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

Final Report
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Prepared for

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Acronyms

A-F

ACO	accountable care organization
ACP	advance care planning
ACT	acute care transition
ADLs	activities of daily living
ADON	assistant director of nursing
AMDA	American Medical Directors Association
AMS	altered mental status
APRN	advanced practice registered nurse
AQAF	Alabama Quality Assurance Foundation: Nursing Facility Initiative (AL)
ATOP2	Comagine Health: Admissions and Transitions Optimization Program (NV & CO)
CASPER	Certification and Survey Provider Enhanced Reports
CFIR	Consolidated Framework for Implementation Research
CFS	cognitive function scale
CHF	congestive heart failure
CI	confidence interval
CMS	Centers for Medicare & Medicaid Services
CNA	certified nursing assistant
C-O	Clinical-Only
COPD	chronic obstructive pulmonary disease
C+P	Clinical + Payment
DD	difference-in-differences
DME	durable medical equipment
DON	director of nursing
DSRIP	Delivery System Reform Incentive Payment Program
ECCP	Enhanced Care and Coordination Provider
ED	emergency department
EMR	electronic medical record
EOL	end of life
FFS	fee-for-service
FY	fiscal year

G-O

GNYHA	Greater New York Hospital Association
HCC	Hierarchical Condition Category
HCPCS	Healthcare Common Procedure Coding System
IDR	Integrated Data Repository

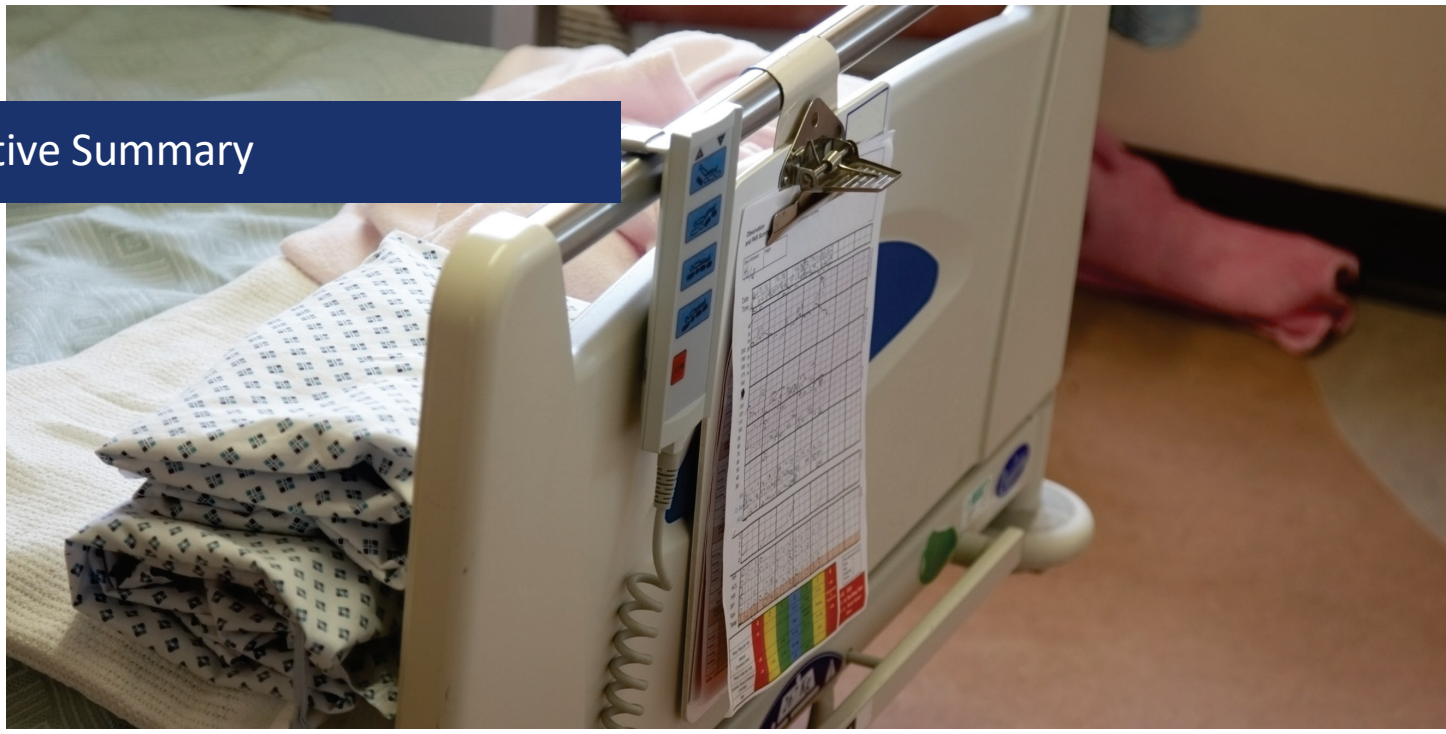
INTERACT	Interventions to Reduce Acute Care Transfers
I-SNP	Institutional Special Needs Plan
JHC	Jewish Healthcare Foundation
MA	Medicare Advantage
MD	medical director
MDS	Minimum Data Set
MOLST	Medical Orders for Life Sustaining Treatment
MOQI	The Curators of the University of Missouri: Sinclair School of Nursing Missouri Quality Initiative for Nursing Homes (MO)
NF	nursing facility
NFA	nursing facility administrator
NFI	Nursing Facility Initiative
NHC	Nursing Home Compare
NHQP	Nursing Home Quality Pool
NP	nurse practitioner
NYS DoH	New York State Department of Health
NY-RAH	The Greater New York Hospital Foundation: New York Reducing Avoidable Hospitalizations (NY)
OPTIMISTIC	Indiana University: Optimizing Patient Transfers, Impacting Medical Quality, and Improving Symptoms: Transforming Institutional Care (IN)
OR	odds ratio

P-W

PA	physician assistant
PAH	potentially avoidable hospitalization
PAL	Programmatic Assistance Letter
PBPY	per beneficiary per year
PIP	performance improvement project
P-O	Payment-Only
POLST	Physician's Orders for Life Sustaining Treatment
POST	Physician Orders for Scope of Treatment
PPE	personal protective equipment
QIO	Quality Improvement Organization
QIPMO	Quality Improvement Program for Missouri
QIS	Quality Improvement Specialist
RAVEN	University of Pittsburg Medical Center Provider Services: Reduce Avoidable Hospitalizations using Evidence-based Interventions for Nursing Facilities (PA)
RHC	rural health clinic
RN	registered nurse
RNCC	registered nurse care coordinator

Rx	pharmacy
SBAR	Situation Background Assessment and Recommendation
SD	standard deviation
SNF	skilled nursing facility
SNP	special needs plans
TAF	T-MSIS Analytic File
T-MSIS	Transformed Medicaid Statistical Information System
UPMC	University of Pittsburg Medical Center
UTI	urinary tract infection
VBP	Value-Based Purchasing
WSRG	within-state reference group

Executive Summary



ES.1 Overview

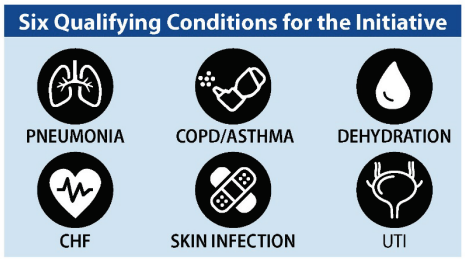
ES 1.1 Overall NFI Goals and Design

Hospitalizations among long-stay nursing facility (NF) residents are costly and often negatively affect residents' functional and mental health due to the stressful environment and aggressive treatments. As a result, such hospitalizations can exacerbate preexisting conditions, such as dementia. These hospitalizations are common; for example, in 2011, a quarter of all NF residents were hospitalized, costing Medicare nearly $15 billon (Office of Inspector General, 2013). Avoiding unnecessary hospitalizations decreases the likelihood of negative health outcomes for residents and reduces Medicare costs. The Centers for Medicare & Medicaid Services (CMS) developed the Initiative to Reduce Avoidable Hospitalizations among Nursing Facility Residents, or Nursing Facility Initiative (NFI), with the goal of reducing potentially avoidable hospitalizations in this population.

In the first phase, NFI 1 (2012–2016), 143 participating facilities partnered with seven Enhanced Care Coordination Providers (ECCPs) in seven states to apply clinical and educational interventions to reduce hospitalizations among long-stay residents. In this report, these facilities are referred to as Clinical-Only (C-O) facilities. Many of the ECCP interventions provided facilities with in-person clinical assistance delivered by registered nurses (RNs) or advanced practice registered nurses (APRNs). Our previous evaluation found that NFI 1 was associated with statistically significant reductions in hospitalizations, potentially avoidable hospitalizations, and emergency department (ED) visits, although it did not achieve net savings to the Medicare program after accounting for implementation costs (see RTI International, 2017). For those ECCPs that provided ECCP nurses on-site, NF interviewees reported that the effectiveness of the NFI 1 interventions was enhanced by

the consistent presence of ECCP nurses. Facilities with on-site ECCP APRNs added that they benefited from the APRNs' ability to assess eligible residents and, in some cases, prescribe and initiate on-site care. The facilities also appreciated the support that ECCP nurses provided to facility staff through NFI 1 training and education.

The second phase, NFI 2 (2016–2020), built on NFI 1 to test a new payment incentive to reduce avoidable hospitalizations. NFI 2 offered financial incentives to participating facilities and practitioners to provide on-site acute care to eligible residents with six health conditions—pneumonia, congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD)/asthma, skin infection, fluid/electrolyte disorder or dehydration, and urinary tract infection (UTI)—that are frequently associated with avoidable hospitalizations. Facilities treating an eligible resident for one of these conditions could receive a short-term per diem payment from Medicare if the condition met certain CMS-defined criteria. Facilities were required to submit specific Medicare claims, as well as documenting the condition and its treatment to receive payment. In addition, practitioners caring for residents on-site could bill for a hospital-level visit. ***Figure ES-1,*** on the following page, illustrates the NFI 2 theory of action.



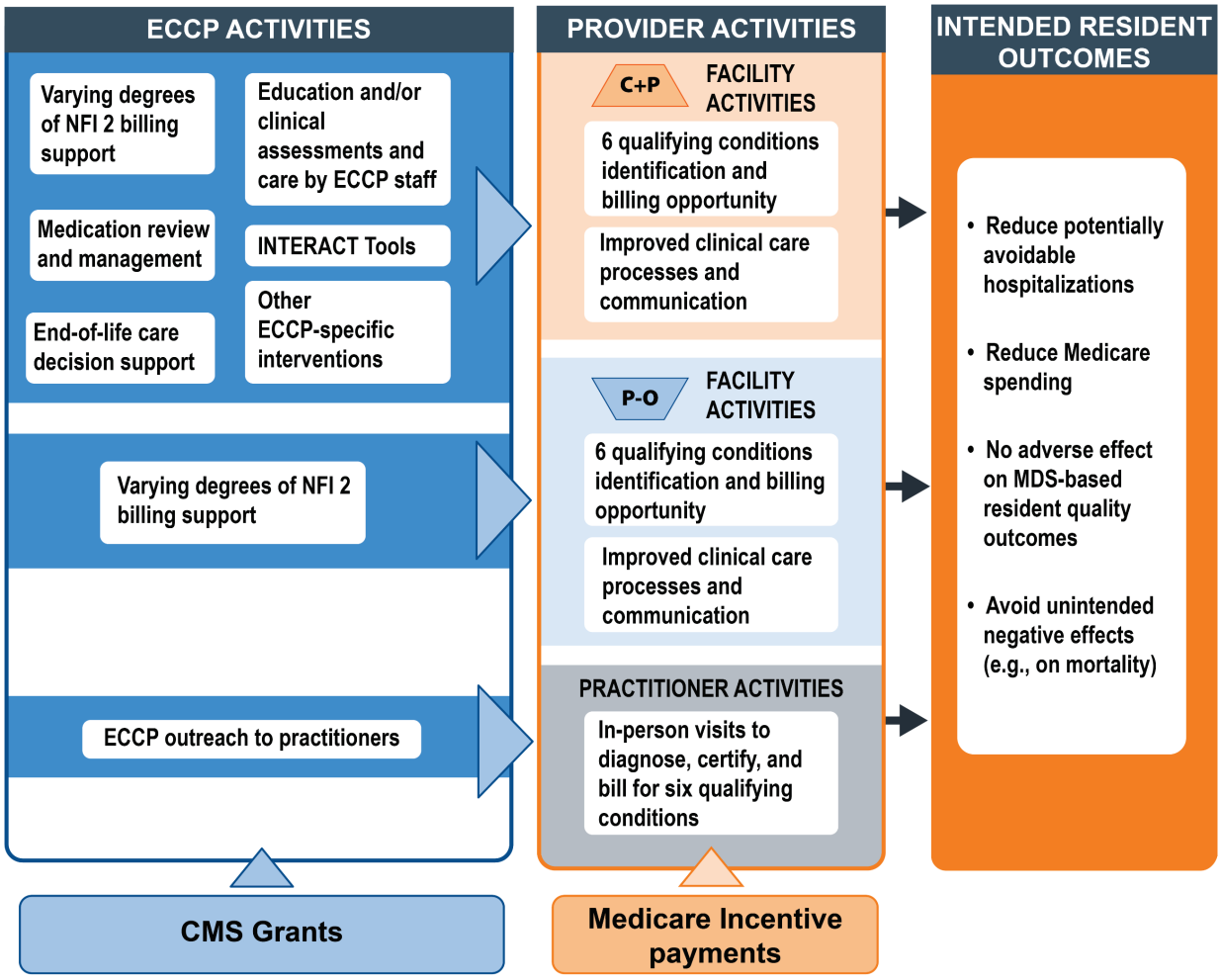
CMS funded six of the original seven ECCPs to implement the NFI 2 payment reform in two NF cohorts:

C+P	**Clinical + Payment (C+P)** facilities, continued from NFI 1 and received NFI 2 payment incentives, as well as many of the ECCP-specific clinical and educational interventions* from NFI 1
P-O	**Payment-Only (P-O)** facilities, recruited specifically for NFI 2, received payment incentives with only limited ECCP technical support

*Clinical + Payment interventions varied across ECCPs, including in the type of support facilities received from the ECCPs, with some also modifying their interventions between NFI 1 and NFI 2. As of Initiative Year 3 (2019), 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.

This report presents the final analyses of the NFI 2 evaluation. In addition, we describe NFI2 findings in a broader policy context and briefly discuss changes in the nursing facility population, the shift away from fee-for-service Medicare toward managed care, industry trends, and policies and programs that overlapped with the Initiative. Throughout the report, we use the terms "NFI 2" and "the Initiative" interchangeably.

Figure ES-1. NFI 2 theory of action



ES 1.2 Overview of Evaluation Approach

CMS contracted with RTI to evaluate all three NFI interventions: NFI 1 Clinical-Only, NFI 2 Clinical + Payment, and NFI 2 Payment-Only. We previously evaluated NFI 1 and released a final report in 2017 (RTI International, 2017). In the present NFI 2 final report, our primary focus is evaluating the two NFI 2 interventions, though we also include a new analysis that compares the relative effectiveness of the three types of NFI interventions.

Participating facilities could submit NFI 2 claims for eligible resident care through September 2020, and we originally planned to conduct the NFI 2 evaluation based on this entire implementation period of fiscal years (FYs) 2017–2020. However, due to the impact of the COVID-19 pandemic, which varied greatly by geography and over time during the final NFI 2 year, it was not appropriate to evaluate NFI 2 based on FY 2020 results. Instead, we present FY 2020 descriptive statistics separately and focus our Initiative evaluation on the earlier years (FY 2017–FY 2019).

Our evaluation focused on four key themes: implementation, on-site treatment for the six conditions, Initiative impact on hospital use, and other outcomes related to the Initiative. As an additional theme, separate from the main evaluation, we also include NFI 2 implementation and descriptive outcomes during the COVID-19 pandemic.

The key research questions[1] we addressed were:

Implementation

- How was NFI 2 implemented, and how did participating ECCP leadership and facility staff perceive Initiative effectiveness?
- What billing patterns for providing care for residents diagnosed with one of the six qualifying conditions were observed over time and across facilities? What patterns were observed in the billing of practitioners? What were the reasons given by facility staff and leaders to explain these patterns?

On-site Treatment for the Six Conditions

- What were the characteristics of the residents who were treated on-site for one of the six conditions under NFI 2? Did the clinical and demographic characteristics of residents differ between those treated on-site and those hospitalized for the six qualifying conditions?

Initiative Impact on Hospital Use

- Was the on-site treatment that was associated with the opportunity to bill under NFI 2 a substitute for hospitalization?
- What was the NFI 2 payment incentive effect on Medicare utilization and expenditures, particularly for hospital-related services? How did the Initiative effect on Medicare utilization and expenditures vary by ECCP and type of intervention?
- Considering NFI intervention as a whole, how did the estimated effects of the three NFI intervention groups (NFI 1 Clinical-Only, NFI 2 Clinical + Payment, and NFI 2 Payment-Only) compare to each other?

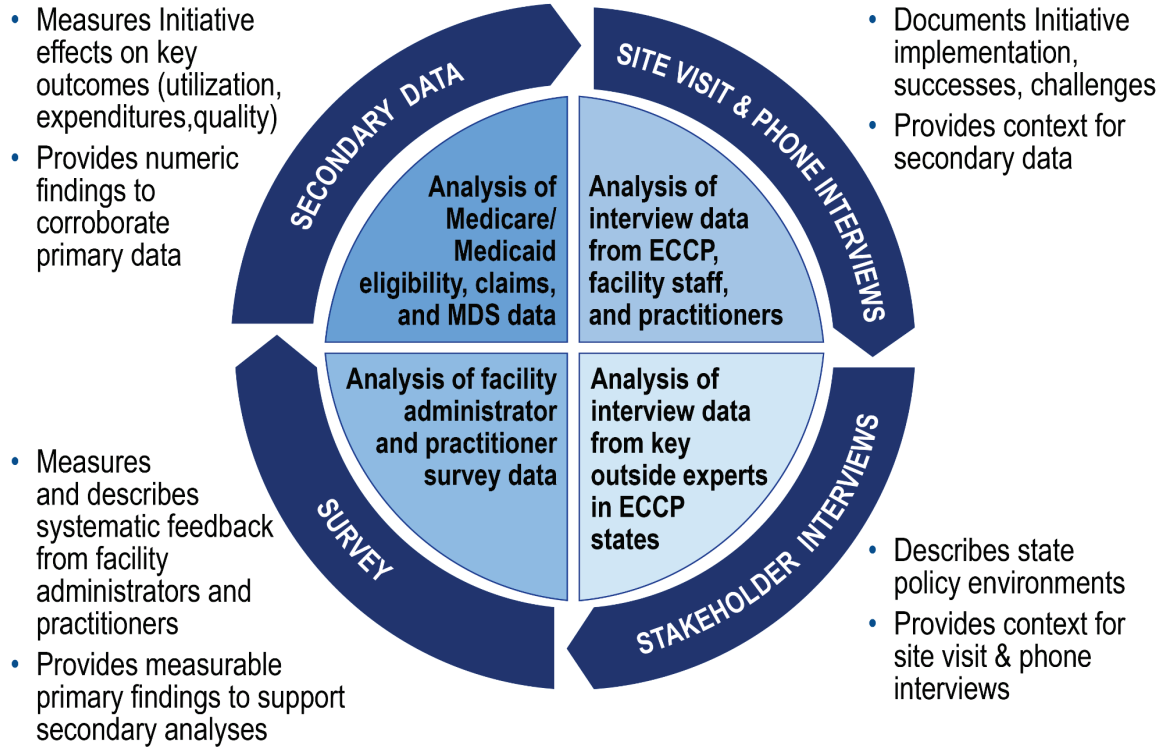
Other Outcomes Related to the Initiative

- How did the NFI 2 payment incentive affect quality of care outcomes for participating residents?

We used 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 complements the other data sources as shown in ***Figure ES-2***.

[1] The full list of research questions is in ***Chapter I.2*** of the main report.

Figure ES-2. Mixed-methods approach



We evaluated NFI 2 effects on utilization, expenditures, and quality of care measures for eligible residents by comparing them to a non-Initiative national comparison group of NF residents who would meet the Initiative eligibility criteria. We employed difference-in-differences (DD) multivariate regression modeling to estimate the impact of adding the payment incentive in each of the intervention groups: the C+P and P-O. Additionally, we performed a second set of DD analyses to simultaneously evaluate all three NFI interventions, as well as a number of other descriptive and cross-sectional analyses. We used several secondary data sources for this evaluation including Medicare/Medicaid claims and eligibility files and MDS (Minimum Data Set) assessments.

In addition, we collected primary data from participants to provide critical context and inform findings from the administrative data analyses. Our approach included a series of site visits to each ECCP and a selection of their partnering facilities, both those facilities carrying over from the NFI 1 clinical intervention with the additional payment incentive (C+P) and new facilities participating only with the payment model (P-O). We also conducted annual telephone interviews with participating facilities; a survey of nursing facility administrators (NFAs); a survey of participating practitioners (physicians, APRNs, and physician assistants); and a series of interviews with key stakeholders from each of the ECCP states. When appropriate, we included additional primary

data sources, such as NFI 2 reports shared by ECCPs, minutes from ECCP workgroup calls, tools or templates shared by facilities, and NFI 2-relevant news media. Primary data collection topics included understanding the rollout and implementation of NFI 2, obtaining feedback on the six conditions eligible for NFI 2 payment, discussing experiences with NFI 2 claims submission and receipt of payment, and evaluating the overall policy landscape and its potential impact on NFI 2 in each ECCP state.

ES.2 Assessing the Implementation and Impact of NFI 2

Our evaluation sought to understand each of the following: how ECCPs and participating nursing facilities implemented NFI 2; how the Initiative's financial incentives affected hospital utilization and Medicare expenditures; and the extent to which NFI 2 affected care quality. Throughout this report, evaluation results are discussed as favorable or unfavorable relative to the overall NFI 2 goals.

ES.2.1 Examining NFI 2 Implementation

CMS designed NFI 2 to provide facilities and practitioners with a financial incentive to treat residents on-site, rather than transferring them for hospital care. **Most interviewed facility staff and practitioners supported this overarching goal of keeping residents in the nursing facilities and agreed with the Initiative focus on the six NFI 2 conditions.** However, interviewees also noted that reducing avoidable hospitalizations already had been a priority prior to NFI 2. **For C+P facilities, the NFI 2 focus on reducing hospitalizations was a continuation of the activities already in place from NFI 1**. Although P-O facilities had not participated in NFI 1, many reported previous facility-wide efforts to minimize avoidable hospital transfers among their residents.

ECCPs facilitated NFI 2 implementation and billing through education opportunities for both C+P and P-O facilities, but C+P facilities relied heavily upon on-site ECCP staff for support with Initiative implementation and billing. ECCP staff, especially APRNs, supported facilities with resident assessments and documentation to submit NFI 2 claims. In contrast, P-O facilities only received technical assistance from ECCPs and sometimes struggled to implement NFI 2 fully without the support of on-site ECCP staff. Two ECCPs also underwent intervention redesigns during NFI 2 and this shift interrupted Initiative implementation for their affiliated facilities.

Although they supported the overall goal of reducing hospitalizations, interviewees described numerous challenges with implementing specific NFI 2 components. **Facility staff and leadership turnover proved to be a major barrier to implementation**, as facilities had to retrain staff and introduce new hires to the Initiative with such frequency that some facilities never moved beyond the initial start-up phase of implementation. Facilities reported that inconsistent staffing reduced overall Initiative buy-in and resulted in less NFI 2 billing. Interviewees also noted the importance of practitioner engagement, which varied widely across facilities. Many practitioners supported

facilities in their NFI 2 claim submissions, but few practitioners regularly submitted their own facility visit NFI 2 claims, despite the fact that these claims were paid at a higher hospital visit rate.

Decreasing numbers of eligible residents also weakened the commitment to NFI 2 among participating facilities. Facility interviewees stressed the importance of having a sufficient number of eligible residents to qualify for NFI 2 billing, reporting that substantial and widespread growth in Medicare managed care had resulted in fewer NFI 2-eligible residents. This trend was exacerbated by CMS's mid-Initiative change in the NFI 2 clinical criteria for the six conditions, leading to fewer resident condition changes meeting the criteria for Initiative claims submission. **With declining billing opportunities, facilities were not able to submit many NFI 2 claims and receive the associated financial incentives** leading to stalled NFI 2 implementation and facility engagement.

ES.2.2 Is There Evidence that On-Site Treatment was a Substitute for Hospitalization?

Although NFI 2 provided facilities with the opportunity to bill for delivering on-site treatment, intending to replace hospitalizations with appropriate treatment in the facility, billing for on-site treatment does not necessarily mean that a hospitalization was avoided. We examined on-site and hospital treatment for the six qualifying conditions, as well as the NFI 2 billing patterns, to determine whether on-site treatment was a substitute for hospitalization.

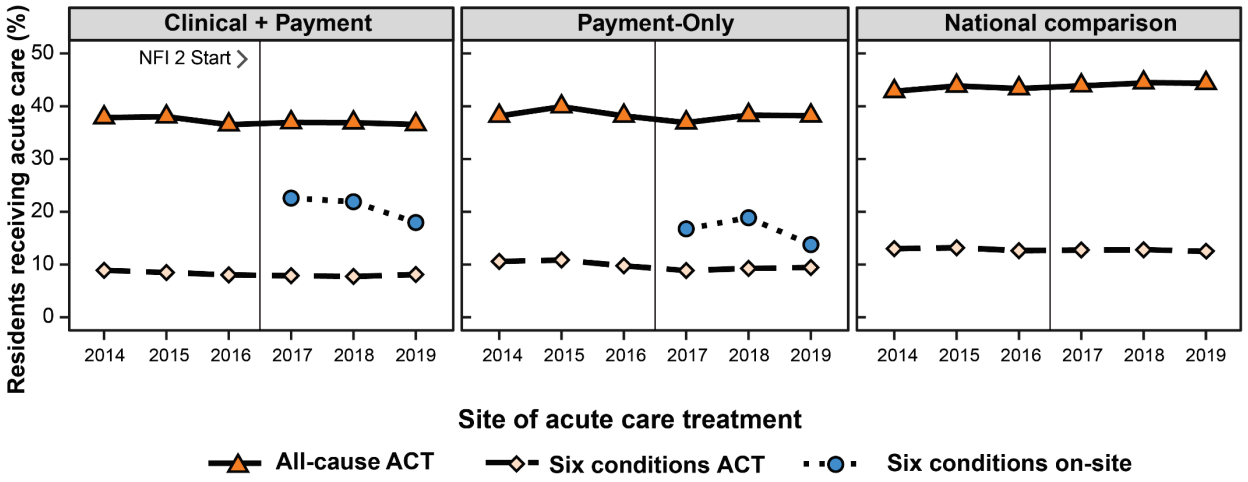
Our analysis strongly suggests that a substantial proportion of the residents treated in the facility as part of NFI 2 would not have been hospitalized.[2] Following NFI 2 implementation, the rate of hospitalization did not change substantially, despite the introduction of billing for on-site treatment and a rate of on-site treatment that actually exceeded treatment in the hospital for the six conditions. Although some hospitalizations may have been avoided, in aggregate, hospitalization rates did not decline. Additionally, **we identified important clinical differences between residents treated on-site and those hospitalized for the six conditions, with those who were less seriously ill more likely to be treated on-site,** again suggesting that residents who were more seriously ill were the ones who were hospitalized both before and after the Initiative. ***Figure ES-3*** contrasts the percentage of residents treated on-site with those who experienced an acute care transition (ACT), which includes inpatient care or treatment as an outpatient in either the ED or as an observation stay.

Our conclusion aligns with interview data regarding staff efforts to keep residents in participating NFs for care. **Many facilities reported that prior to participating in NFI 2, they already had similar processes and activities in place to reduce avoidable hospitalizations, with the Initiative delivering a financial incentive for care that facilities were already providing.**

[2] This argument is also articulated in Segelman et al. (2020), which is based on our findings from 2017 and 2018.

Figure ES-3. Percentage of Initiative-eligible residents treated on-site and in-hospital (ACTs), FY 2014–FY 2019

Hospitalization rates were **stable** over time, despite treatment on-site for six conditions.



ACT = acute care transition

SOURCE: RTI analysis of Medicare claims data.

ES.2.3 Implementation of the Payment Component of NFI 2

Billing patterns for on-site treatment reflect NFI 2 features and changes over time, while also serving as indicators of engagement with the Initiative. The evaluation results indicate several important billing trends:

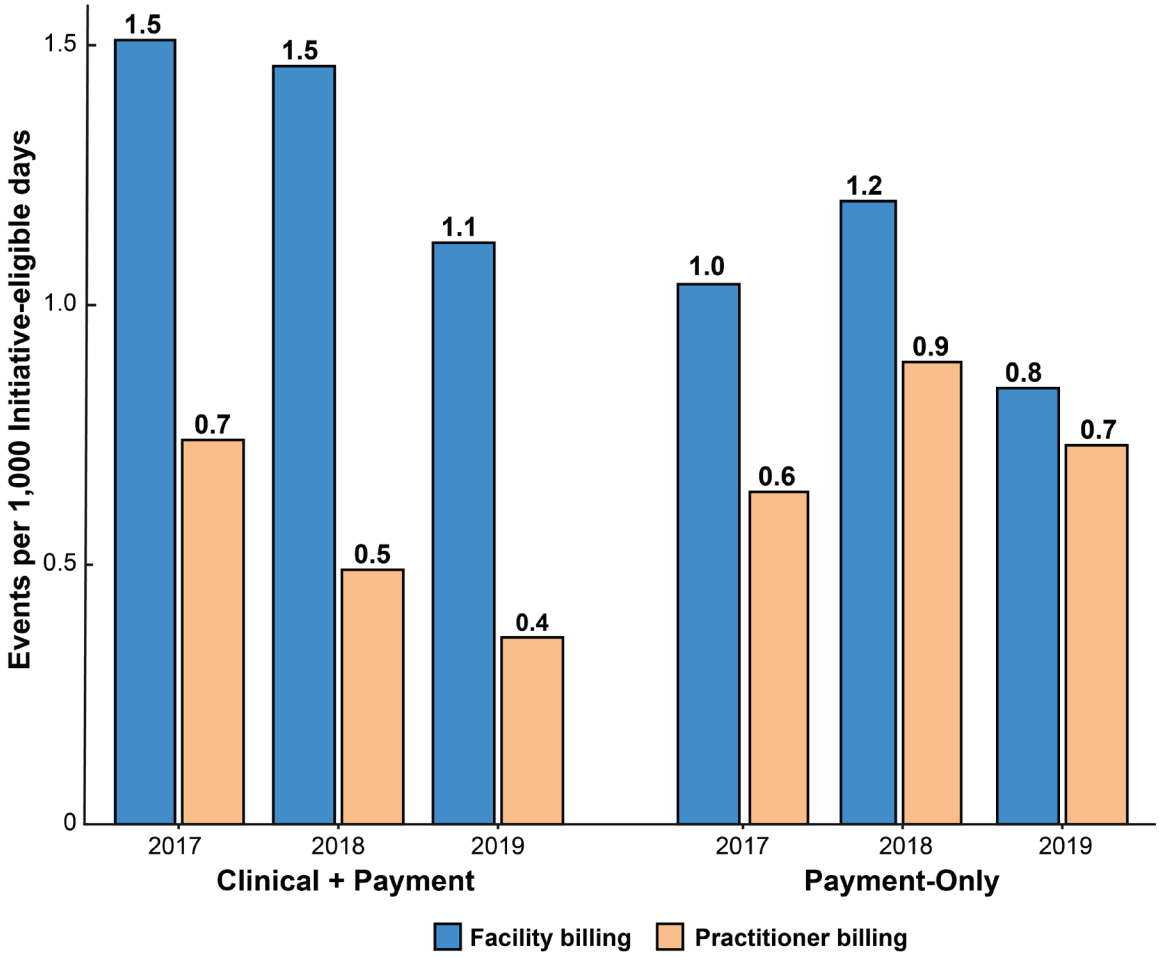
- **C+P facilities billed more for the Initiative due to the work of on-site ECCP staff**. Conversely, practitioners billed more in P-O facilities, where ECCP staff did not certify residents for the NFI 2 conditions (***Figure ES-4***).
- There was substantial variation in billing across facilities, with many facilities not billing at all or billing very little, and the top billing facilities billing frequently. **Over time, billing decreased and became more concentrated among a smaller group of facilities.**
- Pneumonia and UTI were the most commonly billed conditions for on-site treatment.
- Although NFI 2 was designed to incentivize facilities to keep residents on-site for care, **many nursing facilities were not able to bill consistently**. Some facilities that documented resident care for NFI 2 claims also were not able to receive money directly because their corporate business offices were responsible for claims submission and payment receipt, thus absorbing NFI 2 funds into their overall corporate budgets.

Facility interviewees listed several key factors for the reduction in billing over time: revised NFI 2 criteria for the six qualifying conditions, reduced numbers of residents eligible for NFI 2, and staffing and practitioner engagement challenges. Intervention changes for AQAF and NY-RAH also

undermined Initiative billing for facilities affiliated with those ECCPs. In addition, several facilities noted improvements in staff members' clinical skills, as they prioritized early identification of residents with symptoms of the six NFI 2 conditions. These improvements resulted in earlier identification of condition changes, prior to reaching the acuity level needed to meet NFI 2 billing criteria.

Figure ES-4. Facility and practitioner billing for all ECCPs combined, FY 2017–FY 2019

Billing **declined over time**; facility billing was **higher** in C+P and practitioner billing was **higher** in P-O.



SOURCE: RTI analysis of Medicare claims data.

NOTES: The sample used here includes all residents meeting NFI 2 eligibility requirements. This sample is slightly larger than the final analytic sample used in this report's multivariate analyses, which further excludes any resident with a missing covariate of interest. For further details on the sample selection process, see ***Table I-3*** in ***Appendix I***. Practitioner billing is based on code G9685.

ES.2.4 Impact of NFI 2 on Medicare Hospital-related Utilization and Expenditures

Because NFI 2 aimed to enable NFs to treat residents on-site, an important component of our evaluation was assessing the impact of the Initiative on hospital use. **There was no clear evidence that the NFI 2 payment incentives were associated with favorable reductions in hospital use**. We performed a DD analysis and found that, **relative to the national comparison group, utilization of some hospital-related services (hospitalizations, ED visits, and ACTs) unfavorably increased for eligible residents in the C+P facilities.** We found statistically significant increases in the probability of all-cause ED visits (relative increase of 11.4 percent) and potentially avoidable ED visits (relative increase of 10.1 percent). However, the findings of unfavorable increases showed some level of variation based on the method used. **For eligible residents in P-O facilities, we found no consistent evidence for favorable decreases or unfavorable increases in hospital-related utilization across the first three years of NFI 2**. None of the increases or decreases in utilization measures for the P-O facilities were statistically significant (***Figure ES-5***).

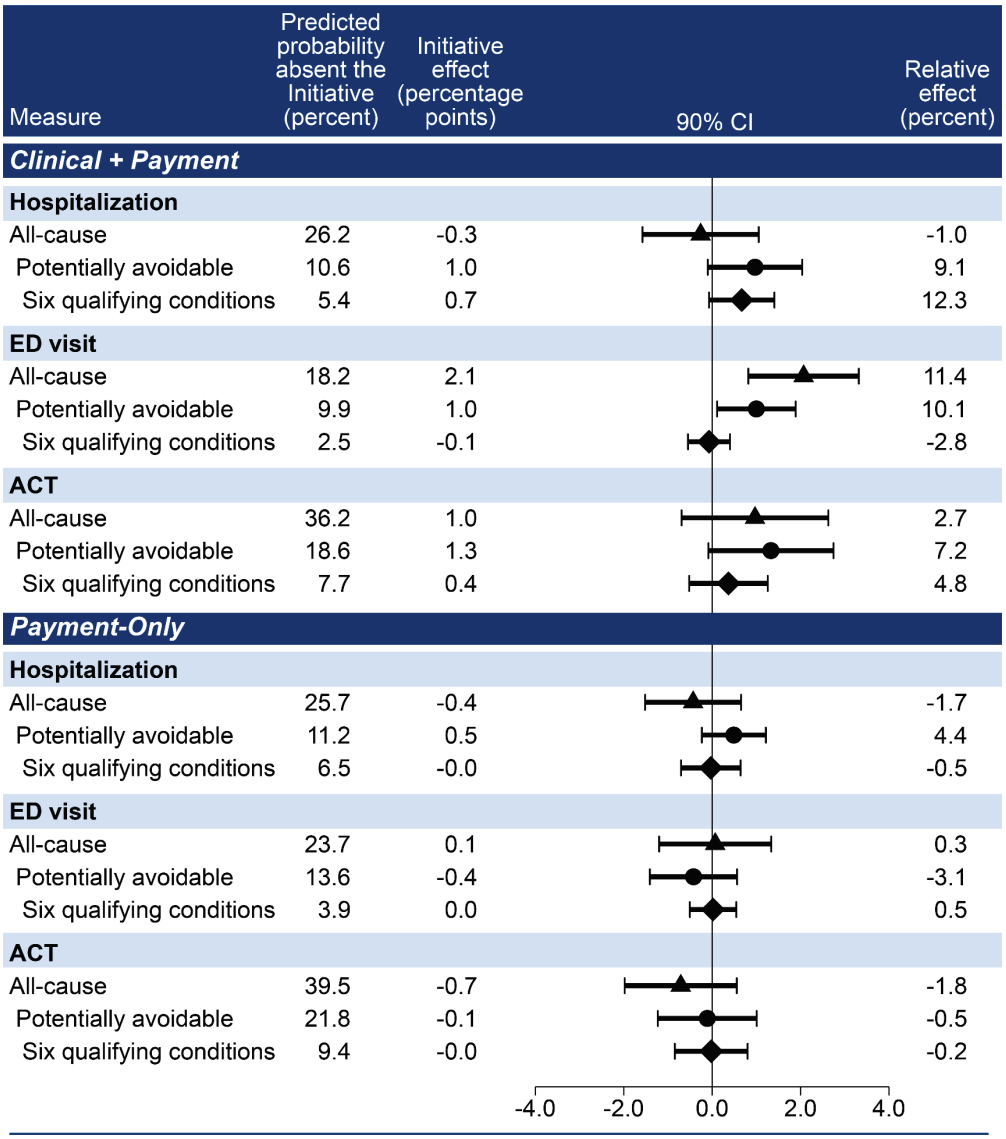
Similar to the utilization results, our DD analysis shows that **during FY 2017–FY 2019, Medicare expenditures increased for eligible residents in C+P facilities relative to residents in the national comparison group.** We found statistically significant increases, relative to the national comparison group, in total Medicare expenditures (4 percent relative increase), expenditures associated with potentially avoidable hospitalizations (14.2 percent relative increase), and hospitalizations due to the six qualifying conditions (22.1 percent relative increase). In comparison, **there was little to no Initiative effect on Medicare expenditures among residents in P-O facilities.** None of the increases or decreases in expenditures for the P-O facilities were statistically significant (***Figure ES-6***).

In summary, these findings indicate that **in FY 2017–FY 2019, there was no clear evidence that either the C+P facilities or P-O facilities attained NFI 2's goal of reducing potentially avoidable hospitalizations and associated costs for eligible residents beyond what was occurring on average among nursing facilities.**

Figure ES-5. All ECCPs: Initiative effect on hospital-related utilization, FY 2017–FY 2019

(probability of any utilization, per resident)

For C+P, there was **no clear evidence** of favorable impacts (things look worse). For P-O, there was **no clear evidence** of favorable impacts (no impact).



SOURCE: RTI analysis of Medicare claims data.

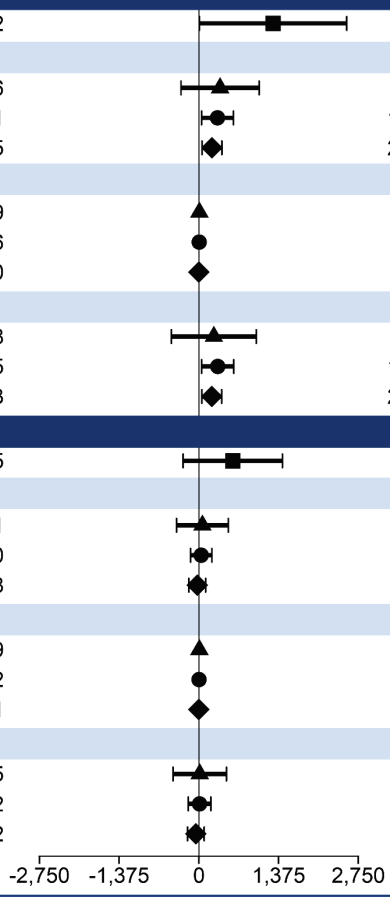
NOTES: The *predicted probability absent the Initiative* is the mean of the predicted probabilities of experiencing the event during their respective exposure period, for the residents in the intervention group, under the scenario that the intervention did not occur. The *Initiative effect* is calculated 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) calculated using unrounded values; calculating the relative Initiative effect using the rounded values in this table will yield different values than those reported here. The magnitude of a relative Initiative effect could be large when the underlying denominator—the predicted level of the measure—is small. In such cases, the relative Initiative effect should be interpreted with caution. ED = emergency department; ACT = acute care transition. Acute care transitions include hospitalizations, emergency department visits, or observation stays.

Figure ES-6. All ECCPs: Initiative effect on Medicare expenditures, FY 2017–FY 2019

(dollars, per resident-year)

For C+P, there was **no clear evidence** of favorable impacts (things look worse). For P-O, there was **no clear evidence** of favorable impacts (no impact).

Measure	Predicted expenditure absent the Initiative (dollars)	Initiative effect (dollars)	90% CI	Relative effect (percent)
Clinical + Payment				
Total Medicare expenditures	32,149	1,282		4.0
Hospitalization expenditures				
All-cause	9,878	366		3.7
Potentially avoidable	2,259	321		14.2
Six qualifying conditions	1,020	225		22.1
ED visit expenditures				
All-cause	264	9		3.2
Potentially avoidable	103	6		5.9
Six qualifying conditions	26	0		0.7
ACT expenditures				
All-cause	10,438	258		2.5
Potentially avoidable	2,388	325		13.6
Six qualifying conditions	1,044	223		21.4
Payment-Only				
Total Medicare expenditures	28,052	585		2.1
Hospitalization expenditures				
All-cause	7,825	61		0.8
Potentially avoidable	2,161	40		1.9
Six qualifying conditions	1,123	-28		-2.4
ED visit expenditures				
All-cause	313	9		2.8
Potentially avoidable	134	2		1.8
Six qualifying conditions	45	-1		-3.3
ACT expenditures				
All-cause	8,284	15		0.2
Potentially avoidable	2,339	12		0.5
Six qualifying conditions	1,189	-52		-4.4



SOURCE: RTI analysis of Medicare claims data.

