Evaluation of the Initiative to Reduce Avoidable Hospitalizations among Nursing Facility Residents—Payment Reform

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EVALUATION OF THE INITIATIVE TO REDUCE AVOIDABLE HOSPITALIZATIONS AMONG NURSING FACILITY RESIDENTS—PAYMENT REFORM

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ACKNOWLEDGMENTS

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Executive Summary

The second phase of the Initiative to Reduce Avoidable Hospitalizations among Nursing Facility Residents (NFI 2) does not show consistent evidence of favorable reductions in utilization or expenditures in Initiative Year 2 beyond what was previously achieved in NFI 1.

Although most facility leadership, staff, and practitioners indicated support for NFI 2 and its goals, many reported that the billing opportunity of NFI 2 did not affect facility culture or practice. Relative to the national comparison group, the facilities that participated in the clinical and educational interventions of NFI 1 and added a payment component in NFI 2, known as the Clinical + Payment facilities, did not experience reductions in utilization and expenditures in Initiative Year 2 beyond what they had previously achieved in NFI 1. The Initiative effect in Payment-Only facilities—newly added to NFI 2—was inconsistent and had limited statistical significance. Additional years of data will provide more definitive insight about Initiative effects.

ES.1 Overview of the Initiative

In October 2016, the Centers for Medicare & Medicaid Services (CMS) began implementing the Payment Reform phase of the Initiative to Reduce Avoidable Hospitalizations among Nursing Facility Residents—herein referred to as NFI 2, or the Initiative. CMS implemented NFI 1 activities from 2012 to 2016 in seven Enhanced Care and Coordination Provider organizations (ECCPs). Six of these ECCPs and their

participating facilities continued to NFI 2, adding the NFI 2 payment component to their existing NFI 1 clinical and educational models. Under NFI 2, the six ECCPs also started working with additional facilities new to the Initiative.

NFI 2 ECCPs*

AQAF	ATOP2	MOQI	NY-RAH	OPTIMISTIC	RAVEN
N=45	N=38	N=40	N=61	N=44	N=35
Alabama Quality Assurance Foundation: Nursing Facility Initiative (AL)	**HealthInsight of Nevada:** Admissions and Transitions Optimization Program (NV & CO)	**The Curators of the University of Missouri:** Sinclair School of Nursing Missouri Quality Initiative for Nursing Homes (MO)	**The Greater New York Hospital Foundation:** New York Reducing Avoidable Hospitalizations (NY)	**Indiana University:** Optimizing Patient Transfers, Impacting Medical Quality, and Improving Symptoms: Transforming Institutional Care (IN)	**University of Pittsburgh Medical Center Community Provider Services:** Reduce Avoidable Hospitalizations using Evidence-based Interventions for Nursing Facilities (PA)

* N = number of participating nursing facilities at the start of NFI 2.

The NFI 2 payment model offers special Medicare billing codes to participating nursing facilities and practitioners (physicians, advanced practice registered nurses, and physician assistants). The billing codes act as a financial incentive for providing care in-house to eligible residents enrolled in Medicare fee-for-service (FFS), rather than transferring them to hospitals for treatment. To receive the financial incentive, facility staff and practitioners assess, diagnose, certify for NFI 2 billing, and treat higher acuity, long-stay residents who may have one of six qualifying conditions that account for a large proportion of potentially avoidable hospitalizations. Facilities receive an extra per diem payment for a period of in-house treatment, and practitioners receive

SIX QUALIFYING CONDITIONS FOR NFI 2

- Pneumonia
- Congestive heart failure (CHF)
- Skin infection
- Urinary tract infection (UTI)
- Fluid/electrolyte disorder or Dehydration
- Chronic obstructive pulmonary disease (COPD)/Asthma
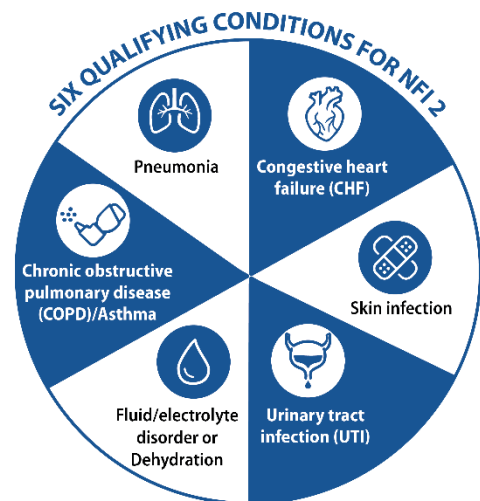
a hospital-level visit payment when evaluating the patient for in-house treatment for the qualifying conditions.

Participating facilities implementing the clinical and educational interventions from NFI 1 in addition to the new NFI 2 payment model are referred to as the *Clinical + Payment* group. Facilities new to NFI 2 are referred to as the *Payment-Only* group. See *Figure ES-1* for a conceptual model of NFI 2.

Figure ES-1.   NFI 2 payment model
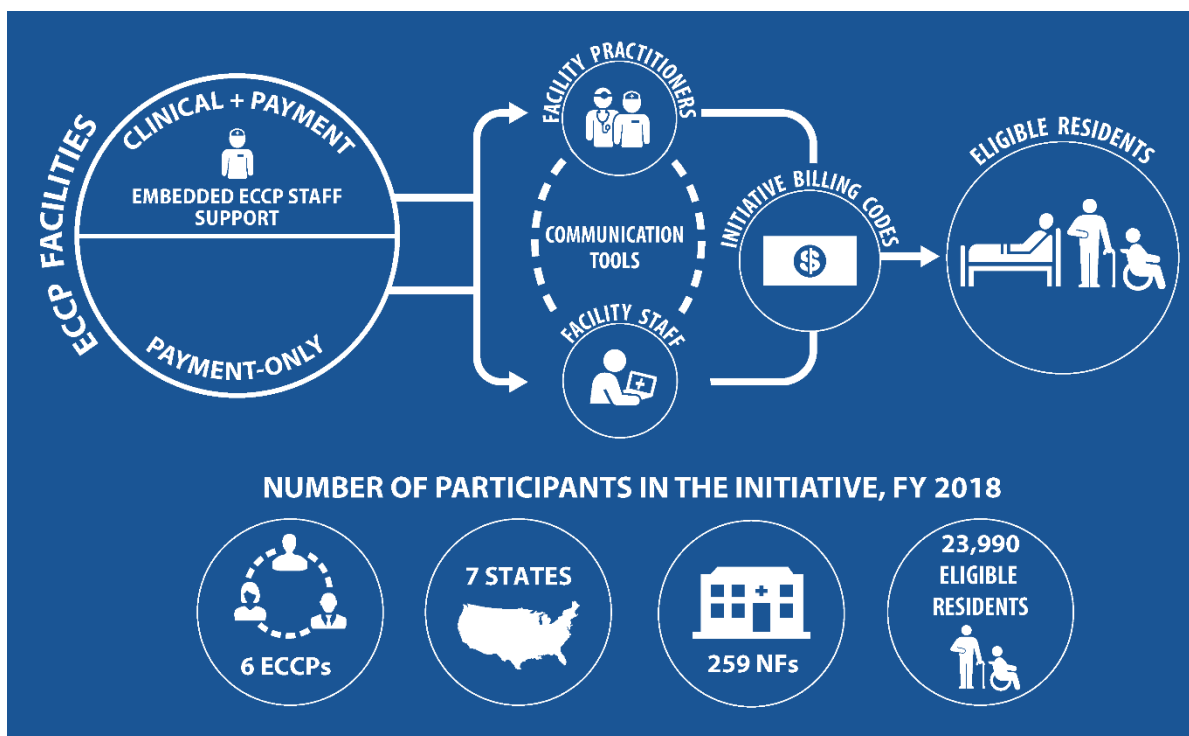
NOTE: Clinical + Payment models vary across ECCPs, including variation in the type of support facilities receive from the ECCP. Three ECCPs embedded full-time clinical staff in facilities, two ECCPs rotated clinical staff across multiple facilities, and one ECCP embedded quality improvement specialists in facilities.

ES.2   Overview of Evaluation Methods

CMS contracts with RTI International to evaluate the Initiative using both primary data and secondary quantitative analyses. In this report, RTI assesses the effectiveness of the NFI 2 payment model as of Initiative Year 2, fiscal year (FY) 2018 (October 1, 2017 through September 30, 2018).[1] RTI addresses the following research questions:

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[1] Initiative Year 2 and FY 2018 are used interchangeably throughout this report.

- How was the Initiative implemented, and how do participating ECCP leadership and facility staff perceive Initiative effectiveness?

- What is the Initiative payment incentive effect on Medicare utilization and expenditures, particularly for hospital-related services, for the Clinical + Payment group and the Payment-Only group?

- How does the Initiative effect on Medicare utilization and expenditures vary by ECCP and type of intervention?

- How does the Initiative affect quality of care outcomes for participating residents?

RTI uses a mixed-methods approach to provide a holistic understanding of NFI 2. Each component of the secondary quantitative analyses and primary data collection and analyses (i.e., site visits, telephone interviews, stakeholder interviews, and surveys) complements the other data sources as shown in **Figure ES-2**.

RTI evaluates NFI 2 effects on utilization and expenditure measures for eligible residents by comparing them to a nationally derived non-Initiative population of nursing facility residents who would meet the Initiative eligibility criteria. RTI uses difference-in-differences (DD) multivariate regression modeling to estimate the Initiative effects.

Figure ES-2. Mixed-methods approach
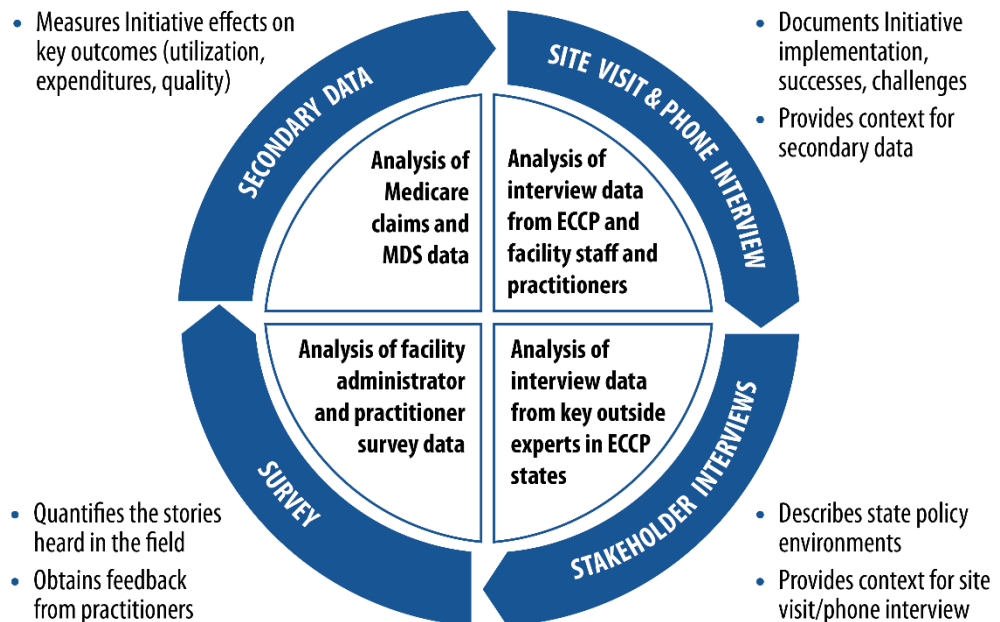
In addition, RTI collects primary data from participants to provide critical context and to inform findings from

We estimate, independently, payment effects in two interventions: (1) adding payment to an existing clinical intervention (Clinical + Payment) and (2) introducing payment to a new group of participant facilities (Payment-Only).

quantitative data analyses. Primary data collection topics include understanding the roll-out and implementation of NFI 2, learning more about the six conditions eligible for payment under NFI 2, discussing experiences submitting NFI 2 claims and receiving payment, and evaluating the overall policy landscape and its potential impact on NFI 2 in each ECCP state.

ES.3 How Nursing Facilities and Practitioners React to the Initiative

RTI's findings indicate that the payment component of NFI 2 does not seem to incentivize substantial changes in facility culture or practice.

Although interview and survey findings among facility leadership, staff, and practitioners indicate general support for NFI 2, some interviewees perceived the Initiative as providing a billing opportunity for existing facility practices.

Low practitioner buy-in and the challenges of billing in corporate structures were key reported barriers to implementation.

Many Clinical + Payment facilities relied on embedded ECCP staff to continue the clinical and educational interventions from NFI 1. They also depended on ECCP staff to assume responsibility for the payment component, such as certifying conditions for NFI 2 and preparing documentation for incentive billing. Some facility floor staff had only limited engagement with NFI 2 activities, even into the second year of the Initiative. This continued reliance on ECCP staff, observed earlier in the Initiative implementation, has further shifted responsibility away from facility staff. Some facility leaders across ECCPs indicated that NFI 2 felt like a financial reward added to the many efforts already in place through NFI 1. They felt that NFI 2 essentially paid the facility for the same care they already provided, without requiring further changes to culture or care practices.

Even in Payment-Only facilities, some practices to improve communication and care were already in place before participating in NFI 2. Similar to Clinical + Payment facilities, many interviewees across ECCPs reported no change in care practices as a result of NFI 2. Rather, they are simply getting paid for efforts already in place, and the payment incentive may not be viewed as a substantial motivator for additional change. However, there are some Payment-Only facilities that designated an NFI 2 champion

(i.e., a staff member who improves engagement by facilitating NFI 2 billing from identifying the change of condition through claims submission). Some ECCPs also provided a liaison to provide training and encouragement for Payment-Only facilities.

Overall engagement in both Clinical + Payment and Payment-Only facilities varies widely within and across ECCPs. Particularly in ECCPs that have undergone substantial model changes (i.e., AQAF and NY-RAH), buy-in among interviewed facility staff and leadership seems lower compared to interviews with similar staff in other ECCPs. Likewise, facility interviewees who reported staff retention challenges, high rates of facility leadership turnover, or low practitioner commitment also reported lower NFI 2 engagement. Our data also indicate tremendous variation in billing volume.

Interviewees said that practitioner engagement was critical to Initiative success. Although many practitioners expressed support for the overarching NFI 2 goals, in practice they struggled to certify conditions within the required time window or faced other challenges submitting practitioner claims. These challenges were often related to practitioner employment status or billing processes (e.g., working in a group practice or being salaried by nursing facilities). Although some practitioners disengaged from the Initiative completely, others continued to support facility billing despite not submitting their own NFI 2 practitioner claim codes.

Similarly, facility staff interviewees in many corporate-owned facilities cited billing structures as a barrier to NFI 2 implementation. In these facilities, staff submitted NFI 2 documentation to a corporate billing office, which in turn submitted claims to and received reimbursement from Medicare. Because of this centralized claim review and submission process, some interviewees across ECCPs were unaware whether their NFI 2 claims had been submitted or if any resultant reimbursements had been received. As such, some facility staff reported that completing NFI 2 activities, including documentation and certification of changes in condition, did not seem worth the investment because they were seeing no monetary benefits.

ES.4   How the Initiative Affects Key Outcomes

Table ES-1 presents a summary of estimated FY 2018 Initiative effects on hospital-related utilization and expenditures for eligible residents in Clinical + Payment facilities, relative to a nationally derived comparison group of nursing facility residents. A parallel summary of results for eligible residents in Payment-Only facilities is provided in *Table ES-2*. Key findings are highlighted below.

> **Overall, combining all ECCPs, eligible residents in Clinical + Payment facilities did not experience reductions in hospital-related utilization and expenditures further than what was achieved in NFI 1, and what was expected based on the baseline trend. In the Clinical + Payment group, the majority of ECCPs experienced statistically significant increases in some utilization and expenditure measures.**

In the Clinical + Payment facilities, there were some unfavorable, statistically significant increases in utilization and expenditures, consistent with a general pattern of increases. These results are from the model combining all Clinical + Payment facilities and represent the overall impact of the Initiative on this group. (See *Table ES-1*, first data column.)

The payment reform intervention was associated with unfavorable, statistically significant increases for several hospital-related measures in four ECCPs: ATOP2 (Nevada), MOQI (Missouri), NY-RAH (New York), and RAVEN (Pennsylvania). In contrast, AQAF (Alabama) showed one favorable, statistically significant reduction in utilization, although the overall direction of effects was mixed. Even though there were no statistically significant changes in OPTIMISTIC (Indiana), there was a general pattern of reductions in utilization and expenditures. (See *Table ES-1*, ECCP-specific data columns.)

Table ES-1. Clinical + Payment: Relative Initiative effect (percent change) on hospital-related utilization and expenditures, FY 2018

Measure	All ECCPs (all states)	AQAF (AL)	ATOP2 (NV)	MOQI (MO)	NY-RAH (NY)	OPTIMISTIC (IN)	RAVEN (PA)
Utilization per resident (probability of hospital-related utilization)							
Any hospitalization							
All-cause	−2.1	−15.4**	−5.4	17.6***	3.1	−0.2	3.4
Potentially avoidable	4.4	−6.3	27.9*	14.0	5.9	−3.4	25.5*
Six qualifying conditions	9.0	4.0	19.4	10.2	−8.2	9.7	87.0***
Any ED visit							
All-cause	7.4*	1.4	8.0	30.4**	13.2	−6.6	16.0*
Potentially avoidable	5.2	3.8	16.0	16.5	10.2	−1.9	13.3
Six qualifying conditions	−16.7	−20.1	−29.4	40.4	−31.7	−0.8	6.9
Any acute care transition							
All-cause	0.7	−6.5	−5.1	19.0***	6.8	−5.3	4.9
Potentially avoidable	3.9	−2.0	16.2	15.0	5.9	−2.9	19.8
Six qualifying conditions	−0.8	−8.0	−0.1	21.2	−13.7	0.5	52.7***
Expenditures per resident-year							
Total Medicare expenditures	5.3**	−2.2	−0.8	8.2**	10.2**	−5.3	8.5*
Hospitalization expenditures							
All-cause	7.6	1.6	−15.7	21.6**	6.2	−6.1	17.8
Potentially avoidable	14.6*	9.8	35.3*	−3.5	17.4	−12.1	36.3*
Six qualifying conditions	20.7*	19.5	35.0	−23.6	7.3	25.0	102.1***
ED visit expenditures							
All-cause	3.3	2.1	13.7	21.1	−5.9	−17.0	21.6
Potentially avoidable	6.3	21.0	21.9	13.4	1.3	−10.7	−5.6
Six qualifying conditions	−6.5	−3.5	44.1	26.1	−45.0	11.2	−8.2
Acute care transition expenditures							
All-cause	6.2	−1.7	−14.0	20.5**	5.7	−9.3	15.2*
Potentially avoidable	13.2*	10.1	36.9*	−1.5	17.0	−15.4	30.0
Six qualifying conditions	18.7*	19.3	27.6	−21.7	4.4	22.5	93.4***

ED = emergency department.

*/**/*** = Significantly different from zero based on a *p*-value cutoff of 0.1/0.05/0.01.

SOURCE: RTI analysis of Medicare claims data (RTI programs MS 110, MS 113, and MS 114).

NOTES: ATOP2 consists of a Clinical + Payment group in Nevada and Payment-Only group in Colorado.

For *utilization,* the relative Initiative effect is the absolute Initiative effect (percentage points) divided by the mean predicted probability of experiencing the event under the scenario that the intervention did not occur. For *expenditures,* the relative Initiative effect is the absolute Initiative effect (dollars) divided by the mean predicted expenditures, under the scenario that the intervention did not occur. All predictions are based on a difference-in-differences regression model with a national comparison group and adjusted for resident- and facility-level characteristics. *Acute care transitions* include hospitalizations, ED visits, or observation stays.

Total *expenditures* cover all categories of Medicare spending: hospital, physician, SNF, home health, DME, lab and other providers and suppliers, hospice, and Part D drugs.

■ indicates a statistically significant decrease. ■ indicates a statistically significant increase.

Overall, combining all ECCPs, eligible residents in Payment-Only facilities did not experience consistent reductions, nor any statistically significant changes. Among eligible residents in the Payment-Only facilities, there was wide variation in the Initiative effects across ECCPs.

There was no consistent pattern of favorable reductions for eligible residents in the Payment-Only group for FY 2018. Although there were no statistically significant changes, about half of the measures suggested favorable reductions in utilization, whereas the other half suggested unfavorable increases. These results are from the model combining all Payment-Only facilities and represent the overall impact of the Initiative on this group. (See *Table ES-2*, first data column.)

In the Payment-Only group, only ATOP2 (Colorado) and RAVEN had some favorable, statistically significant reductions in utilization and expenditures associated with the Initiative. Although ATOP2 also had one unfavorable increase in expenditures, there was a broader pattern of reductions in both ECCPs, albeit stronger in RAVEN. In contrast, MOQI, NY-RAH, and OPTIMISTIC had unfavorable increases in some utilization or expenditure measures. There were no statistically significant changes in AQAF, and the overall pattern of effects was mixed. (See *Table ES-2*, ECCP-specific data columns.)

Table ES-2. Payment-Only: Relative Initiative effect (percent change) on hospital-related utilization and expenditures, FY 2018

Measure	All ECCPs (all states)	AQAF (AL)	ATOP2 (CO)	MOQI (MO)	NY-RAH (NY)	OPTIMISTIC (IN)	RAVEN (PA)
Utilization per resident (probability of hospital-related utilization)							
Any hospitalization							
All-cause	−1.4	−1.1	6.8	0.7	−1.3	4.9	−9.4
Potentially avoidable	5.9	21.0	1.3	−1.7	18.4**	6.3	−10.2
Six qualifying conditions	−3.1	7.2	−19.5	−4.0	−1.1	0.3	−4.1
Any ED visit							
All-cause	−0.7	−3.6	−5.7	11.1	−4.7	12.0*	−14.6
Potentially avoidable	−2.6	−10.4	−8.4	8.7	−5.4	3.0	−3.2
Six qualifying conditions	1.0	−2.4	−37.9**	40.8*	7.6	−3.8	−6.4
Any acute care transition							
All-cause	−2.7	−7.7	−1.2	5.5	−2.5	4.7	−12.6**
Potentially avoidable	0.0	−2.2	−4.5	4.5	6.6	5.6	−14.4
Six qualifying conditions	−3.2	−2.3	−26.4	5.6	2.6	5.6	−10.5
Expenditures per resident-year							
Total Medicare expenditures	2.80	0.8	13.4**	5.5	8.2**	−2.1	−7.7
Hospitalization expenditures							
All-cause	3.7	5.1	−3.9	7.8	12.6*	0.6	−15.1
Potentially avoidable	1.9	18.4	−14.9	16.3	10.7	−4.2	−27.3**
Six qualifying conditions	−3.0	30.4	−25.0	3.2	5.5	−18.6	−22.0
ED visit expenditures							
All-cause	4.5	−3.1	−23.3	12.8	8.4	32.3**	−18.5
Potentially avoidable	5.5	0.4	−41.7***	11.9	6.3	40.9**	10.9
Six qualifying conditions	−0.2	−20.1	−51.4**	27.3	26.7	8.7	13.9
Acute care transition expenditures							
All-cause	2.9	6.1	−6.2	6.8	11.6*	−0.2	−15.0
Potentially avoidable	1.1	17.5	−19.5	14.3	9.1	−0.1	−28.0**
Six qualifying conditions	−3.7	30.0	−29.7	1.7	5.4	−18.3	−22.7

ED = emergency department.

*/**/*** = Significantly different from zero based on a *p*-value cutoff of 0.1/0.05/0.01.

SOURCE: RTI analysis of Medicare claims data (RTI programs MS 110, MS 113, and MS 114).

NOTES: ATOP2 consists of a Clinical + Payment group in Nevada and Payment-Only group in Colorado.

For *utilization,* the relative Initiative effect is the absolute Initiative effect (percentage points) divided by the mean predicted probability of experiencing the event under the scenario that the intervention did not occur. For *expenditures,* the relative Initiative effect is the absolute Initiative effect (dollars) divided by the mean predicted expenditures, under the scenario that the intervention did not occur. All predictions are based on a difference-in-differences regression model with a national comparison group and adjusted for resident- and facility-level characteristics. *Acute care transitions* include hospitalizations, ED visits, or observation stays.

Total *expenditures* cover all categories of Medicare spending: hospital, physician, SNF, home health, DME, lab and other providers and suppliers, hospice, and Part D drugs.

▮ indicates a statistically significant decrease.   ▮ indicates a statistically significant increase.

There were mixed Initiative effects on Minimum Data Set (MDS)-based quality measures.

Our analysis of FY 2018 data showed mixed results regarding the Initiative impact on select MDS-based quality measures (falls with injury, self-reported moderate to severe pain, pressure ulcers, urinary tract infection [UTI], catheter inserted and left in bladder, decline in activities of daily living [ADL], and antipsychotic medication use). In models combining all ECCPs and by ECCP, for Clinical + Payment and Payment-Only facilities, we found some favorable and unfavorable statistically significant effects on quality measures. However, the effect pattern is not consistent or strong enough to draw conclusions. (See *Section 5* for details.)

ES.5   Discussion

As stated in Annual Report 2 and throughout NFI 1, any new implementation model or payment system incentive will take some time to become adopted and yield changes in outcomes. The lack of favorable findings from Initiative Year 2 may be the result of these slow adoption patterns, particularly as two ECCPs were in the process of revising their models during this time period. Nursing facilities and practitioners generally indicated strong support for the Initiative, but some expressed that NFI 2 did not incentivize substantial change in facility culture or practice. Many interviewees reported that they were simply getting paid for efforts already in place. And although practitioners may have supported overarching goals of NFI 2, in practice they struggled to certify conditions in time or faced other challenges with billing.

The evaluation team also uncovered a notable shift in the eligible long-stay nursing facility population, which has declined substantially from 2014 to 2018. The Initiative is limited to traditional FFS long-stay Medicare-Medicaid residents, but with increasing managed care penetration, this population has decreased over time, leading to a smaller pool of eligible residents in participating facilities. Interviewees shared that the decrease in eligible residents reduces the motivation for facilities to submit Initiative claims and benefit monetarily.

"Cherry picking" relatively healthier residents by managed care plans is also possible, leading to potential underestimation of the favorable effect of the Initiative. This "cherry picking" could potentially affect the case mix of Initiative participants, and therefore, the impact analysis. The lower acuity of patients who tend to enroll in managed care, relative to Initiative participants, may not be fully captured in our multivariate models because severity within a medical condition is not always captured

by diagnosis codes. If this selection happens to a larger extent in the intervention group than in the national comparison group, the Initiative impact may be underestimated.

Competing priorities also seem to be a common barrier to NFI 2 implementation, creating both diffusion of effort and confusion for staff. Many facility leaders noted the presence of additional programs in their facilities, ranging from managed care plans to corporate initiatives (e.g., antipsychotic medication reduction or fall prevention efforts). Many of these programs target a subset of residents, placing an additional burden on facility staff and practitioners to identify which residents participate in which programs (i.e., NFI 2, various managed care plans, corporate or facility efforts).

1. Overview

Section 1 highlights how NFI 2 expanded the interventions from NFI 1 and provides an overview of the approach and methods used in this phase of the Initiative.

In October 2016, CMS began implementing the second phase of the Initiative to Reduce Avoidable Hospitalizations among Nursing Facility Residents—herein referred to as NFI 2, or the Initiative. The primary goal of the Initiative is to reduce hospitalization rates among long-stay nursing facility residents.

From 2012 to 2016, CMS implemented NFI 1 activities, a series of facility-level clinical and educational interventions intended to improve detection, documentation, and communication of changes in residents' conditions. NFI 1 was also designed to improve processes for hospital transitions, medication review, and quality assurance.

Seven Enhanced Care and Coordination Provider organizations (ECCPs) individually designed and implemented specific state-based models grounded in the overarching clinical and educational intervention components set forth by CMS for NFI 1. Each ECCP is an independent organization that works with its partnering nursing facilities to implement the Initiative.

NFI 2 ECCPs*

AQAF	ATOP2	MOQI	NY-RAH	OPTIMISTIC	RAVEN
N=45	N=38	N=40	N=61	N=44	N=35
Alabama Quality Assurance Foundation: Nursing Facility Initiative (AL)	**HealthInsight of Nevada:** Admissions and Transitions Optimization Program (NV & CO)	**The Curators of the University of Missouri:** Sinclair School of Nursing Missouri Quality Initiative for Nursing Homes (MO)	**The Greater New York Hospital Foundation:** New York Reducing Avoidable Hospitalizations (NY)	**Indiana University:** Optimizing Patient Transfers, Impacting Medical Quality, and Improving Symptoms: Transforming Institutional Care (IN)	**University of Pittsburgh Medical Center Community Provider Services:** Reduce Avoidable Hospitalizations using Evidence-based Interventions for Nursing Facilities (PA)

* N = number of participating nursing facilities at the start of NFI 2.

NFI 2 expands on the NFI 1 interventions with six of the original seven[2] ECCPs, adding a new Initiative-wide payment model and a second cohort of participating nursing facilities. The NFI 2 payment model offers facilities the opportunity to submit claims with Medicare billing codes as a financial incentive to nursing facilities and practitioners for providing care to eligible Medicare FFS higher acuity, long-stay residents in house, rather than transferring these residents to hospitals for treatment. Participating nursing facilities and practitioners are eligible for the incentive.

