and Coordination Provider.

SOURCE: RTI analysis of Medicare claims data (RTI program ms03; ms_03_count_util).

The results for the estimated effect of ECCP intervention on Medicare expenditures are reported in ***Table 2-49***. The effect estimates for all-cause ED visits, potentially avoidable ED visits and physician services were in the undesirable direction; only the estimate for expenditures on all-cause ED visits was statistically significant, though the increase in expenditures for potentially avoidable ED visits was on the borderline. The effect estimates for the remaining four of the seven types of expenditures, however, were in the desired direction. These four types of expenditure outcomes include total Medicare spending and expenditures for all-cause hospitalizations, potentially avoidable hospitalizations, and SNF services. The effect estimates on two of these expenditure outcomes, all-cause hospitalizations and potentially avoidable hospitalizations, were statistically significant in 2014; they were not statistically significant in 2015.

Table 2-49
Effect of ECCP intervention on expenditure outcomes: Multivariate regression results, 2015, Nebraska

Medicare expenditure	Mean, 2015 ($)	Effect ($)	90% CI		*p*-value	Effect (% of mean)
Total	20,201	-2,010	-4,063	44	0.107	-9.9%
All-cause hospitalizations	3,919	-550	-1,139	38	0.124	-14.0%
Potentially avoidable hospitalizations	1,180	-115	-466	237	0.592	-9.7%
All-cause ED visits	**202**	**97**	**15**	**180**	**0.053**	**48.1%**
Potentially avoidable ED visits	64	48	0	96	0.101	75.2%
Physician services	1,085	16	-132	163	0.862	1.4%
SNF services	5,368	-765	-1,663	132	0.161	-14.3%

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect ($) is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ECCP = Enhanced Care and Coordination Provider; ED = Emergency Department.

SOURCE: RTI analysis of Medicare claims data (RTI program ms04; ms04_glm_exp; ms04_tpm_exp).

Overall, despite a lack of statistical significance in all utilization and expenditure outcomes except for the expenditure for all-cause ED visits, the negative effect estimates for both all-cause and potentially avoidable hospitalizations indicate that there may be a trend of reduced utilization and expenditure for those two types of services associated with the Nebraska ECCP intervention in 2015. In contrast, the effects of the intervention on both all-cause and potentially avoidable ED visits indicated that the ECCP intervention may have resulted in increased spending and utilization on those services. Particularly for all-cause ED visits, although the ECCP effect on the utilization outcomes were not statistically significant, the effect on the expenditure was statistically significant in the undesirable direction. We will continue to monitor these patterns in the remaining year of the Initiative.

Table 2-50 reports the effect of the ECCP intervention on MDS-based quality outcomes in Nebraska, and suggests no overall meaningful effect on quality. The mixture of positive and negative signs of the estimated effect indicated both quality decline in some measures and improvement in others.

Table 2-50
Effect of ECCP intervention on MDS-based quality outcomes (percent of observed quarters per resident with event): Multivariate regression results, 2015, Nebraska

MDS-based quality outcomes	Mean, 2015 (percent)	Effect (percentage points)	90% CI		*p*-value	Effect (% of mean)
One or more falls with injury	13.4	1.8	-2.5	6.2	0.489	13.6%
Self-report moderate to severe pain	13.5	-0.4	-4.8	4.0	0.885	-2.9%
Urinary tract infection	6.3	0.2	-3.3	3.6	0.941	2.6%
Decline in ADLs	16.7	3.0	-0.6	6.6	0.171	18.0%
Depressive symptoms	**6.6**	**4.8**	**0.2**	**9.3**	**0.083**	**72.9%**
Antipsychotic medication use	28.4	-2.2	-6.9	2.4	0.433	-7.9%
Pressure ulcers Stage II or higher	4.0	0.8	-0.7	2.4	0.376	20.8%
Catheter inserted and left in bladder	9.3	1.5	-0.5	3.5	0.209	16.3%

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect (percentage points) is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ADL = Activities of Daily Living; ECCP = Enhanced Care and Coordination Provider.

SOURCE: RTI analysis of MDS assessments data (RTI program jw12; models_5years\qm).

The only statistically significant effect had a positive sign, indicating that the ECCP intervention was associated with an adverse increase of 4.8 percentage points in the average percent of observed quarters per resident with depressive symptoms. This corresponds to an increase of 72.9 percent of the overall mean rate (in ECCP and comparison groups) in 2015, which was 6.6 percent. This MDS-based outcome was not statistically significant and had a sign in the desired direction in 2014. Decline in ADLs was statistically significant with a sign in the undesirable direction in 2014 but it was not statistically significant in 2015. Overall, the signs for the effect for five MDS-based outcomes (all but falls with injury, decline in ADLs and antipsychotic medication use) changed directions from 2014 to 2015.

Given that there were no other significant effects and the random changes in the signs, the ECCP intervention did not demonstrate an overall impact on MDS-based quality outcomes in Nebraska.

2.11.5 Summary of Findings: Nevada

Nevada's Admissions and Transitions Optimization Program (ATOP) provides clinical support, training, and education to 24 participating facilities. ECCP facility-based staffing challenges persisted in 2015. Consequently, instead of one APRN or physician assistant and two RNs rotating among four to five nursing facilities in each of five pods (groups of facilities), as was their model, ECCP clinical staff rotated among five to nine facilities. Only one of the five pods has been consistently staffed since the beginning of the Initiative. The ECCP continued training and promoting the use of INTERACT tools and focused on the SBAR, Stop and Watch, and quality improvement tools. Adoption varied widely, depending upon support of facility leadership, facility staff turnover, the facility's own corporate systems, and integration of ECCP clinical staff. In facilities in which they were fully integrated, ECCP staff were involved in quality improvement and QAPI meetings as well as residents' care conferences. To improve integration, ECCP staff offered trainings tailored to the needs of each facility; for example, some facilities requested assistance with documentation methods and medication administration in preparation for their upcoming surveys. Others received dementia training; skills trainings, such as IV insertion; and condition-specific trainings, such as recognition of dehydration, pneumonia, chronic obstructive pulmonary disease (COPD), sepsis, and UTIs. Other trainings, conducted by the ECCP, were open to both participating and nonparticipating facilities. The ECCP, which is a QIO, believes in improving quality of care in all facilities in the state and, therefore, invites all facilities to its group trainings. Topics of these include INTERACT tools, the Physician Orders for Life-Sustaining Treatment (POLST), and recognition of catheter acquired urinary tract infections (CAUTI). The comparison group is every non-ECCP long-term care nursing facility in the state and has fewer facilities than the ECCP group. This does not preclude finding Initiative effects in Nevada, but the sample difference should be recognized and the regression-based estimates of the intervention effects should be interpreted with caution.

The multivariate regression estimates of the effect of the Nevada ECCP intervention on the probability of having a given type of utilization outcome in 2015 are summarized in ***Table 2-51***. The marginal effects on all-cause and potentially avoidable hospitalizations were negative, which suggests the intervention was associated with a reduction in the probability of experiencing at least one of those types of events. The effect sizes were statistically significant at the 0.10 significance level for both of these outcomes. The intervention was associated with an 8.3 percentage point decrease in the probability of having an all-cause hospitalization, on average, which is the net difference between the ECCP and comparison groups after accounting for the Base Year difference in 2012. This represents a 29.1 percent reduction in the overall (in ECCP and comparison groups) percentage of residents who had a hospitalization in 2015, which was 28.6 percent. The probability of having a potentially avoidable hospitalization, on average, decreased 2.6 percentage points, which was a reduction of 25.5 percent in the overall probability (in ECCP and comparison groups) in 2015, which was 10.2 percent. The marginal effects on all-cause and potentially avoidable ED visits were positive; however, these effect sizes for these two outcomes were not statistically significantly different from zero. Overall, these findings appear to be consistent with the descriptive results presented in ***Table 2-8***. However, based on the

descriptive results, the intervention effect observed on all-cause hospitalizations appears to be driven by an increase in all-cause hospitalizations in the comparison group, rather than a true decrease among the ECCP group.

Table 2-51
Effect of ECCP intervention on probability of any utilization outcome: Multivariate regression results, 2015, Nevada

Probability of having at least one:	Mean, 2015 (percent)	Effect (percentage points)	90% CI		*p*-value	Effect (% of mean)
All-cause hospitalization	**28.6**	**-8.3**	**-12.9**	**-3.7**	**0.003**	**-29.1%**
Potentially avoidable hospitalization	**10.2**	**-2.6**	**-5.1**	**-0.1**	**0.087**	**-25.5%**
All-cause ED visit	20.3	1.4	-1.7	4.4	0.468	6.7%
Potentially avoidable ED visit	7.6	0.5	-1.5	2.5	0.678	6.6%

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect (percentage points) is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ED = Emergency Department; ECCP = Enhanced Care and Coordination Provider.

SOURCE: RTI analysis of Medicare claims data (RTI program ms01; mc01_dich_util).

The effect patterns are similar for the utilization count outcomes, as summarized in ***Table 2-52***. Similar to the probability of having a given type of utilization, the intervention was associated with decreases in the counts of all-cause and potentially avoidable hospitalizations and increases in all-cause and potentially avoidable ED visits. However, only the effect for all-cause hospitalizations was statistically significant. The intervention was associated with a decrease in the count of all-cause hospitalizations by 0.151 per resident, on average, or 36.1 percent less than the average (in ECCP and comparison groups) count per resident in 2015, which was 0.417. The magnitude of this effect estimate more than doubled that found in 2014. As noted above, the increase in comparison group utilization seems to be driving this result.

Table 2-52
Effect of ECCP intervention on count of utilization outcomes: Multivariate regression results, 2015, Nevada

Count of events per resident	Mean, 2015	Effect	90% CI		*p*-value	Effect (% of mean)
All-cause hospitalizations	**0.417**	**-0.151**	**-0.207**	**-0.094**	**< 0.001**	**-36.1%**
Potentially avoidable hospitalizations	0.119	-0.027	-0.057	0.003	0.134	-23.0%
All-cause ED visits	0.298	0.010	-0.038	0.059	0.726	3.5%
Potentially avoidable ED visits	0.090	0.003	-0.021	0.027	0.856	2.9%

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ED = Emergency Department; ECCP = Enhanced Care and Coordination Provider.

SOURCE: RTI analysis of Medicare claims data (RTI program ms03; ms_03_count_util).

The results for the estimated effect of ECCP intervention on Medicare expenditures are reported in ***Table 2-53***. The Initiative was associated with statistically significant reductions in total spending, and spending on all-cause hospitalizations, potentially avoidable hospitalizations, physician services, and SNF services. The intervention was associated with decreased total spending by an estimated $5,086 per resident, on average, which amounts to a 21.7 percent reduction from the average (in ECCP and comparison groups) total expenditures of $23,467 in 2015. Expenditures on all-cause hospitalizations were reduced by an estimated $2,248 per resident in 2015, or a reduction of 37.5 percent in relation to the average expenditure (in ECCP and comparison groups) of $6,002 in 2015. Expenditures on potentially avoidable hospitalizations were reduced by an estimated $533 per resident in 2015, or a 42.5 percent reduction in the average expenditure (in ECCP and comparison groups) of $1,256 in 2015. The intervention was associated with an increase in expenditures on all-cause and potentially avoidable ED visits, but this effect was only statistically significant for all-cause ED visits. The intervention was associated with a $93 increase in all-cause ED spending per resident in 2015, or 39.7 more than the average expenditure (in ECCP and comparison groups) in 2015 of $235. The hospitalization reductions here would also be related to increases occurring in the comparisons. Expenditures on physician services were reduced by an estimated $518 per resident in 2015, or a 27.6 percent reduction in the average expenditure (in ECCP and comparison groups) of $1,876 in 2015. SNF expenditures were reduced by an estimated $2,148 per resident in 2015, or a 24.2 percent reduction in the average expenditure (in ECCP and comparison groups) of $8,878 in 2015.

Table 2-53
Effect of ECCP intervention on expenditure outcomes: Multivariate regression results, 2015, Nevada

Medicare expenditure	Mean, 2015 ($)	Effect ($)	90% CI		*p*-value	Effect (% of mean)
Total	**23,467**	**-5,086**	**-8,611**	**-1,562**	**0.018**	**-21.7%**
All-cause hospitalizations	**6,002**	**-2,248**	**-3,298**	**-1,199**	**< 0.001**	**-37.5%**
Potentially avoidable hospitalizations	**1,256**	**-533**	**-891**	**-175**	**0.014**	**-42.5%**
All-cause ED visits	**235**	**93**	**12**	**175**	**0.060**	**39.7%**
Potentially avoidable ED visits	66	45	-1	92	0.110	69.0%
Physician services	**1,876**	**-518**	**-891**	**-144**	**0.023**	**-27.6%**
SNF services	**8,878**	**-2,148**	**-4,286**	**-9**	**0.099**	**-24.2%**

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect ($) is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ECCP = Enhanced Care and Coordination Provider; ED = Emergency Department.

SOURCE: RTI analysis of Medicare claims data (RTI program ms04; ms04_glm_exp; ms04_tpm_exp).

Table 2-54 summarizes the effect of the ECCP intervention on MDS-based quality outcomes in Nevada. The intervention was associated with worse outcomes for all quality measures except for catheter inserted and left in bladder, which was not statistically significant at the 0.10 significance level. Only two of the MDS-based quality outcomes were statistically significant in Nevada in 2015: one or more fall with injury, for which the intervention was

associated with a 4.3 percentage point increase, and antipsychotic medication use, for which the intervention was associated with a 3.9 percentage point increase.

Table 2-54
Effect of ECCP intervention on MDS-based quality outcomes (percent of observed quarters per resident with event): Multivariate regression results, 2015, Nevada

MDS-based quality outcomes	Mean, 2015 (percent)	Effect (percentage points)	90% CI		*p*-value	Effect (% of mean)
One or more falls with injury	**10.8**	**4.3**	**0.2**	**8.4**	**0.083**	**40.2%**
Self-report moderate to severe pain	13.5	1.2	-4.6	7.0	0.733	9.0%
Urinary tract infection	5.9	1.7	-2.5	5.8	0.502	28.7%
Decline in ADLs	17.3	0.3	-2.7	3.2	0.880	1.6%
Depressive symptoms	2.0	0.3	-2.5	3.1	0.857	15.3%
Antipsychotic medication use	**20.8**	**3.9**	**0.1**	**7.7**	**0.093**	**18.6%**
Pressure ulcers Stage II or higher	7.2	1.2	-0.7	3.1	0.282	17.0%
Catheter inserted and left in bladder	10.0	-0.7	-3.4	1.9	0.652	-7.2%

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect (percentage points) is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ADL = Activities of Daily Living; ECCP = Enhanced Care and Coordination Provider.

SOURCE: RTI analysis of MDS assessments data (RTI program jw12; models_5years\qm).

In summary, compared with the findings in 2014, in Nevada the 2015 data showed a stronger reduction in both all-cause hospitalizations and potentially avoidable hospitalizations among residents in the ECCP group relative to those in the comparison group. There were also larger reductions in expenditure associated with utilization of such services than observed in 2014. The utilization of and expenditures for all-cause and potentially avoidable ED visits in the Nevada ECCP group continued an upward trend as seen before. *Again, these results should be interpreted with caution given the unavoidable use of a small and unmatched comparison group in Nevada than in other states.* We found no improvement in MDS-based quality outcomes that could be attributable to the ECCP intervention in Nevada; if anything, there are indications of an adverse trend in most of the quality outcomes examined among ECCP facility residents relative to those in the comparison group.

2.11.6 Summary of Findings: New York

This ECCP is education focused. The RN Care Coordinators (RNCCs) in the New York Reducing Avoidable Hospitalizations (NY-RAH) initiative do not provide clinical care to residents but focus as consultants on increasing each facility's capacity to (1) identify root causes for potentially avoidable hospitalizations and (2) review and modify its policies or procedures to prevent such hospitalizations. In 2015, the ECCP continued re-educating staff primarily on the INTERACT Tools, including the Stop and Watch and SBAR, serving as liaisons for questions about the Medical Order for Life Sustaining Treatment (MOLST) form, and assisting with changes to facility's palliative care policies. To encourage the sustainability of the QI process, the ECCP set a goal for all facilities to adopt any QI tool by the end of Project Year 4; at the time

of our site visit almost two-thirds of facilities had adopted one. RNCCs continue to review hospitalization data, provided in quarterly reports by the ECCP, and conduct chart reviews to identify hospitalizations patterns. Many facilities reported using this information to inform their performance improvement projects. The electronic transfer of patient discharge summary information from the hospital to the nursing facility (i.e., direct messaging) continues to also be a focus of the ECCP. All but two facilities now have the software installed; however, the use of this information in nursing facilities is still in its infancy.

In New York, the multivariate regression estimates of the effect of the ECCP intervention on the probability of having a given type of utilization outcome in 2015 are summarized in ***Table 2-55***. The intervention effects for three out of the four outcomes were estimated to be in the negative direction, which suggests that the ECCP intervention worked in the desired direction of reducing the probability of utilization. However, the effect sizes were small, and were only statistically significant (at the 0.10 significance level) for the probability of experiencing an all-cause hospitalization. The ECCP intervention was associated with a 2.5 percentage point lower probability of having an all-cause hospitalization, on average, which is the net difference between the ECCP and comparison groups after accounting for the Base Year difference in 2012. This represents a 9 percent reduction in the overall probability (in ECCP and comparison groups) of residents having an all-cause hospitalization in 2015, which was 27.7 percent. This finding accords with the descriptive results presented in ***Table 2-9*** which show a much larger drop in the percentage of residents hospitalized in the ECCP group (from 32.7 percent in 2012 to 27.4 percent in 2015) than in the comparison group (from 30.9 percent in 2012 to 27.8 percent in 2015).

Table 2-55
Effect of ECCP intervention on probability of any utilization outcome: Multivariate regression results, 2015, New York

Probability of having at least one:	Mean, 2015 (percent)	Effect (percentage points)	90% CI		*p*-value	Effect (% of mean)
All-cause hospitalization	**27.7**	**-2.5**	**-4.8**	**-0.2**	**0.078**	**-9.0%**
Potentially avoidable hospitalization	10.5	-1.5	-3.2	0.2	0.147	-14.5%
All-cause ED visit	14.4	0.3	-1.6	2.1	0.822	1.8%
Potentially avoidable ED visit	4.8	-0.6	-1.5	0.3	0.273	-12.0%

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect (percentage points) is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ED = Emergency Department; ECCP = Enhanced Care and Coordination Provider.

SOURCE: RTI analysis of Medicare claims data (RTI program ms01; mc01_dich_util).

The multivariate regression estimates of the effect of the ECCP intervention on the count of utilization events per person in 2015 are summarized in ***Table 2-56***. Here, the intervention effects for all four outcomes were estimated to be in the negative direction, which suggests that the ECCP intervention worked in the desired direction of reducing the count of utilization events. However, the effect sizes were relatively small, and only statistically significant for the count of potentially avoidable hospitalizations. The intervention was associated with a 0.025 lower count

of potentially avoidable hospitalizations per resident, on average. This represents a 20 percent decrease from the average count per resident (in ECCP and comparison groups) in 2015, which was 0.127. This finding accords with the descriptive results presented in ***Table 2-16*** which show a much larger drop in the potentially avoidable hospitalization rate in the ECCP group (from 0.8 events per 1,000 person-days in 2012 to 0.5 in 2015) than in the comparison group (from 0.7 in 2012 to 0.6 in 2015). The result for counts was slightly different from the result for probabilities; the all-cause hospitalization effect was stronger in the probability model.

Table 2-56
Effect of ECCP intervention on count of utilization outcomes: Multivariate regression results, 2015, New York

Count of events per resident	Mean, 2015	Effect	90% CI		*p*-value	Effect (% of mean)
All-cause hospitalizations	0.421	-0.039	-0.094	0.015	0.236	-9.4%
Potentially avoidable hospitalizations	**0.127**	**-0.025**	**-0.049**	**-0.002**	**0.080**	**-20.0%**
All-cause ED visits	0.203	-0.014	-0.044	0.017	0.464	-6.6%
Potentially avoidable ED visits	0.055	-0.005	-0.015	0.006	0.460	-8.8%

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ED = Emergency Department; ECCP = Enhanced Care and Coordination Provider.

SOURCE: RTI analysis of Medicare claims data (RTI program ms03; ms_03_count_util).

The results for the estimated effect of ECCP intervention on Medicare expenditures in 2015 are reported in ***Table 2-57***. The results are mixed, with total Medicare expenditures and expenditures on physician services estimated to have increased while all other measures of expenditures were estimated to have decreased. None of the effects were statistically significant and the magnitudes of the estimated effects were fairly small. This concurs with the descriptive results in which the changes in expenditures in the ECCP group and the comparison group, from 2012 to 2015, were fairly similar to each other (***Table 2-23***). The positive estimated effect of the ECCP intervention on total Medicare expenditures, despite the negative estimated effect on all of the specific utilization categories examined (except physician services), could be caused by an offsetting increase in other expenditure categories not analyzed. For example, Medicare expenditures for all institutional outpatient services continued to increase in 2015 (Table 2-23). The changing transfer patterns are consistent with findings in two NY-RAH facilities during the primary data collection site visits. These two facilities have programs in place where their residents are sent to specialty outpatient clinics instead of the hospital's ED. One facility's program allows anemic residents to avoid the hospital ED when they require a transfusion because of an established agreement with the hospital's blood bank. The other facility has a similar agreement but with a gastrointestinal (GI) clinic in the hospital, which replaces GI tubes that residents remove on their own or need to be replaced. Medical directors at both facilities describe these programs as a way to "bypass" the hospital ED, which often results in a hospital admission. Note that the latter facility just instituted this program in 2016 whereas the former facility developed the program during participation in the CMS Value-Based Purchasing Demonstration, which ended in 2012. Although these two specific programs do not overlap with

the period over which the quantitative effect of ECCP intervention was estimated, there may be similar programs in the NY-RAH and comparison group facilities. These new patterns of care, with the intention of reducing hospitalizations, may result in an increase in Medicare expenditures for all institutional outpatient services.

Table 2-57
Effect of ECCP intervention on expenditure outcomes: Multivariate regression results, 2015, New York

Medicare expenditure	Mean, 2015 ($)	Effect ($)	90% CI		*p*-value	Effect (% of mean)
Total	28,362	452	-2,196	3,099	0.779	1.6%
All-cause hospitalizations	8,260	-216	-1,221	788	0.723	-2.6%
Potentially avoidable hospitalizations	1,850	-212	-555	131	0.309	-11.5%
All-cause ED visits	121	-7	-23	10	0.511	-5.5%
Potentially avoidable ED visits	38	-4	-11	4	0.406	-10.0%
Physician services	2,428	60	-248	369	0.748	2.5%
SNF services	9,937	-90	-1,256	1,076	0.899	-0.9%

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect ($) is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ECCP = Enhanced Care and Coordination Provider; ED = Emergency Department.

SOURCE: RTI analysis of Medicare claims data (RTI program ms04; ms04_glm_exp; ms04_tpm_exp).

These results suggest an overall trend of reduced utilization from 2012 to 2015 attributable to the ECCP intervention in New York. Seven out of eight effect estimates on utilization are in the desired, negative direction. However, the only statistically significant reductions are with respect to the probability of hospitalization and the count of potentially avoidable hospitalizations. It is noteworthy that in 2014 (as reported in the final annual report for Project Year 3), these two utilization outcomes were also the only ones for which there were statistically significant reductions. Finally, our results in 2015 do not indicate a consistent or significant impact of the Initiative on expenditures in New York, similar to findings in 2014. The nonsignificant trend of reductions in Medicare expenditure for hospitalizations, despite some significant albeit inconsistent reduction in both the probability and count of such outcomes, suggest that the hospitalizations prevented by the ECCP intervention may be the lower-cost ones; the more costly hospitalizations may still remain. Changes in the probability of having at least one event could be of a different relative magnitude than the change in the counts of events and the payments associated with the events.

Table 2-58 reports the effect of the ECCP intervention on MDS-based quality outcomes in New York. The impact of the ECCP intervention on five out of the eight quality outcomes was estimated to be negative, which is in the desired direction. Only two out of eight estimated effects are statistically significant, both of which were in the desired direction. The intervention was associated with a statistically significant 1 percentage point reduction in self-reported moderate to severe pain, and a 0.8 percentage point reduction in whether a catheter was inserted and left in bladder. These effects were not found to be statistically significant in 2014 (as

reported in the final annual report for Project Year 3), although they were both estimated in the negative direction.

Table 2-58
Effect of ECCP intervention on MDS-based quality outcomes (percent of observed quarters per resident with event): Multivariate regression results, 2015, New York

MDS-based quality outcomes	Mean, 2015 (percent)	Effect (percentage points)	90% CI		*p*-value	Effect (% of mean)
One or more falls with injury	7.3	-0.6	-1.9	0.6	0.406	-8.7%
Self-report moderate to severe pain	**3.2**	**-1.0**	**-1.9**	**0.0**	**0.092**	**-30.5%**
Urinary tract infection	4.8	-0.7	-2.0	0.7	0.422	-13.8%
Decline in ADLs	11.5	0.9	-1.5	3.3	0.556	7.6%
Depressive symptoms	10.9	0.1	-4.7	5.0	0.963	1.3%
Antipsychotic medication use	19.0	-0.5	-3.8	2.9	0.825	-2.4%
Pressure ulcers Stage II or higher	7.6	0.9	-0.4	2.1	0.274	11.1%
Catheter inserted and left in bladder	**5.0**	**-0.8**	**-1.5**	**0.0**	**0.085**	**-15.7%**

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect (percentage points) is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ADL = Activities of Daily Living; ECCP = Enhanced Care and Coordination Provider.

SOURCE: RTI analysis of MDS assessments data (RTI program jw12; models_5years\qm).

2.11.7 Summary of Findings: Pennsylvania

The University of Pittsburgh Medical Center (UPMC) Community Provider Services Program to Reduce Avoidable Hospitalizations using Evidence-based Interventions for Nursing Facilities (UPMC-RAVEN) is anchored around Certified Registered Nurse Practitioners (CRNPs) providing resident care in the facilities; these CRNPs are very popular, and their work is appreciated. During Project Year 3, all participating UPMC-RAVEN facilities reported being committed to the Initiative and perceived that the Initiative has had an impact on facility culture, including facilities that experienced turnover in facility leadership staff. UPMC-RAVEN CRNPs can assess, write orders, and provide clinical care under a collaborative practice agreement (CPA) in all facilities; CPAs are also required for providing on-call support for telemedicine. One exception to the general NP model is that in some facilities that experienced challenges placing an NP in their facility, the NP was replaced by an Enhanced Care RN (ECRN) who does not have the full scope of practice as CRNP. Facility location, especially if remote and rural, posed some recruitment and retention as well as long-distance travel challenges to UPMC-RAVEN staff, altering the role of some lead NPs into visiting and supporting facilities where facility-based NPs could not be hired. Facilities reported using Stop and Watch and SBAR, with several facilities modifying the tools to better suit their needs or to correct perceived tool defects. However, the uptake of INTERACT tools varied widely across facilities and largely depended on the administration's commitment and willingness to enforce their use, as well as pre-existing practices in the facilities. Telemedicine has been fully implemented but it has experienced multiple challenges related to connectivity, limiting facilities' use of the telemedicine cart. In Project Year 3, telemedicine is still reported as an underutilized component of the Initiative but

the number of telemedicine consults has increased, especially the use of UPMC-RAVEN telephone consults.

In Pennsylvania, the multivariate regression estimates of the effect of the ECCP intervention on the probability of having a given type of utilization outcome are summarized in ***Table 2-59***. All intervention effects were estimated to be in the negative (desired) direction, but unlike the previous year's results they were not estimated to be statistically significant (at the 0.10 level or better). These effects were similar to the multivariate regression estimates of the effect of the ECCP intervention on the mean count of utilization events per person in 2015 that are summarized in ***Table 2-60***. All of the estimated intervention effects have negative signs, but none are statistically significant. These findings align with the descriptive results presented in ***Table 2-10*** and ***Table 2-17*** where the comparison group by 2015 had achieved a similar reduction in utilization outcomes as the ECCP group. In fact, the comparison group showed a notable drop in the percentage of residents experiencing any hospitalization between 2014 and 2015 (***Table 2-10***). These findings are consistent with the survey data (see Figure 3-40), which indicate that the prevalence of PAH-related efforts that are unrelated to the Initiative are high among comparison group facilities. Compared to 95 percent of all comparison facilities, 100 percent of UPMC-RAVEN comparison facilities reported introducing new PAH-related practices in the past few years. Overall, as a state, Pennsylvania demonstrated a high level of non-Initiative PAH-related efforts.

Table 2-59
Effect of ECCP intervention on probability of any utilization outcome: Multivariate regression results, 2015, Pennsylvania

Probability of having at least one:	Mean, 2015 (percent)	Effect (percentage points)	90% CI		*p*-value	Effect (% of mean)
All-cause hospitalization	24.0	-2.2	-5.6	1.1	0.276	-9.3%
Potentially avoidable hospitalization	10.2	-1.6	-4.2	1.0	0.313	-15.6%
All-cause ED visit	19.9	-0.6	-3.7	2.5	0.754	-3.0%
Potentially avoidable ED visit	7.0	-1.4	-2.8	0.1	0.123	-19.6%

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect (percentage points) is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ED = Emergency Department; ECCP = Enhanced Care and Coordination Provider.

SOURCE: RTI analysis of Medicare claims data (RTI program ms01; mc01_dich_util).

Table 2-60
Effect of ECCP intervention on count of utilization outcomes: Multivariate regression results, 2015, Pennsylvania

Count of events per resident	Mean, 2015	Effect	90% CI		*p*-value	Effect (% of mean)
All-cause hospitalizations	0.356	-0.034	-0.098	0.030	0.384	-9.5%
Potentially avoidable hospitalizations	0.122	-0.026	-0.060	0.007	0.192	-21.7%
All-cause ED visits	0.281	-0.009	-0.067	0.048	0.792	-3.3%
Potentially avoidable ED visits	0.078	-0.014	-0.034	0.007	0.267	-17.5%

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ED = Emergency Department; ECCP = Enhanced Care and Coordination Provider.

SOURCE: RTI analysis of Medicare claims data (RTI program ms03; ms_03_count_util).

Although the utilization probability and count models did not show statistically significant effects, beneficial effects of the ECCP intervention are indicated on expenditure outcomes, as summarized in ***Table 2-61***. All effect estimates are negative, suggesting a reduction in spending associated with the ECCP intervention, and statistically significant for all outcomes except potentially avoidable hospitalizations (at the 0.10 significance level or better). The ECCP intervention decreased total Medicare expenditure by $2,372 per resident in 2015, on average, which is the net difference between the ECCP and comparison groups after accounting for the Base Year difference in 2012. This represents a reduction of 11.7 percent in the average total expenditure (in ECCP and comparison groups) of $20,190 in 2015. The intervention effect on all-cause hospitalizations was an estimated reduction by $857, or a reduction of 22.8 percent, relative to the 2015 average expenditure per resident (in ECCP and comparison groups) of $3,767. For all-cause ED visits, the effect estimate was a $35 reduction on average, or a 21.8 percent decrease relative to the 2015 average (in ECCP and comparison groups) of $159. For potentially avoidable ED visits, the effect was an estimated $18 reduction, which amounted to a 39.9 percent decrease relative to the 2015 average (in ECCP and comparison groups) of $44. The effect of the ECCP intervention on physician services and SNF services was also statistically significant, with physician services reduced by $160 and SNF services reduced by $1,096 which, relative to the 2015 average resident expenditure (in ECCP and comparison groups) for each outcome, represented decreases of 11.8 percent and 20.9 percent, respectively.

In 2014, there was strong evidence for the beneficial effect of the ECCP intervention across most utilization and expenditure outcomes in Pennsylvania, but those statistically highly significant results did not persist in 2015 for utilization outcomes. It is possible that this is less because of a change in the performance of the ECCP facilities in 2015 and more because of a change in the performance of the comparison facilities. Our results suggest an overall trend of reduced utilization from 2012 to 2015 as a result of ECCP intervention in Pennsylvania but none of the reduction estimates are statistically significant. The ECCP intervention does continue to show an effect on reducing expenditures in Pennsylvania, although the estimated amount of reduction in most expenditure measures is smaller in 2015 than in 2014.

Table 2-61
Effect of ECCP intervention on expenditure outcomes: Multivariate regression results, 2015, Pennsylvania

Medicare expenditure	Mean, 2015 ($)	Effect ($)	90% CI		*p*-value	Effect (% of mean)
Total	**20,190**	**-2,372**	**-4,036**	**-708**	**0.019**	**-11.7%**
All-cause hospitalizations	**3,767**	**-857**	**-1,388**	**-326**	**0.008**	**-22.8%**
Potentially avoidable hospitalizations	1,051	-210	-512	92	0.253	-20.0%
All-cause ED visits	**159**	**-35**	**-61**	**-8**	**0.032**	**-21.8%**
Potentially avoidable ED visits	**44**	**-18**	**-27**	**-8**	**0.002**	**-39.9%**
Physician services	**1,351**	**-160**	**-307**	**-12**	**0.075**	**-11.8%**
SNF services	**5,243**	**-1,096**	**-1,863**	**-329**	**0.019**	**-20.9%**

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect ($) is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ECCP = Enhanced Care and Coordination Provider; ED = Emergency Department.

SOURCE: RTI analysis of Medicare claims data (RTI program ms04; ms04_glm_exp; ms04_tpm_exp).

Table 2-62 summarizes the effect of the ECCP intervention on MDS-based quality outcomes in Pennsylvania, indicating an overall lack of definitive effect. The signs of the estimated effect indicated both quality improvement and decline, with only one statistically significant effect.

Table 2-62
Effect of ECCP intervention on MDS-based quality outcomes (percent of observed quarters per resident with event): Multivariate regression results, 2015, Pennsylvania

MDS-based quality outcomes	Mean, 2015 (percent)	Effect (percentage points)	90% CI		*p*-value	Effect (% of mean)
One or more falls with injury	**11.8**	**-3.4**	**-5.2**	**-1.7**	**0.001**	**-28.9%**
Self-report moderate to severe pain	11.4	0.0	-3.4	3.4	0.999	0.0%
Urinary tract infection	4.4	0.1	-1.3	1.4	0.930	1.6%
Decline in ADLs	17.2	0.7	-2.0	3.5	0.652	4.3%
Depressive symptoms	5.4	0.4	-4.1	4.9	0.893	6.9%
Antipsychotic medication use	26.3	-0.4	-3.5	2.7	0.838	-1.5%
Pressure ulcers Stage II or higher	4.9	-0.2	-1.4	1.0	0.771	-4.3%
Catheter inserted and left in bladder	6.5	-0.3	-1.9	1.3	0.783	-4.2%

NOTE: The 2015 mean is the unadjusted mean across all ECCP and comparison residents in that year. Effect (percentage points) is the marginal effect of the intervention in 2015. In this year's report, we present the effects as a percentage of the 2015 mean, as opposed to the 2012 mean in last year's report.