NOTES: 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) calculated using unrounded values; calculating the relative Initiative effect using the rounded values in this table will yield different values than those reported here. The magnitude of a relative Initiative effect could be large when the underlying denominator—the predicted level of the measure—is small. In such cases, the relative Initiative effect should be interpreted with caution. 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. Some Initiative effects are so small that point estimates and their associated confidence intervals are close to 0.

ES.2.5 Impact of NFI 2 on MDS-Based Quality Measures

Although improving performance on MDS-based quality measures was not a specific goal of NFI 2, the Initiative may have affected the quality of care for eligible residents. The evaluation assessed the impact of NFI 2 on a set of relevant MDS-based quality measures using descriptive and multivariate regression analyses. We examined seven MDS measures in multivariate analyses:

- One or more falls with injury
- Self-reported moderate to severe pain
- Pressure ulcers Stage II or higher
- UTI
- Catheter inserted and left in bladder
- Decline in activities of daily living (ADLs)
- Antipsychotic medication use

The evaluation found mixed evidence of an association between the payment incentives and some unfavorable changes in quality of care. The Initiative was not associated with a statistically significant change in the majority of quality measures for residents in C+P facilities. For residents in P-O facilities, the Initiative was associated with higher-than-expected rates of undesirable outcomes in four of the seven MDS-based quality measures. Lower baseline prevalence of adverse outcomes among Initiative-eligible residents, coupled with quality improvements over time in the national comparison group, make it more difficult for NFI 2 facilities to achieve further quality improvement relative to the national comparison group. It is important to acknowledge that the intervention groups demonstrated favorable decreases in undesirable outcomes over time in many of the quality measures examined for the evaluation, though the pattern was not as strong as in the national comparison group.

ES.3 Simultaneously Assessing NFI 1 and NFI 2 Effects

We performed a second set of DD analyses for selected outcomes in which we simultaneously evaluated all three NFI interventions (C-O, C+P, P-O), comparing them to one another and using a common baseline year (FY 2012). This analysis largely confirmed our previous findings from separate NFI 1 and NFI 2 analyses. Specifically, we found that **the NFI 1 C-O intervention had a favorable impact on reducing hospital-related utilization and associated expenditures, and there was, again, no clear evidence that the NFI 2 payment intervention in either the C+P or P-O facilities had an effect on reducing hospital-related utilization and associated expenditures.** Unlike our original set of DD analyses, the alternate set of DD analyses did not provide further evidence of an unfavorable increase in hospital-related utilization or associated expenditures for the C+P facilities.

ES.4 NFI 2 Implementation and Facility and Resident Outcomes During the COVID-19 Pandemic in 2020

The COVID-19 pandemic had a devastating impact on residents and nursing facility staff, creating facility-wide operational challenges and impeding NFI 2 implementation in the final Initiative year. ECCPs removed most of their on-site staff, instead pivoting to help participating facilities with remote chart reviews, COVID communication with families, and other pandemic-related supports. In recognition of the COVID-19 pandemic impact in FY 2020, the evaluation only includes descriptive analysis of FY 2020 data and some details on the pandemic's impact on NFI 2 implementation. **As expected, all-cause hospitalizations, total Medicare expenditures, and resident mortality were much higher in FY 2020 compared to other years across Initiative and comparison groups.**

ES.5 Discussion

Both NFI 1 and NFI 2 funded participating ECCPs' and nursing facilities' efforts to reduce avoidable hospitalizations[3] among long-stay residents. Although NFI 1 focused more on educational and clinical interventions in nursing facilities, NFI 2 added a payment component for facilities and practitioners to keep residents on-site for treatment of six conditions which are often associated with avoidable hospitalizations. Our evaluation found that NFI 1 reduced undesirable hospital utilization but did not achieve net savings to the Medicare program. The NFI 2 evaluation produced no clear evidence of a favorable impact on either hospital utilization or Medicare expenditures. Instead, NFI 2 findings indicated that many residents treated on-site during NFI 2 would not have been hospitalized, even absent the Initiative.

Despite widespread participant and stakeholder support for reducing avoidable resident hospitalizations, many facilities struggled to implement NFI 2 fully, potentially contributing to the overall lack of favorable utilization and expenditure findings. The Initiative's two-arm intervention design and clinical criteria revisions midway through implementation contributed to substantial variation and infrequent billing.

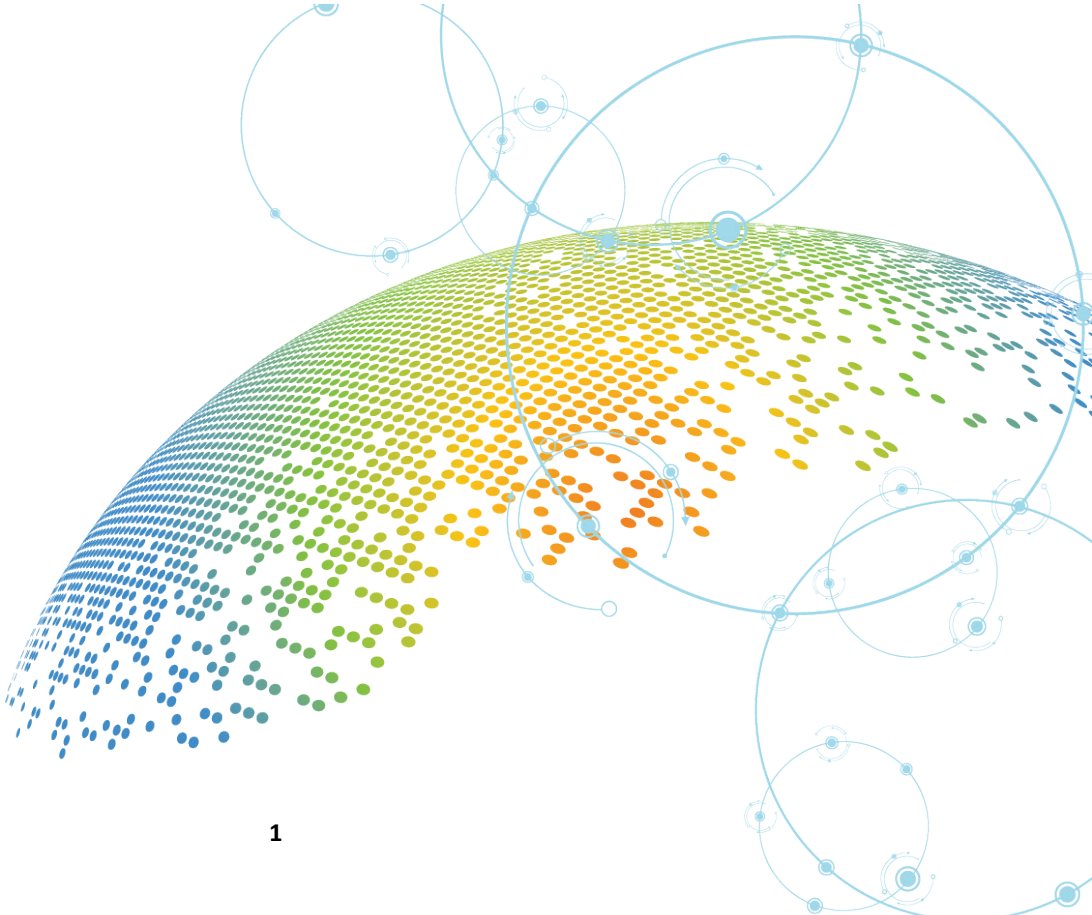
Possible explanations for these findings include the following:

- C+P facilities already had made care practice changes during NFI 1 and found it challenging to reduce hospitalization rates further. Many P-O facilities also reported they already had worked to reduce avoidable hospitalizations prior to participating in NFI 2.

[3] Individual resident conditions vary. This report recognizes that some hospitalizations may be necessary and clinically appropriate. The underlying goal of NFI focused on treating resident conditions that could have been safely treated in the nursing facility and did not warrant hospital care.

- As designed, the NFI 2 financial incentives were not sufficient to motivate substantial changes in facility and practitioner care practices. Structural challenges, such as facility leadership and staff turnover, prevented consistent billing; corporate financial arrangements also prevented some billing facilities from receiving NFI 2 money directly.
- Unlike the NFI 1 facility-wide educational and clinical interventions, NFI 2 was structured to focus more on the Initiative billing component, which did not align well with existing facility or practitioner workflows.
- Larger nursing facility and health policy landscape changes unfolding over the eight years of NFI 1 and NFI 2 framed the Initiative implementation. These changes included more high-acuity residents in nursing facilities, movement away from fee-for-service (FFS) Medicare, and greater presence of on-site APRNs in facilities. For example, several Medicare Advantage models offer similar APRN support and focus on reducing avoidable hospitalizations, providing facilities with alternatives to NFI.
- In conclusion, Medicare payment incentives alone did not enable a change in care practices, as hospital transfer reductions among long-stay nursing facility residents hinge upon clinical staff stability and presence. Moreover, prioritizing on-site care for all residents may work better than focusing on residents with a limited set of strictly defined specific conditions. This holistic approach is only possible with sufficient staffing, appropriate levels of clinical expertise and support, and consistent assignment of nursing staff.

Section I. Introduction



Section I Summary

CMS developed the Initiative to Reduce Avoidable Hospitalizations among Nursing Facility Residents, or Nursing Facility Initiative (NFI), with the goal of reducing potentially avoidable hospitalizations among long-stay nursing facility residents enrolled in fee-for-service (FFS) Medicare.

In the prior phase of NFI, NFI 1 (2012–2016), participating nursing facilities providing clinical and educational interventions partnered with ECCP organizations to reduce hospitalizations for their long-stay residents. We refer to these facilities as Clinical-Only (C-O) facilities.

The second phase, NFI 2 (2016–2020), built on NFI 1 to test a new payment incentive to reduce avoidable hospitalizations. NFI 2 offered financial incentives to participating nursing facilities and practitioners to provide in-house acute care to eligible residents with six health conditions that are frequently associated with avoidable hospitalizations. Meeting and documenting a set of clinical criteria for those conditions was required for a supplemental facility per diem payment from Medicare. In addition to supporting facility NFI 2 claims, certifying practitioners could bill for a hospital-level visit. CMS funded six of the original seven ECCPs to implement the NFI 2 payment reform in two NF cohorts: (1) Clinical + Payment (C+P) facilities, continuing from NFI 1 and receiving NFI 2 payment incentives, as well as many of the ECCP-specific clinical and educational interventions from NFI 1; and (2) Payment-Only (P-O) facilities, recruited specifically for NFI 2 and receiving payment incentives with limited ECCP technical support. Continuing earlier trends, the overall policy environment shifted during NFI 2, with more high-acuity residents in nursing facilities and a higher proportion of residents enrolling in Medicare managed care.

NFI 1 was associated with statistically significant reductions in hospitalizations, potentially avoidable hospitalizations, and emergency department visits, although it did not achieve net savings to the Medicare program after accounting for implementation costs.

The focus of this report is the evaluation of NFI 2. RTI used mixed methods, both primary data collection and analysis and secondary data analysis, to evaluate NFI interventions. We evaluated multiple utilization, expenditure, and quality outcomes using a difference-in-differences regression framework.

Chapter I.1 Background

Key Takeaways

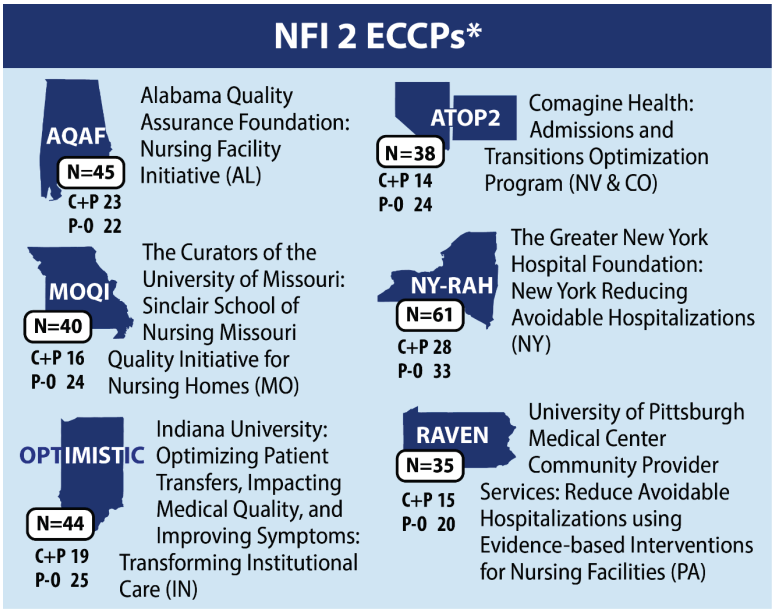
- *Hospitalizations are costly and can cause harm to residents. Avoiding unnecessary hospitalizations decreases the likelihood of negative outcomes for residents and reduces Medicare costs.*
- *NFI 1 (Clinical-Only intervention, 2012–2016) consisted of clinical and educational interventions aimed at reducing potentially avoidable hospitalizations among long-stay nursing facility residents. NFI 1 was associated with statistically significant reductions in all-cause hospitalizations, potentially avoidable hospitalizations, emergency department (ED) visits, and potentially avoidable ED visits. However, it did not achieve net Medicare savings after accounting for implementation costs.*
- *NFI 2 (2016–2020) included both a Clinical + Payment intervention, which added a payment incentive for participating facilities and practitioners, and a Payment-Only intervention which provided the payment incentives to newly recruited facilities. These interventions were intended to incentivize on-site treatment of residents with any of six qualifying NFI 2 conditions often associated with avoidable hospitalizations. This report evaluates the impact of NFI 2.*

I.1.A. Overall NFI Goals and Design

In October 2016, the Centers for Medicare & Medicaid Services (CMS) began implementing the second phase of the Initiative to Reduce Avoidable Hospitalizations among Nursing Facility Residents, adding a payment reform component to the original phase one design. This second

phase of the Nursing Facility Initiative—herein referred to as NFI 2, or the Initiative—attempted to reduce avoidable hospitalizations and associated expenditures among eligible[4] FFS Medicare long-stay nursing facility (NF) residents by incentivizing participating NFs and practitioners to provide on-site acute care to residents with any of six qualifying conditions, rather than transferring them to the hospital. The incentive structure included Initiative-specific billing codes for facilities and practitioners to submit NFI 2 claims for Medicare reimbursement.

This NFI 2 design built upon a prior CMS Initiative. From 2012 through 2016, CMS implemented the first phase (known as NFI 1), consisting of facility-level clinical and educational interventions intended to improve detection, documentation, and communication of changes in residents' conditions with the goal of reducing avoidable hospitalizations.[5] NFI 1 also was designed to improve processes for hospital transitions, medication review, and quality assurance.[6]



* N = number of participating nursing facilities at the start of NFI 2. Nebraska participated in NFI 1 but left the Initiative in NFI 2. C+P is Clinical + Payment and P-O is Payment-Only.

NOTE: The total number of facilities in the figure above are 263, however in many of the analyses for this report, including the difference-in-differences (DD) analyses, we included 259 facilities. More details are provided in ***Appendix Section I.4*** of ***Appendix I***.

Under NFI 1, seven Enhanced Care and Coordination Providers (ECCPs), each working with selected facilities in one specific state, designed and implemented interventions grounded in the overarching clinical and educational intervention components set forth by CMS. Each ECCP was an independent organization that worked with partnering NFs it recruited to participate in the Initiative. The ECCP interventions were designed to train all facility staff to identify resident condition changes quickly and improve communication about those residents. With quick identification and better communication, residents could be treated before their

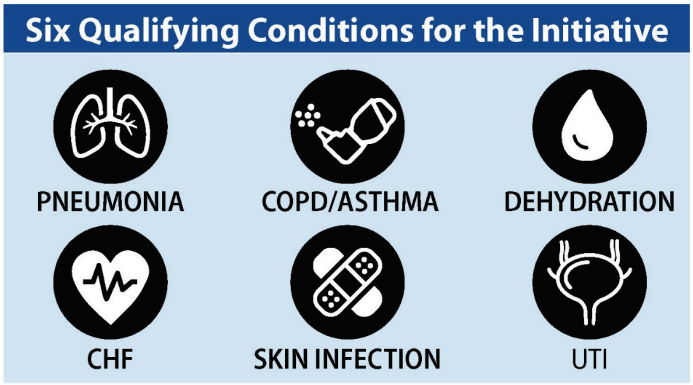
[4] The eligibility criteria for the Initiative are described in detail in ***Appendix I*** and include requirements to reside in the facility for 101 or more days, to have Medicare Part A and Part B fee-for-service status, and to not be enrolled in Medicare hospice.

[5] Individual resident conditions vary. This report recognizes that some hospitalizations may be necessary and clinically appropriate. The underlying goal of NFI focused on treating resident conditions that could have been safely treated in the nursing facility and did not warrant hospital care.

[6] https://www.cms.gov/Medicare-Medicaid-Coordination/Medicare-and-Medicaid-Coordination/Medicare-Medicaid-Coordination-Office/InitiativetoReduceAvoidableHospitalizations/PhaseOneClinicalandEducationalInterventions

conditions worsened, thus reducing their likelihood of needing hospital care. Many of the ECCP interventions also provided facilities with in-person clinical assistance delivered by registered nurses (RNs) or advanced practice registered nurses (APRNs). We summarize the NFI 1 evaluation results in ***Chapter I.1.C.***

NFI 2 expanded the NFI 1 interventions with six of the original seven[7] ECCPs, adding the new Initiative-wide Medicare incentive payment to the first cohort and recruiting a second cohort of participating nursing facilities that received the payment incentive but did not receive the NFI 1 training and clinical interventions. The NFI 2 incentive payment offered participating facilities and practitioners the opportunity to submit claims with special Medicare billing codes. These codes served as a financial incentive to nursing facilities and practitioners for providing acute care to eligible Medicare fee-for-service (FFS) long-stay residents on-site, rather than transferring them to hospitals for treatment. Participating nursing facilities and practitioners taking care of Initiative-eligible residents were able to submit NFI 2 claims.



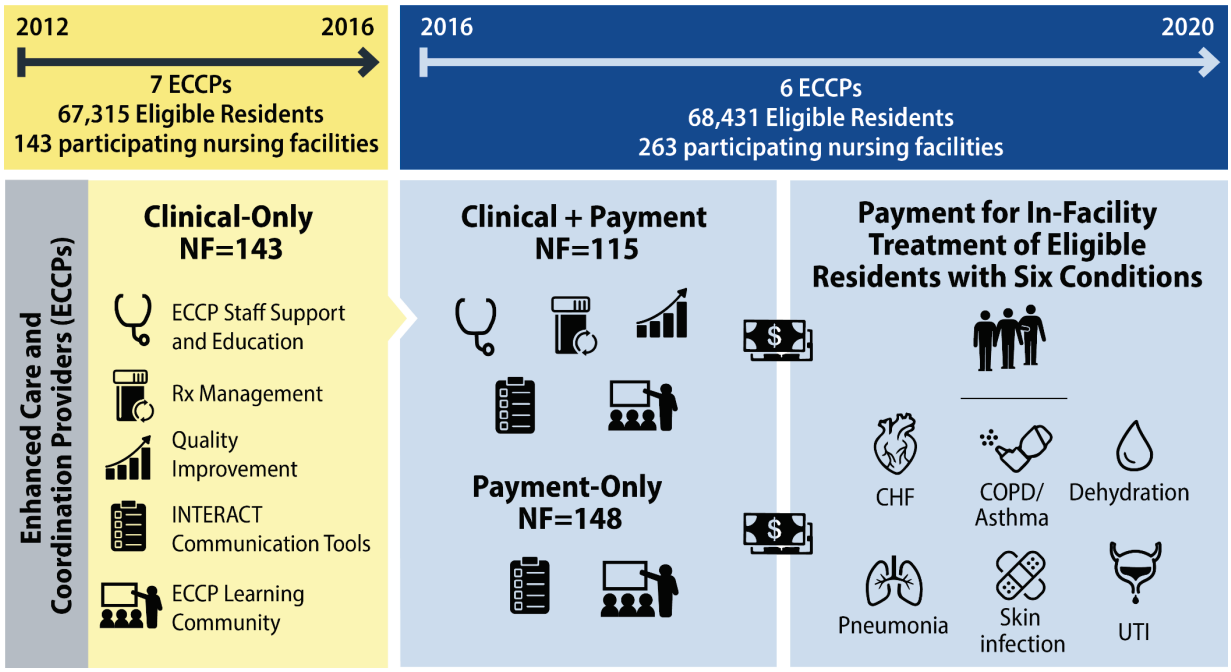
To receive a financial incentive, facility staff and practitioners assessed, diagnosed, and treated residents for any of six qualifying conditions. These six diagnoses—pneumonia, congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD)/asthma, skin infection, fluid/electrolyte disorder or dehydration,[8] and urinary tract infections (UTI)—result in many potentially avoidable hospitalizations. Clinical criteria were originally established and later fine-tuned by CMS to determine which residents would qualify for the incentive payment. Participating facilities could then bill Medicare about $218 per resident per day for a period of on-site treatment under a Part B code created expressly for the Initiative. Practitioners could submit a bill to receive a hospital-level visit payment when evaluating patients as part of providing on-site treatment for the six qualifying conditions.

Figure I-1 illustrates key features and components of the NFI 1 and NFI 2 interventions. This figure depicts both phases, as well as the key components and participants for each.

[7] CHI/Alegent Creighton Health in Nebraska participated in NFI 1 but not in NFI 2. Comagine Health, formerly HealthInsight, continued to work with Nevada facilities from NFI 1. These became NFI 2 C+P facilities. Because of the limited number of facilities in Nevada, they also recruited P-O facilities for NFI 2 from Colorado.

[8] Fluid/electrolyte disorder and dehydration are used interchangeably.

Figure I-1. NFI model overview



As part of NFI 2, participating facilities were divided into Clinical + Payment (C+P) and Payment-Only (P-O) groups. A comparison of the features of the C+P and P-O groups is shown in ***Table I-1***.

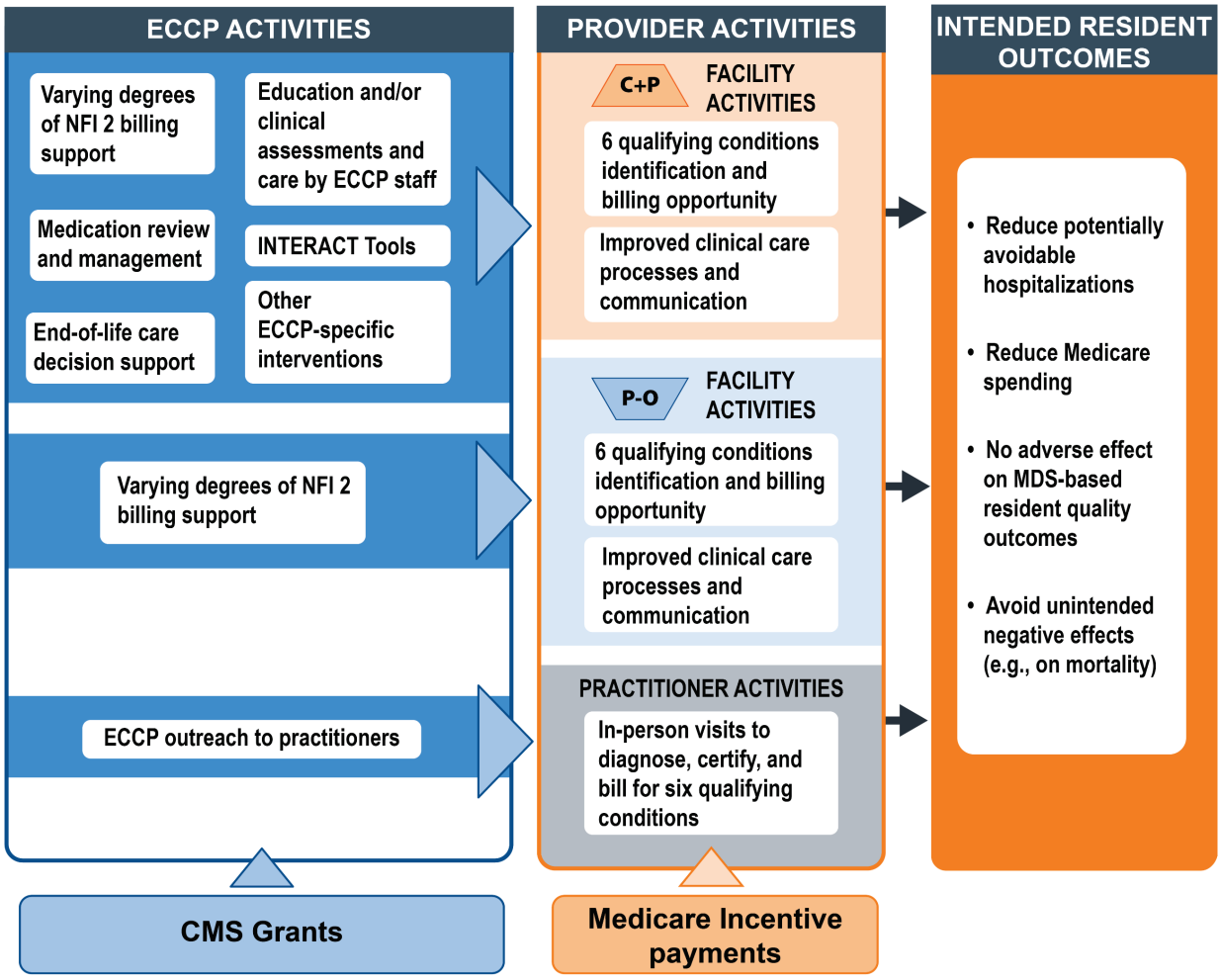
Table I-1. Overview of NFI 2 Facility Group Definitions

C+P	Participating facilities that continued from NFI 1, referred to as the *Clinical + Payment* group,* were implementing both the clinical and educational interventions from NFI 1, plus the new NFI 2 payment intervention related to the six qualifying conditions.
P-O	The cohort of facilities new to the Initiative in NFI 2, referred to as the *Payment-Only* group, was implementing only the NFI 2 payment intervention related to the six qualifying conditions, with limited ECCP support and use of some communication tools, such as INTERACT. The new facilities were recruited from the same states as NFI 1 with the exception of ATOP2 adding Colorado due to a limited number of facilities in Nevada.

NOTE: Clinical + Payment interventions vary across ECCPs, including the type of support facilities receive from the ECCP. In Initiative Year 3 (2019), 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.

Figure I-2 illustrates the theory of action through various Initiative activities implemented by the ECCPs and participant providers aimed at achieving the desired outcomes, such as reducing potentially avoidable hospitalizations and related Medicare spending.

Figure I-2. NFI 2 theory of action

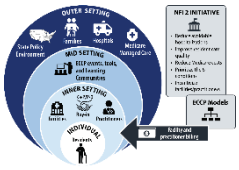


To a different degree, the six ECCPs supported both C+P and P-O facilities as well as practitioners (i.e., physicians, non-ECCP APRNs) by providing education and communication tools, such as INTERACT (Interventions to Reduce Acute Care Transfers), as well as NFI 2 billing support. For C+P facilities, ECCPs also continued many C-O on-site clinical care components, such as end-of-life care planning support, medication management, and other ECCP-specific interventions. This additional support aimed to improve clinical care processes and information exchange; increase timely identification of resident changes in condition; and create more billing opportunities through Medicare payments. The goal of these activities was to encourage facilities to provide higher quality care to residents and avoid unnecessary hospitalizations, improving residents' quality of life and providing Medicare savings.

I.1.B. NFI in a Broader Policy Context

Hospitalizations Among Nursing Facility Residents

NFI 2 sought to reduce hospitalizations among long-stay NF residents. Since at least the 1980s, policymakers and clinicians have been concerned by the rate of hospitalizations among NF residents (Brownell et al., 2014; Ouslander et al., 2000; Zimmer et al., 1988). Hospitalization in this population may cause or exacerbate physical and psychological stress, including delirium and disorientation. It can result in unnecessary tests and procedures and is associated with myriad potential complications, such as hospital-acquired infections, adverse drug events, and functional decline (Xing et al., 2013). Hospitalizations of NF residents also result in substantial Medicare expense amounting to thousands of dollars each day, while daily care in an NF costs only hundreds (Ouslander et al., 2000). In 2011, a quarter of all NF residents were hospitalized, costing Medicare nearly $15 billon (Office of Inspector General, 2013). In ***Appendix M*** we present data analysis to consider the extent of hospitalization, and especially hospitalization for the specific conditions that were the focus of NFI 2, among the population of high-cost NF residents.



CFIR Spotlight: We use the Consolidated Framework for Implementation Research (CFIR) approach (***Chapter I.2.A***) to examine how the outer setting components such as state policy environment and managed care penetration shape NFI 2 implementation.

Previous research has found that many, if not most, hospitalizations from NFs are potentially avoidable. Potentially avoidable hospitalizations are either (a) situations in which facility residents could have been treated in the nursing facility, rather than being sent to a hospital for care, or (b) scenarios when the conditions needing treatment could have been identified sooner in the NF and treated prior to an exacerbation that warrants hospital care. A study involving medical record review by clinicians found that 40 percent of the hospitalizations they examined were avoidable (Saliba et al., 2000). A similar rate of potentially avoidable hospitalizations was also identified using administrative data (Walsh et al., 2012). Other researchers have found even higher rates of potentially avoidable hospitalizations, with some authors reporting that about 60 percent are potentially avoidable (Spector et al., 2013) and others reporting about 50 percent (Xing et al., 2013).

Xing et al. (2013) estimated that avoidable hospitalizations during the last year of NF residents' lives cost Medicare over $1 billion. Because these calculations were based only on hospitalizations in the final year of life, the true cost to Medicare for avoidable hospitalizations among all residents is much greater. Other researchers have also estimated enormous savings to Medicare that reductions in avoidable hospitalizations would yield (Ouslander et al., 2010). Some studies have

suggested that, in most cases, these unnecessary Medicare expenditures actually did not result in improved quality-adjusted survival (Goldfield et al., 2013).

The reasons behind the enormous rates of potentially avoidable hospitalizations among NF residents are multiple and complex, requiring an understanding of the resident population, care delivery in NFs and the payment policies that support the care of this population.

Nursing Facility Population and Industry Trends Relevant to NFI

Most nursing facilities have two distinct populations: short-stay residents, whose stay is paid by Medicare and long-stay residents, whose stay is not Medicare paid. NFI is geared toward the long-stay residents, those who have resided in the facility for 101 days or more (CMS, 2015) and will likely live the rest of their lives in their NFs. These residents sometimes pay privately for their care, but most care for this population is covered by Medicaid, except when residents are on a Medicare-covered skilled nursing facility (SNF) short-stay after a hospitalization. Almost two-thirds of NF residents are dually eligible for Medicaid and Medicare (Konetzka et al., 2015).

The population of long-stay residents has been changing significantly over the last three decades, with direct implications for how NFI was implemented and evaluated. For example, the shift by most state Medicaid programs to case-mix reimbursement systems has led to higher acuity among the NF population (Feng et al., 2006). Highlighting these acuity concerns, between 1985 and 2015 the proportion of chair-bound NF residents increased from 39 percent to 64 percent (Fashaw et al., 2020). Relatedly, inclusion of APRNs among the clinical staff in nursing facilities has been steadily increasing in the last two decades (Gadbois et al., 2015; Intrator et al., 2005). Other policy changes have resulted in many more facilities becoming certified for both Medicare and Medicaid, with dual certification increasing from 33 percent in 1985 to 97 percent in 2015 (Fashaw et al., 2020). The proportion of residents whose primary payer was Medicare, which pays an average daily rate higher than Medicaid, also increased from 9 percent to 15 percent during that time, while the proportion of residents covered by Medicaid has held relatively steady (Fashaw et al., 2020).

Conflicting Incentives in Medicare and Medicaid

Existing Medicare and Medicaid payment policies create some incentives for nursing facilities to treat residents with acute conditions in the hospital. While Medicare is responsible for paying for treatment in the hospital, Medicaid does not provide additional reimbursement to NFs for providing acute care to residents on-site. Following hospitalization, the NF also benefits by receiving a higher payment from Medicare for short-term rehabilitative care (Grabowski, 2007). In some instances, during hospitalization, Medicaid programs make a “bed-hold” payment (described in ***Chapter II.6***) to the NF to hold the empty bed, thus serving as an incentive for the facility to create empty beds through hospitalization. NFI 2 sought to address some of these conflicting incentives that exist between Medicaid and Medicare in NFs by reimbursing the facilities for providing on-site care, rather than sending residents to the hospital.

In fiscal year (FY) 2015, the Medicaid program spent $55 billion on NF care, accounting for about two-thirds of those receiving any care in nursing facilities (KFF, 2017). In that year, states reimbursed NFs an average of $185.70 per resident day for that care (Xu and Intrator, 2020). Research has shown an association between higher state Medicaid payment rates and lower rates of hospitalization (Intrator et al., 2007), suggesting that when facilities are able to provide more on-site resident care, residents are less likely to be transferred for hospital care.

Many hospitalizations of long-stay nursing facility residents could be avoided with increased clinical investment in NFs. Research has suggested that the increased presence of physicians (Intrator et al., 1999), nurse practitioners (Intrator et al. 2004; Mileski et al., 2020), licensed nurses (Grabowski et al., 2008), and telemedicine (Grabowski & O'Malley, 2014) prevent hospital transfers. Yet, many NFs have lacked adequate clinical infrastructure, with very few facilities employing sufficient clinicians or nurses or investing in telemedicine (Grabowski & O'Malley, 2014; Intrator et al., 2005; Katz et al., 2006). This may be beginning to shift, especially as seen in increased employment of nurse practitioners (Auerbach et al., 2020). Medicaid pays for roughly half of all NF expenditures (with the other half coming from Medicare and private pay), but generally does not pay NFs enough to invest in highly skilled staff, such as APRNs. Medicaid's failure to provide higher rates for highly skilled staff can be explained by the disconnect in payer source across hospitals and NFs. When Medicaid covers the cost of highly skilled staff in the NFs, Medicare realizes the savings from reduced hospital transfers. The reason for the underinvestment relates to the conflicting incentives for Medicaid as the dominant payer of NF services.

Nursing Facility Policies and Programs that Overlap with NFI 2

While NFI 2 was intended to offset some of the conflicting incentives between Medicare and Medicaid and provide participating facilities with funding to invest in clinical services, other policies and programs in effect during the Initiative may have influenced the behavior of NFs, including those participating in the Initiative and those in the comparison group. These policies are described in ***Table I-2*** and in the sections below. Insights from stakeholders interviewed as part of the NFI 2 evaluation (described in ***Appendix A***) are also included below.

Table I-2. Coinciding NF-associated policies and programs

Policy/Program	Description	Overlap with NFI 2	NFI States Affected
Bed-hold	State Medicaid policy where NF is paid for an unoccupied bed while a long-stay resident is hospitalized.	Possible financial incentive for NFs to hospitalize residents. Most states' occupancy requirements prevent NFs from receiving payments.	AL, MO, NY, PA (see ***Appendix N*** for further details)
Pay-for-Performance	Medicaid programs that pay NFs to achieve certain established care thresholds.	May improve outcomes for all NF residents in states with these programs, including those in the comparison group.	CO, IN, NY
Medicare Advantage (MA)	Managed care version of Medicare; private insurers paid by Medicare on a per beneficiary per month basis. More flexibility for short-term NF care; can waive the qualifying hospitalization requirement.	NF residents enrolled in MA plans not eligible for NFI 2. Enrollment in MA plans grew from 31% of Medicare beneficiaries in 2016 to 39% in 2020 (KFF, 2021).	All
Institutional Special Needs Plan (I-SNP)	MA plans limited primarily to Medicare beneficiaries who are long-stay NF residents. Model includes APRNs providing clinical care to residents in the facility.	NF residents enrolled in I-SNPs not eligible for NFI 2.	All
Skilled Nursing Facility (SNF) Value-Based Purchasing	Penalties and incentives paid to NFs to reduce rehospitalizations among Medicare beneficiaries.	Reducing rehospitalizations among short-stay residents may have spillover effect on long-stay resident hospitalizations.	All
Accountable Care Organizations	Groups jointly accountable for their patients' health, giving them financial incentives to cooperate and save money. Those that save Medicare money while meeting quality targets keep a portion of the savings.	Improving care or reducing rehospitalizations among short-stay residents may have a spillover effect on long-stay resident hospitalizations and other outcomes.	All

Bed-hold Policies

Many states have bed-hold policies in place, so that residents can return to their own bed in the facility when they return from the hospital. This ensures that Medicaid will pay the facility to keep hospitalized long-stay resident beds unoccupied while the resident is in the hospital. These policies vary by percentage of the daily rate they cover and number of days they will pay. Also, some states require a minimum NF occupancy rate to trigger the payment with the idea that the NF must be near capacity for residents to be at risk of losing their beds. Most stakeholders we spoke to reported that because NF occupancy has been steadily dropping over the past decade, most resident hospitalizations no longer qualify for this payment. Research has shown when states pay a more generous bed-hold rate, facilities have a greater incentive to send residents to hospitals for care (Intrator et al., 2007, 2009; Unruh et al., 2013).

Pay-for-Performance Policies

Several states have implemented pay-for-performance policies in their Medicaid programs. The performance measures included in these models vary across states, but hospitalizations typically were not included among them (Werner et al., 2010), though some of the measures included in these programs may improve other clinical outcomes that are related to hospitalizations. These programs have generally been found not to be successful in improving quality broadly (Werner et al., 2013); however, larger incentives have been found to be more effective (Konetzka et al., 2018).

Of the NFI 2-participating states, stakeholder interviews revealed that only New York had policies or initiatives specifically aimed at reducing hospitalizations with their Delivery System Reform Incentive Payment (DSRIP) and Nursing Home Quality Pool (NHQP) programs. DSRIP did not target long-term care resident hospitalizations, however. Colorado and Indiana have Medicaid pay-for-performance programs, but they do not include any measures related to hospitalizations.

Medicare Advantage and NFI Eligibility

In recent years there has been extraordinary growth in the Medicare Advantage (MA) program, which is the managed care version of Medicare where private insurers are paid by Medicare on a per beneficiary per month basis. Long-stay residents who had an MA plan for their Medicare coverage were ineligible for NFI 2. The proportion of NF patients enrolled in MA increased from 6.9 percent in 2000 to 15.5 percent in 2013 (Jung et al., 2018). Our investigation of MA penetration indicated a similar trend nationwide among long-stay NF residents in more recent years. Enrollment in MA among this population increased from 14 percent in 2014 to 20 percent in 2018, decreasing the population eligible for NFI 2; some of these were Institutional Special Needs Plan (I-SNP) enrollees.

Institutional Special Needs Plans

I-SNPs are a form of MA plan that is limited to Medicare beneficiaries who are long-stay nursing facility residents (or certified as needing NF-level care). I-SNPs use APRNs or physician assistants (PAs) to provide coordinated care in the NF in conjunction with primary care physicians, facility

staff, and other providers at no additional cost to the facility or the resident. Under these I-SNPs, residents experiencing an acute illness are intended to be cared for in the facility, rather than being sent to a hospital, and facilities are paid a higher rate for skilled nursing days without the qualifying hospital stay. Recent research has shown that one I-SNP model, originally called EverCare, had lower ED and inpatient utilization compared to FFS Medicare (McGarry & Grabowski, 2019). Previous research on EverCare also found it lowered hospitalization costs relative to FFS Medicare, with each nurse practitioner saving about $103,000 per year in hospital costs (Kane et al., 2002, 2003). Stakeholders interviewed for this project provided fairly consistent recommendations about practices that NFs could implement to reduce hospitalizations, including greater presence of MDs and APRNs. This is further supported by systematic reviews that found that use of APRNs reduced unnecessary hospitalizations (Mileski et al., 2020). Placing APRNs, or other types of advanced practice nurses, in nursing facilities is a common feature of both I-SNPs and NFI.

Skilled Nursing Facility Value-Based Purchasing

The Skilled Nursing Facility Value-Based Purchasing (SNF VBP) program is a recent change to how Medicare pays for short-term care in NFs. SNF VBP, which was mandated by the Protecting Access to Medicare Act of 2014 and began impacting payment in October 2018, aims to reduce rehospitalizations among Medicare beneficiaries through penalties and incentives. SNF VBP is paid by a 2 percent reduction in Medicare payments to nursing facilities, with 60 percent of these funds being redistributed to those facilities that perform well on the rehospitalization measure used in the program. Larger, rural, and not-for-profit facilities were more likely to earn incentives during the first two years of the program, as were those with the highest registered nurse staffing levels (Daras et al., 2021). This program could have a spillover effect on long-stay resident hospitalizations and the NFI 2 evaluation.

Accountable Care Organizations

In accountable care organizations (ACOs), participating providers, including doctors, hospitals, NFs, and other health care organizations, join together voluntarily to provide coordinated care to their Medicare patients. Many of the patients covered by these programs receive short-term care in NFs. Few NFs are full participants in ACOs (i.e., they do not share in the savings) and are instead paid a per diem rate by the ACO (Colla et al., 2016). However, to receive post-acute patient referrals from ACOs, NFs often have to meet quality or other standards set by the ACO (Kennedy et al., 2020). These standards would likely affect all residents in the facility and not just those referred by the ACO.

I.1.C. NFI 1 Accomplishments

NFI 1 tested a series of ECCP-designed and implemented facility-level clinical and educational interventions to reduce avoidable hospitalizations among long-stay NF residents. Note that although NFI 1 started in late 2012, it took time to “ramp up” the intervention. Therefore, RTI’s

NFI 1 evaluation started with 2014. RTI's NFI 1 evaluation concluded that, when viewing these interventions together, the Initiative was associated with reductions in hospital-related utilization and associated Medicare expenditures (RTI International, 2017), and did not adversely impact resident mortality (Feng et al., 2018) (also see ***Appendix DD***). During the intervention period (2014–2016), the Initiative led to statistically significant reductions in multiple Medicare utilization and expenditure measures for participating residents, relative to residents in the comparison group. There were statistically significant reductions in all-cause and potentially avoidable hospitalizations and ED visits, and in the expenditures associated with all-cause and potentially avoidable hospitalizations. For those measures with statistically significant decreases, the relative effects were between 7.6 percent and 20.8 percent. However, after accounting for the costs of the grants implementing the Initiative, there were no net savings to the Medicare program (RTI International, 2017).