SIX QUALIFYING CONDITIONS FOR NFI 2

- Pneumonia
- Congestive heart failure (CHF)
- Skin infection
- Urinary tract infection (UTI)
- Fluid/electrolyte disorder or Dehydration
- Chronic obstructive pulmonary disease (COPD)/Asthma
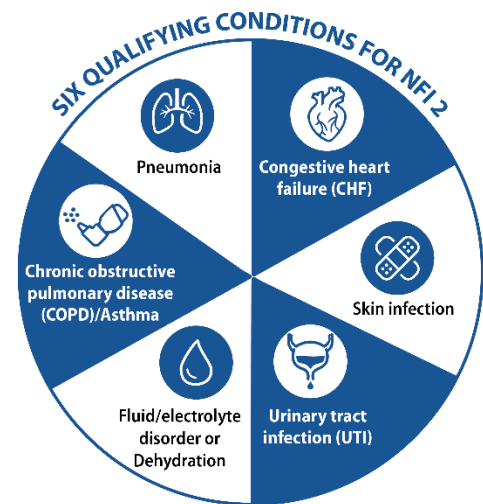
To receive a financial incentive, facility staff and practitioners assess, diagnose, and treat residents who may have any of six qualifying conditions that account for a large

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[2] CHI/Alegent Creighton Health in Nebraska participated in NFI 1 but not in NFI 2. Because of the limited number of facilities in Nevada, HealthInsight recruited Payment-Only facilities for NFI 2 from Colorado.

proportion of potentially avoidable hospitalizations. Participating facilities can then bill about $218 per patient per day under a Medicare Part B code created for the Initiative. Facilities receive extra per diem payments for a period of in-house treatment, and practitioners receive a hospital-level visit payment when evaluating patients for in-house treatment for the qualifying conditions. See *Figure 1-1* for a conceptual model of NFI 2.

Figure 1-1.   NFI 2 payment model
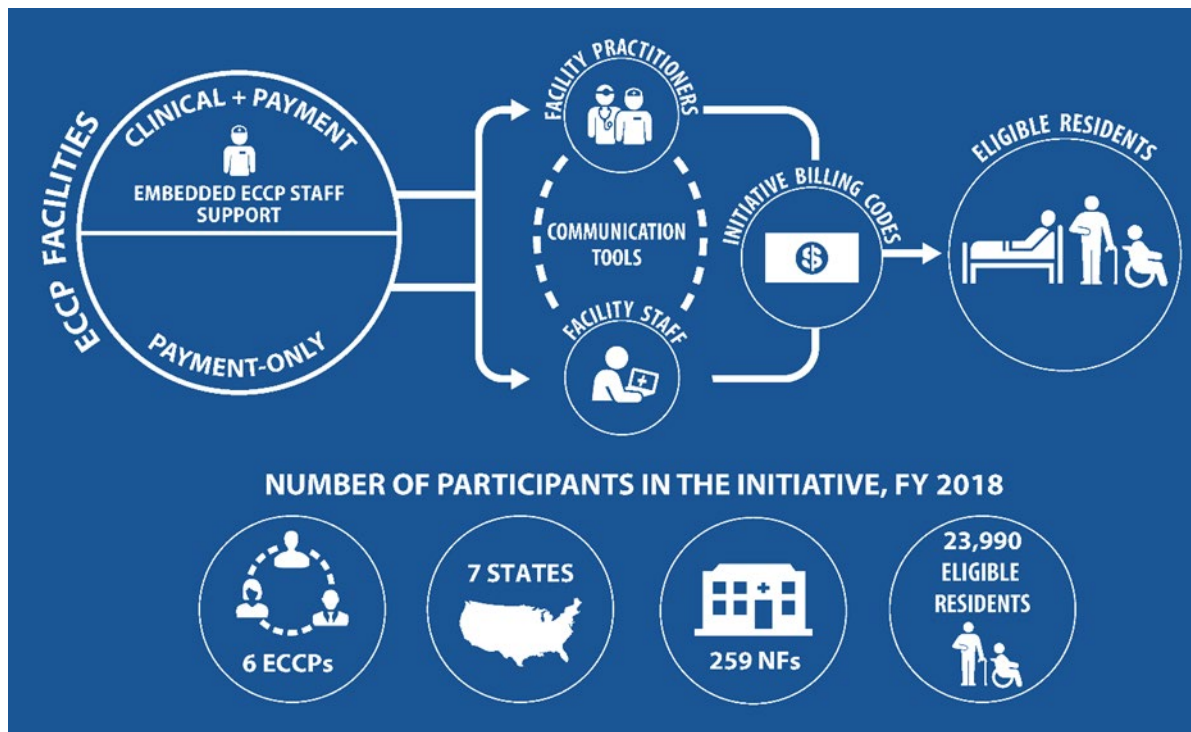
NOTE: Clinical + Payment models vary across ECCPs, including variation in the type of support facilities receive from the ECCP. Three ECCPs embedded full-time clinical staff in facilities, two ECCPs rotated clinical staff across multiple facilities, and one ECCP embedded quality improvement specialists in facilities.

Participating facilities (*Table 1-1*) that continued from NFI 1, referred to as the *Clinical + Payment* group,[3] are implementing both the clinical and educational interventions from NFI 1, plus the new NFI 2 payment model related to the six qualifying conditions.

The cohort of facilities new to the Initiative in NFI 2, referred to as the *Payment-Only* group, is implementing only the NFI 2 payment model related to the six qualifying conditions.

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[3] Clinical + Payment models vary across ECCPs, including variation in the type of support facilities receive from the ECCP. Three ECCPs embedded full-time clinical staff in facilities, two ECCPs rotated clinical staff across multiple facilities, and one ECCP embedded quality improvement specialists in facilities.

Table 1-1. Comparison of participating facilities[4]

Clinical + Payment Group	Payment-Only Group
A subset of incumbent nursing facilities from NFI 1 that are adding the NFI 2 payment model	Newly recruited nursing facilities participating in NFI 2 payment model only
Participated in NFI 1	Did not participate in NFI 1
Continuing ECCP clinical and educational NFI 1 interventions	No ECCP clinical or educational NFI 1 interventions
ECCPs provide training to facility staff on the six qualifying conditions, new billing codes, and data collection activities on an ongoing basis	ECCPs support facilities on billing and data collection activities on an as-needed basis

NFI 1 = Nursing Facility Initiative 1; NFI 2 = Nursing Facility Initiative 2.

1.1 Overview of Evaluation Methods

CMS contracts with RTI to evaluate the Initiative using both primary and secondary quantitative data analyses. In this report, RTI assesses the effectiveness of the NFI 2 payment model as of Initiative Year 2, FY 2018 (October 1, 2017 through September 30, 2018), addressing the following research questions:

- How was the Initiative implemented, and how do participating ECCP leadership and facility staff perceive Initiative effectiveness?

- What is the Initiative payment incentive effect on Medicare utilization and expenditures, particularly for hospital-related services, for the Clinical + Payment group and the Payment-Only group?

- How does the Initiative effect on Medicare utilization and expenditures vary by ECCP and type of intervention?

- How does the Initiative affect quality of care outcomes for participating residents?

The evaluation uses a mixed-methods approach to provide a more holistic understanding of NFI 2. Each component of the secondary quantitative analyses and primary data collection and analyses (i.e., site visits, telephone interviews, stakeholder interviews, and surveys) complements the other data sources as shown in *Figure 1-2*.

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[4] At the start of NFI 2 there were 263 participating facilities: 115 Clinical + Payment and 148 Payment-Only. Because of the intent-to treat design of the DD analysis (see more information in *Appendix K*), the total number of facilities varies over time by data analysis type. The DD model includes 259 facilities: 111 Clinical + Payment and 148 Payment-Only. The primary data collection analyses include 248 facilities—108 Clinical + Payment and 140 Payment-Only—slightly less than the DD analyses because of facility attrition since the start of NFI 2.

Figure 1-2.   Mixed-methods approach

- Measures Initiative effects on key outcomes (utilization, expenditures, quality)

SECONDARY DATA

Analysis of Medicare claims and MDS data

SITE VISIT & PHONE INTERVIEW

Analysis of interview data from ECCP and facility staff and practitioners

- Documents Initiative implementation, successes, challenges
- Provides context for secondary data

Analysis of facility administrator and practitioner survey data

Analysis of interview data from key outside experts in ECCP states

STAKEHOLDER INTERVIEWS

SURVEY

- Quantifies the stories heard in the field
- Obtains feedback from practitioners

- Describes state policy environments
- Provides context for site visit/phone interview

Primary Data Collection and Analysis

The primary data provide information on Initiative operations and give critical context to the findings from quantitative data analyses. In this report, primary data were collected for Initiative Year 2[5] via the following activities:

- Site visits to each ECCP headquarters and a selection of participating Clinical + Payment facilities
- Telephone interviews with participating facilities from both the Clinical + Payment and Payment-Only groups
- Web survey of all participating nursing facility administrators (NFAs)
- Web survey of all participating practitioners (physicians, nurse practitioners, and physician assistants)
- Telephone interviews of key stakeholders across ECCP states
- Review of Sharing Collaborative activities and materials provided by ECCPs

Detailed descriptions of all primary data activities, including methods and findings, can be found in ***Appendices A–I***.

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[5] Primary data reported herein were collected between March 1, 2018, and March 1, 2019, although all data collection focused on respondents' experiences during only Initiative Year 2 (October 1, 2017, through September 30, 2018).

Quantitative Analyses

In this report, RTI uses a wide range of secondary data sources (see **Section 3**)—such as Medicare claims and eligibility files and MDS assessments—to evaluate NFI 2 effects on utilization, expenditures, and quality of care outcomes for eligible long-stay nursing facility residents in Initiative-participating facilities.

To determine the Initiative effects, RTI compares residents eligible for the Initiative to a non-Initiative population of nursing facility residents who would meet the Initiative eligibility criteria. RTI uses a DD multivariate regression model, with separate analyses by ECCP and by intervention group (i.e., Clinical + Payment or Payment-Only), as well as pooled analyses combining ECCPs for each intervention group.

Analyses control for relevant resident-level data (e.g., demographics and health profiles) and facility characteristics. A brief description of the evaluation methodology for Initiative Year 2 can be found in **Section 3** of this report and additional details about the quantitative data analyses can be found in **Appendices J–Q**.

1.2   Report Structure

The remainder of the report is organized as follows. **Section 2** presents findings related to how NFI 2 was implemented and how its effectiveness was perceived by ECCP leadership and facility staff. We highlight primary data findings related to the second Initiative year and FY 2018 billing data for both facilities and practitioners. **Section 3** includes a brief description of the evaluation methodology for Initiative Year 2 and provides an explanation of the comparison group selection and statistical modeling approach. Quantitative data findings regarding NFI 2 effects on utilization and expenditures are presented in **Section 4**, with effects on MDS-based quality measures highlighted in **Section 5**. **Section 6** analyzes nursing facility characteristics and billing data, and **Section 7** examines managed care penetration among the overall long-stay population. **Section 8** discusses overall findings for Initiative Year 2.

2. Implementation
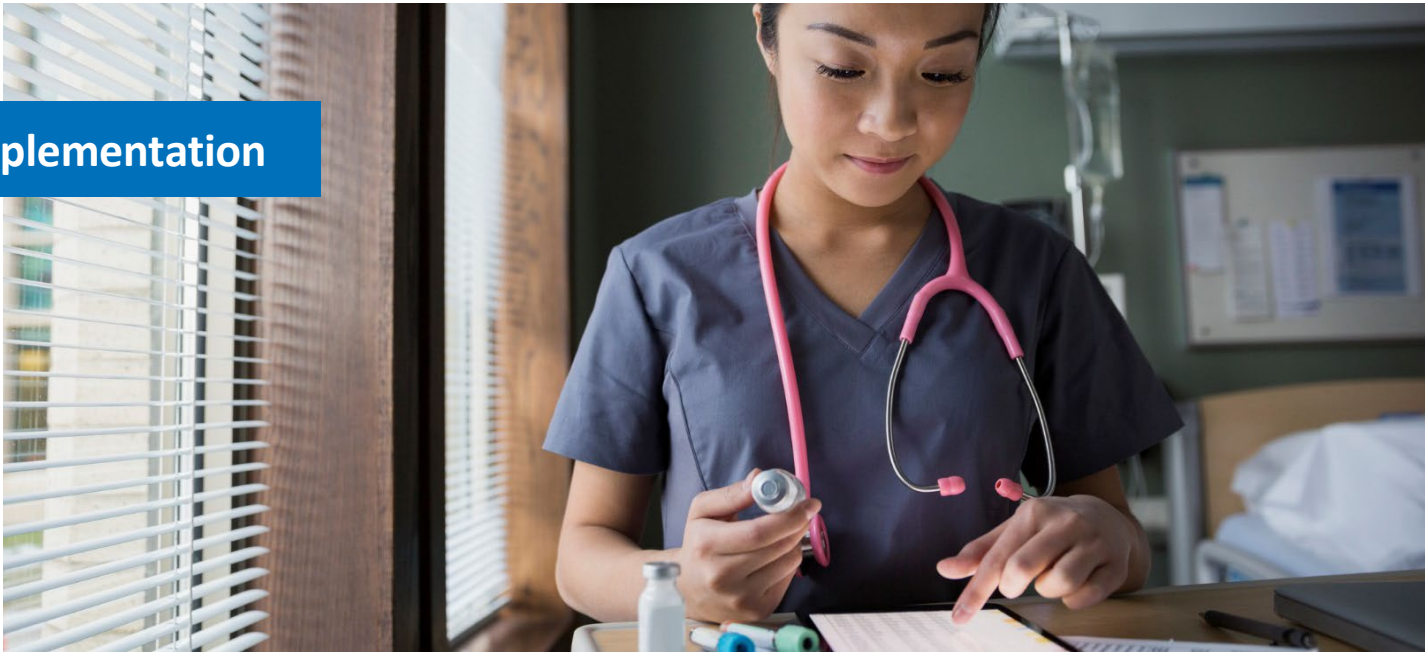
Section 2 highlights overarching findings from telephone interviews, site visits, and surveys, and findings specific to NFI 2 facility and practitioner billing.

Between April and June 2018, RTI conducted telephone interviews with select Clinical + Payment and Payment-Only partner facilities (N = 130) across each of the six NFI 2 ECCPs. Between June and November 2018, RTI also conducted site visits with leadership from all six ECCPs and select Clinical + Payment partner facilities from across all ECCPs (N = 24). Primary facility telephone interview and site visit topics included NFI 2 implementation, application of six conditions eligible for NFI 2 payment, and experiences submitting NFI 2 claims and receiving payment. Separate interviews with key stakeholders (N = 27) explored the overall policy landscape and potential impact on NFI 2.

Detailed findings from all telephone interviews and site visits can be found in **Appendices B–G**. Key stakeholder findings are described in **Appendix H**. This section also reflects key findings from the web surveys of participating NFAs (response rate = 89 percent) and practitioners (response rate = 44 percent). RTI collected data between

January and April 2019, with a lookback period for respondents of calendar year 2018.[6] Please see *Appendix I* for full findings from these two surveys. Facility and practitioner billing data reflect findings from claims submissions during FY 2018. More information about billing data can be found in *Appendix J*. Collectively, all findings from these telephone interviews, site visits, surveys, and billing data provide context for the quantitative results (*Section 4*) pertaining to hospital-related utilization and expenditures.

2.1   Initiative Implementation and ECCP Support of Partner Facilities

Clinical + Payment facility staff continue to rely heavily on ECCP nurses for Initiative activities.

In ECCPs where models shifted, modifying the role of the ECCP nurses, site visit and telephone interviewees report a decline in perceived ECCP support for facilities. Despite these interview findings, surveyed NFAs reported receiving sufficient ECCP support for the Initiative.

As in Initiative Year 1, Clinical + Payment facilities are largely supported by their on-site ECCP nurse, whereas Payment-Only facilities receive support from ECCP leadership. Embedded ECCP nurses in the four original clinical care model ECCPs (ATOP2, MOQI, OPTIMISTIC, RAVEN) continue to provide education and training to facility staff with the full lifecycle of NFI 2 activities, from identifying and treating changes in condition to documenting and often certifying these changes in condition for billing.

Both ECCPs that began NFI 2 with education-only models (AQAF, NY-RAH) have revised their models, with AQAF moving to a clinical care model in response to a

68.8%

of surveyed Clinical + Payment NFAs reported that their ECCP nurse **often or always confirmed a diagnosis** for facility billing.

CMS Programmatic Assistance Letter (PAL) and NY-RAH changing the role of its nurses to focus on quality improvement. Because of these model changes and resulting uncertainty, interviewed Clinical + Payment facility staff in these two ECCPs perceived a decrease in ECCP support in 2018.

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[6] This section reflects key findings from Wave 2 of the NFA and Practitioner surveys. Wave 1 data, collected in early 2018, were presented in the Initiative's Second Annual Report. Survey data from the two waves will be compared in future Initiative reports.

"The [ECCP Nurse] has a few different roles now, but I don't know all of them. I think [AQAF] is changing some of what [ECCP Nurse] does?"

— Interviewed NFA, AQAF

Although these AQAF and NY-RAH model changes only transformed practices in Clinical + Payment facilities, some Payment-Only interviewees from these two ECCPs said that the model change diverted attention toward Clinical + Payment facilities, in turn weakening support for Payment-Only facilities. In contrast, Payment-Only facility staff in ECCPs with consistent models reported receiving sufficient support from ECCPs via trainings, webinars, and, in some ECCPs, specialized staff who visit Payment-Only facilities to address any concerns or questions.

Survey data also indicate some variation in support for facilities across ECCPs. However, overall, survey data show that a majority of both Clinical + Payment NFAs (**86.8 percent**) and Payment-Only NFAs (**94.4 percent**) believed they had received sufficient support to use the NFI 2 billing codes. Notably, surveyed Payment-Only NFAs reported that they received sufficient support more often than their Clinical + Payment counterparts across all support types but one (quality control and review prior to billing) (***Figure 2-1***). Because interviews include many types of facility staff, not just NFAs, it is possible that non-leadership facility staff may sometimes perceive lower ECCP support than NFAs, helping to explain minor differences between interview and survey findings.

Figure 2-1.   Percent of respondents receiving sufficient ECCP support
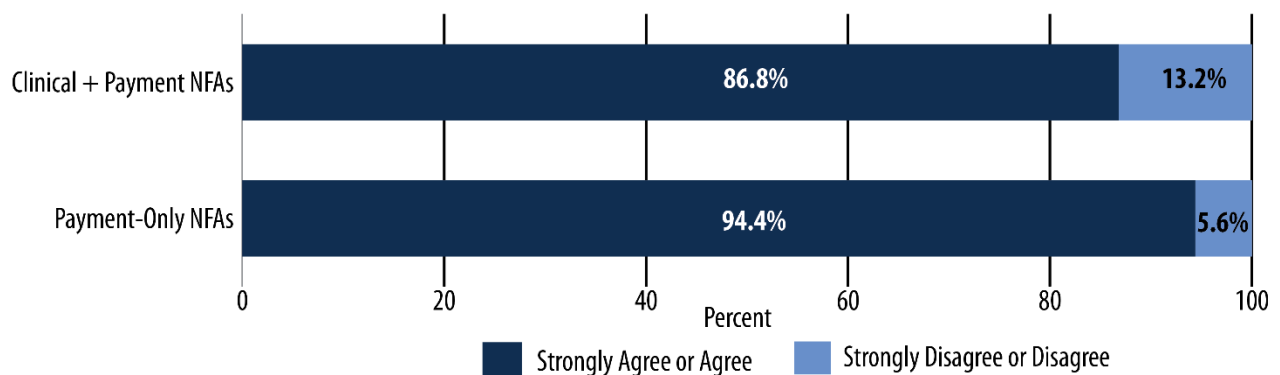
SOURCE: RTI analysis of Nursing Facility Administrator Survey (RTI program JW07).

Responses to ECCP trainings, or Learning Community activities, varied. Some interviewees valued Learning Community activities and the venue they provided for sharing best practices across facilities. Others reported that the trainings were unhelpful and unnecessary, given individualized support from their ECCP nurses in Clinical + Payment facilities or Payment-Only ECCP liaison staff. In response to dwindling

attendance, some ECCPs are attempting to enhance their training offerings to meet the needs and schedules of facility staff. RTI will ask about the results of these enhancements in the next round of primary data collection.

2.2 Six Qualifying Conditions and Accompanying Documentation

Most facility staff and practitioners agreed with six qualifying conditions and their clinical criteria definitions.

Some facilities added or enhanced existing tools to support effective documentation and communication of changes in condition.

In Initiative Year 1, most interviewed facility staff and practitioners agreed that the six qualifying conditions for NFI 2 were most likely associated with avoidable hospitalizations. Most of these interviewees also agreed that the clinical criteria for the six qualifying conditions were appropriate. However, a few interviewees voiced concern that if staff waited until a resident reached the acuity level dictated in the NFI 2 clinical criteria, the resident would be too sick to treat in house and would have to be sent to the hospital.

This year, interviewees still mentioned these concerns, but less often, and in at least two ECCPs, they also reported that

96.6% of surveyed practitioners strongly agreed or agreed that the **clinical criteria are appropriate**.

practitioners believed the clinical criteria did not match their clinical judgment. For example, in some cases the clinical criteria would qualify a resident's condition as pneumonia, but the practitioner would disagree with this qualification and refuse to certify the change in condition for billing. However, this feedback was isolated.

Many facility interviewees reported that the six conditions have become a priority facility-wide, not just among long-stay residents. This application of NFI 2 conditions facility-wide seemed particularly prevalent in facilities with few NFI 2-eligible residents (e.g., because of rapid growth of managed care; see **Section 7** for more discussion).

Among those conditions billed for NFI 2, dehydration remains the least submitted diagnosis because it is considered an adverse event, and, historically, state surveyors review any resident's records known to have a dehydration diagnosis. Pneumonia and urinary tract infection (UTI) were the most frequently used billing codes. These findings are echoed by the claims data, where facilities billed for providing acute care for

pneumonia and UTI at the highest rate among the six qualifying conditions and for dehydration at the lowest rate (***Figures 2-2*** and ***2-3***).

Figure 2-2.   Clinical + Payment: Use of nursing facility billing codes by condition
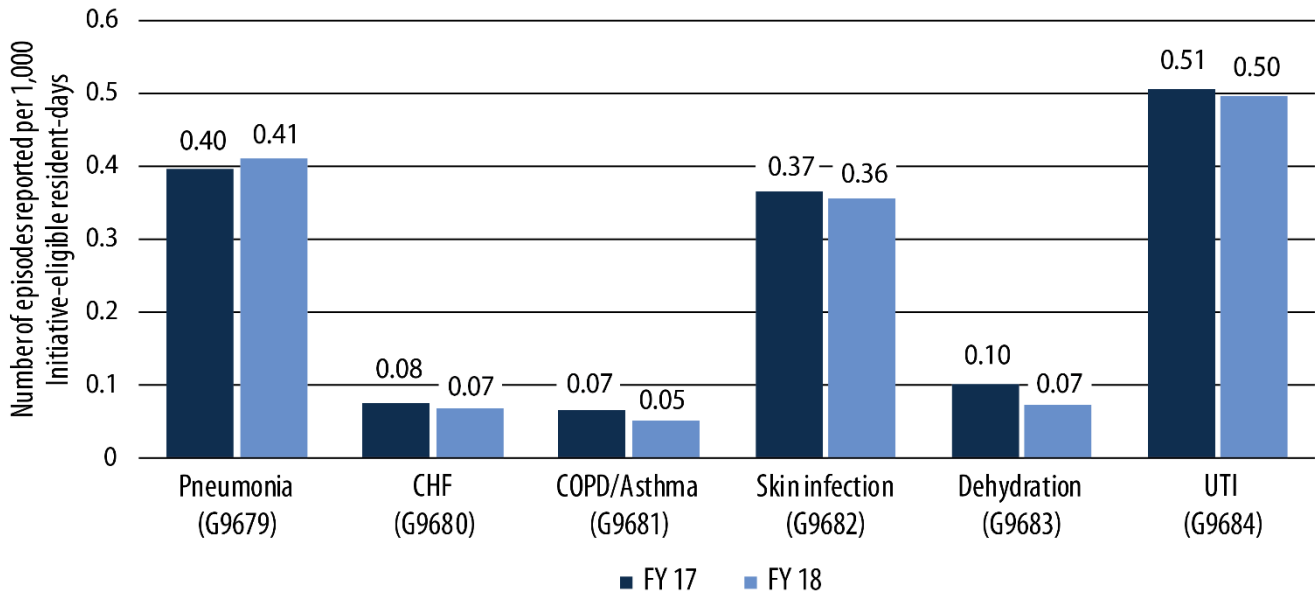
CHF = congestive heart failure; COPD = chronic obstructive pulmonary disease; UTI = urinary tract infection.

SOURCE: RTI program MS 08, csaur\output\pah2_ar2_nbc_1, MS NBC 08, csaur\output\pah2_ar3_nbc_2.

Figure 2-3.   Payment-Only: Use of nursing facility billing codes by condition
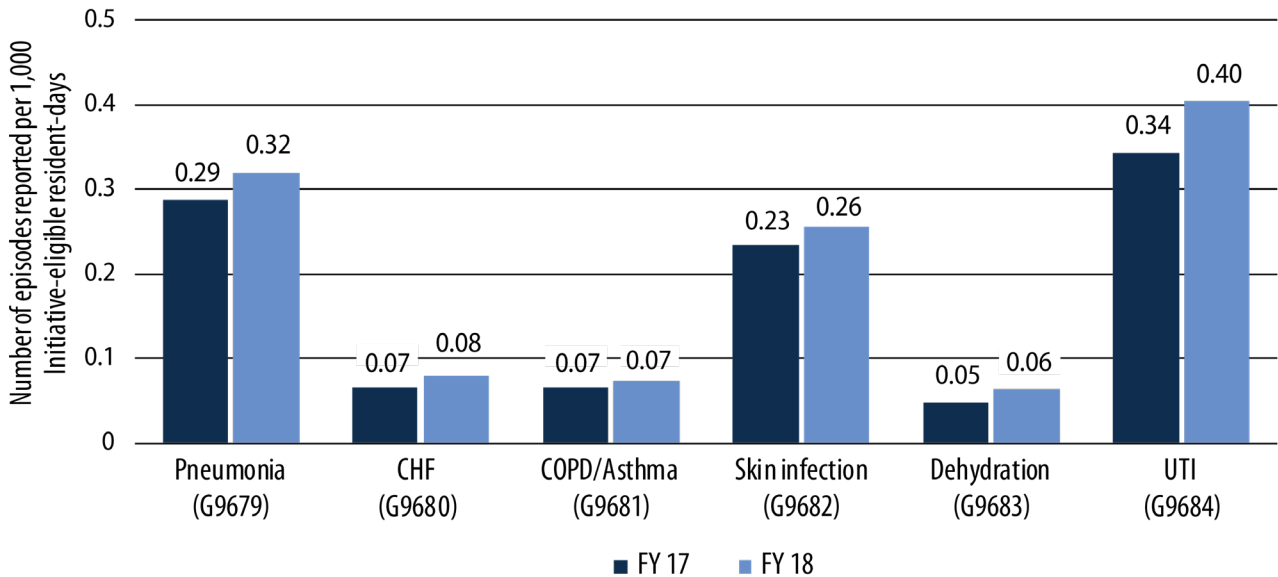
CHF = congestive heart failure; COPD = chronic obstructive pulmonary disease; UTI = urinary tract infection.

SOURCE: RTI program MS 08, csaur\output\pah2_ar2_nbc_1, MS NBC 08, csaur\output\pah2_ar3_nbc_2.

As in Initiative Year 1, almost all facilities in Year 2, regardless of facility type, used Interventions to Reduce Acute Care Transfers (INTERACT) tools to support documentation and communication of changes in condition. This year, interview findings suggest that more facilities are integrating these tools into their electronic medical records (EMRs) to facilitate their use. Some ECCPs also have experimented with shortening or adapting INTERACT tools to meet facility needs or to include the specific clinical criteria definitions for NFI 2 conditions.

"As far as understanding expectations, that's probably what's changed most for us [in 2018]. We understand more what the expectations are. I think that people are capturing more because supporting documents are better. I think that interventions are being done more timely."

— Interviewed MDS Nurse, ATOP 2

In addition to INTERACT enhancements, some ECCPs have created and implemented self-audit tools to help staff evaluate their NFI 2 documentation and ensure that all necessary information is present for billing. Survey data show that **84.7 percent** of facilities reported adding documentation aids to facilitate Initiative implementation.

According to interviewees, these enhancements and additions appear to improve documentation, thereby reportedly improving facility care.

2.3 Facility Staff and Practitioner Participation and Buy-In

A majority of facility staff and practitioners agreed with the goals of NFI 2.

In many cases, high turnover resulted in floor staff having limited to no direct involvement with NFI 2 activities.

Practitioner buy-in to the Initiative remains variable. ECCPs are making efforts to improve practitioner engagement.

Facility Staff Buy-In

Interviewed and surveyed staff were very supportive of NFI 2 and its goals: **84.3 percent** of surveyed NFAs reported that it was extremely important to treat residents on site whenever possible. Although both interviewed and surveyed staff were very supportive of NFI 2 goals, interview findings show that across ECCPs and facility types, facility floor staff had little to no direct involvement with the new payment component of NFI 2.