ADL = Activities of Daily Living; ECCP = Enhanced Care and Coordination Provider.

SOURCE: RTI analysis of MDS assessments data (RTI program jw12; models_5years\qm).

The estimated effect on decline in one or more falls with injury indicated that the ECCP intervention was associated with a reduction of 3.4 percentage points in the average percent of

observed quarters per resident with the adverse outcome. This corresponds to a reduction of 28.9 percent of the mean rate (in ECCP and comparison groups) in 2015, which was 11.8 percent. The results also indicated a 0.7 percentage point increase in the average percent of observed quarters per resident with a decline in ADLs, an adverse outcome, in 2015, although it is not statistically significant. In comparison, the ECCP effect on the same outcome in 2014 was a significant reduction.

Overall, with the mixed signs of effect estimates and only one of them being statistically significant and in the desired direction in 2015, we consider the overall effect of the intervention on these MDS-based quality measures sporadic and inconsistent, similar to results in 2014.

2.12 Effect of the Initiative on Mortality

To examine whether there is any relationship between the Initiative and mortality, we defined a dichotomous mortality variable. The variable was coded 1 if a resident's date of death falls during or within 30 days following his or her Initiative-eligible period (exposure days) in a given year (including up to 30 days into the next year for those present in December). It was coded 0, for those who did not die or for those who died more than 30 days after the Initiative-eligible period. Thus, for example, if a person was discharged from the nursing facility, perhaps to a hospital, did not return to the facility within 30 days and died within the 30 days post discharge, that death was captured. If the death was after that 30-day window, it was not counted.

The multivariate mortality model was estimated in the same manner as the other models for dichotomous outcomes described above. Namely, we estimated a logistic regression model using a generalized estimating equation approach, specifying an exchangeable working correlation structure to account for the clustering of individuals within facilities, and calculated robust standard errors. We computed the marginal effect on mortality in units of change in probability. We present the results, including the marginal effect estimates as a percent of the average mortality in 2015, in ***Table 2-63***.

Table 2-63
Effect of ECCP intervention on mortality: Multivariate regression results, 2015, All States

	Mean, 2015 (percent)	Effect (percentage points)	90% CI		p-value	Effect (% of the mean)
Alabama	26.3	-0.2	-2.7	2.3	0.8569	-0.9%
Indiana	28.0	0.6	-3.0	4.2	0.7497	2.1%
Missouri	27.0	1.7	-2.4	5.9	0.4094	6.4%
Nebraska	29.4	0.02	-4.1	4.1	0.9906	0.07%
Nevada	24.8	2.4	-1.4	6.3	0.2176	9.8%
New York	23.7	-0.8	-2.8	1.3	0.4662	-3.2%
Pennsylvania	25.7	0.4	-1.6	2.3	0.7294	1.4%

NOTE: The 2015 mean is the unadjusted mean across all Initiative-eligible residents in that year. Effect (percentage points) is the marginal effect of the intervention in 2015.

SOURCE: RTI analysis of Medicare claims data (RTI program ms05; ms05_logit_died_v3).

Based on the point estimates shown in ***Table 2-63***, the Initiative is associated with a slight reduction in mortality in Alabama and New York, and with a slight increase in mortality in Indiana, Missouri, Nebraska, Nevada, and Pennsylvania. However, none of the effects are statistically significant and with the exception of Nevada, none of the effects are even close to being statistically significant. Although in Nevada the effect is modestly stronger, this result, as with the other Nevada ECCP effects, should be interpreted carefully given the fact that we were not able to use propensity score matching to construct the small comparison group in Nevada. Thus overall, it appears that there is no evidence that the Initiative has an effect on mortality.

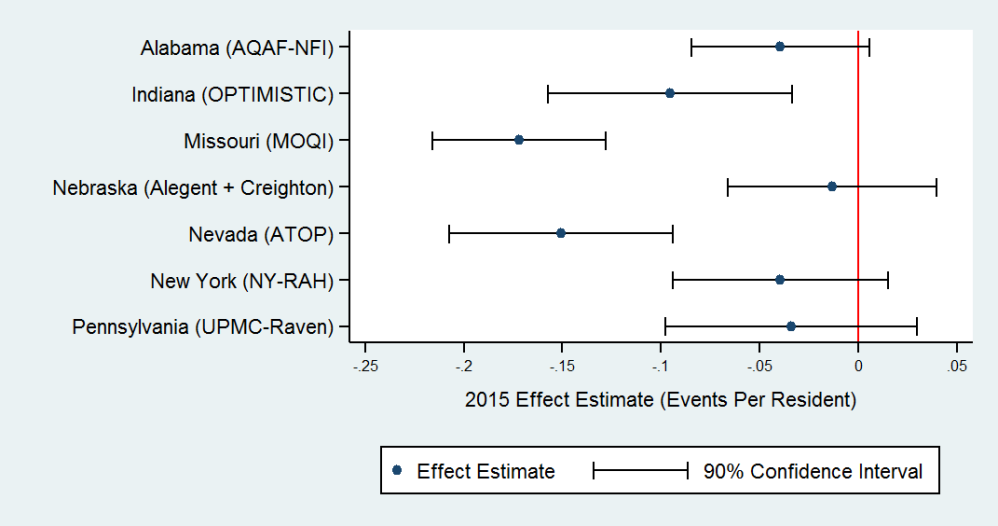
2.13 Discussion of Quantitative Findings

The results presented above from multivariate regression analysis of the 2015 data indicate evidence of continuous ECCP intervention effects on reducing hospitalizations, ED visits, and related Medicare expenditures in most of the seven Initiative states. Overall, these results continue an earlier trend from our analyses of 2013 and 2014 data showing a positive Initiative impact on key utilization and expenditure outcomes. However, on most outcomes the effect estimates vary greatly across the states, possibly driven by differences in specific interventions being implemented by the ECCPs, modes and intensity of implementation and receptivity by facilities. Below, we discuss the pattern of effect estimates in 2015 across all ECCPs on each of four utilization outcomes, including the count of all-cause hospitalizations, count of potentially avoidable hospitalizations, count of all-cause ED visits, and count of potentially avoidable ED visits, per resident. This is followed by a discussion of effect estimates on Medicare expenditures for each of the four types of service utilization as well as on total Medicare expenditures. We use forest plots to display the findings, as illustrated below.

Figure 2-3 summarizes the estimated effect of ECCP intervention on the count of all-cause hospitalizations, per resident, in 2015. For each state, the dot represents the estimated intervention effect (i.e., marginal effect), expressed as the reduction (negative value) or increase (positive value) in the average count of all-cause hospitalizations per resident. The horizontal bars represent each effect estimate's associated 90% confidence interval. The red vertical line at 0 represents a null effect, indicating no decrease or increase in the count of all-cause hospitalizations that is attributable to the ECCP intervention. The farther apart the estimate (dot) and confidence interval (bar) are from the red zero line, the stronger the evidence for an intervention-attributable decrease or increase in the count of utilization events. A confidence interval (bar) that crosses the red vertical line at 0 indicates that the effect estimate (dot) is statistically not different from zero (at the $p < 0.10$ significant level).

Figure 2-3 shows a strong and statistically significant effect of the ECCP intervention on the count of all-cause hospitalizations per resident in three states, Indiana, Missouri, and Nevada, where the 90% confidence intervals are contained entirely below zero, providing strong evidence of an intervention-associated reduction. In the remaining four states, Alabama, Nebraska, New York, and Pennsylvania, the point estimates of the intervention effect (dot) are all below zero, suggesting that the Initiative is associated with a desired direction of effect of a reduction in utilization, although none of the estimates are statistically significant.

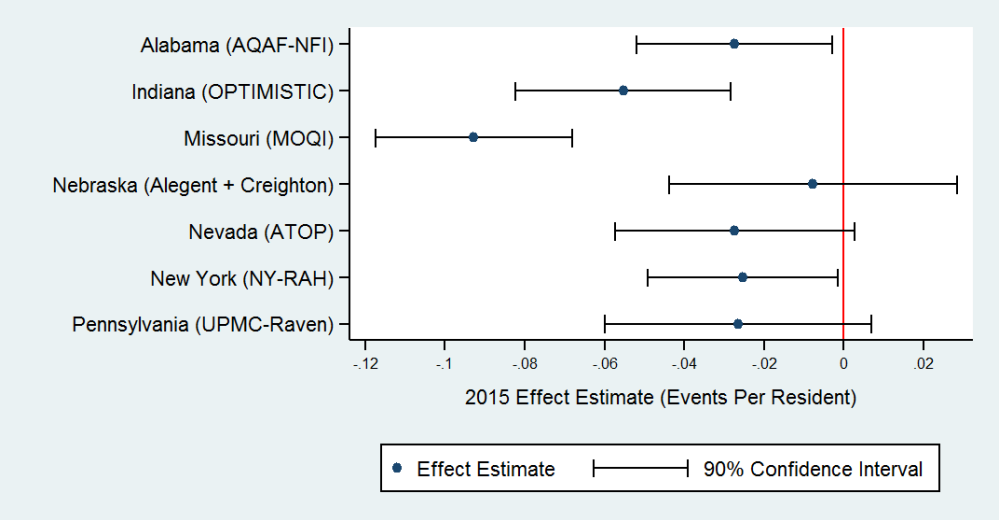
Figure 2-3
Effect of ECCP intervention on the count of all-cause hospitalizations, 2015



NOTE: ECCP = Enhanced Care and Coordination Provider.
SOURCE: RTI analysis of Medicare claims data (RTI program ms03; ms_03_count_util).

Figure 2-4 shows a strong and statistically significant effect of the ECCP intervention on reducing the count of potentially avoidable hospitalizations in four states, including Alabama, Indiana, Missouri, and New York. In all the remaining three states, Nebraska, Nevada, and Pennsylvania, the point estimates of the ECCP effect are below zero, suggesting an intervention-associated reduction, although none of the estimates are statistically significant.

Figure 2-4
Effect of ECCP intervention on the count of potentially avoidable hospitalizations, 2015

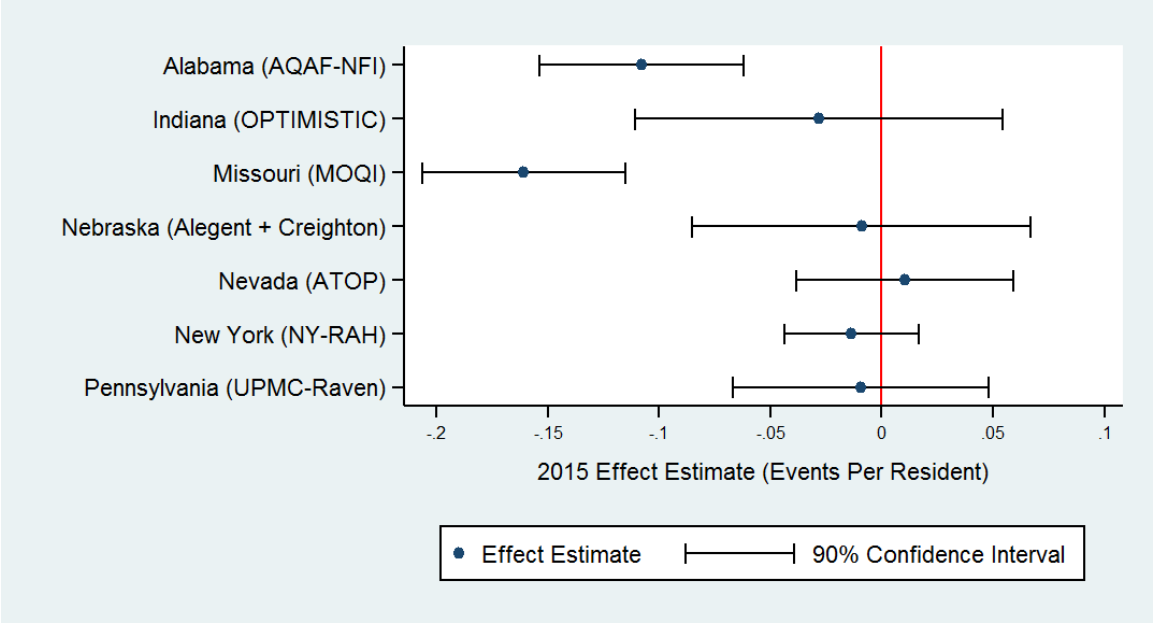


NOTE: ECCP = Enhanced Care and Coordination Provider.

SOURCE: RTI analysis of Medicare claims data (RTI program ms03; ms_03_count_util).

Figure 2-5 reveals evidence of a statistically significant effect of the ECCP intervention on reducing the count of all-cause ED visits in only two states, including Alabama and Missouri. In all but one of the remaining five states, the point estimates of the ECCP effect are below zero, suggesting an intervention-associated reduction, though not statistically significant. In Nevada, the point estimate is greater than zero, suggesting an intervention-associated increase in utilization, although statistically it is not significantly different from zero.

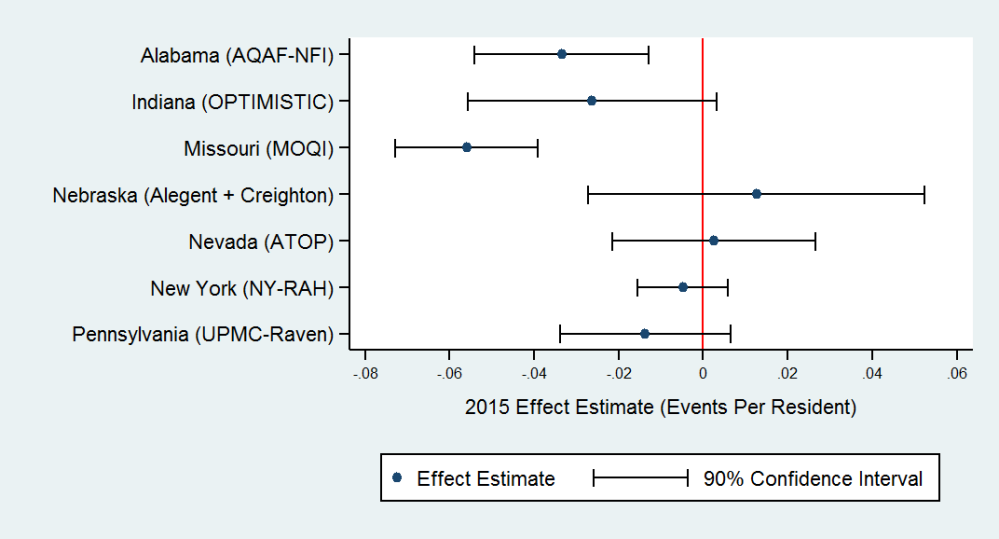
Figure 2-5
Effect of ECCP intervention on the count of all-cause ED visits, 2015



NOTE: ECCP = Enhanced Care and Coordination Provider; ED = Emergency Department.
SOURCE: RTI analysis of Medicare claims data (RTI program ms03; ms_03_count_util).

Similarly, ***Figure 2-6*** shows a strong and statistically significant ECCP intervention effect on lowering the count of potentially avoidable ED visits in only two states: Alabama and Missouri. In three of the remaining five states, Indiana, New York, and Pennsylvania, the point estimates of the ECCP effect are below zero (desirable), and in two of them, Nebraska and Nevada, the point estimates are greater than zero (undesirable), although none of these estimates are statistically significant.

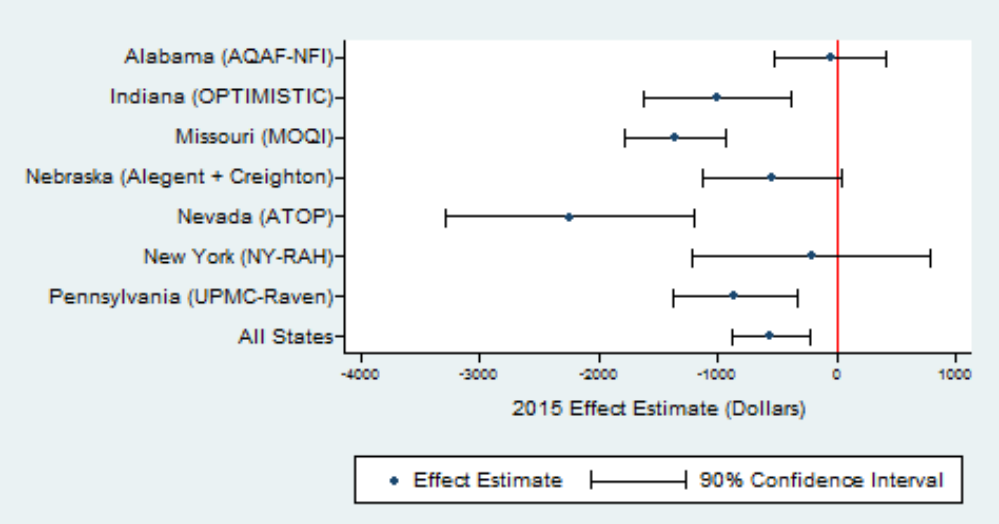
Figure 2-6
Effect of ECCP intervention on the count of potentially avoidable ED visits, 2015



NOTE: ECCP = Enhanced Care and Coordination Provider; ED = Emergency Department.
SOURCE: RTI analysis of Medicare claims data (RTI program ms03; ms_03_count_util).

Turning to expenditure outcomes, ***Figure 2-7*** shows a strong and statistically significant ECCP intervention effect on reducing Medicare expenditure for all-cause hospitalizations in four states: Indiana, Missouri, Nevada, and Pennsylvania. In all the remaining three states, the point estimates are below zero (desirable) but statistically not significant. With all states aggregated together, there was a statistically significant reduction in all-cause hospitalization expenditures.

Figure 2-7
Effect of ECCP intervention on Medicare expenditure for all-cause hospitalizations, per resident, 2015

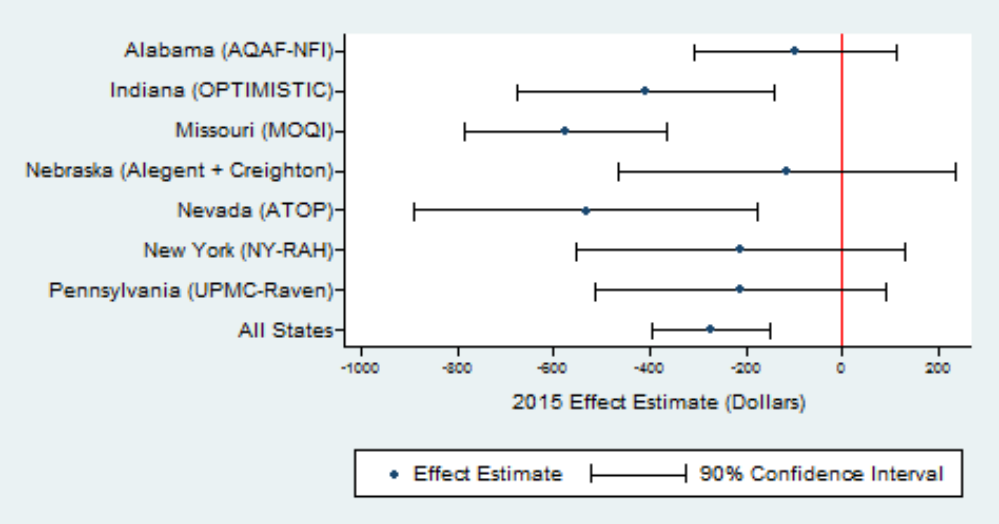


NOTE: ECCP = Enhanced Care and Coordination Provider. All states represents the effect of the ECCP interventions estimated over all states' ECCP and comparison groups combined.

SOURCE: RTI analysis of Medicare claims data (RTI program ms04; ms04_glm_exp; ms04_tpm_exp).

Figure 2-8 shows a strong and statistically significant effect of ECCP intervention on the reduction in Medicare expenditure for potentially avoidable hospitalizations in three states: Indiana, Missouri, and Nevada. In all the remaining four states, the point estimates are below zero (desirable) but statistically insignificant. With all states aggregated together, there was a statistically significant reduction in potentially avoidable hospitalization expenditures.

Figure 2-8
Effect of ECCP intervention on Medicare expenditure for potentially avoidable hospitalizations, per resident, 2015

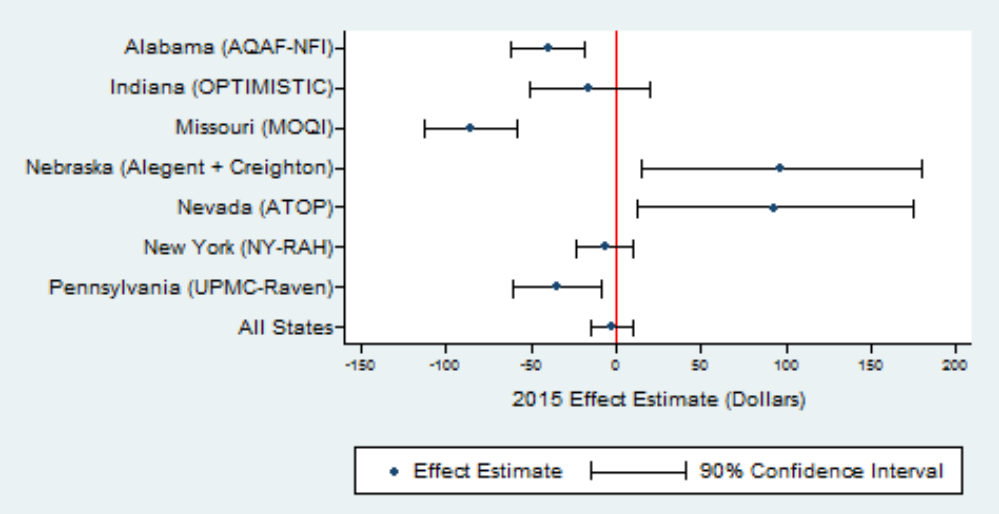


NOTE: ECCP = Enhanced Care and Coordination Provider. All states represents the effect of the ECCP interventions estimated over all states' ECCP and comparison groups combined.

SOURCE: RTI analysis of Medicare claims data (RTI program ms04; ms04_glm_exp; ms04_tpm_exp).

Figure 2-9 indicates a strong and statistically significant effect of ECCP intervention on the reduction of Medicare expenditures for all-cause ED visits in three states: Alabama, Missouri, and Pennsylvania. In two of the remaining four states, Indiana and New York, the point estimates are below zero (desirable) but statistically not significant. However, in Nebraska and Nevada, the effect estimates are greater than zero and statistically significant, suggesting relative increases in expenditure.

Figure 2-9
Effect of ECCP intervention on Medicare expenditure for all-cause ED visits, per resident, 2015

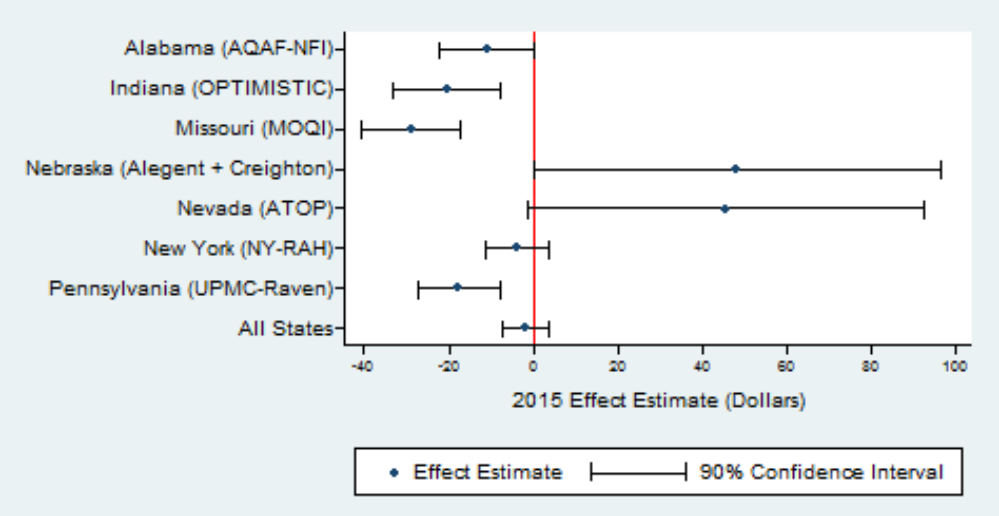


NOTE: ECCP = Enhanced Care and Coordination Provider; ED = Emergency Department. All states represents the effect of the ECCP interventions estimated over all states' ECCP and comparison groups combined.

SOURCE: RTI analysis of Medicare claims data (RTI program ms04; ms04_glm_exp; ms04_tpm_exp).

Regarding the effect estimates on Medicare expenditures for potentially avoidable ED visits, ***Figure 2-10*** shows strong and statistically significant reductions in expenditures in three states: Indiana, Missouri, and Pennsylvania. In two of the remaining states, Alabama and New York, the effect estimates are below zero but statistically not significant. In Nebraska and Nevada, again, the effect estimates are greater than zero and close to statistically significant.

Figure 2-10
Effect of ECCP intervention on Medicare expenditure for potentially avoidable ED visits, per resident, 2015

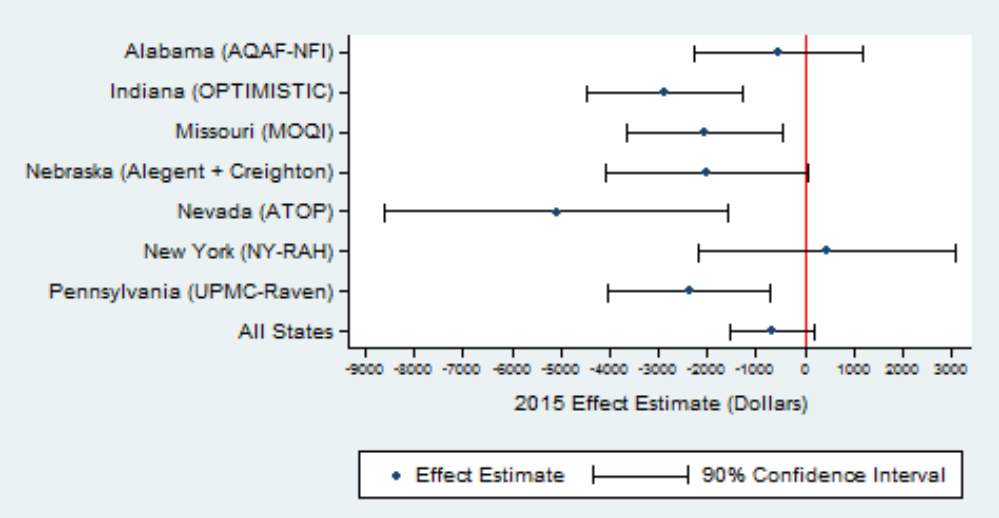


NOTE: ECCP = Enhanced Care and Coordination Provider; ED = Emergency Department. All states represents the effect of the ECCP interventions estimated over all states' ECCP and comparison groups combined.

SOURCE: RTI analysis of Medicare claims data (RTI program ms04; ms04_glm_exp; ms04_tpm_exp).

We also display the effect estimates on total Medicare expenditure in ***Figure 2-11***, which shows strong and statistically significant reductions in four states, including Indiana, Missouri, Nevada, and Pennsylvania. In two of the remaining three states, Alabama and Nebraska, the effect estimates are below zero, but in New York, the estimate is greater than zero; however, none of these estimates are statistically significant.

Figure 2-11
Effect of ECCP intervention on total Medicare expenditure, per resident, 2015



NOTE: ECCP = Enhanced Care and Coordination Provider. All states represents the effect of the ECCP interventions estimated over all states' ECCP and comparison groups combined.
SOURCE: RTI analysis of Medicare claims data (RTI program ms04; ms04_glm_exp; ms04_tpm_exp).

In summary, the 2015 data continue to indicate desired Initiative effects on many of the utilization and expenditure measures and some more consistent patterns of effects for a few of the ECCPs. In Missouri, Indiana, and Alabama, there are strong patterns indicating intervention effects reducing utilization and spending; the measures are not all significant, but most are. Alabama saw a more consistent and stronger pattern of ECCP intervention effects in 2015 than in 2014. Other ECCPs, in New York, and Pennsylvania, show mostly consistent indications of reductions, but relatively few measures are statistically strong. The ECCP effects in Nebraska and Nevada are mixed in sign. Inconsistencies in directions of effects weaken the evidence. Nevada showed stronger intervention effects on reductions in several expenditure outcomes and in all-cause hospitalization in 2015 as compared to 2014, but the usual caveats apply to Nevada.

Statistical significance indicates the probability that an effect could be observed by chance. As large numbers of statistical estimates are made, we observe more chance occurrences of large effects. A consistent pattern of substantive estimated effects is stronger evidence for a causal relationship. It is possible that an increase in ED visits with observation is compatible with a decrease in hospital admissions, but the statistical evidence is weak, and we have no information from site visits and interviews indicating that ECCPs are trying to create this care pattern.

Although the observed reductions in avoidable hospitalizations indicate improvements in quality, the MDS-based quality measures do not show a clear pattern of change related to the Initiative, similar to findings in 2014. If the concentration is more on avoiding hospitalizations and ED use related to resident changes in condition, the effects of the interventions on the broad range of MDS-based quality measures may be very limited. There were a few statistically significant effects of the ECCP intervention on MDS-based quality outcomes which, however, showed mixed signs indicating relative improvement or worsening in quality.

In the context of the qualitative findings from our site visits, phone interviews, and surveys in 2015, we learn that the interventions were more fully implemented in all states but some components were still maturing throughout 2015. They were certainly more developed than in 2014, but were still being refined and components were being rolled out throughout the year. It also became clear that facility leadership, provider buy-in, and personal relationships among all the stakeholders matter as well as the technical forms of interventions. Persistent staff turnover in the ECCPs and facilities complicates matters. With the implementations varied and still ongoing, firm quantitative conclusions cannot be drawn yet. We have not yet been able to tease out what is working among the intervention components. The primary data collection has shown how much variation there is in implementation of what may appear to be a component of the intervention. However, the numbers in the multivariate analyses are pointing in the desired direction and savings, if they are maintained, can be significant.

[This page intentionally left blank.]

SECTION 3
PRIMARY DATA COLLECTION: PROJECT YEAR 4

3.1 Primary Data Collection

Section 3 reports on all primary data collection activities undertaken by RTI for the period of July 1, 2015, through August 1, 2016. Note that we are reporting findings from Project Year 3 (i.e., analysis from survey waves 1, 2, and 3) and the beginning of Project Year 4 (i.e., site visits and telephone interviews). The complete set of findings from Project Year 4, including all remaining site visits and phone interviews for each ECCP, will be included in the separate narrative ECCP reports. These 25 to 30 page reports cover each ECCP following a standard outline and serve as a summary of all site visit and phone interview findings. These reports are not RTI formal deliverables; therefore, they are submitted to CMS after each cycle of data collection is complete and all qualitative data are analyzed in NVivo. The timing of the primary data collection is reasonable for collecting information for a calendar year, but not ideal for full analysis by our annual report deadline.

The primary data collection (PDC) schedule cycle is out of sync with the schedule of RTI deliverables and lags a few months behind. There are several reasons for these delays. In the base project year, most states were still in the process of rolling out their Initiatives. In each ECCP, the Initiative was implemented in cohorts, with some facilities starting as late as August 2013. Site visits were conducted through late spring and summer of that year, allowing enough time for at least the first cohort of facilities in each ECCP to launch some model components. The decision, approved by CMS, was to only visit and interview facilities that had implemented the Initiative for at least 3 months. As a result, RTI was only able to include preliminary PDC findings in the first annual report, as the phone interview and survey tasks were not yet complete. As a result, PDC for the base project year spilled over to the next year; we submitted the first batch of ECCP narrative reports and survey findings in winter 2013 to 2014. Subsequent project years have retained the same schedule. The PDC collection schedule is outlined below:

- Site visits May–July
- Phone interviews August–September
- Qualitative Data Analysis September–October
- ECCP Narrative report development November–December.

As seen from this schedule, the annual reports for each project year, which are due in August–September, are due too early to include most of the PDC findings for the year.

3.2 Research Questions

Qualitative data collected from ECCPs and participating facilities is intended to answer the following five research questions:

1. What changes did participating ECCPs implement?

a. How long did it take to implement these changes? Did all the nursing facility partners implement at the same rate and in the same way?

b. What challenges did the ECCPs face in implementing these changes? What lessons were learned from these experiences?

2. What facilitates a smooth transition to hospital from the nursing facility (or vice versa)?

   a. What model features facilitate these improvements in transitions?

   b. Do the improvements in transitions vary by nursing facility? Are specific nursing facility characteristics associated with the change? Why?

3. What features of the ECCPs' administration and structure account for the successes or failures of their model implementation?

4. Were Learning Community activities effective in preparing ECCPs to succeed?

   a. Were ECCPs amenable to participating in Learning Community activities? To what extent did varying participation in Learning Community activities impact the success of individual ECCPs? What type of staff participated in these activities?

   b. Did instruction networks successfully identify and influence the spread of best practices?

   c. Did Learning Community activities influence changes in the intervention to increase likelihood of success?

   d. Which characteristics of the learning system were most successful and least successful? Were there certain information dissemination methods or activities that were more successful than others?

5. What unintended consequences are observed, if any, at the state, ECCP, nursing facility, and nursing facility resident level?

3.3 Site Visit Schedule

Site visits in all seven ECCPs were completed for Project Year 4 by July 29, 2016. In addition, as of this report submission date, RTI has begun the task of conducting the telephone interviews with facility staff across ECCP facilities that were not visited in person. The primary data collection efforts included the following ECCP models (presented by site visit date):

- The University of Missouri, Sinclair School of Nursing Missouri Quality Initiative for Nursing Homes (MOQI)
  - Site visit dates: May 16, 2016 to May 20, 2016
- Nebraska Alegent + Creighton Health program (Alegent + Creighton)

- Site visit dates: June 13, 2016 to June 17, 2016

- HealthInsight Nevada Admissions and Transitions Optimization Program (ATOP)
  - Site visit dates: June 13, 2016 to June 17, 2016

- New York Reducing Avoidable Hospitalizations (NY-RAH) Project of the Greater New York Hospital Association (GNYHA) Foundation
  - Site visit dates: June 20, 2016 to June 24, 2016

- Alabama Quality Assurance Foundation Nursing Facility Initiative (AQAF-NFI): Initiative to Reduce Avoidable Hospitalizations among Nursing Facility Residents
  - Site visit dates: July 11, 2016 to July 15, 2016

- University of Pittsburgh Medical Center (UPMC) Community Provider Services Program to Reduce Avoidable Hospitalizations using Evidence-based Interventions for Nursing Facilities (UPMC-RAVEN)
  - Site visit dates: July 18, 2016 to July 22, 2016

- Indiana University (IU) Geriatrics Department, Optimizing Patient Transfers, Impacting Medical Quality, and Improving Symptoms: Transforming Institutional Care (OPTIMISTIC)
  - Site visit dates: July 25, 2016 to July 29, 2016

3.4 Facility Site Visit and Telephone Interview Task Overview

All site visits for Program Year 4 are staffed by RTI, with three-person teams assigned to each ECCP. Choosing nursing facilities for site visits was based on a purposive selection to ensure that the final sample represented the range of participating facilities. Most teams selected one or two facilities for revisit and two or three facilities that had not been visited in a prior year; actual facilities visited varied based on facility ability to accommodate the site visit. Based on the data collected on site visits and phone interviews during the previous years, we identified and included facilities that were potential candidates for best practices in terms of implementing the Initiative or those having experienced major barriers to implementation. In addition, sample criteria included facility bed size, ownership, urban/rural status, 5-star quality rating, deficiency history, and practical travel logistics.