The effectiveness of the NFI 1 interventions was enhanced when there was consistent presence of ECCP nurses who provided what interviewees described as a "knowledgeable extra set of hands" in facilities. Based on the secondary analysis of hospitalization data, the ECCPs that were most successful in reducing hospitalizations, OPTIMISTIC, MOQI, and RAVEN, were also the ones that provided full-time nurses and APRNs who delivered consistent, hands-on clinical care. In these ECCPs' facilities, facility staff were more engaged in the Initiative, and described more Initiative-associated change in facility culture compared to ATOP, AQAF, Alegent, and NY-RAH (RTI International, 2017).

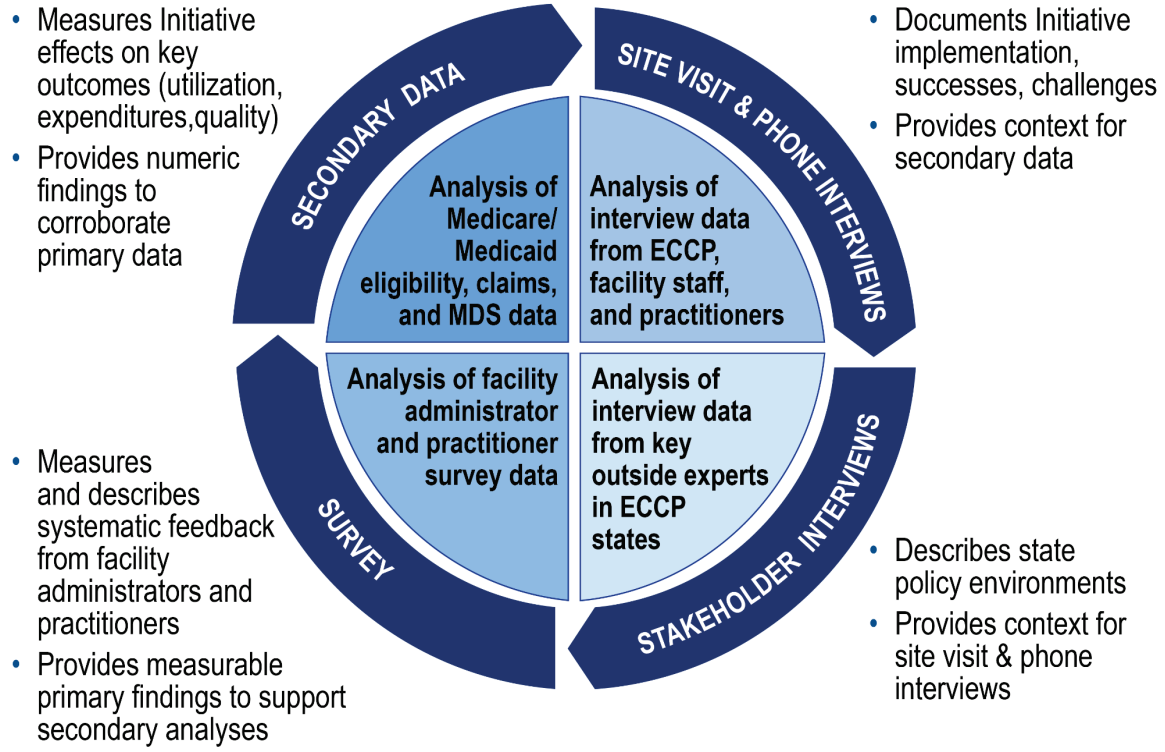
Chapter I.2 Evaluation Approach

Key Takeaways

- *RTI used a mixed-methods approach to evaluate NFI interventions.*
- *Primary data collection included in-person and telephone interviews with facility staff, leaders, and practitioners; interviews with ECCP leadership; interviews with key stakeholders in participating states; surveys of both facility administrators and participating practitioners; and document review and media analysis.*
- *Secondary data analysis used administrative Medicare eligibility and claims data, MDS assessments, and Medicaid eligibility and claims data. We evaluated many of the outcomes using a difference-in-differences regression framework.*
- *This report primarily focuses on the two interventions that were part of NFI 2 (Clinical + Payment and Payment-Only).*

CMS previously contracted with RTI to evaluate NFI 1 during 2012–2016 and currently contracts with RTI to evaluate NFI 2 during 2016–2020. We conducted a mixed-methods evaluation to obtain a holistic understanding of NFI 2. ***Figure I-3*** details the mixed-method approach.

Figure I-3. Mixed-methods approach



NFI 2 ran through September 2020, and we originally planned to conduct the NFI 2 evaluation based on the entire implementation period FY 2016–FY 2020. However, due to the impact of the COVID–19 pandemic, which varied greatly by geography and over time during the final NFI 2 year, it was not appropriate to evaluate NFI 2 based on FY 2020 results. Instead, we present FY 2020 descriptive statistics separately and focus our evaluation on the earlier years.

Our evaluation focused on four key themes: implementation, on-site treatment for the six conditions, Initiative impact on hospital use, and other outcomes related to the Initiative. An additional theme, separate from the main evaluation, was implementation and outcomes during the COVID-19 pandemic. In this final evaluation report, we address the following research questions:

Implementation

- How was NFI 2 implemented, and how did participating ECCP leadership and facility staff perceive Initiative effectiveness? (***Chapter II.2; Chapter II.4***)
- What patterns were observed over time and between facilities in billing for providing care for residents who were diagnosed with one of the six qualifying conditions? What patterns

were observed in the billing practices of practitioners? What were the reasons given by facility staff and leaders to explain these patterns? (***Chapter II.4***)

On-site Treatment for the Six Conditions

- What were the characteristics of the residents who were treated on-site for one of the six conditions under NFI 2? Did the clinical and demographic characteristics of residents differ between those treated on-site and those hospitalized for the six qualifying conditions? (***Chapter II.3***)
- What outcomes were observed for residents following treatment on-site for one of the six conditions? How did these compare to outcomes for residents treated in the hospital for one of the six conditions? (***Chapter II.9***)

Initiative Impact on Hospital Use

- Was the on-site treatment that was associated with the opportunity to bill under NFI 2 a substitute for hospitalization? (***Chapter II.3***)
- What was the NFI 2 Initiative payment incentive effect on Medicare utilization and expenditures, particularly for hospital-related services? How did the NFI 2 Initiative payment incentive effect on Medicare utilization and expenditures vary by ECCP and type of intervention? (***Chapter II.5***)
- Considering NFI intervention as a whole, how did the estimated effects of the three NFI intervention groups (NFI 1 Clinical-Only, NFI 2 Clinical + Payment, and NFI 2 Payment-Only) compare to each other? (***Section III***)

Other Outcomes Related to the Initiative

- How did the NFI 2 payment incentive affect MDS-based quality of care outcomes for participating residents? (***Chapter II.7***)
- How did the NFI 2 payment incentive affect the mortality of participating residents? (***Chapter II.8***)
- Was the Initiative associated with changes in Medicaid expenditures for Initiative-eligible residents between FY 2016 and FY 2018? (***Chapter II.6***)

Implementation and Outcomes During the COVID-19 Pandemic in 2020

- How did rates of facility and practitioner billing for on-site treatment change during FY 2020? (***Chapter IV.2***)
- How did utilization outcomes and Medicare expenditures differ for residents in FY 2020 compared to other Initiative years? (***Chapter IV.2***)
- How did quality of care outcomes differ in FY 2020 from other Initiative years? (***Chapter IV.3***)

- How did resident mortality differ in FY 2020 from other Initiative years? (***Chapter IV.3***)

> According to the U.S. National Institutes of Health, Implementation Science is "The study of methods to promote the adoption and integration of evidence-based practices, interventions, and policies into routine health care and public health settings."
>
> -NIH Fogarty International Center (2021)

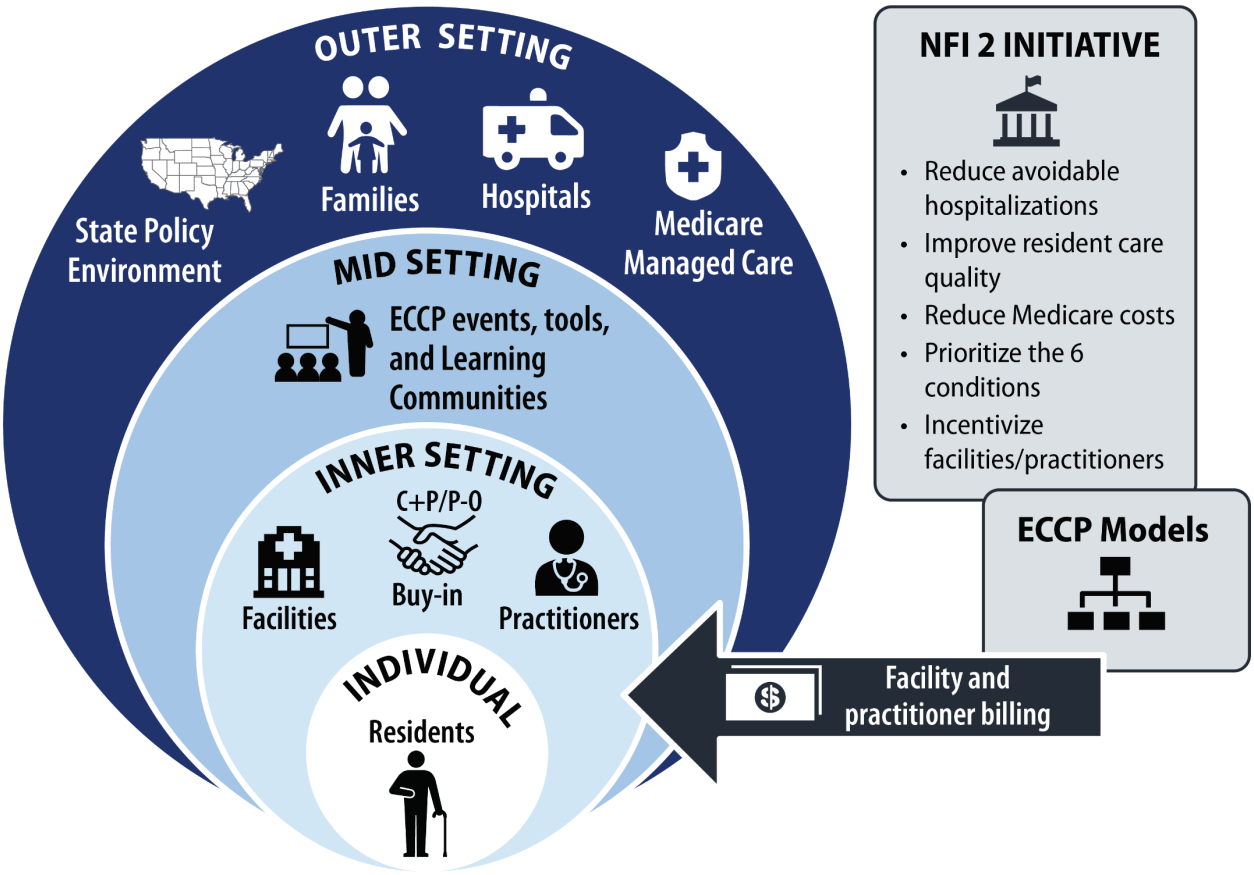
Adopting an Implementation Science Approach to the NFI 2 Evaluation

Throughout our NFI 2 data collection, we observed the importance of relationships in facilitating Initiative implementation. To systematize understanding of how these connections and interactions yielded implementation successes and challenges across ECCPs and over time, we applied an implementation science approach in accordance with the U.S. National Institutes of Health definition (NIH Fogarty International Center, 2021). Numerous studies have relied on implementation science to frame evidence-based research designs, particularly related to health services and testing effectiveness of new care delivery models, such as the one used in NFI 2.

For NFI 2, we conceptualize primary data evaluation findings using a modified version of the Consolidated Framework for Implementation Research (CFIR), which helps to systematize "what works where and why" (Damschroder et al., 2009) across participating facilities and ECCPs and across Initiative years. We explored relationships within the inner setting (e.g., extent to which practitioners and facility staff worked together to implement NFI 2 components); between the inner and mid settings (e.g., extent to which ECCPs supported NFs in Initiative implementation); and between the inner and outer settings (e.g., extent to which external policies and programs influenced implementation and potentially outcomes of NFI 2).

Figure I-4 shows how the modified CFIR framework applied to NFI 2. CFIR provides a structure for describing how NFI 2 components and stakeholders interacted to achieve the intended goal of keeping residents on-site for care, in turn reducing avoidable hospitalizations for NF residents. CFIR positions individual residents within a series of broader settings (i.e., inner and outer settings) to describe how interactions within and across these settings may have affected overall Initiative implementation. For NFI 2, individual NF residents were nested within participating C+P and P-O facilities (inner setting). These residents received care from participating NFI 2 practitioners who worked to implement Initiative components, such as targeting the six conditions and documenting resident changes to submit NFI 2 claims. Facilities and practitioners worked together to achieve common goals of treating residents on-site and avoiding unnecessary hospitalizations, particularly for the six NFI 2 conditions. In absence of these facility and practitioner relationships, NFI 2 may not have been implemented fully and residents may have been unable to benefit fully from early identification of the six conditions and associated on-site nursing facility care.

Figure I-4. NFI 2 viewed through the Consolidated Framework for Implementation Research



ECCPs (mid-setting) guided and supported NF leadership and practitioners to facilitate implementation within facilities. In the C+P group, we explored the extent to which ECCPs provided on-site support with ECCP nurses, APRNs, liaisons, and quality improvement specialists to enhance facility staff members' clinical skills, improve communication, and increase documentation through use of specialized tools and trainings. In addition, we explored how ECCPs encouraged stronger relationships between participating facility staff and practitioners. In P-O group facilities, ECCPs were less involved, by design. Our team reviewed the available ECCP support, including provision of webinars and other learning experiences to help P-O facilities improve their existing communication and documentation practices. We also sought to understand how ECCPs provided educational meetings and webinars, documentation tools, and other supports to both facility groups to support NFI 2 billing processes and claims submissions.

Lastly, our team explored the role of entities external to the Initiative, including states and hospitals (outer setting), that did not have a direct role in NFI 2 implementation, but may have moderated the effect of the Initiative in facilities. For example, hospitals with strong efforts to avoid readmission partnered with some NFI 2 facilities in a joint endeavor to keep residents in nursing facilities for care. Some state policies also may have encouraged on-site NF care and

reduction of avoidable hospitalizations. Outside of NFI 2, other payers, including Medicare MA plans, also may have shaped state policy environments (***Chapter I.1***). These plans may target the same long-stay population, reducing the number of potentially eligible NFI 2 residents. We also explored whether these plans included efforts to reduce potentially avoidable hospitalizations and targeted care practices, such as focusing on the same six NFI 2 conditions, creating even more of a focus on these topics in NFI 2 facilities.

Families also represented the outer setting, as we know their wishes can affect whether a resident may be hospitalized. In spite of NFI 2 APRN education, some families preferred to have their relatives receive hospital-based care, even when NFs had the capabilities to treat conditions on-site. Other families actually advocated to keep their residents on-site and, in some cases, updating end-of-life plans to reflect resident preferences for on-site care.

Primary Data Collection and Analysis

The primary data RTI collected for this evaluation provided information on Initiative operations and gave critical context to the findings from secondary data analyses. This report highlights primary data findings from Initiative Years 1–3 (2016–2019) collected via the following activities:

- Site visits to each ECCP headquarters and a selection of participating C+P and P-O facilities
- Telephone interviews with participating C+P and P-O facilities
- Web surveys of participating nursing facility administrators (NFAs)
- Web surveys of participating practitioners (physicians, APRNs, and PAs)
- Telephone interviews of key stakeholders across ECCP states
- Review of Sharing Collaborative activities and other materials provided by ECCPs

For Initiative Year 4 (2020), the team modified some data collection activities in response to the COVID-19 pandemic. Rather than completing in-person site visits, the team conducted facility and ECCP telephone interviews and ongoing policy and media reviews to document pandemic effects on ECCP states and participating nursing facilities.

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

Administrative Data Analyses

For the analyses presented in this report, we used a wide range of secondary data sources (see ***Appendix I***)—such as Medicare/Medicaid claims and eligibility files and MDS (Minimum Data Set) assessments—to evaluate NFI 2 effects on utilization, expenditures, and quality of care outcomes for eligible long-stay nursing facility residents in participating facilities.

Many of the analyses that we present are designed to measure the effect of the Initiative on a particular outcome of interest. To determine the Initiative effects, we compared residents eligible for the Initiative to a non-Initiative population of NF residents who would meet the Initiative eligibility criteria. We used difference-in-differences (DD) multivariate regression models, with separate analyses by ECCP, as well as pooled analyses combining ECCPs for each intervention group. We obtained separate estimates for each intervention group (i.e., C+P and P-O). All DD analyses control for relevant resident-level data (e.g., demographics, health profiles) and facility characteristics. A brief description of the evaluation methodology can be found in ***Chapter II.5*** of this report and additional details can be found in ***Appendix I.***

Unlike prior annual evaluation reports, this final report presents two sets of DD results using different baseline periods, which serve slightly different purposes. One set of results is analogous to what we have presented in prior reports (RTI International, 2021). This is our primary quantitative analysis to evaluate NFI 2. It is based on FY 2017–FY 2019[9] and uses FY 2014–FY 2016 as the baseline period.

To measure the impact of the Initiative, the DD technique compares changes over time among the Initiative residents to changes among the comparison residents

Unique to this final report, we also conducted an additional set of DD analyses for selected outcomes to evaluate the impact of the NFI 1 Clinical-Only (C-O) intervention, the NFI 2 C+P intervention, and the NFI 2 P-O intervention against a common FY 2012 baseline, so the interventions can be compared against each other across the whole NFI Initiative. We will expand upon the relationship between these two sets of DD analyses in ***Sections III*** and ***V*** of this report.

In addition to the DD approach, we employed descriptive statistics and, in some cases, cross-sectional regression analyses, to address several of our research questions and to provide important context for our main analyses. These other analyses include:

- Studying patterns of Medicaid expenditures (***Chapter II.6***)
- Patterns of facility and practitioner billing under NFI 2 (***Chapter II.3, Chapter II.4***)
- Characteristics of residents who were treated on-site for one of the six conditions (***Chapter II.3***)
- Outcomes observed for residents following on-site treatment for one of the six conditions (***Chapter II.9***)

[9] October 2016–September 2019

Report Structure

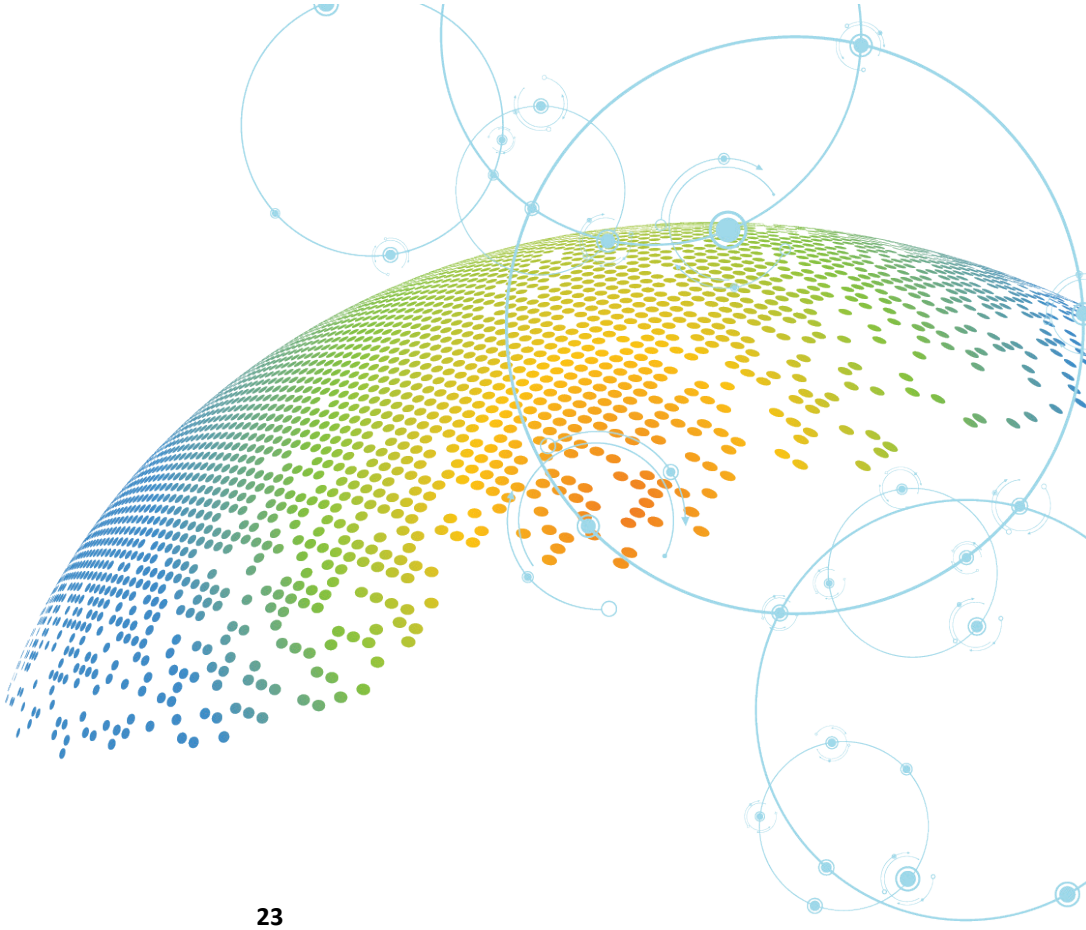
The remainder of the report is divided into four sections (***Table I-3***). Each section is further divided into chapters. Each chapter includes key takeaways and the main analytical findings, with further details provided in the appendices.

Table I-3. Report structure

Section	Topics	Outcomes	Methods
Introduction	NFI 1 / NFI 2 overview		
	Theory of Action		
	Policy Background		
	Evaluation Design		
Section II (2017–2019)	NFI 2 Implementation	Practitioner and Facility Billing and Engagement, Perception of Reducing Hospitalization, Prevalence of The Six Conditions	Descriptive Statistics, Telephone Interviews, Site Visits, Web Surveys
	NFI 2 Impact on Outcomes	Medicare Utilization and Expenditures, Medicaid Expenditures, MDS-based Quality of Care outcomes, Mortality	Descriptive Statistics, Difference-in-Differences Modeling Using 2014-2016 As the Baseline Period
	Health Trajectory for Those Treated On-Site	Acute Care Transitions, Mortality, Subsequent On-Site Care	Descriptive Statistics, Regression Modeling
Section III (2012–2019)	Comparison of the Intervention Impacts from Both NFI 1 and NFI 2 on Outcomes	Medicare Utilization and Expenditures	Descriptive Statistics, Difference-in-Differences Modeling using 2012 as the Baseline Period
Section IV (2020)	NFI 2 Implementation During Final Initiative Year	Practitioner and Facility Engagement, Practitioner and Facility Billing	Descriptive Statistics, Media Analysis
	Healthcare Use During Final Initiative Year	Medicare Utilization and Expenditures, Mortality	Descriptive Statistics, Media Analysis
Discussion	Synthesis of findings		
	Lessons learned		

Section II presents findings related to the implementation and impact of NFI 2 from FY 2017 to FY 2019. We examine NFI 2 implementation using secondary data analysis of Medicare claims submitted for providing on-site treatment, and primary data collected to assess engagement with the Initiative, perception of the Initiative by facility staff, and relationships between facilities and hospitals. Additionally, we describe the impact of the Initiative on Medicare utilization and expenditures, Medicaid expenditures, and measures of care quality. ***Section III*** compares the impact of the NFI 1 C-O, NFI 2 P-O, and NFI 2 C+P interventions, relative to each other, on Medicare utilization and expenditures. ***Section IV*** describes changes in the implementation of the Initiative, and in health care outcomes in the Initiative facilities during the COVID-19 pandemic in 2020. ***Section V*** synthesizes the overall findings for the Initiative in NFI 1 and NFI 2.

Section II. Assessing the Implementation and Impact of NFI 2



Section II Summary

Most facility leaders, staff, and practitioners indicated support for the NFI 2 goals and focus on the six Initiative conditions; however, many also reported challenges with full Initiative implementation and Initiative billing. Many facilities reported that prior to participating in NFI 2, they already had similar processes and activities in place to reduce avoidable hospitalizations, suggesting the Initiative used financial incentives for care practices many facilities were already providing.

Overall, there was no clear evidence that the Initiative payment incentives for the treatment of the six conditions, implemented during 2017–2019, were associated with reductions in hospital-related utilization and associated Medicare expenditures among eligible residents, relative to the national comparison group. NFI 2 billing trends suggest that on-site treatment for the six conditions did not substitute for hospitalization and that many residents treated on-site would not have been hospitalized, regardless of the Initiative.

The Initiative did not result in a consistent pattern of change in Clinical + Payment facility performance on MDS-based quality measures. In Payment-Only facilities, the Initiative was associated with a higher-than-expected rate of undesirable events in about half of the MDS measures. The Initiative was not associated with a statistically significant impact on resident mortality in Payment-Only facilities, but it was associated with higher-than-expected resident mortality in Clinical + Payment facilities. The impact on Medicaid expenditures could not be addressed due to data limitations.

Chapter II.1 Implications of NFI 2 Design

Key Takeaways

- *With the intention of reducing avoidable hospitalizations among long-stay residents further, NFI 2 added a payment incentive to the clinical and educational components introduced in NFI 1. The incentive structure included specialized CMS billing codes for facilities and practitioners when they bill Medicare for treating residents on-site for any of the six NFI 2 conditions.*
- *Key elements of the initial NFI 2 design underwent major changes during implementation, including CMS modifying the clinical criteria for the six conditions and two ECCPs undergoing intervention redesigns.*

II.1.A. NFI 2 Design

As described in ***Section I***, from October 2016 through September 2020, NFI 2 offered financial incentives to participating Clinical + Payment (C+P) and Payment-Only (P-O) facilities and practitioners to treat Initiative-eligible long-stay residents on-site, rather than sending them to hospitals for care. Eligible residents had to be long stay (101 days or more in the facility), participating in traditional Medicare (i.e., fee-for-service, not Medicare Advantage or other managed care), and not enrolled in Medicare hospice. When caring for these residents,

The NFI 2 design and two-group structure, including both C+P and P-O facilities, had direct implications on Initiative implementation.

facilities and practitioners were able to submit Medicare claims for treating any of the designated NFI 2 six conditions in the facilities. These six diagnoses—pneumonia, congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD)/asthma, skin infection, fluid/electrolyte disorder or dehydration,[10] and urinary tract infections (UTI)—result in many potentially avoidable hospitalizations (Walsh et al., 2012). The Initiative encouraged facility staff and practitioners to identify and treat these conditions quickly, thus avoiding or minimizing the effects of an exacerbation and resultant hospitalization. The financial incentive and six-condition design of NFI 2 built upon NFI 1 (2012–2016), which focused on clinical support and facility staff education toward reducing avoidable hospitalizations more broadly and without an associated financial incentive.

II.1.B. What Were the Facility and Practitioner Billing Processes?

Facility Billing Process

Participating facilities and practitioners used special NFI 2 Medicare Healthcare Common Procedure Coding System (HCPCS) codes (G9679–G9686) when submitting claims to Medicare for treating NFI 2 eligible residents. Codes G9679–G9684 allowed facilities to bill for episodes of each of the six conditions. To submit a Medicare claim using one of these special codes, facilities needed to meet two requirements: (1) have the eligible resident's condition certified by a participating NFI 2 practitioner within 48 hours of initial identification, and (2) document the eligible resident's symptoms, condition, and any necessary laboratory or testing values in accordance with the NFI 2 clinical criteria specified for each condition.[11]

Facility NFI 2 billing codes for on-site acute care treatment of a nursing facility resident with:	
G9679–Pneumonia	G9682–Skin infection
G9680–CHF	G9683–Fluid disorder
G9681–COPD/asthma	G9684–UTI

The clinical criteria, provided at the start of NFI 2 to all ECCPs, facilities, and practitioners, outlined the exact thresholds for each of the six conditions, such as presence of fever, elevated white blood cell counts, x-ray observations, and urinalysis bacteria counts. In fall 2018, CMS announced revisions to these criteria for the six NFI 2 conditions, including additional symptoms and laboratory value threshold requirements. These new criteria became effective in January 2019 (Initiative Year 3).

[10] Fluid/electrolyte disorder and dehydration are used interchangeably.

[11] https://www.cms.gov/Medicare-Medicaid-Coordination/Medicare-and-Medicaid-Coordination/Medicare-Medicaid-Coordination-Office/InitiativetoReduceAvoidableHospitalizations/Downloads/NFIClinicalCriteria12102018.pdf

Practitioner Billing Process

In addition to practitioners having to certify residents' conditions within 48 hours to enable facilities to bill, practitioners also had the opportunity to submit their own Medicare claims for NFI 2. Code G9695 allowed practitioners to bill for assessing or treating residents who may have had one of the six NFI 2 conditions. This billing opportunity was usable once per in-facility care episode, often when certifying that the resident had a qualifying diagnosis. This NFI 2 code was paid at the higher rate of a hospital visit, rather than the rate for a regular nursing home visit. The on-site treatment code was intended to entice participating practitioners to make an extra visit to nursing facilities, if needed, to diagnose and certify resident conditions. G9686, the code for NFI 2-specific care coordination conferences, was expected to facilitate person-centered care plan development and increase family engagement with NFI 2. However, because other Medicare chronic care management and advance care planning HCPCS codes with fewer requirements already existed, and the NFI 2 financial incentives were small, most practitioners did not use the G9686 code; it was discontinued at the end of calendar year 2018.

Practitioner NFI 2 billing codes:

G9685–Practitioner payment for the confirmation and treatment of conditions on-site at nursing facility

G9686–Practitioner payment for care coordination and caregiver engagement conference

II.1.C. How Did ECCPs Design Interventions and Support Participating Nursing Facilities?

Although NFI 2 billing opportunities were available to both C+P and P-O facilities, ECCPs continued aspects of their existing NFI 1 interventions to provide additional support to their C+P facilities. Of the six NFI 2 ECCPs, four (ATOP2, MOQI, OPTIMISTIC, and RAVEN) embedded advanced practice registered nurses (APRNs) or registered nurses (RNs) who provided assessments and direct care to facility residents in NFI 1, and these ECCPs built on that initial structure, with APRNs and RNs providing assessments related to the six conditions and supporting facility documentation for NFI 2 billing. The two other ECCPs, AQAF and NY-RAH, remained education-only throughout NFI 1 and continuing into NFI 2, with targeted education on the six conditions and NFI 2 billing requirements. However, both ECCPs shifted midway through NFI 2: AQAF converted to a clinical care intervention and replaced education-only staff with embedded RNs who could support hands-on clinical care, and NY-RAH replaced their educator RNs with quality improvement specialists (QISs) to support quality improvement initiatives that aligned with NFI 2 goals. ***Table II-1*** highlights each ECCP intervention design.

During NFI 2, two of the six ECCPs (AQAF and NY-RAH) experienced intervention redesigns.

Table II-1. ECCP intervention designs for NFI 2

ECCP Name and Type	Intervention Design	
	C+P	P-O
Alabama Quality Assurance Foundation Nursing Facility Initiative (AQAF-NFI), QIO 	At the start of NFI 2, AQAF leadership continued their NFI 1 intervention with embedded RN Care Pathways Coaches (Coaches) supporting Initiative implementation full-time in C+P facilities. Instead of providing clinical care to facility residents, Coaches educated facility staff on NFI 2 processes, including the six conditions and billing documentation, and encouraged them to use INTERACT (Interventions to Reduce Acute Care Transfers) communication tools. During the second year of NFI 2, per CMS request, AQAF moved away from their education-only intervention, switching from embedded full-time RN Coaches in all C+P facilities to part-time (in most C+P facilities) clinical care RNs who could assist in identifying NFI 2 billing opportunities, offer resident care, and help to submit NFI 2 claims. AQAF also provided webinars, conference calls, and occasional site visits to support NFI 2 implementation, documentation, and billing. For more information, see ***Appendix B***.	AQAF encouraged use of INTERACT and other communication tools to support P-O facility billing. They also provided webinars, conference calls, and occasional site visits to support NFI 2 implementation, documentation, and billing. For more information, see ***Appendix B***.
Comagine (formerly HealthInsight) Nevada Admissions and Transitions Optimization Program (ATOP2), QIO 	In the ATOP2 intervention, teams of one APRN and two RNs provided direct clinical support, training, and education to subgroups of four to five C+P facilities. These clinical teams sought to improve care and reduce avoidable hospitalizations by promoting communication via INTERACT tools and offering a variety of trainings and resident clinical care support to assess residents, certify the six conditions, and provide billing support for NFI 2. ATOP2 also trained and promoted use of the POLST (Physician Orders for Life Sustaining Treatment) form to participating C+P facilities. As NFI 2 continued, ATOP2 slowly moved away from the embedded staff intervention, instead using a train-the-trainer approach to engage facility staff to serve as Initiative champions and spearhead NFI 2 documentation and billing. ATOP2 provided webinars, calls, and other support for NFI 2 implementation, documentation, and billing questions. For more information, see ***Appendix C***.	ATOP2 encouraged P-O facilities to use INTERACT or other communication tools and identify facility staff champions to implement and support NFI 2. ATOP2 provided webinars, calls, and other support for NFI 2 implementation, documentation, and billing questions. For more information, see ***Appendix C***.

(continued)

Table II-1. ECCP intervention designs for NFI 2 (continued)

ECCP Name and Type	Intervention Design	
	C+P	P-O
The University of Missouri, Sinclair School of Nursing Missouri Quality Initiative for Nursing Homes (MOQI), University Health System 	The MOQI intervention aimed to reduce rates of avoidable hospitalizations and readmissions in C+P facilities through placement of a full-time APRN in each nursing facility to provide some direct care services, coaching, education, and mentoring to facility staff. ECCP staff also facilitated implementation of INTERACT tools and processes, improvement of clinical quality, and ongoing support for NFI 2 documentation and billing. MOQI APRNs assessed residents for the six conditions and provided clinical training for facility staff related to these conditions. In addition, MOQI offered webinars on a host of topics related to NFI 2, including support for end-of-life conversations. For more information, see ***Appendix D***.	MOQI encouraged use of INTERACT and other communication tools to support P-O facilities. In addition, MOQI offered webinars on a host of topics related to NFI 2, including support for end-of-life conversations. For more information, see ***Appendix D***.
Indiana University (IU) Geriatrics Department, Optimizing Patient Transfers, Impacting Medical Quality, and Improving Symptoms: Transforming Institutional Care (OPTIMISTIC), University Health System 	The OPTIMISTIC intervention placed RNs in each C+P facility to provide direct clinical support, education, and training to nursing facility staff related to the six conditions and NFI 2 documentation. OPTIMISTIC also provided APRNs that rotated between C+P facilities, and these APRNs were able to confirm the six conditions to support facility Initiative billing. OPTIMISTIC nurses supported a suite of tools (American Medical Directors Association [AMDA], INTERACT, and their own) and methods for facilities to improve medical care, and palliative care. OPTIMISTIC RNs and APRNs also conducted intensive clinical reviews of residents in response to resident hospital transitions or acute changes in condition, as well as support for use of Physician Orders for Scope of Treatment (POST) forms, educating families, residents, and nursing facility staff on advance directives. OPTIMISTIC supported C+P facilities to implement NFI 2 through ongoing calls and webinars, as well as podcasts. For more information, see ***Appendix F***.	In addition to recommending use of INTERACT, AMDA, and other tools, OPTIMISTIC supported P-O facilities to implement NFI 2 through ongoing calls and webinars, as well as podcasts. For more information, see ***Appendix F***.

(continued)

Table II-1. ECCP intervention designs for NFI 2 (continued)

ECCP	Intervention Design	
	C+P	P-O
New York Reducing Avoidable Hospitalizations (NY-RAH) Project of Greater New York Hospital Association (GNYHA) Foundation, Hospital Association 	The NY-RAH intervention featured registered nurse care coordinators (RNCCs) who acted as consultants and educators for NFI 2 in their assigned C+P facilities through Year 3 of the Initiative. RNCCs did not provide any clinical care to residents, instead offering education and training to facilities to reduce avoidable hospitalizations, improve transitions between nursing facilities and hospitals, and strengthen palliative and end-of-life care. RNCCs trained facility nursing staff on using both the INTERACT Stop and Watch and SBAR tools to improve the early identification of acute changes in condition and improve physician communication. For palliative and end-of-life care, physicians and social workers were trained by ECCP leadership on the New York Medical Order for Life Sustaining Treatment (MOLST) form. In the third year of NFI 2, NY-RAH implemented a new intervention, eliminating the RNCC role and replacing them with quality improvement specialists who focused more on care quality efforts in C+P facilities. NY-RAH also offered webinars concerning the NFI 2 billing processes and documentation for C+P facilities. For more information, see ***Appendix E***.	NY-RAH encouraged use of INTERACT tools for communication. NY-RAH also offered webinars concerning the NFI 2 billing processes and documentation for P-O facilities. For more information, see ***Appendix E***.
University of Pittsburgh Medical Center Community Provider Services Program to Reduce Avoidable Hospitalizations using Evidence-based Interventions for Nursing Facilities (UPMC-RAVEN), University Health System 	The UPMC-RAVEN intervention focused on clinical care provided by UPMC-RAVEN APRNs in C+P facilities. UPMC-based leadership trained APRNs and RNs in intervention-specific geriatric and palliative care (e.g., use of POLST form) and placed these APRNs and RNs in partner nursing facilities to support education, assessment, certification of the six conditions, and NFI 2 billing. UPMC-RAVEN embedded staff supported INTERACT tools and partnered with Rx Partners to support facility-based committees to reduce polypharmacy and antipsychotic drugs. RAVEN also deployed *Curavi* telemedicine carts to each C+P facility, allowing on-call ECCP APRNs to assist in the diagnosis and treatment of acute changes in condition and other medical emergencies occurring off hours. RAVEN offered trainings and webinars to the C+P facilities as a separate education component through the Jewish HealthCare Foundation. For more information, see ***Appendix G***.	RAVEN provided a dedicated liaison to help support NFI 2 implementation and billing questions for P-O facilities. For more information, see ***Appendix G***.

NOTE: C+P = Clinical + Payment, P-O = Payment-Only, QIO = Quality Improvement Organization

Chapter II.2 Examining NFI 2 Implementation

Key Takeaways

- *ECCPs supported NFI 2 implementation and billing through education opportunities for all facilities. This support varied by facility group. Clinical + Payment facilities relied heavily upon on-site ECCP staff for Initiative implementation and billing. Payment-Only facilities only received technical billing assistance from ECCPs.*
- *Facility and practitioner interviewees supported the overall design of NFI 2 and its focus on reducing hospitalizations, as well as the selection of the six conditions. However, staff and leadership turnover, lack of active and consistent physician engagement, condition criteria revisions mid-Initiative, and the declining population of NFI 2-eligible residents created Initiative implementation and billing challenges for many facilities.*

II.2.A. Overview and Methods

This chapter highlights cross-year key findings from our primary data collection and analysis, including telephone interviews, site visits, and web surveys. We apply the Consolidated Framework for Implementation Research (CFIR) where appropriate to highlight participant and stakeholder relationships within and across settings. The focus is on overall findings, as well as nuances specific to each ECCP, responding to the following research question:

- How was NFI 2 implemented, and how do participating ECCP leadership and facility staff perceive Initiative effectiveness?

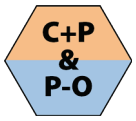
Between 2017 and 2020, RTI conducted at least one interview or survey with every single facility participating in NFI 2.

Across Initiative Years 1–3 (2017–2019), RTI conducted a series of annual site visits with (1) leadership team members from each ECCP headquarters, and (2) staff and leaders from a selection of four to nine C+P and P-O facilities in each ECCP. Facility interviewees included administrators, clinical leaders and staff, practitioners, and business management team members. Additionally, we conducted annual telephone interviews across all ECCPs with facility leaders in C+P and P-O facilities that we did not visit in person. Our team took verbatim notes during site visits and telephone interviews, and we coded findings by theme, facility type, and ECCP within and across Initiative years.

We also conducted two rounds of web surveys of nursing facility administrators (NFAs) in all participating facilities, as well as a separate survey of all participating practitioners (physicians, APRNs, and physician assistants [PAs]). Both the NFA and practitioner surveys were administered in Initiative Years 1 and 2 (2017 and 2018).

Across our various primary data collection efforts, we interviewed and/or surveyed every single participating NFI 2 facility at least once. Full details concerning our interview and survey methodologies are available in ***Appendix A***.

II.2.B. Examining NFI 2 Implementation Across ECCPs



Throughout all years of NFI 2, C+P and P-O interviewees and survey respondents expressed strong support for the underlying goal of keeping residents in nursing facilities for care. ECCP leadership and facility staff and leaders highlighted the importance of avoiding unnecessary resident hospitalizations. To support this on-site care goal, most facility staff, leaders, and practitioners embraced the enhanced communication tools (e.g., INTERACT) and NFI 2 focus on the six conditions, as well as other individual ECCP components, such as telehealth and end-of-life care priorities. C+P facilities also appreciated the support of embedded ECCP staff, particularly in ECCPs with APRNs who could assess and confirm residents with the six conditions to support facility NFI 2 billing. Interviewees from both facility groups benefited from the webinars, calls, and other types of ECCP support to facilitate NFI 2 billing and help ensure continued focus on avoiding hospitalizations.

Despite this strong support for the underlying goals of NFI 2, Initiative implementation varied widely between and within ECCPs. ***Table II-2*** provides high-level summaries of the overarching interviewee perceptions of NFI 2 components and implementation impacts across Initiative years from each ECCP. Following this table, we provide more detail to explain each summarized topic domain.