In Clinical + Payment facilities, where ECCP nurses generally completed most Initiative

54.9% of surveyed NFAs reported that **staff turnover** was a challenge to the Initiative.

activities, staff discussed residual NFI 1 interventions and their ongoing relationships with their ECCP nurses, rather than describing NFI 2 payment components. Staff in Payment-Only facilities described very general awareness of NFI 2, the six conditions, and increased payments that could be coming to the facility but largely deferred to facility leadership on questions of Initiative implementation.

Interviewees attributed this disconnect between floor staff and the Initiative to high rates of staff turnover. As in the previous Initiative year, interviewees from facilities with high turnover reported difficulties with sustaining Initiative tool use, training staff on the six qualifying conditions, and reinforcing overall nursing skills—all of which were said to have an adverse effect on staff buy-in to the Initiative.

"We've had a high turnover rate in our staff, so I think as a center we identified that it'd be a whole lot easier if the managers picked [NFI 2] up... staff were focused on their daily stuff. It's like 'You guys are handling that thing [NFI 2].'"

– Interviewed NFA, RAVEN

Because of limited floor-staff engagement with NFI 2, facility interviewees said sustaining the Initiative was difficult when there was facility leadership turnover. Interview findings suggest that Initiative activities taper off or even come to a halt when those key staff are absent from the facility. Facility leadership staff turnover was reported as a challenge by **30.7 percent** of surveyed NFAs.

Practitioner Buy-In

Most interviewed and surveyed practitioners agreed with the goals of NFI 2, with **92.9 percent** of surveyed practitioners sharing that treating residents on site was very or extremely important to them. This finding was limited to practitioners who responded to a web survey, whereas interviews among facility staff, leadership, and practitioners indicate that practitioner participation in NFI 2 was highly variable.

Some practitioners were very involved in the certifying and billing process, changing their practice patterns to be more available to certify conditions in shorter time windows or pushing facility staff to document all changes in condition properly so that both the facility and the practitioner could bill.

Other practitioners were less involved in the Initiative because they found its requirements for certification and billing to be too burdensome. About half of surveyed practitioners reported that it was challenging to confirm a diagnosis within the required time window and complete all necessary documentation (**53.5** and **51.3 percent**, respectively).

"I think the biggest outcome was getting physicians engaged more and in the facility more.... I think one lady pulled through so many times simply because of those enhanced set of doctors' eyes on her."

– Interviewed MDS Nurse, OPTIMISTIC

Many ECCPs have recognized the difficulties in engaging practitioners in the Initiative. Among surveyed NFAs, the most frequently reported *major* challenge was practitioner buy-in (**11.2 percent**). As such, some ECCPs are focusing their attention on increasing practitioner engagement by empowering their ECCP nurses in Clinical + Payment facilities to provide more training and support to certified practitioners. Some ECCPs are also hiring a designated ECCP leadership staff member to focus on increasing practitioner participation across all participating facilities.

2.4   Facility and Practitioner NFI 2 Billing

Most facilities were able to bill under the Initiative. Between 2017 and 2018, Clinical + Payment facilities showed only minimal billing changes, while billing increased in Payment-Only facilities during this same period. However, many facilities—especially facilities with corporate owners—were unaware of the volume of claims submitted or reimbursements received.

Practitioner billing was variable. Practitioner employment status, practice billing systems, and NFI 2 certification and documentation requirements affected practitioner billing. Between 2017 and 2018 practitioner billing decreased in Clinical + Payment facilities, while increasing in Payment-Only facilities.

Facility Billing

A majority of interviewed and surveyed facility staff reported that their facilities had billed for a qualifying resident change in condition. A slightly higher percentage of surveyed NFAs in Clinical + Payment facilities (**89.1 percent**) reported using NFI 2 billing codes, compared to those in Payment-Only facilities (**85.6 percent**).

Consistent with self-reporting, claims data analysis also showed that there is a higher rate of billing for acute treatment of any of the six qualifying conditions in Clinical + Payment facilities compared to Payment-Only facilities (***Figures 2-4*** and ***2-5***). Our claims analysis also showed minimal change in the rate of billing in Clinical + Payment facilities between 2017 and 2018. In both years, MOQI facilities billed at the highest rates, and AQAF and NY-RAH facilities—which at least initially deployed education-only interventions as opposed to hands-on clinical interventions—billed at the lowest rates.

Figure 2-4. **Clinical + Payment: Use of nursing facility billing codes for any of the six qualifying conditions**
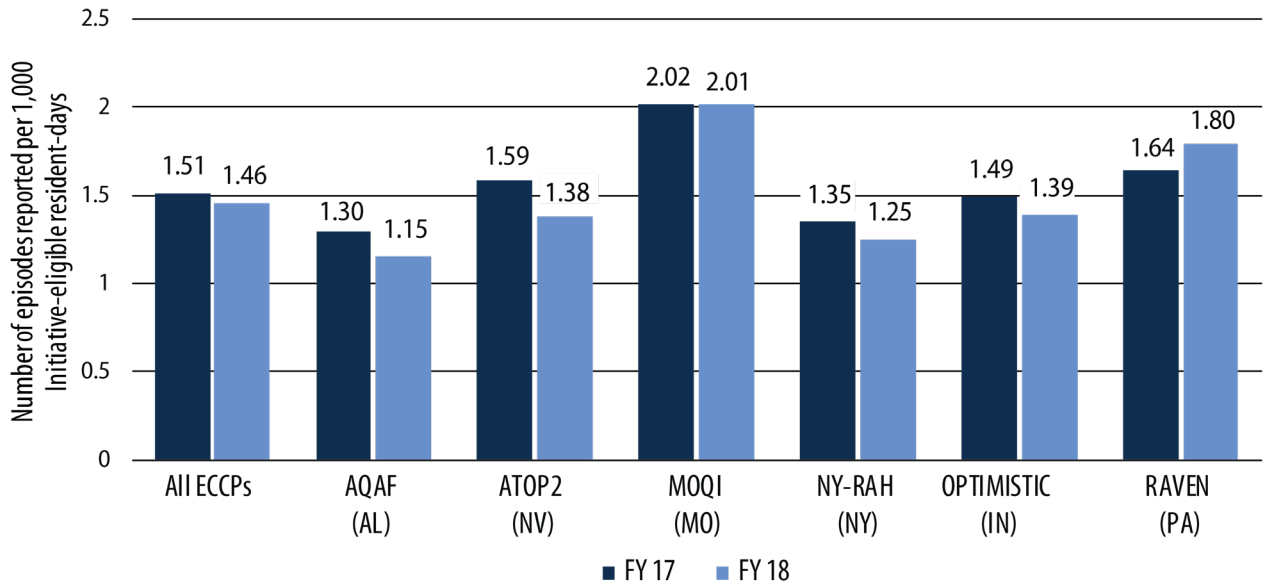
SOURCE: RTI program MS 08, csaur\output\pah2_ar2_nbc_1, MS NBC 08, csaur\output\pah2_ar3_nbc_2.

In Payment-Only facilities, billing was higher on average across ECCPs in 2018 compared to 2017. However, rates declined in some ECCPs and increased in others, with a particularly striking increase in RAVEN. Notably, RAVEN provided a liaison to Payment-Only facilities to support NFI 2 engagement and billing.

Although a majority of facilities had used the billing codes, interviewed and surveyed NFAs still identified areas for improvement, especially because of the volume of perceived missed billing opportunities.

A majority of surveyed NFAs (**64.7 percent**) reported that their facility sometimes, often, or always missed billing opportunities. Among facilities that missed billing opportunities, the main reasons were (1) practitioners not confirming the diagnosis within the required time window (**71.3 percent**) and (2) documentation of the change in condition being incomplete (**70.8 percent**). When asked about ways to increase facility billing under the Initiative (up to three potential changes), surveyed NFAs suggested changes to address these challenges (increasing the confirmation time window and reducing documentation requirements), along with improvements in communication with facility staff (*Figure 2-6*).

Figure 2-5. Payment-Only: Use of nursing facility billing codes for any of the six qualifying conditions

Chart: Number of episodes reported per 1,000 Initiative-eligible resident-days (FY17 dark bars, FY 18 light bars)

Group	FY17	FY 18
All ECCPs	1.04	1.20
AQAF (AL)	0.97	0.71
ATOP2 (CO)	0.87	1.17
MOQI (MO)	0.96	0.68
NY-RAH (NY)	1.06	1.35
OPTIMISTIC (IN)	1.20	1.35
RAVEN (PA)	1.16	1.66
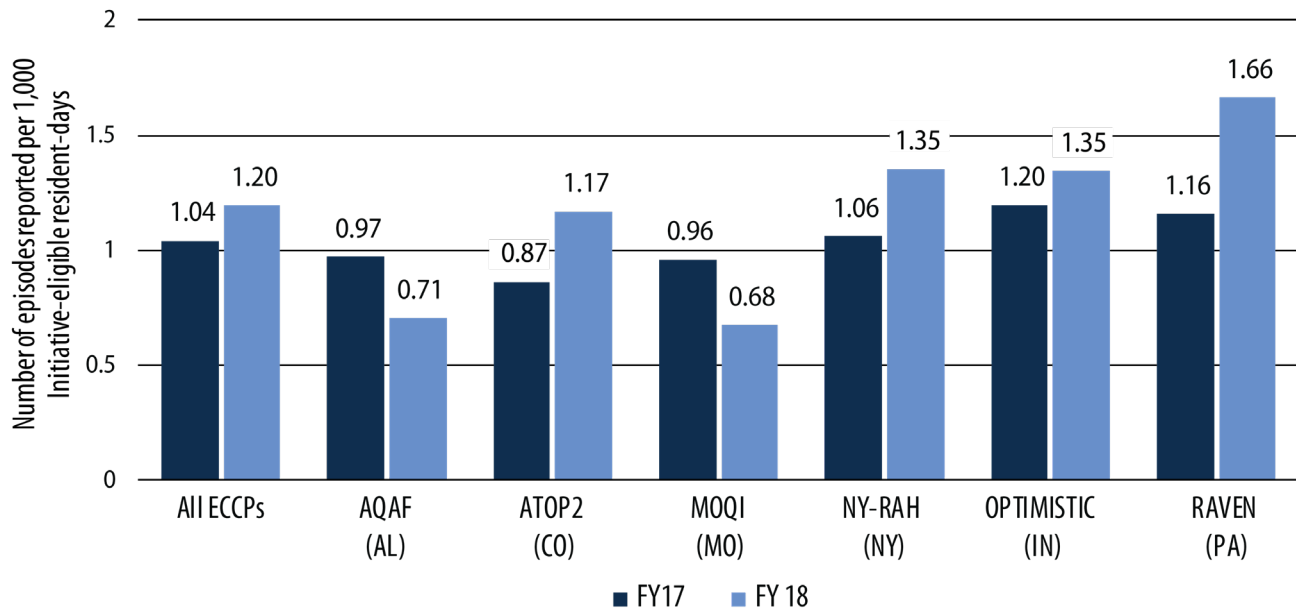
SOURCE: RTI program MS 08, csaur\output\pah2_ar2_nbc_1, MS NBC 08, csaur\output\pah2_ar3_nbc_2.

Figure 2-6. Top three changes suggested by NFAs to increase use of facility billing codes

⏱	**Give practitioners more time to confirm a qualifying diagnosis**
🗣	**Improve communication among nursing staff about a qualifying change in condition**
☑	**Reduce requirements for documentation of changes in condition**

SOURCE: RTI analysis of Nursing Facility Administrator Survey (RTI program JW07).

Interestingly, although most facility staff reported that their facilities had billed, many were unable to cite how many claims they had submitted or how much they were reimbursed. In corporate-owned Clinical + Payment and Payment-Only facilities, this lack of knowledge was attributed to corporate billing structures in which facilities submitted documentation to a corporate billing office, which in turn, submitted the claims to their Medicare Administrative Contractor (MAC) and received the reimbursements from Medicare. In those cases, facility staff and leadership had low awareness of the centralized billing processes and often saw none of the

reimbursement dollars. In facilities that were not corporate-owned, leadership staff were more aware of the volume of claims submitted and resulting reimbursement.

46.0% of NFAs reported that their corporate offices receive NFI 2 payments for their facilities

19.3% of these NFAs reported that their corporate offices did not transfer payment back to their facilities

As interviewed facility staff generally were unaware of the volume of reimbursements received, they also were unaware of any Medicare recoupment efforts. ECCP leadership shared that they expect reimbursements to be recouped from their facilities in coming project years, but facility staff in Year 2 were either unaware of these forthcoming efforts or had no concerns about potential recoupment.

Practitioner Billing

Practitioner billing varied across ECCPs and across facility types. However, survey data indicated that **69.7 percent** of practitioners had submitted an Initiative billing code at least once. Notably, this sample was limited to respondent practitioners with a valid e-mail address, so they may represent a more engaged sample.

According to claims data, with all states aggregated, practitioner billing frequency for treating the six qualifying conditions in FY 2017 was similar between Clinical + Payment and Payment-Only facilities. However, billing decreased in Clinical + Payment facilities in FY 2018 while increasing in Payment-Only facilities. Thus, in FY 2018, billing was much higher in Payment-Only facilities (***Figures 2-7*** and ***2-8***).

Figure 2-7. Clinical + Payment: Use of G9685 practitioner billing codes for any of the six qualifying conditions
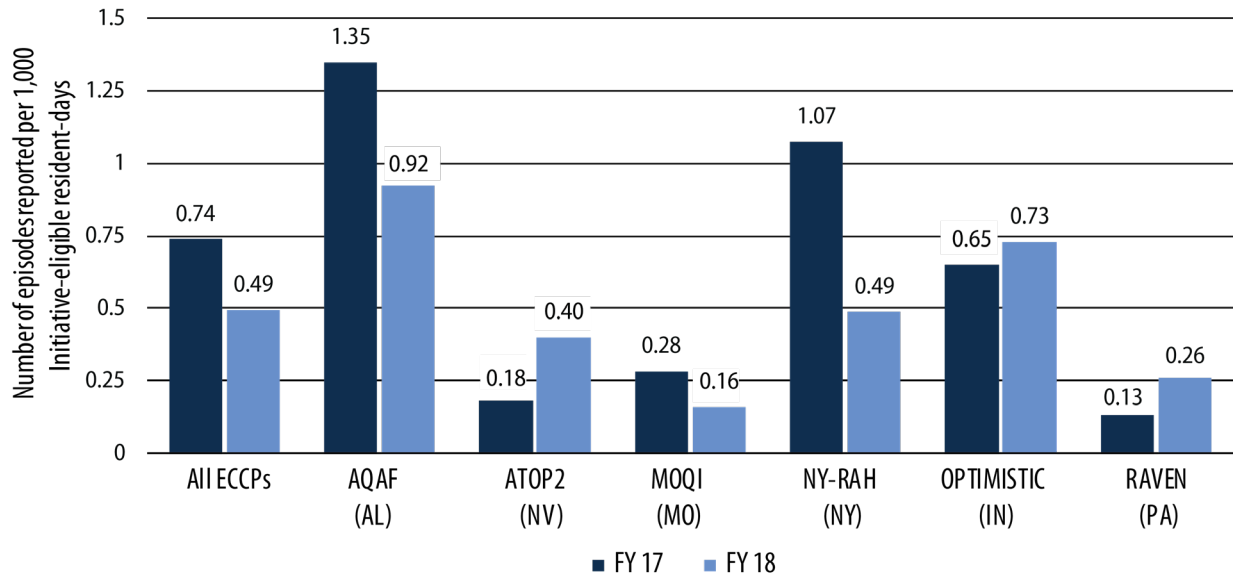
SOURCE: RTI program MS 08, csaur\output\pah2_ar2_nbc_1, MS NBC 08, csaur\output\pah2_ar3_nbc_2.

Figure 2-8. Payment-Only: Use of G9685 practitioner billing codes for any of the six qualifying conditions
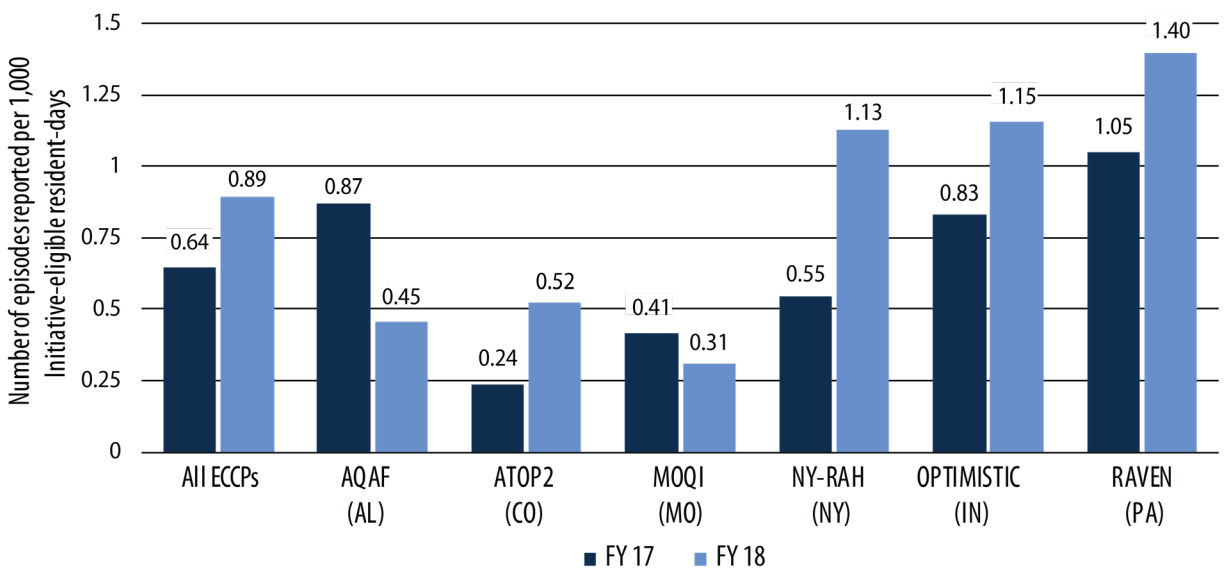
SOURCE: RTI program MS 08, csaur\output\pah2_ar2_nbc_1, MS NBC 08, csaur\output\pah2_ar3_nbc_2.

In Year 2, practitioners who were not billing or who billed infrequently stated that their employment status, billing structures, and NFI 2 time and documentation requirements played a major role in their decision not to bill. As reported in Initiative Year 1, practitioners that are salaried directly by nursing facilities, corporations, or group practices have no incentive to bill for certifying a qualifying change in condition because reimbursements would go to their corporations, not the individual practitioners.

28.8% of surveyed practitioners were not billing for the Initiative

24.2% of non-billing practitioners cited employment status as the reason
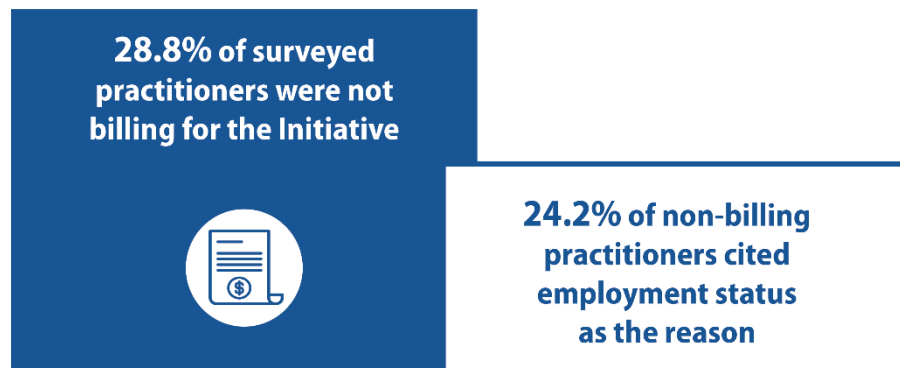
Across ECCPs, there also are a number of designated Rural Health Providers (physicians) participating in the Initiative. Because Rural Health Providers must work certain weekday hours in their Rural Health capacity, they also must bill for service delivery performed during those hours using designated rural health Medicare Part A billing codes. While serving in that Rural Health capacity they cannot use other billing codes, including NFI 2 codes. Therefore, although these providers can certify for facility billing, they cannot submit their own NFI 2 claims while also serving as Rural Health Providers, unless they perform NFI 2 services during evening, night, or weekend hours.

"I think [the reimbursements are] helpful, it doesn't affect me because I am a rural health clinician. If they change that so you can bill for rural health clinics, you would see more success in the program in rural areas."

– Interviewed Practitioner, MOQI

Beyond employment structures, interviewed practitioners also cited their billing processes as a reason for not submitting claims. For example, some practitioners contract with third-party billing companies who take a small percentage of each submitted claim as their fee, reducing participating practitioners' incentive payments.

Similar to facility staff concern over corporate billing structures, some practitioners said they were unsure if their billing offices were submitting their Initiative claims or if they were receiving reimbursements. This lack of communication between practitioners and centralized billing services disincentivized practitioners from putting in the time and effort to (1) certify the condition within the 48-hour time window and (2) complete all accompanying documentation.

When asked about the top three potential improvements that would increase billing under the Initiative, surveyed practitioners suggested better communication from nursing staff, more NFI 2 education and training, and better recognition of resident eligibility. Interestingly, the suggested changes differed by practitioner billing status (i.e., if the practitioner was billing for the Initiative or not).

Of those practitioners who were billing, responses ranged from wanting better communication, a longer confirmation time window, and reduced documentation requirements to increase their rate of billing. These suggested changes are shown in *Figure 2-9*. Of those practitioners who were not billing or were unsure if they were billing, respondents seemed to want more clarity on the basics of the Initiative (i.e., more general education/training and resident eligibility).

> Practitioners' suggested changes vary by billing status.

Figure 2-9.   Top three changes suggested by practitioners to increase use of practitioner billing codes

Practitioners who were billing
Improve communication among nursing staff about a qualifying change in condition
Give practitioners more time to confirm a qualifying diagnosis
Reduce documentation requirements for changes in condition

Practitioners who were not billing/unsure if they were billing
Receive more education and training about the Initiative
Identify residents' eligibility for the Initiative better
Improve communication among nursing staff about a qualifying change in condition

SOURCE: RTI analysis of Practitioner Survey (RTI program JW07)

2.5 Relevant State Policy Landscape

Increased enrollment in managed care plans has the potential to reduce the number of Initiative-eligible residents, in turn eroding NFI 2 financial benefits for the facility.

Many facility leaders noted the presence of competing or similar programs in their facilities, such as corporate programs or I-SNPs structured like NFI 2.

These programs place additional burden on facility staff and practitioners by confusing staff and splitting resources across efforts.

The main goal of NFI 2 centers on reducing hospitalization rates in participating facilities, but the Initiative is operating in an environment of ongoing health policy shifts. One such shift is that other policies and programs may provide analogous services or have similar goals. Survey data show that **85.6 percent** of respondent NFAs' facilities had other non-NFI 2 practices in place to reduce potentially avoidable hospitalizations for eligible long-stay residents, although interview findings showed more variation in this area.

Stakeholder interviews indicated that there are few state-level policy efforts addressing hospitalizations among nursing facility residents. Instead, most states have efforts focused on improving quality more generally, although states vary on whether these efforts are driven by state policy or by industry efforts.

In some states, multiorganizational coalitions have developed to improve coordination and cooperation between health care entities, including nursing facilities, hospitals, home health agencies, and other providers. Because facilities are participating in multiple programs, staff and practitioners are often confused as to which residents participate in which programs. Likewise, when considered altogether, the cumulative effect of documentation requirements, key measurement tools or metrics, and related components of these competing priorities divert staff attention from any single goal (e.g., NFI 2). Stakeholders also reported challenges related to low reimbursement rates, workforce retention and recruitment, and reduced occupancy rates.

Among the policy issues relevant for NFI 2, concern about managed care dominated. Because managed care residents are not eligible to participate in this Initiative, interviewees and surveyed NFAs across ECCPs voiced concern about losing Initiative residents to managed care programs. Interviewees expected the managed care population to continue growing over the coming months and years as managed care offerings for nursing facility residents increase. Analyses of the overall long-stay population suggest that nationally and in some ECCP states, there has been steady growth in Medicare Advantage (MA) penetration rates (see **Section 7**). RTI's construction of analytic files from 2014–2018 also indicates that the number

74.0% of surveyed NFAs reported that **Initiative enrollment could decline** because of increasing resident enrollment in **managed care.**

of potentially eligible long-stay residents who were excluded because they were not enrolled in FFS Medicare has increased over time (see **Table K-9**).

Despite expecting their number of eligible residents to decrease in the coming months, having enough eligible residents was not a major challenge for a majority of surveyed NFAs. Only **4.7 percent** reported that having enough eligible residents was a *major* challenge to the Initiative.

Although most facility staff agreed that managed care penetration is increasing, staff had mixed reactions to the specific plans operating in their facilities. Some interviewees preferred managed care to NFI 2 because of the added support from a full-time managed care advanced practice registered nurse (APRN), along with the higher payments facilities reportedly receive for managed care residents compared to NFI 2 reimbursements. Other interviewees preferred NFI 2 to managed care because they believed managed care plans restricted their treatment options for residents or resulted in increased administrative burden (e.g., more paperwork). For these staff members, the flexibility of NFI 2 is preferable, even if the NFI 2 payments were below those provided by managed care plans.

In buildings with both managed care plans and NFI 2, nearly all interviewees described a degree of stress created by overlapping program agendas.

2.6   Perceptions of Initiative Effectiveness

Most interviewees and surveyed staff in both groups believed the Initiative had been effective in reducing potentially avoidable hospitalizations for eligible long-stay residents.

Most staff did not provide open-ended suggestions for improving the Initiative when asked about recommendations for scaling nationally.

In Initiative Year 1, interview and survey data diverged in respondents' perceptions of NFI 2 effectiveness in reducing avoidable hospitalizations. In contrast, this year's interviewed and surveyed staff in both Clinical + Payment and Payment-Only facilities shared that they had seen some reductions in avoidable hospitalizations that they attributed to the Initiative.

Almost all surveyed NFAs (**91.2 percent**) and practitioners (**83.9 percent**) agreed that NFI 2 had reduced avoidable hospitalizations among their long-stay residents. However, similar to reports from the previous year, Clinical + Payment staff believed that reductions were the result of NFI 1 interventions, including the support of the on-site ECCP nurse, not the new NFI 2 payment component.

Although interviewees in both groups shared that they had seen some reductions in hospitalization rates, they posited that further reductions would be hard to achieve. Some Clinical + Payment staff reported that their hospitalization rates are plateauing because of successful NFI 1 activities, leaving little to no room for further improvement under NFI 2. Similarly, some Payment-Only staff shared that their baseline hospitalization rates were low, and whatever reductions they could have achieved under NFI 2 have already been realized, meaning there is little room for any further reductions in hospitalization rates.

A majority of interviewed and surveyed staff reported that the Initiative had not introduced any new practices into their existing facility routines. Rather, the Initiative only provides new reimbursement opportunities for care processes that were already part of facility practices. This belief was similar across both intervention groups, with **68.1 percent** of surveyed Clinical + Payment NFAs and **70.2 percent** of surveyed Payment-Only NFAs reporting that NFI 2 payments reimbursed their facilities for care practices their staff already were performing.

Among interviewees, there was also some disagreement on the Initiative's effect on facility culture. Most Clinical + Payment interviewees reported that the Initiative had

improved their floor staffs' clinical care skills and shifted staff mindsets away from sending residents to the hospital and toward treating in-house.

"As soon as we see change [in resident condition], we are doing the assessment [and then] labs. We [can] do portable chest x-ray [also]. It is easier to monitor patients in-house. It [NFI 2] helps us pinpoint things sooner, [before] it becomes exacerbated."

— Interviewed facility staff member, NY-RAH

Conversely, Payment-Only staff shared that they had seen some improvements in documentation and communication practices because of the Initiative, but these did not change facility culture.

These generally optimistic views of the Initiative were further reinforced by survey findings about NFA and practitioner opinions on Initiative scalability. In response to open-ended questions about scaling the Initiative nationally, many had no suggestions for improvement. Among the 50 percent of NFAs who provided responses, many support the six qualifying conditions and reimbursement payments and having embedded ECCP staff as components that should be maintained if scaled nationally. Conversely, common suggestions for improvement included additional facility education, longer confirmation time window, and more support from ECCP staff. *Figure 2-10* provides examples of NFA open-ended responses.

Figure 2-10. In their own words: NFAs' suggestions on NFI 2 scalability

> **Most surveyed NFAs did not see the need for major changes to scale the program nationally**
>
> *"I love what this program is about, and I believe that it would not be difficult to align all needed resources, providers, and facility staff/management to implement this program in any facility."*

> **✓ Initiative's components that work well:**
>
> Six qualifying conditions and the clinical criteria
> *"The diagnoses are good."*
>
> Reimbursements to facilities
> *"The extra payment to do this work should be made permanent. It does take extra resources and saves the residents the trauma of a hospitalization and saves Medicare money in the long run."*
>
> Embedded ECCP staff in facilities
> *"Having a[n] RN in the facility from [ECCP] has helped through the years. It has helped my staff to better understand the program."*

> **▲ Initiative's components that need improvement:**
>
> Additional facility staff education
> *"Initial education to ensure [facility] participants clearly understand the program."*
>
> Longer diagnosis confirmation time window
> *"Possible wider windows for confirmation due to some homes not getting but one visit a month from doctors."*
>
> Added support from embedded ECCP staff
> *"I think you should determine if the nurse and payment model works best. If so, please [place] a staff member in participating nursing facilities to oversee the program."*

SOURCE: RTI analysis of Nursing Facility Administrator Survey (RTI program JW07). Full results presented in *Appendix I*.