For Project Year 4, the interview protocols did not change significantly, although the focus shifted slightly to cover topics from the perspective of continued progress and any changes implemented. As in prior years, we streamlined some language, revised some questions to be more targeted and focused, and added topics related to lasting effects of the initiatives and sustainability. The revised interview protocol was resubmitted for approval to the RTI Institutional Review Board (IRB) prior to going into the field. Both in-person and telephone

interviews were conducted according to standard qualitative evaluation practice, guaranteeing respondents anonymity and confidentiality. All in-person interviewees received a one-page summary of the main project activities and a one-page confidentiality statement, and telephone interviewees received the same documents ahead of the interview via e-mail. At the start of each in-person or telephone interview, interviewers reiterate the project activities and confidentiality statement aloud. We also have developed a protocol for facilities who have withdrawn from the Initiative.

All Project Year 4 site visits were completed by late July 2016. Each site visit lasted 5 business days and included two components: (1) *ECCP component*—a visit and interviews with key ECCP leadership and other staff, and (2) *facility component*—a visit to four participating facilities to interview facility staff and, in some cases, the facility's ECCP Nurse. For the ECCP component, some topics of conversation carried into Project Year 4 from previous project years, such as maintaining and improving data collection processes. Other topics focused more on project progress and any changes that have been made since Project Year 3, including new components that may have been rolled out or modifications made to improve existing Initiative efforts. We also discussed desired developments or expansions, challenges encountered to date, and long-range sustainability and lessons learned from the prior years of the project. For the facility component, we focused on Project Year 4 activities, the continuing role of ECCP RNs or NPs and program acceptance, as well as other facility-related issues such as ongoing trainings and ECCP work on advance directives and medication management. Detailed notes were taken during all interviews to capture the findings and then coded with NVivo qualitative data analysis software.

We are progressing with telephone interviews with facilities not visited in person in Project Year 4. Telephone interviews are conducted following a shortened interview guide that touches on the main domains covered in the site visit interviews. Telephone interviewees are the facility staff identified as most appropriate by RTI ECCP leads based on site visit experience. The facility staff targeted for telephone interviews were either the most knowledgeable about or clinically involved with the Initiative. The type of facility staff interviewed included, but was not limited to, Director of Nursing (DON), charge nurse, nursing facility administrator (NFA), and the ECCP RN or NP.

Table 3-1 displays the status of the primary data collection activities in Project Year 4 to date.

Table 3-1
Primary data collection activities in Project Year 4 as of September 30, 2016

ECCP	# of participating NFs	# of NFs site visited	# of NFs interviewed by phone	# of interviews scheduled but not completed	# of NFs nonresponders to phone interviews
Alabama (AQAF-NFI)	23	4	17	0	2
Indiana (OPTIMISTIC)	19	4	10	0	5
Nebraska (Alegent + Creighton)	14	4	9	0	1
Missouri (MOQI)	16	4	9	0	3
Nevada (ATOP)	24	4	18	0	2
New York (NY-RAH)	29	4	19	0	7
Pennsylvania (UPMC-RAVEN)	18	4	9	0	5
Total	143	28	88	0	27

NOTE: NF = Nursing Facility.

This table reflects the number of facilities in the Initiative as of September 1, 2016. One facility in Pennsylvania dropped out of the ECCP in October 2015 (Q4 2015); data from this facility for Q1 through Q3 of 2015 (i.e., before dropping out) was included.

3.5 Nursing Facility Administrator Survey and Comparison Facility Survey Task Overview

3.5.1 Nursing Facility Administrator—Background

One component of RTI's primary data collection efforts is to conduct surveys of NFAs from the participating ECCP facilities. The main objective of the survey is to collect standardized information from all participating nursing facilities, including details about the implementation components, process, successes, and challenges. Surveys are administered annually in four waves (one per year in Project Years 1 through 4) via a web-based application.

The survey instrument and the data collection are designed and managed by the RTI evaluation team in collaboration with RTI's Survey Research Division and Research Computing Division in close consultation with CMS. RTI is responsible for collecting, processing, and analyzing all survey data. The survey and data collection procedures were approved by RTI's IRB.

3.5.2 Nursing Facility Administrator—Instrument Development

RTI designed the wave 3 survey instrument specifically for the evaluation of the Initiative. The aim of the instrument was to obtain information from NFAs (or if necessary, another designated facility contact in management) about their implementation experiences during the third year of the Initiative. The survey instrument was developed with input from an interdisciplinary team, including individuals with expertise in long-term care, health policy, survey methods, and clinical knowledge.

Key survey domains for the wave 3 survey included:

- Introductory items (e.g., respondent's role and tenure at facility; role in the Initiative)
- Facility capabilities (e.g., electronic information systems and customization for the Initiative)
- Implementation successes and challenges (e.g., perspectives on support provided by ECCP, whether the facility had resources to implement, staff resistance, cooperation from partnering organizations)
- Implementation process (e.g., timeline, level of training, staffing and turnover)
- Recommendations and sustainability (i.e., likelihood of continuing specific Initiative components)

After initial domain development, our team refined the domains by adding specific questions within each domain. The wording of the questions and instructions was reviewed thoroughly over the course of several iterations to ensure that they were clear and concise. This was particularly important given that pilot testing of the instrument was not feasible because there were no appropriate facilities where this instrument could be administered in a meaningful way. Where relevant, RTI reviewed other survey instruments (e.g., National Nursing Home Survey) to use similar language for this survey.

The goals of the survey included minimizing respondent burden and reducing overlap with other primary data collection activities. We purposefully limited the overall length of the instrument and the number of questions, incorporating gate questions in the survey design to allow respondents to skip over inapplicable follow-up questions. Based on our tests of the survey instrument, we estimated the completion time for the wave 3 survey to be approximately 15 minutes. Finally, we aimed to minimize overlap with other primary data collection efforts or information collected by Deloitte.

3.5.3 Nursing Facility Administrator—Data Collection

Wave 3 data collection was conducted in a single round from October to December 2015. We asked respondents to use "during the past 12 months" as the reference period.

The response rates overall and by ECCP are reported in ***Table 3-2***. Out of 143 total ECCP facilities surveyed, 124 facilities responded to the survey, for a response rate of 87 percent. Of these 124 facilities, a total of 118 facilities fully completed the survey, and the remaining 6 partially completed the survey. All responses are included in the results. Given the inclusion of partially completed surveys (item nonresponse), the tables and figures presented in this section may contain differing numbers of respondents. Therefore, we report the number of respondents in all analyses.

Table 3-2
Wave 3 response rate overall and by ECCP

State	ECCP	Total number of participating facilities	Response rate	Surveys completed	Partial surveys
AL	AQAF-NFI	23	87.0%	19	1
IN	OPTIMISTIC	19	100.0%	16	3
MO	MOQI	16	75.0%	12	0
NE	Alegent + Creighton	14	78.5%	11	0
NV	ATOP	24	79.2%	17	2
NY	NY-RAH	29	93.1%	27	0
PA	UPMC-RAVEN	18	88.9%	16	0
	All ECCPs	***143***	***86.7%***	***118***	***6***

SOURCE: RTI analysis of wave 3 Nursing Facility Administrator Survey (2015).

All facilities were initially given roughly 3 weeks to complete the questionnaire, with reminder e-mails sent after 2 weeks, and extensions to facilities that had not yet responded. RTI sent out introductory e-mails to nursing facility administrators with a link to the web-based application with their log-in ID and password. We also provided appropriate contact information for RTI and CMS for questions or any technical difficulties. After 2 weeks, facilities that had not yet completed the questionnaire were sent a reminder e-mail alerting them that there was 1 week left to complete the survey. Facilities that had still not completed the questionnaire were sent another e-mail alerting them they had been granted an extension. At this point, individual follow-ups began by telephone for nonresponding facilities. These follow-up calls were helpful in ensuring that respondents received the e-mail invitation and were also effective in promoting cooperation. Additional follow-up e-mails were sent to nonresponding facilities.

During the data collection phase, the RTI team was also able to address all technical issues dealing with access to the survey, password issues, and time-outs. Many of these issues were communicated to RTI via the e-mail account that had been created for this survey (pah@rti.org). Facilities also used the toll-free telephone number provided to notify RTI of any difficulties they were experiencing. The RTI team followed up individually with facilities where an undeliverable e-mail receipt was received to the survey's e-mail address so that the questionnaire could be routed to the correct respondent.

3.5.4 Comparison Facility Survey

In spring 2015, RTI proposed conducting an expansion of the primary data collection survey task for our evaluation, which was approved by our CMS Contracting Officer's Representative (COR). The objective of this additional task was to assess the extent to which nursing facilities in the comparison group were implementing practices similar to those featured in ECCPs: INTERACT (Interventions to Reduce Acute Care Transfers) tools or other initiatives aimed at reducing potentially avoidable hospitalizations, such as placing advanced practice registered nurses (APRNs) or nurse practitioners (NPs) on the floors. These data are not available in the existing secondary data sources. RTI's difference-in-difference approach to estimating the effects of the Initiative practices is dependent on the assumption that the ECCP's

practices are not being conducted in the comparison groups. If some comparison facilities followed the procedures featured in the ECCPs, then this approach could underestimate the effects of the Initiative on hospitalizations. Understanding whether observed effects are being diluted by parallel changes will be important in interpreting our overall evaluation results.

We conducted a brief and targeted one-time, web-based survey of comparison facilities selected from the ECCP states. We asked nursing facility administrators in comparison facilities if their facility had introduced any policies or procedures designed to reduce avoidable hospitalizations of long-stay residents since January of 2011. If administrators answered affirmatively, we asked about specific interventions and quality improvement areas analogous to Initiative components, such as the placement of an APRN in their facility, use of the SBAR or other tools to standardize communications between nurses and physicians, and hospitalizations rate tracking or review. Out of 262 comparison facilities, we were able to contact 236 facilities, of whom 101 responded (43 percent response rate). Data collection took place from June to August of 2015.

Although in-depth state-specific findings are provided in Section 3.6, the survey results indicated that overall, 95 percent of respondent comparison facilities reported having introduced policies or procedures designed specifically to reduce avoidable hospitalizations of long-stay residents since January 2011. Among facilities reporting any overall practice, 93 percent reported the introduction of hospitalization rate tracking or review; 79 percent reported SBAR (INTERACT), Know It All Before You Call (AMDA), or other similar forms to standardize communication between nurses and physicians; and 71 percent reported Stop and Watch (INTERACT) to improve CNAs' recognition of changes in condition or other systems to alert staff to changes in residents' conditions that could lead to hospitalizations. We also identified some patterns in the specific policies and procedures reported by comparison facilities. When analyzing aggregated data across all states, a clear pattern emerged showing a clustering of INTERACT tools use. We also found that some policies and procedures, such as use of APRNs and electronic communication, tended to be introduced earlier, either prior to or around the start of the Initiative. Additional information on the background, methods, and results of this work are available upon request.

3.5.5 Integrating Nursing Facility Administrator and Comparison Facility Survey findings

We selected key questions from waves 1-3 of the Nursing Facility Administrator Survey and the Comparison Facility Survey. For the Nursing Facility Administrator Survey, we evaluated trends over time, notable findings from wave 3, and differences between respondents from all ECCPs and respondents from a state-specific ECCP.

Key NFA questions include:

- **Implementation timeline** (When do you expect that all components will be phased in?)

- **Training support** (Is the training support provided by the ECCP sufficient?)

- **Financial resources** (Does the facility have the financial resources required to implement the Initiative?)

- **Staffing resources** (Does the facility have staffing resources required to implement the Initiative?)

- **Staff support** (Are licensed nursing staff supportive of the Initiative?)

- **Staff turnover** (Is staff turnover not a significant barrier to implementation?)

- **Helpfulness of ECCP nurse** (How helpful has the ECCP nurse been in working with your staff on the Initiative?)

- **Personal support** (What is your personal level of support of the Initiative?)

Then we evaluated the extent to which nursing facilities in the comparison group were implementing practices to reduce avoidable hospitalizations of the long-stay population in the Comparison Facility Survey. We compared these responses to identical questions about the extent of similar activities, but unrelated to the Initiative, that were occurring in ECCP facilities, in wave 3 of the Nursing Facility Administrator Survey. In both surveys, we first asked respondents if their facility had introduced any policy or procedure that reduced avoidable hospitalizations of long-stay residents since January of 2011 (among ECCP facilities, limited to non-Initiative endeavors). If respondents answered affirmatively, we asked about the specific practices that were introduced, which are listed in ***Table 3-3.*** The full set of results for these survey items will be presented in the Final Project Report.

Our goal was to evaluate the extent of efforts unrelated to the Initiative that had the same aim of reducing avoidable hospitalizations among the long-stay population, which were occurring in both comparison and ECCP facilities. We examined the extent of such practices across all respondents in the ECCP and comparison groups, as well as within each ECCP's state. Among respondents who had introduced any practice, we compared the use of specific policies or procedures.

Table 3-3
Practices related to reducing avoidable hospitalizations of long-stay residents introduced independently of the Initiative

APRN	Placement of an advanced practice registered nurse (APRN) or nurse practitioner (NP) whose job is either entirely, or in part, to focus on preventing avoidable hospitalizations of long-stay residents
SBAR	**SBAR** (INTERACT) or **Know It All Before You Call** (AMDA), **or other similar forms** to standardize communication between nurses and physicians
S&W	**Stop and Watch** (INTERACT) to improve certified nursing assistants' (CNAs') recognition of changes in condition, **or other systems** to alert staff to changes in residents' conditions that could lead to hospitalizations
Care Paths	**Care Paths** (INTERACT), **Clinical Guidelines** (AMDA), **or other guides** to manage conditions associated with avoidable hospitalizations (e.g., Chronic Obstructive Pulmonary Disease [COPD], urinary tract infections [UTIs], fever, dehydration, changes in behavior)
RCA	**Root Cause Analysis** of reasons for hospitalizations (e.g., INTERACT QI), **reviews of medications** associated with hospitalizations, **or medication reconciliation** for post-hospital care
Hospital tracking	**Hospitalization rate tracking or review** (by your facility and/or by local admitting hospitals)
Electronic communication	Consultations with physicians or physician extenders via electronic communication, including telemedicine, secure texting, CareMail, or other electronic means to prevent avoidable hospitalizations
Other	Any other policy or procedure that may affect long-stay resident hospitalizations, please specify

SOURCE: RTI comparison facility domains developed for survey instrument.

3.6 Preliminary Findings from Site Visits, Telephone Interviews, and Surveys

This section presents the integrated ECCP-level results from our primary data collection efforts to date, including survey results completed in December 2015 and site visit and telephone interview findings completed in September 2016. During the ECCP interviews in the summer of 2016, RTI staff gathered information regarding the ECCP initiatives. Below is a summary of these findings by ECCP, followed by a summary of ECCP-level survey data highlights from the Nursing Facility Administrator Survey and Comparison Facility Survey.

3.6.1 Alabama Quality Assurance Foundation Nursing Facility Initiative (AQAF-NFI): Initiative to Reduce Avoidable Hospitalizations among Nursing Facility Residents

Site Visit and Telephone Interviews

Continuing through 2016 (Project Year 4), the AQAF-NFI team is implementing the majority of features described in the original operations manual. All facilities report use of at least some INTERACT tools, such as SBAR, Stop and Watch, Care Pathways, Transfer Forms, or the QI Tool. However, the 23 facilities vary in frequency of use and preference for these tools,

with some facilities reporting highest use of SBAR, others preferring Stop and Watch, and still others indicating that the Transfer Forms are used most frequently. Participating facilities have implemented a morning huddle format to discuss patient needs and change of condition. Many facilities also have implemented special quality improvement/Quality Assurance and Performance Improvement (QAPI) teams to address key concerns such as staff stability, medication management, and reducing hospitalizations. The AQAF-NFI nurse on site in each facility continues to assist with these special teams, while also encouraging use of INTERACT tools and related staff training, as needed. Because this model focuses on AQAF-NFI–to-staff knowledge transfer, rather than clinical care of residents, the AQAF-NFI leadership continues to describe this Initiative as being very cost-effective and sustainable.

As the Initiative progressed the AQAF-NFI leadership team determined that a top-down approach may be more effective to deploying large-scale efforts that require facility culture change. Rather than bringing in an outsider (the AQAF-NFI nurse) and trying to partner that nurse with facility staff members to deploy this Initiative, the AQAF-NFI team feels the change should begin with corporate and facility leadership, especially the administrator. To that end, they have introduced monthly executive leadership training opportunities and have encouraged all administrators to participate. These trainings involve a new partnership with an executive who worked in leadership training for Chick-Fil-A; the prior partnership with B&F Consulting has been dissolved. These opportunities assist administrators in learning new methods for addressing key concerns (e.g., staff stability), while also working together with other administrators who may face similar challenges. By bringing Initiative facility administrators to a centrally-located series of AQAF-NFI trainings, these administrators also have the opportunity to learn more about the Initiative so that they can become more engaged and share that enthusiasm facility wide to achieve greater staff buy-in and investment. AQAF-NFI leadership also developed an Accelerated Performance Option (APO) in which half (11) of the participating facilities received extra AQAF-NFI visits and coaching, though most facilities have AQAF-NFI visits on a quarterly basis. AQAF-NFI team members indicated a belief that once the infrastructure is in place for culture change and has had time to become routine and stable, reductions in hospitalizations will follow.

Although these executive leadership trainings have become the primary focus of AQAF's Initiative, it is unclear whether they are having a positive effect on facilities. However, a number of facility interviewees shared positive feedback about the trainings, citing them as an improvement from prior years, and reporting a high level of attendance. A few indicated that the trainings were extra work that takes staff out of busy facilities, but these negative attitudes seemed to be the minority. Overall, most facility interviewees indicated that the Initiative has made at least some impact on hospitalization rates, with nearly all respondents saying that the number of patients who are sent to the hospital seems to have decreased or leveled off since this Initiative started 4 years ago.

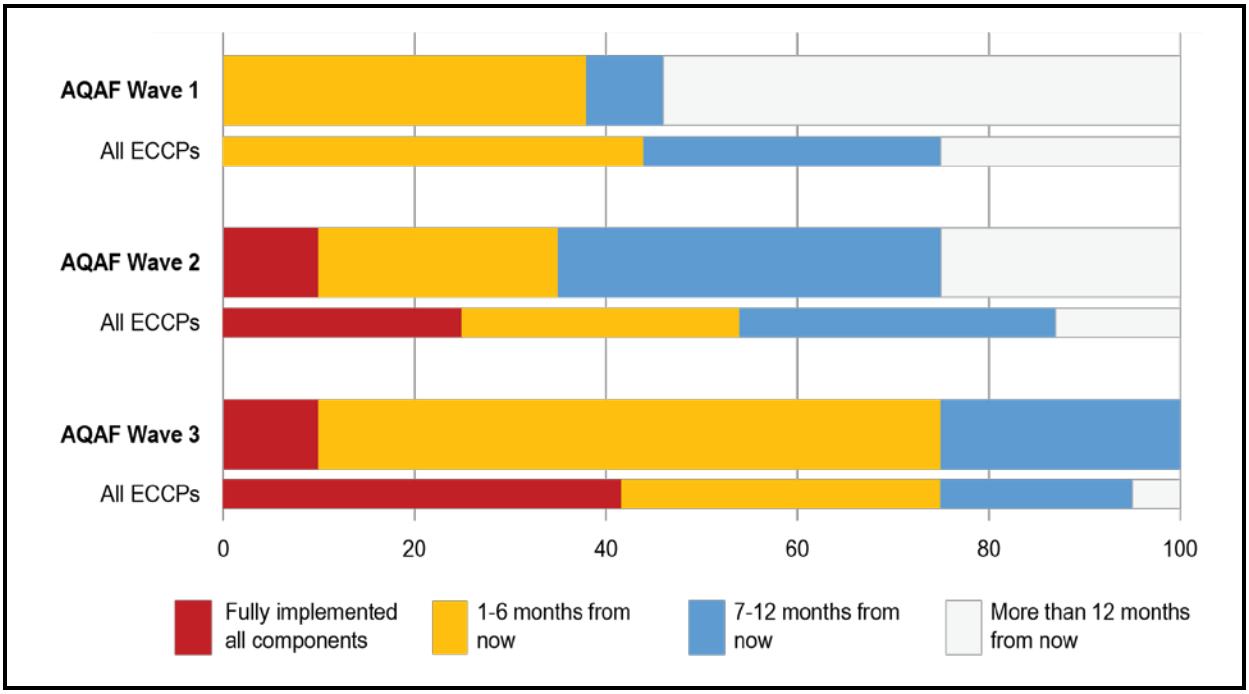
Some components of the original AQAF-NFI model (e.g., encouraging use of advance directives) still have limited use across participating facilities, and these variations have been explained by differences in leadership support and timing. Although concern about supporting leadership is being addressed through the executive trainings, timing was said to be the one major component over which the Initiative has no control. A major shift in how facility

administrators and staff think about changes in condition and hospitalizations takes time to develop necessary relationships, take root, and become entrenched—even more than the 4 years of the Initiative to date. AQAF-NFI leadership said that only after the 4 years are all the components starting to come together, but they feel even more time will be needed to see concrete results. To this end, AQAF-NFI leadership is continuing to encourage the facilities to maintain the components of the Initiative that have been put into practice, while planning next steps for Phase II. This focus on the coming years has reinvigorated the AQAF-NFI team by providing more time to continue the current efforts and apply lessons learned from Phase I. Ultimately, they feel this model is the most cost-effective means of reducing avoidable hospitalizations, but they remain insistent that this type of systemic change takes several years before real results can be observed.

Web-Based Surveys

Figure 3-1 presents expected timelines for implementing the Initiative among AQAF-NFI facility respondents only and across all ECCP respondents. Notably, 54 percent of AQAF-NFI respondents expected full implementation to take more than 12 months in wave 1, compared to only 25 percent of all ECCP respondents. This trend continued in waves 2 and 3, where fewer AQAF-NFI respondents indicated that they had fully implemented all components, compared to respondents from all ECCPs. By wave 3, only 10 percent of AQAF-NFI respondents reported fully implementing the Initiative, compared to 42 percent of all respondents. **AQAF-NFI respondents not only expected a longer timeline initially, but reported slower implementation progress relative to all ECCPs across all waves.**

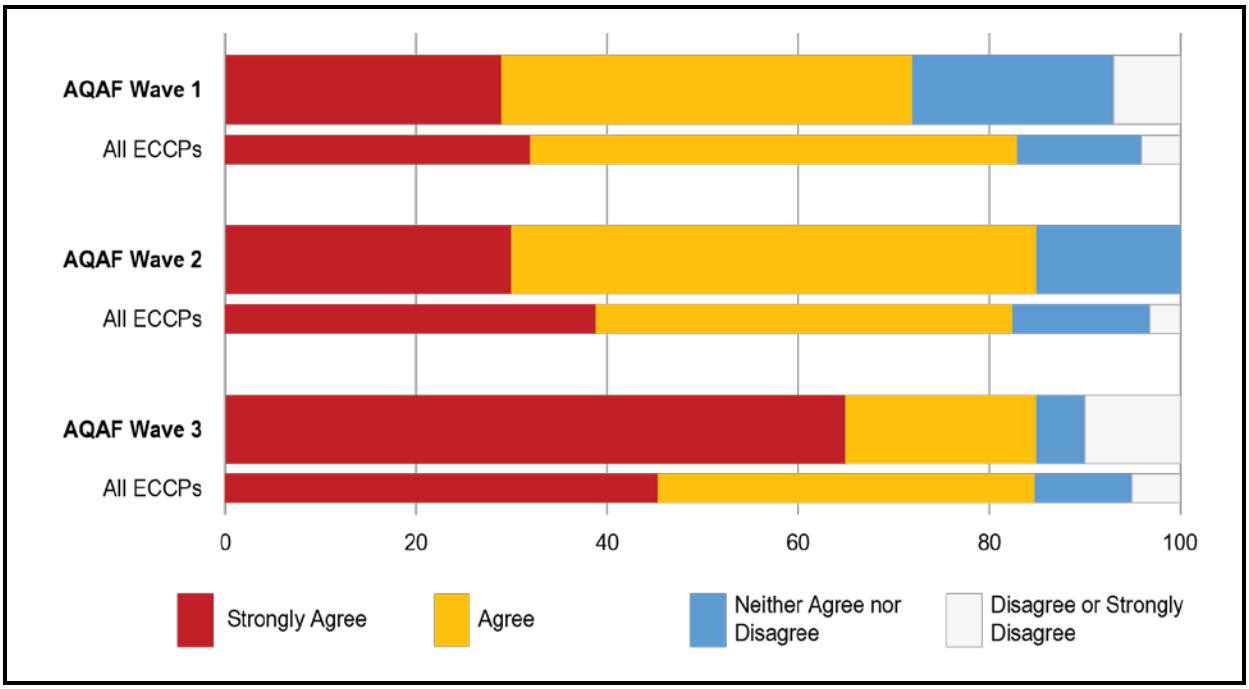
Figure 3-1
Implementation timeline, AQAF



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

Respondents reported whether training support provided by the ECCP was sufficient in ***Figure 3-2***. The percentage of AQAF-NFI respondents who strongly agreed training support was sufficient increased dramatically between wave 2 (30 percent) and wave 3 (65 percent), which was much higher compared to wave 3 overall (45 percent). The percentage of respondents who agreed or strongly agreed training was sufficient was similar among AQAF-NFI and all ECCP respondents, however. **Overall, although slow to support the Initiative in the beginning, AQAF-NFI respondents experienced a surge of support about their level of ECCP training between waves 2 and 3, to a level that even exceeded overall levels of strong support across all ECCPs by wave 3**.

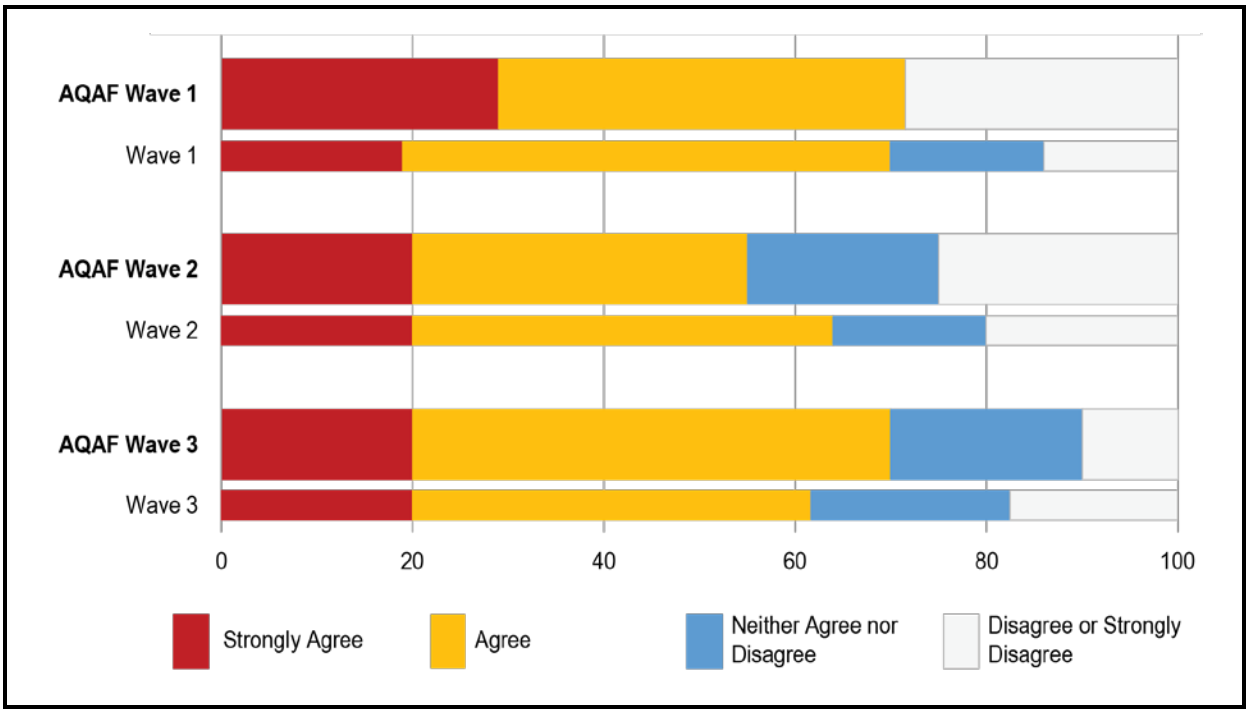
Figure 3-2
Training support, AQAF-NFI



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

Figure 3-3 indicates whether staff turnover was a significant barrier to implementation. In wave 1, a higher percentage of AQAF-NFI respondents (29 percent versus 14 percent among all ECCPs) disagreed or strongly disagreed that staff turnover was <u>not</u> a barrier to implementation, suggesting turnover was indeed a strong initial barrier for AQAF-NFI facilities. By wave 3, this trended in the opposite direction, as AQAF-NFI respondents indicated that staff turnover was a barrier less frequently (10 percent) than all ECCP respondents (18 percent). **Although staff turnover was an initial barrier to implementation in AQAF-NFI facilities, it appears that the staff retention improved with time, and this was no longer a barrier by wave 3, and was even less of a barrier relative to all ECCP facilities.**

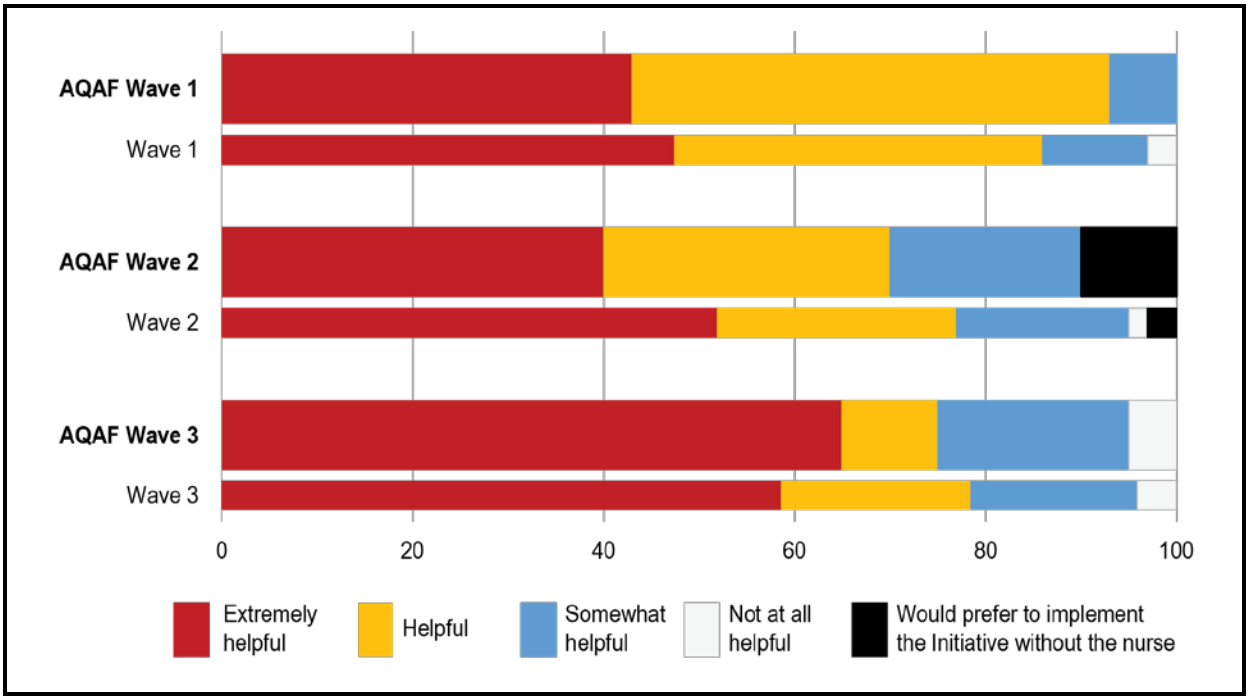
Figure 3-3
Staff turnover, AQAF-NFI



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

Figure 3-4 depicts respondents' attitudes about the helpfulness of their ECCP nurse. Overall, AQAF-NFI respondents provided positive feedback about their ECCP nurses in waves 1 and 3, but indicated some disagreement in wave 2. AQAF-NFI was among only three ECCPs where facility respondents indicated that they would prefer to implement the Initiative without the ECCP nurse (10 percent in wave 2). By wave 3 however, 65 percent of AQAF-NFI respondents indicated their ECCP nurse was extremely helpful, compared to 59 percent of overall respondents. **The attitudes toward AQAF-NFI nurses were not consistent across survey years: although a minority of AQAF-NFI respondents indicated strong dissatisfaction with their ECCP nurse during wave 2, wave 3 attitudes were similar to all ECCP respondents.**

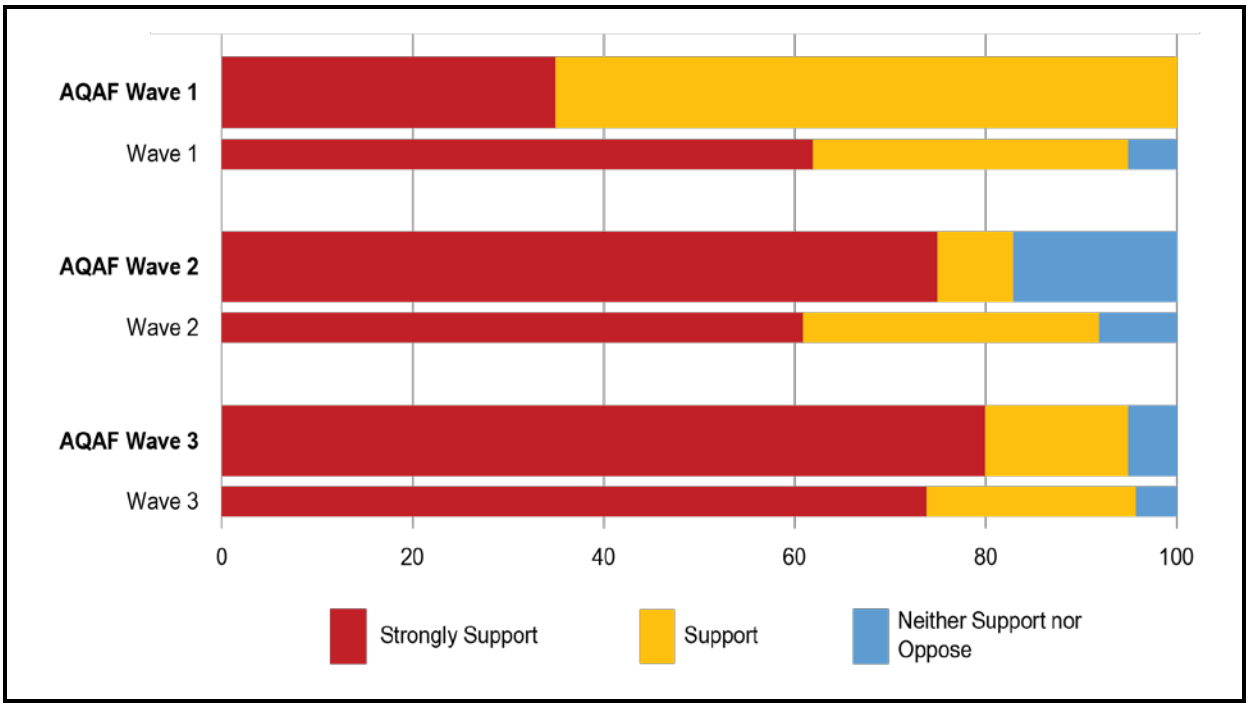
Figure 3-4
Helpfulness of ECCP nurse, AQAF-NFI



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

Respondents indicated their personal level of support for the Initiative in ***Figure 3-5***. A higher percentage of AQAF-NFI respondents indicated strong support for the Initiative with each subsequent wave. Although fewer AQAF-NFI respondents strongly supported the Initiative in wave 1, just 35 percent, this percentage jumped to 75 percent in wave 2, and to 80 percent in wave 3, ultimately showing slightly higher rates of strong support among AQAF-NFI respondents than all ECCP respondents. However, a slightly higher percentage of wave 2 AQAF-NFI respondents (17 percent) indicated they neither supported nor opposed the Initiative, compared to all ECCP respondents (8 percent). **Overall, although AQAF-NFI respondents initially indicated a lower level of strong support for the Initiative, their personal level of strong support for the Initiative increased dramatically by waves 2 and 3, to levels comparable to all ECCPs.**

Figure 3-5
Personal support, AQAF-NFI

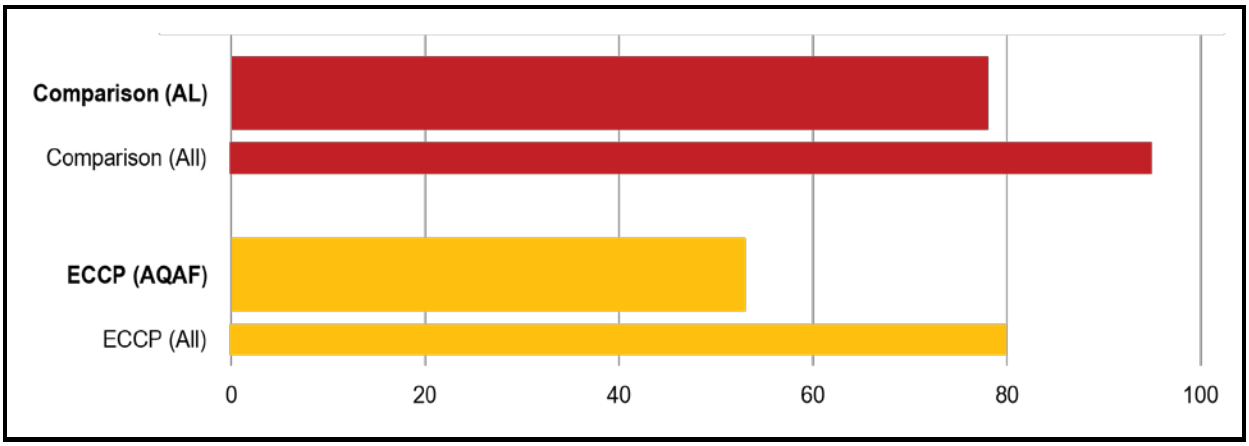


SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

To conclude, we present data about the introduction of non-Initiative related practices to reduce avoidable hospitalizations among long-stay residents. These practices occur in the comparison group facilities as well as in the facilities participating in the Initiative alongside Initiative-driven components. For the ECCP facilities, in wave 3 of the Nursing Facility Administrator survey, we asked: *Since January 2011*, *has your nursing facility introduced any policies or procedures designed specifically to reduce avoidable hospitalizations of long-stay residents for reasons unrelated to the Initiative?* Such policies or procedures may include, but are not limited to tools such as SBAR (Situation, Background, Assessment, Recommendation) and INTERACT (Interventions to Reduce Care Transfers). They may also include Quality Improvement (QI) efforts aimed at reducing avoidable hospitalization of long-stay residents, such as analyses of hospitalizations.