Table II-2. ECCP interviewees' cross-year, cross-facility perceptions of NFI 2 components and factors

Topic	AQAF (AL)	ATOP2 (NV/CO)	MOQI (MO)	OPTIMISTIC (IN)	NY-RAH (NY)	RAVEN (PA)
Evidence of PAHs	😐 Reduced PAHs early on, but not much in the final years of NFI 2	😐 Reduced PAHs, but NFI 2 was just one of multiple facility PAH reduction efforts	🙂 Reduced PAHs through changes in clinical skills adapted during NFI 2	🙂 Reduced PAHs through changes in clinical skills adapted during NFI 2, not NFI 2 billing	😐 Reduced PAHs, but were hesitant to attribute reductions to NFI 2	😐 Reduced PAHs early on, but not much in the final years of NFI 2
Facility Billing	☹ NFI 2 billing frequency was slow from the start and lessened even more over time for C+P, in part due to the AQAF intervention change; P-O facilities billed only occasionally	🙂 NFI 2 billing frequency started strong and remained steady in C+P, but weakened over time in P-O facilities	🙂 NFI 2 billing frequency started strong and remained moderate in C+P, but weakened over time in P-O facilities	😐 NFI 2 billing frequency was slow at first in both facility groups, increased somewhat, and tapered in the final years	😐 NFI 2 billing frequency was slow from the start and lessened even more over time for C+P, in part due to the NY-RAH intervention change; P-O facilities billed NFI 2 more regularly	😐 NFI 2 billing frequency was moderate from the start in C+P facilities and lessened over time; P-O facilities billed more regularly through NFI 2
Practitioner Billing and Engagement	☹ NFI 2 billing frequency was low and engagement varied in both facility groups	☹ NFI 2 billing frequency was low and engagement varied in both facility groups	☹ NFI 2 billing frequency was low and engagement was moderate to low in both facility groups	☹ NFI 2 billing frequency was low and engagement varied; P-O facilities had less engaged practitioners	☹ NFI 2 billing frequency was low and engagement varied in both facility groups	☹ NFI 2 billing frequency was low and engagement varied; P-O facilities had more engaged practitioners
Six Conditions	☹ Conditions were appropriate, but 2019 change in NFI 2 criteria created some challenges for both facility groups	🙂 Conditions were appropriate and helped enhance staff skills; only some challenges with criteria changes	🙂 Conditions were appropriate and helped enhance staff skills; only some challenges with criteria changes	🙂 Conditions were appropriate and helped enhance staff skills; only some challenges with criteria changes	☹ Conditions were appropriate, but 2019 change in NFI 2 criteria created some challenges for both facility groups	🙂 Conditions were appropriate and helped enhance staff skills; only some challenges with criteria changes

(continued)

Table II-2. ECCP interviewees' cross-year, cross-facility perceptions of NFI 2 components and factors (continued)

Topic	AQAF (AL)	ATOP2 (NV/CO)	MOQI (MO)	OPTIMISTIC (IN)	NY-RAH (NY)	RAVEN (PA)
Hospital Engagement	☹ NFI 2 had minimal effects; low hospital engagement	☹ NFI 2 had minimal effects; low hospital engagement	☺ Strong hospital NFI 2 support, especially from acute care hospitals	☹ Hospital engagement was low, despite NFI 2 relationship-building efforts	☹ NFI 2 had minimal effects; low hospital engagement	☹ Hospitals were aware of NFI 2 but not directly engaged
End of Life	😐 Minimal activity; not a C+P intervention component	😐 Minimal activity; not a C+P intervention component	☺ APRNs facilitated EOL conversations in C+P facilities and worked to improve advance directive uptake	☺ APRNs facilitated EOL conversations in C+P facilities and worked to improve advance directive uptake	☺ RNCCs/QISs worked with C+P facilities to improve advanced directive uptake	☺ APRNs facilitated EOL conversations in C+P facilities and worked to improve advance directive uptake
Telehealth	😐 Not an intervention component, though some facilities expressed interest in it	😐 Not an intervention component, though some facilities expressed interest in it	☺ Used successfully in some rural facilities, with more use in the final years of NFI 2	😐 Not an intervention component, though some facilities had non-NFI 2 experience with it	😐 Not an intervention component, though some facilities had expressed interest in it	☹ A key intervention component made widely available, but facilities reported infrequent use

Legend:

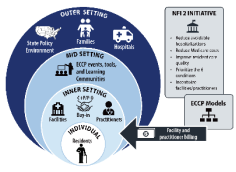
😐 Perception of no change (\) ☹ Negative perception (-) ☺ Positive perception (+)

EOL = end of life; PAH = potentially avoidable hospitalization.

NOTE: These overarching findings represent the most commonly stated interview findings by ECCP and by topic; this content is not intended to represent every interviewee's perspective.

II.2.C. How Did Participating NFI 2 Facility Staff Perceive the NFI 2 Effect on Avoidable Hospitalizations?

Despite appreciating the overarching goal and the supporting educational and clinical tools, interviewees shared that NFI 2 had not motivated substantial changes in care practices or reductions in potentially avoidable hospitalization rates over time in their facilities. Interviewees often said that they believed their facilities may have reduced avoidable hospitalizations, but they were not sure whether these reductions could be attributed to NFI 2. Note that the present discussion about NFI staff perception complements our analysis in ***Chapter II.5***, which addresses whether by examining Medicare claims we are able to detect reductions in avoidable hospitalizations. Interviewees provided several explanations for fewer hospitalization reductions:



CFIR Spotlight: this subsection highlights the inner setting, NFI 2 buy-in among staff in participating facilities.

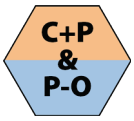
- C+P facilities already had reduced avoidable hospitalizations during NFI 1, and many interviewees said their facilities struggled to make further reductions in NFI 2.

Facility Interviewees' perspectives on NFI 2 impact sometimes differed from the administrative data analysis results, which measured participating facilities against a comparison group of non-NFI facilities.

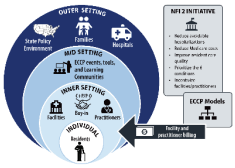
- Many P-O facilities also noted that the focus on keeping residents on-site for care had been prioritized in their facilities prior to NFI 2, such that the Initiative provided financial support for efforts already in place, rather than effecting change to existing clinical care practices.
- Facilities from both groups faced challenges with staff and leadership turnover that disrupted NFI 2 implementation. Each time new staff or leaders arrived, Initiative implementation processes stopped and restarted. In facilities with recurring staff turnover, the Initiative never made it past the initial staff education phase to reach full implementation.
- Many facilities experienced reductions in their populations of eligible long-stay residents over time. Most of these reductions were due to eligible residents transitioning to Medicare managed care plans or hospice care. When facilities had fewer NFI 2 eligible residents, Initiative implementation tended to be less of a facility priority, even if facility interviewees said they still tried to avoid hospitalizations.
- Some families continued to support hospitalization, regardless of resident health condition or facility treatment capabilities.
- Practitioner support was not always universal. A small number of practitioners supported hospitalization, citing concerns about jeopardizing their licensure if their residents failed to receive what they perceived as needed hospital care.

Ultimately, most interviewees from both facility groups explained that their facilities worked to avoid unnecessary hospitalizations because on-site care could yield better resident outcomes, not because of extra facility income. For C+P facilities, these practices were well established in NFI 1; for P-O facilities, many had separate efforts already in place to keep residents on-site for care. Accordingly, interviewees felt uncertain about attributing facility changes in hospitalization rates directly to NFI 2 during the Initiative years, as these changes may have been due to other causes. Interviewees typically could not differentiate between changes associated with NFI 2 and changes associated with other efforts (e.g., presence of Medicare managed care in the facility with a similar goal of reducing avoidable hospitalizations), even if the eligible resident populations were different for each effort.

II.2.D. How Did Participating Facility Interviewees Perceive the NFI 2 Six Conditions and Clinical Criteria?



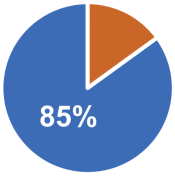
Most participating facility interviewees recognized the importance of keeping residents on-site for care whenever possible, even prior to NFI 2; however, the targeted Initiative effort to prioritize the six conditions was new for most facilities. Across all years of NFI 2, many facility interviewees noted that the NFI 2 focus on the six conditions led to clinical staff becoming more attuned to identifying early signs and symptoms of these conditions among their residents. As an ATOP2 P-O administrator noted,



CFIR Spotlight: this subsection focuses on the inner setting, facility staff and leaders' relationship with NFI 2 design features.

"I think we have a higher focus on the six diagnoses. I think we've gotten better at caring for people with the six diagnoses because [now] we have a focus on them."

Most facility and practitioner interviewees also agreed that the six conditions were appropriate for their resident populations, explaining that these were the conditions that most often resulted in potentially avoidable hospitalizations in their facilities. UTI and pneumonia were cited as the most frequently diagnosed conditions of the six, while fluid/electrolyte disorder or dehydration was billed infrequently. These perceptions align with findings based on Medicare claims as confirmed by ***Figure II-4*** in ***Chapter II.3***. A few interviewees suggested additional conditions could be considered for inclusion in future initiatives to reduce avoidable hospitalizations, including falls prevention, diabetes treatment, and care for dementia/behavioral health conditions.



Most surveyed NFAs provided documentation aids to staff to support implementing the Initiative.

At the start of NFI 2, CMS required that participating facilities implement a formal process for identifying, documenting, and communicating about resident conditions, and almost all facilities maintained these processes across years of NFI 2. Facilities used specific tools, such as INTERACT, that provided frameworks and worksheets to enhance communication and detail the initial resident changes in condition, while also supporting staff to track specific symptoms, assessments, and laboratory results. Then clinical staff used these same tools to communicate findings with facility leadership (e.g., director of nursing [DON]) and practitioners, as well as billing staff who would submit NFI 2 claims. In NFI 2 Year 1 and Year 2, 85.8 and 84.7 percent of surveyed NFAs reported adding documentation aids for staff to facilitate Initiative implementation, respectively. Although many facility interviewees said they planned to maintain use of some documentation and communication tools beyond the end of NFI 2, most noted that they would not continue the same intensive level of documentation required for submitting Initiative claims. When asked to explain, interviewees said NFI 2 required excessive documentation that sometimes misaligned with or contradicted prompts within their electronic medical records systems. Facility interviewees said managing the extra NFI 2 requirements was time consuming and took away from other needed facility tasks.

Additionally, the 2019 clinical criteria revisions made it harder for some residents to qualify for NFI 2, even if they were treated for one of the six conditions. For example, removing altered mental status (AMS) from the UTI criteria as a qualifying symptom and adding fever to the skin infection criteria meant that some residents treated for UTI or skin infection were not eligible for the facility to submit NFI 2 claims. As one OPTIMISTIC P-O executive director shared,

"The change to the criteria in UTI was horrible. Removing altered mental status—that was the biggest for us… The people we are trying to keep [on-site] are fragile people with dementia who cannot communicate needs or symptoms and are most affected by transfer."

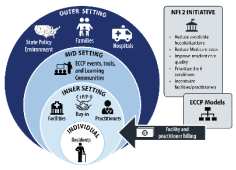
Additionally, many interviewees from across ECCPs and facility groups shared that meeting the revised NFI 2 criteria meant that residents had to be allowed to reach what they felt was an unnecessarily high threshold of illness. Facility clinical staff who had been trained in early identification of resident changes in condition were able to identify and treat the six conditions long before they reached the required levels of severity for NFI 2 billing. Interviewees expressed frustration, noting that they had done all the documentation necessary for NFI 2, and practitioners had certified conditions within 48 hours, but facilities were unable to receive NFI payment because the resident conditions had not exacerbated to the required level specified in the NFI 2 clinical criteria. A RAVEN P-O administrator explained,

"Because we're identifying the symptoms of many of these conditions so quickly now, I think we're getting them started and treated before they get enough symptoms to qualify. We're not going to stop treatment so they can get another symptom to be eligible for billing, but… if we hadn't caught it so quickly, we could have maybe captured them for RAVEN."

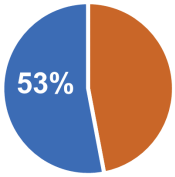
In sum, interviewees indicated that even though facility awareness of and treatment for the six conditions had increased through NFI 2, the facilities were not always able to receive the Initiative's financial incentive for residents who were identified and treated early.

II.2.E. How Did Facility Staff and Practitioners Perceive the 48-Hour Window for Certifying Conditions for NFI 2?

For facilities to submit NFI 2 claims, practitioners had to certify eligible resident changes in condition within two days of initial identification. Early in NFI 2, this follow-up process was challenging for many facilities. Many facility interviewees reported that practitioners care for geographically dispersed patients and only visit residents once or twice per month, making the extra NFI 2 condition change certification visits inconvenient. Embedded ECCP APRNs in C+P facilities resolved some of these concerns, certifying condition changes for eligible NFI 2 residents during the week, but overnights and weekends remained challenging. A few facilities also reported confusion about whether the certification window actually could be extended to 72 hours, rather than 48, to eliminate the need for weekend NFI 2 certifications. P-O facilities without ECCP APRNs faced challenges with practitioners getting to the facilities within the required 48-hour window. In Initiative Years 1 and 2 (2017–2018), over half of all surveyed practitioners (52.4 to 53.5 percent) reported that certifying residents within the time window was a challenge. Among surveyed NFAs in facilities not submitting NFI 2 claims, around 70 percent said that lack of practitioner confirmation for qualifying diagnoses in the required time window was either a major reason or part of the reason their facilities were not billing (see ***Appendix H***).



CFIR Spotlight: this subsection highlights the inner setting relationship between facility staff and practitioners.



About half of surveyed practitioners reported challenges in certifying resident conditions within the NFI 2-required 48-hour window.

Over time, these concerns resolved for many facilities. Many physician practices added APRNs to support nursing facility residents, and many facilities also added their own APRNs or contracted with APRN provider agencies. These additional staff were neither added specifically to support NFI

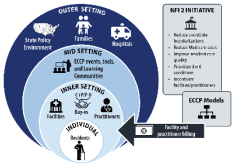
2, nor were they funded via NFI 2 financial incentives in most cases, but many were also able to assist with resident certifications for the Initiative. As one AQAF C+P NFA said,

"If [staff] see something [with residents], they're bringing it to our attention sooner so that we can get the NP [nurse practitioner] in there to see them. The NP has helped tremendously."

These non-ECCP APRNs often visited facilities daily or multiple times each week, which increased the turnaround time for assessing residents and resolved many of the concerns about meeting the 48-hour follow-up requirement for NFI 2 claims.

II.2.F. What Were Participants' Responses to the NFI 2 Financial Incentives?

The financial incentive was intended to induce behavior change for both facilities and practitioners, providing monetary gain for efforts to treat residents on-site. However, for many facilities and most practitioners, the incentive was not a significant motivation. Note that the present discussion of participant perspectives on NFI 2 billing is complemented by our analysis of patterns of facility and practitioner billing presented in ***Chapter II.4***.



CFIR Spotlight: this subsection highlights the inner setting, facility and practitioner engagement with the NFI 2 financial incentives.

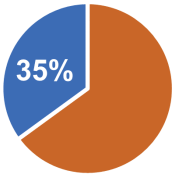
Facility Incentives

Figure II-1. Facility interviewees' top three responses to NFI 2 financial incentives

	**1. Many facilities prioritized reducing hospitalizations prior to NFI 2, with the Initiative providing a financial opportunity for care practices already in place.**
	**2. When eligible residents shifted from Medicare FFS to managed care or hospice, facilities had smaller NFI 2–eligible populations and fewer opportunities to submit NFI 2 claims.**
	**3. Facilities were more likely to submit NFI 2 claims when they received NFI 2 Medicare reimbursements directly, rather than having the money flow into corporate accounts.**

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

Facilities noted that the incentive was similar to what the facilities could receive from other payers, such as the rates reimbursed by some Medicare Advantage plans. Among NFAs, some of the perceived weakness of the financial incentive may have come from the low volume of billing opportunities, rather than with the rate of reimbursement. Although 95.8 percent of surveyed NFAs responded that billing made financial sense for their facilities in Initiative Year 2 (a drop from 99.1 percent in Initiative Year 1), 22.7 percent said the lack of eligible residents was somewhat of a challenge or a major challenge to making billing worthwhile. ***Figure II-1*** highlights key facility survey responses concerning financial incentives.



More than a third of surveyed NFAs in Year 2 reported that the decline in numbers of Initiative-eligible residents created challenges for NFI 2 billing.

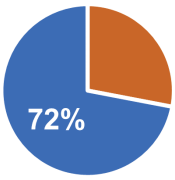
C+P

Carrying over from NFI 1, C+P facilities already had established efforts to reduce avoidable hospitalizations, with interviewees noting that the money really did not change existing practices to treat residents in their facilities. As one MOQI C+P DON shared,

"I just want the residents to have whatever is best. If we get paid extra [that is] awesome, but we try to apply the same principles. We keep them out of the hospital."

P-O

Although they did not participate in NFI 1, many P-O facilities also had existing practices in place to reduce avoidable hospitalizations prior to NFI 2. Interviewees from these facilities explained that the money was an added benefit for well-established care practices. From Initiative Year 1 to 2, 73.7 and 70.2 percent, respectively, of P-O NFAs surveyed agreed that Initiative billing codes were reimbursing their facilities for care being provided prior to NFI 2. A NY-RAH P-O medical director explained,



Most surveyed P-O NFAs said NFI 2 provided a financial incentive for care practices their facilities had implemented prior to the Initiative.

"We already had low rehospitalization rates. I think it was already ascertained before [NFI 2] started. We were already treating on-site and using INTERACT. We already had the diagnostic capabilities. So, I'm not sure if [fewer hospitalizations] can be attributed to NY-RAH."

A few interviewees said their facilities took advantage of the financial incentive and billed consistently across NFI 2 years. Typically, these interviewees described well-established

documentation and billing practices already in place, making NFI 2 claims submission routine. These facilities also received their incentive payments directly, compared with some incentives that were held in corporate accounts without direct facility access. For those facilities that did not receive payments directly, interviewees noted lower NFI 2 facility engagement.

A very small number of facilities also adopted a philosophy of trying to submit any claims that might qualify, arguing that even if CMS rejected or recouped the money, the facility would make up the difference in sheer volume of NFI 2 claims.

Practitioner Incentives

Figure II-2. Practitioner interviewees' top three responses to NFI 2 financial incentives

	**1. Practitioners shared that the amount of Initiative reimbursement was not worth the extra effort to collect and submit the required NFI 2 documentation.**
	**2. Some practitioners feared that NFI 2 billing would incur Medicare audits or recoupment.**
	**3. Some practitioners could not submit NFI 2 claims due to their corporate structures or because they were also working as rural health providers affiliated with Rural Health Clinics.**

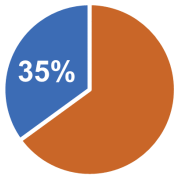
SOURCE: RTI analysis of Practitioner Survey (RTI program JW07).

Practitioners also reported concerns with the rate of NFI 2 billing, explaining that from a cost–benefit perspective, the amount of reimbursement was not worth the extra documentation and billing efforts. In the first two years of the Initiative, 51 percent of surveyed practitioners responded that the level of clinical documentation was either a major challenge or somewhat of a challenge in confirming diagnoses for NFI 2 (***Figure II-2***). A few practitioners also faced challenges with their corporate central billing offices not supporting the addition of NFI 2 billing codes, creating barriers to practitioner billing for the Initiative. Compared to NFAs, somewhat fewer surveyed practitioners in Years 1 and 2 agreed that billing made financial sense: 82.8 percent in Year 2 compared to 85.8 percent in Year 1. Many practitioners were willing to certify conditions to support facility billing but were reluctant to complete the work to submit their own practitioner NFI 2 claims. Some practitioners also expressed lack of trust in the system, raising concerns about potential CMS recoupment. A NY-RAH C+P NFA noted,

"[Practitioners] are not submitting [claims]. They are scared of being audited."

Some facility interviewees across ECCPs also said their practitioners work in rural health clinics (RHCs). RHCs must bill for service delivery using only designated rural health billing codes, so these practitioners cannot use NFI 2 or other billing codes while serving in that rural health care provider capacity. For RHC practitioners to bill for NFI 2, they had to visit the nursing facility and certify conditions when they were not "on the clock" as RHC providers (e.g., in the evening, after business hours). Accordingly, most facility practitioners who were also RHC providers opted not to submit NFI 2 claims.

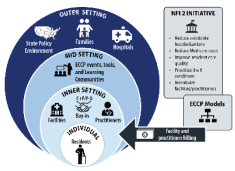
Surveyed practitioners were more concerned with the reimbursement rate of the billing codes than NFAs. More than one-third of practitioners in both Initiative Years 1 and 2 (36.3 and 34.2 percent, respectively) cited the payment amount as a challenge, meaning they did not feel the amount of potential financial incentive justified the time and effort to submit NFI 2 claims. One in four surveyed practitioners found the lack of eligible residents and the risk of legal issues to be challenges. Compared to the financial incentive, surveyed practitioners considered the time window for certification and level of documentation needed to be even greater challenges to billing. However, the practitioners who responded to the survey (43.9 percent of all participating) were likely more engaged with NFI 2 overall, and their responses may reflect a more favorable attitude than participating practitioners more broadly.



More than a third of surveyed practitioners indicated that the NFI 2 reimbursement was not worth the effort to submit Initiative claims.

II.2.G. How Did Nursing Facilities Identify and Treat NFI-2 Eligible Populations?

Participating facilities submitted NFI 2 claims for providing care to eligible residents (Medicare fee-for-service and long-stay (101 cumulative days or more in the nursing facility). Residents who were receiving rehabilitative services or other short-stay care were ineligible, as were residents enrolled in Medicare hospice or Medicare Advantage (MA) plans.



CFIR Spotlight: this subsection highlights the relationship within the inner setting, between facility staff and eligible residents.

Most facilities implemented a few of the NFI 2 education and communication practices (e.g., early identification of the six conditions) via broad staff education and use of specific communication tools, such as INTERACT. The process for facilities that had implemented NFI 2 was as follows: facility staff identified conditions, assessed residents, documented care, and consulted with practitioners for residents, but this workflow had existed prior to NFI 2. The general process did not change for Initiative-eligible residents. In fact, many clinical staff and nursing assistants remained unaware of which facility residents were part of NFI 2. Instead, a few facility leaders or

their NFI 2 implementation designees, and ECCP staff in C+P facilities, identified which residents were eligible for the Initiative, and gathered needed documentation - often after a resident change in condition had been identified and treated. Then they worked with billing managers separately to submit NFI 2 claims. Most clinical care and support staff members had no awareness of resident NFI 2 eligibility and had no role in the billing processes.

Practitioners also had low awareness of resident eligibility. Surveyed practitioners who were not billing noted that clearer guidelines around identifying which residents were eligible could have increased their use of practitioner billing codes.

Initially, most C+P and P-O facilities had sizable numbers of NFI 2-eligible residents, as population size was one of the P-O facility selection criteria for NFI 2 participation.[12] However, over time, many facilities observed a substantial decline in the number of residents who could participate in NFI 2. MA enrollment (***Chapter I.1***) soared in most ECCP states between 2016 and 2020, and several interviewees shared that they believe hospice enrollment also increased in their facilities. Residents who enrolled in MA plans or hospice had to be removed from NFI 2; facilities could not bill Medicare for these residents even if they experienced one of the six NFI 2 conditions.

As eligible populations became smaller over time in many facilities, leadership and clinical staff shifted focus away from NFI 2 documentation and billing, particularly for C+P facilities (***Table II-4*** in ***Chapter II.4***). A number of facilities stopped submitting NFI 2 claims altogether. As one AQAF P-O NFA shared,

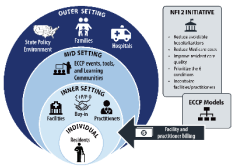
"We had so few cases, [NFI 2 billing] wasn't worth it."

Without substantial eligible patient volume, many facilities deprioritized NFI 2 implementation and sustainment.

[12] https://www.cms.gov/Medicare-Medicaid-Coordination/Medicare-and-Medicaid-Coordination/Medicare-Medicaid-Coordination-Office/Downloads/NFIGuidanceParticipatingFacilities12102018.pdf

II.2.H. How Were Facility Staff, Leaders, and Practitioners Engaged in NFI 2 Implementation?

Findings from the interviews conducted during this evaluation indicated that engagement with the Initiative varied widely across facilities and ECCPs, where we define engagement as being engaged actively in Initiative implementation and billing. This finding aligns with variation in billing across facilities that is described in ***Chapter II.4***. Facilities with the highest engagement tended to have stable facility leadership and staff, large populations of Initiative-eligible residents, and supportive practitioners who visited the facility regularly. Facilities that reported higher levels of engagement typically billed NFI 2 more frequently, though NFI 2 billing tapered over time for most facilities, even those with engaged staff.



CFIR Spotlight: this subsection focuses on relationships between the inner setting facility staff and practitioners and the middle setting ECCP interventions.

Facility Staff Engagement

Facility staff stability emerged as one of the most important factors for successful implementation of NFI 2. Even though clinical staff and assistants often did not know which residents were eligible for NFI 2, high rates of staff turnover eroded implementation progress by requiring continuous retraining of new staff on the process of identifying the six conditions, reaching practitioners, and providing needed documentation and communication. This instability in many facilities prevented the Initiative from being fully established. Among surveyed NFAs, 45.5 percent responded that turnover was a challenge during the first survey, and that number rose in the second survey to more than half of those surveyed (54.9 percent) (see ***Appendix H*** for more detail).

Some facilities hoped NFI participation would resolve some of their turnover issues by focusing more on education and improved clinical practices, but turnover remained a consistent challenge. An OPTIMISTIC C+P NFA stated,

"We started the Initiative to focus on change in culture of the building. With the turnover rate, we did not have [Initiative] consistency."

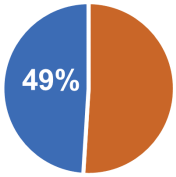
Ongoing Initiative training efforts required facility time and resources, so some facilities reported that with higher turnover rates, the Initiative eroded existing facility budgets without ever reaching sufficient implementation to generate new revenue through NFI 2 claims.

Similarly, facilities without stable leadership could not sustain NFI 2, because each leadership transition effectively hit "pause" on the Initiative. These pauses could last weeks or even months, interrupting any previously established NFI 2 implementation processes among the clinical staff.

Many facility staff also felt they had no real role in NFI 2. In NFI 1, facilities deployed Initiative components, such as training on INTERACT tools (e.g., Stop and Watch) to the entire facility, including staff at all levels. Our evaluation found that staff engagement was the key to implementing NFI 1. In contrast, even in C+P facilities, interviewees said NFI 2 focused more on billing, with only senior clinical staff (e.g., Charge Nurses, ADONs, DONs) and business office or billing staff having key roles. Clinical staff and certified nursing assistants (CNAs) reported that they had no real ownership of any aspect of NFI 2, and many P-O CNA interviewees knew very little about NFI 2. In C+P facilities, surveyed NFAs indicated the overall level of education and support they received for NFI 2 decreased from Initiative Year 1 to 2 (2017 to 2018); the proportion who felt they and their staff received sufficient support declined somewhat from 96.8 percent to 86.8 percent.

Practitioner Participation

Although practitioners generally supported the NFI goals, practitioner engagement was difficult to sustain for many facilities throughout NFI 2 (***Appendix H***). Again, engagement here is defined as both supporting facility billing and submitting their own practitioner NFI 2 claims. In the initial round of surveys, prior to CMS removing the care coordination code, only 15.4 percent of surveyed practitioners reported billing both codes to confirm changes in condition and care coordination conferences for those confirmations; however, 46.7 percent reported confirming diagnoses alone. The difference was starkest in the C+P group, with 10.7 percent charging both codes, and 50.8 percent charging only changes in condition, compared to the P-O group where 20.3 percent of practitioners billed both codes and 42.4 percent billed only for the changes in condition. This pattern held in the second round of surveys, where a slightly higher percentage of C+P practitioners billed both codes (15.7 percent) and a slightly lower percentage billed just for changes in condition (47.0 percent). Both groups were larger in the second survey wave for the P-O group with 28.0 percent of practitioners billing both types of codes, and 45.6 percent billing just the changes in condition. Notably these surveys conducted in NFI 2 Years 1 and 2 captured early findings, and interview responses across Years 3 and 4 indicated much lower rates of billing.



Across both surveys, around half of practitioners reported billing NFI 2 for resident condition changes.

ECCPs provided ongoing training and support to practitioners, educating them on the goals of the Initiative, but response to this outreach varied. In the first wave, 36.9 percent of surveyed practitioners said they had not received sufficient training and education related to confirming a diagnosis for a qualifying change in condition for NFI 2, and that decreased to 31.7 percent in the second survey (see ***Appendix H*** for more detail). Practitioners who were present in the facilities more often typically had greater awareness of the Initiative and were more receptive to NFI 2 training. Some facility interviewees reported that their practitioners were on-site regularly (e.g.,

facility-employed APRNs or physician practice APRNs who visited facilities several times per week); these practitioners often supported NFI 2 goals, including certifying residents so that facilities could submit NFI 2 claims. However, practitioners who visited facilities infrequently or had smaller facility resident rosters typically were much less engaged with NFI 2.

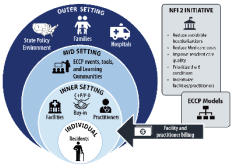
A few practitioners never embraced the Initiative goals. As one MOQI P-O NFA explained,

"Our challenge here is that it is hard to get our in-house doctor on board. His preference is sending to the hospital."

When practitioners were not engaged, facilities faced barriers certifying resident conditions and submitting NFI 2 claims. C+P facility interviewees with on-site APRNs described few challenges with practitioner engagement, compared with C+P and P-O facilities that had no on-site APRNs.

II.2.I. How Did Facility–Hospital Relationships Evolve During NFI 2?

C+P & P-O



CFIR Spotlight: this subsection highlights the relationship between the inner setting participating facilities and the outer setting hospitals.

At the start of NFI 2, most facilities across ECCPs noted that referring hospitals were aware and supportive of the Initiative generally, but they were not directly engaged with NFI 2 efforts. A few facility interviewees reported that local hospitals viewed nursing facility participation in NFI 2 as a means of extending support to existing hospital efforts to reduce penalties for readmissions. As a MOQI C+P NFA explained,

"The majority of hospitals are happy and aware of the project. [We] have gone in to collaborate with the hospitals, and the goals of the hospital are the same [reducing readmissions]. It has opened more lines of communication and built more relationships."

However, many interviewees also noted no change in their relationships with local hospitals. Of those facilities that described improved relationships with hospitals, a few also described the formation of partnerships (e.g., regular meetings) with hospitals to unite efforts toward reducing hospitalizations. Facilities explained that some hospitals were neutral to the idea of the Initiative, but when facilities were able to describe NFI 2 goals in detail, including the focus on the six conditions, many hospitals became more supportive. This hospital support also became more of a business opportunity. A RAVEN P-O NFA added,

"If our [hospitalization] rate is better than others, hospitals want to work with us. That's huge from a marketing perspective."

Several other facility administrators across ECCPs noted similar benefits of being able to advertise their participation in NFI 2 as a selling feature to area hospitals.

Chapter II.3 Is There Evidence that On-Site Treatment was a Substitute for Hospitalization?

Key Takeaways

- *Our analyses suggest that on-site treatment did not substitute for hospital use and that many residents treated on-site would not otherwise have been hospitalized. Evaluation results indicate the lack of substantive change in hospitalization rates from the baseline period, despite the introduction of billing for on-site treatment and a rate of on-site treatment exceeding treatment in the hospital for the six conditions.*
- *Many facilities reported that prior to participating in NFI 2, they already had similar processes and activities in place to reduce avoidable hospitalizations, with the Initiative delivering a financial incentive for care that facilities were already providing.*

II.3.A. Overview and Methods

In this chapter, we describe the extent that residents in the Initiative facilities received treatment for the six qualifying conditions both on-site and in the hospital, and we describe differences between those treated on-site and those treated in the hospital. We do this to address the following key research questions:

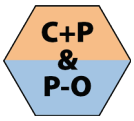
- Was the on-site treatment that was associated with the opportunity to bill under NFI 2 a substitute for hospitalization?

- What were the characteristics of the residents who were treated on-site for one of the six conditions under NFI 2? Did the clinical and demographic characteristics of residents differ between those treated on-site and those hospitalized for the six qualifying conditions?

The analyses presented here are based on Medicare claims data from the FY 2014–FY 2019 period. On-site treatment is measured from FY 2017 through FY 2019. We provide more details about the measures of on-site and in-hospital treatment, and additional analytical details, in ***Appendices I and L***.

II.3.B. Patterns of Treatment for the Six Conditions Over Time

As previously described, NFI 2 provided facilities with the opportunity to bill for delivering on-site treatment. The intent was that residents who would otherwise be treated in the hospital for the six qualifying conditions would instead be treated in the facility (***Chapter II.5*** highlights Initiative effects on hospital-related utilization). However, billing for treating a resident in the facility does not necessarily mean that a hospitalization was avoided. Our analysis strongly suggests that a substantial proportion of the residents treated in the facility as part of NFI 2 would not have been hospitalized.[13]

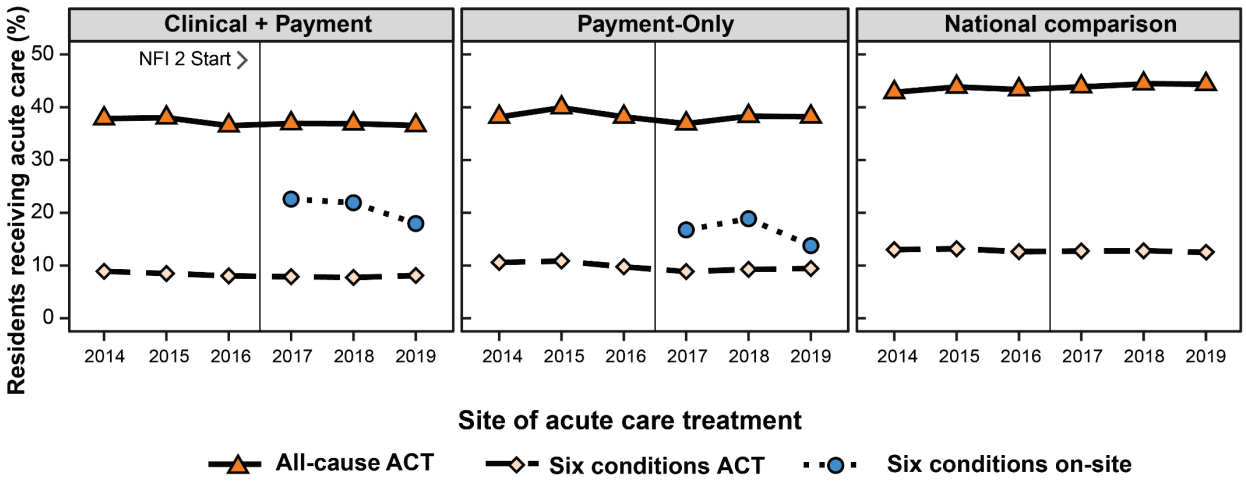


Hospitalization were stable over time: Although there were a substantial number of payments for on-site treatment, many of these payments were for residents who would not have been hospitalized.

Following NFI 2 implementation, the rate of hospitalization did not change substantially, despite a higher percentage of residents being treated on-site than were treated in the hospital for the six conditions. This indicates that many of the residents who were treated on-site would not have been hospitalized even in the absence of the Initiative. The percentage of residents treated on-site and who experienced an acute care transition (ACT), which includes either inpatient care, or treatment as an outpatient in either the emergency department (ED) or as an observation stay, is shown in ***Figure II-3.*** Similar figures using alternative measurements of healthcare utilization (rates vs. percentage and inpatient vs. ACT) are shown in ***Appendix K (Figures K-1*** to ***K-3)***.

[13] This argument is also articulated in Segelman et al. (2020), which is based on our findings from 2017 and 2018.

Figure II-3. Percentage of Initiative-eligible residents treated on-site and in-hospital (ACTs), FY 2014–FY 2019



ACT = acute care transition

SOURCE: RTI analysis of Medicare claims data.

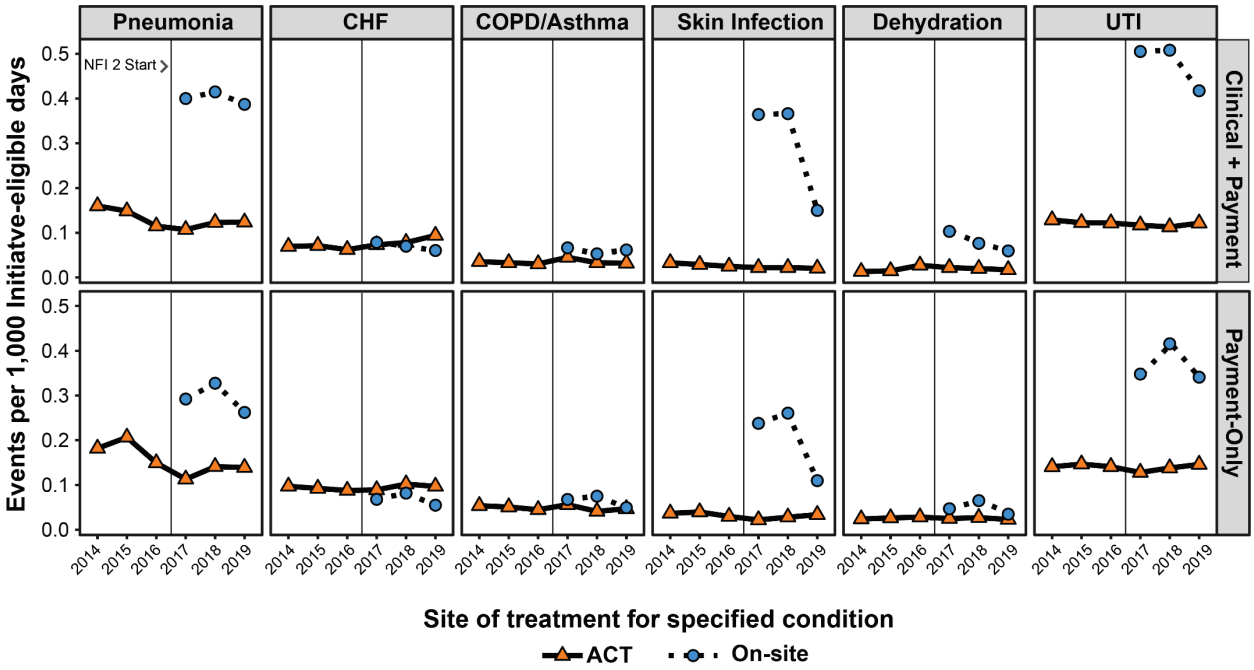
C+P & P-O

As seen in ***Figure II-4***, the same pattern of a higher rate of on-site treatment compared to hospitalization coupled with the stable hospitalization rate can also be observed for individual conditions. Again, hospitalization rates did not decrease as would be expected if on site treatment prevented hospitalization. This pattern held clearly for pneumonia and UTI across years, and for skin infection in 2017–2018 (on-site treatment for skin infection declined substantially in 2019[14]).

[14] This was due to changes in the Initiative clinical criteria for skin infection as explained in RTI International (2021).

Figure II-4. Acute care events for the six qualifying conditions, FY 2014–FY 2019

(events per 1,000 Initiative-eligible resident-days)



CHF = congestive heart failure; COPD = chronic obstructive pulmonary disease; UTI = urinary tract infection; ACT = acute care transition.

SOURCE: RTI analysis of Medicare claims data.

Taken together, these findings indicate that although there was a substantial number of payments for on-site treatment, most were for residents who would not have been hospitalized. If on-site treatment substituted for hospitalizations, then there would be more of a difference (reduction) between the pre-NFI 2 hospitalization rates (FY 2014–FY 2016) and the rates after NFI 2 was implemented (FY 2017–FY 2019). Of those residents receiving on-site nursing facility treatment, most would have been treated on-site even absent the Initiative.

These results align with interview findings regarding pre-NFI 2 efforts to keep residents in participating nursing facilities for care. Throughout NFI 2, interviewees across ECCPs and facilities noted that the NFI 2 payment component was not producing substantial changes in facility care practices; rather, many participating facilities already prioritized on-site care, either through NFI 1 or other similar efforts. The Initiative provided an additional financial award for on-site care practices already in place. Identifying residents with the six qualifying conditions and treating them on-site when appropriate represents a good clinical practice. However, it is beyond the scope of this report to evaluate the appropriateness of providing reimbursement for care practices that were reported as already being in place.

The Initiative provided an additional financial award for on-site care practices already in place.

With this mindset of facility-based care well established in many facilities, interviewees noted that efforts to reduce avoidable hospitalization benefited residents facility-wide, not just Initiative-eligible residents. Besides reimbursing facilities for care practices that were already in place, NFI 2 payments may have impacted care in other ways. For example, evidence from interviews shows that ECCP education increased facility nursing staff confidence and competence, resulting in improvements in on-site care, including more staff comfort with administering intravenous antibiotics.

Another analysis also indicated that facilities with higher billing for providing on-site treatment were not necessarily doing a better job helping their residents avoid unnecessary hospitalizations. We performed a correlation analysis to examine the relationship between facility-level billing for on-site treatment and facility-level rates of ACTs. If a large amount of on-site care substitutes for hospital treatment, we would expect to see a strong inverse correlation. Our analysis did not detect a strong correlation, indicating the lack of a large amount of substitution.[15]

> High-billing nursing facilities did not necessarily do a better job helping their residents avoid hospitalizations.

II.3.C. Characteristics of Residents Treated On-Site and In-Hospital

We found important clinical differences between those treated on-site and those hospitalized for the six conditions. Although this could be expected even if on-site treatment was successfully substituting for many of the lower acuity hospitalizations, it is also consistent with our conclusion that most residents treated on-site would have remained on-site (not hospitalized) absent the Initiative. These clinical differences suggest that higher-acuity cases were more likely to result in hospitalization, whereas residents who were less seriously ill were treated in nursing facilities. To make these comparisons, we categorized residents into the following four groups based on their treatment status for any of the six qualifying conditions in a given year:

> There are important clinical differences between residents treated on-site and those hospitalized for the six conditions, indicating a lower acuity for those treated on-site.