Practitioners were also asked about Initiative scalability and approximately 60 percent of surveyed practitioners provided responses. Among the responses, practitioners supported the six qualifying conditions and reimbursement payments as Initiative components that should be maintained if scaled nationally. Common suggestions for improvement included additional facility education, additional practitioner education, and increased reimbursements. *Figure 2-11* provides examples of practitioner's open-ended responses.

Figure 2-11. In their own words: Practitioners' suggestions on NFI 2 scalability

The majority of surveyed practitioners did not see the need for major changes to scale the program nationally

"All of it [should continue]. It is a fantastic program for nursing homes."

Initiative's components that work well:

Six qualifying conditions and the clinical criteria
"The strictly defined conditions that make them objectively easy to identify."

Reimbursement to facilities
"I think the criteria are appropriate and there is incentive not only for the patients, but also for the provider and the facility."

Initiative's components that need improvement:

Additional facility staff education
"Continued education and reinforcement to nursing staff and ancillary staff of their importance in the role of catching changes in conditions and acting on it appropriately."

Additional practitioner education
"More frequently scheduled educational updates."

Increased practitioner and facility reimbursement
"I think it's all about money honestly. If you pay out more to docs and facilities, your adherence will improve."

SOURCE: RTI analysis of Practitioner Survey (RTI program JW07). Full results presented in *Appendix I*.

2.7   Sharing Collaborative

ECCPs continued to participate in Sharing Collaborative activities and found the opportunity to collaborate across ECCPs valuable.

Sharing Collaborative meetings were implemented at the beginning of NFI 2 to support shared best practices and challenges while also providing a forum for ECCPs to discuss common questions with the implementation contractor and CMS. Early on, these meetings were focused on troubleshooting data collection and facility billing questions.

In Year 2, ECCPs increasingly shared best practices and detailed updates during Learning Work Groups and discussed reports provided by Social & Scientific Systems, Inc. and Telligen (SSS-T) during Data and Reporting Work Groups. Also in Year 2, a third regular work group, the Data User Work Group, was created after ECCPs gained access to additional data for their own analysis. The Data User Work Group is led by the ECCPs and used as a forum to discuss both efforts to use the data and specific programming challenges.

Although the Data User Work Group continues to meet regularly, the number of scheduled Learning Work groups and Data and Reporting Work Groups has decreased steadily. A summary of the sharing collaborative activities can be found in ***Table 2-1***.

Interviews indicated that nearly all ECCP leaders found it valuable to have questions answered and hear what other ECCPs were experiencing. However, some interviewees shared that as time went on and the Initiative was fully implemented, these group meetings became less useful than one-on-one interactions with CMS or other ECCPs.

Table 2-1. Summary of sharing collaborative meetings

Meeting information[1]	Data and reporting work group	Learning work group	Data user work group	Learning collaborative
Frequency of meeting	Once a month until October 2018, once every 2 months thereafter	Once a month	Once a month	Ad-hoc[2]
Number of meetings	6	4	9	2
Attendees	ECCP data collection staff, SSS-T, CMS, RTI	ECCP staff, SSS-T, CMS, RTI	ECCP data analysis staff, SSS-T, CMS, RTI	ECCP staff and invited guests (practitioners, facility staff), SSS-T, CMS, RTI
Purpose of meeting	Discuss data reporting requirements Answer ECCP data collection questions	Share challenges, best practices, and lessons learned Communicate changes in models or requirements	Share progress and information about additional data analyses conducted by ECCPs	Share information not covered in three regular work groups
Examples of topics discussed	Share data reporting quality issues or concerns Share strategies for effective data collection	Share lessons learned during the SSS-T site visits Discuss changes in clinical criteria	Discuss analysis progress Review programming issues and receive feedback	Present clinical and reporting requirements to a broad audience

[1] From March 1, 2018, to March 1, 2019.

[2] On an as-needed basis, CMS determines that a Learning Collaborative should take place outside of the regular work groups. These ad hoc meetings seem most likely to occur when CMS perceived that it would be helpful to discuss or explain a specific topic with a wider audience than just the ECCP leadership. In January 2018, for example, CMS held a meeting focused on practitioner documentation and engagement that was open to nursing facility staff and practitioners and the ECCPs.

3. Quantitative Methods

Section 3 describes RTI's NFI 2 evaluation methodology, which was developed with approval by CMS and is intended to provide an overview of the technical approach used for the analysis results reported in subsequent sections.

As described in **Section 1**, we use a DD multivariate regression approach to address our key research questions:

- What is the Initiative payment incentive effect on Medicare utilization and expenditures, particularly for hospital-related services, for the Clinical + Payment group and the Payment-Only group?
- How does the Initiative effect on Medicare utilization and expenditures vary by ECCP and type of intervention?
- What is the Initiative effect on quality of care outcomes?

3.1   Use of National Comparison Group

DD models are often used to measure the impact of an intervention for which a randomized controlled trial is not feasible. This strategy requires (1) using an intervention group and comparison group and (2) observing the outcome before and after the intervention in both groups. With "parallel trends" assumed, the outcome of

interest would change by the same amount in the intervention and comparison groups if neither group had participated in the intervention. Therefore, we could identify the effect of the intervention as the difference between the change in the intervention group relative to its baseline and the change in the comparison group relative to its baseline.

The estimated intervention effect obtained from a standard DD analysis depends heavily on whether the parallel-trends assumption is reasonable. If possible, we pick a comparison group for which this assumption is likely to hold. We originally planned to create comparison groups from within the same state as the ECCP to account for state-level variations such as state policy changes or changes in local market conditions. However, our NFI 1 findings discovered some spillover effect, which indicated that other within-state facilities also picked up some components of NFI 1.[7] In fact, some ECCPs deliberately encouraged the spread of good practices beyond the Initiative participants. This spillover effect created the potential to underestimate the Initiative effects because the results for the within-state comparison facilities may look so similar to the Initiative facilities that it would seem the Initiative had minimal impact.

Therefore, we concluded that despite the advantages of using a within-state comparison group, this structure might not give full credit to the intervention for reducing hospitalizations if the within-state comparison facilities were implementing similar interventions. To address this limitation, we determined that it would be better to use a national comparison group selected from outside the Initiative-participating states and adjust for differences in trends. Using a national comparison group, because of its large size, also has the important advantage of producing stable estimates for regression model parameters.

We created this national comparison group of nursing facility residents from non-Initiative states in each year (FY 2014–FY 2018) to be used as a uniform comparison group for all ECCPs. The comparison group includes all nursing facility residents in states[8] that have not been involved with either NFI 1 or NFI 2, subject to both facility- and resident-level exclusion criteria.

The facility-level exclusions were based on criteria established by CMS for participation in the Initiative, plus other criteria designed to exclude facilities with unusual populations. The resident-level criteria ensured that comparison group residents would

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[7] Ingber, M., Feng, Z., Khatutsky, G., et al. Evaluation of the initiative to reduce avoidable hospitalizations among nursing facility residents. Final report. Report for Centers for Medicare & Medicaid Services. Waltham, MA: RTI International, Sept. 2017. Available at: https://downloads.cms.gov/files/cmmi/irahnfr-finalevalrpt.pdf

[8] Facilities and residents in Alaska, Hawaii, Washington, DC, Puerto Rico, Guam, and the U.S Virgin Islands were excluded from the national comparison group because of potential differences from the 48 contiguous states; Nebraska was also excluded because it was involved in NFI 1.

meet the same eligibility criteria as Initiative participants, such as being long-stay and enrolled in FFS Medicare. We also used propensity score methods to exclude outliers, residents from the national comparison group whose characteristics were very different from those of Initiative-participating residents.

The national comparison group is likely to have very little spillover from NFI 1 and, with approximately three-quarters of a million would-be eligible residents in each year, will ensure stable estimates of regression model parameters. We conducted further analyses to assess the reasonableness of the parallel-trends assumption, as described below.

In addition to the national comparison group, we created a within-state reference group (WSRG) to capture possible state-level policy or other changes for a sensitivity analysis. In *Appendix Q,* we present the set of impact estimates relative to the WSRG. We present a more detailed description of our comparison group construction, including the use of resident-level propensity scores to trim outlier residents from the national comparison group, in *Appendix K*.

3.2   Adjusting for Baseline Trends

After selecting the national comparison group in each year, we empirically assessed the trend in outcomes for the 3 years prior to the Initiative (2014–2016). Those 3 years are used as the baseline period for NFI 2 evaluation and are also the period that NFI 1 was in place. This assessment is needed to test whether the parallel-trends assumption for the DD analysis is reasonable. We found evidence[9] in the Clinical + Payment group of greater reductions in outcomes over time than the national comparison group. By not accounting for these trends, we risk overstating the impact of the Initiative.

Therefore, we replaced the standard parallel-trends assumption with the assumption that the intervention and comparison groups would continue to change, for one more year, according to their own baseline trends absent the Initiative. We then identified the effect of the NFI 2 intervention as the difference between the change in the intervention group relative to its baseline trend and the change in the national comparison group relative to its baseline trend. This approach was applied to analyses for both the Clinical + Payment group and the Payment-Only group.

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[9] Specifically, we examined the interaction term between time and membership in the intervention group in the FY 2017 probability and count models. We found that all of the interaction term coefficients in the Clinical + Payment group had negative signs, and some were statistically significant. Thus, the measures for the Clinical + Payment group decreased more sharply over the years 2014 through 2016. More details are presented in Appendix K of the second Annual Report. We also reexamined these coefficients based on the FY 2018 models and found a similar pattern.

Although this approach removes the need for the stringent and potentially problematic parallel-trends assumption, our assumption that the nonparallel trends would continue unchanged from the baseline period may not be realistic. For example, if the impact of the NFI 1 interventions plateaued in 2015 or 2016, or if hospitalization rates were reduced to the point where they hit a "floor" and further reductions became difficult, then the trends from the baseline period would change. By accounting for the different baseline trends, we risk understating the impact of the Initiative, especially for the Clinical + Payment group.

For the analysis of 2017 data in the second Annual Report, our approach was to use the model with the assumption that the nonparallel trends would continue unchanged from the baseline period, as our primary analysis. We considered this approach primary because this assumption was plausible and yields more conservative impact estimates than a parallel-trends assumption. However, we also ran a sensitivity analysis based on a standard parallel-trends assumption with 1 year of baseline data (2016).

For our analysis of 2018 data in this report, we adopt the same basic approach but make an important adaptation. We posit that although it may be plausible to assume that the nonparallel trends would continue unchanged from the baseline period to 2017 (the first Initiative year), it is not plausible to assume that the relatively high rate of reduction in hospitalizations in the Clinical + Payment group would continue indefinitely. *Therefore, for 2018, we assume the trend to have "flattened" and compare actual outcomes in 2017 and 2018 to the same benchmark.* This is explained in more detail in **Appendix K**. And as we did for the second Annual Report, we present sensitivity analysis results based on a standard parallel-trends assumption using 2016 as the baseline year (see **Appendix Q**).

3.3   Scope of Analysis

The Clinical + Payment facilities employ a two-part intervention in which the clinical component began in 2012 as part of NFI 1, and the payment component began in 2016 as part of NFI 2. The Payment-Only facilities represent a new intervention that began in 2016.

In the NFI 2 evaluation analyses to date, we have focused on the impact of introducing payment

> The Initiative design and evaluation focus on the impact of introducing payment in two intervention groups: one with an ongoing existing clinical intervention (Clinical + Payment), and a new group without any clinical intervention (Payment-Only).

in two interventions (1) adding payment to an existing clinical intervention (Clinical + Payment) and (2) introducing payment to a new group of participant facilities (Payment-Only). Given differences in Initiative implementation and in the analytical approaches

used for NFI 1 and NFI 2 evaluations, we are not able to directly compare the effect of the clinical intervention alone (from NFI 1) to the effect of the payment intervention in NFI 2 in this report. We also cannot directly estimate the total effect of the compound intervention in Clinical + Payment facilities. Therefore, we cannot compare the combined effect of the clinical and the payment components to the payment component alone at this time. Future reports may consider these types of analyses.

In this report, we focus on evaluating the impact of the Initiative on 9 types of resident-level hospital-related utilization events and 10 expenditure measures (the expenditures associated with each of the utilization events plus total Medicare expenditures) (***Figure 3-1***). For each type of utilization event, we consider two measures: both the probability of at least one event occurring and the count of all events, for a total of 28 measures (9 probability, 9 count, and 10 expenditure). All these measures are based on Medicare claims data from each resident's Initiative-eligible period in each year. The expenditure measures are adjusted to reflect a full year, and thus are measured in dollars per resident-year. The probability and count outcomes are expected to yield similar results. The difference between the two is that counts account for residents with repeated utilization events. We also note that total Medicare expenditures includes a wide range of Medicare covered services (e.g., skilled nursing care, Part D drugs, durable medical equipment, and outpatient services) beyond the other expenditure measures which are focused on subsets of hospital expenditures.

To predict these outcomes, we perform multivariate analyses that control for relevant resident-level data (e.g., resident demographics and health profiles) and facility characteristics.

Figure 3-1.   Nine types of utilization events evaluated

Hospitalizations

➢ All-cause
  • Potentially avoidable
    ○ Potentially avoidable for the six qualifying conditions

Emergency department visits

➢ All-cause
  • Potentially avoidable
    ○ Potentially avoidable for the six qualifying conditions

Acute care transitions

➢ All-cause
  • Potentially avoidable
    ○ Potentially avoidable for the six qualifying conditions

Acute care transitions describe any transition from the nursing facility to the hospital, combining observation stays with hospitalizations and ED visits. The data sources and precise definitions of each of these nine events are presented in ***Appendix K***. Importantly, hospitalizations and ED visits, especially "all-cause" metrics, include events that may be clinically appropriate and require acute care in the hospital. The NFI 2 goal is only to reduce the transfers that are safely avoidable when changes of condition are detected and treated in the nursing facility in a timely manner. Furthermore, we include 10 MDS-based quality measures, including:

- catheter inserted and left in bladder,
- one or more falls with injury,
- self-reported moderate to severe pain,
- pressure ulcers stage II or higher,
- decline in activities of daily living (ADLs),
- UTI,
- antipsychotic medication use,
- anti-anxiety or hypnotic medication use,
- weight loss, and
- physically restrained.

We perform multivariate analysis of all the quality measures above, except the last three, which are for descriptive analysis only.

In addition to these outcomes, we provide descriptive results in ***Appendices M–O*** for utilization and expenditure measures including for each of the six qualifying conditions individually. ***Appendix P*** provides descriptive results for MDS-based quality measures. We conduct separate analyses for each ECCP intervention group (i.e., Clinical + Payment vs. Payment-Only) and pooled analyses combining ECCPs for each intervention group. A full description of our methods, including data sources, definition of Initiative-eligible residents, comparison group selection, definition of outcome measures, selection of covariates, and statistical methods, can be found in ***Appendix K***.

4. Utilization and Expenditures

Section 4 reports on DD multivariate regression analyses that estimate the effects of the Initiative on key hospital-related Medicare utilization and expenditure measures. Furthermore, we describe how these effects varied by ECCP for each intervention group (Clinical + Payment and Payment-Only).

We present estimates of the Initiative effect on hospital-related utilization and expenditures, and on total Medicare expenditures, for each resident's Initiative-eligible period during FY 2018 (Initiative Year 2). We provide an overview of our methods in **Section 3**, including our rationale for using a comparison group of nationally derived nursing facility residents, and a detailed discussion of our methods in **Appendix K**.

Additional in-depth results can be found in several appendices:

- **Appendix L** presents descriptive statistics for the covariates used in the multivariate models.

- **Appendices M–O** present descriptive results for the utilization and expenditure measures.

- **Appendix Q** provides results from two types of sensitivity analysis:
  - Using a WSRG to capture the influence of possible state-level policy changes
  - Using only 1 baseline year (2016) and assuming parallel trends.

- *Appendix R* provides an example of complete multivariate regression results for one of the models.

We first describe the results from the pooled models that combined the six ECCPs. These models allow us to observe the overall impact of the Initiative

> When describing the Initiative effects from DD multivariate regressions, statements about "reductions" or "increases" are always relative to changes in the national comparison group, after accounting for baseline trends, unless otherwise noted.

on each outcome, separately for the Clinical + Payment intervention group and the Payment-Only intervention group. We then describe the results from the models, analyzing each ECCP separately to highlight variation in the Initiative effects across ECCPs. Throughout, we provide additional context from primary data collection findings to help interpret specific results (see *Appendices B–G* for detailed site visit findings).

For the DD analyses presented in this section, we included eligible residents from 111 facilities in the Clinical + Payment group and 148 facilities in the Payment-Only group, as explained more fully in *Section 1* and *Appendix K.*

4.1   Overall Impact of the Initiative

Our evaluation found that eligible residents in Clinical + Payment facilities did not experience reductions in hospital-related utilization and related Medicare expenditures further than what was achieved in NFI 1, and what was expected based on the baseline trend.

Eligible residents in Payment-Only facilities did not experience consistent reductions, nor any statistically significant changes.

In the Clinical + Payment group, there were some unfavorable, statistically significant increases in utilization and expenditures in FY 2018, consistent with a general pattern of increases.[10] In particular, there were statistically significant increases in the probability and count of all-cause ED visits, and in the count of potentially avoidable ED visits (see *Tables 4-1, 4-2,* and *4-3*). As an illustration, for eligible residents in this intervention group, the predicted probability of experiencing an ED visit in FY 2018, absent the Initiative, would be 18.6 percent. The Initiative was associated with a

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[10] Note that this statement is strictly regarding NFI 2 and is not being compared to the effect of NFI 1, as we explain in Section 3.

statistically significant increase of 1.4 percentage points. This corresponds to a 7.4 percent relative increase in the average resident's probability of an all-cause ED visit.

We also found statistically significant increases in total Medicare expenditures, as well as expenditures for potentially avoidable hospitalizations and acute care transitions, and hospitalizations and acute care transitions for the six qualifying conditions. There was a broader pattern of increases in hospitalizations and decreases in ED visits for utilization and expenditure measures relating to the six conditions, although only the increase in hospitalization expenditures was statistically significant. The multivariate analysis results are consistent with the patterns we observed for the unadjusted utilization and expenditure measures (**Appendices M–O**). Compared to 2016, descriptive results for the Clinical + Payment facilities indicate higher hospital-related utilization and expenditures in 2018.

In the Payment-Only group, there was no consistent pattern of reductions for eligible residents in FY 2018. Although there were no statistically significant changes, about half of the measures suggested favorable reductions in utilization, while the other half suggested unfavorable increases (see **Tables 4-1, 4-2,** and **4-3**). In analyzing Medicare expenditures, we found slight reductions for expenditures related to the six qualifying conditions, but increases in the other measures of hospital-related expenditures and total expenditures. For utilization related to the six qualifying conditions, there was no pattern and the results lacked statistical significance. Again, these multivariate analysis results for the Payment-Only group are consistent with the unadjusted utilization patterns we observed for the same year (**Appendices M–O**). Compared to 2016, descriptive results for the Payment-Only facilities indicate higher hospital-related utilization and expenditures in 2018.

As explained in **Section 3**, we conducted two sensitivity analyses to confirm the robustness of our results. In the first sensitivity analysis, we compared the intervention group to a WSRG instead of the national comparison group. In the second sensitivity analysis, we used 2016 as the baseline year for comparison between the intervention group and the national comparison group. In both sensitivity analyses, effect patterns were somewhat more favorable for both the Clinical + Payment and Payment-Only groups. The pattern of unfavorable increases in the Clinical + Payment group moderately weakened, while in the Payment-Only group a general pattern of reductions emerged. This is discussed in more detail in **Appendix Q**.

Table 4-1. Initiative effect on probability of hospital-related utilization per resident, FY 2018, all ECCPs (all states)

Measure	Predicted probability absent the Initiative (percent)	Absolute Initiative effect (percentage points)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
Any hospitalization						
All-cause	26.9	−0.6	−2.0	0.8	0.500	−2.1
Potentially avoidable	11.0	0.5	−0.6	1.6	0.470	4.4
Six qualifying conditions	5.7	0.5	−0.2	1.3	0.259	9.0
Any ED visit						
All−cause	**18.6**	**1.4**	**0.1**	**2.7**	**0.083**	**7.4**
Potentially avoidable	10.2	0.5	−0.4	1.5	0.355	5.2
Six qualifying conditions	2.6	−0.4	−0.9	0.1	0.148	−16.7
Any acute care transition						
All−cause	36.9	0.2	−1.5	1.9	0.817	0.7
Potentially avoidable	19.1	0.7	−0.7	2.2	0.397	3.9
Six qualifying conditions	8.0	−0.1	−1.0	0.9	0.920	−0.8
Payment-Only						
Any hospitalization						
All-cause	26.3	−0.4	−1.7	1.0	0.657	−1.4
Potentially avoidable	11.6	0.7	−0.2	1.6	0.229	5.9
Six qualifying conditions	6.8	−0.2	−1.0	0.6	0.652	−3.1
Any ED visit						
All-cause	24.2	−0.2	−1.6	1.2	0.846	−0.7
Potentially avoidable	14.0	−0.4	−1.5	0.7	0.592	−2.6
Six qualifying conditions	4.0	0.0	−0.6	0.6	0.917	1.0
Any acute care transition						
All-cause	40.1	−1.1	−2.5	0.4	0.224	−2.7
Potentially avoidable	22.4	0.0	−1.3	1.3	0.996	0.0
Six qualifying conditions	9.8	−0.3	−1.2	0.6	0.583	−3.2

ED = emergency department.

SOURCE: RTI analysis of Medicare claims data (RTI program MS 110).

NOTE: The *predicted probability absent the Initiative* is the mean of the predicted probabilities of experiencing the event during their respective exposure period, for the residents in the intervention group, under the scenario that the intervention did not occur. The *Initiative effect* is calculated based on a difference-in-differences regression model with a national comparison group and adjusted for resident-level and facility-level characteristics. It is the difference between the predicted probabilities of the event with and without the intervention. The *relative effect* = (absolute Initiative effect) / (predicted probability absent the Initiative). *Acute care transitions* include hospitalizations, ED visits, or observation stays.

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

Table 4-2.   Initiative effect on count of hospital-related utilization events per resident, FY 2018, all ECCPs (all states)

Measure	Predicted count absent the Initiative (events per year)	Absolute Initiative effect (events per year)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
Hospitalizations						
All-cause	0.432	−0.003	−0.032	0.027	0.887	−0.6
Potentially avoidable	0.132	0.011	−0.005	0.026	0.255	8.1
Six qualifying conditions	0.065	0.008	−0.002	0.017	0.175	11.8
ED visits						
All-cause	**0.272**	**0.025**	**0.000**	**0.049**	**0.097**	**9.0**
Potentially avoidable	**0.119**	**0.013**	**0.000**	**0.025**	**0.089**	**10.9**
Six qualifying conditions	0.028	−0.004	−0.010	0.001	0.188	−15.4
Acute care transitions						
All-cause	0.701	0.025	−0.019	0.069	0.350	3.6
Potentially avoidable	0.252	0.022	0.000	0.044	0.100	8.7
Six qualifying conditions	0.092	0.003	−0.009	0.015	0.668	3.4
Payment-Only						
Hospitalizations						
All-cause	0.405	0.001	−0.028	0.030	0.953	0.2
Potentially avoidable	0.140	0.008	−0.005	0.022	0.298	6.0
Six qualifying conditions	0.078	0.000	−0.009	0.010	0.964	0.4
ED visits						
All-cause	0.359	0.009	−0.023	0.040	0.654	2.4
Potentially avoidable	0.173	−0.003	−0.018	0.011	0.714	−1.9
Six qualifying conditions	0.045	−0.001	−0.008	0.006	0.809	−2.4
Acute care transitions						
All-cause	0.768	0.010	−0.041	0.061	0.739	1.3
Potentially avoidable	0.313	0.005	−0.017	0.027	0.690	1.7
Six qualifying conditions	0.123	−0.002	−0.015	0.012	0.834	−1.4

ED = emergency department.

SOURCE: RTI analysis of Medicare claims data (RTI program MS 112).

NOTE: The *predicted count absent the Initiative* is the mean of the predicted counts of events, for the residents in the intervention group, under the scenario that the intervention did not occur. The *Initiative effect* is calculated based on a difference-in-differences regression model with a nationally selected comparison group and adjusted for resident-level and facility-level characteristics. It is the difference between the predicted counts with and without the intervention. *The relative effect = (absolute Initiative effect) / (predicted count absent the Initiative). Acute care transitions* include hospitalizations, ED visits, or observation stays.

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

Table 4-3. Initiative effect on Medicare expenditures, FY 2018, all ECCPs (all states)

Measure	Predicted expenditure absent the Initiative (dollars)	Absolute Initiative effect (dollars)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
Total Medicare expenditures	**33,389**	**1,758**	**399**	**3,116**	**0.033**	**5.3**
Hospitalization expenditures						
All-cause	9,886	755	−108	1,618	0.150	7.6
Potentially avoidable	**2,294**	**334**	**38**	**630**	**0.063**	**14.6**
Six qualifying conditions	**1,065**	**221**	**33**	**409**	**0.053**	**20.7**
ED visit expenditures						
All-cause	269	9	−19	37	0.607	3.3
Potentially avoidable	104	7	−8	21	0.454	6.3
Six qualifying conditions	26	−2	−9	5	0.688	−6.5
Acute care transition expenditures						
All-cause	10,519	648	−273	1,569	0.247	6.2
Potentially avoidable	**2,443**	**323**	**19**	**627**	**0.080**	**13.2**
Six qualifying conditions	**1,103**	**206**	**9**	**404**	**0.085**	**18.7**
Payment-Only						
Total Medicare expenditures	28,611	788	−245	1,821	0.210	2.8
Hospitalization expenditures						
All-cause	7,829	288	−251	827	0.380	3.7
Potentially avoidable	2,234	42	−180	264	0.756	1.9
Six qualifying conditions	1,171	−35	−198	128	0.725	−3.0
ED visit expenditures						
All-cause	318	14	−18	47	0.468	4.5
Potentially avoidable	138	8	−9	24	0.440	5.5
Six qualifying conditions	46	0	−9	9	0.985	−0.2
Acute care transition expenditures						
All-cause	8,336	246	−308	799	0.465	2.9
Potentially avoidable	2,445	27	−206	259	0.849	1.1
Six qualifying conditions	1,239	−45	−212	122	0.655	−3.7

ED = emergency department.

SOURCE: RTI analysis of Medicare claims data (RTI programs MS 113 and MS 114).

NOTE: The *predicted expenditure absent the Initiative* is the mean of the predicted expenditures, for the residents in the intervention group, under the scenario that the intervention did not occur. Predicted expenditures are based on a resident being eligible for the Initiative for the entire year (365 days). *The Initiative effect* is calculated based on a difference-in-differences regression model with a nationally selected comparison group and adjusted for resident-level and facility-level characteristics. It is the difference between the predicted expenditures with and without the intervention. The *relative effect* = (absolute Initiative effect) / (predicted expenditure absent the Initiative). *Acute care transitions* include hospitalizations, ED visits, or observation stays. Total *expenditures* cover all categories of Medicare spending: hospital, physician, SNF, home health, DME, lab and other providers and suppliers, hospice, and Part D drugs.

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

4.2   Initiative Impact Across Individual ECCPs

Although the overarching findings described above are important, there were also notable differences in the pattern of Initiative effects across ECCPs.

> **In the Clinical + Payment group, the majority of ECCPs experienced statistically significant increases in some utilization and expenditures in FY 2018. There was wide variation in the Initiative effects for the Payment-Only group.**

In the Clinical + Payment group, the payment reform intervention was associated with unfavorable, statistically significant increases for several hospital-related measures in four ECCPs—ATOP2 (Nevada), MOQI (Missouri), NY-RAH (New York), and RAVEN (Pennsylvania). In contrast, AQAF (Alabama) showed one favorable, statistically significant reduction in utilization, although the overall direction of effects was mixed. Even though there were no statistically significant changes in OPTIMISTIC (Indiana), there was a general pattern of reductions in utilization and expenditures.

In the Payment-Only group, only ATOP2 (Colorado) and RAVEN had favorable, statistically significant reductions in utilization and expenditures associated with the Initiative. Although ATOP2 also had one unfavorable increase in expenditures, there was a broader pattern of reductions in both ECCPs, albeit stronger in RAVEN. In contrast, MOQI, NY-RAH, and OPTIMISTIC had unfavorable increases in some utilization or expenditure measures. There were no statistically significant changes in AQAF, and the overall pattern of effects was mixed.

4.3   AQAF (Alabama)

For eligible residents in AQAF's Clinical + Payment group in FY 2018, the Initiative was not associated with a consistent pattern of changes in utilization or expenditures (see *Tables 4-4, 4-5,* and *4-6*). Despite one statistically significant favorable reduction in the probability of an all-cause hospitalization, the broader pattern was mixed for all measures. Findings for the six qualifying conditions were also mixed.

For residents in the Payment-Only group, there were no statistically significant changes in utilization or expenditures. Results for ED visits showed a slightly more favorable pattern, but there were no other patterns across measure types, including for the six qualifying conditions.