Although the percentage of comparison facilities in Alabama that reported introducing practices to reduce avoidable hospitalizations (78 percent) was the lowest among all states' comparison facilities (95 percent), the findings indicated that the vast majority of responding comparison facilities had introduced practices similar to the Initiative. Results from the ECCP facilities demonstrate a similar pattern, with 53 percent of AQAF-NFI facilities introducing non-Initiative related practices, markedly less than among all ECCPs (80 percent), but still indicating a high level of concurrent practices (***Figure 3-6***).

Figure 3-6
Introduced non-Initiative PAH-related practices, Alabama



SOURCE: RTI analysis of Comparison Facilities Survey and wave 3 of the Nursing Facility Administrator Survey (data collected June of 2015 to December of 2015).

Table 3-4 indicates some overlap between the most frequently reported non-Initiative practices among AQAF-NFI ECCP and Alabama comparison facilities, including the introduction of root cause analysis, SBAR, and Care Paths. Unlike all other states' comparison facilities and ECCPs, AQAF-NFI ECCP respondents did not report a high frequency of hospitalization rate tracking; instead, the most frequently reported practice was SBAR (80 percent). Among Alabama comparison facilities, the most frequently reported practice was hospitalization rate tracking (83 percent). The 80 percent rate signifies that 80 percent of respondent facilities had implemented SBAR or a similar practice since 2011, which may have been prior to or concurrent to the Initiative, but implemented for non-Initiative reasons. Thus, this measures any concurrent practices that had similar goals to the Initiative during the baseline

and project years. Further in-depth analysis of these survey items will be included in the Final Project Report.

Table 3-4
Most common non-Initiative PAH-related practices, Alabama

Alabama Comparison Respondents	AQAF-NFI ECCP Respondents
▪ Hospitalization rate tracking—83% ▪ Root Cause Analysis—57% ▪ SBAR—43% ▪ Care Paths—43%	▪ SBAR—80% ▪ Root Cause Analysis—60% ▪ Stop and Watch—50% ▪ Care Paths—50%

In summary, the survey data indicate that compared to other ECCPs, AQAF-NFI facilities reported slower implementation of the Initiative components and were slow to support the Initiative in the beginning, although this support grew in subsequent years. Although staff turnover was an initial barrier to implementation of the Initiative in AQAF-NFI facilities, it appears that the staff retention improved with time and this was no longer a barrier by wave 3 of the implementation. The attitudes toward AQAF-NFI nurses were somewhat inconsistent but also improved by wave 3 of the Initiative. The findings also indicate that the vast majority of responding comparison facilities in Alabama had introduced practices similar to the Initiative, with SBAR being the most frequently reported practice.

3.6.2 Indiana University (IU), Optimizing Patient Transfers, Impacting Medical Quality, and Improving Symptoms: Transforming Institutional Care (OPTIMISTIC)

Site Visit and Telephone Interviews

In 2016 (Project Year 4), the OPTIMISTIC team continued efforts to improve medical and palliative care, with on-site OPTIMISTIC clinical staff performing various activities, including assessments performed at the time of acute change in resident condition; the collaborative care review (CCR) process to reduce polypharmacy; advance care planning discussions with residents and families; training of facility staff on various clinical skills; use of INTERACT tools; and completion of the Physician Orders for Scope of Treatment (POST) form. Facility-based ECCP staff includes seven NPs with a total of six FTEs (one FTE currently vacant) and 18 RNs providing coverage to 19 facilities (16 full-time RNs each have their own facility [16 FTEs], one full-time RN splits time between two facilities [1 FTE], one small facility has a half-time RN [.5 FTE]). In addition to facility-based RNs, there is a full-time program administrator who manages the facility-based RNs, and another full-time RN who works part time managing facility-based RNs and part time as palliative care coach. During Project Year 3, OPTIMISTIC hoped to hire two additional NPs to focus on polypharmacy in addition to the six facility-based NPs; OPTIMISTIC was unable to fill those positions because of a limited hiring pool. OPTIMISTIC administered the retention bonus they implemented in Project Year 3 and there has been minimal turnover among on-site OPTIMISTIC clinical staff.

In Project Year 4, there were several changes in the OPTIMISTIC leadership staff. The medical director position has been split between a new medical director and an assistant medical director. The assistant medical director position was filled by the transitions core lead and a new transitions core lead was hired. The research coordinator position also turned over. Finally, an additional position was added in information systems. Two new committees were initiated at the leadership level. The IMPACT group establishes outcome criteria by which future pilot programs intended to improve implementation of aspects of the OPTIMISTIC model will be evaluated. The Scientific Committee was established to evaluate various components of the OPTIMISTIC model and publish information regarding the evaluation.

The OPTIMISTIC Intensive Care Unit, planned during Project Year 3 to provide a more intense NP visit schedule to residents with frequent rehospitalizations, was piloted. Leadership stated the NPs were not able to maintain the intensity of the schedule and believe that one visit occurring 48 to 72 hours post-hospital discharge and one in approximately 1 week later was equally effective. The revised program is called Extended Transitions Care. All NPs currently perform polypharmacy CCRs, a process rolled out in 15 of 19 facilities, and facility response was very positive. Because of facility/corporate concerns regarding reduction of psychoactive medications, ECCP NPs do not address psychoactive medications unless specifically requested to do so.

OPTIMISTIC initiated a pilot program in 2015 to improve ECCP RN's skills in analysis and interpretation of QI data. The RNs were expected to have a more integral role in facility QI processes; however, facilities were not responsive to ECCP RN efforts to initiate facility QI projects, so the pilot was not adopted.

OPTIMISTIC resumed disseminating a restructured monthly data report after the report structure was modified last year. Facility leadership had mixed responses regarding the utility of these reports, with leadership finding reports valuable when they were explained by the OPTIMISTIC RN.

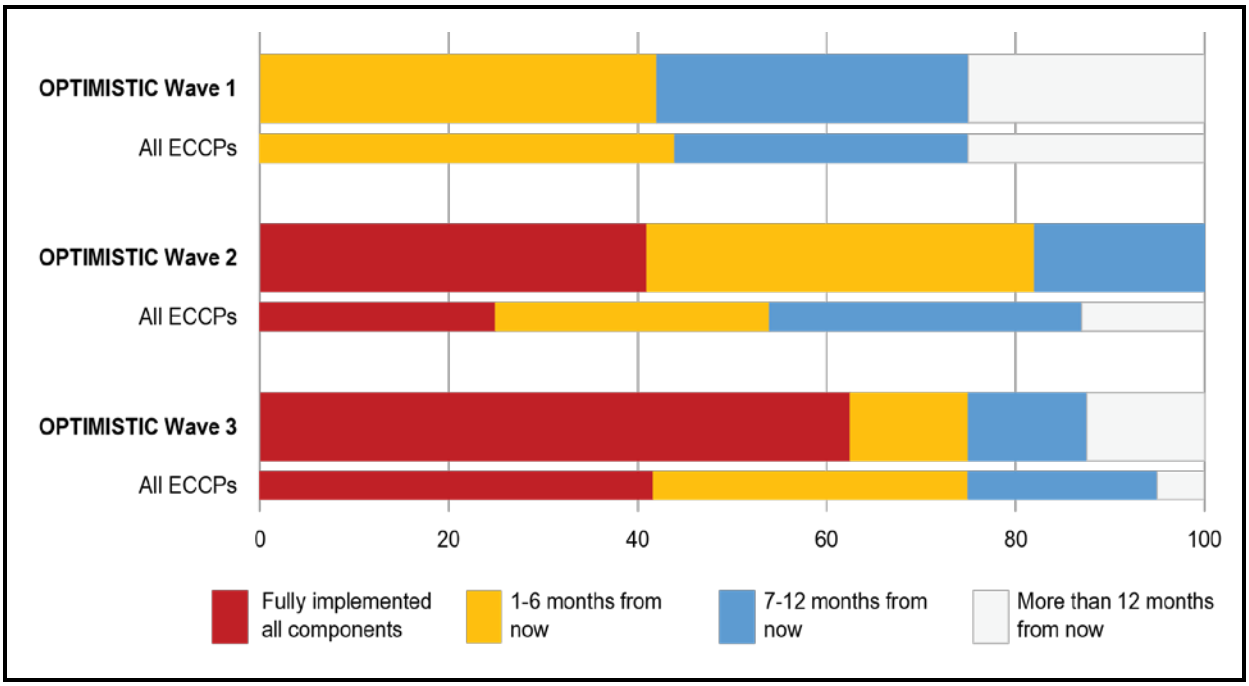
OPTIMISTIC has been closely monitoring Advance Care Planning (ACP) activities in 2015 and 2016. During that time, the RN palliative care position was created (as noted above) and RNs were given specific, monthly goals for ACP discussions and completion of POST forms. POST-form completion rose from around 20 percent of OPTIMISTIC residents in April 2015 to 80 percent at the time of our most recent site visit (August 2016).

In general, facility engagement and use of the model is high and facilities report, anecdotally, that potentially avoidable hospitalizations have been reduced through use of the model.

Web-Based Survey Results

Figure 3-7 shows timelines for implementation of the Initiative in OPTIMISTIC facilities. In wave 1, OPTIMISTIC respondents reported a timeline similar to that of the overall respondents, but by wave 3, more OPTIMISTIC facilities had fully implemented the Initiative. In wave 2, 41 percent of OPTIMISTIC respondents (compared to 25 percent of overall respondents), indicated that they had fully implemented the Initiative. This gap widened slightly in wave 3, despite a higher percentage of OPTIMISTIC respondents who reported needing 12 months or more for implementation, with 63 percent of OPTIMISTIC respondents and 42 percent of overall respondents indicating that they had fully implemented the program.

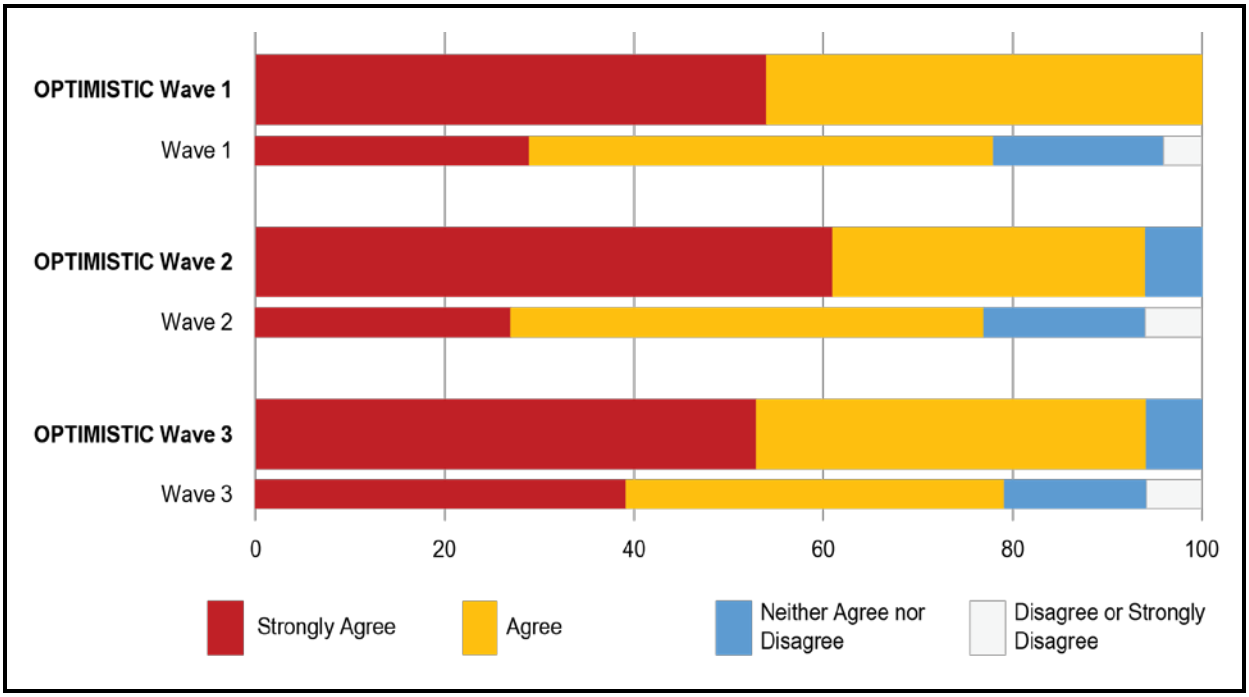
Figure 3-7
Implementation timeline, OPTIMISTIC



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

Respondents indicated whether their facility had the financial resources required to implement the Initiative in ***Figure 3-8***. OPTIMISTIC respondents indicated much more frequently than overall respondents who they had the financial resources necessary to fully implement the Initiative (94 percent in waves 2 and 3 versus approximately 78 percent for overall respondents). In addition, no OPTIMISTIC respondents indicated that they disagreed or strongly disagreed that they had the resources to implement the program in any wave. **Overall, Indiana respondents did not seem to view financial resources as a barrier to implementing the Initiative.**

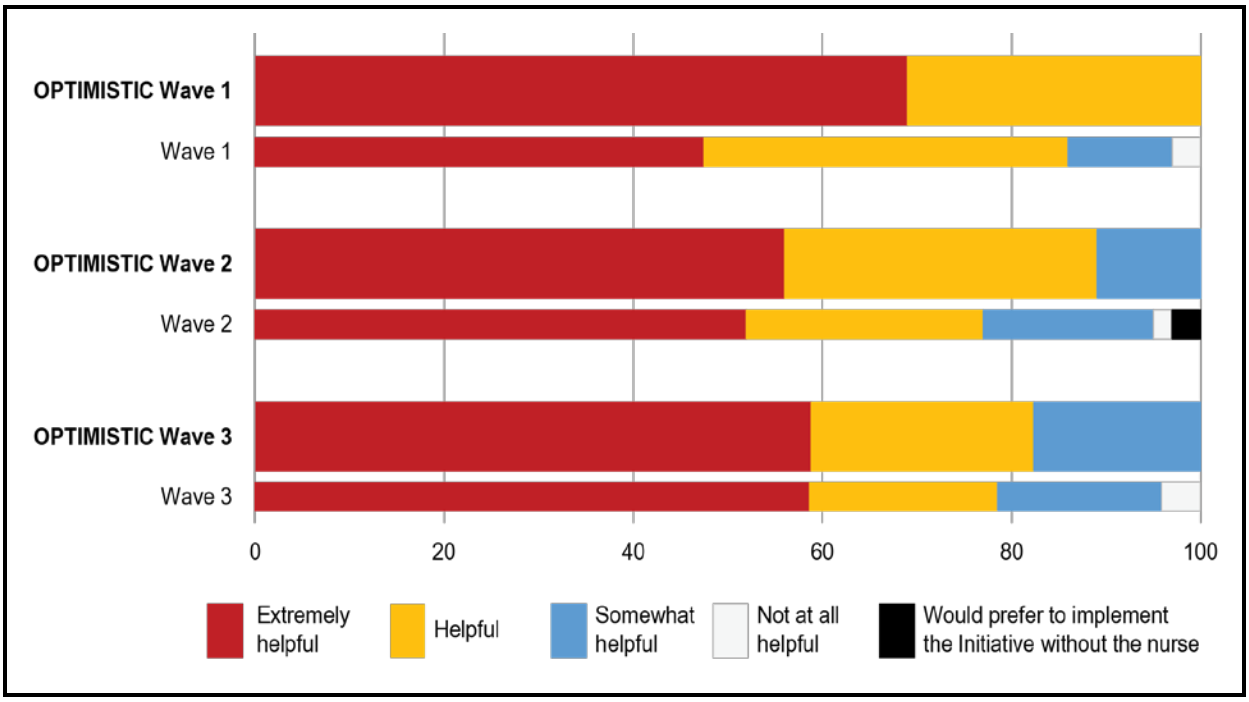
Figure 3-8
Financial resources, OPTIMISTIC



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

For ***Figure 3-9***, respondents were asked to rate the helpfulness of their ECCP nurse. For all waves, OPTIMISTIC respondents indicated their ECCP nurse was at least somewhat helpful, with the percentage of those considering the nurse helpful or extremely helpful around 10 percentage points higher than all ECCP respondents in waves 1 and 2, and approximately 5 points higher in wave 3. No OPTIMISTIC respondents indicated their ECCP nurse was not helpful or that they would prefer to implement the Initiative without the nurse during any wave, as a small percentage of the overall respondents did. **OPTIMISTIC respondents generally rated ECCP nurses as more helpful than respondents did overall and showed a high level of satisfaction with them across all waves.**

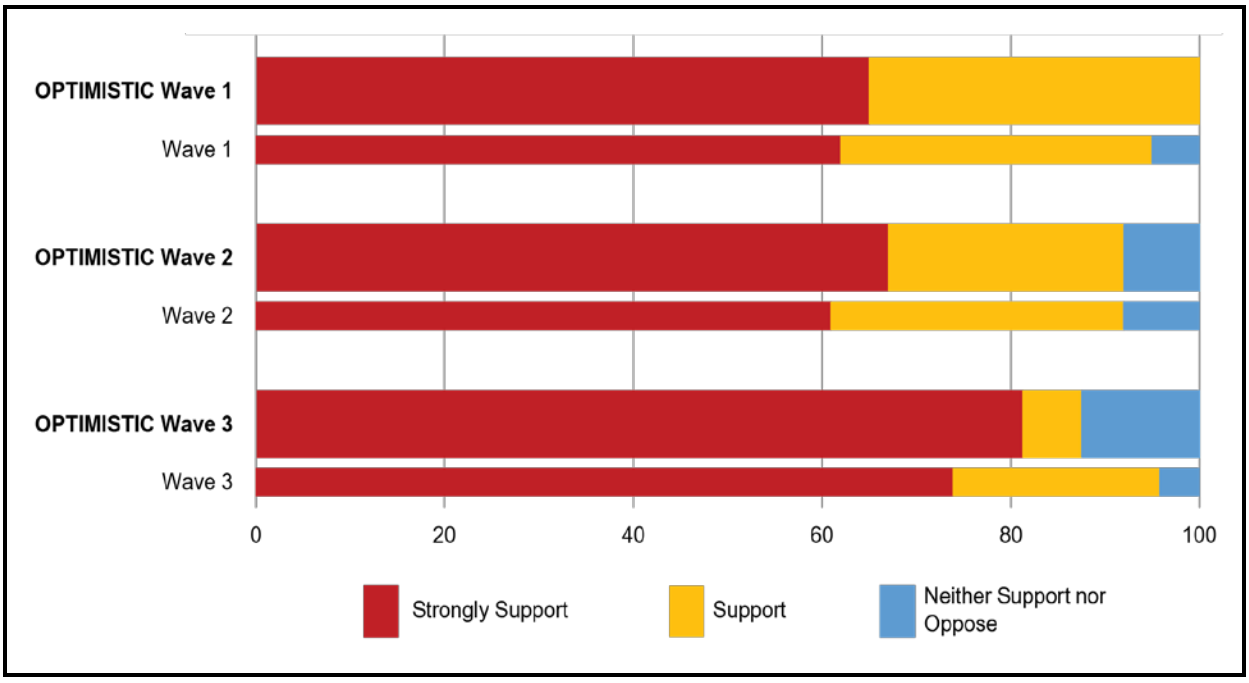
Figure 3-9
Helpfulness of the ECCP nurse, OPTIMISTIC



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

Figure 3-10 presents the personal level of support for the Initiative indicated by respondents. There are two trends of interest in these data for OPTIMISTIC. First, the number of OPTIMISTIC respondents who strongly supported the Initiative increased in each wave, from 65 percent in wave 1 to 81 percent in wave 3, which was higher than the level of personal support from all ECCP respondents (62 percent in wave 1, 74 percent in wave 3). The percentage of OPTIMISTIC respondents who neither supported nor opposed the Initiative increased from wave 2 (8 percent) to wave 3 (13 percent), which in wave 3 was higher than the respondents overall (4 percent). **In conclusion, the data show growth of both strong support and some indifference toward the Initiative in OPTIMISTIC facilities.**

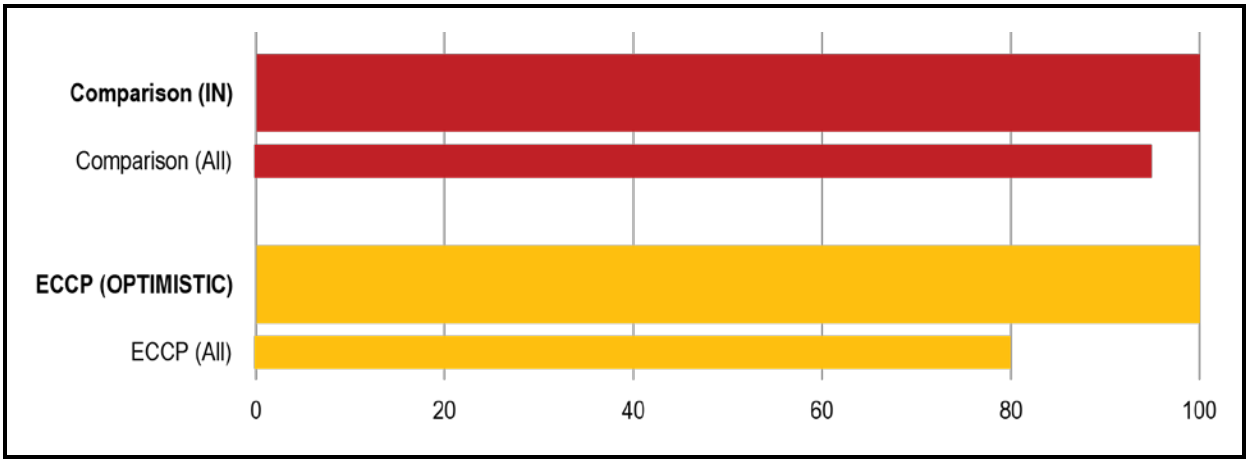
Figure 3-10
Personal support, OPTIMISTIC



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

Figure 3-11 presents data on non-Initiative efforts to reduce avoidable hospitalizations from the Comparison Facility Survey and wave 3 of the Nursing Facility Administrator Survey to ECCPs. **Both comparison facilities and ECCP facilities in Indiana reported exceptionally high rates of PAH efforts not related to the Initiative, with 100 percent of respondents indicating they had introduced PAH-related policies or procedures in their facilities.** The comparison between OPTIMISTIC respondents and all ECCP respondents is particularly striking, as only 80 percent of all ECCP respondents reported implementing non-Initiative policies or procedures.

Figure 3-11
Introduced non-Initiative PAH-related practices, Indiana



SOURCE: RTI analysis of Comparison Facility Survey and wave 3 of the Nursing Facility Administrator Survey (data collected June of 2015 to December of 2015).

The non-Initiative PAH-related policies or procedures most frequently mentioned by respondents are indicated in ***Table 3-5***. Comparison facilities in Indiana reported implementing hospitalization rate tracking and Stop and Watch most frequently, while OPTIMISTIC ECCP facilities indicated they had also introduced hospitalization rate tracking, followed by root cause analysis.

Table 3-5
Most common non-Initiative PAH-related practices, Indiana

Indiana Comparison Respondents	OPTIMISTIC ECCP Respondents
▪ Hospitalization rate tracking—100% ▪ Stop and Watch—85% ▪ SBAR—77%	▪ Hospitalization rate tracking—81% ▪ Root Cause Analysis—81% ▪ SBAR—69%

In summary, almost two thirds of OPTIMISTIC facilities reported fully implementing the Initiative by wave 3, with most respondents indicating that financial resources were not a barrier to implementing the Initiative. OPTIMISTIC respondents generally rated the helpfulness of their ECCP nurse higher than respondents overall and reported increasing levels of personal support for the Initiative. Both comparison facilities and ECCP facilities in Indiana reported

exceptionally high rates of implementing PAH efforts unrelated to the Initiative, with 100 percent of respondents indicating that non-Initiative PAH-related policies or procedures had been introduced in their facilities. Comparison facilities reported implementing hospitalization rate tracking and Stop and Watch mostly frequently, while ECCP facilities reported hospitalization rate tracking and root cause analysis mostly frequently.

3.6.3 University of Missouri, Sinclair School of Nursing Missouri Quality Initiative for Nursing Homes (MOQI)

Site Visit and Telephone Interviews

In 2016, all 16 of the Missouri Quality Initiative facilities remained in the Initiative. Project staff stabilized early in Project Year 2 and continued to be stable in Project Year 4. The ECCP maintained overall fidelity to the model and continued intensified efforts in the APRN, quality improvement, advance directives, and health information technology (HIT) components. Staff at nearly all visited facilities reported anecdotal evidence that the MOQI is reducing many hospitalizations. The use of INTERACT tools, particularly Stop and Watch and SBAR, has become routine in more facilities. APRNs continued to focus on root cause analysis and met as needed with the Project Coordinator and the Project Supervisor to review each facility transfer. The APRNs also continued to use customized reports on transfers in the project's Qualtrics database and used the information to target education and work with facility quality improvement committees.

ECCP and facility staff reported many successes in the MOQI Project; in their view, it is moving in the right direction. The APRNs are well established in all facilities and, according to the interviews, hospitalization rates have continued to decrease and or remain stable in most facilities. Staff in the site visited facilities reported that family and physician demands for hospitalizations have decreased, quality improvement projects have continued with new emphasis on reducing facility acquired infections, and there has been major progress in increasing the number of residents with ADs. The ECCP reported that HIT initiatives are gaining momentum and use in more facilities; however, nursing facility staff remained ambivalent about CareMail and CareView. Instead, staff in most facilities reported using Mediprocity, a HIPAA-compliant texting application, and Epic, an EHR used by local hospitals, for secure health information exchange. The ECCP provided training on Mediprocity and provided guidance on Epic in their monthly updates. ECCP nurses reported that licensed practical and registered nurses have increased their knowledge and skills, and improved communication with other providers, resulting in increased confidence in their clinical practice overall.

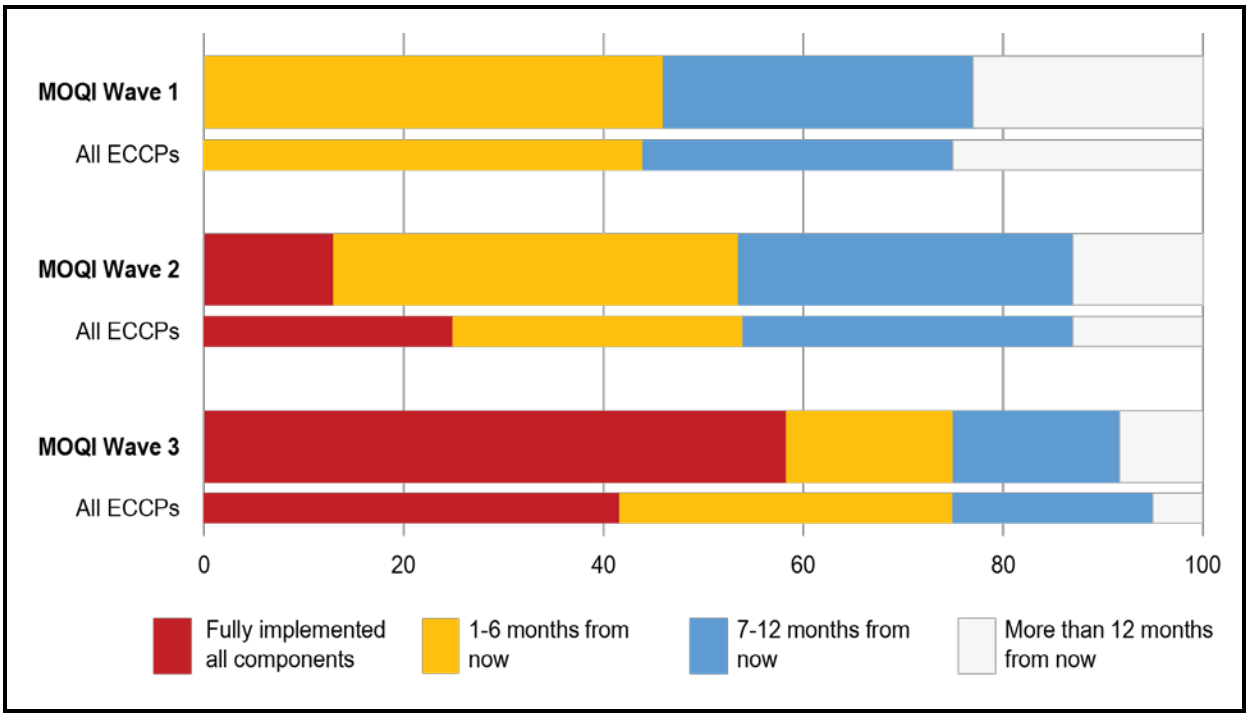
Reflecting back to the 4 years of implementation, ECCP and faculty staff reported several challenges. Recognizing the difficulty of implementing the Initiative and having the proper dose of the interventions was an overall challenge in Phase I. Facility staff turnover, particularly among certified nursing assistants, is viewed as one of the greatest challenges in sustaining the accomplishments of Phase 1 and a concern going into Phase 2 of the Initiative. In addition, more registered nurse hours to care for increasingly acutely ill residents will be needed in Phase 2, and recruitment will be difficult. The challenges of recruiting and retaining staff will be compounded by the necessity of educating nursing staff in the care of the targeted clinical conditions to reduce hospitalizations. This will require additional staffing as well as additional operating and capital

resources to safely care for nursing home residents. The MOQI project participants are enthusiastic about Phase 2, particularly the retention of the ECCP nurse. There is a strong sentiment that 4 more years will enhance sustainability and that nursing facility leadership support is an essential component of continued progress and success.

Web-Based Survey Results

The expected timelines for implementation of the Initiative are displayed in ***Figure 3-12***. While MOQI respondents and all respondents reported a similar distribution of timelines in wave 1, fewer MOQI respondents reported full implementation of the Initiative relative to all respondents in wave 2. In wave 3, a relatively higher percentage of MOQI respondents specified that they had fully implemented the Initiative (58 percent versus 42 percent overall). **MOQI began with a slow/average implementation timeline that improved considerably by wave 3**.