- *No acute care*: No on-site or in-hospital treatment for any of the six qualifying conditions[16]
- *On-site treatment only*: On-site treatment for one or more of the six qualifying conditions, but no in-hospital treatment for any of the six qualifying conditions

[15] See Appendix M in RTI International (2021).

[16] May include residents who had one of the conditions and perhaps even received treatment, but were not treated on-site with an NFI 2 episode or in the hospital.

- *Hospital treatment only*: In-hospital treatment for one or more of the six qualifying conditions, but no on-site treatment for any of the six qualifying conditions
- *On-site and hospital treatment*: Both on-site and in-hospital treatment for one or more of the six qualifying conditions.

Table II-3 contrasts demographic characteristics and resident comorbidities[17] among these four categories of residents. In C+P facilities, residents treated solely on-site for one of the six conditions had an average hierarchical condition category (HCC) count, a measure of the number of comorbidities, of 4.9, similar to those not treated for the six conditions (4.6) and much lower than[18] residents treated only in the hospital (6.9) or treated both on-site and in the hospital (6.9). HCC scores for residents in P-O facilities followed a similar pattern. Residents from both groups who were treated on-site and not in the hospital for one of the six conditions tended to be older than other residents. Notably, residents who were not hospitalized for the six conditions had higher levels of cognitive impairment than those treated in the hospital, as demonstrated both by the prevalence of dementia as well as cognitive function scale (CFS) scores. In C+P facilities, residents receiving only on-site care had similar incidence of dementia (54.3 percent) as residents not treated for the six conditions (53.0 percent). However, the residents receiving hospital-only treatment had lower incidence of dementia (44.1 percent), as did residents receiving both on-site nursing facility and hospital care (40.8 percent). P-O facilities exhibit a similar pattern. CFS scores for those in both groups not treated in the hospital for the six conditions were about 1.2, compared to about 1.0 for those treated in the hospital. Our findings are consistent with results from a recent study that showed that nursing facility residents with dementia received fewer hospitalizations (Temkin-Greener et al., 2019).

[17] The characteristics and comorbidities described in this section and ***Table II-3*** are explained further in the discussion of independent variables (***I.9***) in ***Appendix I.***

[18] A limitation of these counts of HCCs is that they depend on diagnoses in the resident's medical record, which are influenced by hospital treatment in the prior year. Because those treated on-site tended to be somewhat older, they could possibly have been less likely to be sent to the hospital based on their age and thus have fewer HCCs.

Table II-3. Characteristics of residents by status of acute care received, FY 2017–FY 2019

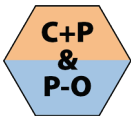
(All six qualifying conditions combined)

Measure	No acute care for six qualifying conditions	On-site treatment only	Hospital treatment only	On-site and hospital treatment
Clinical + Payment				
Total N	23,782	5,937	1,743	805
Average age (years)	78.8	80.5	77.5	77.9
Percentage died	21.3	23.7	34.7	31.7
Percentage with dementia	**53.0**	**54.3**	**44.1**	**40.8**
Average HCC count	**4.6**	**4.9**	**6.9**	**6.9**
Average CFS (0-3)	**1.2**	**1.2**	**1.0**	**1.0**
Percentage with any acute care transition	30.1	36.4	100.0	100.0
Average total Medicare expenditures per resident-year ($)	18,063	25,340	49,658	58,746
Payment-Only				
Total N	27,603	5,248	2,581	732
Average age (years)	80.7	82.8	79.2	81.1
Percentage died	22.0	23.5	36.3	33.2
Percentage with dementia	**55.5**	**56.7**	**44.3**	**43.3**
Average HCC count	**4.2**	**4.5**	**6.3**	**6.1**
Average CFS (0-3)	**1.2**	**1.2**	**1.0**	**1.0**
Percentage with any acute care transition	30.8	35.0	100.0	100.0
Average total Medicare expenditures per resident-year ($)	15,718	23,090	43,529	47,849

HCC= hierarchical condition categories; CFS = cognitive function scale; CHF = congestive heart failure

SOURCE: RTI analysis of Medicare claims data.

NOTES: Unlike Medicare expenditures reported elsewhere in this report, the total Medicare expenditures in this table are not annualized. More details on some of the measures in this table are provided in ***Appendix I***. Bolding is used to emphasize those variables which are specifically mentioned in the text. Residents were categorized based on their status during a given year.



In ***Table K-3 in Appendix K***, we present similar descriptive statistics, broken down by condition. Patterns for HCC scores, dementia, and CFS are similar as when all conditions are combined.

Chapter II.4 Examining Implementation of the Payment Component of NFI 2

Key Takeaways

- *Clinical + Payment facilities billed at a higher rate than Payment-Only facilities for the Initiative due to the work of on-site ECCP staff. Conversely, practitioners billed more in Payment-Only facilities, where ECCP staff did not certify for the NFI 2 conditions.*
- *There was substantial variation in billing across facilities, with many facilities not billing at all or billing very little, and others billing frequently. Over time, billing decreased and became more concentrated among a smaller group of facilities.*
- *Pneumonia and UTI were the most commonly billed conditions for on-site treatment.*
- *Although NFI 2 was designed to provide a financial incentive for facilities to keep residents on-site for care, many nursing facilities were not able to bill consistently. Some billing facilities were not able to receive money directly, with payments going to corporate offices and not directly to individual facilities.*

II.4.A. Overview and Methods

In this chapter, we describe patterns in facility and practitioner billing across ECCPs during NFI 2. Our goal is to address the following research questions:

- How was NFI 2 implemented, and how did participating ECCP leadership and facility staff perceive Initiative effectiveness?
- What patterns were observed over time and between facilities in billing for providing care for residents who were diagnosed with one of the six qualifying conditions? What patterns were observed in the billing practices of practitioners? What are the reasons given by facility staff and leaders to explain these patterns?

The secondary data results we present are based on our analysis of Medicare claims for the special Initiative billing codes which include codes for facilities and practitioners. The facility codes enable us to identify billing for any specific one of the six conditions. We provide more details about these methods in ***Appendix K.*** In addition to this quantitative approach, we also conducted interviews and surveys among participating ECCP leadership, practitioners, and facility leaders and staff.

II.4.B. Variation in Billing Across Facilities

As shown in ***Chapter II.3***, much of the billing for on-site treatment did not represent substitution for treatment in the hospital. We argued that facilities with higher billing for providing on-site treatment were not necessarily doing a better job helping their residents avoid unnecessary hospitalizations, including for the six conditions. Nonetheless, the patterns of billing for providing on-site treatment reflect features of the Initiative including changes over time in the Initiative design. They are also indicators of engagement with the Initiative, could reflect the impact of ECCP staff in facilities, and provide insight into the prevalence of the six conditions among nursing facility residents.

C+P facilities billed more compared to P-O facilities.

Our analyses indicate that billing rates[19] varied substantially across and within ECCPs, as well as between the two groups of facilities. First, we observed higher billing in C+P versus P-O (***Figure II-5***). Higher billing among C+P facilities could indicate they had greater capacity to provide on-site treatment due to available ECCP staff who assisted with billing and documentation, or it could suggest more engagement with the Initiative in general, following from their participation in NFI 1. Relatedly, lower practitioner billing among C+P facilities is also due to the presence of ECCP nurses, many of whom provided hands-on care for at least part of NFI 2 in most ECCPs (all but NY-RAH). ECCP nurses did not submit NFI 2 bills for themselves but could diagnose and certify that residents had one of the NFI 2 six conditions for facility Initiative billing. In P-O facilities, practitioners that certified residents as having NFI 2 conditions were not affiliated with ECCPs and were able to submit their own NFI 2 claims.

[19] Rates are measured as events per 1,000 resident-days, which takes facility size into account

Where ECCP staff were not present, ECCPs provided different levels of support for facility billing activities. In P-O facilities, only half of ECCPs provided consistent, direct in-person or telephonic billing support, with a specifically assigned ECCP liaison.

Second, facility billing rates varied notably among ECCPs. For C+P facilities in FY 2019, billing was highest for MOQI and lowest for OPTIMISTIC. For P-O facilities in FY 2019, the billing rate was highest for NY-RAH and lowest for MOQI. In fact, facility and practitioner billing rates in the NY-RAH and OPTIMISTIC P-O facilities in FY 2019 were around double the rates of AQAF and more than double those of MOQI (***Appendix K, Figures K-4*** and ***K-5***). The high billing in NY-RAH could have been partly due to decreases in state Medicaid nursing facility payment rates (see Section I), which may have created an additional incentive for some facilities to submit more NFI 2 claims.

Third, there was great variation in billing across facilities. Facilities at the 75th percentile of billing for on-site treatment billed at around twice the rate of median facilities throughout FY 2017–FY 2019 for both NFI 2 groups (***Appendix K, Tables K-13*** to ***K-18***). Many facilities did not bill at all (***Table II-4***). Billing was concentrated among the top billers: the top 10 percent of facilities accounted for between 24 percent and 39 percent of all billing (***Table II-4***). Additionally, of the 26 facilities identified as being the top 10 percent of billers in FY 2017, 9 were top billers in all three years. Of the top 10 percent in each year, 15 were top billers in two of the three Initiative years from FY 2017 to FY 2019 (results not shown). This means that a relatively large percentage of all billing during FY 2017–FY 2019 was accounted for by a relatively small number of facilities.

The concentration of billing among top billers increased over time.

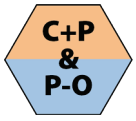
This concentration of billing among top billers increased over time (***Table II-4***), partly because the number of non-billing facilities also increased over time. In P-O facilities, the number of facilities not submitting any claims more than doubled from 22 in FY 2018 to 49 in FY 2019—roughly a third of all P-O facilities (***Table II-4***). In both AQAF groups, there were many non-billing facilities during the three NFI 2 years. In FY 2019, the non-billing P-O facilities were primarily from AQAF, ATOP, OPTIMISTIC, and MOQI (***Appendix K, Table K-23***). Overall, 16 ECCP facilities did not submit a single claim for on-site treatment for the duration of the Initiative. Of these 16, 12 dropped out of the Initiative. Following our intent-to-treat approach, these dropouts were still included in our analysis. More details are provided in ***Appendix I***.

Table II-4. All ECCPs: Non-billing facilities and episodes billed by the top 10 percent of facilities, FY 2017–FY 2019

Year	Number of Facilities		Number of Non-Billing Facilities (% of Total Facilities)		% Billing by Top 10% of Facilities	
	C+P	P-O	C+P	P-O	C+P	P-O
2017	112	148	9 (8.0)	23 (15.5)	24.0	31.0
2018	111	148	12 (10.8)	22 (14.9)	26.7	29.9
2019	111	148	17 (15.3)	49 (33.1)	29.5	39.1

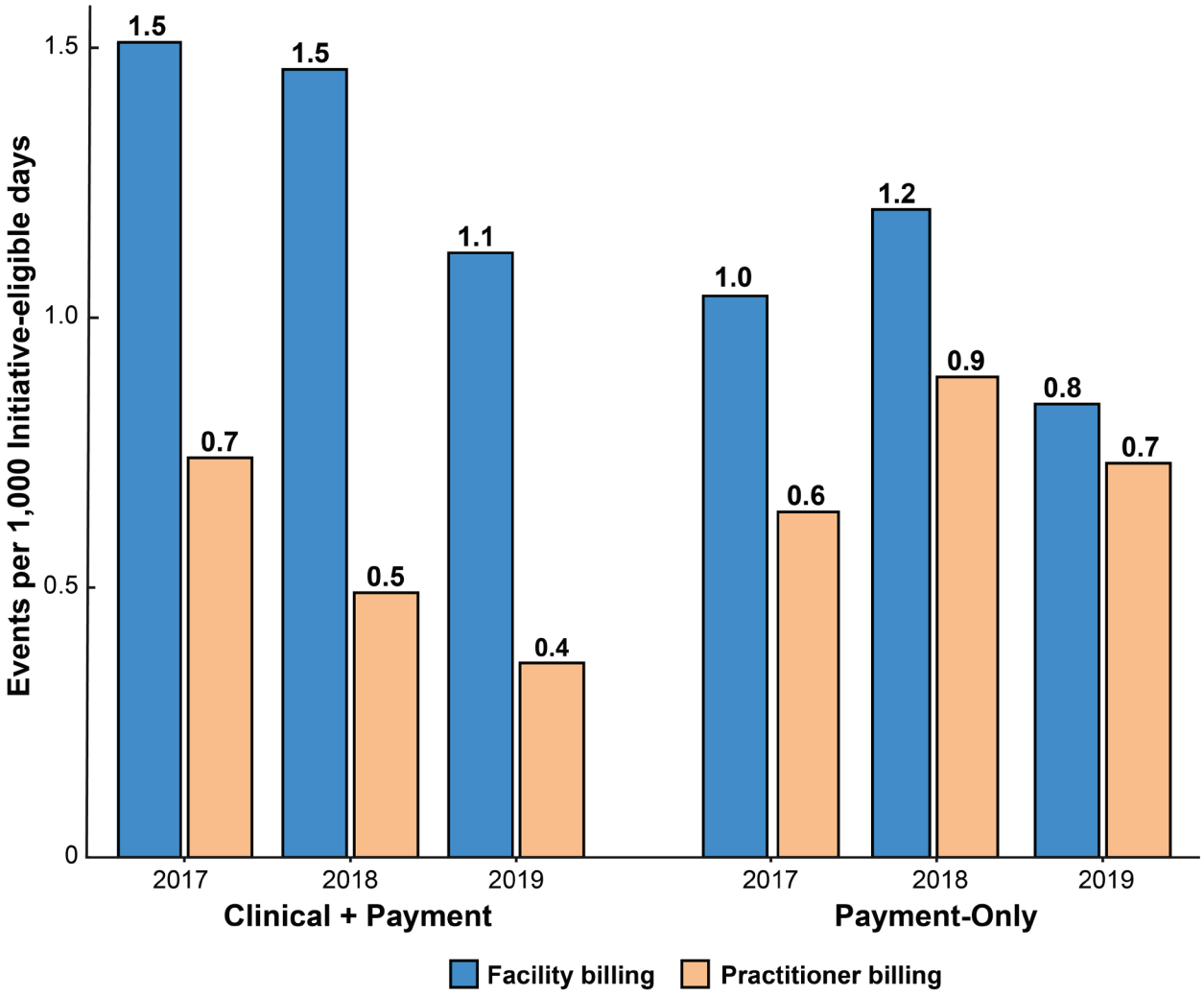
SOURCE: RTI analysis of Medicare claims data.

NOTES: Billing was measured based on the rate per 1,000 Initiative-eligible resident-days for all six qualifying conditions combined. The top 10 percent of facilities across all ECCPs were identified separately for each year, for each of the C+P and P-O groups. For example, for the C+P group in 2017, we selected the 12 facilities with the highest billing based on the rate of per 1,000 Initiative-eligible resident-days. The change in the number of C+P facilities between 2017 and 2018 was due to a facility merger (see ***Appendix I***).



Finally, we observed that overall billing rates declined considerably between FY 2018 and FY 2019. In C+P facilities, billing decreased from an average 1.5 episodes per 1,000 Initiative-eligible resident-days in FY 2018 to 1.1 episodes in 2019. For P-O facilities, billing decreased from 1.2 episodes in FY 2018 to 0.8 episodes in 2019 (***Figure II-5***). Based on a monthly analysis presented in ***Chapter IV.2*** (***Figure IV-3***), we found that, in fact, billing also declined between FY 2017 and FY 2018, once we remove the first several months of FY 2017. During these first months of the Initiative, facilities were apparently "coming up to speed" in implementing their processes for billing for providing on-site care for the six conditions.

Figure II-5. Facility and practitioner billing for all ECCPs combined, FY 2017–FY 2019



SOURCE: RTI analysis of Medicare claims data.

NOTES: The sample used here includes all residents meeting NFI 2 eligibility requirements. This sample is slightly larger than the final analytic sample used in this report's multivariate analyses, which further excludes any resident with a missing covariate of interest. For further details on the sample selection process, see ***Table I-3*** in ***Appendix I***. Practitioner billing is based on code G9685.

Overall billing rates declined considerably between 2018 and 2019.

In addition to the overall decrease in facility claims for on-site treatment, claims specific to each of the six conditions also decreased in 2019[20] (see ***Figure II-4 in Chapter II.3***). Most notably, facilities billed far fewer skin infections in FY 2019 compared to FY 2018. Similarly, average rates of on-site billing for pneumonia and UTIs decreased moderately, though these remain the two most-billed conditions, which together accounted for

[20] There is a partial exception to this in that claims for on-site treatment for COPD increased between 2018 and 2019 in the C+P group.

over 60 percent of all billing. On-site billing for CHF and dehydration declined; billing remained stable for COPD/asthma.

II.4.C. Facility Interviewee Explanations for Billing Decline

Our analyses documented a substantial decline in billing during the later NFI 2 years. Interviewees shared some reasons for this decline, including lower overall NFI 2 engagement and other factors or barriers affecting the billing process. Facilities may have billed less due to other competing priorities, such as growth of Medicare managed care that reduced the number of NFI-2 eligible residents and created additional requirements for facility staff (e.g., additional MA plan-specific documentation). Alternatively, infrequent NFI 2 billing may indicate a change in clinical care in facilities. Facility staff who were trained to identify and treat the six conditions may have identified these conditions before they exacerbated to the level required by the NFI 2 clinical criteria. In that case, lower NFI 2 billing may indicate better facility care. Facility interviewees provided several explanations for reduced Initiative billing over time, and the most frequently mentioned reasons are described as follows:

- **Revised NFI 2 criteria for the six qualifying conditions.** In fall 2018, CMS announced revised criteria for the six NFI 2 conditions that became effective in January 2019. Interviewees said that changes, such as removing AMS from the UTI criteria as a qualifying symptom and adding fever to the skin infection criteria as a required symptom, resulted in fewer resident conditions meeting NFI 2 billing requirements.
- **Reduced number of residents eligible for NFI 2.** The eligible population decreased in nearly all ECCPs across both C+P and P-O facilities, largely due to growth in Medicare managed care plans and growth in use of hospice and palliative care services. Fewer NFI 2-eligible residents led to fewer Initiative billing opportunities and to reduced focus on NFI 2 documentation.
- **Improvements in staff clinical skills, confidence, and capabilities.** NFI 2 facility staff in both groups were trained to catch changes in condition before they exacerbated by (1) identifying and communicating resident changes early, and (2) improving capacity to test and treat residents on-site. However, quicker identification of resident conditions also resulted in fewer facility billing opportunities, as resident conditions never reached the severity level to meet NFI 2 clinical criteria.
- **Intervention changes for AQAF and NY-RAH.** Following receipt of CMS Programmatic Assistance Letters (PALs), AQAF added a clinical care component to their intervention in 2018, and NY-RAH shifted to a quality improvement intervention in 2019. Because ECCP-embedded staff were integral to helping C+P facilities gather needed documentation to submit NFI 2 claims, facilities submitted fewer NFI 2 claims when they experienced ECCP nurse turnover, transition, or absence during these model transitions. P-O facilities also reported delays in their interactions with these ECCPs, as ECCP leaders focused on adjusting their C+P models.

- **Staff turnover undermining Initiative implementation.** Frequent turnover of key facility leaders (e.g., NFA, DON) and clinical staff created ongoing Initiative starts and stops, with required reintroduction and training for new staff. These interruptions in facility Initiative implementation delayed or impeded NFI 2 billing.

In Initiative Year 2 (FY 2018), we surveyed facility leaders (i.e., mostly NFAs and some DONs) and practitioners to ask about potential changes that would have increased facility and practitioner billing. Surveying these NFI 2 participants allowed us to gather feedback from both the facility point of view and from practitioners who provided slightly different perspectives based on their specific roles certifying conditions for NFI 2. We limited the survey questions to changes reflective of the design and rollout of NFI 2 implementation and excluded factors common to the broader nursing facility landscape, such as staff turnover and growth of managed care. The questions aimed to identify the most salient changes for NFAs and practitioners that would have affected their billing. ***Figure II-6*** lists the top 3 NFAs' recommendations to increase billing (full results are presented in ***Appendix H***).

Figure II-6. Top three changes suggested by surveyed NFAs to increase facility billing

	**1. Give practitioners more time to confirm a qualifying diagnosis**
	**2. Improve communication among nursing staff about a qualifying change in condition**
	**3. Reduce requirements for documentation of changes in condition**

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

When asked about the top three potential improvements to increase NFI 2 billing, surveyed practitioners suggested better communication from nursing staff, more NFI 2 education and training, and better recognition of resident eligibility (***Table H-40, Appendix H***). Interestingly, the practitioner billing status (i.e., if the practitioner was billing for the Initiative) affected their responses. Billing practitioners recommended better communication, a longer confirmation time window, and reduced documentation requirements to increase their billing rates (***Figure II-7***). Practitioners who were not billing or were unsure if they were billing, requested more clarity on the basics of the Initiative (i.e., more general education/training and identifying resident eligibility), in addition to improved communication with nursing staff.

Figure II-7. Top three changes suggested by surveyed practitioners to increase practitioner billing

Practitioners who were billing	
	1. Improve communication among nursing staff about a qualifying change in condition
	2. Give practitioners more time to confirm a qualifying diagnosis
	3. Reduce documentation requirements for changes in condition
Practitioners who were not billing/unsure if they were billing	
	1. Receive more education and training about the Initiative
	2. Identify residents' eligibility for the Initiative better
	3. Improve communication among nursing staff about a qualifying change in condition

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

Chapter II.5 Impact of NFI 2 on Medicare Hospital-related Utilization and Expenditures

Key Takeaways

- *The evaluation found no clear evidence that either the Clinical + Payment or the Payment-Only facilities attained NFI 2's goal of reducing potentially avoidable hospitalizations and associated costs for eligible residents.*
- *There was mixed evidence of unfavorable increases in hospital-related utilization and expenditures among residents in Clinical + Payment facilities.*
- *Among residents in Payment-Only facilities, there were no consistent patterns in hospital-related utilization and expenditures, suggesting that NFI 2 had little to no impact on the measures evaluated.*
- *Initiative payment incentives for the six conditions did not yield savings for Medicare for eligible residents in the Clinical + Payment or Payment-Only facilities.*

II.5.A. Overview and Methods

We used a difference-in-difference (DD) multivariate regression approach applied to Medicare data to address these key research questions:

- What was the NFI 2 Initiative payment incentive effect on Medicare utilization and expenditures, particularly for hospital-related services?

- How did the NFI 2 Initiative payment incentive effect on Medicare utilization and expenditures vary by ECCP and type of intervention?

When describing the Initiative effects from DD multivariate regressions, "decreases" or "increases" are always relative to changes in the national comparison group, after accounting for baseline trends.

Our evaluation is based on all Initiative-eligible residents in the C+P and P-O facilities, unless otherwise noted. All eligible residents in the Initiative facilities were considered impacted by the Initiative regardless of whether they were actually certified and treated for the six qualifying conditions. As described in ***Appendix I***, we applied an intent-to-treat approach and, thus, a small number of facilities that dropped out of the Initiative were still included in the evaluation. For the DD multivariate regression approach, we considered FY 2014–FY 2016 to be the baseline period for the analysis and we used a national group of nursing facility residents from non-Initiative states in each year (FY 2014–FY 2019) as a uniform comparison group for all ECCPs. Since we observed differing trends between the intervention and comparison groups during this baseline period,[21] we incorporated different trends in our models. As explained further in ***Appendix I***, we assumed and estimated linear trends that continued from FY 2014 until FY 2017 and then flattened, or in other words, the trends from FY 2014 to FY 2016 would continue through FY 2017, but not in FY 2018 and FY 2019. The comparison group included all nursing facility residents in states that had not been involved with either NFI 1 or NFI 2, subject to both facility- and resident-level exclusion criteria.

The three years prior to the Initiative (FY 2014–FY 2016) served as the baseline period for the main analysis for the NFI 2 evaluation.

The facility-level exclusions were based on criteria established by CMS for participating in the Initiative, plus other criteria designed to exclude facilities with nontraditional populations like veterans' homes. The resident-level criteria ensured that comparison group residents would meet the same eligibility criteria as Initiative participants, such as being long-stay and enrolled in FFS Medicare. The facility- and resident-level criteria are discussed in further detail in ***Appendix I***. We used propensity score methods to exclude outliers; these outlier residents from the national comparison group had characteristics that were very different from those of Initiative-participating residents. 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 I***.

We conducted three sensitivity analyses. These are further described in ***Appendix I*** and results are described below and presented in more detail in ***Appendix W***. First, in addition to the national comparison group, we created a within-state reference group (WSRG) to capture possible state-

[21] See Appendix K in RTI International (2019).

level policy or other changes. We did not use a WSRG in our main analysis because ECCP and facility interviewees described positive spillover effects in the Initiative states to facilities not participating in the Initiative, particularly among facilities with the same corporate leadership. Second, we created two variations on our primary method for defining the baseline period to examine the impact of using a differential linear trend instead of assuming parallel trends. We first assumed parallel trends with FY 2016 as the baseline year, and next used the average of FY 2014–FY 2016 as the baseline. This latter approach risks overstating the impact of NFI 2 by crediting the Initiative with changes that took place during the baseline period. These two approaches were not used in the main analysis because we observed differing trends between the Initiative facilities and the national comparison group, especially for the C+P facilities that were implementing NFI 1 during the baseline period. Thus, the approach with the linear trend is likely more realistic and more conservative.

As described in ***Chapter I.1***, the C+P facilities employed a two-part intervention in which the clinical component began in FY 2012 as part of NFI 1 (formerly known as C-O), and the payment component was added in FY 2016 as part of NFI 2. The P-O facilities represent a new intervention that began in FY 2016.

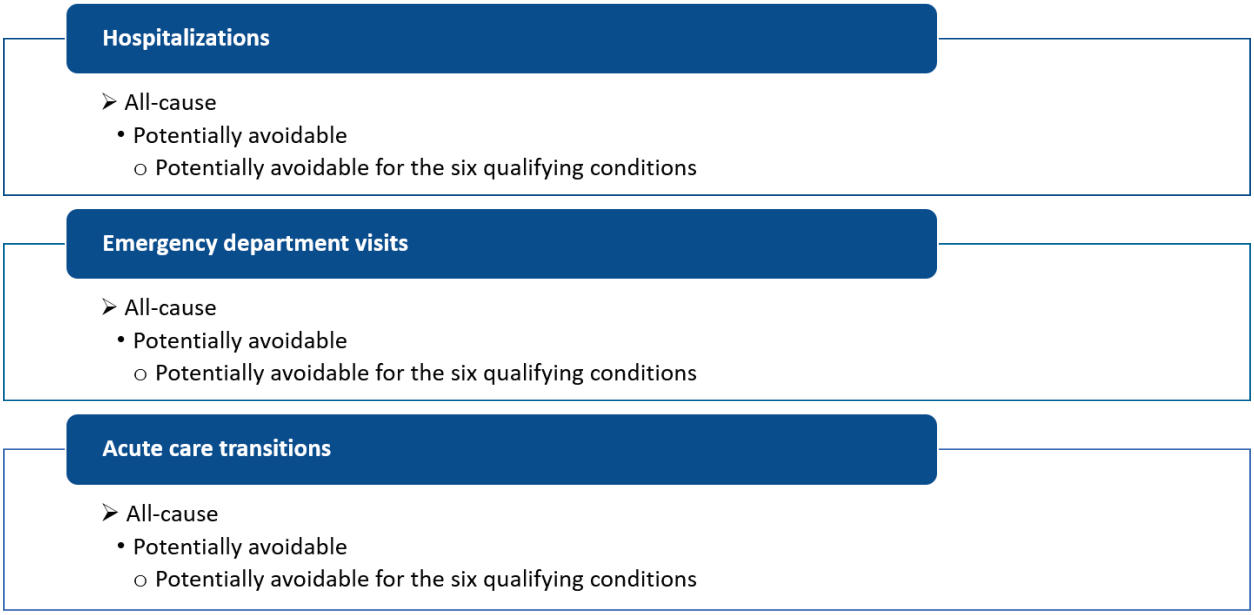
In this chapter and in subsequent chapters in ***Section II***, we focus on the impact of introducing payment in two intervention groups: one with ongoing existing clinical or educational interventions (C+P), and a new group without any clinical interventions (P-O). In contrast, in ***Section III*** we report our results from a separate set of analyses that examine the combined impact of NFI 1 and NFI 2 using a FY 2012 baseline to compare the different Initiative groups (NFI 1 C-O, NFI 2 C+P, and NFI 2 P-O) to each other. We will consider the relationship of these two sets of analyses in ***Sections III*** and ***V*** of this report and discuss any discrepant findings in ***Section V***.

We evaluate the Initiative impact on the probability of nine types of annual resident-level hospital-related utilization events and ten expenditure measures (the expenditures associated with each of the utilization events plus total Medicare expenditures) (***Figure II-8***). These measures are based on Medicare claims data from each resident's total eligible time in each year. The data sources and precise definitions of each of these nine events are presented in ***Appendix I***. The expenditure measures were adjusted to reflect a full year and measured in dollars per resident-year. Total Medicare expenditures included a wide range of Medicare-covered services (e.g., inpatient, skilled nursing care, Part D drugs, durable medical equipment, outpatient services). Hospital-related expenditures for any resident typically account for less than half of their total Medicare expenditures. In previous reports, we have also reported

Hospital-related expenditures for any resident typically account for less than half of their total Medicare expenditures.

results on the count of the different utilization events (RTI International, 2021). We report the results for the count of all utilization events for all ECCPs combined in ***Appendix U***.[22]

Figure II-8. Utilization outcomes



To predict these outcomes, we performed multivariate analyses that controlled for relevant resident-level data such as resident demographic characteristics, health and functional status, and participation in other CMS initiatives or demonstrations. We also controlled for facility characteristics, including for-profit status and whether the facility was hospital based. Detailed information on the covariates included in our models is presented in ***Appendix I,*** and descriptive statistics on the final set of model covariates are in ***Appendix T***.

Acute care transitions describe any transition from the nursing facility to the hospital, combining hospitalizations and ED visits with observation stays.

Below, we present estimates of the average Initiative effect on hospital-related utilization and expenditures, and on total Medicare expenditures, based on measuring the outcome for each resident's total eligible time during a year, for the first three years of NFI 2 (FY 2017, FY 2018, and FY 2019).

[22] 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.

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

- ***Appendices O*** through ***Q*** present descriptive results for the utilization and expenditure measures.
- ***Appendix T*** presents descriptive statistics for the covariates used in the multivariate models.
- ***Appendix W*** provides results from sensitivity analyses including:
  - Using a WSRG to capture the influence of possible state-level policy changes.
  - Using only one baseline year (FY 2016) and assuming parallel trends.
  - Using the average of all three baseline years (FY 2014–FY 2016) and assuming parallel trends.

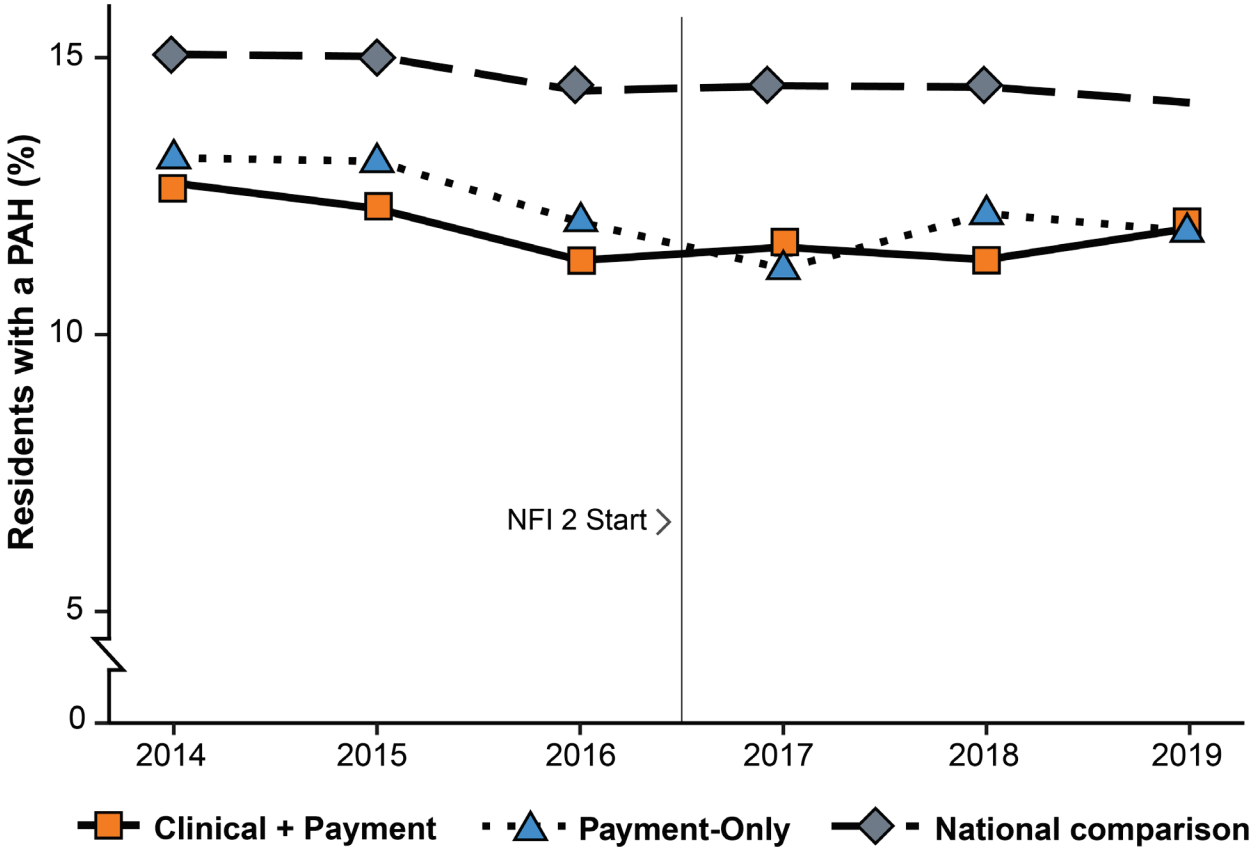
II.5.B. Patterns in Unadjusted Hospital-Related Utilization and Expenditures

Hospital-Related Utilization

We calculated unadjusted descriptive statistics of utilization and expenditure outcome measures among Initiative-eligible residents in participating ECCP facilities (i.e., C+P and P-O, separately) and the national comparison group for FY 2014–FY 2019. These patterns in unadjusted hospital-related utilization and expenditure measures provide context for the multivariate DD results below.

For most utilization measures, residents in both Initiative groups had lower hospital-related utilization (percentage of residents with a given outcome and rates per 1,000 resident-days) than residents in the national comparison group. Often, residents in the C+P facilities had marginally lower utilization than those in the P-O facilities. For example, in FY 2018, 14.38 percent of eligible residents in the national comparison group had a potentially avoidable hospitalization while only 11.12 percent and 11.99 percent of eligible residents in the C+P and P-O facilities had one, respectively. The unadjusted utilization percentages and rates are presented fully in ***Appendix O and P***, respectively. When examining patterns over time, utilization among eligible residents in both C+P and P-O facilities decreased in the baseline period (FY 2014–FY 2016) to a slightly greater degree than in the national comparison group. During the first three years of NFI 2 (FY 2017–FY 2019), however, utilization among eligible residents in either Initiative group did not decline, while utilization declined slightly in the national comparison group, suggesting that neither Initiative group reduced utilization relative to the national comparison. This indicates that while hospital-related utilization was lower among eligible residents in the Initiative facilities, NFI 2 does not appear to have reduced utilization relative to the national comparison group. ***Figure II-9*** illustrates the pattern over time for the percentage of residents with a potentially avoidable hospitalization.

Figure II-9. All ECCPs: Percentage of residents with a potentially avoidable hospitalization, FY 2014–FY 2019



PAH = potentially avoidable hospitalization.

SOURCE: RTI analysis of Medicare claims data.

Medicare Expenditures

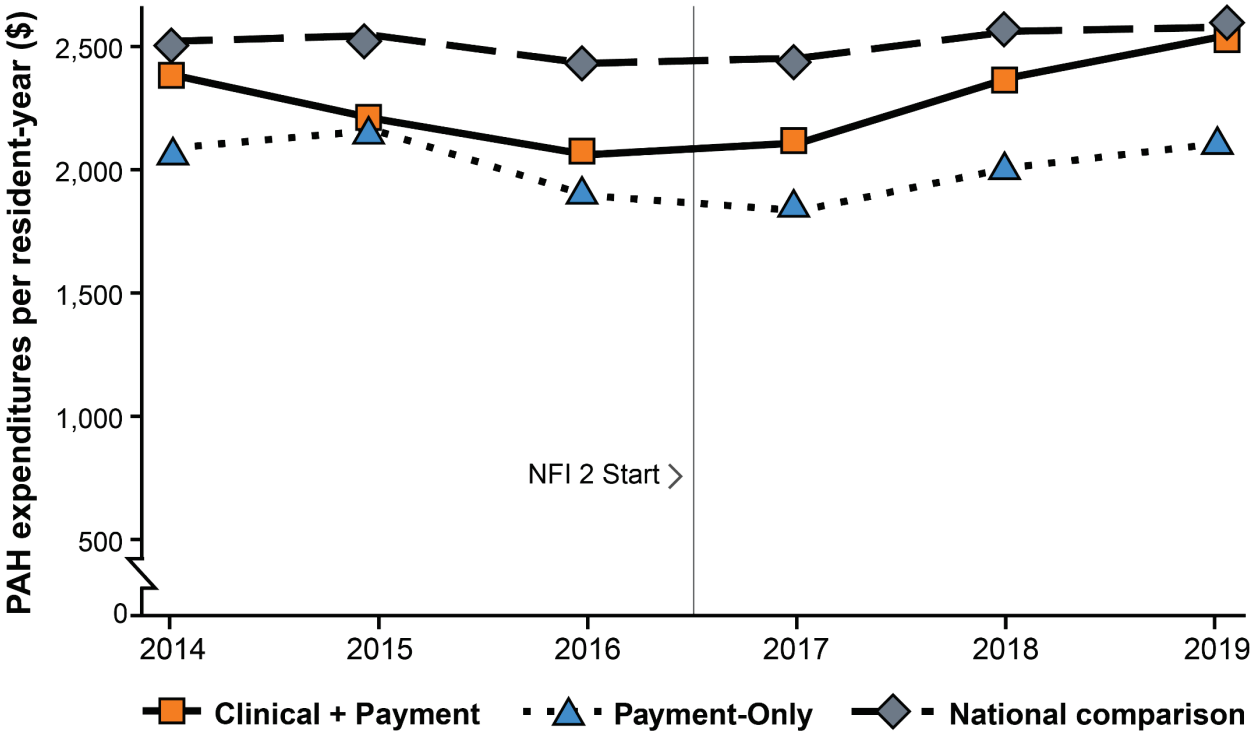
Average total Medicare, all-cause hospitalization, and all-cause acute transition expenditures per resident were highest for residents in C+P facilities, slightly lower in the national comparison group, and lowest in P-O facilities. For example, in FY 2018, the average cost for all-cause hospitalizations per resident-year was $9,564 for eligible residents in C+P facilities, $7,179 for eligible residents in P-O facilities, and $8,530 for residents in the national comparison group. For most other measures, expenditures were highest among residents in the national comparison group with no consistent relative pattern for residents in C+P and P-O facilities. These results are presented fully in ***Appendix Q***. ***Figure II-10*** below gives the example of expenditures for potentially avoidable hospitalization, where expenditures were highest in the national comparison group, followed by the C+P and then P-O facilities (in FY 2018 they were $2562, $2375, and $2010, respectively).

C+P & P-O

When examining patterns over time, for most measures, expenditures decreased for eligible residents in both C+P and P-O facilities in the baseline period (FY 2014–FY 2016) while expenditures increased or remained consistent for residents in the national comparison group

during this time. During NFI 2 (FY 2017–FY 2019), expenditures decreased in the first year of NFI 2 for eligible residents in P-O facilities, and then increased thereafter, while expenditures increased for residents in the national comparison group for the entire period. This suggests that NFI 2 may have reduced expenditures for residents in P-O facilities in the first year of NFI 2, but these reductions were not sustained. For eligible residents in C+P facilities, expenditures increased at a greater rate during NFI 2 than for residents in the national comparison group, suggesting that while NFI 1 may have reduced expenditures, no further improvements were made during NFI 2. ***Figure II-10*** displays this pattern for potentially avoidable hospitalization expenditures per resident-year over time for each group. Other expenditure measures had similar patterns, with no evidence that either of the Initiative groups reduced any expenditures relative to the national comparison group during NFI 2.

Figure II-10. All ECCPs: Potentially avoidable hospitalization expenditures per resident-year, FY 2014–FY 2019



PAH = potentially avoidable hospitalization.

SOURCE: RTI analysis of Medicare claims data.

II.5.C. Initiative Impact on Utilization and Expenditures Across All ECCPs

Initiative Impact Across FY 2017–FY 2019

Below we discuss our multivariate DD results estimating the impact of NFI 2 on utilization and expenditure outcomes across all ECCPs for FY 2017–FY 2019. We present these results separately for C+P and P-O facilities. As a complement to this section, we discussed the participating NFI 2 facility staff's perception of NFI 2's impact on avoidable hospitalizations in ***Chapter II.2.C***.

Figure II-11 displays the Initiative effect on utilization outcomes, including the predicted probability absent the Initiative, the Initiative effect, and the relative effect for C+P and P-O facilities separately. The 90 percent confidence interval (CI) is the bar spanning the point estimate of the effect for each outcome.