Table 4-4. Initiative effect on probability of hospital-related utilization per resident, FY 2018, AQAF (Alabama)

Measure	Predicted probability absent the Initiative (percent)	Absolute Initiative effect (percentage points)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
Any hospitalization						
All-cause	**34.4**	**−5.3**	**−9.5**	**−1.1**	**0.037**	**−15.4**
Potentially avoidable	14.8	−0.9	−3.7	1.9	0.585	−6.3
Six qualifying conditions	7.2	0.3	−1.3	1.9	0.769	4.0
Any ED visit						
All-cause	23.5	0.3	−2.1	2.7	0.814	1.4
Potentially avoidable	14.4	0.6	−2.1	3.2	0.735	3.8
Six qualifying conditions	4.8	−1.0	−2.2	0.3	0.211	−20.1
Any acute care transition						
All-cause	44.6	−2.9	−7.5	1.7	0.299	−6.5
Potentially avoidable	25.5	−0.5	−4.3	3.3	0.825	−2.0
Six qualifying conditions	11.3	−0.9	−3.0	1.2	0.471	−8.0
Payment-Only						
Any hospitalization						
All-cause	28.5	−0.3	−3.5	2.8	0.870	−1.1
Potentially avoidable	12.5	2.6	−0.5	5.7	0.161	21.0
Six qualifying conditions	7.5	0.5	−2.0	3.1	0.730	7.2
Any ED visit						
All-cause	27.6	−1.0	−4.7	2.7	0.654	−3.6
Potentially avoidable	16.5	−1.7	−5.2	1.8	0.420	−10.4
Six qualifying conditions	4.9	−0.1	−2.2	2.0	0.923	−2.4
Any acute care transition						
All-cause	44.3	−3.4	−7.1	0.3	0.132	−7.7
Potentially avoidable	25.4	−0.6	−4.4	3.2	0.805	−2.2
Six qualifying conditions	11.4	−0.3	−3.5	2.9	0.893	−2.3

ED = emergency department.

SOURCE: RTI analysis of Medicare claims data (RTI program MS 110).

NOTE: The *predicted probability absent the Initiative* is the mean of the predicted probabilities of experiencing the event during their respective exposure period, for the residents in the intervention group, under the scenario that the intervention did not occur. The *Initiative effect* is calculated based on a difference-in-differences regression model with a national comparison group and adjusted for resident-level and facility-level characteristics. It is the difference between the predicted probabilities of the event with and without the intervention. The *relative effect* = (absolute Initiative effect) / (predicted probability absent the Initiative). *Acute care transitions* include hospitalizations, ED visits, or observation stays.

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

Table 4-5. Initiative effect on count of hospital-related utilization events per resident, FY 2018, AQAF (Alabama)

Measure	Predicted count absent the Initiative (events per year)	Absolute Initiative effect (events per year)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
Hospitalizations						
All-cause	0.553	−0.071	−0.160	0.018	0.189	−12.9
Potentially avoidable	0.189	−0.009	−0.050	0.033	0.736	−4.5
Six qualifying conditions	0.082	0.009	−0.009	0.028	0.406	11.4
ED visits						
All–cause	0.362	0.024	−0.028	0.076	0.452	6.6
Potentially avoidable	0.170	0.035	−0.005	0.074	0.147	20.5
Six qualifying conditions	0.049	−0.008	−0.023	0.008	0.414	−15.3
Acute care transitions						
All–cause	0.916	−0.044	−0.175	0.086	0.575	−4.8
Potentially avoidable	0.366	0.021	−0.043	0.085	0.586	5.7
Six qualifying conditions	0.132	0.002	−0.024	0.028	0.891	1.7
Payment-Only						
Hospitalizations						
All-cause	0.411	0.025	−0.036	0.086	0.502	6.1
Potentially avoidable	0.142	0.042	−0.002	0.086	0.113	29.8
Six qualifying conditions	0.082	0.017	−0.015	0.050	0.382	21.0
ED visits						
All-cause	0.391	−0.012	−0.085	0.062	0.796	−2.9
Potentially avoidable	0.200	−0.017	−0.066	0.032	0.573	−8.4
Six qualifying conditions	0.056	−0.003	−0.027	0.021	0.820	−5.9
Acute care transitions						
All-cause	0.818	0.000	−0.115	0.115	0.999	0.0
Potentially avoidable	0.341	0.027	−0.050	0.103	0.569	7.8
Six qualifying conditions	0.137	0.014	−0.036	0.063	0.649	9.9

ED = emergency department.

SOURCE: RTI analysis of Medicare claims data (RTI program MS 112).

NOTE: The *predicted count absent the Initiative* is the mean of the predicted counts of events, for the residents in the intervention group, under the scenario that the intervention did not occur. The *Initiative effect* is calculated based on a difference-in-differences regression model with a nationally selected comparison group and adjusted for resident-level and facility-level characteristics. It is the difference between the predicted counts with and without the intervention. *The relative effect = (absolute Initiative effect) / (predicted count absent the Initiative). Acute care transitions* include hospitalizations, ED visits, or observation stays.

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

Table 4-6.   Initiative effect on Medicare expenditures, FY 2018, AQAF (Alabama)

Measure	Predicted expenditure absent the Initiative (dollars)	Absolute Initiative effect (dollars)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
Total Medicare expenditures	31,709	−703	−3,192	1,785	0.642	−2.2
Hospitalization expenditures						
All-cause	8,551	140	−1,178	1,459	0.861	1.6
Potentially avoidable	2,368	232	−334	799	0.500	9.8
Six qualifying conditions	960	187	−94	468	0.273	19.5
ED visit expenditures						
All-cause	272	6	−35	47	0.818	2.1
Potentially avoidable	109	23	−8	53	0.217	21.0
Six qualifying conditions	34	−1	−15	13	0.887	−3.5
Acute care transition expenditures						
All-cause	9,404	−159	−1,404	1,086	0.833	−1.7
Potentially avoidable	2,546	257	−241	756	0.396	10.1
Six qualifying conditions	976	189	−99	476	0.280	19.3
Payment-Only						
Total Medicare expenditures	26,289	203	−2,298	2,704	0.894	0.8
Hospitalization expenditures						
All-cause	6,052	307	−631	1,245	0.590	5.1
Potentially avoidable	1,601	294	−125	713	0.248	18.4
Six qualifying conditions	762	232	−64	528	0.197	30.4
ED visit expenditures						
All-cause	272	−9	−61	44	0.789	−3.1
Potentially avoidable	115	0	−31	32	0.980	0.4
Six qualifying conditions	47	−9	−33	15	0.518	−20.1
Acute care transition expenditures						
All-cause	6,391	387	−563	1,338	0.502	6.1
Potentially avoidable	1,735	303	−122	728	0.241	17.5
Six qualifying conditions	795	238	−44	520	0.164	30.0

ED = emergency department.

SOURCE: RTI analysis of Medicare claims data (RTI programs MS 113 and MS 114).

NOTE: The *predicted expenditure absent the Initiative* is the mean of the predicted expenditures, for the residents in the intervention group, under the scenario that the intervention did not occur. Predicted expenditures are based on a resident being eligible for the Initiative for the entire year (365 days). *The Initiative effect* is calculated based on a difference-in-differences regression model with a nationally selected comparison group and adjusted for resident-level and facility-level characteristics. It is the difference between the predicted expenditures with and without the intervention. The *relative effect* = (absolute Initiative effect) / (predicted expenditure absent the Initiative). *Acute care transitions* include hospitalizations, ED visits, or observation stays. Total *expenditures* cover all categories of Medicare spending: hospital, physician, SNF, home health, DME, lab and other providers and suppliers, hospice, and Part D drugs.

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

In 2018, AQAF leadership focused primarily on addressing the PAL they received from CMS, resulting in a model transition in Clinical + Payment facilities, and amid the model transition, a decline in available AQAF support for Payment-Only facilities. This may have resulted in relatively less NFI 2 engagement in 2018 compared to the prior year. In addition to AQAF model changes, Alabama continues to experience tremendous growth in managed care, including a plan developed by nursing home corporations in the state. Interviewees described concerns about the simultaneity of AQAF's model change with the boom in managed care. Many worried that the net effect would be lower facility and practitioner buy-in to NFI 2 and fewer eligible NFI 2 residents.

For more information about the Initiative in AQAF facilities, see **Appendix B** for a full summary of site visit and survey findings and **Tables M-3, N-3,** and **O-3** for descriptive results.

4.4   ATOP2 (Nevada/Colorado)

In Nevada's ATOP2 Clinical + Payment group, the Initiative was associated with statistically significant increases in four utilization and expenditure measures for eligible residents in FY 2018 (see **Tables 4-7, 4-8,** and **4-9**). In particular, there were increases in the probability, count, and expenditures for potentially avoidable hospitalizations, with no other consistency in the direction of the Initiative effect, including no patterns for the six qualifying conditions.

In the Payment-Only group (Colorado), the Initiative was associated with four statistically significant favorable reductions in utilization and expenditures, particularly for measures of ED visits for the six qualifying conditions. There was also one statistically significant increase in total Medicare expenditures, but this contrasted with the favorable results from the other hospital-related expenditures.

Table 4-7.   Initiative effect on probability of hospital-related utilization per resident, FY 2018, ATOP2 (Nevada/Colorado)

Measure	Predicted probability absent the Initiative (percent)	Absolute Initiative effect (percentage points)	90% CI		p-value	Relative effect (percent)
Clinical + Payment (Nevada)						
Any hospitalization						
All-cause	28.8	−1.6	−4.4	1.2	0.357	−5.4
Potentially avoidable	**9.0**	**2.5**	**0.3**	**4.7**	**0.056**	**27.9**
Six qualifying conditions	4.5	0.9	−0.8	2.5	0.377	19.4
Any ED visit						
All-cause	19.0	1.5	−2.6	5.7	0.547	8.0
Potentially avoidable	9.4	1.5	−2.1	5.1	0.487	16.0
Six qualifying conditions	3.2	−0.9	−3.5	1.7	0.559	−29.4
Any acute care transition						
All-cause	39.9	−2.1	−6.8	2.7	0.475	−5.1
Potentially avoidable	17.1	2.8	−0.5	6.1	0.166	16.2
Six qualifying conditions	7.2	0.0	−3.2	3.2	0.995	−0.1
Payment-Only (Colorado)						
Any hospitalization						
All-cause	19.1	1.3	−1.9	4.5	0.508	6.8
Potentially avoidable	8.0	0.1	−2.0	2.2	0.940	1.3
Six qualifying conditions	4.7	−0.9	−2.8	1.0	0.436	−19.5
Any ED visit						
All-cause	25.4	−1.5	−4.3	1.4	0.398	−5.7
Potentially avoidable	14.4	-1.2	−3.5	1.1	0.394	−8.4
Six qualifying conditions	**6.6**	**−2.5**	**−4.3**	**−0.7**	**0.024**	**−37.9**
Any acute care transition						
All-cause	35.6	−0.4	−3.5	2.6	0.818	−1.2
Potentially avoidable	20.0	−0.9	−3.7	1.9	0.605	−4.5
Six qualifying conditions	10.0	−2.6	−5.3	0.0	0.104	−26.4

ED = emergency department.

SOURCE: RTI analysis of Medicare claims data (RTI program MS 110).

NOTE: The *predicted probability absent the Initiative* is the mean of the predicted probabilities of experiencing the event during their respective exposure period, for the residents in the intervention group, under the scenario that the intervention did not occur. The *Initiative effect* is calculated based on a difference-in-differences regression model with a national comparison group and adjusted for resident-level and facility-level characteristics. It is the difference between the predicted probabilities of the event with and without the intervention. The *relative effect* = (absolute Initiative effect) / (predicted probability absent the Initiative). *Acute care transitions* include hospitalizations, ED visits, or observation stays.

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

Table 4-8. Initiative effect on count of hospital-related utilization events per resident, FY 2018, ATOP2 (Nevada/Colorado)

Measure	Predicted count absent the Initiative (events per year)	Absolute Initiative effect (events per year)	90% CI		p-value	Relative effect (percent)
Clinical + Payment (Nevada)						
Hospitalizations						
All-cause	0.479	−0.015	−0.077	0.047	0.690	−3.2
Potentially avoidable	**0.100**	**0.045**	**0.016**	**0.074**	**0.010**	**44.9**
Six qualifying conditions	0.049	0.012	−0.004	0.028	0.230	23.9
ED visits						
All-cause	0.322	0.002	−0.091	0.095	0.975	0.6
Potentially avoidable	0.122	0.018	−0.033	0.069	0.562	14.8
Six qualifying conditions	0.034	−0.011	−0.040	0.018	0.524	−32.7
Acute care transitions						
All-cause	0.819	−0.022	−0.140	0.097	0.765	−2.6
Potentially avoidable	0.229	0.058	−0.008	0.123	0.148	25.2
Six qualifying conditions	0.081	0.002	−0.036	0.039	0.948	1.8
Payment-Only (Colorado)						
Hospitalizations						
All-cause	0.272	0.004	−0.053	0.061	0.902	1.6
Potentially avoidable	0.096	0.002	−0.029	0.032	0.926	1.8
Six qualifying conditions	0.052	−0.005	−0.028	0.019	0.745	−9.0
ED visits						
All-cause	0.390	−0.039	−0.115	0.038	0.404	−10.0
Potentially avoidable	0.192	−0.031	−0.070	0.008	0.192	−16.0
Six qualifying conditions	**0.078**	**−0.034**	**−0.059**	**−0.010**	**0.023**	**−44.1**
Acute care transitions						
All-cause	0.670	−0.037	−0.146	0.072	0.577	−5.5
Potentially avoidable	0.288	−0.029	−0.080	0.023	0.358	−10.0
Six qualifying conditions	0.130	−0.039	−0.080	0.002	0.119	−30.2

ED = emergency department.

SOURCE: RTI analysis of Medicare claims data (RTI program MS 112).

NOTE: The *predicted count absent the Initiative* is the mean of the predicted counts of events, for the residents in the intervention group, under the scenario that the intervention did not occur. The *Initiative effect* is calculated based on a difference-in-differences regression model with a nationally selected comparison group and adjusted for resident-level and facility-level characteristics. It is the difference between the predicted counts with and without the intervention. *The relative effect = (absolute Initiative effect) / (predicted count absent the Initiative). Acute care transitions* include hospitalizations, ED visits, or observation stays.

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

Table 4-9. Initiative effect on Medicare expenditures, FY 2018, ATOP2 (Nevada/Colorado)

Measure	Predicted expenditure absent the Initiative (dollars)	Absolute Initiative effect (dollars)	90% CI		p-value	Relative effect (percent)
Clinical + Payment (Nevada)						
Total Medicare expenditures	33,972	−278	−4,633	4,077	0.916	−0.8
Hospitalization expenditures						
All-cause	15,151	−2,383	−5,704	938	0.238	−15.7
Potentially avoidable	**2,164**	**765**	**70**	**1,460**	**0.070**	**35.3**
Six qualifying conditions	998	349	−170	868	0.269	35.0
ED visit expenditures						
All-cause	335	46	−71	162	0.517	13.7
Potentially avoidable	109	24	−32	80	0.483	21.9
Six qualifying conditions	18	8	−9	25	0.454	44.1
Acute care transition expenditures						
All-cause	15,858	−2,215	−6,817	2,388	0.429	−14.0
Potentially avoidable	**2,379**	**878**	**107**	**1,649**	**0.061**	**36.9**
Six qualifying conditions	1,105	305	−366	975	0.455	27.6
Payment-Only (Colorado)						
Total Medicare expenditures	**20,233**	**2,720**	**490**	**4,949**	**0.045**	**13.4**
Hospitalization expenditures						
All-cause	5,059	−199	−1,334	937	0.773	−3.9
Potentially avoidable	1,699	−253	−782	277	0.433	−14.9
Six qualifying conditions	846	−211	−623	200	0.398	−25.0
ED visit expenditures						
All-cause	464	−108	−239	23	0.173	−23.3
Potentially avoidable	**256**	**−107**	**−171**	**−43**	**0.006**	**−41.7**
Six qualifying conditions	**105**	**−54**	**−90**	**−17**	**0.015**	**−51.4**
Acute care transition expenditures						
All-cause	5,620	−346	−1,539	847	0.633	−6.2
Potentially avoidable	2,045	−400	−899	100	0.188	−19.5
Six qualifying conditions	980	−291	−688	106	0.228	−29.7

ED = emergency department.

SOURCE: RTI analysis of Medicare claims data (RTI programs MS 113 and MS 114).

NOTE: The *predicted expenditure absent the Initiative* is the mean of the predicted expenditures, for the residents in the intervention group, under the scenario that the intervention did not occur. Predicted expenditures are based on a resident being eligible for the Initiative for the entire year (365 days). *The Initiative effect* is calculated based on a difference-in-differences regression model with a nationally selected comparison group and adjusted for resident-level and facility-level characteristics. It is the difference between the predicted expenditures with and without the intervention. The *relative effect* = (absolute Initiative effect) / (predicted expenditure absent the Initiative). *Acute care transitions* include hospitalizations, ED visits, or observation stays. Total *expenditures* cover all categories of Medicare spending: hospital, physician, SNF, home health, DME, lab and other providers and suppliers, hospice, and Part D drugs.

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

Primary data collection findings indicate no major developments or changes compared to the prior year. In Clinical + Payment facilities, ECCP nurses continued to drive engagement with NFI 2. Similar to other states, eligibility for ATOP2 was perceived as decreasing in Nevada because of increasing managed care penetration. Although engagement still varied in Payment-Only facilities, especially for a subset of more rural Colorado facilities, the remaining facilities were well positioned to implement the Initiative. Similar to last year, these facilities reported that their existing high standards of care means that NFI 2 effectively reimburses them for the kinds of care they were already providing prior to participating in the Initiative.

For more information about the Initiative in ATOP2 facilities, see **Appendix C** for a full summary of site visit and survey findings and **Tables M-4, N-4,** and **O-4** for descriptive results.

4.5   MOQI (Missouri)

In the Clinical + Payment group, the Initiative was associated with nine statistically significant increases in utilization and expenditures, especially for measures of all-cause hospitalizations and acute care transitions (see **Tables 4-10, 4-11,** and **4-12**). There were no statistically significant increases in measures relating to the six conditions, although the direction of effects was more promising for related expenditures overall.

In the Payment-Only group, the Initiative was associated with one statistically significant increase in the probability of a potentially avoidable ED visit for the six qualifying conditions. This finding was consistent with an overall pattern of increases in utilization and expenditures. However, the Initiative effect on the probability of a hospitalization for the six qualifying conditions was in a favorable direction, although not statistically significant.

Table 4-10. Initiative effect on probability of hospital-related utilization per resident, FY 2018, MOQI (Missouri)

Measure	Predicted probability absent the Initiative (percent)	Absolute Initiative effect (percentage points)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
Any hospitalization						
All-cause	**22.7**	**4.0**	**1.8**	**6.2**	**0.003**	**17.6**
Potentially avoidable	9.7	1.4	−0.8	3.5	0.298	14.0
Six qualifying conditions	5.4	0.6	−1.0	2.1	0.570	10.2
Any ED visit						
All-cause	**15.3**	**4.6**	**1.1**	**8.2**	**0.033**	**30.4**
Potentially avoidable	8.0	1.3	−1.0	3.6	0.347	16.5
Six qualifying conditions	1.5	0.6	−0.4	1.6	0.319	40.4
Any acute care transition						
All-cause	**31.8**	**6.0**	**3.1**	**9.0**	**0.001**	**19.0**
Potentially avoidable	16.1	2.4	−0.9	5.7	0.229	15.0
Six qualifying conditions	6.4	1.4	−0.4	3.1	0.196	21.2
Payment-Only						
Any hospitalization						
All-cause	28.8	0.2	−3.2	3.6	0.923	0.7
Potentially avoidable	14.9	−0.3	−2.6	2.1	0.863	−1.7
Six qualifying conditions	9.3	−0.4	−2.4	1.6	0.760	−4.0
Any ED visit						
All-cause	28.3	3.1	−0.5	6.7	0.154	11.1
Potentially avoidable	17.2	1.5	−1.5	4.5	0.417	8.7
Six qualifying conditions	**5.0**	**2.0**	**0.3**	**3.8**	**0.054**	**40.8**
Any acute care transition						
All-cause	43.7	2.4	−1.5	6.3	0.306	5.5
Potentially avoidable	26.7	1.2	−2.7	5.1	0.607	4.5
Six qualifying conditions	12.6	0.7	−1.9	3.3	0.656	5.6

ED = emergency department.

SOURCE: RTI analysis of Medicare claims data (RTI program MS 110).

NOTE: The *predicted probability absent the Initiative* is the mean of the predicted probabilities of experiencing the event during their respective exposure period, for the residents in the intervention group, under the scenario that the intervention did not occur. The *Initiative effect* is calculated based on a difference-in-differences regression model with a national comparison group and adjusted for resident-level and facility-level characteristics. It is the difference between the predicted probabilities of the event with and without the intervention. The *relative effect* = (absolute Initiative effect) / (predicted probability absent the Initiative). *Acute care transitions* include hospitalizations, ED visits, or observation stays.

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

Table 4-11. Initiative effect on count of hospital-related utilization events per resident, FY 2018, MOQI (Missouri)

Measure	Predicted count absent the Initiative (events per year)	Absolute Initiative effect (events per year)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
Hospitalizations						
All-cause	**0.337**	**0.084**	**0.030**	**0.138**	**0.011**	**24.9**
Potentially avoidable	0.113	0.019	−0.006	0.044	0.212	16.8
Six qualifying conditions	0.063	0.007	−0.013	0.026	0.566	10.6
ED visits						
All–cause	**0.215**	**0.056**	**0.007**	**0.105**	**0.059**	**26.2**
Potentially avoidable	0.088	0.013	−0.014	0.040	0.439	14.5
Six qualifying conditions	0.014	0.008	−0.002	0.017	0.175	52.4
Acute care transitions						
All–cause	**0.546**	**0.144**	**0.067**	**0.221**	**0.002**	**26.4**
Potentially avoidable	0.202	0.032	−0.012	0.075	0.228	15.7
Six qualifying conditions	0.078	0.013	−0.010	0.036	0.346	16.9
Payment-Only						
Hospitalizations						
All-cause	0.447	−0.006	−0.083	0.071	0.896	−1.4
Potentially avoidable	0.177	0.004	−0.031	0.039	0.854	2.2
Six qualifying conditions	0.111	−0.004	−0.030	0.022	0.789	−3.9
ED visits						
All-cause	0.435	0.064	−0.008	0.136	0.144	14.7
Potentially avoidable	0.231	0.011	−0.028	0.050	0.644	4.8
Six qualifying conditions	0.062	0.021	−0.001	0.042	0.122	32.9
Acute care transitions						
All-cause	0.885	0.065	−0.054	0.183	0.370	7.3
Potentially avoidable	0.409	0.015	−0.044	0.075	0.672	3.8
Six qualifying conditions	0.175	0.016	−0.026	0.058	0.535	9.0

ED = emergency department.

SOURCE: RTI analysis of Medicare claims data (RTI program MS 112).

NOTE: The *predicted count absent the Initiative* is the mean of the predicted counts of events, for the residents in the intervention group, under the scenario that the intervention did not occur. The *Initiative effect* is calculated based on a difference-in-differences regression model with a nationally selected comparison group and adjusted for resident-level and facility-level characteristics. It is the difference between the predicted counts with and without the intervention. *The relative effect = (absolute Initiative effect) / (predicted count absent the Initiative). Acute care transitions* include hospitalizations, ED visits, or observation stays.

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

Table 4-12.   Initiative effect on Medicare expenditures, FY 2018, MOQI (Missouri)

Measure	Predicted expenditure absent the Initiative (dollars)	Absolute Initiative effect (dollars)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
Total Medicare expenditures	**26,096**	**2,144**	**516**	**3,772**	**0.030**	**8.2**
Hospitalization expenditures						
All-cause	**5,657**	**1,220**	**431**	**2,009**	**0.011**	**21.6**
Potentially avoidable	1,709	−60	−605	485	0.856	−3.5
Six qualifying conditions	1,060	−251	−634	133	0.282	−23.6
ED visit expenditures						
All-cause	223	47	−11	105	0.185	21.1
Potentially avoidable	78	11	−25	46	0.628	13.4
Six qualifying conditions	21	6	−14	26	0.649	26.1
Acute care transition expenditures						
All-cause	**6,080**	**1,249**	**210**	**2,288**	**0.048**	**20.5**
Potentially avoidable	1,763	−26	−577	526	0.938	−1.5
Six qualifying conditions	1,070	−232	−616	152	0.321	−21.7
Payment-Only						
Total Medicare expenditures	24,699	1,347	−340	3,034	0.189	5.5
Hospitalization expenditures						
All-cause	6,453	503	−563	1,570	0.437	7.8
Potentially avoidable	2,110	344	−128	817	0.231	16.3
Six qualifying conditions	1,278	40	−297	378	0.844	3.2
ED visit expenditures						
All-cause	379	48	−40	137	0.368	12.8
Potentially avoidable	169	20	−16	57	0.362	11.9
Six qualifying conditions	58	16	−9	41	0.301	27.3
Acute care transition expenditures						
All-cause	6,996	479	−484	1,443	0.413	6.8
Potentially avoidable	2,331	333	−244	910	0.342	14.3
Six qualifying conditions	1,374	24	−364	412	0.920	1.7

ED = emergency department.

SOURCE: RTI analysis of Medicare claims data (RTI programs MS 113 and MS 114).

NOTE: The *predicted expenditure absent the Initiative* is the mean of the predicted expenditures, for the residents in the intervention group, under the scenario that the intervention did not occur. Predicted expenditures are based on a resident being eligible for the Initiative for the entire year (365 days). *The Initiative effect* is calculated based on a difference-in-differences regression model with a nationally selected comparison group and adjusted for resident-level and facility-level characteristics. It is the difference between the predicted expenditures with and without the intervention. The *relative effect* = (absolute Initiative effect) / (predicted expenditure absent the Initiative). *Acute care transitions* include hospitalizations, ED visits, or observation stays. Total *expenditures* cover all categories of Medicare spending: hospital, physician, SNF, home health, DME, lab and other providers and suppliers, hospice, and Part D drugs.

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

Overall, facility staff interviewees shared positive comments about the Initiative and its impact on their residents. In both intervention groups, MOQI staff provided additional training to facility staff on the criteria for the six qualifying conditions, required documentation, and claims submissions. Despite these positive sentiments, some facilities have few residents who are eligible for the Initiative, and a number of facilities reported high turnover among facility leadership, making NFI 2 sustainability a challenge.

For more information about the Initiative in MOQI facilities, see **Appendix D** for a full summary of site visit and survey findings and **Tables M-5, N-5,** and **O-5** for descriptive results.

4.6   NY-RAH (New York)

In the Clinical + Payment group, eligible residents' participation in the Initiative was associated with three statistically significant increases in utilization and expenditure measures (see **Tables 4-13, 4-14,** and **4-15**). Although the majority of measures were in an unfavorable direction, the direction of effects for the six qualifying conditions indicated a somewhat more promising pattern, although none of these were statistically significant.

For residents in the Payment-Only group, the Initiative was associated with four statistically significant increases, three of them for expenditures. This is consistent with an overall pattern of increased utilization and expenditures, which holds for measures of the six qualifying conditions. The unfavorable direction of effects is consistent for the count and expenditure outcomes, but more mixed for the probability measures.

Table 4-13. **Initiative effect on probability of hospital-related utilization per resident, FY 2018, NY-RAH (New York)**

Measure	Predicted probability absent the Initiative (percent)	Absolute Initiative effect (percentage points)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
Any hospitalization						
All-cause	27.1	0.8	−1.7	3.4	0.588	3.1
Potentially avoidable	10.9	0.6	−1.9	3.2	0.678	5.9
Six qualifying conditions	6.7	−0.6	−2.2	1.1	0.592	−8.2
Any ED visit						
All-cause	16.7	2.2	−0.4	4.8	0.167	13.2
Potentially avoidable	8.6	0.9	−0.4	2.1	0.258	10.2
Six qualifying conditions	1.7	−0.5	−1.3	0.2	0.233	−31.7
Any acute care transition						
All-cause	35.5	2.4	−0.8	5.7	0.222	6.8
Potentially avoidable	17.8	1.1	−1.6	3.7	0.514	5.9
Six qualifying conditions	8.1	−1.1	−3.0	0.8	0.336	−13.7
Payment-Only						
Any hospitalization						
All-cause	25.8	−0.3	−3.1	2.4	0.846	−1.3
Potentially avoidable	**9.5**	**1.8**	**0.4**	**3.1**	**0.034**	**18.4**
Six qualifying conditions	5.6	−0.1	−1.2	1.1	0.930	−1.1
Any ED visit						
All-cause	20.7	−1.0	−3.8	1.8	0.568	−4.7
Potentially avoidable	11.8	−0.6	−2.5	1.3	0.579	−5.4
Six qualifying conditions	2.4	0.2	−0.6	0.9	0.700	7.6
Any acute care transition						
All-cause	37.5	−0.9	−3.6	1.7	0.562	−2.5
Potentially avoidable	18.9	1.3	−1.0	3.5	0.351	6.6
Six qualifying conditions	7.4	0.2	−1.1	1.5	0.806	2.6

ED = emergency department.

SOURCE: RTI analysis of Medicare claims data (RTI program MS 110).