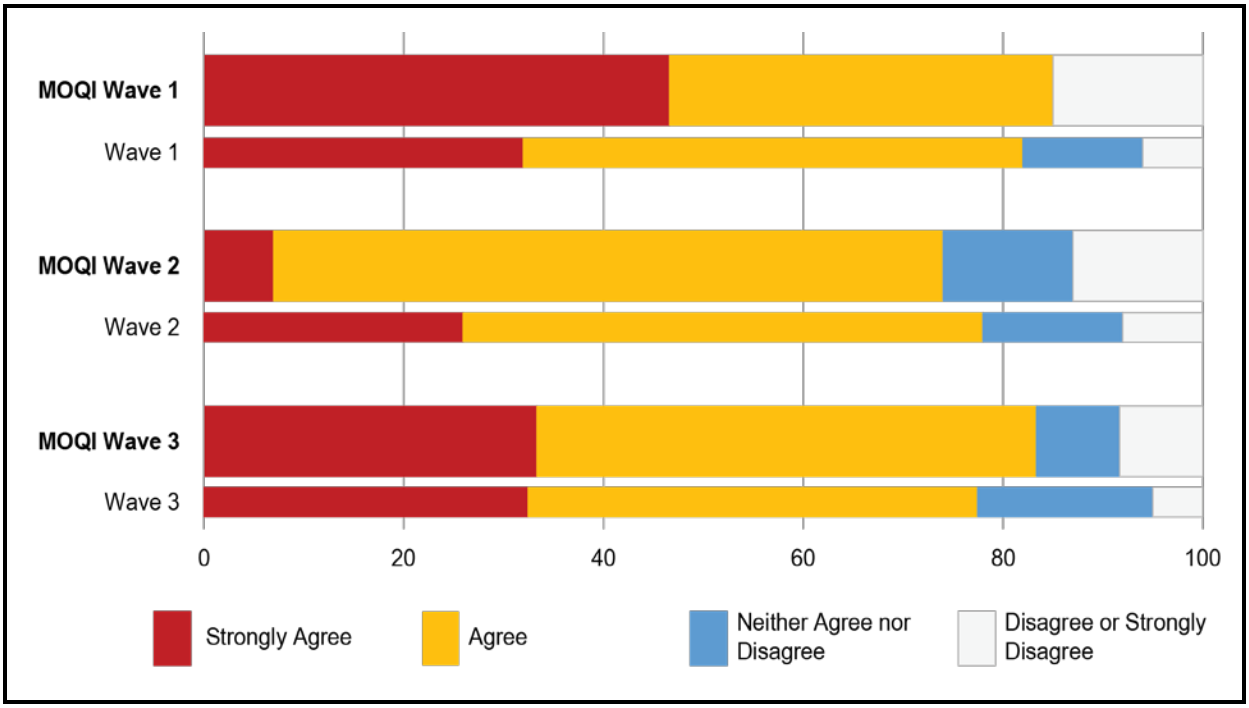
Figure 3-12
Implementation timeline, MOQI



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

Figure 3-13 presents data on MOQI staff support of the Initiative. A higher percentage of MOQI respondents agreed or strongly agreed that the facility staff supported the Initiative in waves 1 and 3. These positive indications of high staff support in MOQI were offset by the much lower percentage of facilities in wave 2 that strongly agreed (only 7 percent, compared to 26 percent of all respondents). There was also a modest, but consistently higher percentage, of MOQI respondents who disagreed or strongly disagreed that the facility staff supported the Initiative across all waves. **Although there was a drop in enthusiasm in wave 2 and a minority of MOQI staff that did not support the Initiative, the majority of facility staff consistently supported the Initiative across all waves.**

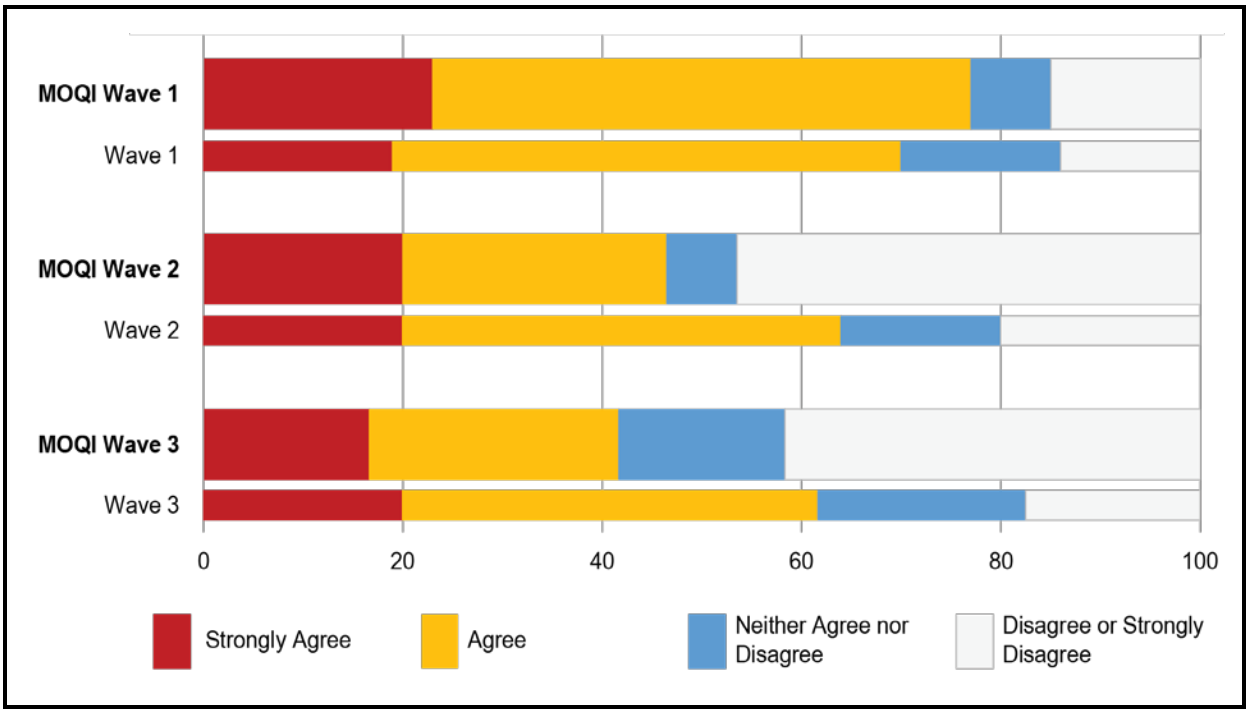
Figure 3-13
Staff support, MOQI



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

Figure 3-14 represents respondents' feedback on staff turnover as a barrier the Initiative. **Given the percentage of respondents who disagreed or strongly disagreed that staff turnover was <u>not</u> a barrier in waves 2 and 3, staff turnover seems to have been a particularly strong barrier to implementation** for MOQI. In wave 2, 47 percent of MOQI respondents indicated that turnover was a barrier, as did 42 percent in wave 3. Only 20 percent of all respondents in wave 2 and 18 percent in wave 3 reported that it was a significant barrier. This trend was not present in wave 1, indicating that staff turnover might not have been an initial barrier for MOQI respondents, but one they experienced as they moved forward with implementation.

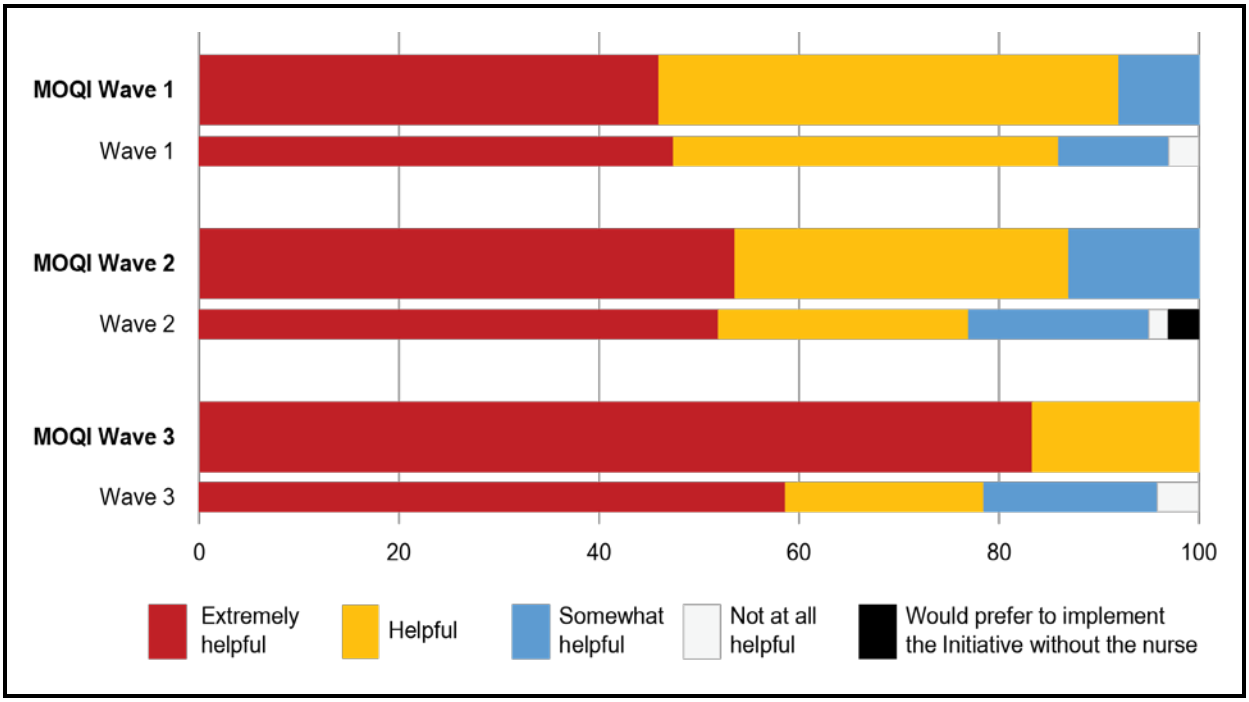
Figure 3-14
Staff turnover, MOQI



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

In ***Figure 3-15***, respondents' indicated how helpful their ECCP nurse was. **MOQI respondents show a high level of enthusiasm for the helpfulness of their ECCP nurse.** None of the MOQI respondents indicated that their nurse was not at all helpful or that they would prefer to implement the Initiative without them during any wave, and a smaller percentage than overall respondents indicated that their ECCP nurse was only somewhat helpful (mostly notably in wave 3, 0 percent). Moreover, all wave 3 MOQI respondents indicated their ECCP nurse was helpful, and 83 percent indicated that they were extremely helpful (compared to 59 percent overall).

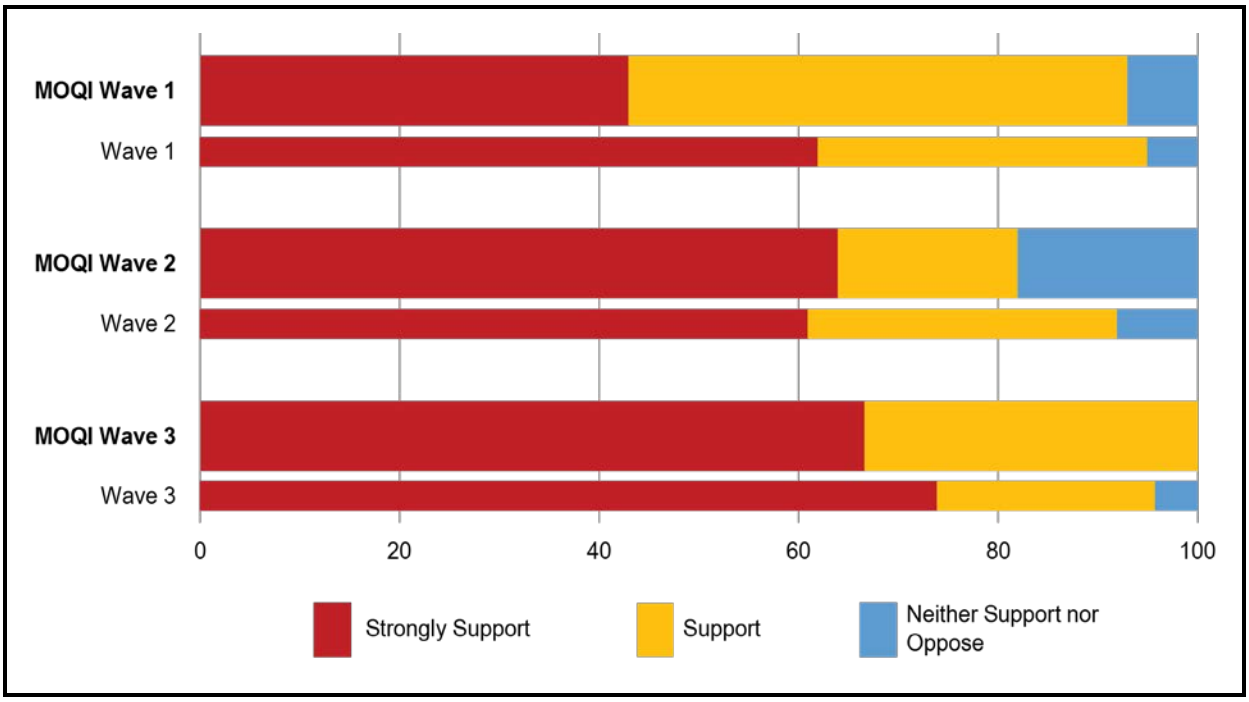
Figure 3-15
Helpfulness of the ECCP nurse, MOQI



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

Figure 3-16 indicates MOQI respondents' personal levels of support for the Initiative. **While it appears that support for the Initiative by MOQI respondents was initially similar to the overall level of support in wave 1, and was lower in wave 2, by wave 3 more MOQI respondents indicated support of the Initiative.** In fact, all MOQI respondents indicated that they either supported or strongly supported the Initiative in wave 3, although the percentage of "strongly support" MOQI respondents (67 percent) remained below the overall percentage of "strongly support" respondents (74 percent).

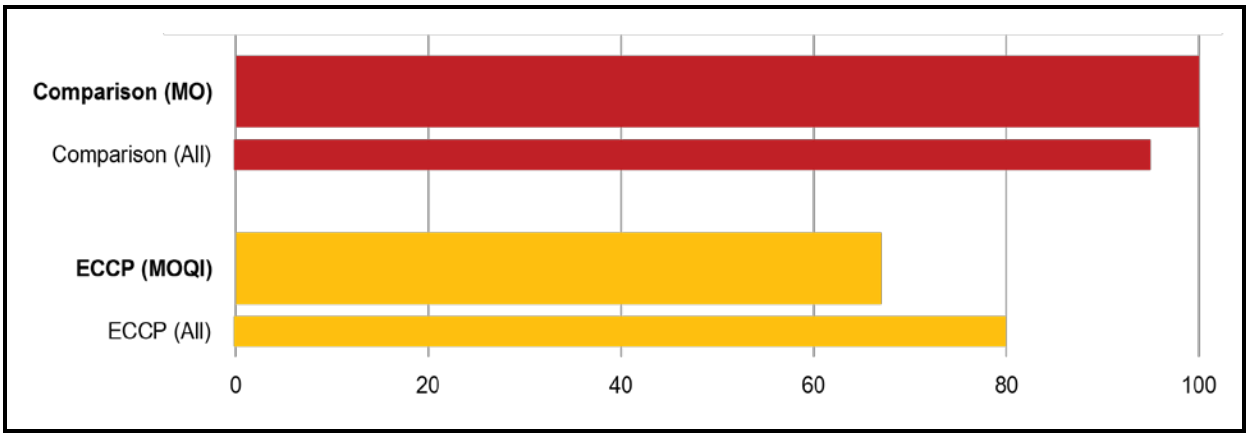
Figure 3-16
Personal support, MOQI



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

Figure 3-17 shows the percentage of facilities that reported introducing non-Initiative measures to reduce PAHs. **MOQI respondents reported introducing non-Initiative PAH-related policies or procedures less frequently (67 percent) than either their in-state comparison facilities (100 percent) or all ECCP respondents (80 percent).** However, especially among comparison facilities within Missouri, this indicates a high level of parallel change in practice. Both MOQI and overall ECCP respondents also had lower percentages of facilities report that they had introduced a new program or policy than Missouri or overall comparison respondents. These findings are still restricted to practices unrelated to the Initiative, and thus, do not represent any overall level of practices within facilities to reduce PAHs.

Figure 3-17
Introduced non-Initiative PAH-related practices, Missouri



SOURCE: RTI analysis of Comparison Facilities Survey and wave 3 of the Nursing Facility Administrator Survey (data collected June of 2015 to December of 2015).

As shown in ***Table 3-6***, MOQI respondents reported implementing specific programs at a lower rate than comparison respondents in Missouri, but the most frequently introduced practices, including SBAR and Care Paths, were in the majority of facilities. Among comparison facilities in Missouri, hospitalization rate tracking and SBAR were the most frequent practices.

Table 3-6
Most common non-Initiative PAH-related practices, Missouri

Missouri Comparison Respondents	MOQI ECCP Respondents
▪ Hospitalization rate tracking—90% ▪ SBAR—90% ▪ Stop and Watch—80%	▪ SBAR—63% ▪ Care Paths—63% ▪ Hospitalization rate tracking—50%

In summary, more than half of MOQI respondents reported that they had fully implemented the Initiative by wave 3. The overall staff support for the Initiative was generally high but dipped somewhat in wave 2. MOQI respondents reported a high level of enthusiasm for the helpfulness of their ECCP nurse and also indicated high levels of personal support by wave 3. Staff turnover seems to have been a particularly strong barrier to implementation in later years

of the Initiative. The MOQI ECCP respondents reported implementing non-Initiative PAH-related policies or procedures less frequently than either all ECCPs or their in-state comparison facilities. However, all comparison facilities in Missouri reported implementing PAH-related efforts, with SBAR and hospitalization rate tracking being the most common.

3.6.4 Nebraska Alegent + Creighton Health Program (Alegent + Creighton)

Site Visit and Telephone Interviews

In 2016, the Alegent ECCP sustained the program that it had built in participating facilities during the first 3 years of implementation. Most components still are being administered with fidelity to the original plan, although Alegent's education program for facility staff continues to evolve. Components of the Alegent ECCP include: direct care, medication management, dental assessments and cleanings, improved communication, and education. Apart from the dental assessment and cleanings, all components are administered by NPs, who spend an average of 1 to 2 days per week in each participating facility. The ECCP continues to focus primarily on the medication management and clinical care components of the Initiative, with the NPs taking an active role in the management of enrolled residents' care.

After not receiving CMS funding for Phase II, ECCP leadership is starting to focus more concretely on sustainability. After the end of the grant, the ECCP will merge many of its operations with the Nursing Home Network (NHN), an Alegent program that provides NPs to facilities to care for skilled patients in facilities. The NHN currently operates in 10 facilities in the Omaha area, two of which also participate in the ECCP. Like the NHN NPs, the ECCP NPs will begin to bill for their services rather than having their salaries supported by a fixed source of funding. The ECCP NPs will continue to focus on long-term care residents, although they likely will expand their case load to become financially self-sustaining. This new funding arrangement means that the ECCP is unlikely to retain its entire supporting staff. The consulting pharmacist's position will be terminated, and the dental hygienists are seeking alternate funding to maintain their role. Although the ECCP has not finalized a sustainability plan with any participating facilities, they are likely to continue to work in facilities in which they already have a strong relationship with the medical director and in which the facility does not already receive regular visits by an NP who is not affiliated with the ECCP or NHN.

The Alegent ECCP has experienced other shifts in staffing not related to the impending termination of the grant. Two NPs left the ECCP, and one new NP was hired. The Director of the ECCP recently was named Interim Chief Nursing Officer for CHI Health, which resulted in a significant reduction of her time spent on the ECCP. Many functions of her role have been filled by one of the NPs who has been with the ECCP since the start of implementation. This NP now serves as the Associate Director and has discontinued her clinical role in facilities. The ECCP data analyst also left the project, as the process of collecting and analyzing data from participating facilities no longer requires a dedicated analyst. Most facilities now use the same EMR, Point Click Care, from which NPs easily can download the information required to complete the CMS/Deloitte reports using the tools that the data analyst developed. Finally, the ECCP hired a training coordinator to facilitate the NICHE educational tool in facilities, but low use of that tool made this position unnecessary.

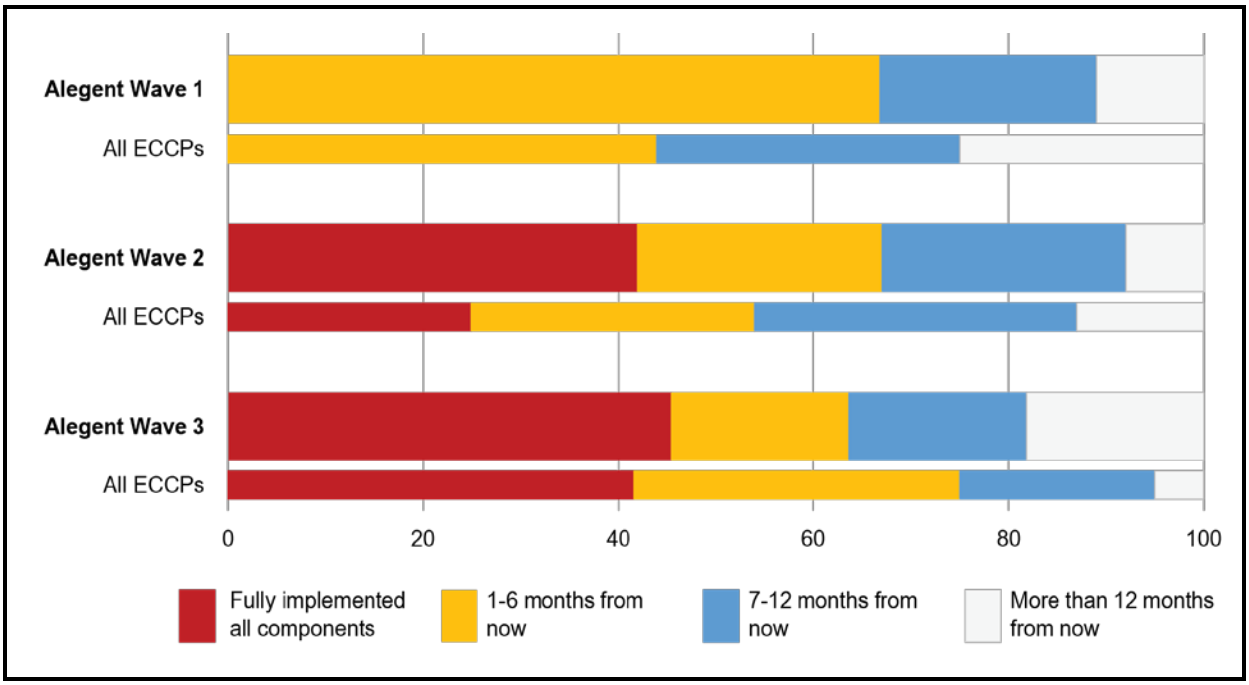
Alegent continues to evolve the formal education that it provides to facilities. After discontinuing its original plan to develop and provide regular in-service trainings in 2015, Alegent provided participating facilities with access to the NICHE (Nurses Improving Care for Healthsystem Elders) online learning system. However, only a few facilities decided to have their staff take this training. Of the facilities whose staff did complete NICHE training, no facilities reported having a plan for systematically integrating the content of the course into their facility operations. Several aspects of Alegent's education did remain constant through 2016, and these typically were praised by facilities. The NPs continue to provide ad hoc training and mentorship to nurses in all participating facilities. Floor staff often approach the NPs with clinical questions, and facility leadership sometimes request that the NPs repeat previous in-service trainings in INTERACT tools and urinary tract infections. The ECCP dental hygienists continue to provide twice yearly in-service trainings on oral hygiene to CNAs. Although all facilities appreciate these trainings, only some report that they impact the behavior of CNAs in the facility.

All other aspects of ECCP operations remain consistent with what was observed in 2015. ECCP NPs regularly conduct medication reviews, attend care planning meetings, attend quality improvement meetings, and respond to residents' emergent conditions. The NPs are deeply integrated into most participating facilities, who view the ECCP NPS as important components of their residents' care team.

Web-Based Survey Results

Figure 3-18 presents respondents' expected timelines for full implementation of the Initiative. Alegent respondents reported a faster initial timeline than overall respondents in waves 1 and 2. However, by wave 3, a similar percentage of Alegent facilities had fully implemented the Initiative compared to all respondents (42 and 45 percent, respectively), and Alegent had a greater percentage of facilities that expected a timeline of more than 12 months, relative to all facilities (18 and 5 percent, respectively). **While Alegent facilities initially reported a faster implementation timeline, by wave 3 this had slowed down to a similar or longer timeline.**

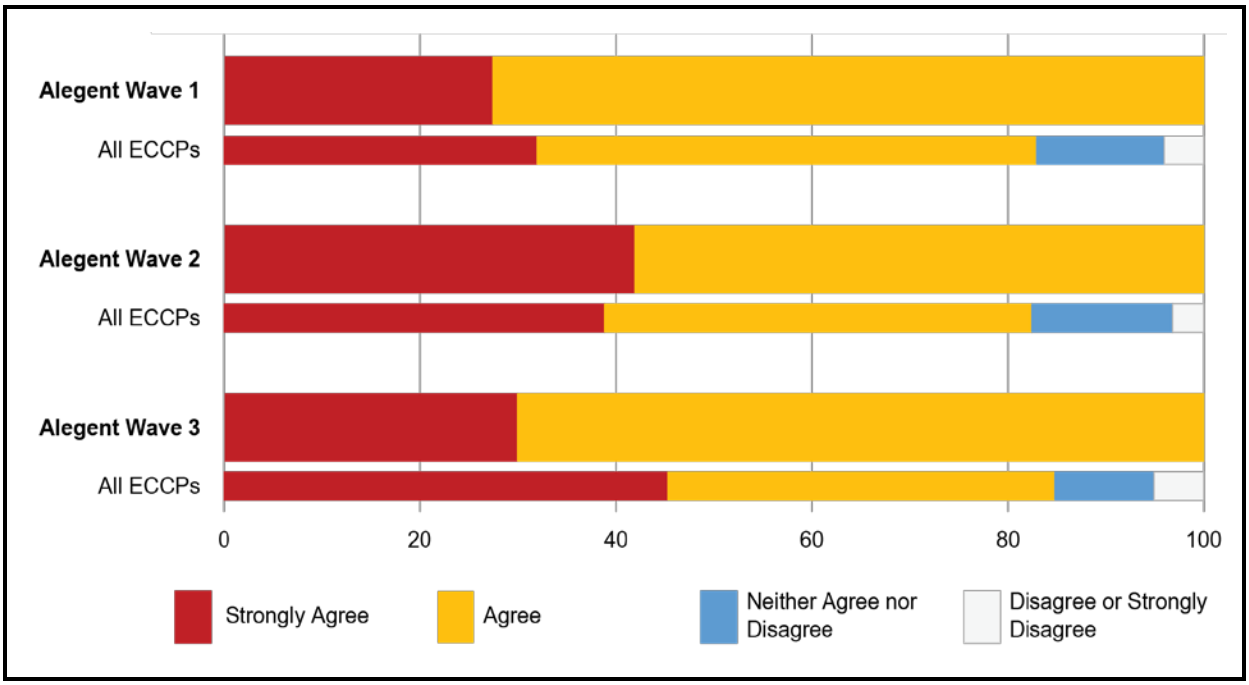
Figure 3-18
Implementation timeline, Alegent



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

In ***Figure 3-19***, respondents indicated if the training provided by the ECCP was sufficient. All Alegent respondents specified that they agreed or strongly agreed training was sufficient in every wave, which compares well to the percentage of overall respondents in wave 3 (85 percent). In wave 3, however, a lower percentage of Nebraska respondents strongly agreed that training was sufficient relative to overall respondents. **Overall, Alegent respondents consistently indicated high levels of satisfaction with the training provided by ECCP.**

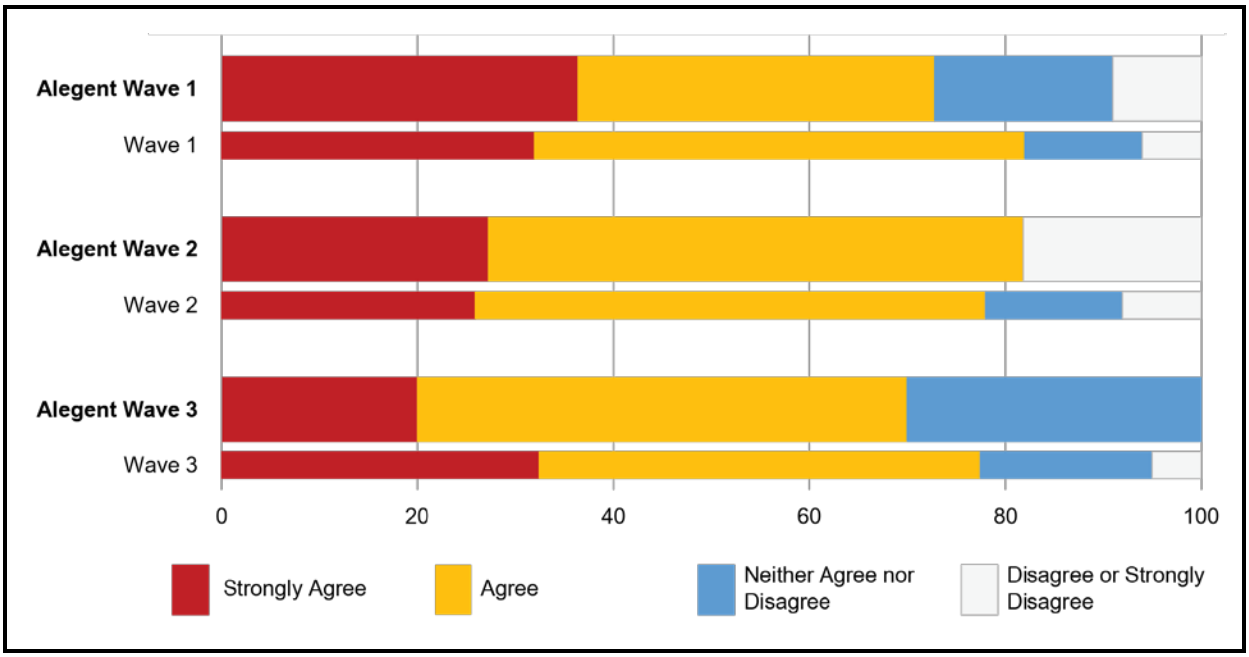
Figure 3-19
Training support, Alegent



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

Respondents indicated whether their staffing was sufficient for implementation of the Initiative in ***Figure 3-20.*** In waves 1 and 2, a higher percentage of Alegent respondents indicated that staffing was a challenge compared to all respondents. This improved in wave 3, but 30 percent still indicated they neither agreed nor disagreed, leading to a slightly lower percentage of Alegent respondents who felt they had sufficient staffing than all respondents. **Overall, Alegent facilities indicated that staffing resources were a particular barrier to implementation of the Initiative.**

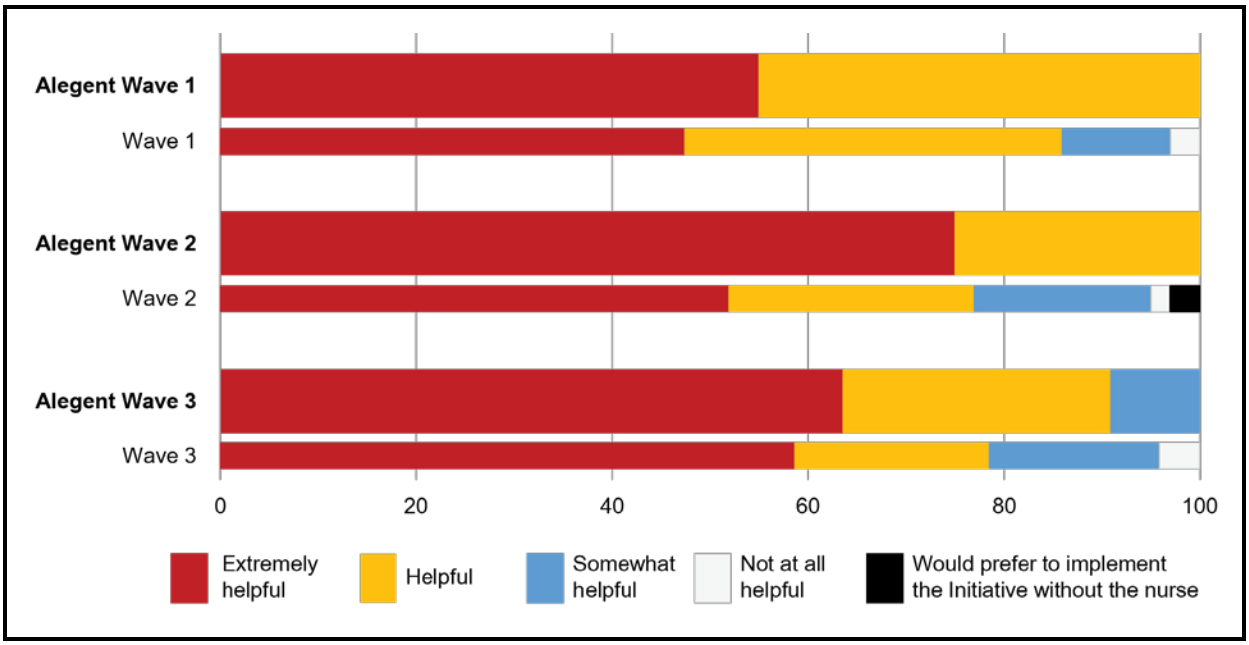
Figure 3-20
Staffing resources, Alegent



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

Figure 3-21 represents respondents' ratings of how helpful their ECCP nurse was. Waves 1 and 2 show overwhelming support for the Alegent nurses' helpfulness, with all respondents indicating their nurse was helpful or extremely helpful. In wave 3, Alegent respondents were not as positive, with a smaller percentage reporting their nurse was extremely helpful (64 percent compared to 75 percent overall in wave 2), and some indicating that the nurse was only somewhat helpful (9 percent). Still, 91 percent of Nebraska respondents reported that their ECCP nurse was at least helpful in wave 3, compared to 79 percent of all respondents. **Across all waves, Alegent respondents gave a very positive evaluation of the ECCP nurses' helpfulness when compared to all respondents.**

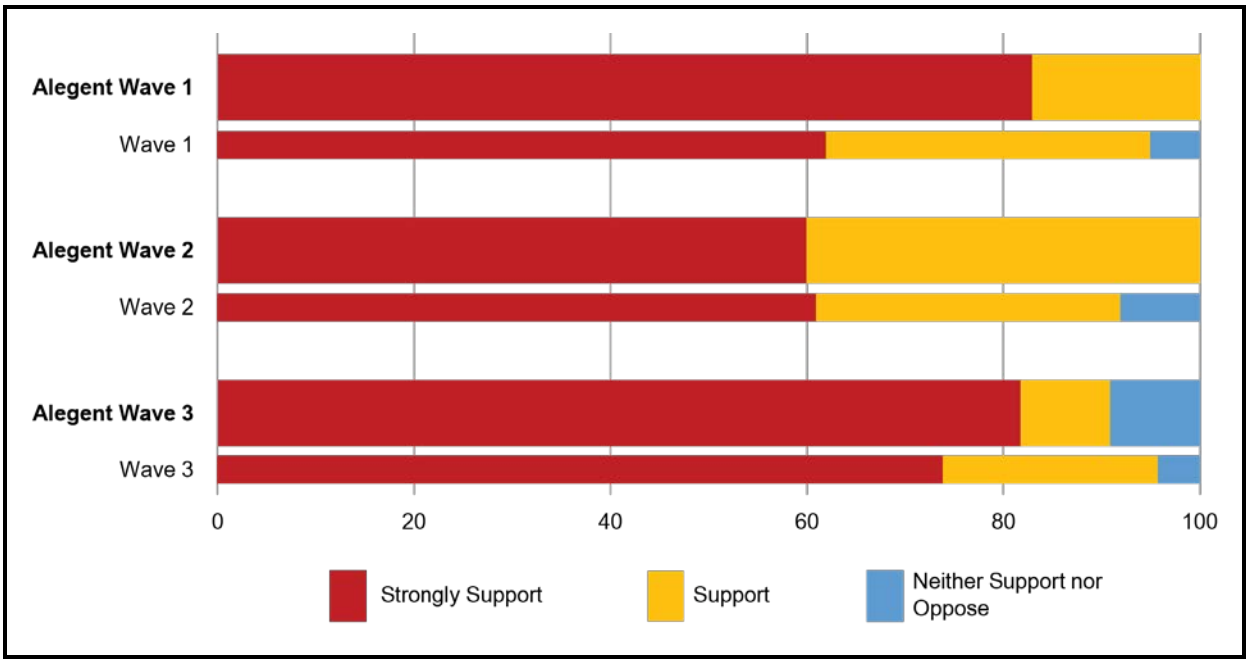
Figure 3-21
Helpfulness of ECCP nurse, Alegent



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

Figure 3-22 summarizes respondents' personal level of support for the Initiative. Alegent respondents indicated high levels of support for the Initiative in waves 1 and 2; with 100 percent of respondents either supportive or strongly supportive. In wave 3, 82 percent indicated strong support of the Initiative, which was higher than the percentage of all respondents (74 percent). A slightly higher percentage of Alegent respondents indicated they neither supported nor opposed the Initiative in wave 3 (9 percent compared to 4 percent overall). **Despite small fluctuations, Alegent respondents reported consistently high support of the Initiative across all waves.**

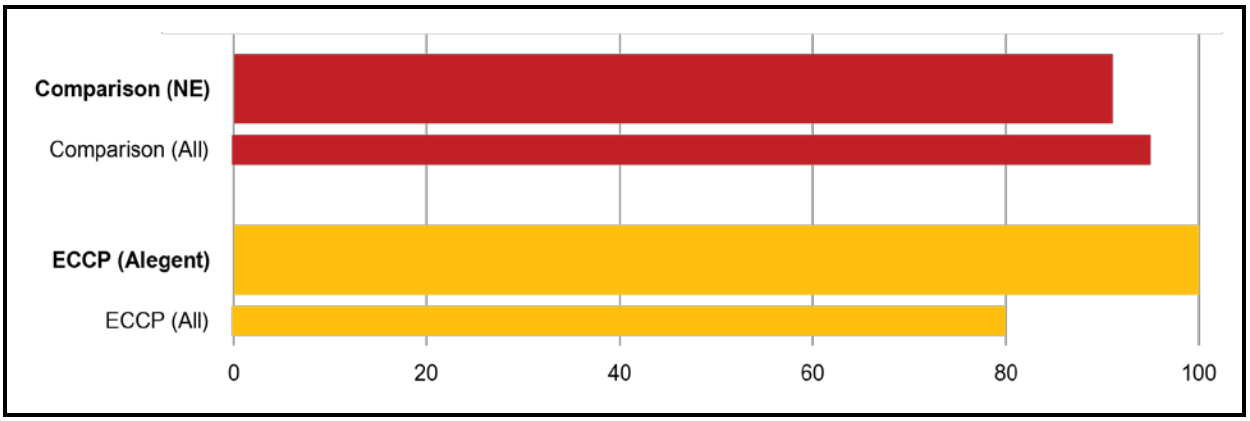
Figure 3-22
Personal support, Alegent



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

Finally, ***Figure 3-23*** reports on the introduction of PAH-related practices unrelated to the Initiative. Unique among ECCPs, a higher percentage of Alegent respondents (100 percent) reported introducing PAH-related efforts, compared to either the Nebraska comparison respondents (91 percent) or all comparison respondents (95 percent). **Overall, both Nebraska comparison facilities and Alegent facilities indicated a particularly high level of parallel changes in practices related to PAHs.**

Figure 3-23
Introduced non-Initiative PAH-related practices, Nebraska



SOURCE: RTI analysis of Comparison Facilities Survey and wave 3 of the Nursing Facility Administrator Survey (data collected June of 2015 to December of 2015).