Our DD results show that over the course of the first three years of NFI 2, relative to the national comparison group, utilization of some hospital-related services (hospitalizations, ED visits, and ACTs) increased for eligible residents in the C+P facilities. Out of the nine probability of utilization measures evaluated, seven increased and two of these increases were statistically significant. We found statistically significant increases in the probability of all-cause ED visits (relative increase of 11.4 percent) and potentially avoidable ED visits (relative increase of 10.1 percent). As an illustration, for eligible residents in C+P facilities, the probability of experiencing a potentially avoidable ED visit in FY 2017, FY 2018, or FY 2019 increased by 1.0 percentage points from a predicted probability of 9.9 percent absent the Initiative. This corresponded to a 10.1 percent relative increase in their predicted probability, as shown in ***Figure II-11.***

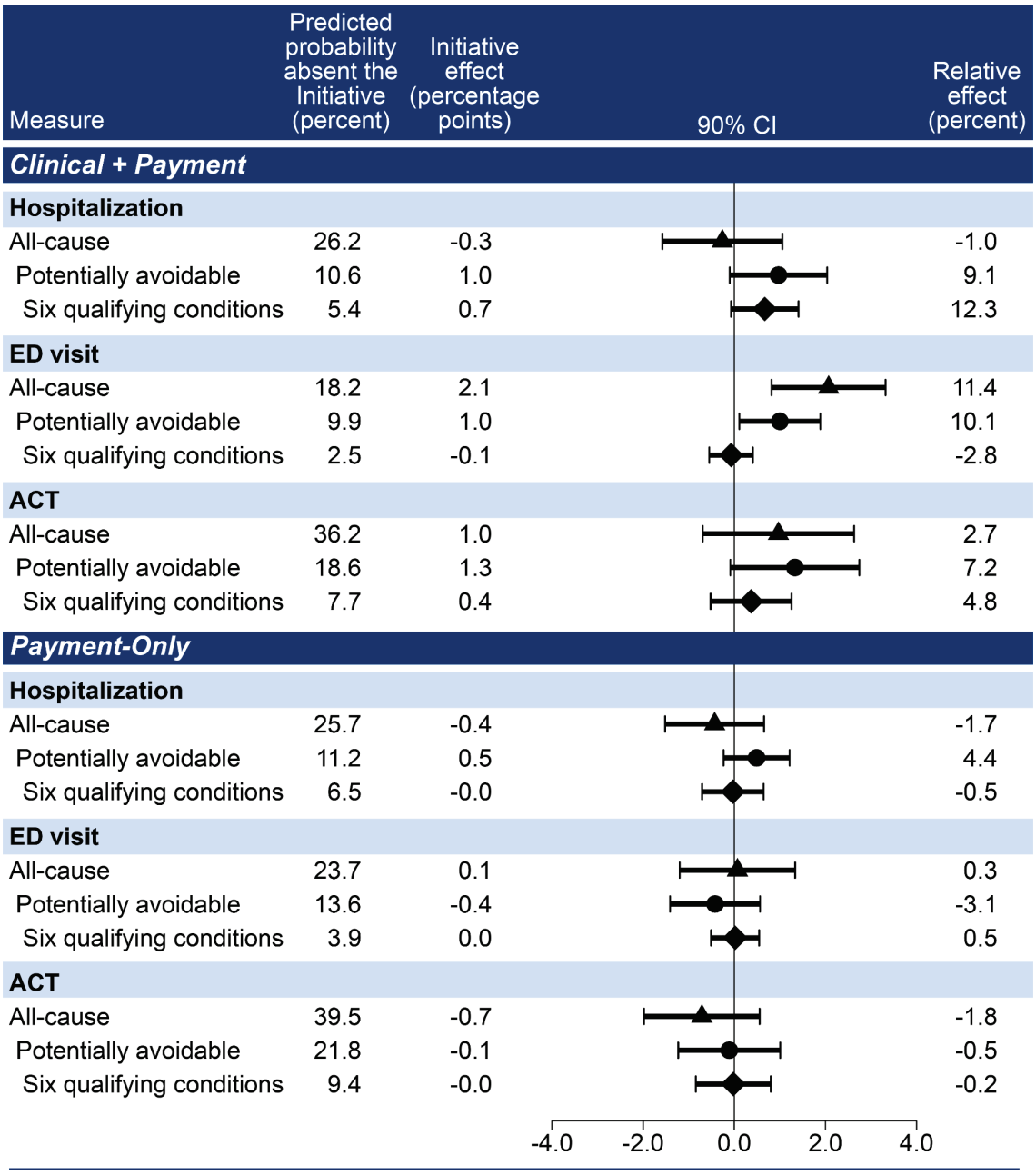
C+P

In contrast to unfavorable findings for the eligible residents in C+P facilities, for eligible residents in P-O facilities, we found no consistent evidence for favorable decreases or unfavorable increases in hospital-related utilization across the first three years of NFI 2. Out of the nine probability of utilization measures evaluated, six decreased relative to the national comparison group and three increased, although none of these increases or decreases were statistically significant (***Figure II-11***).

P-O

Figure II-11. All ECCPs: Initiative effect on hospital-related utilization, FY 2017–FY 2019

(probability of any utilization, per resident)



SOURCE: RTI analysis of Medicare claims data.

NOTES: 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) calculated using unrounded values; calculating the relative Initiative effect using the rounded values in this table will yield different values than those reported here. The magnitude of a relative Initiative effect could be large when the underlying denominator—the predicted level of the measure—is small. In such cases, the relative Initiative effect should be interpreted with caution. ED = emergency department; ACT = acute care transition. Acute care transitions include hospitalizations, emergency department visits, or observation stays.

Figure II-12 displays the Initiative effect on expenditure outcomes, including the predicted expenditure absent the Initiative, the Initiative effect in dollars, the 90 percent CI, and the relative effect for the C+P and P-O groups.

Similar to our utilization results, our DD analysis shows that during FY 2017–FY 2019, Medicare expenditures increased for eligible residents in C+P facilities relative to residents in the national comparison group. All ten expenditure measures increased, and five of these increases were statistically significant. We found statistically significant increases, relative to the national comparison group, in total Medicare expenditures (4 percent relative increase), expenditures associated with potentially avoidable hospitalizations (14.2 percent relative increase), and hospitalizations due to the six qualifying conditions (22.1 percent relative increase). The predicted expenditure for potentially avoidable hospitalizations was $2,259 per resident-year, absent the Initiative, and the Initiative was associated with an increase of $321 per resident-year, which is a relative increase of 14.2 percent. We also found statistically significant increases in expenditures associated with potentially avoidable ACTs (13.6 relative increase) and ACTs due to the six qualifying conditions (21.4 percent relative increase).

C+P

In comparison, findings indicate little to no Initiative effect on Medicare expenditures among residents in P-O facilities, relative to residents in the national comparison group. Of the ten expenditure measures evaluated for residents in P-O facilities, seven increased and three decreased. None of these increases or decreases were statistically significant.

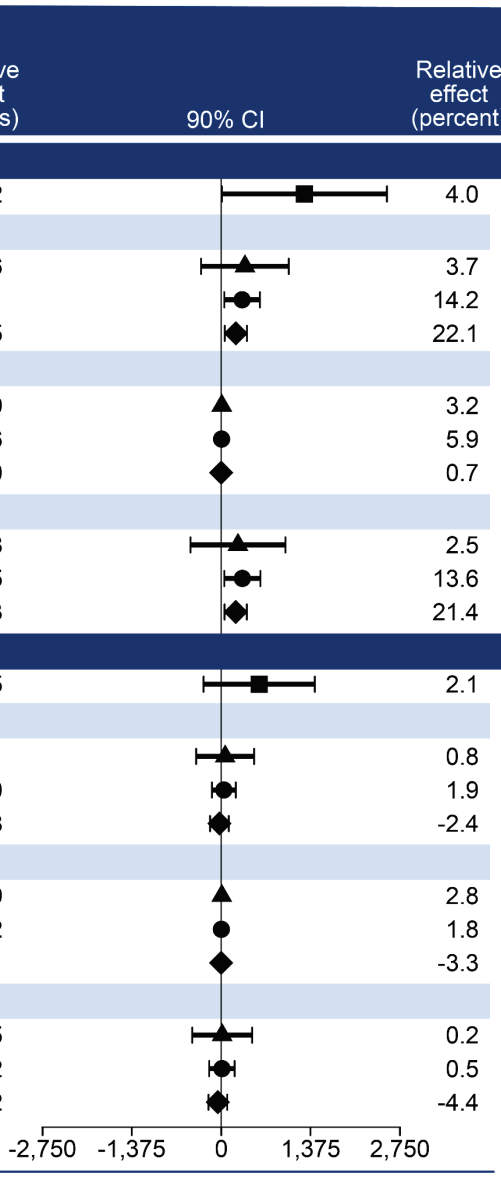
P-O

We note that for a given outcome (e.g., all-cause hospitalization), the utilization and corresponding expenditures usually, but not always, change in the same direction. If at least one of the effects is statistically significant, they almost always change in the same direction (see ***Appendix Table V-13***).

Figure II-12. All ECCPs: Initiative effect on Medicare expenditures, FY 2017–FY 2019

(dollars, per resident-year)

Measure	Predicted expenditure absent the Initiative (dollars)	Initiative effect (dollars)	Relative effect (percent)
Clinical + Payment			
Total Medicare expenditures	32,149	1,282	4.0
Hospitalization expenditures			
All-cause	9,878	366	3.7
Potentially avoidable	2,259	321	14.2
Six qualifying conditions	1,020	225	22.1
ED visit expenditures			
All-cause	264	9	3.2
Potentially avoidable	103	6	5.9
Six qualifying conditions	26	0	0.7
ACT expenditures			
All-cause	10,438	258	2.5
Potentially avoidable	2,388	325	13.6
Six qualifying conditions	1,044	223	21.4
Payment-Only			
Total Medicare expenditures	28,052	585	2.1
Hospitalization expenditures			
All-cause	7,825	61	0.8
Potentially avoidable	2,161	40	1.9
Six qualifying conditions	1,123	-28	-2.4
ED visit expenditures			
All-cause	313	9	2.8
Potentially avoidable	134	2	1.8
Six qualifying conditions	45	-1	-3.3
ACT expenditures			
All-cause	8,284	15	0.2
Potentially avoidable	2,339	12	0.5
Six qualifying conditions	1,189	-52	-4.4



SOURCE: RTI analysis of Medicare claims data.

NOTES: The *predicted expenditure absent the Initiative* is the mean of the predicted expenditures, for the resident 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) calculated using unrounded values; calculating the relative Initiative effect using the rounded values in this table will yield different values than those reported here. The magnitude of a relative Initiative effect could be large when the underlying denominator—the predicted level of the measure—is small. In such cases, the relative Initiative effect should be interpreted with caution. 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. Some Initiative effects are so small that point estimates and their associated confidence intervals are close to 0.

Sensitivity Analyses

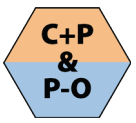
To confirm the robustness of our results, we also conducted three sensitivity analyses estimating the effect of the Initiative across FY 2017–FY 2019. We interpret the sensitivity analysis results below and provide full results in ***Appendix W***.

As explained above, we conducted a sensitivity analysis using a WSRG instead of a national comparison group to capture possible state-level policy or other changes. In the WSRG sensitivity analysis, effect patterns were not as unfavorable compared to the main analysis for residents in both C+P and P-O facilities, which is contrary to what we expected based on the reported effects of spillover. We would have expected the WSRG sensitivity analysis to be less favorable than the main analysis if Initiative facilities were spreading NFI practices of reducing PAHs to other non-Initiative facilities in the same state.

Sensitivity analyses conducted:

- Using the within state reference group (WSRG) as the comparison group
- Assuming parallel trends with a FY 2016 baseline
- Assuming parallel trends with a FY 2014–FY 2016 baseline

We conducted two additional sensitivity analyses that assumed parallel trends instead of incorporating different linear trends in the Initiative and comparison groups. As explained above, we performed these analyses as a way of examining the importance of using the differential linear trend. In one sensitivity analysis, we used FY 2016 as the baseline, and in the other we used the average of FY 2014–FY 2016 as the baseline. In the sensitivity analysis using FY 2016 as the baseline year for comparison, effect patterns were slightly better for C+P facilities, although not favorable, and very similar to the patterns in the main analysis for P-O facilities.



In the third sensitivity analysis, which used the average of FY 2014–FY 2016 as the baseline, the effect patterns turned favorable in both groups. In this sensitivity analysis alone, the results for the P-O facilities were strongly favorable, with statistically significant decreases in six of the probability of utilization measures and four of the expenditure measures. This appears to be driven by the inclusion of FY 2015 as part of the baseline period when hospitalization rates and Medicare expenditures were generally higher in P-O facilities compared to other years (see descriptive results in ***Appendices O*** through ***Q***). Given that this analysis was the only one that indicated favorable reductions in the P-O facilities and that we have an explanation for why this analysis produced different results than the other analyses, we find no clear evidence of reductions in utilization or expenditures. For C+P facilities, the results of this sensitivity analysis also showed a consistent pattern of decreases with a few that were statistically significant. In this case, the results appear to be influenced by higher

Based on a combination of main and sensitivity analyses, there is no clear evidence of reductions in utilization or expenditures in either Initiative group.

hospital utilization in FY 2014–FY 2015, followed by a large drop in FY 2016 and relative stability during FY 2017–FY 2019 in C+P facilities. This drop between FY 2015 and FY 2016 predates the start of NFI 2 in October 2016, and impacts the NFI 2 evaluation results when using FY 2014–FY 2016 as the baseline. We therefore also find no clear evidence of reductions in utilization or expenditures for eligible residents in C+P facilities.

C+P & P-O

In summary, we do not find clear evidence based on our findings from FY 2017–FY 2019, that either C+P facilities or P-O facilities attained NFI 2's goal of reducing potentially avoidable hospitalizations and the costs associated with them. Furthermore, our results suggest that NFI 2 could have unfavorably increased some measures of hospital-related utilization and their costs for eligible residents in C+P facilities. We provide additional discussion of this point in ***Chapter V.1*** and argue that the evidence for unfavorable increases is not robust to model specification.

Initiative Impact for FY 2017, FY 2018, and FY 2019

In addition to estimating the impact of the different Initiative groups pooled across FY 2017–FY 2019 on the utilization and expenditure measures, we also examined the impact of the different Initiative groups in each of these years individually (see ***Appendix U*** for full results). Our DD results showed that for each of these years, the Initiative effect on the probability of, and expenditures related to, all-cause hospitalizations, ED visits, and ACTs remained relatively consistent across years for eligible residents in C+P facilities. However, the Initiative effect on utilization and expenditures outcomes became increasingly unfavorable over time for potentially avoidable and six qualifying conditions measures. Many of these measures increased relative to the national comparison group in all three years, but the increases were most likely to be statistically significant in FY 2019. For example, in FY 2018, there was a non-significant increase in the probability of a potentially avoidable hospitalization (relative increase of 8.1 percent; p-value of 0.191), and in FY 2019 there was a statistically significant increase in this measure (relative increase of 15.3 percent; p-value of 0.044).

C+P

Among eligible residents in P-O facilities, our DD results for FY 2017, FY 2018, and FY 2019 individually showed that for almost all measures the Initiative effect was in the favorable direction in FY 2017, and then over time the Initiative effect became less favorable. Importantly, over all the individual year effects for all the different utilization and expenditure measures (57 in total), almost all the effects were not statistically significant. There were only two statistically significant increases (one for FY 2018 and one for FY 2019) and one statistically significant decrease in FY 2017, relative to the national comparison group for residents in P-O facilities.

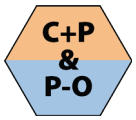
P-O

When looking at the Initiative effect year by year, there remains no strong evidence that NFI 2 reduced hospital-related utilization or expenditures for residents in either Initiative group.

Similar to the pooled results above, when looking at the Initiative effect on utilization and expenditure outcomes year by year, there remains no clear evidence that NFI 2 reduced hospital-related utilization or expenditures for residents in either Initiative group.

II.5.D. Initiative Impact on Utilization and Expenditures for Individual ECCPs

In addition to examining the overall impact of NFI 2 on utilization and expenditure outcomes across all ECCPs combined, we also examined NFI 2's impact for each ECCP individually. This individual analysis of NFI 2's impact for each ECCP is important because each implemented the Initiative differently, as described in ***Chapter II.1.C***. We present summaries of estimated FY 2017–FY 2019 relative Initiative effects on the probability of any hospital-related utilization and Medicare expenditures separately by ECCP for eligible residents in C+P and P-O facilities, respectively, relative to the national comparison group in ***Table II-5*** and ***Table II-6***. ECCP by ECCP summaries are presented in ***Figure II-13 through Figure II-18.***



Our DD results for the individual ECCPs vary greatly. Among the C+P facilities, ATOP2, MOQI, OPTIMISTIC, and RAVEN all had at least two statistically significant unfavorable increases among all the utilization and expenditure measures, while AQAF and NY-RAH had no statistically significant changes in any of the utilization or expenditure measures. Among the P-O facilities, AQAF, ATOP2, MOQI, and OPTIMISTIC had at least one statistically significant unfavorable increase among all the utilization and expenditure measures. ATOP2 and RAVEN both had at least two statistically significant favorable decreases among all the utilization or expenditure measures. NY-RAH had no statistically significant changes in any of the measures. Although some interviewees believed NFI 2 might have had an effect on reducing hospitalizations in their facilities, most were unsure whether these findings were attributable to the Initiative. These analyses of hospitalization rates confirm that NFI 2 did not reduce avoidable hospitalizations in participating nursing facilities.

Table II-5. Clinical + Payment: Relative Initiative effect on hospital-related utilization and expenditures, FY 2017–FY 2019

Measure	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	−9.6	−7.2	+14.0**	−1.3	−0.7	7.2
Potentially avoidable	3.9	+27.7***	15.6	0.5	0.7	+31.3*
Six qualifying conditions	11.7	+27.6**	21.8	−14.0	4.3	+76.4***
Any emergency department visit						
All-cause	8.8	12.8	+28.2**	10.1	−6.7	+24.8**
Potentially avoidable	5.9	20.6	+27.2*	8.0	−1.4	18.2
Six qualifying conditions	−21.3	−21.1	+66.2*	−7.9	8.5	19.1
Any acute care transition						
All-cause	−1.6	−2.7	+16.7***	3.0	−5.9	11.0
Potentially avoidable	2.1	16.2	18.0	1.6	−0.2	22.1
Six qualifying conditions	−3.4	8.2	+34.8*	−14.3	−1.5	+46.5**
Expenditures per resident-year						
Total Medicare expenditures	−0.4	1.3	+8.7**	4.4	−1.2	+9.4*
Hospitalization expenditures						
All-cause	−2.3	−15.5	+19.5***	2.4	1.7	+16.9*
Potentially avoidable	5.8	+29.3*	3.5	14.3	1.1	+47.2**
Six qualifying conditions	19.4	40.7	−13.6	1.5	+37.9*	+109.2***
Emergency department visit expenditures						
All-cause	5.2	9.9	14.6	−4.7	−13.8	26.8
Potentially avoidable	10.5	19.3	21.2	0.3	−12.3	5.6
Six qualifying conditions	−5.1	81.4	20.3	−27.3	24.4	−2.3
Acute care transition expenditures						
All-cause	−5.1	−14.8	+20.1**	1.8	−0.8	15.5
Potentially avoidable	5.2	28.5	8.2	15.6	−2.7	+41.3**
Six qualifying conditions	20.2	33.1	−10.8	−0.5	+35.8*	+101.2***

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

SOURCE: RTI analysis of Medicare claims data.

NOTES: ATOP2 consists of a C+P group in Nevada and P-O 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. The magnitude of a relative Initiative effect could be large when the underlying denominator—the predicted level of the measure— is small. In such cases, the relative Initiative effect should be interpreted with caution. 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.

Table II-6. Payment-Only: Relative Initiative effect on hospital-related utilization and expenditures, FY 2017–FY 2019

Measure	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	2.9	3.7	0.8	−5.6	0.1	−6.2
Potentially avoidable	+21.7*	1.7	−1.5	7.0	3.8	−9.7
Six qualifying conditions	14.5	−8.6	−7.6	−0.9	−1.5	−3.1
Any emergency department visit						
All-cause	1.6	−4.2	6.7	−3.4	8.8	−10.2
Potentially avoidable	−3.3	−6.5	4.8	−8.0	−2.1	−4.8
Six qualifying conditions	−0.9	−28.1**	+31.7*	0.4	1.9	−10.5
Any acute care transition						
All-cause	−0.8	−1.1	5.0	−4.7	0.7	−8.6
Potentially avoidable	4.3	−4.8	4.3	−0.7	0.2	−11.2
Six qualifying conditions	7.8	−18.9	4.3	0.8	4.5	−8.5
Expenditures per resident-year						
Total Medicare expenditures	4.0	+13.6**	3.8	4.4	−4.0	−6.5
Hospitalization expenditures						
All-cause	5.8	2.1	5.1	4.5	−4.0	−13.8
Potentially avoidable	+23.8*	−10.7	11.9	5.0	−6.6	−23.0*
Six qualifying conditions	+37.6**	−18.8	−7.0	6.3	−21.8	−19.7
Emergency department visit expenditures						
All-cause	−1.9	−17.4	10.3	5.3	+27.6**	−15.4
Potentially avoidable	8.9	−36.2**	9.5	−2.8	+24.9*	7.2
Six qualifying conditions	−14.9	−41.2**	21.3	11.8	3.2	8.2
Acute care transition expenditures						
All-cause	5.9	−1.0	4.6	3.5	−4.1	−14.0
Potentially avoidable	+23.7**	−16.7	10.1	3.3	−3.7	−24.9*
Six qualifying conditions	+36.6**	−23.1	−8.8	6.0	−22.2	−21.4

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

SOURCE: RTI analysis of Medicare claims data.

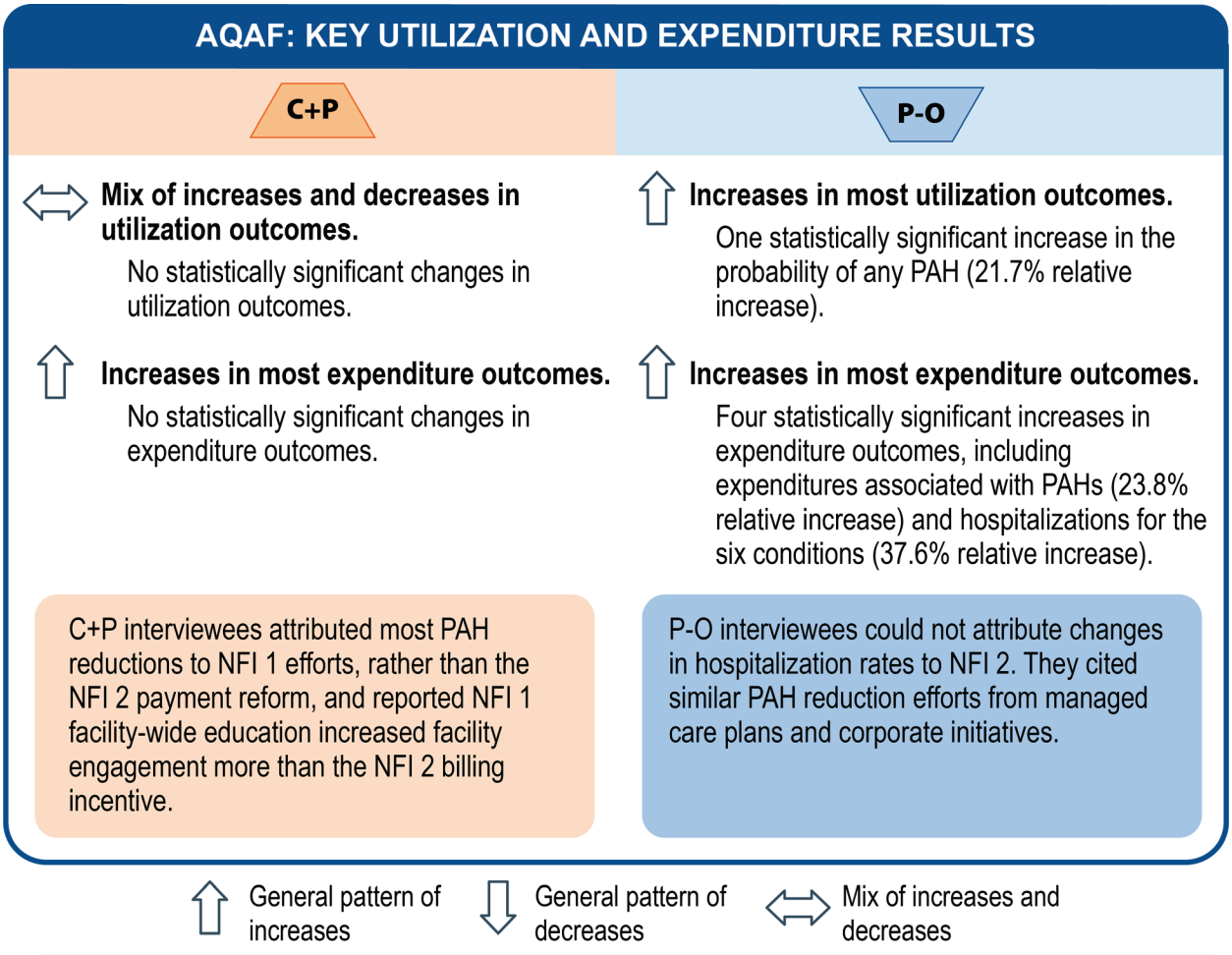
NOTES: ATOP2 consists of a C+P group in Nevada and P-O group in Colorado.

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. The magnitude of a relative Initiative effect could be large when the underlying denominator—the predicted level of the measure— is small. In such cases, the relative Initiative effect should be interpreted with caution. 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.

Figure II-13 summarizes the utilization and expenditure results for AQAF. Please see ***Appendix V***, ***Tables V-1*** and ***V-2*** for more detailed results.

Figure II-13. AQAF: Summary of utilization and expenditure results, FY 2017–FY 2019

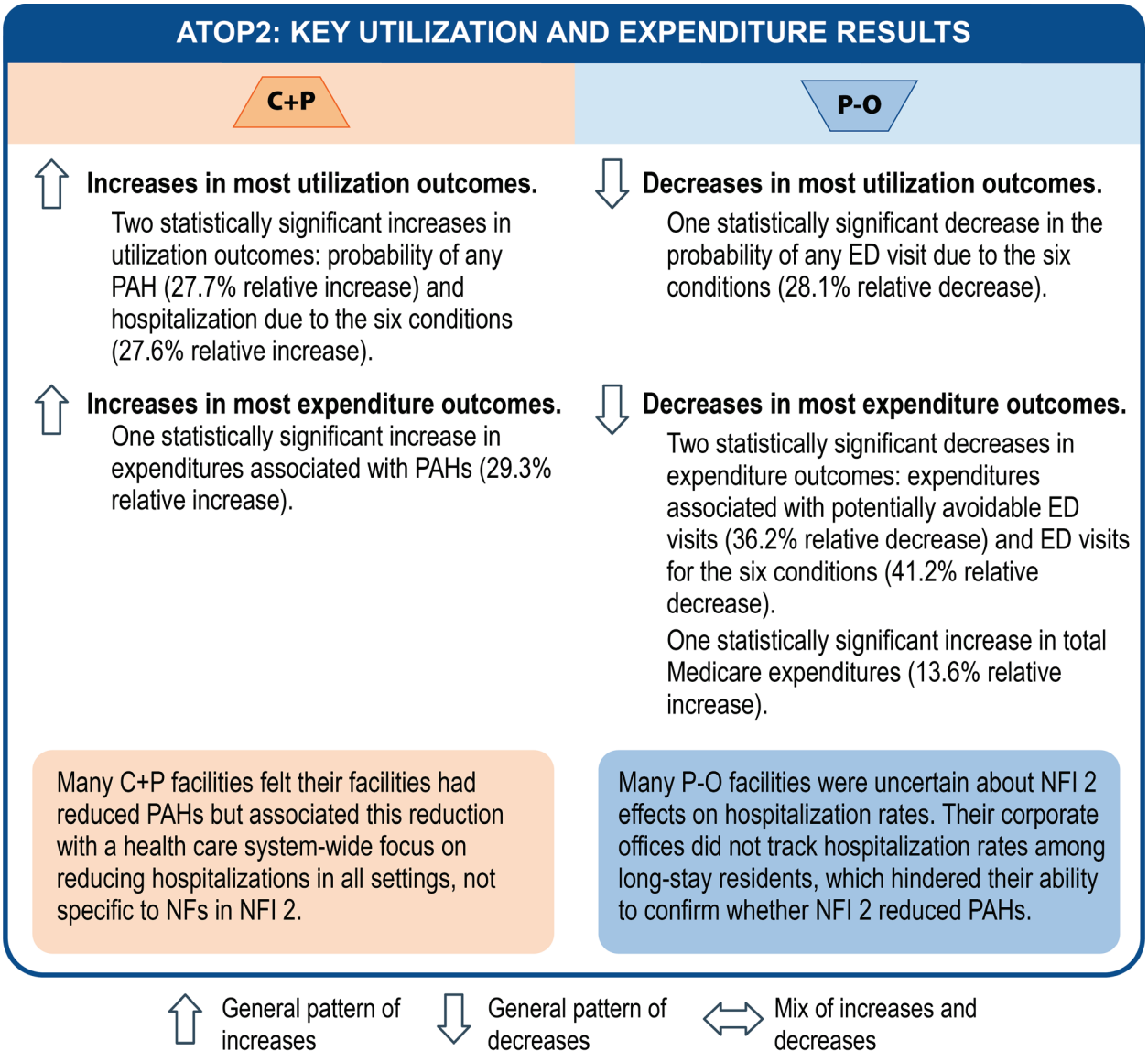


SOURCE: RTI analysis of Medicare claims data.

NOTE: The magnitude of a relative Initiative effect could be large when the underlying denominator—the predicted level of the measure— is small. In such cases, the relative Initiative effect should be interpreted with caution.

Figure II-14 summarizes the utilization and expenditure results for ATOP2. Please see ***Appendix V, Tables V-3*** and ***V-4*** for more detailed results.

Figure II-14. ATOP2: Summary of utilization and expenditure results, FY 2017–FY 2019

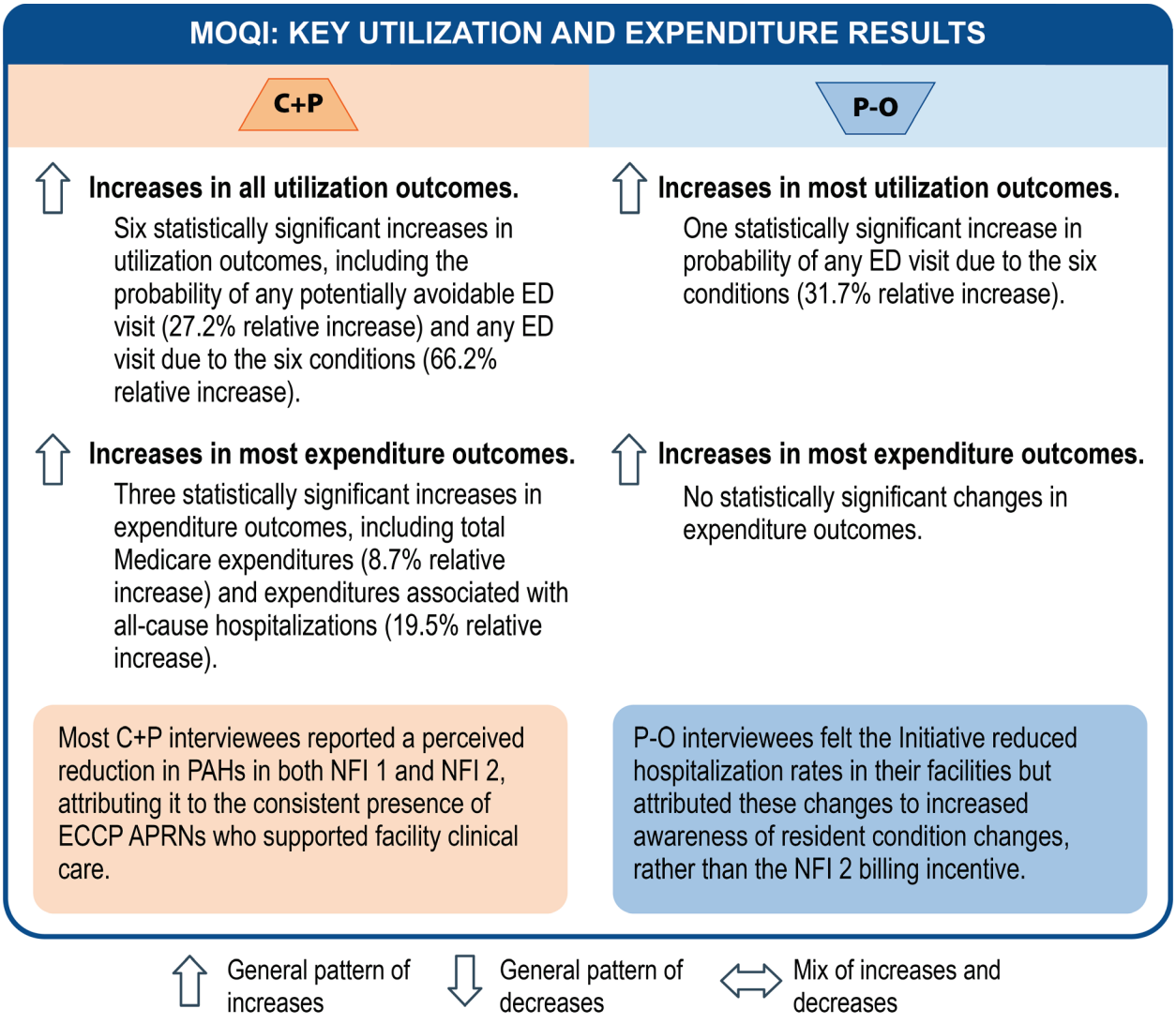


SOURCE: RTI analysis of Medicare claims data.

NOTE: The magnitude of a relative Initiative effect could be large when the underlying denominator—the predicted level of the measure— is small. In such cases, the relative Initiative effect should be interpreted with caution.

Figure II-15 summarizes the utilization and expenditure results for MOQI. Please see ***Appendix V, Tables V-5*** and ***V-6*** for more detailed results.

Figure II-15. MOQI: Summary of utilization and expenditure results, FY 2017–FY 2019

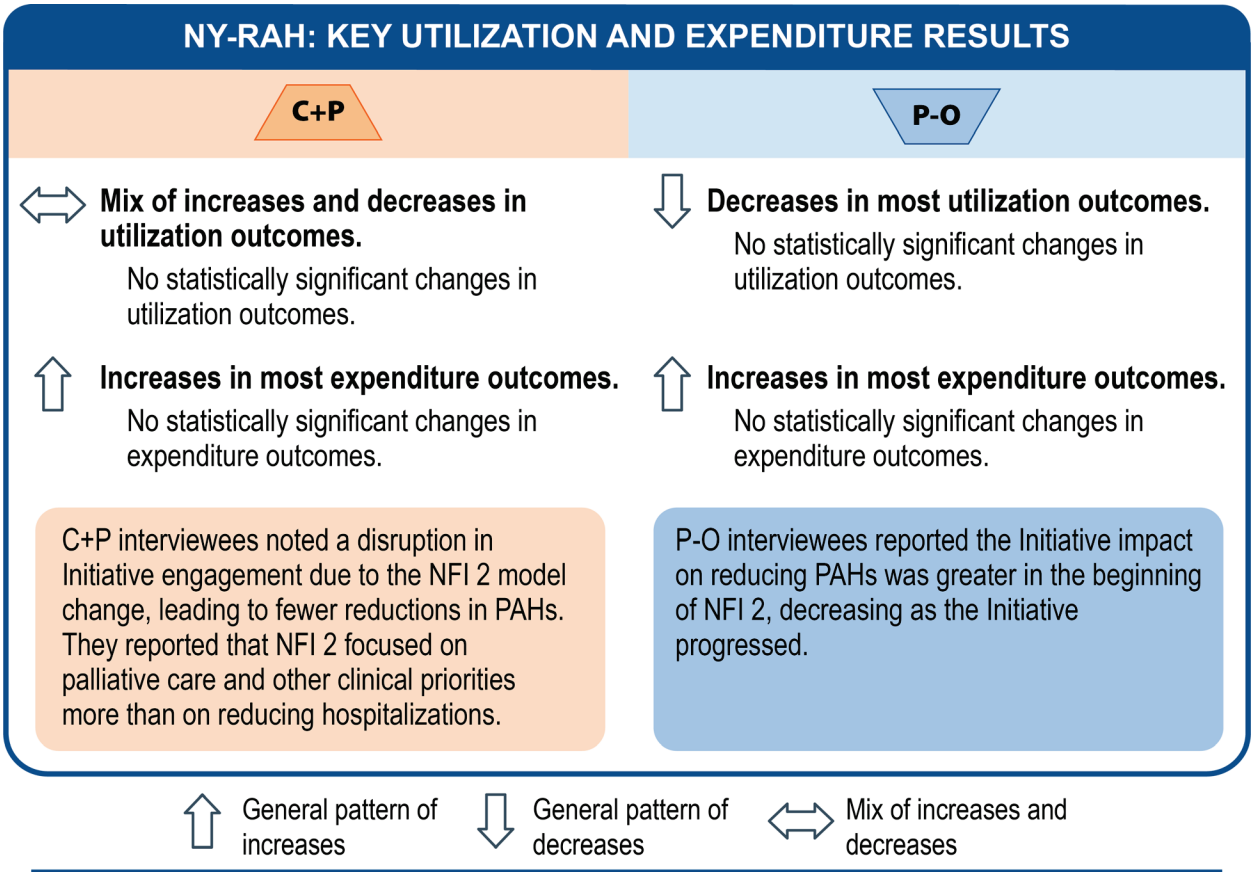


SOURCE: RTI analysis of Medicare claims data.

NOTE: The magnitude of a relative Initiative effect could be large when the underlying denominator—the predicted level of the measure— is small. In such cases, the relative Initiative effect should be interpreted with caution.

Figure II-16 summarizes the utilization and expenditure results for NY-RAH. Please see ***Appendix V, Tables V-7*** and ***V-8*** for more detailed results.

Figure II-16. NY-RAH: Summary of utilization and expenditure results, FY 2017–FY 2019

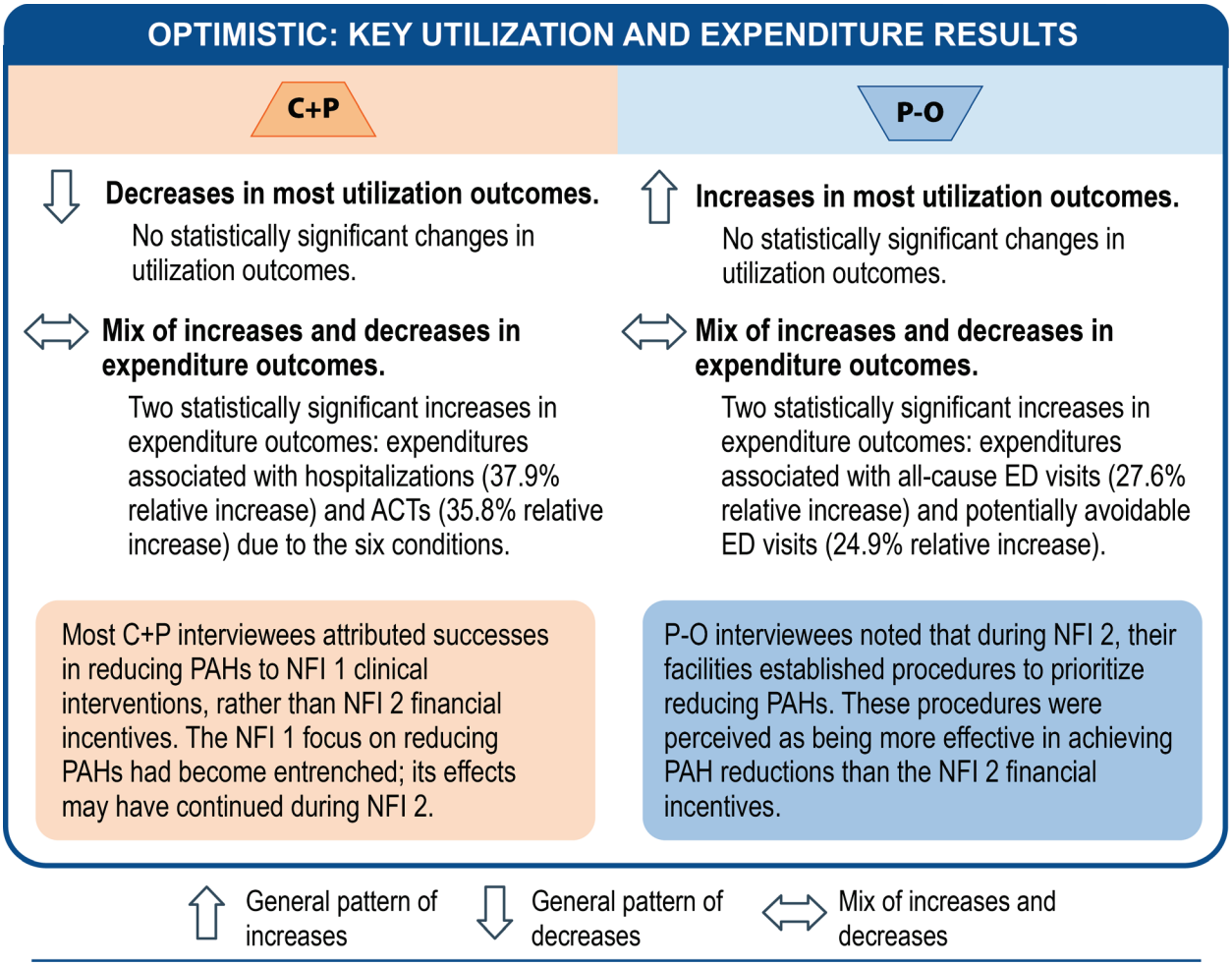


SOURCE: RTI analysis of Medicare claims data.

NOTE: The magnitude of a relative Initiative effect could be large when the underlying denominator—the predicted level of the measure— is small. In such cases, the relative Initiative effect should be interpreted with caution.

Figure II-17 summarizes the utilization and expenditure results for OPTIMISTIC. Please see ***Appendix V, Tables V-9*** and ***V-10*** for more detailed results.