NOTE: The *predicted probability absent the Initiative* is the mean of the predicted probabilities of experiencing the event during their respective exposure period, for the residents in the intervention group, under the scenario that the intervention did not occur. The *Initiative effect* is calculated based on a difference-in-differences regression model with a national comparison group and adjusted for resident-level and facility-level characteristics. It is the difference between the predicted probabilities of the event with and without the intervention. The *relative effect* = (absolute Initiative effect) / (predicted probability absent the Initiative). *Acute care transitions* include hospitalizations, ED visits, or observation stays.

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

Table 4-14. Initiative effect on count of hospital-related utilization events per resident, FY 2018, NY-RAH (New York)

Measure	Predicted count absent the Initiative (events per year)	Absolute Initiative effect (events per year)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
Hospitalizations						
All-cause	0.483	−0.011	−0.073	0.051	0.769	−2.3
Potentially avoidable	0.136	0.007	−0.028	0.043	0.736	5.4
Six qualifying conditions	0.081	−0.010	−0.032	0.013	0.474	−11.9
ED visits						
All–cause	**0.243**	**0.056**	**0.011**	**0.100**	**0.038**	**23.1**
Potentially avoidable	**0.101**	**0.020**	**0.004**	**0.036**	**0.040**	**19.7**
Six qualifying conditions	0.019	−0.007	−0.015	0.001	0.150	−38.9
Acute care transitions						
All–cause	0.712	0.060	−0.027	0.147	0.259	8.4
Potentially avoidable	0.233	0.031	−0.010	0.072	0.210	13.3
Six qualifying conditions	0.100	−0.017	−0.044	0.010	0.300	−17.0
Payment-Only						
Hospitalizations						
All-cause	0.395	0.032	−0.027	0.091	0.372	8.1
Potentially avoidable	0.118	0.018	−0.002	0.037	0.143	15.0
Six qualifying conditions	0.061	0.002	−0.011	0.015	0.827	2.8
ED visits						
All-cause	0.311	0.017	−0.053	0.086	0.692	5.4
Potentially avoidable	0.140	−0.002	−0.025	0.020	0.866	−1.6
Six qualifying conditions	0.024	0.002	−0.006	0.010	0.687	8.2
Acute care transitions						
All-cause	0.700	0.055	−0.060	0.169	0.434	7.8
Potentially avoidable	0.257	0.017	−0.018	0.053	0.418	6.8
Six qualifying conditions	0.086	0.004	−0.012	0.020	0.665	4.9

ED = emergency department.

SOURCE: RTI analysis of Medicare claims data (RTI program MS 112).

NOTE: The *predicted count absent the Initiative* is the mean of the predicted counts of events, for the residents in the intervention group, under the scenario that the intervention did not occur. The *Initiative effect* is calculated based on a difference-in-differences regression model with a nationally selected comparison group and adjusted for resident-level and facility-level characteristics. It is the difference between the predicted counts with and without the intervention. *The relative effect = (absolute Initiative effect) / (predicted count absent the Initiative). Acute care transitions* include hospitalizations, ED visits, or observation stays.

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

Table 4-15. Initiative effect on Medicare expenditures, FY 2018, NY-RAH (New York)

Measure	Predicted expenditure absent the Initiative (dollars)	Absolute Initiative effect (dollars)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
Total Medicare expenditures	**41,791**	**4,265**	**799**	**7,731**	**0.043**	**10.2**
Hospitalization expenditures						
All-cause	15,489	964	−1,386	3,315	0.500	6.2
Potentially avoidable	3,148	548	−279	1,375	0.276	17.4
Six qualifying conditions	1,764	129	−438	697	0.708	7.3
ED visit expenditures						
All-cause	299	−18	−87	51	0.675	−5.9
Potentially avoidable	114	1	−29	32	0.937	1.3
Six qualifying conditions	24	−11	−23	1	0.135	−45.0
Acute care transition expenditures						
All-cause	16,539	941	−1,668	3,549	0.553	5.7
Potentially avoidable	3,302	562	−199	1,324	0.224	17.0
Six qualifying conditions	1,853	82	−501	665	0.818	4.4
Payment-Only						
Total Medicare expenditures	**32,207**	**2,645**	**583**	**4,707**	**0.035**	**8.2**
Hospitalization expenditures						
All-cause	**10,287**	**1,299**	**65**	**2,532**	**0.083**	**12.6**
Potentially avoidable	2,432	260	−182	702	0.333	10.7
Six qualifying conditions	1,231	67	−253	388	0.730	5.5
ED visit expenditures						
All-cause	277	23	−34	81	0.508	8.4
Potentially avoidable	119	7	−20	35	0.656	6.3
Six qualifying conditions	26	7	−4	18	0.315	26.7
Acute care transition expenditures						
All-cause	**10,824**	**1,252**	**195**	**2,309**	**0.051**	**11.6**
Potentially avoidable	2,623	239	−226	703	0.398	9.1
Six qualifying conditions	1,284	70	−260	400	0.728	5.4

ED = emergency department.

SOURCE: RTI analysis of Medicare claims data (RTI programs MS 113 and MS 114).

NOTE: The *predicted expenditure absent the Initiative* is the mean of the predicted expenditures, for the residents in the intervention group, under the scenario that the intervention did not occur. Predicted expenditures are based on a resident being eligible for the Initiative for the entire year (365 days). *The Initiative effect* is calculated based on a difference-in-differences regression model with a nationally selected comparison group and adjusted for resident-level and facility-level characteristics. It is the difference between the predicted expenditures with and without the intervention. The *relative effect* = (absolute Initiative effect) / (predicted expenditure absent the Initiative). *Acute care transitions* include hospitalizations, ED visits, or observation stays. Total *expenditures* cover all categories of Medicare spending: hospital, physician, SNF, home health, DME, lab and other providers and suppliers, hospice, and Part D drugs.

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

During FY 2018, the NY-RAH leadership team began shifting their overall model, including diminishing the role of their NY-RAH Registered Nurse Care Coordinators (RNCCs) in participating Clinical + Payment facilities. By the end of FY 2018, the RNCC role had been dissolved completely. In addition to the model change itself, anticipation of the imminent model changes may have had negative effects, as several facilities reported losing their RNCCs prior to the end of year because these nurses knew they would be losing their jobs. Although the model change affected only Clinical + Payment facilities directly, the general shift in focus of NY-RAH leadership during the model transition also may have reduced engagement across participating facilities.

For more information about the Initiative in NY-RAH facilities, see **Appendix E** for a full summary of site visit and survey findings and **Tables M-6, N-6,** and **O-6** for descriptive results.

4.7 OPTIMISTIC (Indiana)

In OPTIMISTIC's Clinical + Payment group, the Initiative was not associated with any statistically significant changes in utilization or expenditures for eligible residents in FY 2018 (see **Tables 4-16, 4-17,** and **4-18**). However, there was an overall pattern of reductions in the desired direction, in contrast to the other ECCPs' Clinical + Payment groups. Measures of probability and expenditures were generally more promising than counts. Effects for the six qualifying conditions were less promising than the overall pattern.

In the Payment-Only group, the Initiative was associated with four statistically significant increases in utilization and expenditures, particularly for measures of all-cause ED visits. Although the direction of the utilization measures indicated a pattern of increases, this finding was less consistent for the expenditures. The direction of effect for measures of the six qualifying conditions was slightly more favorable than the all-cause and potentially avoidable measures.

Table 4-16. Initiative effect on probability of hospital-related utilization per resident, FY 2018, OPTIMISTIC (Indiana)

Measure	Predicted probability absent the Initiative (percent)	Absolute Initiative effect (percentage points)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
Any hospitalization						
All-cause	25.7	−0.1	−3.1	3.0	0.979	−0.2
Potentially avoidable	12.0	−0.4	−2.5	1.7	0.752	−3.4
Six qualifying conditions	5.8	0.6	−1.0	2.1	0.546	9.7
Any ED visit						
All-cause	22.1	−1.5	−5.0	2.1	0.500	−6.6
Potentially avoidable	12.0	−0.2	−2.5	2.1	0.867	−1.9
Six qualifying conditions	2.6	0.0	−1.0	1.0	0.971	−0.8
Any acute care transition						
All-cause	39.4	−2.1	−6.0	1.9	0.387	−5.3
Potentially avoidable	21.5	−0.6	−3.7	2.4	0.739	−2.9
Six qualifying conditions	8.5	0.0	−1.9	2.0	0.971	0.5
Payment-Only						
Any hospitalization						
All-cause	25.5	1.3	−1.7	4.2	0.487	4.9
Potentially avoidable	12.2	0.8	−1.5	3.0	0.574	6.3
Six qualifying conditions	6.8	0.0	−1.7	1.7	0.988	0.3
Any ED visit						
All-cause	**24.3**	**2.9**	**0.2**	**5.6**	**0.077**	**12.0**
Potentially avoidable	15.5	0.5	-2.2	3.2	0.779	3.0
Six qualifying conditions	4.0	−0.2	−1.7	1.4	0.874	−3.8
Any acute care transition						
All-cause	39.8	1.9	−0.8	4.5	0.254	4.7
Potentially avoidable	23.6	1.3	−1.7	4.4	0.471	5.6
Six qualifying conditions	9.4	0.5	−1.5	2.6	0.677	5.6

ED = emergency department.

SOURCE: RTI analysis of Medicare claims data (RTI program MS 110).

NOTE: The *predicted probability absent the Initiative* is the mean of the predicted probabilities of experiencing the event during their respective exposure period, for the residents in the intervention group, under the scenario that the intervention did not occur. The *Initiative effect* is calculated based on a difference-in-differences regression model with a national comparison group and adjusted for resident-level and facility-level characteristics. It is the difference between the predicted probabilities of the event with and without the intervention. The *relative effect* = (absolute Initiative effect) / (predicted probability absent the Initiative). *Acute care transitions* include hospitalizations, ED visits, or observation stays.

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

Table 4-17. Initiative effect on count of hospital-related utilization events per resident, FY 2018, OPTIMISTIC (Indiana)

Measure	Predicted count absent the Initiative (events per year)	Absolute Initiative effect (events per year)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
Hospitalizations						
All-cause	0.380	0.007	−0.050	0.065	0.835	1.9
Potentially avoidable	0.127	0.011	−0.021	0.043	0.578	8.6
Six qualifying conditions	0.060	0.010	−0.009	0.029	0.365	17.2
ED visits						
All–cause	0.303	−0.031	−0.082	0.020	0.322	−10.1
Potentially avoidable	0.137	−0.001	−0.029	0.028	0.969	−0.5
Six qualifying conditions	0.028	0.002	−0.009	0.012	0.807	5.4
Acute care transitions						
All–cause	0.682	−0.027	−0.101	0.046	0.539	−4.0
Potentially avoidable	0.267	0.006	−0.033	0.045	0.809	2.1
Six qualifying conditions	0.088	0.011	−0.009	0.030	0.358	12.2
Payment-Only						
Hospitalizations						
All-cause	0.388	0.031	−0.031	0.093	0.408	8.0
Potentially avoidable	0.152	0.013	−0.019	0.045	0.506	8.5
Six qualifying conditions	0.084	0.002	−0.024	0.027	0.922	1.8
ED visits						
All-cause	**0.360**	**0.056**	**0.006**	**0.105**	**0.066**	**15.4**
Potentially avoidable	0.195	0.013	−0.027	0.053	0.589	6.7
Six qualifying conditions	0.046	−0.004	−0.023	0.015	0.745	−8.2
Acute care transitions						
All-cause	0.754	0.090	−0.002	0.182	0.107	12.0
Potentially avoidable	0.346	0.028	−0.028	0.085	0.414	8.1
Six qualifying conditions	0.129	−0.004	−0.038	0.031	0.868	−2.7

ED = emergency department.

SOURCE: RTI analysis of Medicare claims data (RTI program MS 112).

NOTE: The *predicted count absent the Initiative* is the mean of the predicted counts of events, for the residents in the intervention group, under the scenario that the intervention did not occur. The *Initiative effect* is calculated based on a difference-in-differences regression model with a nationally selected comparison group and adjusted for resident-level and facility-level characteristics. It is the difference between the predicted counts with and without the intervention. *The relative effect = (absolute Initiative effect) / (predicted count absent the Initiative). Acute care transitions* include hospitalizations, ED visits, or observation stays.

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

Table 4-18.   Initiative effect on Medicare expenditures, FY 2018, OPTIMISTIC (Indiana)

Measure	Predicted expenditure absent the Initiative (dollars)	Absolute Initiative effect (dollars)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
Total Medicare expenditures	35,373	−1,866	−5,044	1,312	0.334	−5.3
Hospitalization expenditures						
All-cause	8,157	−498	−1,473	477	0.400	−6.1
Potentially avoidable	2,597	−315	−907	276	0.381	−12.1
Six qualifying conditions	859	215	−124	554	0.297	25.0
ED visit expenditures						
All-cause	319	−54	−122	13	0.186	−17.0
Potentially avoidable	134	−14	−52	24	0.535	−10.7
Six qualifying conditions	28	3	−14	20	0.762	11.2
Acute care transition expenditures						
All-cause	8,783	−814	−1,980	351	0.250	−9.3
Potentially avoidable	2,845	−437	−1,122	247	0.294	−15.4
Six qualifying conditions	884	198	−150	547	0.349	22.5
Payment-Only						
Total Medicare expenditures	29,460	−631	−2,693	1,431	0.615	−2.1
Hospitalization expenditures						
All-cause	7,401	44	−1,168	1,256	0.952	0.6
Potentially avoidable	2,604	−109	−723	505	0.771	−4.2
Six qualifying conditions	1,453	−270	−759	218	0.363	−18.6
ED visit expenditures						
All-cause	**308**	**100**	**35**	**164**	**0.011**	**32.3**
Potentially avoidable	**143**	**58**	**19**	**97**	**0.014**	**40.9**
Six qualifying conditions	50	4	−19	28	0.762	8.7
Acute care transition expenditures						
All-cause	8,025	−17	−1,680	1,646	0.987	−0.2
Potentially avoidable	2,798	−3	−631	626	0.995	−0.1
Six qualifying conditions	1,537	−281	−785	223	0.360	−18.3

ED = emergency department.

SOURCE: RTI analysis of Medicare claims data (RTI programs MS 113 and MS 114).

NOTE: The *predicted expenditure absent the Initiative* is the mean of the predicted expenditures, for the residents in the intervention group, under the scenario that the intervention did not occur. Predicted expenditures are based on a resident being eligible for the Initiative for the entire year (365 days). *The Initiative effect* is calculated based on a difference-in-differences regression model with a nationally selected comparison group and adjusted for resident-level and facility-level characteristics. It is the difference between the predicted expenditures with and without the intervention. The *relative effect* = (absolute Initiative effect) / (predicted expenditure absent the Initiative). *Acute care transitions* include hospitalizations, ED visits, or observation stays. Total *expenditures* cover all categories of Medicare spending: hospital, physician, SNF, home health, DME, lab and other providers and suppliers, hospice, and Part D drugs.

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

Across both intervention groups, facility staff shared positive sentiments regarding NFI 2, particularly regarding improved nursing skills and data integration. However, ECCP clinical nurse hours in Clinical + Payment facilities have decreased and the initial focus on facility staff communication and training has been supplanted by a focus on billing documentation. Also, given earlier model achievements in NFI 1, it is possible that some positive feedback relates to prior successes, rather than specific FY 2018 achievements.

For more information about the Initiative in OPTIMISTIC facilities, see **Appendix F** for a full summary of site visit and survey findings and **Tables M-7, N-7,** and **O-7** for descriptive results.

4.8   RAVEN (Pennsylvania)

In the Clinical + Payment group, participation in the Initiative was associated with 12 statistically significant increases in measures of utilization and expenditures (see **Tables 4-19, 4-20,** and **4-21**). In particular, the Initiative effects indicated statistically significant increases in the probability, count, and expenditures for potentially avoidable hospitalizations and hospitalizations and acute care transitions for the six qualifying conditions.

In contrast, among residents in the Payment-Only group, participation in the Initiative was associated with six statistically significant favorable reductions in utilization and expenditures. These included reductions in the probability and count of all-cause acute care transitions and counts and expenditures for potentially avoidable hospitalizations. Results for the six qualifying conditions indicated a similar pattern, but none were statistically significant.

Table 4-19. Initiative effect on probability of hospital-related utilization per resident, FY 2018, RAVEN (Pennsylvania)

Measure	Predicted probability absent the Initiative (percent)	Absolute Initiative effect (percentage points)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
Any hospitalization						
All-cause	19.8	0.7	−1.6	3.0	0.624	3.4
Potentially avoidable	**7.7**	**2.0**	**0.2**	**3.7**	**0.061**	**25.5**
Six qualifying conditions	**3.1**	**2.7**	**1.7**	**3.7**	**0.000**	**87.0**
Any ED visit						
All-cause	**15.5**	**2.5**	**0.3**	**4.7**	**0.061**	**16.0**
Potentially avoidable	8.5	1.1	−1.0	3.3	0.383	13.3
Six qualifying conditions	2.5	0.2	−1.0	1.4	0.816	6.9
Any acute care transition						
All-cause	29.1	1.4	−1.7	4.5	0.453	4.9
Potentially avoidable	14.4	2.9	−0.2	5.9	0.121	19.8
Six qualifying conditions	**5.2**	**2.7**	**1.4**	**4.0**	**0.001**	**52.7**
Payment-Only						
Any hospitalization						
All-cause	28.1	−2.6	−6.4	1.2	0.253	−9.4
Potentially avoidable	13.5	−1.4	−4.1	1.3	0.396	−10.2
Six qualifying conditions	7.3	−0.3	−2.8	2.2	0.839	−4.1
Any ED visit						
All-cause	22.7	−3.3	−7.1	0.5	0.158	−14.6
Potentially avoidable	10.5	−0.3	−3.3	2.6	0.849	−3.2
Six qualifying conditions	3.5	−0.2	−1.7	1.2	0.804	−6.4
Any acute care transition						
All-cause	**40.8**	**−5.2**	**−9.5**	**−0.9**	**0.049**	**−12.6**
Potentially avoidable	21.9	−3.2	−7.0	0.7	0.174	−14.4
Six qualifying conditions	10.4	−1.1	−3.6	1.4	0.478	−10.5

ED = emergency department.

SOURCE: RTI analysis of Medicare claims data (RTI program MS 110).

NOTE: The *predicted probability absent the Initiative* is the mean of the predicted probabilities of experiencing the event during their respective exposure period, for the residents in the intervention group, under the scenario that the intervention did not occur. The *Initiative effect* is calculated based on a difference-in-differences regression model with a national comparison group and adjusted for resident-level and facility-level characteristics. It is the difference between the predicted probabilities of the event with and without the intervention. The *relative effect* = (absolute Initiative effect) / (predicted probability absent the Initiative). *Acute care transitions* include hospitalizations, ED visits, or observation stays.

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

Table 4-20. Initiative effect on count of hospital-related utilization events per resident, FY 2018, RAVEN (Pennsylvania)

Measure	Predicted count absent the Initiative (events per year)	Absolute Initiative effect (events per year)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
Hospitalizations						
All-cause	0.289	0.036	−0.003	0.075	0.129	12.4
Potentially avoidable	**0.088**	**0.030**	**0.003**	**0.056**	**0.065**	**33.8**
Six qualifying conditions	**0.032**	**0.036**	**0.023**	**0.049**	**0.000**	**112.9**
ED visits						
All–cause	0.215	0.032	−0.031	0.094	0.406	14.7
Potentially avoidable	0.098	0.009	−0.020	0.037	0.618	8.8
Six qualifying conditions	0.028	0.001	−0.012	0.015	0.879	4.3
Acute care transitions						
All–cause	0.501	0.062	−0.028	0.151	0.258	12.3
Potentially avoidable	0.187	0.037	−0.014	0.087	0.239	19.6
Six qualifying conditions	**0.058**	**0.039**	**0.023**	**0.056**	**0.000**	**67.8**
Payment-Only						
Hospitalizations						
All-cause	**0.485**	**−0.095**	**−0.169**	**−0.022**	**0.033**	**−19.7**
Potentially avoidable	**0.172**	**−0.033**	**−0.064**	**−0.002**	**0.080**	**−19.3**
Six qualifying conditions	0.086	−0.009	−0.039	0.021	0.630	−10.2
ED visits						
All-cause	0.328	−0.068	−0.139	0.004	0.119	−20.7
Potentially avoidable	0.113	−0.001	−0.036	0.034	0.959	−1.0
Six qualifying conditions	0.037	−0.003	−0.018	0.013	0.793	−6.7
Acute care transitions						
All-cause	**0.812**	**−0.166**	**−0.270**	**−0.062**	**0.009**	**−20.4**
Potentially avoidable	0.284	−0.035	−0.080	0.010	0.203	−12.3
Six qualifying conditions	0.124	−0.013	−0.046	0.020	0.529	−10.2

ED = emergency department.

SOURCE: RTI analysis of Medicare claims data (RTI program MS 112).

NOTE: The *predicted count absent the Initiative* is the mean of the predicted counts of events, for the residents in the intervention group, under the scenario that the intervention did not occur. The *Initiative effect* is calculated based on a difference-in-differences regression model with a nationally selected comparison group and adjusted for resident-level and facility-level characteristics. It is the difference between the predicted counts with and without the intervention. *The relative effect = (absolute Initiative effect) / (predicted count absent the Initiative). Acute care transitions* include hospitalizations, ED visits, or observation stays*.

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

Table 4-21.   Initiative effect on Medicare expenditures, FY 2018, RAVEN (Pennsylvania)

Measure	Predicted expenditure absent the Initiative (dollars)	Absolute Initiative effect (dollars)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
Total Medicare expenditures	**24,944**	**2,131**	**310**	**3,952**	**0.054**	**8.5**
Hospitalization expenditures						
All-cause	5,269	940	−63	1,943	0.123	17.8
Potentially avoidable	**1,176**	**426**	**11**	**842**	**0.092**	**36.3**
Six qualifying conditions	**403**	**411**	**233**	**590**	**0.000**	**102.1**
ED visit expenditures						
All-cause	181	39	−18	97	0.262	21.6
Potentially avoidable	86	−5	−35	25	0.793	−5.6
Six qualifying conditions	33	−3	−24	19	0.839	−8.2
Acute care transition expenditures						
All-cause	**5,460**	**829**	**50**	**1,609**	**0.080**	**15.2**
Potentially avoidable	1,283	385	−3	773	0.102	30.0
Six qualifying conditions	**434**	**406**	**215**	**596**	**0.001**	**93.4**
Payment-Only						
Total Medicare expenditures	32,444	−2,488	−5,981	1,004	0.241	−7.7
Hospitalization expenditures						
All-cause	8,673	−1,314	−2,931	304	0.182	−15.1
Potentially avoidable	**2,651**	**−723**	**−1,281**	**−166**	**0.033**	**−27.3**
Six qualifying conditions	1,343	−295	−773	182	0.309	−22.0
ED visit expenditures						
All-cause	316	−59	−150	33	0.292	−18.5
Potentially avoidable	89	10	−20	40	0.597	10.9
Six qualifying conditions	31	4	−13	22	0.691	13.9
Acute care transition expenditures						
All-cause	9,272	−1,391	−3,068	287	0.173	−15.0
Potentially avoidable	**2,885**	**−809**	**−1,437**	**−181**	**0.034**	**−28.0**
Six qualifying conditions	1,419	−323	−818	173	0.285	−22.7

ED = emergency department.

SOURCE: RTI analysis of Medicare claims data (RTI programs MS 113 and MS 114).

NOTE: The *predicted expenditure absent the Initiative* is the mean of the predicted expenditures, for the residents in the intervention group, under the scenario that the intervention did not occur. Predicted expenditures are based on a resident being eligible for the Initiative for the entire year (365 days). *The Initiative effect* is calculated based on a difference-in-differences regression model with a nationally selected comparison group and adjusted for resident-level and facility-level characteristics. It is the difference between the predicted expenditures with and without the intervention. The *relative effect* = (absolute Initiative effect) / (predicted expenditure absent the Initiative). *Acute care transitions* include hospitalizations, ED visits, or observation stays. Total *expenditures* cover all categories of Medicare spending: hospital, physician, SNF, home health, DME, lab and other providers and suppliers, hospice, and Part D drugs.

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

Among Clinical + Payment facilities, staff turnover continues to be a challenge, which may potentially lower staff buy-in implementing NFI 2. Staff also cited increased managed care penetration as reducing their Initiative-eligible population and increasing administrative burden, both of which can draw staff resources and attention away from the Initiative. In the Payment-Only group, the continued presence of an ECCP Nursing Facility Liaison who travels monthly to train staff, review documentation, and encourage facility staff with claims submissions may provide these facilities with additional support that results in greater NFI 2 engagement.

For more information about the Initiative in RAVEN facilities, see *Appendix G* for a full summary of site visit and survey findings and *Tables M-8, N-8,* and *O-8* for descriptive results.

5. MDS-based Quality Measures

Section 5 describes analysis of MDS-based quality measures to determine whether quality of care was affected by the Initiative.

NFI 2 aims to reduce avoidable hospitalizations, thereby improving quality of care while also lowering expenditures. The Initiative may have an impact on MDS-based quality measures when ECCP interventions target certain events as the pathways to reduce avoidable hospitalizations (e.g., antipsychotic medication use or falls). For example, in Clinical + Payment facilities the ECCP nurses may provide additional care for participating residents, thereby reducing the incidence of certain undesirable events. Alternately, participating ECCPs' successes in reducing avoidable hospitalizations or lowering expenditures may result in unintended consequences, such as residents experiencing undesirable events more frequently or having them for a longer period of time.

To evaluate the Initiative's effects on quality, we examined 10 MDS-based quality measures[11] (see **Appendix K, Table K-7** for specifications for the full set of measures). We analyzed descriptive statistics from FY 2014 to FY 2018 for all 10 quality measures

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[11] The measures included in both descriptive analyses and multivariate logistic regression analyses are catheter inserted and left in bladder, one or more falls with injury, self-report moderate to severe pain, pressure ulcers stage II or higher, decline in ADLs, UTI, and antipsychotic medication use. The measures included only in descriptive analyses are antianxiety or hypnotic medication use, weight loss, and physically restrained.

among the Initiative-eligible residents in ECCP facilities (Clinical + Payment and Payment-Only, respectively) and the national comparison group, to identify and understand the quality trends. The full descriptive results are presented in ***Appendix P.***

Additionally, we conducted multivariate logistic regression analysis for seven of these MDS-based quality measures. We selected these seven measures based on their statistical features, such as mean and distribution, to ensure that multivariate analysis yields meaningful and stable results (see ***Tables 5-1*** through ***5-7***). The multivariate models followed the general specification of the regression models used to analyze measures of utilization and expenditures (described in ***Section 3***). We calculated each MDS-based quality measure as the proportion of observed quarters with the presence of each adverse event for each resident, producing an annual score for each resident ranging from 0 to 1. The outcomes measured are undesirable, so lower scores indicate better quality, and a decrease in scores would indicate quality improvement. The multivariate results are estimated relative to the national comparison group, after accounting for baseline trends from 2014–2016.

Table 5-1. Initiative effect on MDS-based quality measures (percent of observed quarters with event per resident-year), FY 2018, all ECCPs (all states)

Measure	Predicted mean absent the Initiative (percent)	Absolute Initiative effect (percentage points)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
One or more falls with injury	12.4	−0.1	−1.1	0.9	0.878	−0.7
Self-reported moderate to severe pain	3.1	0.2	−0.5	0.8	0.629	6.2
Pressure ulcers Stage II or higher	4.6	0.1	−0.3	0.4	0.784	1.3
Urinary tract infection	2.1	0.2	−0.1	0.5	0.338	9.0
Catheter inserted and left in bladder	4.4	0.2	−0.1	0.6	0.324	4.8
Decline in ADLs	**11.8**	**1.2**	**0.0**	**2.4**	**0.089**	**10.5**
Antipsychotic medication use	18.2	0.3	−0.9	1.6	0.665	1.8
Payment-Only						
One or more falls with injury	12.9	0.8	−0.2	1.8	0.180	6.4
Self-reported moderate to severe pain	**3.1**	**0.6**	**0.1**	**1.2**	**0.042**	**20.4**
Pressure ulcers Stage II or higher	3.6	0.0	−0.4	0.3	0.865	−1.1
Urinary tract infection	**2.1**	**0.8**	**0.4**	**1.1**	**0.000**	**35.5**
Catheter inserted and left in bladder	4.8	0.3	−0.1	0.7	0.260	5.6
Decline in ADLs	12.8	0.7	−0.2	1.6	0.208	5.3
Antipsychotic medication use	**17.2**	**1.3**	**0.4**	**2.2**	**0.013**	**7.7**

ADLs = activities of daily living; MDS = Minimum Data Set.

SOURCE: RTI analysis of MDS data (RTI program ID 113).

NOTES: The *predicted mean absent the Initiative* is the mean of the predicted percentage of observed quarters with event per resident per year, for the residents in the intervention group, under the scenario that the intervention did not occur. The *Initiative effect* is calculated based on a difference-in-differences regression model with a nationally selected comparison group and adjusted for resident- and facility-level characteristics. It is the difference between the predicted mean percentage of observed quarters with event per resident per year with and without the intervention. The *relative effect* = (absolute Initiative effect) / (predicted mean absent the Initiative).