The Alegent ECCP and comparison respondents in Nebraska both reported the same most frequently introduced PAH-related practices: hospitalization rate tracking, SBAR, and Stop and Watch. Overall, the percentage of facilities reporting these practices was quite similar (as seen in ***Table 3-7***).

Table 3-7
Most common non-Initiative PAH-related practices, Nebraska

Nebraska Comparison Respondents	Alegent ECCP Respondents
▪ SBAR—90% ▪ Hospitalization rate tracking—89% ▪ Stop and Watch—80%	▪ Hospitalization rate tracking—91% ▪ SBAR—82% ▪ Stop and Watch—73%

To summarize, Alegent facilities had a faster implementation timeline in waves 1 and 2, which slowed by wave 3. A lack of sufficient staffing was a particular barrier to implementation. Compared to all facilities, Alegent facilities indicated higher levels of satisfaction with the training provided by ECCP and with the helpfulness of ECCP nurses, as well as consistently high levels of personal support of the Initiative across all waves. Uniquely, 100 percent of Alegent ECCP facilities had incorporated a non-Initiative effort at reducing PAHs, which was a higher percentage than the comparison respondents in Nebraska (91 percent). The most frequently reported procedures included hospitalization rate tracking, SBAR, and Stop and Watch.

3.6.5 HealthInsight Nevada Admissions and Transitions Optimization Program (ATOP)

Site Visit and Telephone Interviews

HealthInsight, a QIO, continues to promote the ATOP initiative, including the use of INTERACT tools and educational support to 24 facilities in Nevada. During the June 2016 site visit, ECCP leadership informed the evaluation team that they had reduced their goal of preventing avoidable hospitalizations from 67 percent to 44 percent.

The model of one APRN and two RNs per pod of five facilities has been adjusted because of continued ECCP facility-based staff turnover; seven nurses left the ECCP in 2015 and five were replaced. A physician assistant (PA) had been hired in 2015 because of the difficulty in filling APRN positions; rather than the budgeted five APRN positions, there have been two APRNs and one PA for the past 2 years. The PA has recently left and a PhD-level APRN was recently hired; she will supervise ECCP nurses in 10 facilities. Another pod (five facilities) has not had an APRN for the past 2 years. A part-time RN who had been hired for a small remote facility, has left and that position was eliminated; other staff are visiting this facility every 6 weeks for 2 days.

Other staffing changes included adjustments of ECCP nurse schedules; rather than all three nurses in a pod visiting one facility at the same time, each nurse is now generally assigned to visit two facilities per week, depending upon the number of ATOP enrollment per facility. A facility-based ECCP RN moved out of state and is now doing data entry for two facilities and also training new staff in using the Registry, the ECCP's data management system. The pod to which she had been assigned now has an APRN and one RN. The ECCP data analyst had also recently been replaced. A part-time pharmacist who was transferred from another area of HealthInsight in 2015 is still assigned to ATOP; however, she has been on medical leave for some time.

Each year the RTI evaluation team aims to visit a range of facilities during its site visit to understand the breadth of ECCP activities performed in each facility, best practices, and engagement of both the ECCP nurses and of facility leadership and staff. During 2016, the site visit team chose one facility that had not responded to RTI's phone interview or survey requests for the past 2 years. The other three facilities were chosen because of reports of medium or positive adoption of the ATOP interventions. In two of the visited facilities, the facility leadership was very positive about ATOP training and activities that promoted early recognition of changes in condition, improved communication about changes, and ECCP nurse support in care planning discussions with residents. In those facilities the Stop and Watch and SBAR were considered part of their facility culture; facility leadership believed these activities would continue without the ECCP's involvement. One of these facilities promoted the POLST (Physician Orders for Life Sustaining Treatment); however, facility leadership noted that the time ECCP nurses spent with residents discussing their options would not be afforded in their facilities, should the Initiative end.

In the other two visited facilities, facility leadership either said they did not understand the role of ATOP or, through the interview, it became apparent that they did not understand

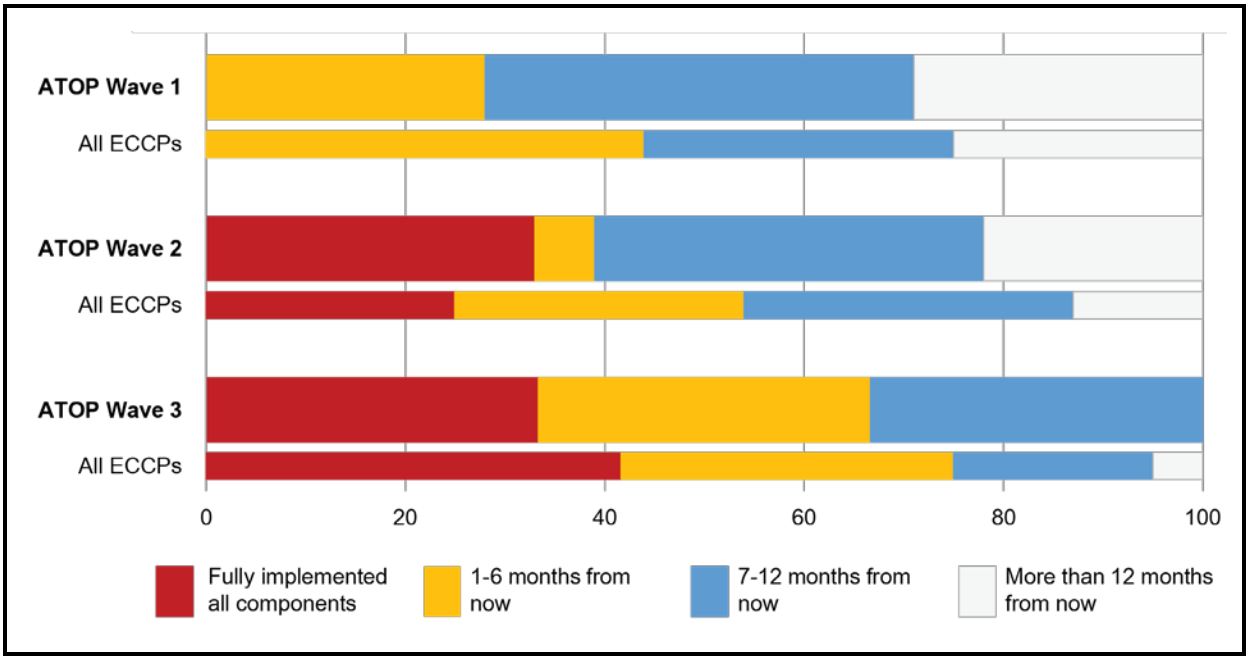
ATOP's purpose of reducing avoidable hospitalizations in the long-term care population. None of the ATOP interventions had been integrated into these facilities. One facility had not, until recently, allowed the ECCP nurse to train or promote INTERACT tools; they had recently agreed to begin using the Stop and Watch tool; however, at the time of the site visit, it had not been introduced. The other facility accepted the SBAR forms that were completed by the ECCP nurse; however, facility staff did not use the forms themselves. As required by the ECCP, each ECCP nurse completes the INTERACT QI tool to determine the root cause of each transfer; facility leadership in neither facility reviewed these findings, which were provided to them monthly. A high rate of turnover of facility leadership appeared to be a factor in the lack of engagement in both facilities. The corporate leadership of one facility was reportedly not interested in supporting ATOP in any of their five facilities in the state, while corporate oversight did not seem to be a factor in the other facility, whose sibling facility is highly engaged in the ATOP Initiative.

Two activities that had begun in 2015, a pilot using secure text messaging software (Qliqsoft) and a pilot to introduce INTERACT-based patient order sets in some of the ATOP facilities ended because of lack of acceptance by facility PCPs and data integration challenges, respectively. Another ATOP activity, that involved a train-the-trainer course for ATOP nurses to provide a 6-hour training program to CNAs in each facility, resulted in training of CNAs in 8 of the 24 facilities that agreed to participate.

Web-Based Survey Results

Figure 3-24 indicates respondent's expected timelines for implementing the Initiative. A higher percentage of ATOP respondents reported they had fully implemented the Initiative in wave 2 (33 percent versus 25 percent overall), but this progress stagnated in wave 3 with an equal percentage (33 percent) of respondents indicating full implementation (compared to 42 percent overall). In wave 3, ATOP respondents still expected a longer timeline, with only 66 percent indicating they would be fully implemented in 6 months compared to 75 percent of all respondents. **ATOP reported strong implementation progress in waves 1 and 2, which stagnated in wave 3.**

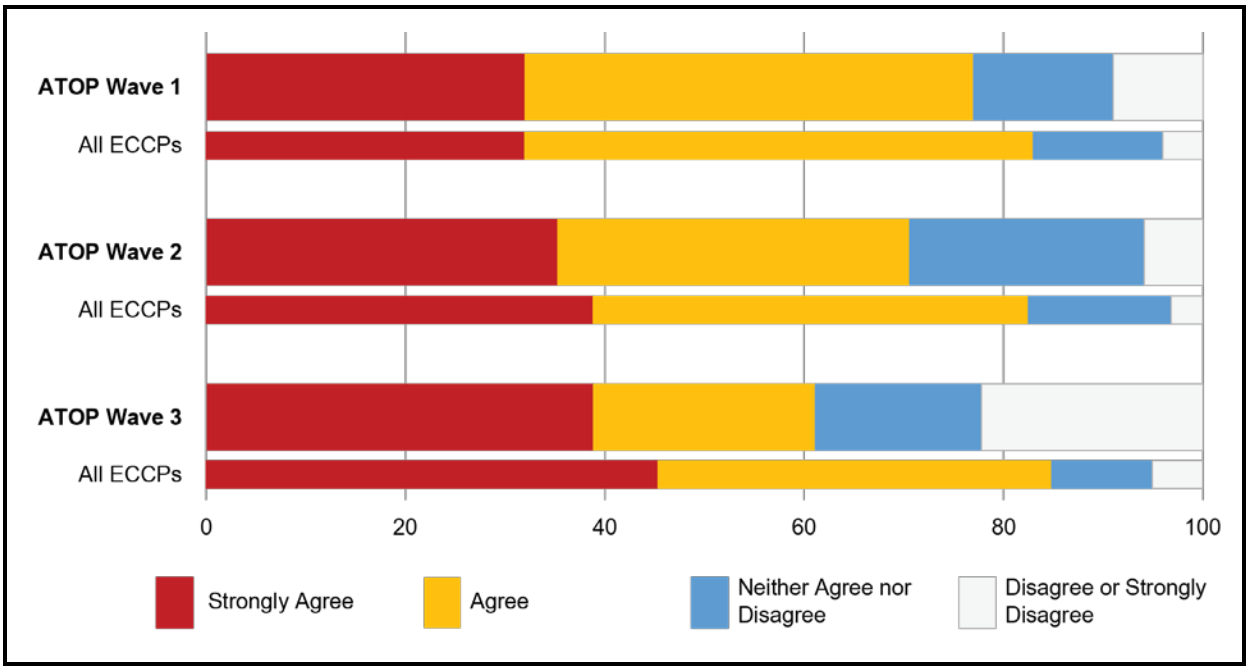
Figure 3-24
Implementation timeline, ATOP



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

Respondents reported whether training provided by the ECCP was sufficient in ***Figure 3-25.*** In each wave, compared to the total sample, there was a lower percentage of ATOP respondents who agreed or strongly agreed that training was sufficient, which decreased with each subsequent wave**. By wave 3, ATOP respondents seemed particularly disappointed in the level of training, with 22 percent indicating they disagreed or strongly disagreed that ECCP training was sufficient, compared to just 5 percent of respondents overall.** This lack of satisfaction with training may be the result of reduced ATOP nurse staffing. Having difficulty replacing nurses, particularly NPs during this time frame, the ECCP assigned its nurses among many facilities to maintain a presence in all facilities. Thus, instead of having an ATOP nurse visit two or three times per week, nurses visited some facilities only once per week or less, and likely concentrated on data collection, rather than training activities.

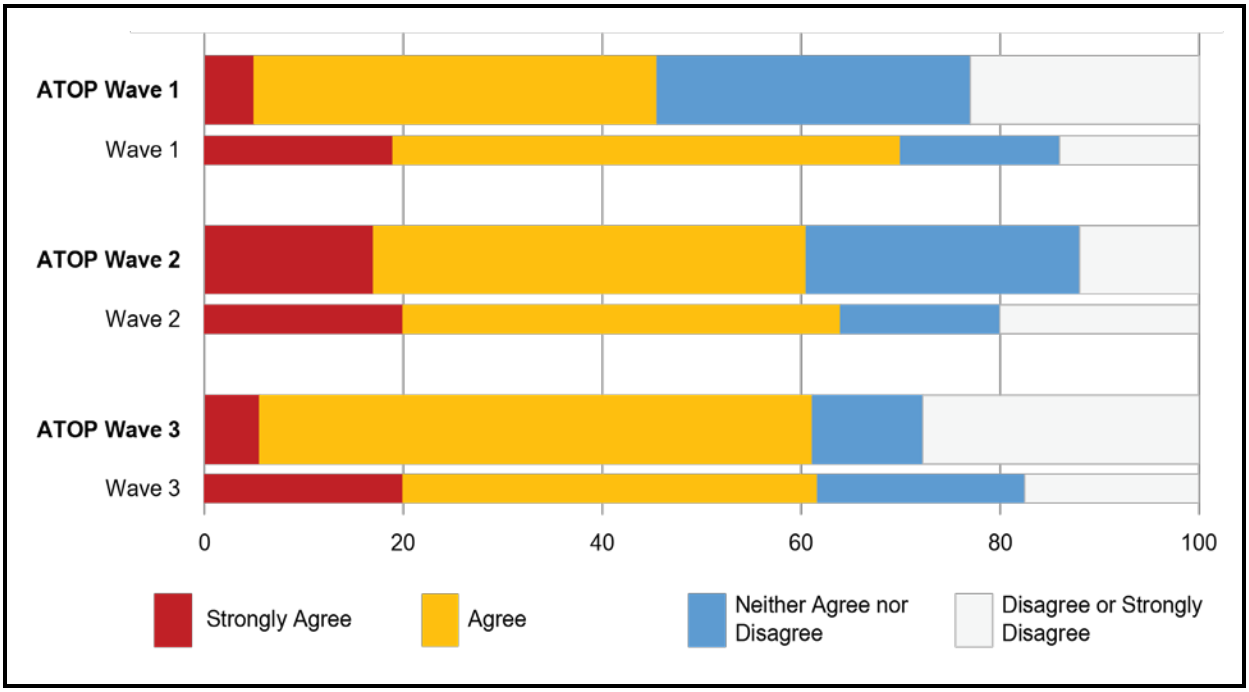
Figure 3-25
Training support, ATOP



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

Another potential barrier to implementation for ATOP is staff turnover. ***Figure 3-26*** shows responses to whether staff turnover was a significant barrier to implementation. **Staff turnover seems to have been a particularly significant barrier for ATOP respondents during waves 1 and 3**, with 23 percent of ATOP respondents in wave 1 (compared to 14 percent among all respondents) and 28 percent in wave 3 (compared to 18 percent among all respondents) indicating that they disagreed or strongly disagreed that staff turnover was not an issue. In fact, ATOP experienced ongoing nursing staff turnover that affected some pods (groups of five facilities served by two RNs and an NP) more than others. In an attempt to cover all facilities, ATOP leadership rotated some nurses among more than five facilities; one pod was without a NP for a full year prior to the wave 3 survey.

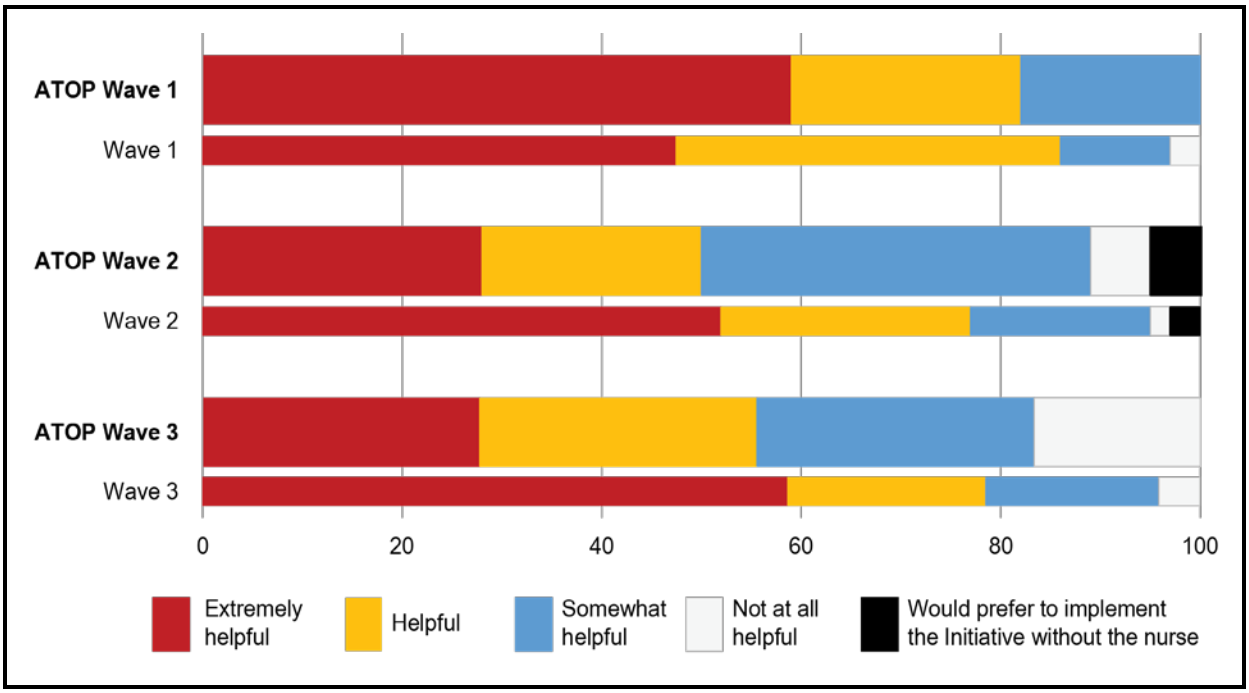
Figure 3-26
Staff turnover, ATOP



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

Figure 3-27 presents respondents' opinions of their ECCP nurses' helpfulness. Although ATOP respondents rated their ECCP nurses favorably in wave 1, with 59 percent indicating they were extremely helpful, these positive ratings fell in waves 2 and 3. In wave 2, 6 percent of ATOP respondents indicated that they would prefer to implement the Initiative without the ECCP nurse, double the percentage of all respondents. By wave 3, a low percentage of ATOP respondents indicated their ECCP nurse was helpful or extremely helpful (56 percent compared to 79 percent overall), and 17 percent indicated that they were not helpful at all. **ATOP respondents rated their ECCP nurses as less helpful with each subsequent wave, showing a moderate trend of decreasing support.** This reduced satisfaction may also be attributed to the high turnover of ECCP nurses and the fact that some remote facilities were not visited as frequently as originally planned. Other facilities may have expressed dissatisfaction because of the lack of consistently assigned ECCP staff.

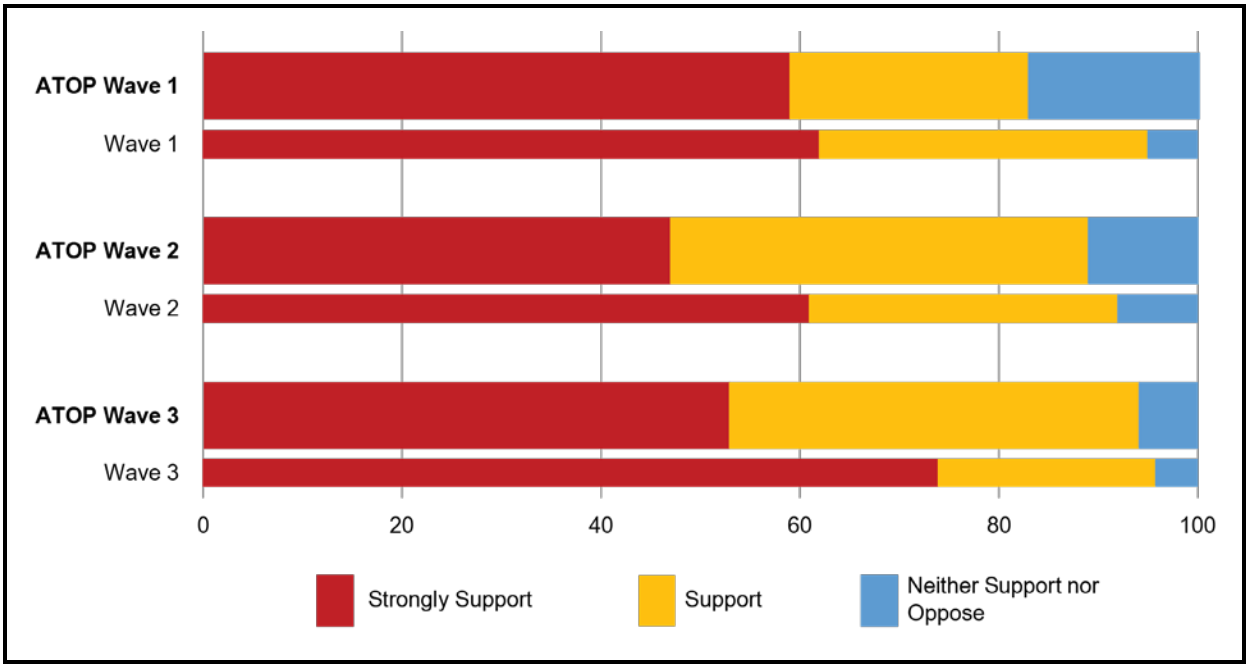
Figure 3-27
Helpfulness of ECCP nurse, ATOP



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

Respondents' reported their level of personal support for the Initiative in ***Figure 3-28***. **Overall, ATOP respondents indicated similar levels of support for the Initiative to all respondents.** There were some differences in the percentage that reported strong support, which was most striking in wave 3, where only 53 percent of ATOP respondents strongly supported the Initiative, compared to 74 percent of all respondents.

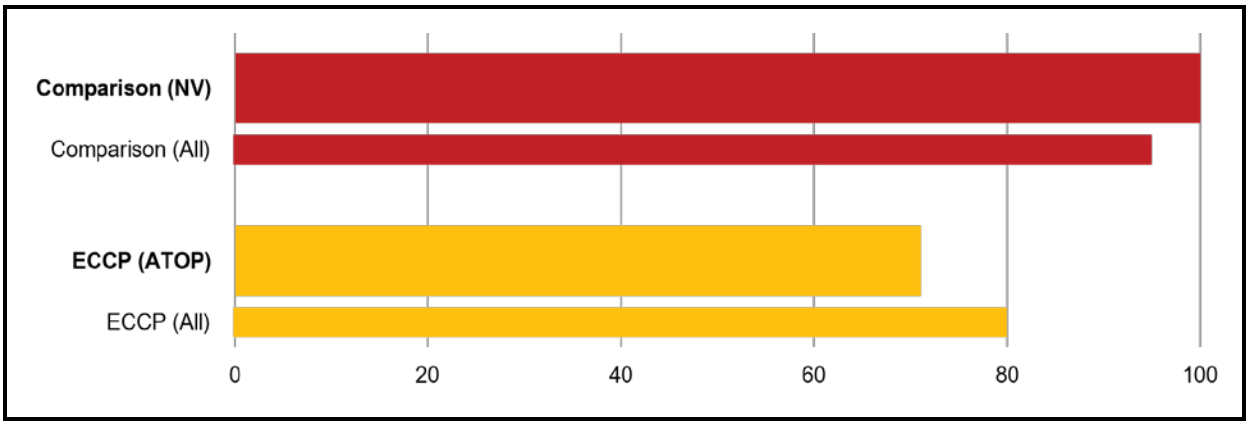
Figure 3-28
Personal support, ATOP



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

To conclude the discussion of ATOP survey data, ***Figure 3-29*** summarizes the degree of PAH-related practices introduced among all facilities. **A lower percentage of ATOP respondents implemented non-Initiative interventions to reduce hospitalizations compared to Nevada comparison facilities.** Nevada comparison facilities, however, had a particularly high implementation rate of 100 percent, compared to the overall comparison facility rate of 95 percent. Overall, there was still extensive practice of non-Initiative PAH-related practices among all facilities.

Figure 3-29
Introduced non-Initiative PAH-related practices, Nevada



SOURCE: RTI analysis of Comparison Facilities Survey and wave 3 of the Nursing Facility Administrator Survey (data collected June of 2015 to December of 2015).

As ***Table 3-8*** shows, ATOP facilities that introduced new procedures were mostly likely to introduce SBAR, Stop and Watch, and hospitalization rate tracking. The same policies were popular in Nevada comparison facilities, but they were implemented slightly less frequently.

Table 3-8
Most common non-Initiative PAH-related practices, Nevada

Nevada Comparison Respondents	ATOP ECCP Respondents
▪ Hospitalization rate tracking—80% ▪ SBAR—60% ▪ Stop and Watch—60%	▪ SBAR—92% ▪ Stop and Watch—75% ▪ Hospitalization rate tracking—75%

To summarize, despite ATOP's initially strong implementation progress, this progress stagnated by wave 3, with no new facilities fully implementing the Initiative. ATOP respondents also reported staff turnover as a barrier to implementation. Notably. ATOP respondents were particularly disappointed in the training provided by the ECCP in wave 3, also rating the ECCP nurses as less helpful with each subsequent wave. However, personally, ATOP respondents indicated similar levels of support for the Initiative overall, compared to all respondents. As indicated by respondents, a lower percentage of ATOP facilities had introduced non-Initiative interventions to reduce hospitalizations compared to Nevada comparison facilities, but their overall rates were still quite high (just over 70 and 100 percent).

3.6.6 New York Reducing Avoidable Hospitalization (NY-RAH) Project of Greater New York Hospital Association (GNYHA) Foundation

Site Visit and Telephone Interviews

The GNYHA Foundation continues to manage and support the NY-RAH project in 2016. The main feature of the NY-RAH model is the placement of RNCCs in participating facilities to provide education and mentoring to facility staff. Twenty-nine facilities continue to participate across the Bronx, Manhattan, Brooklyn, Queens, and on Long Island (Nassau and Suffolk Counties). Two facilities, Hebrew Home for the Aged and Palisades Nursing Facility will merge into one licensed facility in fall of 2016.

In the last year of the project, ECCP leadership remained stable and very little RNCC turnover occurred. A decrease in RNCC turnover was attributed to the ECCP clinical director who in the past year has focused on hiring RNCCs with the experience required to meet the goals and needs of the project, including education, presentation and data interpretation and analysis skills. ECCP leadership report that this has been an improvement and helped with the success of the project in some facilities. One RNCC coach position is fully staffed, but the float RNCC positions, which were created in Project Year 3, no longer exist because there is no immediate need for them. The RNCC coach position is still primarily used as a float position, although anecdotally we learned the coach assists some RNCCs with facility presentations of hospitalization data.

Project Year 4 represents the highest level of integration of the RNCCs in the facilities since the Initiative has started. RNCCs are well known in facilities and continue to re-educate facility staff on intervention tools as needed either in group sessions or during one-on-one check-ins on the floor. RNCC attendance at morning/stand-up meetings is common among facilities, and many RNCCs also participate in hospitalization review meetings with facility leadership.

The NY-RAH model is fully implemented and Project Year 4 has seen the continued use of tools that focus on identifying changes in condition, including the Stop and Watch and SBAR. Project Year 4 has seen a renewed focus on the Stop and Watch tool re-education to encourage its use by all facility staff, including CNAs, therapy, activities, environmental services, and family. SBAR continues to be widely used by nurses. Physician buy-in is consistent, although the presence of an on-site physician continues to be a deterrent to SBAR form completion. The ECCP has also allowed flexibility for the version of SBAR each facility selects; therefore, different versions of the SBAR are being used. Both the ECCP and facility leadership and staff consider the use of the Stop and Watch and SBAR tools as highly sustainable. This may be evidenced by many more facilities adding electronic versions of the Stop and Watch to the CNA kiosks and the SBAR to electronic medical record (EMR) systems for nurses.

End-of-life planning, including completion of the Medical Order for Life-Sustaining Treatment MOLST forms, increasing the number of residents with advance directives and changes to facility palliative care policies all continue to be an ongoing focus in Project Year 4. Advance directive (AD) completion rates have increased across most facilities and the MOLST form is used more. Buy-in from both social workers and physicians has increased. The paper MOLST form is primarily used among all facilities while the eMOLST (electronic MOLST) has

been permanently delayed in the majority of facilities because of technological challenges. Many facilities have adopted formal policies to make the MOLST a formal requirement. For this reason, the sustainability of the MOLST is high.

Direct Messaging also continues to be a primary focus of the ECCP in Project Year 4, although facilities report it is still in its infancy. Many more messages containing electronic discharge summary information are being sent from hospitals to nursing facilities, as indicated by the ECCPs tracking report. However, very few nursing facilities are aware they are receiving the messages and for those who are, very few review and use the information. There has been little improvement to addressing the barriers we noted in Project Year 3. The ECCP is starting to address some of these challenges through a small pilot with a few RNCCs. The ECCP plans to increase their responsibilities to track the information received from hospitals, focus on improving nursing facility workflow, and act as a liaison between the facility and the ECCP for technological issues. Facilities could not assess the sustainability of direct messaging because of its low level of implementation and use thus far.

Facility adoption of a QI Tool adoption has been a major goal of NY-RAH in the last year of the project. At the time of our site visit, almost two-thirds of facilities had adopted a QI tool. The ECCP has allowed flexibility in the QI tool selected by facilities, and many facilities have opted to use the INTERACT QI tool. Corporate leadership also drives the QI tool choice for many of the participating nursing facilities because of their own goals for avoiding readmissions and hospitalizations. Facilities reported variation in the sustainability of the NY-RAH QI process. Leadership at some facilities remarked that their ECCP RNCCs were essential to assist with the QI process because facilities often lack the resources needed to have dedicated staff for this process.