Figure II-17. OPTIMISTIC: Summary of utilization and expenditure results, FY 2017–FY 2019

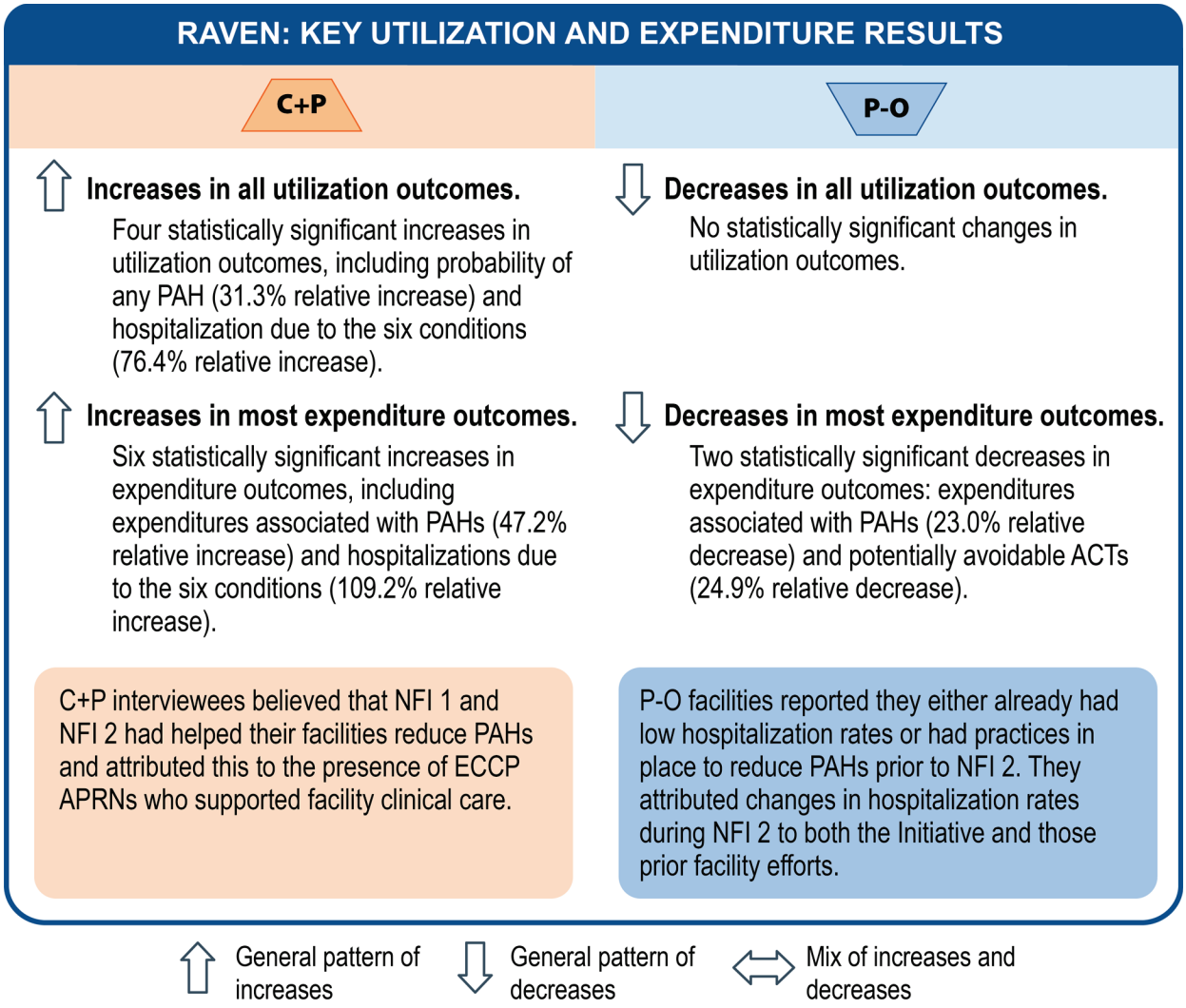


SOURCE: RTI analysis of Medicare claims data.

NOTE: The magnitude of a relative Initiative effect could be large when the underlying denominator—the predicted level of the measure— is small. In such cases, the relative Initiative effect should be interpreted with caution.

Figure II-18 summarizes the utilization and expenditure results for RAVEN. Please see ***Appendix V, Tables V-11*** and ***V-12*** for more detailed results.

Figure II-18. RAVEN: Summary of utilization and expenditure results, FY 2017–FY 2019



SOURCE: RTI analysis of Medicare claims data.

NOTE: The magnitude of a relative Initiative effect could be large when the underlying denominator—the predicted level of the measure— is small. In such cases, the relative Initiative effect should be interpreted with caution.

II.5.E. Initiative Impact on Aggregate Medicare Expenditures

A key question in evaluating the impact of NFI 2 is understanding its estimated effect on the total Medicare expenditures for the Initiative-eligible population in ECCP facilities. Earlier in this chapter, we presented DD estimates of the Initiative effect on multiple expenditure measures per resident-year across FY 2017–FY 2019. To accurately

There is no clear evidence that any of the individual ECCPs attained NFI 2's goal of reducing avoidable hospitalizations.

estimate the total impact on the cost of NFI 2, multiple adjustments were made to these DD estimates. First, we multiplied the estimated effects by the total number of eligible residents in each ECCP across FY 2017–FY 2019 to derive an aggregate estimate of NFI 2's effect on total Medicare expenditures. Second, since our DD estimates are annualized, we multiplied this aggregate annualized estimate by the proportion of the year during which the average resident was eligible for and participated in the Initiative to estimate actual dollar amounts instead of annualized dollars. These adjustments gave us the Initiative's effect on gross spending (Medicare spending on services).

We then made two adjustments to obtain the net impact. First, we accounted for grants awarded to ECCPs to implement the Initiative. For C+P facilities, grant payments were made for ECCP clinical components as well as the payment component of NFI 2. Since our goal in this analysis is to estimate the impact of the payment intervention in a group of facilities with an existing clinical intervention, we only want to consider the costs for the payment component as part of the cost of the intervention. To estimate grant amounts for the payment component of the intervention, we calculated the average amount paid per eligible resident in the P-O facilities and multiplied this amount by the number of eligible residents in C+P facilities.[23] Second, we subtracted recoupments from ECCPs following CMS audits of facility and practitioner billing. In accounting for recoupment payments, we count the total amount of recoupment reported to RTI by CMS in October 2021 but we note the following considerations: (1) we are unsure if any of the recoupment amounts were already factored into our expenditure data, a matter that depends on the method of recoupment and the time of recoupment relative to the expenditure information in our data; (2) we may have already accounted for recoupments related to facilities not properly determining eligibility by including in the analysis only residents we deemed eligible based on the definition of Initiative eligibility we applied; and (3) there will likely be more recoupments (and thus further reductions to total costs) for FY 2019 for which we cannot account. Based on the first two considerations we might be overcounting the amount of recoupment and based on the third consideration we might be undercounting it.

> Aggregate analysis of expenditures indicates that neither C+P facilities nor P-O facilities yielded savings for the Medicare Program.

C+P & P-O

Table II-7 presents estimates of the Initiative effects on gross and net Medicare expenditures, by ECCP and Initiative group (the estimated effects for individual ECCPs are based on the results presented in ***Appendix V***). Our estimates show that, overall, the Initiative had an unfavorable impact on Medicare expenditures. There was a statistically significant unfavorable increase in expenditures relative to the comparison group for eligible residents in C+P facilities across all ECCPs combined. For P-O facilities, this unfavorable Initiative effect was not statistically significant,

[23] The grants awarded to the ECCPs for implementation of NFI2 interventions were provided by section 1115A of the Social Security Act, added by section 3021 of the Patient Protection and Affordable Care Act (P.L. 111-148), through cooperative agreements with the Centers for Medicare & Medicaid Services.

prior to the addition of Medicare grant amounts to ECCPs, but was statistically significant afterwards. Additional results for specific categories of Medicare expenditures are presented in ***Appendix BB***.

Table II-7. Initiative effect on aggregate Medicare expenditures, FY 2017–FY 2019

State	Number of Eligible Residents	Mean Exposure Days	Initiative Effect on Total Medicare Expenditures per Resident ($)			Initiative Effect on Aggregate Medicare Expenditures ($million)			Total NFI 2 Grants to ECCPs ($million)	Total NFI2 Recoupments to CMS ($million)	Net Cost to Medicare of NFI 2 Initiative ($million)		
			Estimate	90% CI		Estimate	90% CI				Estimate	90% CI	
Clinical + Payment													
AQAF (AL)	5,100	242	−115	−2,126	1,897	−0.388	−7.188	6.413	0.815	0.095	0.333	−6.467	7.134
ATOP2 (NV)	4,986	249	455	−4,039	4,949	1.576	−13.993	17.145	1.794	0.107	3.620	−11.949	19.189
MOQI (MO)	4,103	254	2,226	521	3,930	5.870	1.374	10.366	1.485	0.082	6.740	2.243	11.236
NY-RAH (NY)	10,333	235	−408	−3,413	2,597	−2.879	−24.060	18.303	2.296	0.308	−0.892	−22.073	20.290
OPTIMISTIC (IN)	3,206	228	1,763	−1,832	5,359	3.528	−3.665	10.721	0.672	0.111	4.292	−2.901	11.485
RAVEN (PA)	4,419	272	2,332	226	4,437	7.675	0.744	14.607	1.268	0.108	8.835	1.904	15.766
All	32,147	243	1,282	11	2,552	27.379	0.233	54.526	8.335	0.811	34.903	7.756	62.050
Payment-Only													
AQAF (AL)	4,284	254	1,035	−1,108	3,177	3.080	−3.296	9.455	0.685	0.039	3.726	−2.650	10.101
ATOP2 (CO)	4,483	241	2,674	813	4,535	7.912	2.406	13.418	1.933	0.119	9.726	4.220	15.232
MOQI (MO)	5,343	254	963	−403	2,329	3.587	−1.501	8.674	1.239	0.075	4.751	−0.336	9.839
NY-RAH (NY)	11,183	246	1,405	−58	2,867	10.595	−0.438	21.629	2.484	0.154	12.925	1.892	23.959
OPTIMISTIC (IN)	5,911	240	−1,166	−2,975	642	−4.531	−11.557	2.495	1.613	0.100	−3.018	−10.044	4.008
RAVEN (PA)	4,875	254	−2,001	−5,245	1,243	−6.791	−17.800	4.218	1.399	0.085	−5.478	−16.487	5.531
All	36,079	248	585	−271	1,441	14.322	−6.632	35.276	9.354	0.573	23.103	2.149	44.057

SOURCE: CMS Grant Awards to ECCPs and RTI analysis of Medicare claims data.

NOTES: ATOP2 consists of a C+P group in Nevada and P-O group in Colorado.

Number of ECCP Participants, 2017–2019 is the number of residents eligible for expenditure calculations; due to differing exclusions these numbers may differ slightly from other eligibility numbers presented in this report.

Resident exposure days is truncated for residents with less than 30 days of exposures. Mean exposure days is the mean of these truncated values

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

Chapter II.6 Medicaid Expenditures for Dual Initiative-Eligible Residents

Key Takeaways

Medicaid expenditures between FY 2016 and FY 2018 increased among both Initiative-eligible residents and the within-state reference group. There were no substantive differences in Medicaid spending among ECCP states, facility groups, or compared to the within-state reference group; however, data limitations prevent any attribution of changes in Medicaid expenditures to the Initiative.

II.6.A. Overview and Methods

The primary goals of NFI 2 were to reduce potentially avoidable hospitalizations among nursing facility residents and reduce associated Medicare expenditures. ***Section II.5*** of this report provided estimates of the NFI 2 impact on Medicare expenditures. In this section, we report on Medicaid expenditures for Initiative-eligible residents who are dually eligible for Medicare and Medicaid. Based on results presented in ***Appendix T***, slightly above 80 percent of the study population is dually eligible. We use FY 2016–FY 2018 data, the most recent Medicaid data available.

This analysis seeks to answer the following research question:

- Was the Initiative associated with changes in Medicaid expenditures for Initiative-eligible residents between FY 2016 and FY 2018?

Several factors were important in examining the role of the Initiative on Medicaid expenditures. First, for dual-eligible beneficiaries, Medicaid was responsible for paying Medicare deductibles and coinsurance. Thus, reductions in hospitalizations, observation stays, or ED visits may have reduced Medicaid acute care transition (ACT) expenditures only by reducing Medicare deductibles and coinsurance payments. States vary in cost sharing payment, with some not paying if Medicare had already paid more than the Medicaid program would pay. Reducing hospital use would not affect Medicaid spending in such cases.

Second, some states had bed-hold policies under which Medicaid continues to pay the nursing facility for "holding" the bed while a resident was hospitalized and until the resident returned to the nursing facility. For example, among ECCP states, Alabama, Missouri, New York, and Pennsylvania paid nursing facilities to hold beds for varying amounts of time. Therefore, if NFI 2 succeeded in treating some residents in the nursing facility who would otherwise have been hospitalized, then the impact on Medicaid expenditures would depend on the nature of the bed-hold policy for hospitalizations. For states without a bed-hold policy for hospitalization, any days residents were in the facility for acute care and not in the hospital would result in an increase in Medicaid long-term care spending because the resident remained in the nursing facility. For states with a bed-hold policy, Medicaid would have paid the nursing facility for some or all the hospital days (in full or partial per diem rates); therefore, any impact on Medicaid expenditures would be diminished. Bed-hold policies differ across the ECCP states, both in the number of hospitalization days for bed-hold payment and the amount paid (see ***Appendix N.1*** for a summary of policy details for each state).

We used the FY 2016–FY 2018 Transformed Medicaid Statistical Information System (T-MSIS) Analytic Files (TAF) from CMS's Chronic Conditions Warehouse in February 2021.[24] Medicaid is a state-administered program, and each state submits T-MSIS data files to CMS that include enrollment, service utilization, and payment data. CMS, through a contractor, examined the quality of the data from each state. Overall, data for FY 2016–FY 2018 had low quality concerns suggesting that data quality could be adequate to perform an analysis of Medicaid expenditures for long-term care residents in the states participating in the Initiative (see ***Appendix Section N.2*** for additional detail on data quality).

To calculate Medicaid expenditures, we began by identifying the sample. The sample was limited to the seven ECCP states in the Initiative, including residents of Clinical + Payment (C+P) and Payment-Only (P-O) nursing facilities in the Initiative, as well as nursing facility residents in the

[24] The Chronic Conditions Warehouse updates TAF data periodically, so replication using future data extracts may produce different results. The analysis of Medicare uses a longer time frame. Medicaid data prior to 2016 were available in the Medicaid Analytic Extract (MAX) files. There are numerous differences between the MAX and T-MSIS files making compatibility challenging, and there were greater uncertainties about data quality in the MAX data. In consultation with CMS, it was decided to focus on the T-MSIS data.

WSRG. In addition, sample members were required to have at least one long-term care claim in the Medicaid data during the exposure period. In addition, we excluded residents with comprehensive or long-term Medicaid managed care for one or more months because Medicaid payment data may not be complete in managed care encounter data. We did not attempt to use the national comparison group due to the inherent complexities of using and validating Medicaid data across so many state programs. Attempting to assess and address data quality issues across all states in the national comparison group would far exceed available resources, making such analysis impractical. Limiting the sample to the ECCP states also limits the impact of state-level policy differences. Details for sample identification are provided in ***Appendix Section N.3***.

Our analyses of Medicaid payments included all payments made for any claim during an exposure period for Initiative-eligible residents. We identified the types of services and summed the payments for all claims within an exposure period. The total Medicaid expenditures included long-term care, hospital, ED, observation stays, prescription, and other claims from the inpatient and outpatient files. After summing the claims in each year at the beneficiary level, we observed some residents had negative values as payments in a year, which we believed to be erroneous data, so we excluded those beneficiary records from the expenditure analyses. Only 0.3 percent (1,208 beneficiary-year observations) were excluded due to negative expenditures.[25]

We calculated the mean annualized Medicaid payment per beneficiary for all states combined and for each individual state by group: C+P, P-O, and WSRG. To calculate the annualized Medicaid expenditures, we determined the total Initiative exposure for each beneficiary by year and adjusted expenditures to represent an annual amount by dividing by the fraction of the year of exposure. Three states (Missouri, New York, and Pennsylvania) did not have TAF data available for the first three months of FY 2016 (October 2015–December 2015). Consequently, the exposure period for these states was adjusted to exclude these three months, and annualized expenditures for those three states were computed based on 9 months of data in FY 2016. In addition, some residents had very short exposure periods, potentially leading to extreme values when annualized. Thus, exposure periods less than 30 days were set to 30 days when annualizing expenditures.

Most of this evaluation report relies on Medicare claims data to examine service utilization. The quality of Medicare data is generally considered quite high and can be used to support a rigorous quantitative analysis. Less is known about the quality of the state-specific Medicaid data, and the Medicaid analysis should be considered exploratory in comparison to the analysis of Medicare data. As described below, there are several reasons to be cautious about drawing conclusions for any Initiative effects on Medicaid spending. In addition to three states not having complete data for FY 2016, several states have year-to-year changes in expenditures that seem questionable. Thus, we took the approach of performing a descriptive analysis of the Medicaid data, focusing on

[25] Each person could have up to 3 years of data. Only the year(s) with negative expenditures were excluded.

differences in average expenditures between Initiative-eligible residents and the WSRG, but we do not draw conclusions regarding the effects of the Initiative on Medicaid expenditures.

II.6.B. Patterns in Medicaid Expenditures

There were no substantive differences in Medicaid spending among ECCP states, facility groups, or compared to the WSRG.

We examined Medicaid expenditures for Initiative-eligible residents and the WSRG in FY 2016–FY 2018. The average Medicaid expenditures per beneficiary per year (PBPY) are presented in ***Table II-8***. The average Medicaid expenditure PBPY for the C+P ECCPs combined ranged from $50,856 in FY 2016 to $55,667 in FY 2017 (with FY 2018 averaging $54,580), and expenditures for the P-O ECCPs combined ranged from $48,394 in FY 2016 to $51,215 in FY 2018. There was greater variation in the WSRG, with Medicaid expenditures ranging from $43,987 in FY 2016 to $53,427 in FY 2018.[26] [27] Differences in Medicaid expenditures for the C+P, P-O, and WSRG varied across the three years, although none were substantive.[28] As expected for a sample of nursing facility residents, more than 95 percent of Medicaid expenditures were for long-term care services. Medicaid expenditures for ACT services comprised a small percentage of total Medicaid expenditures, with average Medicaid expenditures for potentially avoidable ACTs typically under $100 per year. This was only the cost sharing paid for Medicare-covered services, and states vary in their coverage policies for these services.

[26] As discussed below, we did not assess statistical significance of the differences in Medicaid expenditures. Thus, the presentation and discussion of results focuses merely on a descriptive discussion of the results.

[27] There are numerous potential reasons for the overall increase in Medicaid expenditures PBPY, with potential explanations including inflation and state-level policy changes including reimbursement changes.

[28] The Year 4 evaluation report included an analysis of Medicaid expenditures using the 2016 TAF files. The 2016 TAF files were updated after the analysis was performed for the Year 4 evaluation report, and the results in the Final report uses the updated files. Thus, any comparisons between the 2016 results reported in the Final Report and the Year 4 report should be made with caution.

Table II-8. Medicaid expenditures per beneficiary per fiscal year, FY 2016–FY 2018

Measure	All ECCP states combined								
	2016			2017			2018		
	ECCP		WSRG	ECCP		WSRG	ECCP		WSRG
	C+P	P-O		C+P	P-O		C+P	P-O	
Number of Initiative-eligible residents	8,181	9,232	107,872	8,371	9,303	108,441	5,951	7,846	95,942
Exposure days, mean	251	249	242	273	277	276	260	272	271
Total Medicaid expenditures, $, mean (SD)	50,856 (29,707)	48,394 (24,410)	43,987 (26,018)	55,667 (30,794)	50,584 (23,820)	49,661 (25,498)	54,580 (34,295)	51,215 (22,273)	53,427 (26,598)
Medicaid expenditures excluding long-term care expenditures, $, mean (SD)	1,988 (5,114)	2,093 (5,349)	1,973 (6,043)	2,087 (5,589)	2,013 (5,839)	1,946 (6,447)	2,745 (8,699)	2,434 (7,596)	2,256 (9,161)
Long-term care Medicaid expenditures (Only), $. mean (SD)	48,869 (29,694)	46,301 (24,214)	42,014 (25,562)	53,580 (30,688)	48,571 (23,424)	47,715 (25,002)	51,835 (33,512)	48,781 (21,410)	51,171 (25,668)
Acute care transition expenditures									
All-cause, $, mean (SD)	300 (2,181)	286 (2,420)	271 (2,822)	375 (2,972)	301 (3,674)	316 (4,003)	519 (6,457)	379 (4,770)	336 (6,892)
Potentially avoidable, $, mean (SD)	75 (1,054)	104 (2,093)	77 789)	72 (706)	65 (574)	87 (1,107)	108 (2,097)	92 (864)	91 (2,057)

SOURCE: RTI analysis of Medicaid TAF for FY 2016–FY 2018.

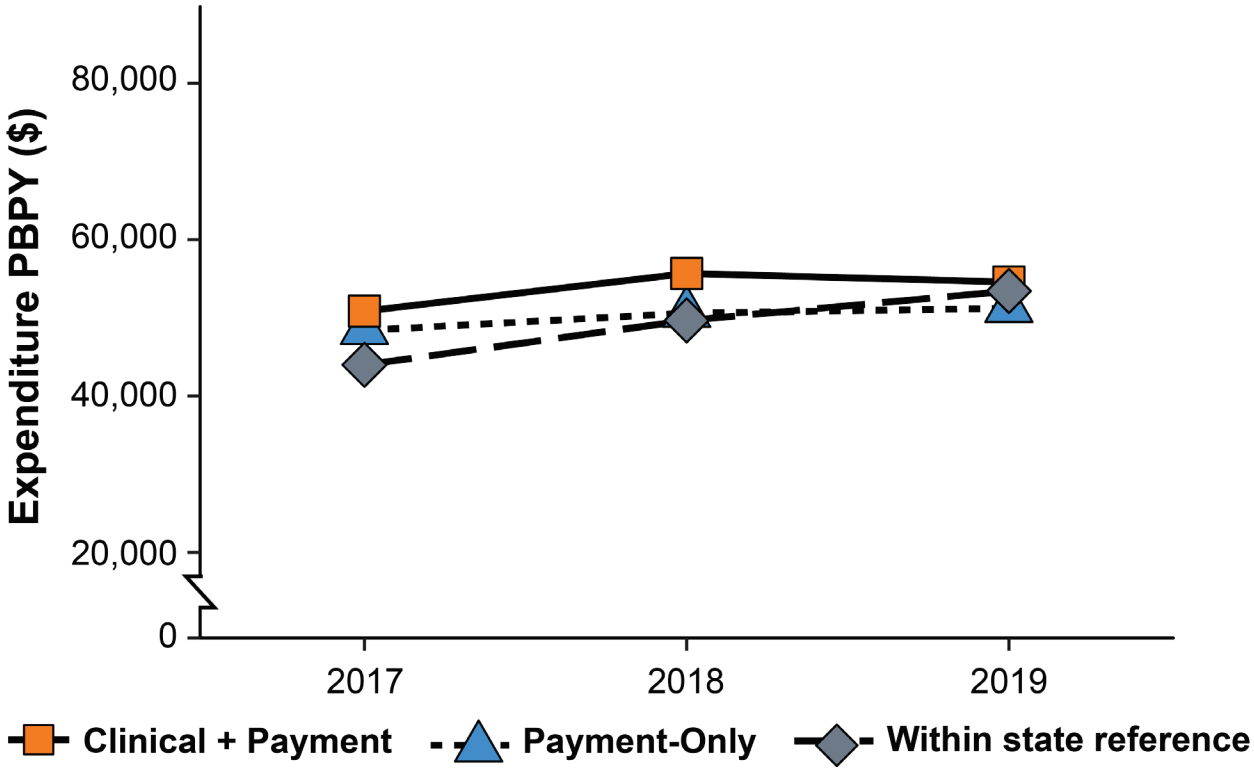
NOTE: Only non-managed care beneficiaries with at least one long-term claim during the episode. Total Medicaid expenditures included long-term care, hospital, ED, observation stays, prescriptions and other claims from the inpatient, outpatient, long-term, and the prescription files. Expenditures are annualized based on the number of exposure days during the year.

Patterns of Medicaid Expenditures Overall and by State (ECCP)

The figures illustrate there is little consistency in findings across states.

Below we provide figures illustrating PBPY expenditures overall and in each ECCP state. While findings may vary across stats, for us to conclude that the Initiative was having a clear effect on Medicaid expenditures, we would expect to see some consistency in findings across states. However, as described below, there was little consistency in findings across states.

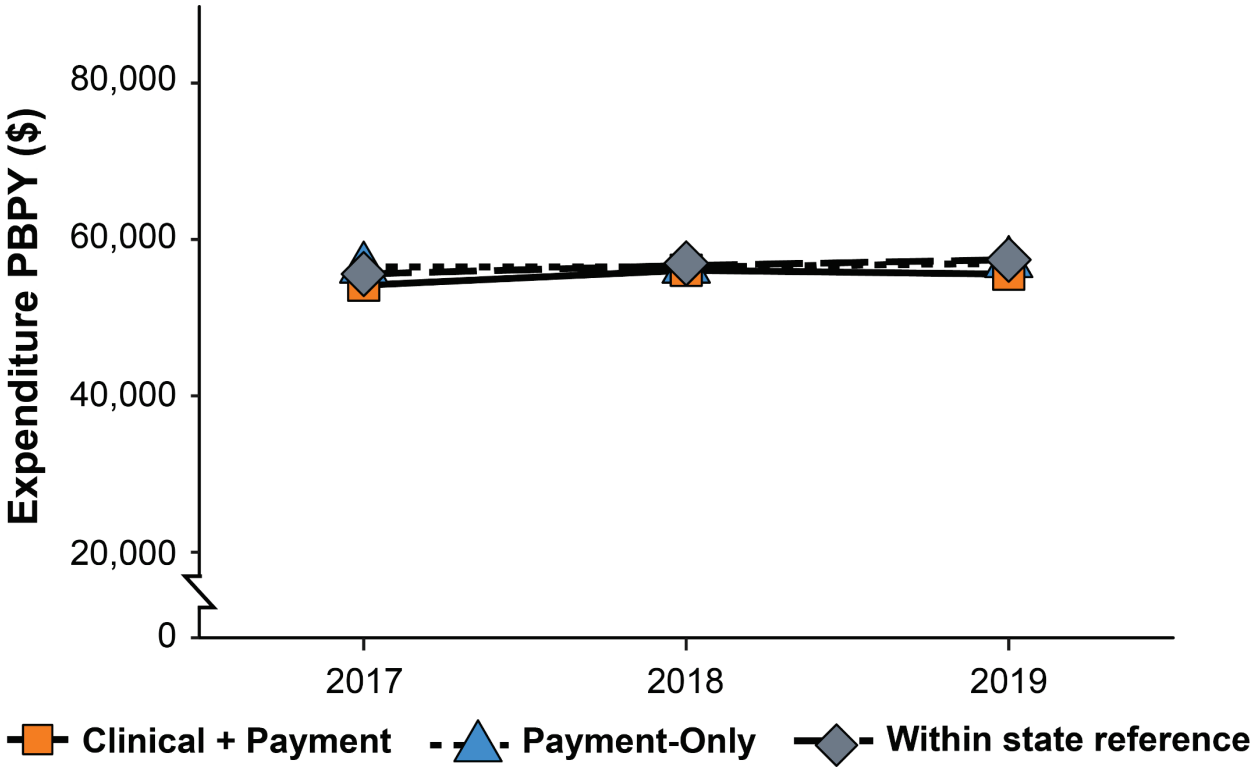
Figure II-19. Total Medicaid expenditures—All ECCPs



SOURCE: RTI analysis of Medicaid TAF for FY 2016–FY 2018.

Alabama–Medicaid expenditures were very stable in Alabama, with relatively little variation between groups and over time. There were only small differences between C+P, P-O, and the WSRG groups. This is consistent with the bed hold-policy in Alabama mitigating any effect of the Initiative on long-term care expenditures. Changes over time were also small.

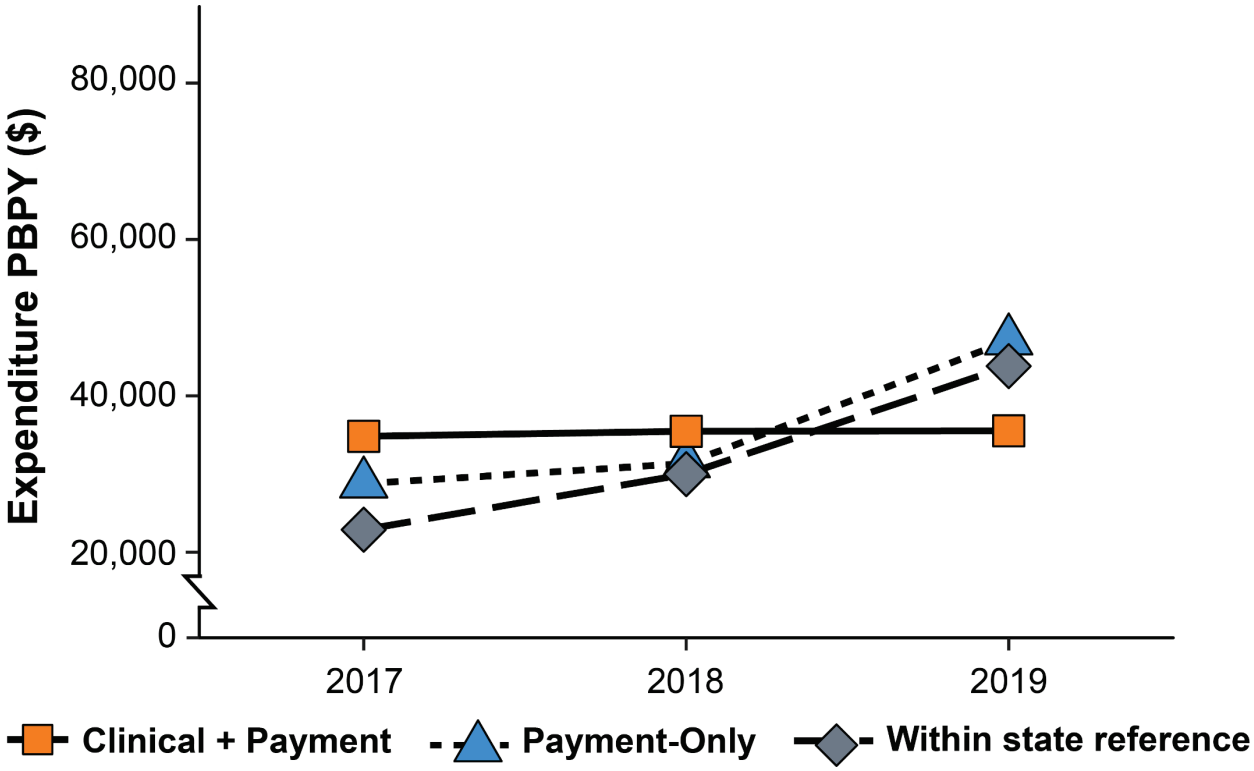
Figure II-20. Total Medicaid expenditures—Alabama



SOURCE: RTI analysis of Medicaid TAF for FY 2016–FY 2018.

Indiana–Medicaid expenditures reported in the Indiana TAF data were lower than those of other states but exhibited substantial variation over time. For example, total Medicaid expenditures reported in the TAF data for the WSRG increased from $29,979 in FY 2017 to $43,799 in FY 2018. The P-O facilities had a similar trend. The increasing expenditures could result from changing payment policies or increasing data completeness. In Indiana, the per diem rate is higher for nursing facilities nominally owned by a government entity. Changing ownership patterns have increased Medicaid costs. However, it is unclear whether there is a differential impact for C+P facilities in terms of changing ownership patterns or data completeness.

Figure II-21. Total Medicaid expenditures—Indiana

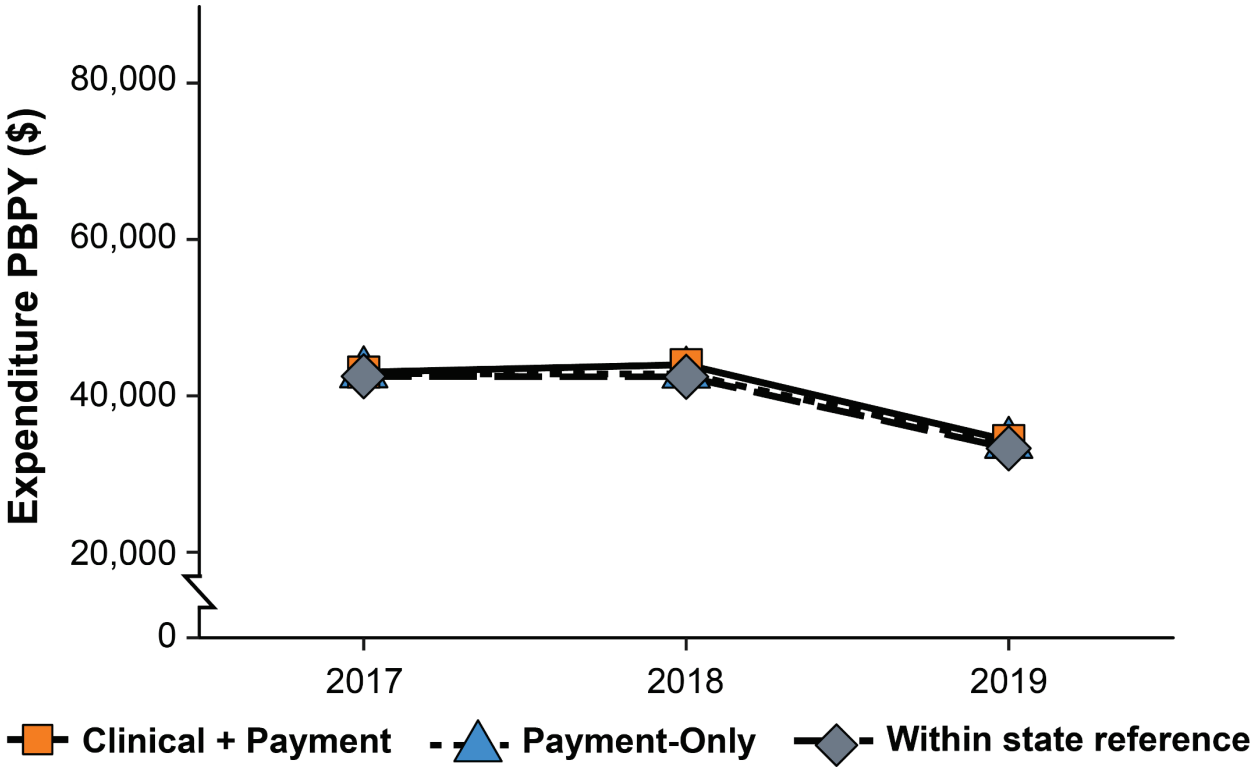


SOURCE: RTI analysis of Medicaid TAF for FY 2016–FY 2018.

Missouri–Medicaid expenditures exhibit little difference between C+P, P-O, and WSRG groups in each year. Expenditures declined for all groups in FY 2018.[29] Missouri has a bed-hold policy that paid nursing facilities up to three days to hold beds for residents who are hospitalized, mitigating any potential Initiative effect on expenditures.

[29] We investigated whether there was a reduction in nursing home claims in 2018 that might reflect a reduction in data completeness. However, when looking at monthly nursing home claims, the number of nursing claims were similar in 2017 and 2018.

Figure II-22. Total Medicaid expenditures—Missouri

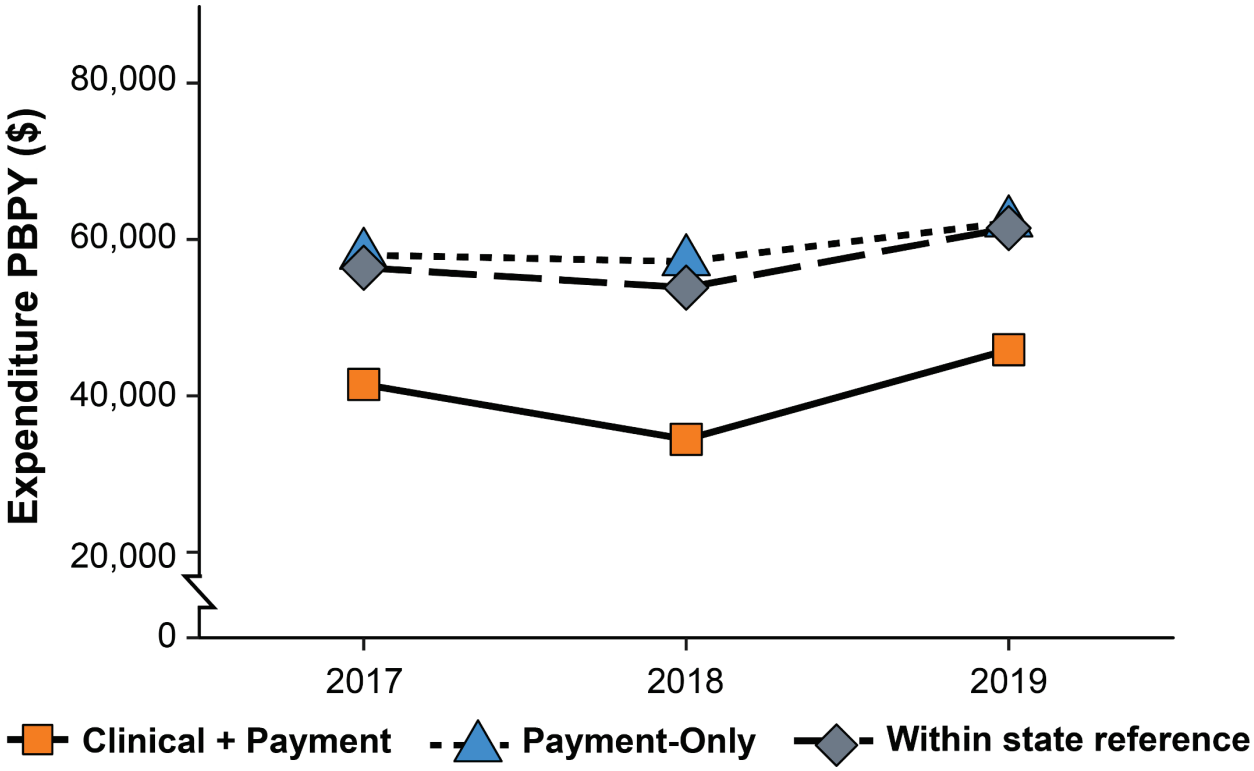


SOURCE: RTI analysis of Medicaid TAF for FY 2016–FY 2018.

Colorado/Nevada–All three groups had a similar pattern over the three years, with expenditures declining between FY 2016 and FY 2017 before increasing to their highest level in FY 2018. However, making accurate comparisons by group is difficult, as the C+P and P-O groups were in different states for this ECCP and may reflect state-level policy differences.[30]

[30] An alternative would be to present the data for this ECCP in separate graphs, one for each state. However, the patterns of spending are the same in each group, making it likely that separate analyses for each state would lead to a similar conclusion.

Figure II-23. Total Medicaid expenditures—Colorado/Nevada

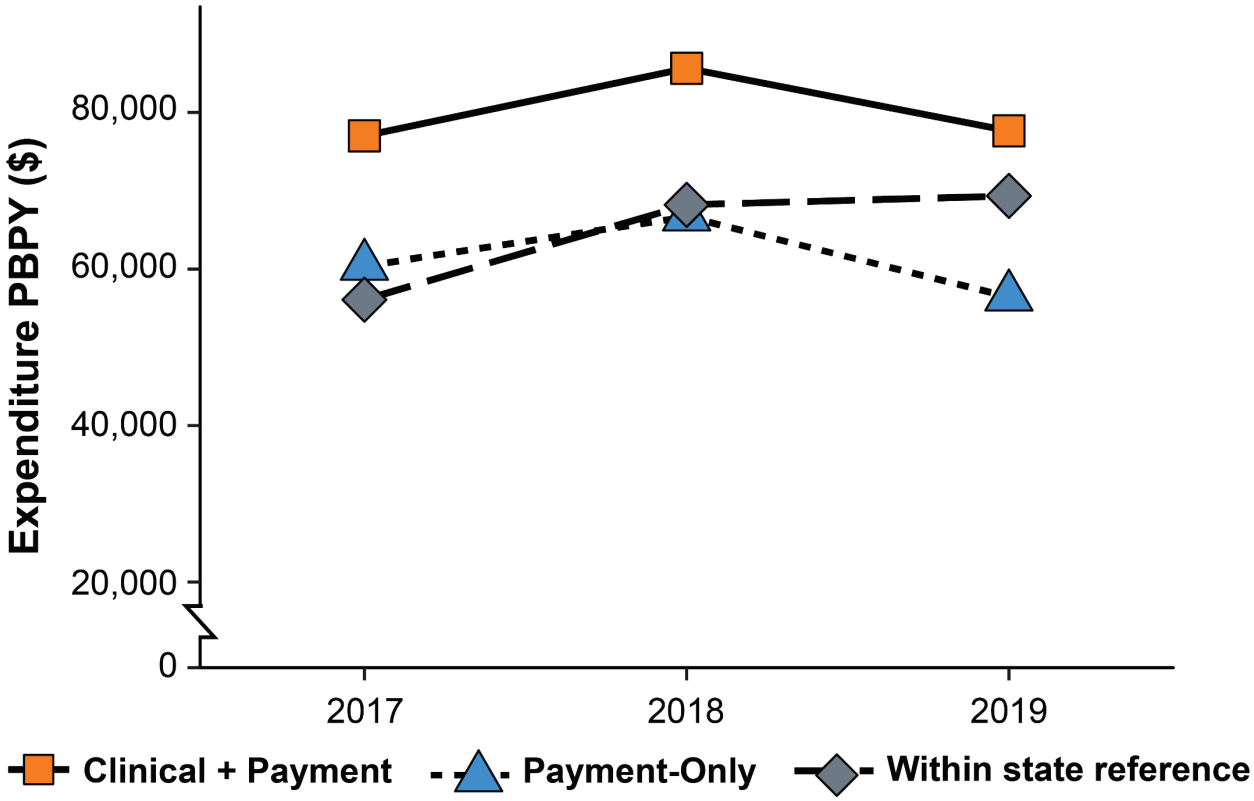


SOURCE: RTI analysis of Medicaid TAF for FY 2016–FY 2018.

New York–The C+P group had the highest average Medicaid expenditures in all three years. The higher Medicaid expenditures for the C+P group likely reflected the high concentration of C+P facilities in the New York City area, where reimbursement rates are higher than the rest of the state.[31] Changes over time were similar for the C+P and P-O groups, while the WSRG had increased expenditures in each year. The differences in trajectories are observed despite New York's bed-hold policy that compensated nursing facilities up to 14 days a year for bed holds, which would be expected to mitigate any Initiative effects. The results observed for New York are not consistent with the findings from the Medicare analysis, which showed little Initiative effect on hospitalizations.