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

Table 5-2. Initiative effect on MDS-based quality measures (percent of observed quarters with event per resident-year), FY 2018, AQAF (Alabama)

Measure	Predicted mean absent the Initiative (percent)	Absolute Initiative effect (percentage points)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
One or more falls with injury	15.7	−1.4	−3.3	0.5	0.235	−8.9
Self-reported moderate to severe pain	3.3	−0.4	−1.9	1.2	0.702	−10.9
Pressure ulcers Stage II or higher	3.1	−0.2	−0.8	0.5	0.720	−4.9
Urinary tract infection	3.1	0.5	−0.3	1.3	0.311	16.0
Catheter inserted and left in bladder	2.8	0.0	−0.6	0.7	0.917	1.4
Decline in ADLs	12.5	0.6	−2.3	3.4	0.745	4.6
Antipsychotic medication use	21.0	1.1	−1.6	3.8	0.503	5.3
Payment-Only						
One or more falls with injury	10.9	0.4	−1.9	2.6	0.794	3.3
Self-reported moderate to severe pain	3.6	0.3	−1.1	1.8	0.713	8.9
Pressure ulcers Stage II or higher	3.4	−0.1	−1.1	0.9	0.846	−3.5
Urinary tract infection	2.0	0.4	−0.2	1.1	0.280	21.7
Catheter inserted and left in bladder	3.4	0.5	−0.1	1.2	0.167	15.7
Decline in ADLs	11.8	1.1	−1.1	3.2	0.414	8.9
Antipsychotic medication use	**20.2**	**3.4**	**0.5**	**6.2**	**0.054**	**16.6**

ADLs = activities of daily living; MDS = Minimum Data Set.

SOURCE: RTI analysis of MDS data (RTI program ID 113).

NOTES: The *predicted mean absent the Initiative* is the mean of the predicted percentage of observed quarters with event per resident per year, for the residents in the intervention group, under the scenario that the intervention did not occur. The *Initiative effect* is calculated based on a difference-in-differences regression model with a nationally selected comparison group and adjusted for resident- and facility-level characteristics. It is the difference between the predicted mean percentage of observed quarters with event per resident per year with and without the intervention. The *relative effect* = (absolute Initiative effect) / (predicted mean absent the Initiative).

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

Table 5-3.   Initiative effect on MDS-based quality measures (percent of observed quarters with event per resident-year), FY 2018, ATOP2 (Nevada/Colorado)

Measure	Predicted mean absent the Initiative (percent)	Absolute Initiative effect (percentage points)	90% CI		p-value	Relative effect (percent)
Clinical + Payment (Nevada)						
One or more falls with injury	12.8	−0.1	−2.8	2.5	0.929	−1.1
Self-reported moderate to severe pain	**10.0**	**−3.2**	**−6.0**	**−0.3**	**0.066**	**−31.5**
Pressure ulcers Stage II or higher	4.4	1.1	−0.1	2.2	0.117	24.0
Urinary tract infection	1.5	0.6	−0.1	1.3	0.154	42.5
Catheter inserted and left in bladder	8.3	−1.1	−2.9	0.8	0.339	−13.0
Decline in ADLs	14.1	−0.2	−3.5	3.1	0.910	−1.6
Antipsychotic medication use	**17.4**	**4.7**	**1.9**	**7.5**	**0.006**	**26.9**
Payment-Only (Colorado)						
One or more falls with injury	**14.8**	**2.9**	**0.2**	**5.5**	**0.079**	**19.3**
Self-reported moderate to severe pain	4.3	1.3	−0.7	3.3	0.293	29.9
Pressure ulcers Stage II or higher	2.7	−0.2	−1.0	0.6	0.673	−7.3
Urinary tract infection	2.2	0.3	−0.3	0.9	0.368	14.8
Catheter inserted and left in bladder	**5.9**	**1.1**	**0.2**	**2.1**	**0.045**	**19.2**
Decline in ADLs	**14.2**	**−1.9**	**−3.7**	**0.0**	**0.094**	**−13.3**
Antipsychotic medication use	17.4	−1.5	−3.5	0.5	0.232	−8.5

ADLs = activities of daily living; MDS = Minimum Data Set.

SOURCE: RTI analysis of MDS data (RTI program ID 113).

NOTES: The *predicted mean absent the Initiative* is the mean of the predicted percentage of observed quarters with event per resident per year, for the residents in the intervention group, under the scenario that the intervention did not occur. The *Initiative effect* is calculated based on a difference-in-differences regression model with a nationally selected comparison group and adjusted for resident- and facility-level characteristics. It is the difference between the predicted mean percentage of observed quarters with event per resident per year with and without the intervention. The *relative effect* = (absolute Initiative effect) / (predicted mean absent the Initiative).

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

Table 5-4. Initiative effect on MDS-based quality measures (percent of observed quarters with event per resident-year), FY 2018, MOQI (Missouri)

Measure	Predicted mean absent the Initiative (percent)	Absolute Initiative effect (percentage points)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
One or more falls with injury	16.2	−1.4	−4.4	1.7	0.463	−8.4
Self-reported moderate to severe pain	2.9	1.5	0.0	3.0	0.112	52.4
Pressure ulcers Stage II or higher	3.5	0.1	−1.0	1.2	0.852	3.5
Urinary tract infection	2.1	0.6	−0.2	1.4	0.195	30.2
Catheter inserted and left in bladder	4.9	0.5	−0.2	1.3	0.252	10.7
Decline in ADLs	**9.4**	**4.3**	**0.6**	**8.1**	**0.057**	**46.2**
Antipsychotic medication use	**15.1**	**2.8**	**0.8**	**4.8**	**0.023**	**18.5**
Payment-Only						
One or more falls with injury	16.6	1.6	−1.3	4.5	0.354	9.8
Self-reported moderate to severe pain	4.1	0.7	−0.3	1.8	0.262	17.9
Pressure ulcers Stage II or higher	**2.3**	**1.1**	**0.3**	**1.9**	**0.018**	**49.1**
Urinary tract infection	**2.4**	**2.0**	**0.6**	**3.3**	**0.015**	**82.4**
Catheter inserted and left in bladder	3.6	0.0	−0.9	0.9	0.991	0.3
Decline in ADLs	13.4	−0.3	−2.5	1.8	0.803	−2.5
Antipsychotic medication use	19.2	1.5	−0.6	3.6	0.237	7.9

ADLs = activities of daily living; MDS = Minimum Data Set.

SOURCE: RTI analysis of MDS data (RTI program ID 113).

NOTES: The *predicted mean absent the Initiative* is the mean of the predicted percentage of observed quarters with event per resident per year, for the residents in the intervention group, under the scenario that the intervention did not occur. The *Initiative effect* is calculated based on a difference-in-differences regression model with a nationally selected comparison group and adjusted for resident- and facility-level characteristics. It is the difference between the predicted mean percentage of observed quarters with event per resident per year with and without the intervention. The *relative effect* = (absolute Initiative effect) / (predicted mean absent the Initiative).

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

Table 5-5. Initiative effect on MDS-based quality measures (percent of observed quarters with event per resident-year), FY 2018, NY-RAH (New York)

Measure	Predicted mean absent the Initiative (percent)	Absolute Initiative effect (percentage points)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
One or more falls with injury	**7.7**	**2.4**	**0.9**	**3.8**	**0.008**	**30.7**
Self-reported moderate to severe pain	**0.9**	**0.9**	**0.4**	**1.5**	**0.005**	**109.4**
Pressure ulcers Stage II or higher	6.7	−0.1	−0.9	0.8	0.890	−1.0
Urinary tract infection	1.8	0.4	−0.1	0.9	0.227	21.1
Catheter inserted and left in bladder	3.9	0.4	−0.2	1.0	0.240	11.3
Decline in ADLs	8.1	1.4	−0.1	2.9	0.116	17.6
Antipsychotic medication use	**14.4**	**−1.9**	**−3.7**	**−0.1**	**0.076**	**−13.5**
Payment-Only						
One or more falls with injury	10.7	0.7	−0.8	2.2	0.452	6.5
Self-reported moderate to severe pain	1.8	0.1	−0.6	0.7	0.891	2.8
Pressure ulcers Stage II or higher	5.0	−0.1	−0.8	0.6	0.794	−2.2
Urinary tract infection	**1.9**	**0.8**	**0.3**	**1.4**	**0.016**	**43.9**
Catheter inserted and left in bladder	5.3	0.5	−0.3	1.3	0.341	8.9
Decline in ADLs	10.3	1.2	−0.4	2.8	0.206	11.8
Antipsychotic medication use	18.1	1.3	−0.3	3.0	0.180	7.3

ADLs = activities of daily living; MDS = Minimum Data Set.

SOURCE: RTI analysis of MDS data (RTI program ID 113).

NOTES: The *predicted mean absent the Initiative* is the mean of the predicted percentage of observed quarters with event per resident per year, for the residents in the intervention group, under the scenario that the intervention did not occur. The *Initiative effect* is calculated based on a difference-in-differences regression model with a nationally selected comparison group and adjusted for resident- and facility-level characteristics. It is the difference between the predicted mean percentage of observed quarters with event per resident per year with and without the intervention. The *relative effect* = (absolute Initiative effect) / (predicted mean absent the Initiative).

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

Table 5-6. Initiative effect on MDS-based quality measures (percent of observed quarters with event per resident-year), FY 2018, OPTIMISTIC (Indiana)

Measure	Predicted mean absent the Initiative (percent)	Absolute Initiative effect (percentage points)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
One or more falls with injury	**16.1**	**−2.8**	**−5.3**	**−0.3**	**0.063**	**−17.6**
Self-reported moderate to severe pain	1.6	0.2	−0.6	1.0	0.661	12.8
Pressure ulcers Stage II or higher	3.5	0.4	−0.3	1.0	0.365	10.0
Urinary tract infection	1.7	−0.5	−1.2	0.3	0.301	−27.3
Catheter inserted and left in bladder	4.3	0.4	−0.3	1.1	0.344	9.5
Decline in ADLs	12.8	1.7	−2.2	5.5	0.471	13.2
Antipsychotic medication use	17.6	−0.7	−3.9	2.4	0.699	−4.2
Payment-Only						
One or more falls with injury	15.2	1.5	−1.5	4.4	0.416	9.6
Self-reported moderate to severe pain	2.6	0.7	−0.6	2.0	0.367	27.3
Pressure ulcers Stage II or higher	3.4	−0.1	−1.0	0.8	0.858	−3.0
Urinary tract infection	2.4	0.7	−0.1	1.5	0.162	29.4
Catheter inserted and left in bladder	4.8	−0.1	−0.9	0.8	0.892	−1.5
Decline in ADLs	**14.4**	**2.7**	**0.3**	**5.1**	**0.066**	**18.7**
Antipsychotic medication use	15.0	1.9	−0.3	4.1	0.148	12.7

ADLs = activities of daily living; MDS = Minimum Data Set.

SOURCE: RTI analysis of MDS data (RTI program ID 113).

NOTES: The *predicted mean absent the Initiative* is the mean of the predicted percentage of observed quarters with event per resident per year, for the residents in the intervention group, under the scenario that the intervention did not occur. The *Initiative effect* is calculated based on a difference-in-differences regression model with a nationally selected comparison group and adjusted for resident- and facility-level characteristics. It is the difference between the predicted mean percentage of observed quarters with event per resident per year with and without the intervention. The *relative effect* = (absolute Initiative effect) / (predicted mean absent the Initiative).

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

Table 5-7. Initiative effect on MDS-based quality measures (percent of observed quarters with event per resident-year), FY 2018, RAVEN (Pennsylvania)

Measure	Predicted mean absent the Initiative (percent)	Absolute Initiative effect (percentage points)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
One or more falls with injury	**9.4**	**2.5**	**0.0**	**5.0**	**0.099**	**26.6**
Self-reported moderate to severe pain	4.1	0.5	−1.8	2.7	0.736	11.2
Pressure ulcers Stage II or higher	**4.1**	**−1.0**	**−1.7**	**−0.4**	**0.009**	**−25.1**
Urinary tract infection	2.3	0.0	−1.0	1.0	0.984	0.4
Catheter inserted and left in bladder	3.9	0.4	−0.4	1.3	0.404	11.3
Decline in ADLs	17.7	−0.5	−3.1	2.1	0.766	−2.7
Antipsychotic medication use	24.7	2.7	−1.1	6.4	0.238	10.9
Payment-Only						
One or more falls with injury	11.4	−2.2	−4.7	0.3	0.155	−19.2
Self-reported moderate to severe pain	5.0	0.5	−1.2	2.3	0.613	10.7
Pressure ulcers Stage II or higher	3.6	−0.9	−1.9	0.1	0.142	−25.3
Urinary tract infection	2.1	0.1	−0.7	0.8	0.894	2.8
Catheter inserted and left in bladder	5.4	−0.5	−2.0	0.9	0.546	−10.1
Decline in ADLs	16.0	−0.5	−2.8	1.8	0.717	−3.1
Antipsychotic medication use	**11.8**	**2.1**	**0.1**	**4.1**	**0.085**	**17.9**

ADLs = activities of daily living; MDS = Minimum Data Set.

SOURCE: RTI analysis of MDS data (RTI program ID 113).

NOTES: The *predicted mean absent the Initiative* is the mean of the predicted percentage of observed quarters with event per resident per year, for the residents in the intervention group, under the scenario that the intervention did not occur. The *Initiative effect* is calculated based on a difference-in-differences regression model with a nationally selected comparison group and adjusted for resident- and facility-level characteristics. It is the difference between the predicted mean percentage of observed quarters with event per resident per year with and without the intervention. The *relative effect* = (absolute Initiative effect) / (predicted mean absent the Initiative).

Bold text indicates values are significantly different from zero based on a p-value cutoff of 0.1.

5.1   Overall Impact of the Initiative on MDS Quality Measures

In the Clinical + Payment group, we found no statistically significant Initiative effects in FY 2018 for six of seven MDS-based quality measures in the pooled model combining the six ECCPs (see *Table 5-1*). Only one MDS-based quality measure showed a change that was large enough to be statistically significant: decline in activities of daily living (ADLs). This measure reports the percentage of quarters in which a resident's need for help with ADLs, such as bed mobility, transferring, eating, and toileting, increased unfavorably when compared to the prior assessment. For eligible residents in this intervention group, the predicted probability of experiencing a decline in ADLs in FY 2018, absent the Initiative, would be 11.8 percent. The Initiative was associated with a statistically significant increase of 1.2 percentage points. This corresponds to a 10.5 percent relative increase in the average resident's probability of a decline in ADLs.

> **There were mixed Initiative effects on Minimum Data Set (MDS)-based quality measures.**

In the Payment-Only group there was a statistically significant increase in undesirable events in three of seven MDS-based quality measures. These results indicate that Initiative-eligible residents in Payment-Only facilities had moderate to severe pain, had UTIs and received antipsychotic medications more frequently than would be expected in the absence of the Initiative in FY 2018. The increase in UTIs in Payment-Only facilities could have resulted, in part, from increased surveillance and reporting of the condition because it is one of the six targeted conditions qualifying for incentive payment under NFI 2.

5.2   Results across Individual ECCPs

Among individual ECCPs, the majority of quality measure scores were not statistically significantly different from what would be predicted in the absence of the Initiative, and there was no clear pattern in which quality measures were affected by the Initiative.

In the Clinical + Payment group, four ECCPs (ATOP2 [Nevada], MOQI [Missouri], NY-RAH [New York], and RAVEN [Pennsylvania]) each showed statistically significant higher-than-predicted scores (unfavorable) in one to two quality measures. These unfavorable results were spread across four quality measures. Four ECCPs (ATOP2 [Nevada], NY-RAH [New York], OPTIMISTIC [Indiana], and RAVEN [Pennsylvania]) showed statistically significant lower-than-predicted scores (favorable) in one quality measure each, and it was a different quality measure for each of the four ECCPs.

In the Payment-Only group, each of the six individual ECCPs showed statistically significant higher-than-predicted scores (unfavorable) in one to two quality measures. These unfavorable results were spread across six quality measures. One ECCP (ATOP2 [Colorado]) showed a statistically significant lower-than predicted score (favorable) in one quality measure, ADL decline.

Together, our multivariate analysis results show a lack of evidence thus far to support the Initiative's effects on improving quality for Initiative-eligible residents beyond the general trend in quality improvement that occurred nationally and preceded the NFI 2 Initiative (FY 2014 to FY 2016).

6. Nursing Facility Characteristics and the Rate of NFI 2 Acute Care Billing

In **Section 6**, we present the results of the data analysis to explore how certain nursing facility characteristics might have affected the use of NFI 2 billing codes in FY 2017. The analysis examined acute care treatment for the six qualifying conditions.

6.1 Introduction and Study Design

In this section, we present the results of the data analysis to explore how certain nursing facility characteristics might have affected the use of NFI 2 billing codes in FY 2017. (Note that unlike the rest of this report, this analysis was based on FY 2017. Analysis of FY 2018 NFI 2 billing data was incomplete at the time of preparing this report but will be included in the next annual report.) The analysis examined acute care treatment for the six qualifying conditions. These results are not definitive. Other factors, in addition to those used, may be important.

Acute care episodes were identified based on Healthcare Common Procedure Coding System billing codes G9679–G9684 and measured in number of episodes per 1,000 Initiative-eligible resident-days. These codes are billed by facilities for the treatment episodes and do not include billings by practitioners for certifying the qualifying conditions. We conducted the analysis based on data from Initiative-eligible residents in 257 nursing facilities, excluding three of the original 260 facilities used in our primary

analysis (for FY 2017) because of missing data for some of the facility-level variables. These variables are not used in our primary analysis, so this exclusion is for this special analysis only.

We posit that the ability to provide on-site acute care is a key factor influencing the billing rate. Therefore, if we identify facility-level factors that are associated with the billing rate, we would argue that these factors could reflect the facility's capability to provide acute care. For this analysis, we examined several factors, including nursing facility staffing and quality ratings.

Facility-level variables were derived from the Payroll-Based Journal (PBJ), Certification and Survey Provider Enhanced Reports (CASPER), and Nursing Home Compare (NHC). We list the

> Findings from the analysis may help payers target efforts to those nursing facilities with the greatest capacity for providing acute care to residents, or alternatively, to better support the facilities that may need additional help in developing this capacity.

variables we included in the analysis, along with their means, standard deviations and percentiles for continuous variables, and percentages for categorical variables in ***Tables 6-1*** and ***6-2***.

We used the following three multivariate linear regression analyses to test associations between nursing facility characteristics and the facility-level rate of acute care episode billing:

- Including all nursing facilities in the Initiative (N = 257)

- Including only the Clinical + Payment facilities (N = 111)

- Including only the Payment-Only facilities (N = 146)

Given the small number of nursing facilities in our sample and the relatively large number of independent variables being tested, inexplicable correlations may appear. We estimated three separate models to show similarities and differences in the results across the three samples. Characteristics that appear consistently in all three models are more likely to be predictive of NFI 2 billing code use.

We also conducted several sensitivity analyses, applied only to the model that included all nursing facilities:

- Excluding nursing facilities with less than 4 quarters of PBJ data in CY 2017.[12] These facilities were included in the primary analysis based on the assumption

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[12] Although the rate of billing codes was based on FY 2017, PBJ data were only available beginning in CY 2017.

that staffing levels from the quarters with PBJ records are consistent throughout the year.

- Excluding nursing facilities with outlier values of acute care episodes per 1,000 Initiative-eligible resident-days, physician staffing, and certified nursing aide (CNA) staffing. Each exclusion was run separately.

6.2   Results

Multivariate results are presented in ***Table 6-3***. Larger magnitudes of β indicate stronger associations. We identified several important findings.

This finding was robust to the sensitivity analyses described above. A plausible

We found that nursing facilities with higher CNA staffing were strongly associated with higher billing rates in all three models (p < 0.05).

explanation is that higher CNA staffing may result in CNAs being less overwhelmed and having more time to pay attention to resident changes in condition and to alert nursing staff about the changes. Paradoxically, nursing facilities with higher licensed staffing had lower billing rates, but this relationship was not consistently statistically significant.

Facilities with a higher proportion of residents with advance directives tended to have lower billing rates, although this result was not consistently statistically significant. Facilities with a star rating of four or five stars had higher rates of billing, but this relationship was not consistently statistically significant.

At this point in the evaluation we do not have a firm explanation for the CNA and licensed staffing associations with treating residents in the facilities. These are only speculations. We will continue to explore data from our site visits, interviews, and surveys to seek firmer explanations.

Table 6-1. Nursing facility characteristics (continuous variables): Means, standard deviations, and percentiles

Characteristic	Mean	SD	Min	10th percentile	25th percentile	50th percentile	75th percentile	90th percentile	Max
NFI 2 acute care episodes per 1,000 resident-days[1]	1.189	1.073	0.000	0.000	0.392	0.978	1.718	2.707	7.685
Count of eligible residents	106	58	23	55	72	92	122	157	471
Licensed (LPN+RN) staffing HPRD	1.448	0.315	0.383	1.071	1.269	1.432	1.627	1.851	2.344
CNA staffing HPRD	2.276	0.426	1.422	1.835	1.968	2.187	2.483	2.842	4.109
Case-mix index[†]	11.828	1.114	7.408	10.374	11.164	11.933	12.544	13.100	16.493
Physician (medical director + other physicians) HPRD	0.021	0.023	0.000	0.003	0.006	0.013	0.025	0.049	0.184
Proportion of residents with advance directives	0.516	0.349	0.000	0.028	0.190	0.526	0.842	1.000	1.000
Proportion of male residents	0.322	0.106	0.117	0.203	0.242	0.304	0.380	0.484	0.608
Proportion of residents under 65	0.119	0.105	0.000	0.015	0.042	0.099	0.165	0.240	0.851
Average age of residents 65+	82.719	3.089	72.500	78.371	80.450	82.932	84.981	86.667	90.588
Proportion of residents with CHF	0.318	0.086	0.100	0.213	0.263	0.309	0.368	0.422	0.615
Proportion of residents with COPD	0.257	0.087	0.068	0.153	0.202	0.250	0.304	0.370	0.645
Proportion of residents with skin ulcer	0.134	0.075	0.000	0.050	0.080	0.120	0.175	0.229	0.416

CHF = congestive heart failure; COPD = chronic obstructive pulmonary disease; HPRD = hours per resident-day; LPN = licensed practical nurse; RN = registered nurse.

[1] Outcome variable.

[†] Case-mix index is a weighted sum of the variables for the proportion of residents in a facility with specific characteristics, with a higher value indicating a higher level of acuity and care needs of the residents. This case-mix variable is based on Feng et al. (2006). The effect of state Medicaid case-mix payment on nursing home resident acuity. *Health Services Research, 41*(4 Pt 1), 1317–1336.

SOURCE: RTI analysis based on Medicare claims data, MDS, PBJ, CASPER, and NHC (RTI program MS NBC 07).

NOTE: Results based on N = 257 of the 260 nursing facilities used in the primary analysis.

Table 6-2. Nursing facility characteristics (categorical variables): Percent of nursing facilities with each attribute

Characteristic	Percent
Metropolitan location	78.6
Chain affiliation	59.5
For-profit	67.3
Clinical lab on site	81.3
X-ray on site	84.8
Presence of physician extenders (physician assistants or nurse practitioners)	66.1
Overall star rating	
1	5.8
2	14.0
3	18.7
4	23.7
5	37.7
AQAF Clinical + Payment	8.9
AQAF Payment-Only	8.6
ATOP2 Clinical + Payment	5.4
ATOP2 Payment-Only	9.3
MOQI Clinical + Payment	6.2
MOQI Payment-Only	8.6
NY-RAH Clinical + Payment	9.3
NY-RAH Payment-Only	12.8
OPTIMISTIC Clinical + Payment	7.4
OPTIMISTIC Payment-Only	9.7
RAVEN Clinical + Payment	5.8
RAVEN Payment-Only	7.8

SOURCE: RTI analysis based on PBJ, CASPER, and NHC (RTI program MS NBC 07).

NOTE: Results based on N = 257 of the 260 nursing facilities used in the primary analysis. Metropolitan location is based on Rural/Urban Continuum code 1-3.

Table 6-3.   Multivariate regression results: Nursing facility characteristics associated with billing for providing on-site acute care (number of episodes per 1,000 Initiative-eligible resident-days)

Characteristic	All facilities			Clinical + Payment facilities			Payment-Only facilities		
	β	SE	p	B	SE	p	β	SE	p
Intercept	−5.582	4.306	0.196	−6.217	6.571	0.347	−8.611	5.925	0.149
Count of eligible residents	−0.001	0.001	0.590	0.000	0.002	0.783	−0.003	0.002	0.265
Licensed (LPN+RN) staffing HPRD	−0.449	0.284	0.115	−0.439	0.436	0.317	**−0.781**	**0.415**	**0.062**
CNA staffing HPRD	**0.665**	**0.177**	**<0.001**	**0.556**	**0.242**	**0.024**	**0.985**	**0.280**	**0.001**
Case-mix index[†]	0.067	0.071	0.349	**0.184**	**0.104**	**0.081**	0.062	0.101	0.543
Physician (medical director + other physicians) HPRD	1.664	3.134	0.596	−0.525	4.611	0.910	2.209	4.352	0.613
Presence of physician extenders	−0.094	0.148	0.528	−0.088	0.230	0.702	0.003	0.211	0.988
Proportion of residents with advance directives	**−0.352**	**0.204**	**0.085**	−0.512	0.321	0.114	−0.293	0.282	0.299
Proportion of male residents	−0.031	1.017	0.976	0.108	1.514	0.943	0.090	1.483	0.952
Proportion of residents under 65	0.943	1.064	0.376	0.574	1.641	0.727	1.900	1.554	0.224
Average age of residents 65+	0.060	0.047	0.206	0.055	0.070	0.438	0.091	0.066	0.171
Proportion of residents with CHF	1.397	0.863	0.107	0.781	1.282	0.544	**2.135**	**1.232**	**0.086**
Proportion of residents with COPD	0.832	0.892	0.352	1.932	1.183	0.106	−0.129	1.398	0.927
Proportion of residents with skin ulcer	−1.625	1.116	0.147	−1.149	1.503	0.447	**−3.061**	**1.740**	**0.081**
Metropolitan location	−0.248	0.188	0.190	**−1.061**	**0.329**	**0.002**	0.163	0.245	0.509
Chain affiliation	0.029	0.259	0.910	−0.492	0.354	0.168	**0.792**	**0.404**	**0.052**
For-profit	−0.012	0.288	0.968	0.567	0.394	0.154	−0.629	0.434	0.150
Clinical lab on site	**0.547**	**0.231**	**0.019**	−0.066	0.476	0.890	**0.760**	**0.284**	**0.009**
X-ray on site	−0.222	0.255	0.386	0.776	0.495	0.121	**−0.562**	**0.323**	**0.085**
Overall star rating									
1	−0.099	0.312	0.752	0.056	0.417	0.893	−0.571	0.478	0.235
2	−0.050	0.238	0.833	0.058	0.321	0.858	−0.291	0.373	0.437
3	‡	‡	‡	‡	‡	‡	‡	‡	‡
4	0.173	0.205	0.397	0.160	0.290	0.583	0.027	0.301	0.929
5	0.266	0.194	0.171	**0.526**	**0.281**	**0.065**	−0.029	0.293	0.921

(continued)

Table 6-3. Multivariate regression results: Nursing facility characteristics associated with billing for providing on-site acute care (number of episodes per 1,000 Initiative-eligible resident-days) (continued)

Characteristic	All facilities			Clinical + Payment facilities			Payment-Only facilities		
	β	SE	p	B	SE	p	β	SE	p
AQAF Clinical + Payment	**−0.662**	**0.385**	**0.087**	**−0.909**	**0.452**	**0.048**	—	—	—
AQAF Payment-Only	**−0.775**	**0.402**	**0.055**	—	—	—	−0.380	0.420	0.368
ATOP2 Clinical + Payment	0.268	0.418	0.522	0.073	0.474	0.878	—	—	—
ATOP2 Payment-Only	**−0.606**	**0.363**	**0.097**	—	—	—	−0.307	0.356	0.390
MOQI Clinical + Payment	0.092	0.415	0.826	0.281	0.470	0.551	—	—	—
MOQI Payment-Only	−0.660	0.401	0.101	—	—	—	−0.332	0.429	0.440
NY-RAH Clinical + Payment	‡	‡	‡	‡	‡	‡	—	—	—
NY-RAH Payment-Only	−0.319	0.297	0.285	—	—	—	‡	‡	‡
OPTIMISTIC Clinical + Payment	−0.001	0.365	0.998	0.057	0.407	0.888	—	—	—
OPTIMISTIC Payment-Only	−0.185	0.360	0.607	—	—	—	0.256	0.356	0.473
RAVEN Clinical + Payment	0.351	0.389	0.367	0.217	0.446	0.628	—	—	—
RAVEN Payment-Only	−0.142	0.361	0.695	—	—	—	0.311	0.367	0.398

CHF = congestive heart failure; COPD = chronic obstructive pulmonary disease; HPRD = hours per resident day; LPN = licensed practical nurse; RN = registered nurse. — = data not applicable; ‡ = reference category.

[†] Case-mix index is a weighted sum of the variables for the proportion of residents in a facility with specific characteristics, with a higher value indicating a higher level of acuity and care needs of the residents. This case-mix variable is based on Feng et al. (2006). The effect of state Medicaid case-mix payment on nursing home resident acuity. *Health Services Research,* 41(4 Pt 1), 1317-1336.

SOURCE: RTI analysis based on Medicare claims data, MDS, PBJ, CASPER, and NHC (RTI program NBC MS 06; sarnold\output\pah2_nbc_ms06_010319).