We also found that at least two participating NY-RAH facilities have transfer programs in place where their residents are sent to specialty outpatient clinics instead of the hospital's ED. One facility's program allows anemic residents to avoid the hospital ED when they require a transfusion due to an established agreement with the hospital's blood bank. The other facility has a similar agreement but with a gastrointestinal (GI) clinic in the hospital that replaces resident's GI tubes. The latter facility just instituted this program in 2016, whereas the former facility developed their program during their participation in the CMS Value-Based Purchasing Demonstration sometime during 2009 to 2012. Both medical directors describe these programs as a way to "bypass" the hospital ED that often results in a hospital admission. The medical director who recently instituted this program with a local hospital-based GI clinic reported reducing their hospital transfer rate from 25 percent to 2 percent within a period of 3 to 4 months. The medical director at the facility with the pre-established program stated transfers because of transfusions reduced by 75 percent. The medical directors at our other site visit facilities and DONs, during our facility telephone interviews, did not describe similar transfer programs.

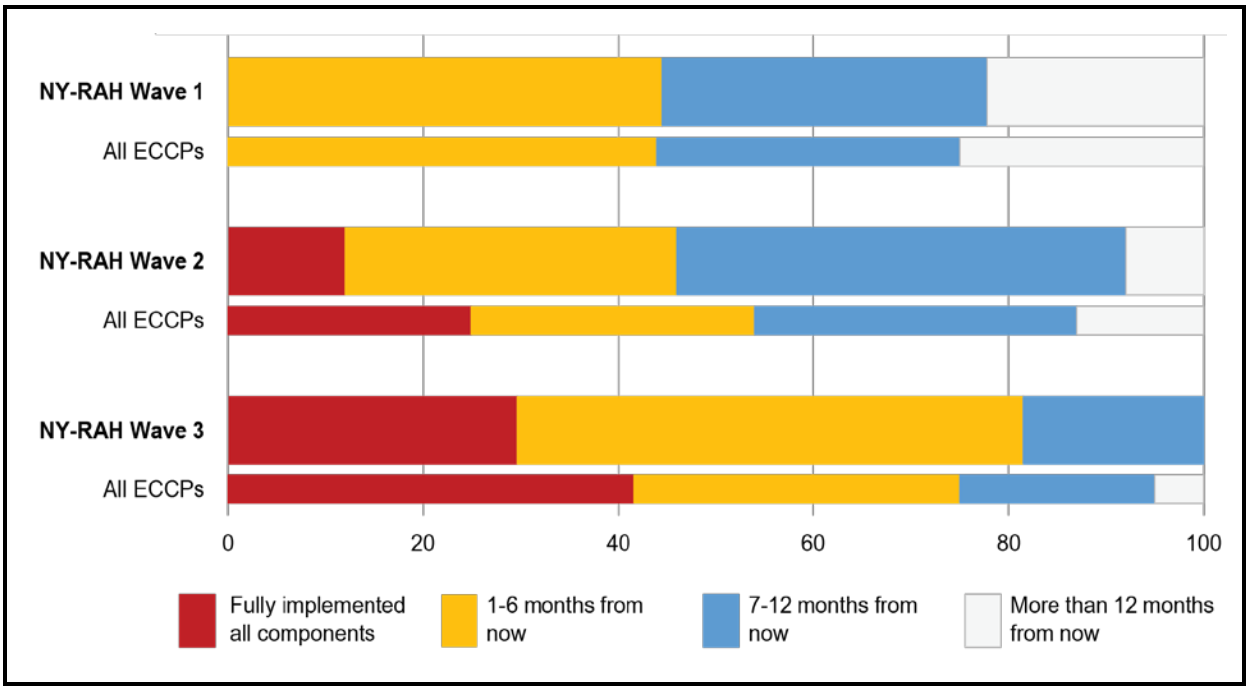
New York State continues to have several competing initiatives that focus on reducing hospitalizations. The Delivery System Reform Incentive Payment (DSRIP) program is currently in its second year and has the primary goal of reducing avoidable hospital use by 25 percent over 5 years. The state has designated a series of 25 Performing Provider Systems (PPSs) across the state, which are responsible for leading a variety of DSRIP projects in their region. Two of the

DSRIP projects that a PPS can lead overlap with the interventions implemented under NY-RAH, including implementation of the INTERACT project and integration of palliative care in nursing facilities. Three PPSs that include 12 facilities participating in NY-RAH are implementing the INTERACT project for nursing facilities, including all NY-RAH facilities in Suffolk County and some in Nassau and Queens counties. Although no NY-RAH facility is participating in a PPS that focuses on the DSRIP project to integrate palliative care in nursing facilities specifically, there may be some overlap with the NY-RAH palliative and end-of-life care activities in these facilities because of the additional focus on the INTERACT advanced care planning and palliative care tools. The DSRIP overlap with NY-RAH facilities and potential comparison facilities is most notable in Suffolk where all nursing facilities in the county are participating in DSRIP (n=46), which includes eight NY-RAH facilities. The DSRIP program was mentioned both by ECCP and facility leadership as a vehicle for sustaining the NY-RAH interventions, particularly in terms of the continued use of the INTERACT Stop and Watch and SBAR tools. We did not hear anything specific related to the palliative care or advanced care planning tools. The Fully Integrated Duals Advantage (FIDA) program has not had as much effect on NY-RAH or its goals because of low enrollment in FIDA-participating health plans. The increasing enrollment in Medicare Advantage health plans, however, has become more of an issue for determining eligible residents for the NY-RAH initiative. We heard of significant drops in NY-RAH eligible beneficiaries because of increased enrollment in Medicare Advantage in a few, smaller facilities but little to no effect on NY-RAH eligibility in very large facilities.

Web-Based Survey Results

Figure 3-30 shows respondents' expected timelines for full implementation of the Initiative. By wave 3, 30 percent of NY-RAH respondents reported fully implementing the Initiative, which was lower than all respondents (42 percent). However, when combined with responses expecting full implementation within 1 to 6 months, NY-RAH respondents indicated only a slightly shorter overall timeline relative to all respondents (82 percent versus 75percent, respectively). **Overall, NY-RAH respondents indicated a slower timeline and degree of implementation progress.**

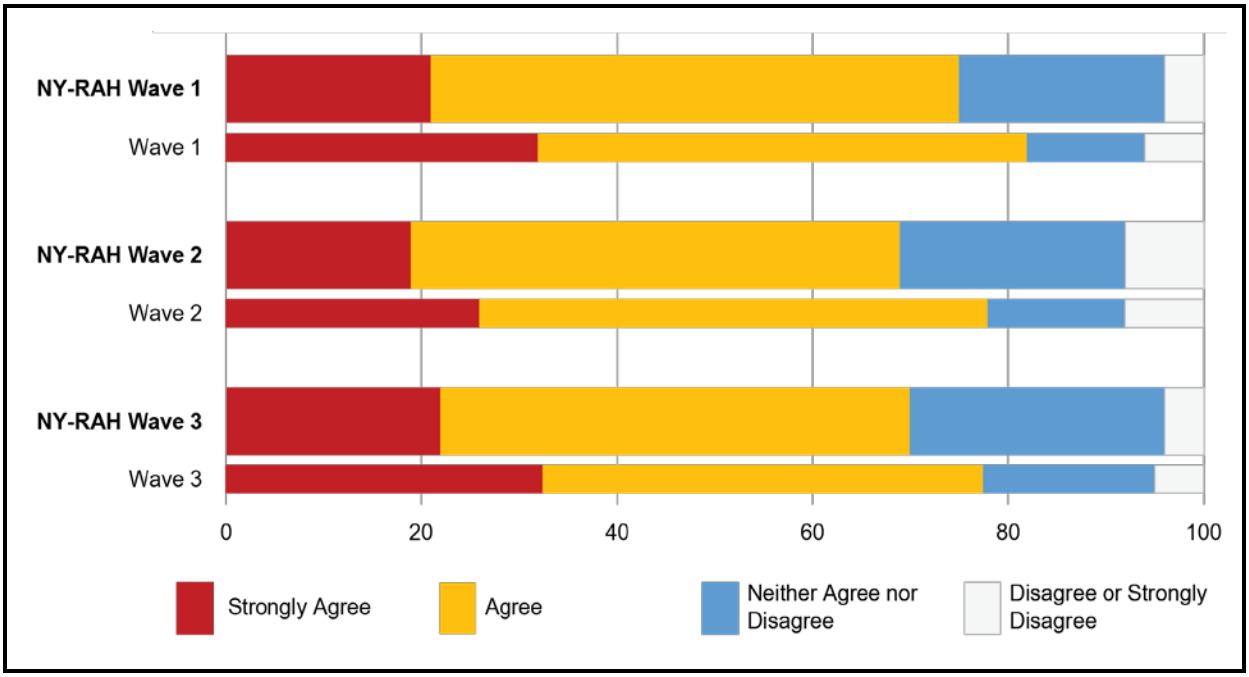
Figure 3-30
Implementation timeline, NY-RAH



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

For ***Figure 3-31***, respondents indicated levels of staff support of the Initiative. **In general, NY-RAH respondents indicated slightly less staff support for the Initiative relative to all respondents.** Fewer NY-RAH respondents than all respondents strongly agreed or agreed that staff supported the Initiative. Only 70 percent of NY-RAH respondents strongly agreed or agreed that staff were supportive in wave 3, compared to 78 percent of all respondents.

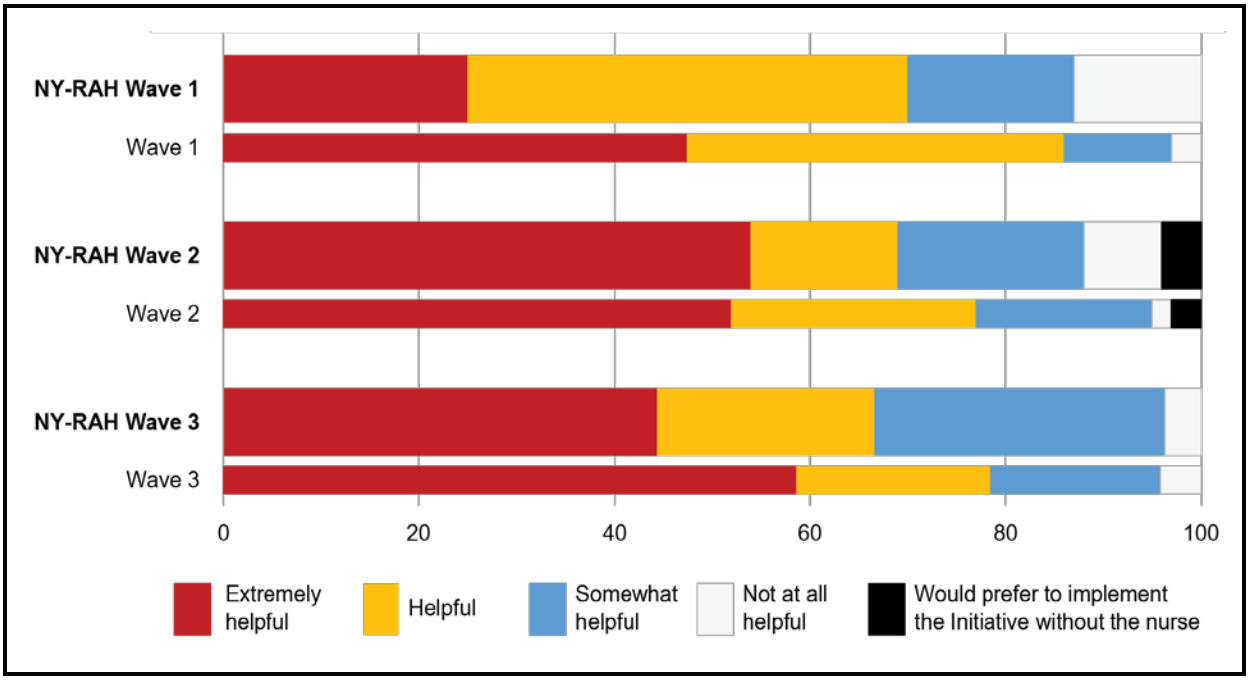
Figure 3-31
Staff support, NY-RAH



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

Figure 3-32 presents respondent opinions regarding the helpfulness of their ECCP nurse. **NY-RAH support for ECCP nurses was lower than in other models: fewer NY-RAH respondents consistently indicated their ECCP nurse was extremely helpful or helpful than all respondents. NY-RAH was also among several ECCPs with facilities that indicated the ECCP nurse was not helpful at all or they would prefer to implement the Initiative without the nurse.** This can be seen in wave 2, where 12 percent of NY-RAH respondents indicated their ECCP nurse was not helpful at all or they would prefer to implement without them, when the percentage for all respondents was 5 percent. The trend continued into wave 3, with only 44 percent of NY-RAH respondents indicated their ECCP nurse was extremely helpful, compared to 59 percent of all respondents.

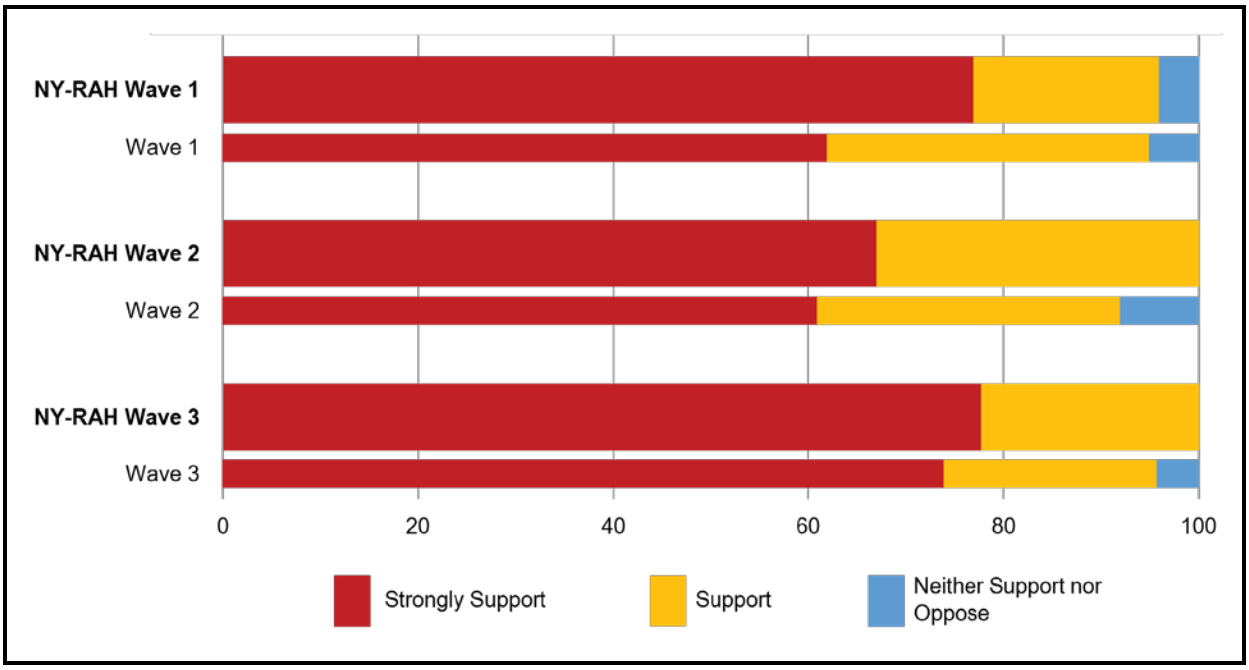
Figure 3-32
Helpfulness of the ECCP nurse, NY-RAH



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

To summarize the respondents' opinions of the ECCP, they were asked to indicate their level of personal support for the Initiative. **In *Figure 3-33*, NY-RAH respondents indicated slightly stronger personal support of the Initiative in each subsequent wave, with no respondents expressing less than support or strongly support in waves 2 and 3**. In wave 3, 78 percent of NY-RAH respondents specified strong support and 22 percent support, which was slightly higher than all respondents at 74 percent and 22 percent respectively (and 4 percent neither support nor oppose).

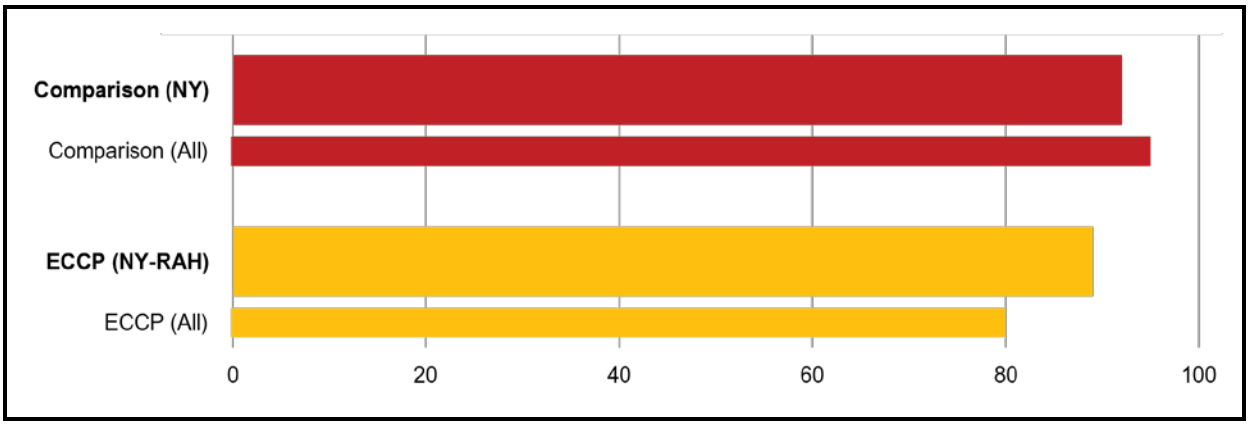
Figure 3-33
Personal support, NY-RAH



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

Figure 3-34 indicates the degree of PAH-related non-Initiative practices among all respondents. **Both NY-RAH ECCP facilities and New York comparison facilities reported a very high level of parallel practices, around 90 percent.** The NY-RAH respondents reported a higher percentage of PAH-related efforts (88 percent) compared to all ECCPs (80 percent).

Figure 3-34
Introduced non-Initiative PAH-related practices, New York



SOURCE: RTI analysis of Comparison Facilities Survey and wave 3 of the Nursing Facility Administrator Survey (data collected June of 2015 to December of 2015).

In facilities that had introduced a new policy or procedure, hospitalization rate tracking and SBAR were the most frequently reported PAH-related practice among New York comparison and NY-RAH ECCP facilities (***Table 3-9***).

Table 3-9
Most common non-Initiative PAH-related practices, New York

New York Comparison Respondents	NY-RAH ECCP Respondents
▪ Hospitalization rate tracking—90% ▪ SBAR—77% ▪ Care Paths—76%	▪ Hospitalization rate tracking—78% ▪ SBAR—75% ▪ Root Cause Analysis—74%

Overall, NY-RAH respondents indicated slower implementation progress compared to all ECCP respondents, as well as less staff support and less positive attitudes about the helpfulness of the ECCP nurse. However, personal levels of support for the Initiative from administrators who responded to the survey increased slightly with each wave. Both NY-RAH ECCP facilities and New York comparison facilities reported a high percentage of PAH-related non-Initiative practices.

3.6.7 University of Pittsburgh Medical Center (UPMC) Community Provider Services Program to Reduce Avoidable Hospitalizations using Evidence-based Interventions for Nursing Facilities (UPMC-RAVEN)

Site Visit and Telephone Interviews

During the fourth year of data collection, the UPMC-RAVEN model continues to develop and support all components originally planned for implementation, demonstrating strong fidelity to the original model design. The Initiative is firmly established in most facilities, has wide support and continues to receive overwhelmingly positive feedback. One facility lags behind in terms of acceptance of the UPMC-RAVEN initiative. This facility is very rural and, up until recently, UPMC-RAVEN leadership has struggled to find an NP to work in the facility. The UPMC-RAVEN RN in the facility will be replaced with a newly hired NP in the coming months. After 20 months of only having two lead NPs, a third lead NP has also been hired. One facility withdrew from the Initiative in October 2015, leaving 18 participating facilities in the Initiative at the time of RTI's visit.

As in prior years, the facility staff's recognition and acceptance of the UPMC-RAVEN initiative continues, including reports of increased physician buy-in and support. The most valuable component of UPMC-RAVEN is consistently cited to be the clinical care provided by the UPMC-RAVEN nurses. The Initiative uses both NPs and RNs in facilities. Of the facilities visited, two were staffed by RNs and two by NPs. Overall, the UPMC-RAVEN nurses are well received and their skills and knowledge are valued in the facilities.

Telemedicine equipment is operational in all facilities. However, connectivity issues prevent consistent use of the technology. As in prior years, a majority of facility staff report that telemedicine would be a valuable tool but the use of telemedicine consultations is still low—averaging approximately four actual telemedicine consults a month across all facilities between June 2015 and June 2016. However, the telephonic after-hours support by telemedicine NPs is being increasingly used by most of the facilities. To increase use of telemedicine, the telemedicine team travels to facilities to retrain staff on telemedicine use. Over the past year, the UPMC-RAVEN telemedicine team has attempted to boost connectivity in facilities by purchasing and installing routers on telemedicine carts. A major barrier to improving connectivity in some for-profit facilities is the corporate network security policies. Facility staff report that corporate leadership would not allow telemedicine carts to be connected to facility high-speed internet because of worries about network security and HIPAA regulations.

Building on the work from the prior year, UPMC-RAVEN introduced Interdisciplinary Pharmacy Review Teams (IDT teams) into two additional facilities bringing the total number of facilities with IDT teams to five. UPMC-RAVEN also began conversations with four other facilities to either join existing medication review panels or introduce IDT meetings. In addition to IDT team activities, UPMC-RAVEN pharmacy consultants conduct their regular tasks of reviewing records from each participating facility and making recommendations on UPMC-RAVEN residents.

INTERACT tools are used in all facilities but use remains inconsistent across staff types. Across all facilities, SBAR is reported to be used more frequently than Stop and Watch. One visited facility has implemented condition-specific SBARs. In most facilities, electronic SBARs

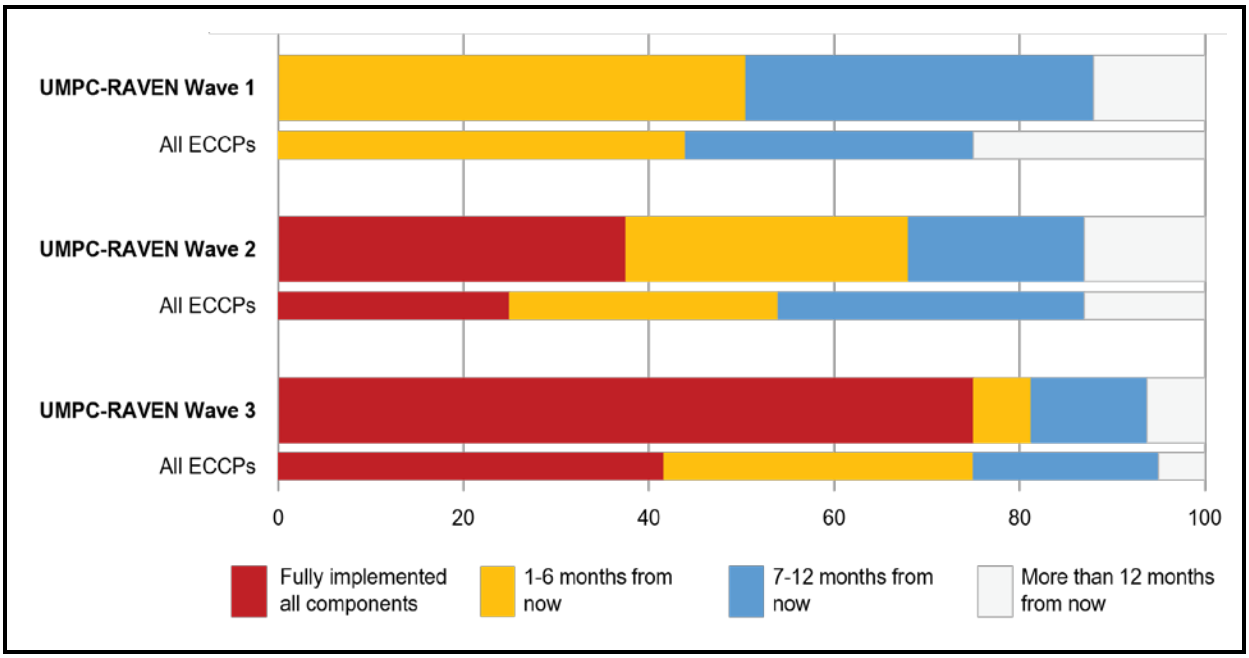
are used by wing and charge nurses and paper Stop and Watches are used by CNAs and therapy staff. Facilities did not report formal refresher trainings from Jewish Healthcare Foundation for INTERACT tools but did report informal conversations between facility leadership and staff to encourage tool use.

As mentioned previously, UPMC-RAVEN nurses are considered the most valuable component of the Initiative. The nurses are heavily involved in QI/QAPI process, end-of-life care planning, medication management, and informal staff training. Specifically, UPMC-RAVEN nurses continue to complete root cause analyses for all hospitalizations. Some facilities use these data to understand readmission rates, while others are unfamiliar with the data provided by UPMC-RAVEN. UPMC-RAVEN nurses maintain their role in end-of-life care by reviewing and advising residents and families on advance directives and reviewing POLST or other facility-specific care planning forms. This process is well received by facility staff and residents. All facilities report end-of-life planning as one of the most valuable roles of UPMC-RAVEN nurses.

Web-Based Survey Results

Figure 3-35 indicates implementation timelines among all facilities. **Relative to all ECCP respondents, UPMC-RAVEN respondents had a notably faster facility implementation timeline.** By Wave 3, 75 percent of UPMC-RAVEN respondents indicated their facility had fully implemented all components of the Initiative, compared to 42 percent of all facilities. This trend was already apparent by wave 2, where 38 percent of UPMC-RAVEN facilities had fully implemented all components (compared to 25 percent of overall facilities).

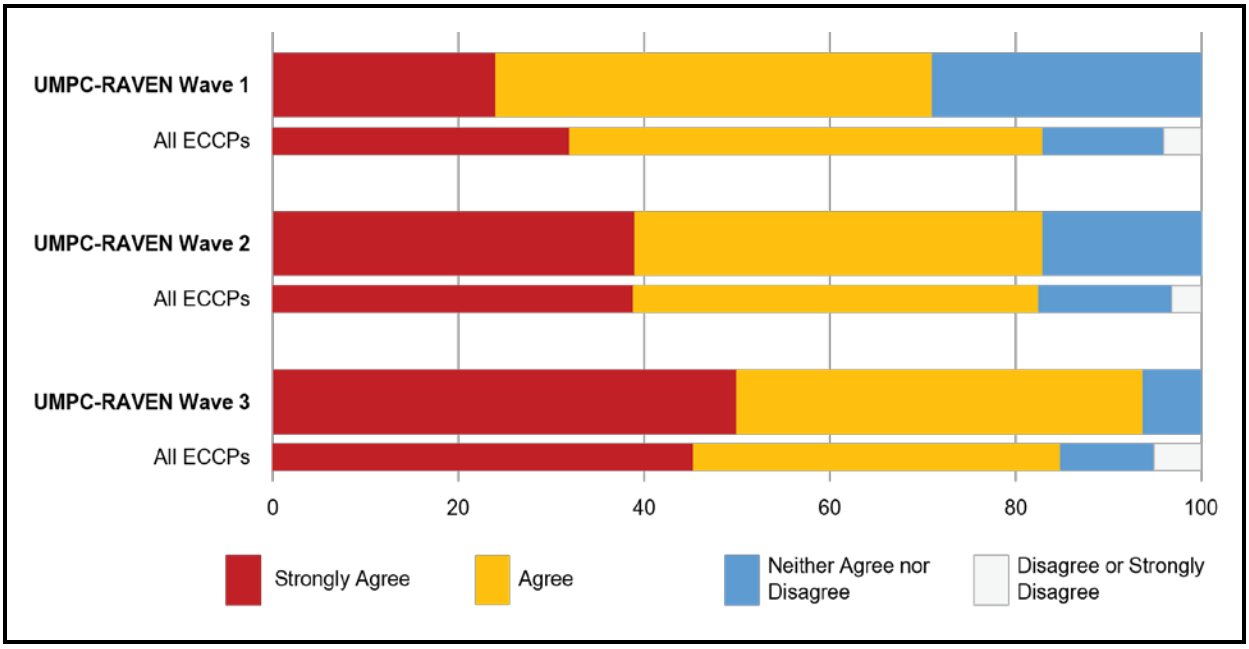
Figure 3-35
Implementation timeline, UMPC-RAVEN



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

Figure 3-36 shows the respondents' replies when asked if the training provided by the ECCP was sufficient as implementation progressed. **Relative to all facilities, UPMC-RAVEN respondents reported a much higher level of training support.** Across all waves, no respondents indicated that they disagreed or strongly disagreed that the training provided by the ECCP was sufficient (ranged from 3 to 5 percent among all facilities). The percentage of UPMC-RAVEN respondents who agreed or strongly agreed that training support was sufficient, increased from 71 percent to 94 percent from wave 1 to 3; this did not notably change among all facilities.

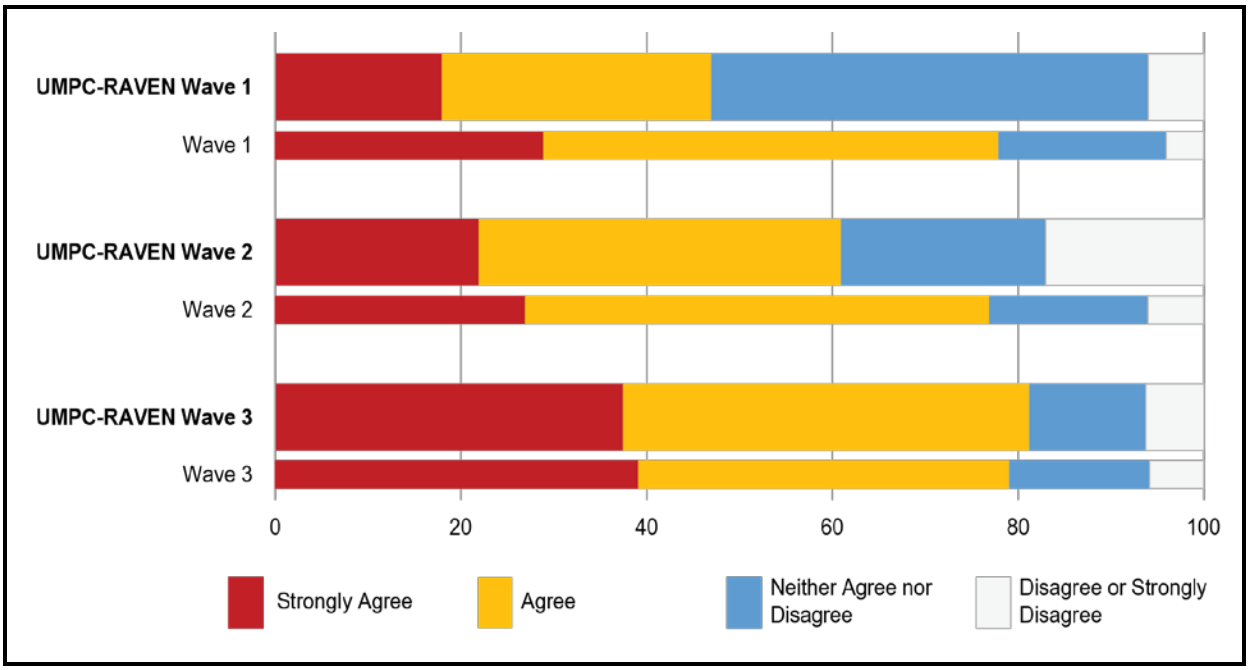
Figure 3-36
Training support, UMPC-RAVEN



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

Figure 3-37 indicates respondents' views on their facility's ability to financially support the Initiative. Among all facilities, the percentage of respondents who agreed or strongly agreed financial resources were sufficient remained stable across waves, ranging from 77 to 79 percent. **For UPMC-RAVEN respondents, the percentage who reported sufficient financial resources increased across all waves, from 47 percent in wave 1 to 82 percent in wave 3, which was slightly higher than the overall facilities.**

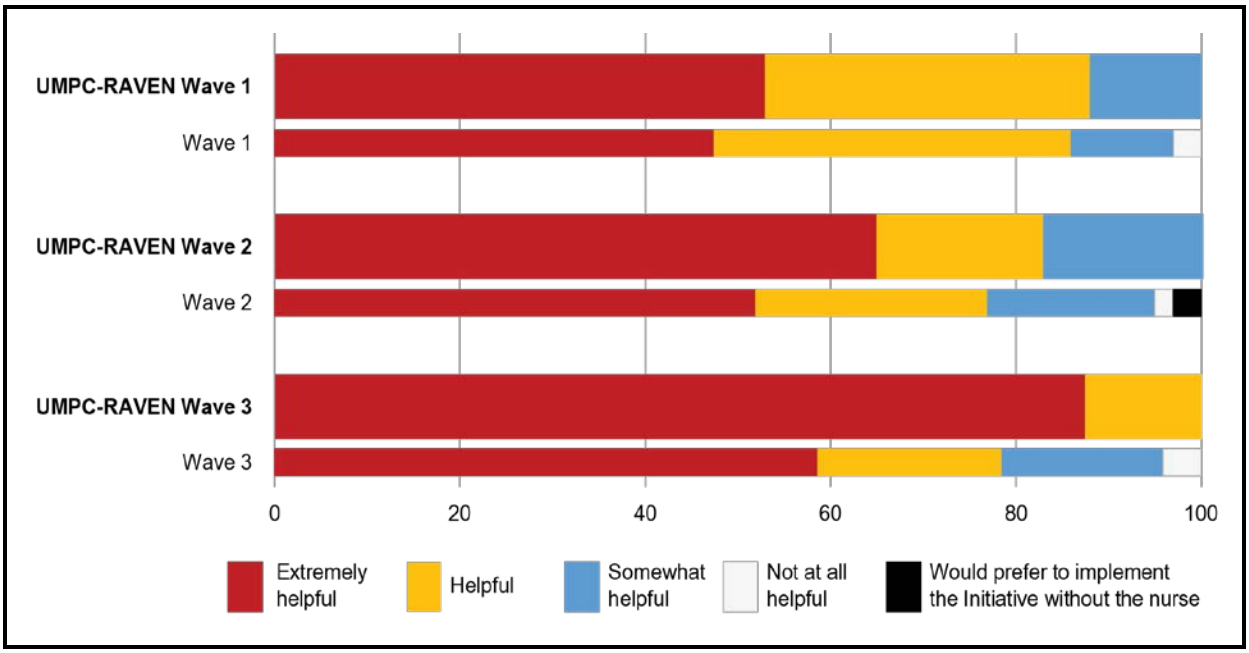
Figure 3-37
Financial resources, UMPC-RAVEN



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

Figure 3-38 presents respondents' opinions about the helpfulness of their ECCP nurse. UPMC-RAVEN **respondents generally felt their ECCP nurse was much more helpful compared to respondents from all facilities**. The percentage of UPMC-RAVEN respondents who indicated the ECCP nurse was extremely helpful increased across all waves, from 53 percent in wave 1 to 88 percent in wave 3. Although the percentage of overall respondents who thought the ECCP nurse was extremely helpful also increased, it rose from 48 percent in wave 1 to only 59 percent in wave 3. Notably, by wave 3, UPMC-RAVEN respondents only reported their ECCP nurse as helpful or extremely helpful, compared to overall facilities, where 21 percent of respondents indicated somewhat helpful or less.

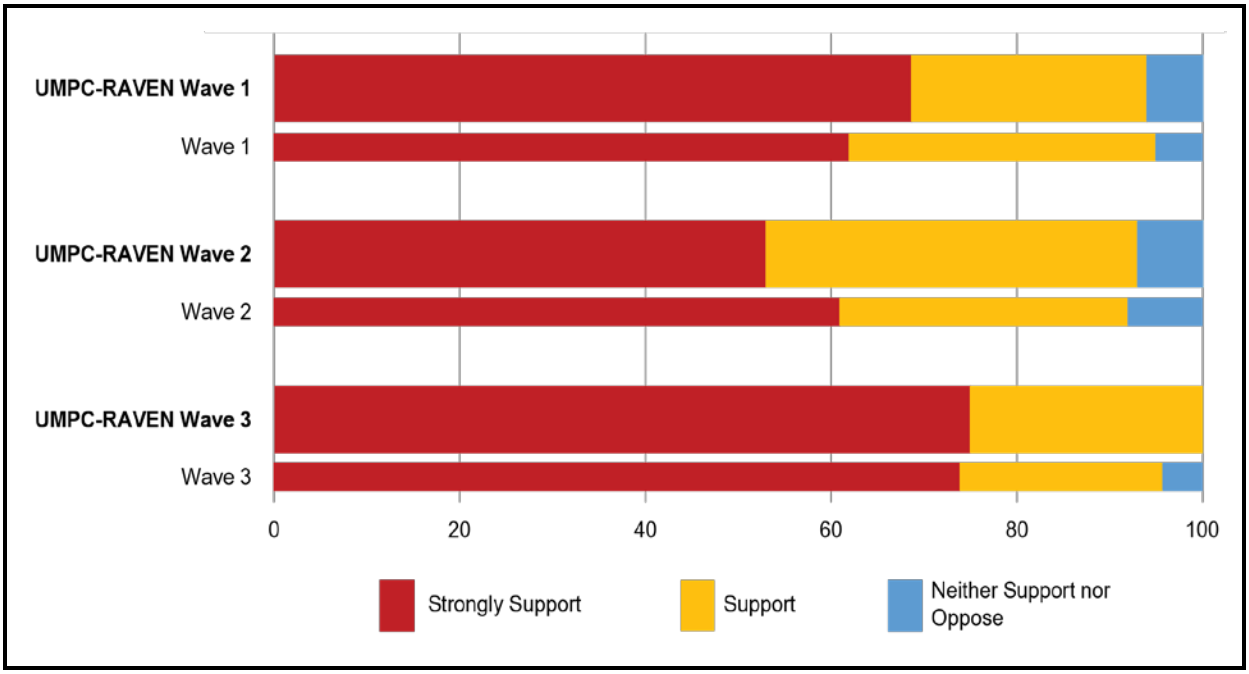
Figure 3-38
Helpfulness of ECCP nurse, UMPC-RAVEN



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

Figure 3-39 presents respondents' personal levels of support for the Initiative. **By wave 3, 100 percent of UPMC-RAVEN respondents either strongly supported or supported the Initiative**. Although the percent of wave 2 respondents who strongly supported the Initiative was lower for UPMC-RAVEN (53 percent) relative to all facilities (61 percent), by wave 3 the percent was similar among both (around 75 percent.)

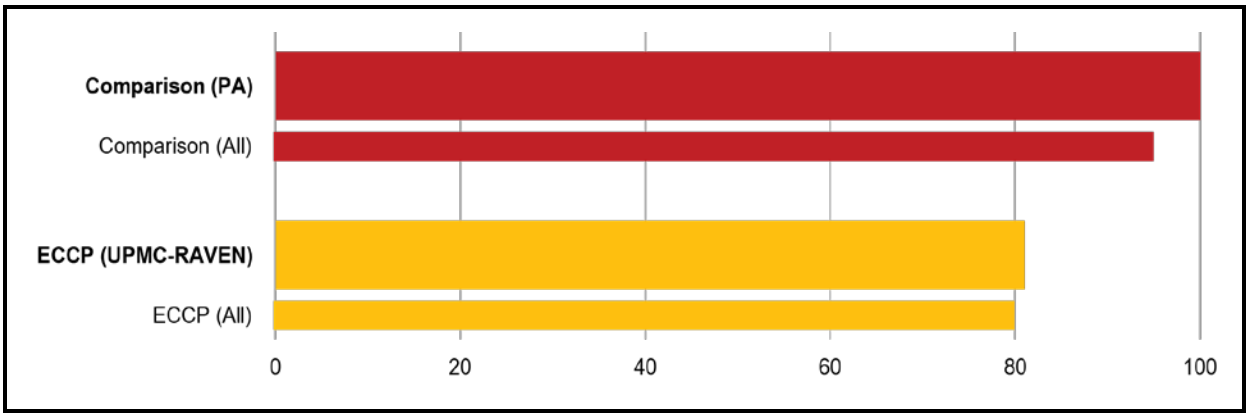
Figure 3-39
Personal support, UMPC-RAVEN



SOURCE: RTI analysis of waves 1, 2, and 3 of the Nursing Facility Administrator Survey (data collected August of 2013 to December of 2015).

Finally, ***Figure 3-40*** synthesizes responses about the introduction of any PAH-related non-Initiative practices among all facilities. Compared to 95 percent of all comparison facilities, 100 percent of UPMC-RAVEN comparison facilities had introduced new PAH-related practices. Among ECCP facilities, about 80 percent of both UPMC-RAVEN and overall facilities had introduced a non-Initiative PAH-related policy or procedure. Overall, Pennsylvania and UPMC-RAVEN demonstrated a high level of non-Initiative PAH-related efforts.

Figure 3-40
Introduced non-Initiative PAH-related practices, Pennsylvania



SOURCE: RTI analysis of Comparison Facilities Survey and wave 3 of the Nursing Facility Administrator Survey (data collected June of 2015 to December of 2015).

RAVEN respondents and Pennsylvania comparison facilities reported identical practices as their most common PAH-related non-Initiative practices: hospitalization rate tracking (100 percent in both), followed by SBAR and root cause analysis. These were among the highest percentages reported across all states (***Table 3-10***).

Table 3-10
Most common non-Initiative PAH-related practices, Pennsylvania

Pennsylvania Comparison Respondents	RAVEN ECCP Respondents
▪ Hospitalization rate tracking—100% ▪ SBAR—88% ▪ Root Cause Analysis—80%	▪ Hospitalization rate tracking—100% ▪ SBAR—92% ▪ Root Cause Analysis—85%

Overall, relative to all ECCPs, UPMC-RAVEN reported a faster implementation timeline for the Initiative, a much higher level of training support from ECCP, and more positive attitudes about the helpfulness of ECCP nurses. The percentage of respondents reporting sufficient financial resources lagged in wave 1 but caught up by wave 3. By wave 3, 100 percent of UPMC-RAVEN respondents supported the Initiative. Pennsylvania comparison facilities and UPMC-RAVEN facilities also reported a particularly high level of PAH-related non-Initiative practices, with identical patterns of frequently reported practices (notably, 100 percent for hospitalization rate tracking).

3.7 Key ECCP Model Features: Project Year 4 Site Visits

In this section, the features of and changes to the implementations are updated and tabulated in a way that allows comparisons to be made across the ECCPs. ***Table 3-11*** displays organizational change data, such as the number of participating facilities. ***Table 3-12*** shows changes to staffing and subcontractors in Project Year 4, and ***Table 3-13*** shows changes to nurse practice agreements. ***Table 3-14*** focuses on changes made in Project Year 4 to data collection practices and tools. ***Table 3-15*** displays changes made to the intervention, such as new efforts for education, medication management, or advance care planning and palliative care. Lastly, ***Table 3-16*** explores feedback on Initiative sustainability from both the perspective of the ECCP leadership and the facility staff. All columns of these tables will be fully completed for the final version of this report.

3.8 Learning Community Activities

ECCPs are responsible for participating in the Learning Community with the goal of disseminating best practices and lessons learned so that successes can be replicated throughout all facilities in the Initiative. In previous project years, we attended the Learning Community events to evaluate the Learning Community activities and identify which components contributed to successful model implementation and which elements should be replicated or modified to sustain intervention and successful implementation nationwide. We also had access to the Learning Community website and gathered feedback on the Learning Community events from site visits and the website.

Since early Project Year 3 (February 2015), we had not been informed of any Learning Community activities or events and we no longer have access to the Learning Community website. Therefore, for Project Year 4 we had no information or knowledge of any Learning Community activities to continue to identify which events or components ECCPs found most useful or valuable during implementation. In recent discussions with CMS and several ECCPs, we learned that the Learning Community events have resumed on a limited basis, including webinars held in December 2015 (discussing the overall Initiative's analytic framework and overview reporting) and February 2016 (discussing improving data collection and quality) and a call in March 2016 (sharing session to discuss health information technology knowledge). We did not attend these more recent events because we did not learn of them until after their occurrence, and we continue to not have access to the website.

3.9 Analysis of ECCP Quarterly Monitoring Reports

Deloitte's Quarterly Monitoring Reports of ECCPs in the Initiative provide another data source for RTI's evaluation. The operations contractor generates quarterly narrative and dashboard reports from CMS data sources and from data collected and reported by ECCP staff. The reports are designed to track and trend the implementation of the interventions and monitor the activities in the ECCPs. The narrative reports contain quarterly goals, intervention updates, staffing updates (both facilities and ECCP), facility engagement assessments, and best practices, among other pertinent information. The dashboards provide population data, data on tool use, transfers, nursing facility staff turnover, ECCP staff effort, and other domains, aggregated by each ECCP. Data at the nursing facility level are also displayed in some domains.

Table 3-11
ECCP organizational changes from 2015 through 2016

	Alabama (AQAF-NFI)	Indiana (OPTIMISTIC)	Missouri (MOQI)	Nebraska (Alegent + Creighton)	Nevada (ATOP)	New York (NY-RAH)	Pennsylvania (UPMC-RAVEN)
Number of facilities participating in the Initiative	23	19	16	14	24	29 (2 facilities: Hebrew Home for the Aged and Palisade Nursing Home will merge under one license in fall 2016)	18
Number of facility ownership changes	0	0	0	2	0	1 (1 pending)	0
Number of participation agreement signed	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Number of facilities that became ineligible	0	0	0	0	0	0	0
Number of facilities withdrawn from Initiative	0	0	0	0	0	0	1
Sharing of ECCP award funds with facilities	No	Did not receive award funds	No	No	N/A	Direct Messaging Mailbox Accounts through MedAllies ($15/per box)	No
Partners/other entities providing new financial/ in-kind support for the Initiative to ECCP	Yes, CMS provided an additional award in Project Year 3	OPTIMISTIC received a no cost extension of their John H. Hartford Planning Grant through Dec 2016	Yes, CMS has provided an additional award ($131,719).	No	No	N/A	No

NOTE: ECCP = Enhanced Care Coordination Provider.

Table 3-12
ECCP staff and subcontractor changes in 2016

	Alabama (AQAF-NFI)	Indiana (OPTIMISTIC)	Missouri (MOQI)	Nebraska (Alegent + Creighton)	Nevada (ATOP)	New York (NY-RAH)	Pennsylvania (UPMC-RAVEN)
ECCP							
ECCP Employees	Additional staff for Phase 2 have already been hired		One ECCP staff member is no longer with the ECCP	One staff member (data analyst) left and was not replaced. One part-time training program coordinator was hired, but left and was not replaced.	No changes	No changes	No changes
Leadership staff	The original data analyst position (1 FTE) for the ECCP has been split into two new FTEs, one for data and one for communications	The Medical Director was replaced by two new medical directors with a decrease from 0.5 to 0.45 FTE; the Transitions Core title was changed to assistant medical director with no change to the 0.2 FTE	No changes	The ECCP director became Chief Nursing Office of the CHI Health system and is now less than 0.5 FTE on the ECCP. One NP transitioned off her role as a facility-based NP, and now serves as the ECCP Associate Director.	No changes	Project Director, Medical Director, Deputy Project Director, Assistant Project Director (previously Project Manager), Clinical Director, IT specialist, Analyst	No changes
Facility-based ECCP staff	There has been some turnover through the past year, but as of our site visit, there are 23 FTE ECCP nurses (one in each of the 23 facilities)		No changes	Net change of 1.5 FTE decrease. 1 NP was hired, 2 NPs left, 0.5 NP transitioned into the ECCP Associate Director role.	0.5 RN eliminated from 1 remote NF 1 APRN/PA position eliminated. 1 FTE RN staff remains assigned, but has moved out of state and is responsible for data activities and not facility-based activities.	3 FTE positions open: 2 FTE RNCC positions open, 1 FTE Float RNCC position open	CRNP – 3 positions open

(continued)

Table 3-12 (continued)
ECCP staff and subcontractor changes in 2016

	Alabama (AQAF-NFI)	Indiana (OPTIMISTIC)	Missouri (MOQI)	Nebraska (Alegent + Creighton)	Nevada (ATOP)	New York (NY-RAH)	Pennsylvania (UPMC-RAVEN)
Total FTE facility-based staff by type	No changes	7 NPs (6 FTE) 18 RNs (17.5 FTEs)	No changes	5.0 FTE NPs	0.5 RN and 1 APRN/PA eliminated	27 FTE RNCC positions; 24 currently filled	3 Lead CRNPs, 8 CRNPs, 7 RNs
Supervisory Staff	No changes	Nurse Manager (1 FTE) was promoted to project administrator; a facility-based RN continued as a manager (0.25 FTE) and began a new position as palliative care coach (0.75 FTE)	No changes	No changes	No changes	2 FTE clinical nurse managers: 1 FTE clinical manager hired.	1 Lead NP left. Position has been filled with an anticipated September start date bringing total number of Lead NPs back to 3
Consultants	No changes	No changes	No changes	No changes	1 part time Medical Director added to the southern region	5	No changes
Subcontractors							
Education	AQAF-NFI is no longer partnering with B&F Consulting; their new education partner is Scott Wozniak.	No changes	No changes	N/A	No changes	No changes	No changes
Pharmacy	No changes	No changes	No changes	Decreased from 0.5 to 0.15 FTE	The 0.5 FTE HealthInsight pharmacist assigned to ATOP is on medical leave	N/A	No changes

(continued)

Table 3-12 (continued)
ECCP staff and subcontractor changes in 2016

	Alabama (AQAF-NFI)	Indiana (OPTIMISTIC)	Missouri (MOQI)	Nebraska (Alegent + Creighton)	Nevada (ATOP)	New York (NY-RAH)	Pennsylvania (UPMC-RAVEN)
IT	N/A	IS Core Lead subcontract moved from the Indiana University to Purdue, but remained the same FTE	No changes	N/A	No changes	No changes	No changes
Other (including visiting coaches)	N/A	The Palliative care core subcontract with the University of Pennsylvania ended in spring of 2016. The services provided by the original subcontract were absorbed by the ECCP RN palliative care coach.	N/A	N/A	N/A	N/A	

NOTES: APRN = Advanced Practice Registered Nurse; CCR = collaborative care review; CRNP = Certified Registered Nurse Practitioner; ECCP = Enhanced Care Coordination Provider; FTE = Full-time employee; HIT = health information technology; IHI = Institute for Healthcare Improvement; JHF = Jewish Healthcare Foundation; NF = nursing facility; NP = nurse practitioner; RMU = Robert Morris University; RN = Registered Nurse; RNCC = Registered Nurse Care Coordinators.

Table 3-13
Functions and changes to nurse practice arrangements in 2016

	Alabama (AQAF-NFI)	Indiana (OPTIMISTIC)	Missouri (MOQI)	Nebraska (Alegent + Creighton)	Nevada (ATOP)	New York (NY-RAH)	Pennsylvania (UPMC-RAVEN)
Key functions of ECCP Nurses in facilities							
Education only	X					X	
Education, assessment, and care provision			X				
Education, assessment, writing orders, care provision		X		X	X		X
Changes to state policies in collaborative practice agreements (CPA)	N/A	No	No	No	No	N/A	No

NOTES: CPA = collaborative practice agreement; ECCP = Enhanced Care Coordination Provider.

Table 3-14
ECCP data collection in 2016

	Alabama (AQAF-NFI)	Indiana (OPTIMISTIC)	Missouri (MOQI)	Nebraska (Alegent + Creighton)	Nevada (ATOP)	New York (NY-RAH)	Pennsylvania (UPMC-RAVEN)
New systems for CMS-required data collection	No	No	No	No	No	N/A	No
Changes to data submission process in 2015	Updated the existing secure portal for AQAF-NFI nurses to submit data	No	No	No	No	No	No
New technology used by staff for data collection	No	No	No	No	No	No	No
New technology used for other purposes	Upgraded smartphones for AQAF-NFI nurses	No	No	The ECCP is now using C-SNAP (CMS Secure Net Access Portal) to determine eligibility for newly admitted facility residents.	No	No	No
ECCP reports to NFs on hospitalization rates	Facility scorecards have been updated.	OPTIMISTIC monthly reports to facilities	Yes, facilities are provided with monthly hospitalization rates to compare with their targeted improvement rate	Yes, the ECCP presented data on hospitalization rates during semi-annual steering committee meetings and facility QA meetings	Yes, no changes to quarterly reports. ECCP continues to share PAH hospitalization rates	ECCP provides continues to provide quarterly facility progress reports that includes two metrics hospital transfer rates.	Yes, no changes, ECCP shares results with facilities quarterly based on data gathered in the Acute Care Transfer Review form

(continued)

Table 3-14 (continued)
ECCP data collection in 2016

	Alabama (AQAF-NFI)	Indiana (OPTIMISTIC)	Missouri (MOQI)	Nebraska (Alegent + Creighton)	Nevada (ATOP)	New York (NY-RAH)	Pennsylvania (UPMC-RAVEN)
New data sharing activities between ECCP and participating facilities	AQAF-NFI nurses are now getting scorecards, and AQAF-NFI is planning physician scorecards in the fall.	No	No	No	INTERACT Patient Order Set pilot in 6 NFs and Qliqsoft pilot texting to PCPs in 5 NFs both ended.	No	Yes. ECCP has implemented a new Facility Engagement Tool to help gauge facility engagement with the Initiative and help set goals for improvement

NOTES: ACOC = Acute Change of Condition; AD = advance directives; ECCP = Enhanced Care Coordination Provider; PCPs = primary care physicians; PHI = personal health information; RNs = Registered Nurses.

Table 3-15
Summary of changes to interventions

	Alabama (AQAF-NFI)	Indiana (OPTIMISTIC)	Missouri (MOQI)	Nebraska (Alegent + Creighton)	Nevada (ATOP)	New York (NY-RAH)	Pennsylvania (UPMC-RAVEN)
Early Identification of Change in Condition and Condition Management	No changes	No changes	Hydration program to prevent dehydration; perineum care focus to prevent UTIs; infection control – Community Immunity	No changes	No changes	Stop and Watch: No changes	No changes
Support to Improve Communication with Physicians	No changes	No changes	ECCP conducted training on Mediprocity HIPAA-compliant texting application	No changes	No changes	SBAR: no changes AMDA Know-it-All Before You Call Cards: no changes	Condition-specific SBARs were developed by JHF for use in the facilities; some facilities are now using condition-specific SBARs
Care Transition Improvement	No changes	The OPTIMISTIC ICU program was reduced in terms of the number of follow-up visits NPs were required to do for residents who had been readmitted to a hospital within 30 days and was renamed Extended Transitions Care.	No changes	No changes	Efforts to improve transitions have not started.	Interact Transfer Form: No changes	No changes

(continued)

Table 3-15 (continued)
Summary of changes to interventions

	Alabama (AQAF-NFI)	Indiana (OPTIMISTIC)	Missouri (MOQI)	Nebraska (Alegent + Creighton)	Nevada (ATOP)	New York (NY-RAH)	Pennsylvania (UPMC-RAVEN)
Medication Management	No changes	No changes	No changes	No changes	No changes	Medication Reference Cards: no changes Medication guidelines: introduced in 2015/16.	UPMC-RAVEN Pharmacy staff expanded psychotropic medication review teams to two more facilities; plan to roll out in more facilities and/or build partnerships to engage in existing medication review efforts at facilities
End of Life/Palliative Care	No changes	Generating lists of specific residents each month for ECCP RNs to address resulted in increased ACP discussion and POST completion for OPTIMISTIC residents.	ECCP participated in the Healthcare Decisions Day in 2014, 2015, and 2016. ECCP participated in the Conversation Project in 09/2015	No changes	No changes	MOLST: no changes Palliative Care Education: no changes	No changes

(continued)

Table 3-15 (continued)
Summary of changes to interventions

	Alabama (AQAF-NFI)	Indiana (OPTIMISTIC)	Missouri (MOQI)	Nebraska (Alegent + Creighton)	Nevada (ATOP)	New York (NY-RAH)	Pennsylvania (UPMC-RAVEN)
Quality Improvement (including RCA, PDSA, QAPI)	Continuing to develop QAPI teams in all facilities to address key concerns (e.g., consistent staffing, hospitalizations, medications).	A pilot program aimed at increasing ECCP RN's role in facility QI was discontinued due to lack of facility buy-in.	Implemented FOCUS-PDSA to address hospitalization rates; called enhanced Quality Improvement; conducted training on infection control – Community Immunity Program	No changes	ECCP nurses continue to provide INTERACT QI root cause analyses for every transfer to NF DONs. In 2016, the ECCP medical directors are also reviewing these data	NY-RAH QI Tool: no changes	No changes
IT Interventions	N/A	N/A	Conducted training on Mediprocity (a secure texting app)	N/A	N/A	Direct Messaging: No changes	Attempts to improve connectivity and retrain staff in telemedicine
Other	Monthly executive leadership trainings for facility administrators and facility leadership staff.	A CCR process focusing on polypharmacy was initiated in Project Year 3 and has been rolled out in 15 of 19 facilities.	One visited facility is collaborating with local hospital to implement acute care unit in the NF	No changes	8 NFs agreed to have retention training for CNAs. ECCP nurses were trained in train-the-trainer and provided training.	N/A	N/A

NOTE: ACP = advance care planning; CAUTI = catheter-associated urinary tract infection; CCR = Collaborative Care Review; CNA = certified nursing assistant; EOL = end of life care; FOCUS-PDSA = Find Organize Clarify, Understand, Select – Plan Do Study Act; JHF = Jewish Healthcare Foundation; MOLST = Medical Order for Life-Sustaining Treatment; NF = nursing facility; NP = nurse practitioner; PDSA = Plan Do Study Act; QAPI = quality assurance and performance improvement; QI = quality improvement; RCA = root cause analysis; RMU = Robert Morris University; RNCC = Registered Nurse Care Coordinator; UTI = urinary tract infection.

Table 3-16
Sustainability

	Alabama (AQAF-NFI)	Indiana (OPTIMISTIC)	Missouri (MOQI)	Nebraska (Alegent + Creighton)	Nevada (ATOP)	New York (NY-RAH)	Pennsylvania (UPMC-RAVEN)
Interventions reported to potentially continue after end of the Initiative							
ECCP reports	Stop and Watch, SBAR, Care Pathways, QI Tool, Transfer Forms, and QAPI teams.	SBAR, POST forms, ECCP RN	Stop and Watch, SBAR, QI activities, advance care directives and advance care tool, changes in record systems, medication reconciliation, Care Path Tool, relationship with stakeholders, nursing and social work developed skills	The ECCP plans to keep NPs in 4-5 of the participating nursing facilities and continue to their role as associate medical directors of the facilities and primary care providers for residents. The ECCP program will be merged with CHI Health's existing Nursing Home Network and ECCP NPs will begin to bill for their services.	Stop and Watch, SBAR, critical thinking skills, awareness of conditions leading to hospitalizations	Stop and Watch, SBAR, MOLST, Palliative Care processes, QI tool	Use of the INTERACT tools and POLST. The use of telemedicine is uncertain as there are connectivity issues
Facility reports from 4 visited facilities	Some combination of Stop and Watch, SBAR, Care Pathways, QI Tool, Transfer Forms, and QAPI teams, but not all components in all facilities.	SBAR, POST forms	Stop and Watch, SBAR, QI activities, nurse assessment skills, hospitalization reductions	Nursing facilities support having a NP in the facility, but did not express plans to retain them once the Initiative ends. Some facilities intend to continue use of INTERACT tools after the Initiative ends	Stop and Watch, SBAR, critical thinking skills, nurse assessments in 2 visited NFs. None in 2 other visited NFs.	Stop and Watch, SBAR, MOLST, Palliative Care Policies, QI tool	Stop and Watch and SBAR. Support having a NP and continuing telemedicine, but unsure about funding and logistics for these elements.

NOTES: ECCP = Enhanced Care Coordination Provider; MD = Medical Doctor, MOLST = Medical Orders for Life-Sustaining Treatment; NP = Nurse Practitioner, POLST= Physician Orders for Life Sustaining Treatment; POST = Physician Orders for Scope of Treatment; QAPI = Quality Assurance and Performance Improvement; QI = Quality Improvement; SBAR = Situation Background Assessment Recommendation (tool); SNF = Skilled Nursing Facility.

SOURCE: RTI data collected during 2015 site visits.

Originally, our team had considered using data from the Quarterly Monitoring Reports, as well as raw quarterly data used to generate these reports, for RTI quantitative and qualitative analyses. After considerable investigation, RTI's quantitative team came to the conclusion that it was not feasible to incorporate data from the dashboards into their analyses. However, the narrative reports are extensively used to track ECCPs' progress; narrative report findings are incorporated into the RTI ECCP narrative reports.

[This page intentionally left blank.]

SECTION 4
DISCUSSSION

Overall, the 2015 secondary data analyses continue to indicate desired Initiative effects on most of the Medicare utilization and expenditure measures and some more consistent patterns of effects for a few of the ECCPs. Rates of utilization, particularly for avoidable hospitalizations, are also quality measures because hospitalizations, per se, are very stressful for nursing facility residents and expose them to additional health risks. The ECCPs in Missouri, Indiana, and Alabama, in particular, demonstrated a relatively strong pattern of Initiative effects on reducing utilization and expenditures; the effect estimates are not all significant statistically, but most are. Notably, Alabama saw a more consistent and stronger pattern of ECCP intervention effects in 2015 than in 2014, possibly resulting from increased support for the Initiative from facility leadership. According to RTI's primary data analysis, in 2015 the Alabama ECCP expanded ongoing education efforts to include not only facility staff but also facility administrators, owners, and members of corporate office leadership. Inclusion of these individuals across all levels of facility management and ownership has increased buy-in and support for the overarching goals of the Initiative, following more of a top-down approach that encouraged both leadership and staff engagement. In Missouri, the Initiative's impact has been attributed to the MOQI APRNs being well integrated, extensively used, and positively received at all facilities. ECCP staff reported that APRNs have been able to reduce avoidable hospitalizations through focused staff education to improve clinical staff assessment and clinical decision-making skills, assess patients (without writing orders), contribute to the facilities' QI programs, and collaborate with facility leadership staff. In Indiana, OPTIMISTIC RNs provided similar clinical support, education, and training of facility staff, and were seen as bringing a more interdisciplinary team approach to keeping residents out of the hospital. In addition, the role of OPTIMISTIC RNs and NPs in end-of-life discussions and completion of POST advance directives was identified as a key contributor to their success.

Other ECCPs, in New York, and Pennsylvania, show mostly consistent indications of reductions, but few measures are statistically strong. In New York, the pattern and strength of the estimated Initiative effects remained largely the same in 2015 as in 2014. In Pennsylvania, the effect estimates on all utilization measures were weaker in 2015 relative to 2014. Similar to the pattern observed in 2014, in 2015 the ECCP effects in Nebraska and Nevada were mixed in sign, with some indications of reduction in hospitalizations and increase in ED visits. Such inconsistencies in directions of effects weaken the evidence. In Nebraska, only one effect estimate, on Medicare expenditure for all-cause ED visits, reached statistical significance in 2015; however, it went in the undesired direction indicating an increase in expenditure. Indeed, evidence to date points to the weakest impact of ECCP intervention on key utilization and expenditure outcomes in Nebraska, relative to all other ECCPs. In 2015, data for Nevada revealed stronger Initiative effects on reducing all-cause hospitalizations and several expenditure measures, as compared to 2014, but these results should be interpreted with caution given the limitations of the small, nonmatched comparison group, which had atypically worsening performance.

It is important to note that statistical significance refers to the probability that an effect could be observed by chance. As statistical estimates are made in large numbers, we observe

more chance occurrences of large effects. A pattern of substantive estimated effects is stronger evidence for a causal relationship than sporadic findings.

In 2015, the MDS-based quality measures do not show a clear pattern of change related to the Initiative, similar to findings in 2014. If the concentration is more on avoiding hospitalizations and ED use related to resident changes in condition, the effects of the interventions on the broad range of MDS-based quality measures may be limited. There were a few statistically significant effects of the ECCP intervention on MDS-based quality outcomes which, however, showed mixed signs indicating relative improvement or worsening in quality. Note that even in the absence of any Initiative effect, using a 0.10 significance level for testing would yield some significant findings. The prevalence of this "false significant" can be as high as 10 percent if doing a large number of tests. Thus, given the small number of statistically significant findings and inconsistent signs, the analyses of MDS-based quality measures do not suggest any Initiative effect on quality of care.

The quantitative analysis results based on the 2015 data indicate evidence of continuing ECCP intervention effects on reducing hospitalizations, ED visits, and related Medicare expenditures in most of the seven Initiative states. Overall, these results continue an earlier trend from the first two Initiative years, 2013 and 2014, showing a positive Initiative impact on key utilization and expenditure outcomes. Our quantitative analysis also shows variation in the Initiative effect across the states. Our primary data collection indicates that there are components of the interventions, their implementation, and other factors, varying across ECCPs and facilities that may account for variation in the Initiative effects as well.

Continuing from 2015, the 2016 site visits and telephone interviews also demonstrated varied progress across the ECCPs. Although most ECCPs have implemented all or nearly all of their model components, some ECCPs are still in the midst of implementation. Despite varied degrees of implementation, the response to the ECCP RNs and NPs generally has been positive across all ECCPs. Facilities report a strong appreciation for extra staff on site, particularly nurses who provide clinical support. Most participating facilities also report appreciation for the education provided by the ECCPs. Although the existing quantitative data indicate various degrees of success in reducing hospitalizations thus far, the majority of interviewees viewed the Initiative as positive and potentially beneficial for residents.

Of particular note, relationships remain critically important for success within all ECCPs and across all levels. The "fit" of the ECCP nurses with the facility staff is pivotal in affecting culture change and developing new best practices within facilities (e.g., consistent use of INTERACT tools). Likewise, the relationships between staff and facility leadership, as well as corporate ownership, were said by interviewees to affect the overall potential success of the ECCP Initiatives and greatly influence the consistency of INTERACT tool use. Early engagement across all levels of staff, leadership, and ownership was said by interviewees to be critical in successful deployment of any intervention to nursing facilities. In terms of challenges, qualitative findings pointed to difficulty with implementing new technology, lack of consistent buy-in among specific physicians, pressure from families, and lack of facility leadership support as the main barriers to implementation of the Initiative. Staff turnover in the ECCPs and facilities, particularly among facility leadership, as well as staff retention difficulties, further complicated the implementation.

In the context of the qualitative findings from our site visits, phone interviews, and surveys in the summer of 2016, we know that the interventions were certainly more developed than in 2015, but in most ECCPs they were still being refined and improved, and certain components were being rolled out throughout the year. This continuous evolution over time of individual components of the Initiative across ECCPs makes it difficult to ultimately tease out what individual interventions are working well. Meanwhile, some new components, such as revised INTERACT TOOLS (for example, condition-specific SBARs, or new programs for leadership training) not planned in the original design, were being introduced in several ECCPs. However, the results from multivariate analyses are pointing in the desired direction and savings. If these trends are maintained in the final year of data analysis for 2016, there would be a stronger evidence base to make positive conclusions about the overall effect of the Initiative. However, it remains difficult to attribute these positive results to the specific interventions that are part of each individual ECCP model, given the challenges in quantifying those specific intervention components and the fact that the Initiative is constantly evolving with some new features being experimented with in several ECCPs in the last year of the Initiative.

Thinking forward to the final year of the Initiative in its current form, many facilities reported a greater focus on sustainability. Some INTERACT tools, medication review with the focus on reducing antipsychotic medications, quality improvement/QAPI efforts to reduce avoidable admission, and advance care planning—were the Initiative components indicated by facilities as most likely to remain in place after the end of the project. Beyond these specific components of the Initiative, several interviewees across ECCPs indicated that the project has opened their eyes to more opportunities to improve care for residents, while also potentially reducing hospitalizations and resultant costs. Even if the data are inconclusive or inconsistent in demonstrating reductions in hospitalization rates across all ECCPs, this anecdotal evidence suggests a potential mindset shift in facilities that may result in better care and fewer hospitalizations over time.

An additional consideration identified during site visits and phone interviews is the possibility that there is some degree of parallel change in practice in the comparison groups. A web-based survey of comparison facilities in 2015 indicated that 95 percent of comparison facilities that responded reported that their facility has introduced policies or procedures designed specifically to reduce avoidable hospitalizations of long-stay residents since January 2011. The intensity of the training and the presence of clinical staff that the ECCPs bring to the facilities seems to make a difference beyond just introducing new tools, as may be occurring in the comparison facilities. Also of note, according to wave 3 of the Nursing Facility Administrator survey conducted in 2015, 80 percent of the ECCP facilities that responded indicated that they had also introduced policies and procedures to reduce potentially avoidable hospitalizations that were unrelated to the Initiative as implemented by their ECCP. It will be challenging to disentangle potential contamination caused by co-occurring initiatives in the comparison group and possibly in ECCP facilities as well. We plan to investigate this further in the final project year.

[This page intentionally left blank.]

REFERENCES

Donabedian, A. Evaluating the Quality of Medical Care. *Milbank Memorial Fund Quarterly* 44:166–203, 1966.

Saliba, D. and Joan Buchanan, J. Development & validation of a revised nursing home assessment tool: MDS 3.0. Prepared by RAND Corporation for CMS's Division of Chronic and Post-Acute Care, April 2008.

Walsh, E.G., Freiman, M., Haber, S., Bragg, A., Ouslander, J., and Wiener, J.M. Cost drivers for dually eligible beneficiaries: Potentially avoidable hospitalizations from nursing facility, skilled nursing facility, and home and community-based services waiver programs. Report prepared for Centers for Medicare & Medicaid Services, August 2010. Available at: http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Reports/downloads/costdriverstask2.pdf