NOTE: Results based on N=257, 111, and 146 of the 260 nursing facilities used in the primary analysis. Metropolitan location is based on Rural/Urban Continuum code 1-3.

Findings that are statistically significant at the level of p < 0.1 are bolded.

7. Medicare Managed Care Penetration Among Long-Stay Nursing Facility Residents

Section 7 describes the extent and trends of Medicare managed care penetration in the population of long-stay nursing facility residents, both nationally and in each of the seven Initiative states.

RTI's primary data collection findings and Medicare eligibility data indicate a growing presence of Medicare managed care and MA programs in nursing facilities. As part of the broader national context in which NFI 2 operates, growth in Medicare managed care could affect the eligible population for NFI 2 by decreasing the number of FFS residents.

In addition, particular types of managed care plans, such as institutional special needs plans (I-SNPs), potentially overlap with NFI 2. I-SNPs often include an NP to provide additional care, similar to the model design used in Clinical + Payment facilities in NFI 1 and NFI 2. Our analysis aims to describe managed care trends in the overall long-stay population, nationally and by ECCP state. These tables do not provide information specific to the intervention facilities, nor the full eligibility criteria of NFI 2. They simply provide initial context on Medicare managed care penetration in the long-term care population of nursing facility residents and some insight into state-specific trends.

Specifically, for all Medicare beneficiaries residing in nursing facilities nationally, we developed annual analytical files from 2014–2018, selecting long-stay residents (stays of at least 101 days), regardless of their enrollment in Medicare managed care or FFS, who

stayed in the facility in April. Each yearly file provides a point-in-time snapshot of the nationwide long-stay population of nursing facility residents, who may or may not actually meet all the eligibility criteria for participation in NFI 2.

We examined these data for several demographic and enrollment characteristics. Resident characteristics were stable over time for gender, age, race, and dual-eligibility status, as shown in **Table 7-1**. **Table 7-2** describes the national number and percentage of long-stay residents who were enrolled in four major types of plans: MA, I-SNPs (a subset of MA), other managed care plans (e.g., Program of All-Inclusive Care for the Elderly [PACE]), and traditional Medicare FFS. **Tables 7-3** through **7-9** present the enrollment plan distribution for each ECCP state and are arranged in alphabetical order by state. In **Figure 7-1**, we illustrate the percentage of residents enrolled in MA in each state and nationally from 2014 to 2018.

There was substantial variation in managed care penetration among ECCP states. In New York, Colorado, and Pennsylvania, MA penetration was higher

> Nationally, the share of long-stay residents enrolled in MA increased from 14.4 to 18.3 percent from 2014 to 2018. The share of residents enrolled in an I-SNP also increased, from 4.1 to 7.0 percent.

than the national average, and it increased from approximately 25–28 percent in 2014 to 34–37 percent in 2018. In Nevada, Missouri, and Indiana, a smaller proportion of residents were enrolled in MA compared to the national average, still less than 16 percent in 2018. Interestingly, Alabama experienced the sharpest growth in MA enrollment, from 6.8 percent of long-stay residents enrolled in 2014 (the lowest of all ECCP states) to 26.4 percent in 2018 (higher than Nevada, Missouri, Indiana, and the national average). Generally, the trend for I-SNP enrollment nationally and in the ECCPs mirrored that of MA overall, showing a steady increase from 2014 to 2018. Once again, Alabama showed the most drastic growth in I-SNP enrollment, increasing from 0.1 percent in 2014 to 14.6 percent in 2018. Site visit and telephone interviewee findings provide a clear explanation for this increase in both I-SNPs and MA in Alabama (see **Appendix B**). Simpra, an I-SNP created by Alabama nursing facility companies contracts with NPs to provide care and began enrolling residents in January 2018. The plan was reportedly offered in more than 50 percent of nursing facilities and was perceived by facility leadership as an expansion of AQAF.

Table 7-1. Characteristics of long-stay nursing facility residents, April 2014–2018, national

Characteristic	2014		2015		2016		2017		2018	
	N	%	N	%	N	%	N	%	N	%
Number of long-stay residents	960,013	100.0	943,356	100.0	932,270	100.0	912,491	100.0	901,165	100.0
Gender										
Female	659,592	68.7	642,708	68.1	630,048	67.6	611,442	67.0	597,188	66.3
Male	300,421	31.3	300,648	31.9	302,222	32.4	301,049	33.0	303,977	33.7
Age										
Mean	—	80.6	—	80.4	—	80.3	—	80.1	—	79.8
Race										
White, non-Hispanic	776,769	80.9	759,390	80.5	747,346	80.2	727,193	79.7	714,476	79.3
Black, non-Hispanic	131,655	13.7	131,982	14.0	132,204	14.2	132,391	14.5	132,814	14.7
Asian	14,886	1.6	15,020	1.6	15,197	1.6	15,350	1.7	15,552	1.7
Hispanic	20,648	2.2	20,591	2.2	20,533	2.2	20,256	2.2	20,253	2.3
Other	16,055	1.7	16,373	1.7	16,990	1.8	17,301	1.9	18,070	2.0
Dual-eligibility status										
Medicare only	183,191	19.1	179,851	19.1	167,742	18.0	159,632	17.5	155,177	17.2
Partial-benefit dual	5,416	0.6	5,284	0.6	5,508	0.6	5,336	0.6	5,471	0.6
Full-benefit dual	771,406	80.4	758,221	80.4	759,020	81.4	747,523	81.9	740,510	82.2

— = data not applicable.

SOURCE: RTI analysis (RTI Programs JW04 and JW06).

NOTE: Table includes all Medicare-eligible long-stay residents with a stay of 101+ days in a nursing facility in April of a given year.

Table 7-2. Long-stay nursing facility residents, by type of Medicare plan enrollment, April 2014–2018, national

Plan type	2014		2015		2016		2017		2018	
	N	%	N	%	N	%	N	%	N	%
Number of long-stay residents	960,013	100	943,356	100	932,270	100	912,491	100	901,165	100.0
Medicare Advantage	138,068	14.4	142,755	15.1	151,718	16.3	164,310	18.0	182,804	20.3
I-SNP	39,807	4.1	41,756	4.4	49,061	5.3	53,691	5.9	63,429	7.0
Other managed care plans	22,038	2.3	44,248	4.7	48,642	5.2	48,550	5.3	44,709	5.0
Traditional Medicare FFS	799,907	83.3	756,353	80.2	731,910	78.5	699,631	76.7	673,652	74.8

FFS = fee-for-service; I-SNP = Institutional Special Needs Plan.

SOURCE: RTI analysis (RTI Programs JW04 and JW06).

NOTE: Medicare Advantage (MA) includes all coordinated care plans (CCPs), including health maintenance organizations (HMOs), preferred provider organizations (PPOs), Medicare savings accounts (MSAs), and SNPs (special needs plans). I-SNPs are already included in the count for total MA beneficiaries. Other managed care plans include Plans for All-Inclusive Care for the Elderly (PACE), demonstration plans, Medicare Cost Plans, and Health Care Prepayment Plans (HCPPs).

Table 7-3. Long-stay nursing facility residents, by type of Medicare plan enrollment, April 2014–2018, Alabama

Plan type	2014		2015		2016		2017		2018	
	N	%	N	%	N	%	N	%	N	%
Number of long-stay residents	16,680	100	16,197	100	16,155	100	15,756	100	15,732	100
Medicare Advantage	1,137	6.8	1,224	7.6	1,388	8.6	2,275	14.4	4,154	26.4
I-SNP	9	0.1	192	1.2	281	1.7	489	3.1	2,296	14.6
Other managed care plans	85	0.5	70	0.4	80	0.5	85	0.5	82	0.5
Traditional Medicare FFS	15,458	92.7	14,903	92.0	14,687	90.9	13,396	85.0	11,496	73.1

FFS = fee-for-service; I-SNP = Institutional Special Needs Plan.

SOURCE: RTI analysis (RTI Programs JW04 and JW06).

NOTE: Medicare Advantage (MA) includes all coordinated care plans (CCPs), including health maintenance organizations (HMOs), preferred provider organizations (PPOs), Medicare savings accounts (MSAs), and SNPs (special needs plans). I-SNPs are already included in the count for total MA beneficiaries. Other managed care plans include Plans for All-Inclusive Care for the Elderly (PACE), demonstration plans, Medicare Cost Plans, and Health Care Prepayment Plans (HCPPs).

Table 7-4. Long-stay nursing facility residents, by type of Medicare plan enrollment, April 2014–2018, Colorado

Plan type	2014		2015		2016		2017		2018	
	N	%	N	%	N	%	N	%	N	%
Number of long-stay residents	11,086	100	10,780	100	10,891	100	10,943	100	11,004	100
Medicare Advantage	3,149	28.4	3,181	29.5	3,458	31.8	3,698	33.8	3,744	34.0
I-SNP	2,138	19.3	2,222	20.6	2,526	23.2	2,720	24.9	2,712	24.6
Other managed care plans	442	4.0	470	4.4	499	4.6	487	4.5	505	4.6
Traditional Medicare FFS	7,495	67.6	7,129	66.1	6,934	63.7	6,758	61.8	6,755	61.4

FFS = fee-for-service; I-SNP = Institutional Special Needs Plan.

SOURCE: RTI analysis (RTI Programs JW04 and JW06).

NOTE: Medicare Advantage (MA) includes all coordinated care plans (CCPs), including health maintenance organizations (HMOs), preferred provider organizations (PPOs), Medicare savings accounts (MSAs), and SNPs (special needs plans). I-SNPs are already included in the count for total MA beneficiaries. Other managed care plans include Plans for All-Inclusive Care for the Elderly (PACE), demonstration plans, Medicare Cost Plans, and Health Care Prepayment Plans (HCPPs).

Table 7-5. Long-stay nursing facility residents, by type of Medicare plan enrollment, April 2014–2018, Indiana

Plan type	2014		2015		2016		2017		2018	
	N	%	N	%	N	%	N	%	N	%
Number of long-stay residents	27,775	100.0	27,428	100.00	27,236	100.00	26,820	100	26,763	100
Medicare Advantage	2,261	8.1	2,481	9.1	2,823	10.4	3,388	12.6	4,241	15.9
I-SNP	32	0.1	108	0.4	780	2.9	989	3.7	1,354	5.1
Other managed care plans	545	2.0	524	1.9	539	2.0	555	2.1	581	2.2
Traditional Medicare FFS	24,969	89.9	24,423	89.0	23,874	87.7	22,877	85.3	21,941	82.0

FFS = fee-for-service; I-SNP = Institutional Special Needs Plan.

SOURCE: RTI analysis (RTI Programs JW04 and JW06).

NOTE: Medicare Advantage (MA) includes all coordinated care plans (CCPs), including health maintenance organizations (HMOs), preferred provider organizations (PPOs), Medicare savings accounts (MSAs), and SNPs (special needs plans). I-SNPs are already included in the count for total MA beneficiaries. Other managed care plans include Plans for All-Inclusive Care for the Elderly (PACE), demonstration plans, Medicare Cost Plans, and Health Care Prepayment Plans (HCPPs).

Table 7-6. Long-stay nursing facility residents, by type of Medicare plan enrollment, April 2014–2018, Missouri

Plan type	2014		2015		2016		2017		2018	
	N	%	N	%	N	%	N	%	N	%
Number of long-stay residents	26,638	100	26,363	100	26,451	100	25,887	100	25,208	100
Medicare Advantage	2,140	8.0	2,315	8.8	2,844	10.8	3,226	12.5	3,513	13.9
I-SNP	6	0.0	19	0.1	347	1.3	508	2.0	564	2.2
Other managed care plans	418	1.6	462	1.8	504	1.9	614	2.4	701	2.8
Traditional Medicare FFS	24,080	90.4	23,586	89.5	23,103	87.3	22,047	85.2	20,994	83.3

FFS = fee-for-service; I-SNP = Institutional Special Needs Plan.

SOURCE: RTI analysis (RTI Programs JW04 and JW06).

NOTE: Medicare Advantage (MA) includes all coordinated care plans (CCPs), including health maintenance organizations (HMOs), preferred provider organizations (PPOs), Medicare savings accounts (MSAs), and SNPs (special needs plans). I-SNPs are already included in the count for total MA beneficiaries. Other managed care plans include Plans for All-Inclusive Care for the Elderly (PACE), demonstration plans, Medicare Cost Plans, and Health Care Prepayment Plans (HCPPs).

Table 7-7. Long-stay nursing facility residents, by type of Medicare plan enrollment, April 2014–2018, Nevada

Plan type	2014		2015		2016		2017		2018	
	N	%	N	%	N	%	N	%	N	%
Number of long-stay residents	2,862	100	2,880	100	2,853	100	2,966	100	3,023	100
Medicare Advantage	305	10.7	301	10.5	300	10.5	351	11.8	374	12.4
I-SNP	0	0.0	0	0.0	6	0.2	5	0.2	11	0.4
Other managed care plans	3	0.1	5	0.2	3	0.1	4	0.1	2	0.1
Traditional Medicare FFS	2,554	89.2	2,574	89.4	2,550	89.4	2,611	88.0	2,647	87.6

FFS = fee-for-service; I-SNP = Institutional Special Needs Plan.

SOURCE: RTI analysis (RTI Programs JW04 and JW06).

NOTE: Medicare Advantage (MA) includes all coordinated care plans (CCPs), including health maintenance organizations (HMOs), preferred provider organizations (PPOs), Medicare savings accounts (MSAs), and SNPs (special needs plans). I-SNPs are already included in the count for total MA beneficiaries. Other managed care plans include Plans for All-Inclusive Care for the Elderly (PACE), demonstration plans, Medicare Cost Plans, and Health Care Prepayment Plans (HCPPs).

Table 7-8. Long-stay nursing facility residents, by type of Medicare plan enrollment, April 2014–2018, New York

Plan type	2014		2015		2016		2017		2018	
	N	%	N	%	N	%	N	%	N	%
Number of long-stay residents	76,252	100	75,394	100	75,678	100	74,486	100	73,763	100
Medicare Advantage	20,933	27.5	22,859	30.3	25,111	33.2	25,914	34.8	27,119	36.8
I-SNP	11,551	15.1	13,496	17.9	15,864	21.0	16,618	22.3	17,268	23.4
Other managed care plans	864	1.1	1,146	1.5	1,460	1.9	1,550	2.1	1,583	2.2
Traditional Medicare FFS	54,455	71.4	51,389	68.2	49,107	64.9	47,022	63.1	45,061	61.1

FFS = fee-for-service; I-SNP = Institutional Special Needs Plan.

SOURCE: RTI analysis (RTI Programs JW04 and JW06).

NOTE: Medicare Advantage (MA) includes all coordinated care plans (CCPs), including health maintenance organizations (HMOs), preferred provider organizations (PPOs), Medicare savings accounts (MSAs), and SNPs (special needs plans). I-SNPs are already included in the count for total MA beneficiaries. Other managed care plans include Plans for All-Inclusive Care for the Elderly (PACE), demonstration plans, Medicare Cost Plans, and Health Care Prepayment Plans (HCPPs).

Table 7-9. Long-stay nursing facility residents, by type of Medicare plan enrollment, April 2014–2018, Pennsylvania

Plan type	2014		2015		2016		2017		2018	
	N	%	N	%	N	%	N	%	N	%
Number of long-stay residents	57,522	100	56,281	100	56,171	100	55,647	100	54,957	100
Medicare Advantage	14,115	24.5	14,487	25.7	15,475	27.5	16,850	30.3	18,425	33.5
I-SNP	2,366	4.1	2,625	4.7	3,098	5.5	3,730	6.7	4,916	8.9
Other managed care plans	624	1.1	639	1.1	610	1.1	672	1.2	641	1.2
Traditional Medicare FFS	42,783	74.4	41,155	73.1	40,086	71.4	38,125	68.5	35,891	65.3

FFS = fee-for-service; I-SNP = Institutional Special Needs Plan.

SOURCE: RTI analysis (RTI Programs JW04 and JW06).

NOTE: Medicare Advantage (MA) includes all coordinated care plans (CCPs), including health maintenance organizations (HMOs), preferred provider organizations (PPOs), Medicare savings accounts (MSAs), and SNPs (special needs plans). I-SNPs are already included in the count for total MA beneficiaries. Other managed care plans include Plans for All-Inclusive Care for the Elderly (PACE), demonstration plans, Medicare Cost Plans, and Health Care Prepayment Plans (HCPPs).

Figure 7-1. Percentage of long-stay nursing facility residents enrolled in Medicare Advantage, April 2014–2018
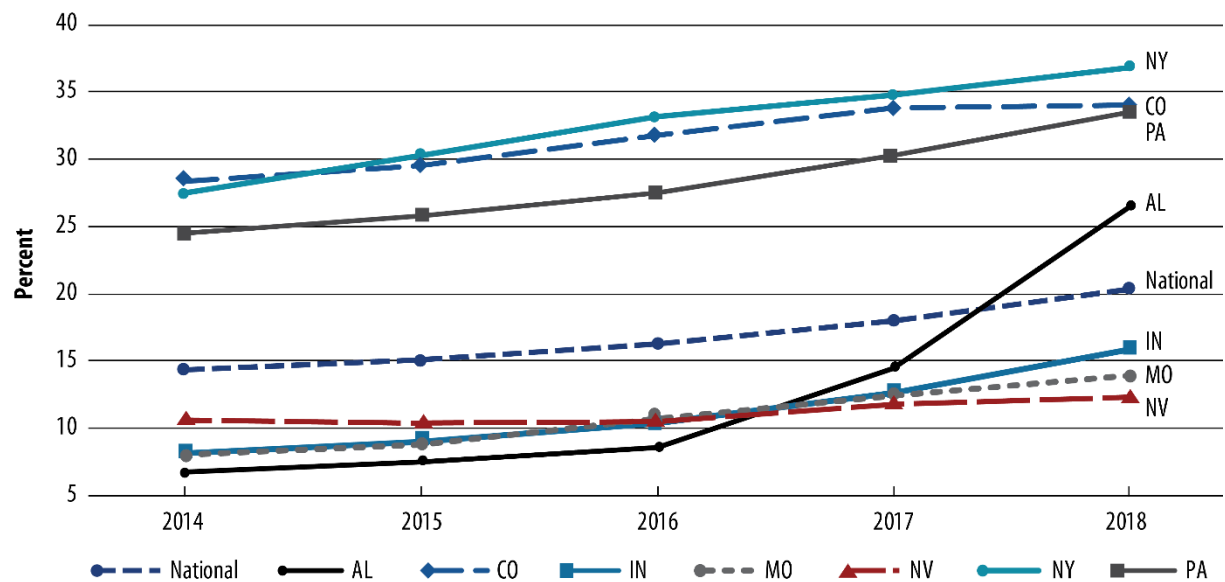
SOURCE: RTI analysis (RTI Program: JW04).

NOTE: Medicare Advantage includes all coordinated care plans (CCPs), including health maintenance organizations (HMOs), preferred provider organizations (PPOs), Medicare savings accounts (MSAs), and special needs plans (SNPs).

8. Discussion

Section 8 discusses key findings regarding the Initiative effects on utilization, expenditure, and MDS-based quality measures in the second year of the Initiative (FY 2018), informed by insights on NFI 2 implementation gained from primary data collection. It also notes several caveats that should be considered in interpreting the evaluation results presented in this report.

8.1   Lack of Initiative Effects on Reducing Utilization and Expenditures

In this report, we present evaluation results based on data from the second Initiative year, FY 2018. Our DD estimates showed no consistent evidence that in FY 2018 the Initiative has led to favorable reductions in hospital-related utilization or expenditures in either the Clinical + Payment group or the Payment-Only group. Judged by the number of statistically significant and favorable effects in relation to statistically significant and unfavorable effects, the Payment-Only facilities as a group performed relatively better in response to the incentive payments than Clinical + Payment facilities.

Within each group (Clinical + Payment or Payment-Only), there is considerable variation in the estimated Initiative effects across individual ECCPs. In the Clinical + Payment group, the FY 2018 data showed statistically significant favorable Initiative effects on at least one utilization and expenditure measure in only one ECCP (AQAF). That contrasts

with four ECCPs (ATOP2, MOQI, NY-RAH, and RAVEN) that had statistically significant unfavorable Initiative effects. There were no statistically significant changes in OPTIMISTIC.

In the Payment-Only group, two ECCPs (ATOP2 and RAVEN) achieved favorable and statistically significant reductions in some utilization and expenditure measures, whereas four ECCPs (ATOP2, MOQI, NY-RAH, and OPTIMISTIC) showed some unfavorable and statistically significant increases. Note that ATOP2 had effects in both directions. There were no statistically significant changes in AQAF. Results from sensitivity analyses, using alternative specifications, suggest a slightly more favorable pattern of the Initiative effects.

The FY 2018 results may indicate that clinical practices concerning hospitalization of Initiative-eligible residents did not change substantially, even though facilities provided acute care services for eligible residents as indicated by submitted NFI 2 claims.

In both intervention groups, low practitioner buy-in and the challenges of billing in corporate structures were key reported barriers to implementation. These challenges were often

> Although many practitioners expressed support for the overarching NFI 2 goals, in practice they struggled to certify conditions within the required time window or faced other challenges submitting practitioner claims.

related to practitioner employment status or billing processes (e.g., working in a group practice or being salaried by nursing facilities). Although some practitioners disengaged from the Initiative completely, others continued to support facility billing despite not submitting their own NFI 2 codes on practitioner claims.

Similarly, facility staff interviewees in many corporate-owned facilities cited billing structures as a barrier to NFI 2 implementation. In these facilities, staff submitted NFI 2 documentation to a corporate billing office, which in turn, submitted claims to and received reimbursement from Medicare. Because of this centralized claim review and submission process, some interviewees across ECCPs were unaware whether their NFI 2 claims had been submitted, or if any resulting reimbursements had been received. As such, some facility staff reported that completing NFI 2 activities, including documentation and certification of changes in condition, did not seem worth the investment because they were seeing no monetary benefits.

Competing priorities also seem to be a common barrier to NFI 2 implementation. Many facility leaders noted the presence of additional programs in their facilities, ranging from managed care plans to corporate initiatives (e.g., antipsychotic medication reduction or fall prevention efforts). Many of these programs target a subset of residents, placing an additional burden on facility staff and practitioners to identify

which residents participate in which programs (i.e., NFI 2, various managed care plans, corporate or facility efforts).

Among Clinical + Payment facilities, some facility floor staff had only limited engagement with NFI 2 activities, even into the second year of the Initiative. Many Clinical + Payment facilities relied on embedded ECCP staff to continue the clinical and educational interventions from NFI 1. They also depended on ECCP staff to assume responsibility for the payment component, such as certifying conditions for NFI 2 and preparing documentation for incentive billing. This continued reliance on ECCP staff, observed earlier in the Initiative implementation, has further shifted the responsibility away from facility staff. Some facility leaders across ECCPs indicated that NFI 2 felt like a financial reward added to the many efforts already in place through NFI 1.

Even in Payment-Only facilities, some practices to improve communication and care were already in place before participating in NFI 2. Similar to Clinical + Payment facilities, many interviewees across ECCPs reported no change in care practices as a result of NFI 2. Rather, they are simply getting paid for practices already in place, and the payment incentive may not be viewed as a substantial motivator for additional change. However, there are some Payment-Only facilities that designated an NFI 2 champion (i.e., a staff member who improves engagement by facilitating NFI 2 billing from identifying the change of condition through claims submission). Some ECCPs also provided a liaison to provide training and encouragement for Payment-Only facilities.

Overall engagement in both Clinical + Payment and Payment-Only facilities varies widely within and across ECCPs. Particularly in ECCPs that have undergone substantial model changes (i.e., AQAF and NY-RAH), facility staff and leadership buy-in seems a bit lower compared to other ECCPs. Likewise, facilities that have reported staff retention challenges, high rates of facility leadership turnover, or low practitioner commitment also reported lower NFI 2 engagement. Our site visit and telephone interview findings and claims analysis also indicate tremendous variation in billing volume.

It is important to note that in 2018, midway through Initiative implementation, ECCPs continued to report some inconsistencies among facilities' and practitioners' understanding of the Initiative design, particularly the billing requirements and details. In response, CMS offered several clarifications of the billing requirements. It is not clear how quickly these periodic updates to guidance have been absorbed and adopted by participating facilities. However, this process indicates that the learning curve among participating facilities and practitioners continues to this day.

8.2 Mixed Initiative Effects on MDS-based Quality Measures

Our analysis of FY 2018 data showed mixed results regarding Initiative impact on MDS-based quality measures. We found a few favorable and statistically significant effects and several unfavorable and statistically significant effects on some quality measures across ECCPs. However, the effect pattern is not consistent or strong enough to draw conclusions.

Descriptive analyses of trends in the 10 MDS-based quality measures over time add context to the multivariate analysis results. The absolute prevalence of 7 of 10 of these undesirable events has generally been decreasing in the national comparison group from FY 2014 to FY 2018 (see descriptive statistics in *Appendix P, Table P-1*). These trends indicate an overall improvement in quality over time, unrelated to the Initiative. The trends are mixed in the intervention groups. In the Clinical + Payment group, the prevalence of the undesirable events trended downward in 7 of 10 measures, and in the Payment-Only group, the prevalence trended downward in 5 of 10 measures.

Despite these mixed trends over time, the Initiative group quality measure scores were lower (indicating higher quality) than the national comparison group for most of the quality measures across all years measured. The lower baseline prevalence of adverse events among Initiative-eligible residents, coupled with decreasing prevalence over time in the national comparison group, may make it harder for NFI 2 facilities to achieve further quality improvement relative to the national comparison group.

8.3 Caveats

There are several important points to bear in mind when interpreting our results. First, we are measuring *changes* in the outcome measures and not the *absolute level* of the outcome measures themselves. Thus, our model does not account for the fact that it may be easier to reduce a measure from a high level to a medium level than from a medium level to a low level, or potentially more so from a low level to an even lower level. Based on a review of the descriptive results in *Appendices M–O*, the national comparison group had higher rates of utilization than the Initiative states. Rates for the Clinical + Payment group and Payment-Only group were reasonably similar. Correspondingly, the quality measure indicators were lower in both intervention groups, indicating higher quality than the national comparison group. Therefore, if it is indeed easier to reduce a measure from a relatively higher level than from a lower level, then our approach may understate the effects of the Initiative in lower quality facilities.

Second, our finding of relatively few statistically significant and favorable Initiative effects may be driven partly by model specifications. As described in *Section 3*, our results are based on accounting for different baseline trends between the intervention and comparison groups. If, relative to the comparison group, the outcome in the

intervention group has been decreasing over time because of prior NFI 1 interventions, the model expects that, absent the Initiative, this trend would continue into the next year. This may be a reasonable assumption, but it has consequences. Namely, the Initiative is only credited with reducing an outcome if it is reduced beyond the prediction based on the trend.

In both the Clinical + Payment and the Payment-Only groups, the outcome measures in the intervention groups were mostly decreasing over the years 2014–2016 relative to the national comparison group, but this downward trend was stronger in the Clinical + Payment group (see **Section 3**). This finding is unsurprising given that the Clinical + Payment facilities participated in NFI 1 and were able to reduce these outcomes during 2014–2016. Thus, it may have been harder to achieve further reductions during NFI 2 in the Clinical + Payment group, particularly for the ECCPs where NFI 1 yielded the strongest reductions during 2014–2016. This is still true despite the "flattening of the baseline trend" for FY 2018, as described in **Section 3**.

In interpreting the ECCP-specific results, one point we made in the previous annual report is still relevant: of the six Clinical + Payment groups, the one that trended down the most (a favorable result) over the baseline period (FY 2014–FY 2016) relative to the national comparison group was MOQI, followed by RAVEN and NY–RAH. In contrast, AQAF mostly trended up over time relative to the national comparison group. Thus, in a sense, it may have been difficult for MOQI, RAVEN, and NY-RAH to achieve further reductions in FY 2018 relative to their NFI 1 trends, and relatively easier for AQAF to do so.

Finally, it is noteworthy that the Initiative-eligible population in our study has declined substantially over the years 2014–2018. Although the total population of long-stay nursing facility residents has not changed much over this period, the number of Initiative-eligible residents kept in our evaluation analysis after exclusions has dwindled. This reduction is largely because of the growth of Medicare managed care (as shown in **Tables 7-2** through **7-9** and on **Figure 7-1)**. Moreover, interviewees shared that the decrease in eligible residents reduces the motivation for facilities to submit Initiative claims and benefit monetarily.

"Cherry picking" relatively healthier residents by managed care plans is also possible, leading to potential underestimation of the favorable effect of the Initiative. This "cherry picking" could potentially affect the case mix (i.e., composition in terms of demographics and health profiles) of Initiative participants, and therefore, the impact analysis. The lower acuity of patients who tend to enroll in managed care, relative to Initiative participants, may not be fully captured in our multivariate models because severity within a medical condition is not always captured in diagnosis codes. If this selection happens to a larger extent in the intervention group than in the national comparison group, the Initiative impact may be underestimated.

In summary, there is no consistent evidence that the Initiative has yielded statistically significant reductions in utilization, expenditures, or quality in Initiative Year 2. In future reports, we will gather and analyze two additional years of data to determine trends in Initiative effects as NFI 2 unfolds in remaining years. Likewise, we will also continue interviewing participating ECCP leadership and facility leaders and staff to provide context for the Initiative findings.