[31] See https://www.health.ny.gov/facilities/long_term_care/reimbursement/nhr/.

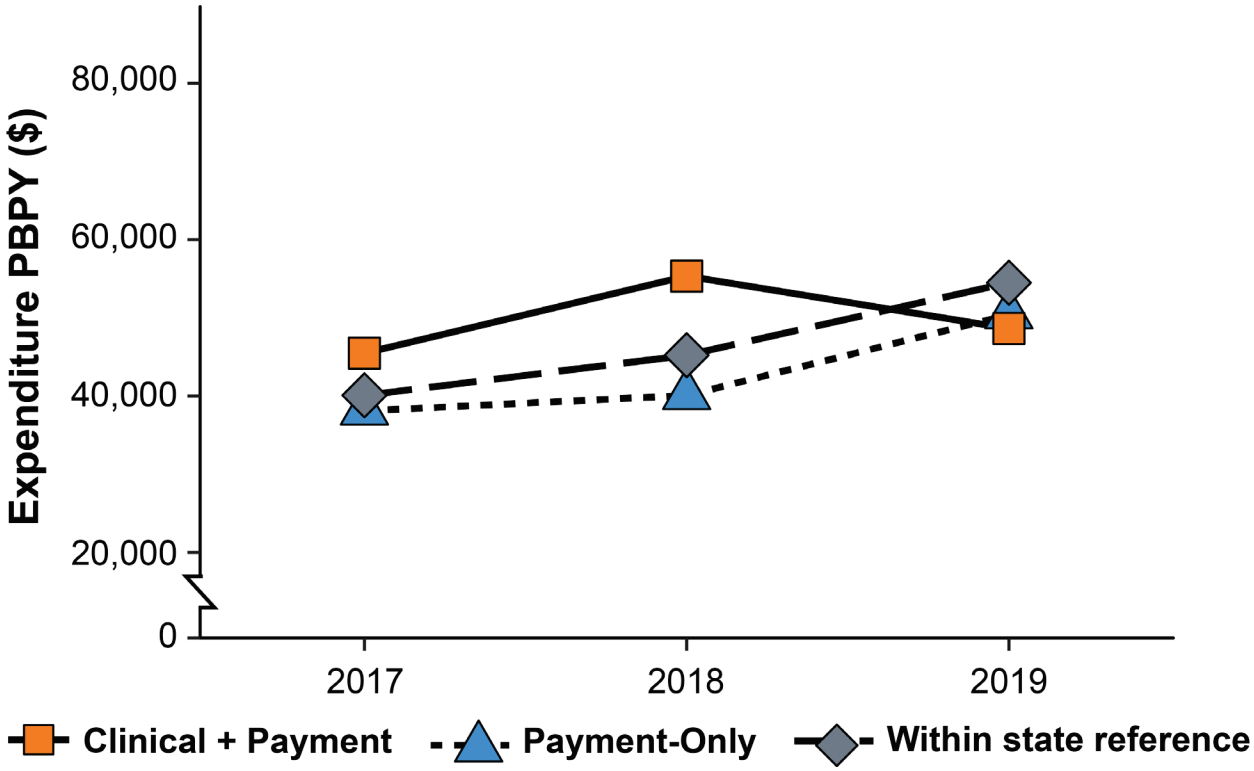
Figure II-24. Total Medicaid expenditures—New York



SOURCE: RTI analysis of Medicaid TAF for FY 2016–FY 2018.

Pennsylvania–Both the P-O and WSRG groups had similar upward trends in expenditures, while expenditures for the C+P group did not exhibit a clear trend. Different trajectories existed between the groups, despite the presence of a bed-hold policy that paid nursing facilities to hold a bed for up to 15 days. Once again, the results observed for Pennsylvania are not consistent with the findings from the Medicare analysis which showed little Initiative effect on hospitalizations, especially when taking the bed-hold policy into account. As such, the Initiative is unlikely to be the cause of different patterns in expenditures.

Figure II-25. Total Medicaid expenditures—Pennsylvania



SOURCE: RTI analysis of Medicaid TAF for FY 2016–FY 2018.

Limitations

Overall, attributing any changes in Medicaid expenditures to the Initiative would be difficult. First, the only year of Medicaid data available before the start of NFI 2 was FY 2016, and data for three states were incomplete from FY 2016. Moreover, several states had year-to-year changes in expenditures that seem questionable and may reflect incomplete data, other data anomalies, or confounding state policy changes. Thus, despite the DQ (Data Quality) Atlas, which is available at Medicaid.gov and assessed the quality of Medicaid data, having only low concerns about data quality (***Appendix N***), we had reason to be concerned about the patterns observed in several states, particularly for long-term care expenditures. Finally, changes in Medicaid long-term care expenditures, the primary component of total Medicaid expenditures among Initiative-eligible residents, were not consistent with the analysis of Medicare data that suggested virtually no effect on preventable hospitalizations (***Section II.5.C***). While the large standard deviations in ***Table II-8*** might suggest the differences and trends in Medicaid expenditures would not be statistically significant, even this might be viewed as too strong of a conclusion, given questions about the data. Consequently, we did not assess statistical significance or draw conclusions regarding the effects of the Initiative on Medicaid expenditures.

Chapter II.7 Impact of NFI 2 on MDS-Based Quality Measures

Key Takeaways

- *The Initiative was not associated with a statistically significant change in the majority of quality measures for residents in Clinical + Payment facilities.*
- *For residents in Payment-Only facilities, the Initiative was associated with higher-than-expected rates of undesirable outcomes in four of the seven MDS-based quality measures.*
- *Lower baseline prevalence of adverse outcomes among Initiative-eligible residents, coupled with quality improvements over time in the national comparison group, made it more difficult for NFI 2 facilities to achieve further quality improvement relative to the national comparison group.*
- *There is mixed evidence that the NFI 2 payment incentives were associated with some unfavorable changes in quality of care.*

II.7.A. Overview and Methods

Although improving performance on MDS-based quality measures was not a specific goal of NFI 2, the Initiative may have affected the quality of care for eligible residents. Some facility interviewees said they believed care quality improved for residents due to an increased focus on early identification and treatment of resident condition changes, particularly for the six NFI 2 conditions. Based on this anecdotal feedback, it is possible that NFI interventions may be associated with

MDS-based quality measure scores which overlap with pathways related to resident hospitalizations. For example, working to reduce potentially avoidable hospitalizations for UTIs may involve better monitoring of catheterized residents, potentially leading to fewer catheter-associated UTIs. Alternatively, special NFI 2 focus and monitoring may lead to additional testing and more frequent UTI diagnoses. Other MDS-based measures may not appear directly related to specific Initiative components, but taken together, they give a broad picture of quality of care. These MDS-based measures are also used in tools such as Nursing Home Compare to allow current and potential residents, family members, and facilities to better understand facility care quality.

MDS measures examined[32] (lower scores indicate better quality):

- One or more falls with injury
- Self-reported moderate to severe pain
- Pressure ulcers Stage II or higher
- UTI
- Catheter inserted and left in bladder
- Decline in activities of daily living (ADLs)
- Antipsychotic medication use
- Antianxiety or hypnotic medication use
- Weight loss
- Physical restraint

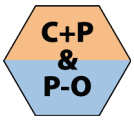
In consultation with CMS, we selected and analyzed 10 MDS-based quality measures using descriptive statistics (***Appendix R***) and used multivariate regression analysis to examine a smaller subset of seven of these measures.[33] Additionally, we explored measures of quality based on infections associated with health care use. These results are described fully in ***Appendix AA***. We calculated each MDS-based quality measure as the proportion of observed quarters with the presence of an adverse event for each resident, producing an annual score for each resident ranging from 0 to 1. Because the outcomes analyzed are unfavorable (e.g., the resident had one or more falls with injury), lower scores indicate better quality. The multivariate regressions for the MDS-based quality measures used the same model design as the utilization and expenditure analyses (***Appendix I***). The multivariate results were estimated relative to the national comparison group, after accounting for baseline trends from FY 2014 through FY 2016 and are used to address this key research question:

[32] 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 activities of daily living (ADLs), UTI, and antipsychotic medication use. The measures included only in descriptive analyses are antianxiety or hypnotic medication use, weight loss, and physical restraint.

[33] These measures were selected due to their statistical characteristics allowing stable and meaningful results with the multivariate regression methodology.

- How did the NFI 2 payment incentive affect MDS-based quality of care outcomes for participating residents? How did NFI 2 affect MDS-based quality of care outcomes for participating residents?

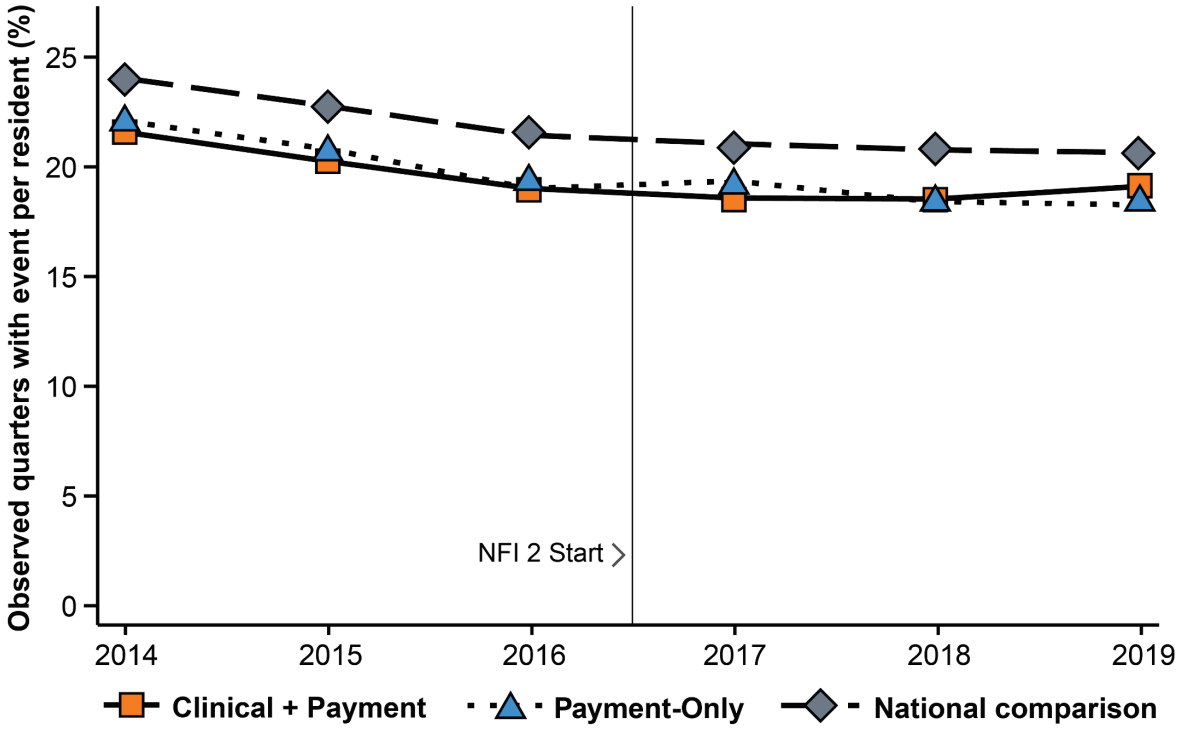
II.7.B. Patterns in Unadjusted MDS-Based Quality Measure Performance from FY 2014 to FY 2019



To provide context for the multivariate results, we explored patterns over time of unadjusted MDS-based quality measure performance. The descriptive statistics illustrate patterns in outcomes among Initiative-eligible residents in participating ECCP facilities (i.e., C+P and P-O, separately) and the national comparison group. We present descriptive statistics for FY 2014 through FY 2019.

For most MDS-based quality measures, residents in both NFI 2 facility groups had fewer undesirable events compared to the national comparison group in FY 2016, prior to the start of NFI 2. In the intervention period (FY 2017–FY 2019), residents in the Initiative groups continued to have fewer undesirable events than residents in the national comparison group, though these differences were smaller for residents in P-O facilities on multiple quality measures. For most of the MDS-based quality measures, residents' experience of undesirable events decreased or remained consistent over time, from FY 2014 to FY 2019, for the Initiative groups and national comparison group. The full descriptive results are available in ***Appendix R***. As an example, ***Figure II-26*** shows the patterns over time in resident receipt of antipsychotic medications.

Figure II-26. All ECCPs: Use of antipsychotic medication, FY 2014–FY 2019



SOURCE: RTI analysis of MDS data.

II.7.C. Initiative Impact on MDS-Based Quality Measure Performance Across All ECCPs

C+P

For residents in C+P facilities, our DD results showed no statistically significant Initiative-associated effects for six of the seven MDS-based quality measures for the pooled model combining the six ECCPs across FY 2017 to FY 2019 (see ***Figure II-27*** for results and definitions of terms). These findings are not surprising, given that the MDS measures do not align directly with most of the NFI 2 six conditions; UTI and skin integrity (i.e., pressure ulcers and skin infections) were the only conditions that were both related to Initiative priorities and included in MDS quality measures.

In C+P facilities, the Initiative was associated with a higher probability of residents having a catheter inserted and left in the bladder (unfavorable) than would be expected absent the Initiative. For Initiative-eligible residents in C+P facilities, the predicted probability of having a catheter placed and left in the bladder across FY 2017 to FY 2019 absent the Initiative was 4.4 percent (***Figure II-27***). Initiative participation was associated with higher-than-expected probability of an unfavorable outcome by a statistically significant 0.4 percentage points. This represents an 8.2 percent relative increase in the average resident's probability of having a catheter placed and left in the bladder. Descriptive results show C+P facilities scored better on this measure than the national comparison group, including in FY 2018 and FY 2019 (***Appendix R***). The unfavorable DD result may be partially explained by a downward trend in the baseline period that leveled off during the Initiative. None of our interview findings indicated any change in catheter use for residents during NFI 2.

P-O

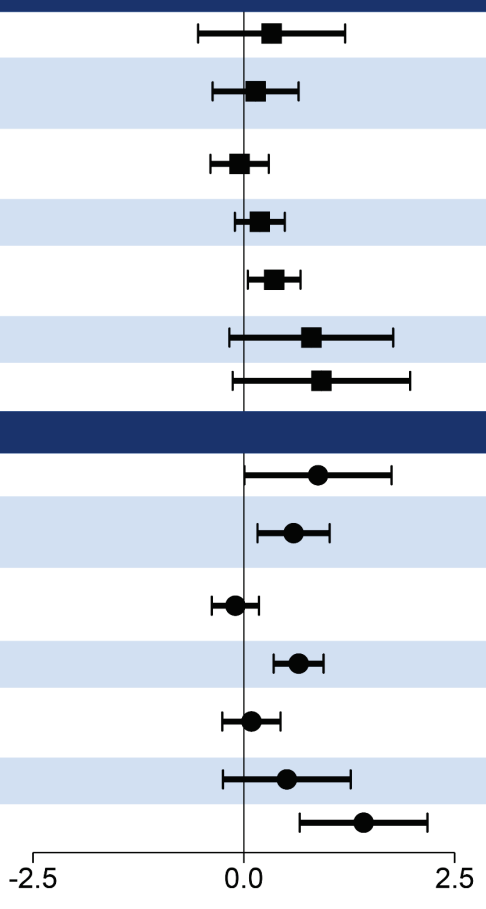
For residents in P-O facilities, four MDS-based quality measures showed statistically significant higher-than-expected probability of undesirable events (***Figure II-27***). These results indicate that Initiative-eligible residents in the P-O group experienced several types of undesirable events more frequently than would be expected absent the Initiative, FY 2017 through FY 2019. Specifically, we found that the following outcomes were affected: one or more falls with injury, self-reported moderate to severe pain, UTI, and antipsychotic medication use. Descriptive results show that residents in P-O group facilities had lower rates of self-reported moderate to severe pain, UTI, and antipsychotic medication use than the national comparison group. These rates have decreased over time in the P-O group, though not to the same extent as in the national comparison group (***Appendix R***). Because of these trends, it was difficult for P-O facilities to achieve further quality improvement relative to the national comparison group, so we see unfavorable DD results for P-O facilities on those three measures despite improvement over time. However, the rate of residents experiencing one or more falls with injury increased over time in the P-O group while remaining level in the national comparison group. Facility interviewees never shared any findings or anecdotes that might explain these results. Rather, interviewees insisted that care quality had remained stable throughout the Initiative and reported no changes in their MDS-based quality outcomes due to NFI 2 participation.

UTI occurrence had the largest relative effect of all tested MDS-based quality measures. The Initiative was associated with a statistically significant 0.7 percentage point higher-than-expected probability of UTI, a 28.4 percent relative effect. Given that UTIs are one of the NFI 2 six conditions, higher-than-expected probability in P-O facilities could have been a result of increased surveillance and reporting. Interviewees from many facilities across ECCPs shared that out of all six NFI 2 conditions, UTI was the most-often assessed and treated NFI 2 condition for their residents. Notably, MDS coding for UTI differs from required NFI 2 UTI documentation. More frequent use of the NFI 2 billing codes also may have encouraged facilities to code more MDS UTIs, yet when asked about any NFI 2 effects on MDS quality measures, none of the facility interviewees indicated any change in MDS coding resulting from their NFI 2 participation. Arguably this theory also would hold true for C+P facilities, though their participation across both NFI 1 and NFI 2 may have resulted in different care practices that adjusted the frequency of UTI coding. Because there was no NFI 2 requirement or incentive to track MDS measures that might have overlapped with NFI 2 billing episodes, facility interviewees said they did not make any connection between their Initiative activities and their MDS reporting requirements.

Figure II-27. All ECCPs: Initiative effect on MDS-based quality measures, FY 2017–FY 2019

(percent of observed quarters with event per resident)

Measure	Predicted mean absent the Initiative	Initiative effect (percentage points)	90% CI	Relative effect (percent)
Clinical + Payment				
One or more falls with injury	12.1	0.3		2.7
Self-reported moderate to severe pain	3.1	0.1		4.6
Pressure ulcers Stage II or higher	4.4	-0.1		-1.1
Urinary tract infection	2.2	0.2		8.5
Catheter inserted and left in bladder	4.4	0.4		8.2
Decline in ADLs	11.9	0.8		6.7
Antipsychotic medication use	17.8	0.9		5.2
Payment-Only				
One or more falls with injury	12.8	0.9		6.9
Self-reported moderate to severe pain	3.2	0.6		18.4
Pressure ulcers Stage II or higher	3.6	-0.1		-2.8
Urinary tract infection	2.3	0.7		28.4
Catheter inserted and left in bladder	4.9	0.1		1.8
Decline in ADLs	12.8	0.5		4.0
Antipsychotic medication use	17.3	1.4		8.2



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

SOURCE: RTI analysis of MDS data.

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 national comparison group and adjusted for resident-level 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* = (Initiative effect) / (predicted mean absent the Initiative) calculated using unrounded values; calculating the relative Initiative effect using the rounded values in this table will yield different values than those reported here. The magnitude of a relative Initiative effect could be large when the underlying denominator—the predicted probability absent the Initiative—is small. In such cases, the relative Initiative effect should be interpreted with caution.

II.7.D. Initiative Impact on MDS-Based Quality Measure Performance for Individual ECCPs

Analyzing individual ECCPs did not provide clarity on the effect of the Initiative on the residents' MDS-based quality measures. We neither found clear patterns in the direction of change, nor identified specific quality measures impacted by the Initiative. The multivariate analysis did not provide evidence of quality improvement for eligible residents due to the Initiative beyond any quality improvement trend that occurred nationally and preceded the Initiative (FY 2014–FY 2016).

C+P

In the C+P group, three ECCPs (ATOP2, NY-RAH, and RAVEN) each had one to two quality measures that showed statistically significant undesirable Initiative effects. Additionally, MOQI had three quality measures with statistically significant undesirable Initiative effects. Again, interviewees offered no evidence to suggest any negative effect of NFI 2 on resident care quality. Rather, interviewees reported that their facility care practices and care quality either remained similar to or improved from what they had been prior to NFI 2. Two ECCPs (NY-RAH and RAVEN) each had one quality measure with statistically significant desirable Initiative effects, perhaps supporting interviewees' perceptions of potential improvement in resident care quality during their participation in NFI 2.

> Among individual ECCPs, there was no clear pattern of change across the MDS-based quality measures, but the Initiative was associated with more unfavorable effects than favorable effects.

P-O

In the P-O group, five ECCPs (AQAF, ATOP2, NY-RAH, OPTIMISTIC, and RAVEN) each had one quality measure that showed a statistically significant undesirable association with the Initiative, while MOQI had three. These effects were spread across six quality measures. We found no statistically significant desirable associations with the Initiative on MDS-based quality measures in the P-O group. These findings differ from facility interview feedback, which highlighted no effect of NFI 2 on MDS quality measures and no negative change in care practices or care quality. Three important points may help provide context:

- First, facility interviewees had trouble conceptualizing a relationship between NFI 2 and MDS. Most were surprised or confused about interview questions related to quality measurement because they believed MDS had nothing to do with NFI 2. Rather, the facility perception of NFI 2 centered on reducing avoidable hospitalizations via identification and treatment of the six conditions. Because the NFI 2 clinical criteria for the six conditions differed from the MDS criteria, even for the same diagnoses (e.g., UTI), facility interviewees made no connection between NFI 2 and MDS quality measurement.
- Second, CMS incentivized facilities to reduce avoidable hospitalizations through use of NFI 2 billing codes and resultant payments. With no associated financial incentive for changes

in MDS reporting or outcomes, facilities had no reason to focus on MDS-based quality measures during their Initiative participation.

- Third, interviewees never indicated that care quality had declined during NFI 2. However, facility interviewees could consider only their own facility performance over time. They may have believed that the quality of care stayed the same or improved, but they would not have been able to compare those results to those of comparison group facilities.

Chapter II.8 Impact of NFI 2 on Resident Mortality

Key Takeaways

- *For residents in Clinical + Payment facilities, the Initiative was associated with higher-than-expected mortality for all ECCPs combined and in three individual ECCPs.*
- *The Initiative was not associated with a statistically significant impact on resident mortality in Payment-Only facilities for all ECCPs combined but was associated with higher-than-expected mortality in one individual ECCP.*
- *Analysis of the primary data collected for the evaluation did not reveal consistent evidence that ECCP end-of-life support activities led to the higher-than-expected mortality among eligible residents.*

II.8.A. Overview and Methods

Considering the NFI 2 goal of treating residents in-house whenever clinically appropriate, it is important to examine whether facilities could handle the potential increase in residents' frailty and acuity without negative health consequences, such as increased mortality. RTI's evaluation of NFI 1 demonstrated that the initial efforts to reduce avoidable hospitalizations in the original cohort of C-O facilities could succeed without increasing resident mortality rates (Feng et al., 2018). To continue this investigation, we examined whether NFI 2 was associated with any change in resident mortality during NFI 2. Although the Initiative was not expected to impact mortality, such an effect could occur for various reasons. For example, an increased focus on detecting and

treating acute changes in condition could lead to reduced mortality. Conversely, there could be an unfavorable increase in mortality if the Initiative's focus on on-site treatment led to delays in needed hospitalizations, or if attention was diverted from other resident care needs. Increased adoption of end-of-life (EOL) intervention components in some ECCP C+P facilities also may have resulted in better adherence to documenting resident and family wishes to reduce or remove life-sustaining treatments which, in turn, could lead to an increase in mortality rates for residents. The goal of these ECCP interventions was to educate residents, families, and facility staff to align with improved person-centeredness through documenting and following residents' EOL treatment goals and preferences. Increased mortality may have indicated an increase in facilities following patient and family care preferences, i.e., to remain on-site through end of life, which would be considered a favorable outcome.

To assess the impact of the Initiative on mortality among Initiative-eligible residents, we examined unadjusted trends in resident mortality rates and conducted DD multivariate regression analysis of resident mortality. We used data from FY 2014 through FY 2019, for all Initiative-eligible residents in the ECCP facilities (separately for C+P and P-O). We also analyzed site visits and telephone interview data collected during the Initiative to understand the potential impact of ECCP EOL intervention components on EOL care, including advance care planning (ACP) and palliative or comfort care treatments. In addition, we looked at how the percentage of eligible residents with an advance directive changed over the course of NFI 1 and NFI 2. These analyses are used to address the following research question:

- How did the NFI 2 payment incentive affect the mortality of participating residents?

For both the unadjusted trends and the DD models, we examined mortality during each fiscal year and used statistical techniques that were similar to the ones we used for other outcomes described in previous chapters (and described in more detail in ***Appendix I***). One complicating factor for using DD models to measure the impact of the Initiative on mortality is hospice use. Hospice use was an eligibility exclusion criterion for the Initiative overall. Furthermore, residents with hospice use were expected to be at a higher risk of imminent death than those without, and hospice use was unevenly distributed across Initiative and comparison groups. Residents could be included in our study sample and then enroll in hospice, ending their Initiative-eligible period, before dying. If we counted only deaths occurring during a resident's Initiative-eligible period, our estimates could be biased. To address this issue, we counted all deaths that occurred during the fiscal year, regardless of whether the death occurred during or after an Initiative-eligible period. This differed from NFI 1 when a hospice stay was not an exclusion criterion. By using a broader timeframe to examine the mortality outcome, we counted some deaths occurring long after a resident's Initiative-eligible period, but we expected such instances to be evenly distributed across Initiative and comparison groups.

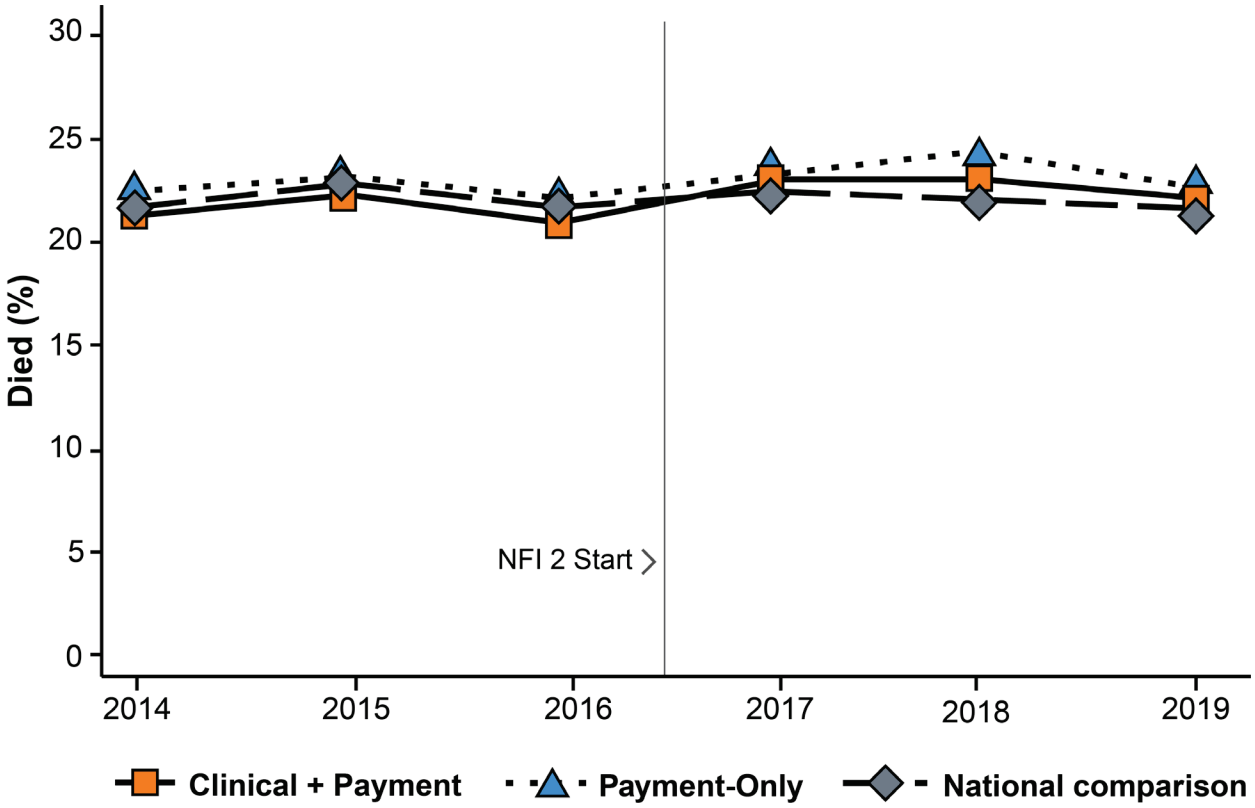
II.8.B. Patterns in Unadjusted Resident Mortality Rates from FY 2014 to FY 2019

We conducted descriptive analyses to understand the mortality patterns over time for Initiative-eligible residents in each intervention group and in the national comparison group. The analyses included Initiative-eligible and comparison group residents each year from FY 2014 through FY 2019. As explained above, we examined mortality within the fiscal year to compare the patterns from the base period (FY 2014–FY 2016) to the intervention period (FY 2017–FY 2019).

Figure II-28 shows the unadjusted mortality rate from FY 2014 to FY 2019 for the P-O and the C+P groups for all ECCPs combined and the national comparison group. ***Figures S-1*** to ***S-6*** in ***Appendix S*** show the patterns for each ECCP individually. The rates for the individual ECCPs with smaller sample sizes are subject to more variability.

The unadjusted mortality rates in all groups increased from FY 2016 to FY 2017, the first Initiative year, with a larger increase for the intervention groups compared to the national comparison group. Mortality in the P-O group increased further in FY 2018 before decreasing in FY 2019, while the mortality rates for the C+P and national comparison group decreased slightly from FY 2017 to FY 2019. Relative to the baseline period, there was higher mortality across both intervention groups during NFI 2 in the six ECCPs combined, although the mortality rates were lower in FY 2019 than in FY 2017 or FY 2018. However, mortality rates for both intervention groups were higher than the national comparison group from FY 2017 through FY 2019. Mortality in the P-O group was higher than in the C+P group or the national comparison group in each year, 2014 through 2019.

Figure II-28. All ECCPs: Percentage of residents who died each year, FY 2014–FY 2019



SOURCE: RTI analysis of Medicare eligibility and enrollment data.

II.8.C. Impact of the Initiative on Mortality Rates Among Initiative-Eligible Residents

To further understand how the Initiative affected mortality rates among all Initiative-eligible residents, including those not treated on-site, we conducted multivariate DD regression analysis. ***Appendix S*** presents additional sensitivity models to estimate the Initiative impact on mortality.

We present estimates of the Initiative effect on mortality in FY 2017 through FY 2019, relative to the national comparison group, using the levels and trends from FY 2014 to FY 2016 as the base period (***Figure II-29***). Positive effect values indicate that the Initiative was associated with a relative increase in mortality rate, and negative effect values indicate that the Initiative was associated with a relative decrease in mortality rate, compared to the national comparison group. Relative effect is calculated by dividing the Initiative effect by the predicted probability absent the Initiative.

C+P

In the C+P group for all ECCPs combined, the Initiative effect on mortality was a statistically significant 1.1 percentage point higher-than-expected mortality, which is a 4.9 percent relative increase from the predicted probability absent the Initiative of 21.6 percent. Participating in the Initiative was associated with a statistically significant unfavorable increase in mortality for residents in AQAF, OPTIMISTIC, and RAVEN facilities. The individual ECCP relative effects ranged

from a 6.5 percent decrease in mortality rate for ATOP2 (largest favorable decrease), which was not statistically significant, to a statistically significant 13.8 percent increase in mortality rate for AQAF (largest unfavorable increase). Notably, AQAF did not focus on EOL care efforts as a key component of their intervention design in C+P facilities. In contrast, OPTIMISTIC and RAVEN had direct care models with a strong focus on EOL activities.

P-O

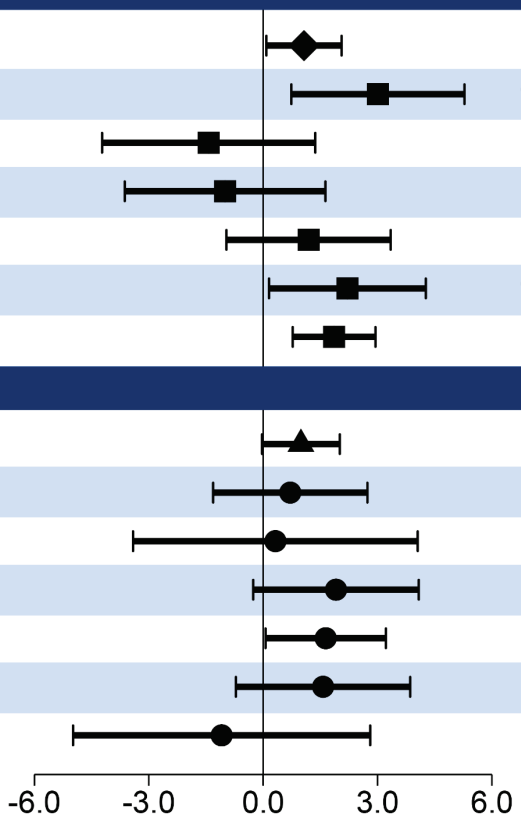
In the P-O group, the relative effect on mortality rate was an unfavorable increase of 4.4 percent (not statistically significant), with all ECCPs combined. Participating in the Initiative was associated with an unfavorable increase in mortality for residents in NY-RAH facilities, with a statistically significant 7.5 percent increase in mortality rate. The relative effect of the Initiative ranged from a 4.5 percent decrease in mortality in RAVEN (not statistically significant) to a 9.3 percent increase in mortality in MOQI (not statistically significant). NY-RAH offered webinars and training materials related to EOL care for P-O facility residents through their NFI 2 website but provided no direct assistance to facilities on this topic. Many P-O facilities commented on adding APRNs to their own staff who were often more adept at EOL care, including having conversations with residents and families about their EOL choices and preferences.

In ***Chapter V.1***, we discuss how factors other than the Initiative may help account for these unfavorable mortality results. One of these factors was unmeasured selection bias toward a sicker or higher-acuity case-mix among the Initiative-eligible resident population, possibly due to increases in managed care enrollment.

Figure II-29. Initiative effect on mortality, FY 2017–FY 2019

(probability of death during the year)

ECCP	Predicted probability absent the Initiative (percent)	Initiative effect (percentage points)	90% CI	Relative effect (percent)
Clinical + Payment				
All ECCPs (6 states)	**21.6**	**1.1**		**4.9**
AQAF (AL)	21.8	3.0		13.8
ATOP2 (NV)	21.9	-1.4		-6.5
MOQI (MO)	22.8	-1.0		-4.4
NY-RAH (NY)	21.1	1.2		5.6
OPTIMISTIC (IN)	21.8	2.2		10.1
RAVEN (PA)	20.5	1.9		9.1
Payment-Only				
All ECCPs (6 states)	**22.5**	**1.0**		**4.4**
AQAF (AL)	21.4	0.7		3.3
ATOP2 (CO)	23.7	0.3		1.4
MOQI (MO)	20.5	1.9		9.3
NY-RAH (NY)	22.0	1.6		7.5
OPTIMISTIC (IN)	23.6	1.6		6.7
RAVEN (PA)	24.2	-1.1		-4.5



SOURCE: RTI analysis of Medicare claims data.

NOTES: The *predicted probability absent the Initiative* is the mean of the predicted probabilities of mortality during the fiscal 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 national comparison group and adjusted for resident-level and facility-level characteristics. It is the difference between the predicted probabilities of mortality with and without the intervention. The *relative effect* = (Initiative effect) / (predicted probability absent the Initiative) calculated using unrounded values; calculating the relative Initiative effect using the rounded values in this table will yield different values than those reported here.

II.8.D. ECCP End-of-Life Care at Participating Facilities

> Analysis of NFI 2 site visit and phone interviews (2017–2019) and the prevalence of advance directives among residents (2014–2019) did not reveal consistent evidence that ECCP end-of-life care activities led to the higher-than-expected mortality among eligible residents.

Our analysis did not reveal consistent evidence that ECCP implementation of ECCP EOL activities explained the statistically significant resident mortality findings described above. Site visit and telephone interviews from FY 2017 through FY 2019 and an analysis of percent of eligible residents with advance directives by ECCP and facility groups from FY 2014 to FY 2019, did not reveal reliable evidence, though it does show variation among ECCPs.

Increased completion and use of resident advance directives, a goal of many of the ECCP activities since NFI 1, could have indicated residents opting out of hospitalization or life-saving interventions, which could have potentially increased mortality rates. Any such increase, however, should be viewed as facilities following patient preferences, thus not an undesirable effect. Further, helping residents to meet their EOL planning goals is an indicator of high-quality care.

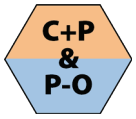
During our interviews with facility staff, there was no indication of either decreased or increased mortality attributable to any incentive component, including some ECCP's EOL training and education for staff and eligible residents. Staff confirmed that they continued to focus on EOL conversations with residents and families and encouraged them to engage in EOL planning by documenting their wishes in advance directives, especially among models that had included ECCP APRNs since NFI 1 (MOQI, RAVEN, OPTIMISTIC).

Our additional analysis of the percentage of eligible residents with advance directives[34] shows an increase of almost 7 percentage points from 2014 to 2019 among C+P facility residents across all ECCPs. In comparison, the percentage of P-O eligible residents with an advance directive, among all ECCPs, dropped almost 4 percentage points over the same period. However, the P-O and the National Comparison Group facilities maintain a higher percent of residents with advance directives through all Initiative years compared to C+P facilities.

The following section describes the EOL intervention intensity we learned about from staff during primary data collection activities from FY 2016 to FY 2019 and a separate analysis of the percentage of eligible residents among C+P and P-O facilities with an advance directive to better understand if this NFI 1 and NFI 2 goal may explain some of the significant mortality findings.

[34] These data were originally drawn from the CASPER database. See ***Appendix CC*** for additional information about data limitations.

ECCP EOL Activities



At the beginning of NFI 2, all ECCPs intended to continue NFI 2 EOL activities among their C+P facilities, with their plans outlined in their NFI 2 Operations Manuals. The goal was for C+P facilities to continue to promote more desirable practices around EOL, ACP, and palliative care to better align with resident and family preferences. During NFI 2, most ECCPs directed these activities to their C+P facilities only. However, a few ECCPs (RAVEN, and NY-RAH) offered webinars and other training resources to P-O facilities. Overall, the interview data indicated that the Initiative led to more EOL care planning and education among staff, residents, and resident families, particularly in the C+P group, and especially among two ECCPs where the embedded ECCP APRNs led these efforts (i.e., OPTIMISTIC and RAVEN).

Examples of EOL care activities of ECCP nurses in C+P facilities:

- Education for residents, families
- Staff education about having difficult EOL conversations
- Chart reviews, completion and updating of advance directives and POLST forms

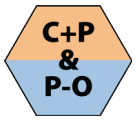
Although ECCPs with embedded APRNs had stronger EOL activities, the primary data show that some ECCP EOL activities weakened in intensity after the first year. Facility interviews revealed that some ECCP leadership believed EOL care had not received the same attention in NFI 2 as it had in NFI 1. One potential cause was the lack of a billing incentive for facilities or practitioners tied directly to EOL care. Although the G9686 Practitioner Payment for Care Coordination and Caregiver Engagement Conference billing code was introduced at the start of NFI 2 and intended to encourage practitioners to discuss resident's treatment goals and preferences, it was previously reported as difficult to implement, and CMS discontinued it at the end of calendar year 2018 (RTI International, 2019).

Other factors outside of the Initiative may account for some of the differences in the level of involvement of ECCP nurses in EOL activities, which could play a role in the mortality findings. At the start of NFI 2, three ECCP states—Indiana, New York, and Nevada—amended their laws to permit APRNs and PAs to sign ACP forms,[35] which previously required a physician signature. This may have increased the number of transferrable ACP forms signed or updated because facility-based APRNs were typically more available than physicians, especially among the C+P facilities with embedded ECCP APRNs. We also identified some variance in state and facility-based programs aimed at improving EOL care. For example, some nursing facility corporate offices had long-standing EOL care programs that existed well before NFI 2. Finally, participating facilities in both groups consistently reported some level of family resistance to treating residents in-house, in

[35] ACP forms include the Physician Orders for Life Sustaining Treatment (POLST), which has different names in various states.

addition to a varying hesitance toward ACP; some of this resistance was cultural and varied across states and geographic regions.

Percentage of Residents with Advance Directives



As part of the NFI 1 and NFI 2 designs, many ECCP interventions were designed to increase the number of eligible residents with advance directives. Therefore, we examined the percentage of residents with at least one advance directive and the trend for the last two years of NFI 1 (FY 2014–FY 2016) and the first three years of NFI 2 (FY 2017–FY 2019). These data were originally drawn from the CASPER database and reflect an average of facility-level proportions of all residents with advance directives, rather than a proportion of eligible residents in our sample with advance directives.[36] An important limitation is that CASPER only reports if a resident had one or more advance directive of any kind and does not distinguish if the resident had any specific type of order, such as a "do not resuscitate" or a "do not hospitalize" order.

Our findings (***Figure II-30***) show that in FY 2014, C+P facilities had a lower percentage of residents (40.7 percent) with at least one advance directive compared to the percentage of residents (57.4 percent) in P-O facilities. Through 2019, C+P facilities experienced a 6.9 percentage point increase of residents with an advance directive, while the percentage of residents in P-O facilities decreased by 3.7 percentage points. Notably, P-O facilities were eligible to participate in NFI 2 only if they were 3-star facilities or higher on Nursing Home Compare. NFI 1 C+P facilities had no minimum facility star requirements. This may have accounted for some of the percent difference (16.7 percent) when comparing P-O residents with an advance directive to C+P residents at baseline, as facilities with three stars or more were considered to offer better quality of care to their residents (e.g., higher staffing to resident ratios). As noted in the previous section, many other state policy and facility factors (e.g., profit and chain status) may also explain the observed differences in advance directives among C+P and P-O facilities at baseline and continuing through 2019.

Across all ECCPs, in C+P facilities, the percentage of residents with at least one advance directive increased through FY 2017,[37] though it consistently remained below both the national comparison and P-O group mean percentages (***Figure II-30***).

The C+P ECCPs with statistically significant higher-than-expected mortality findings were AQAF, OPTIMISTIC, and RAVEN (***Figure II-29***). AQAF had the lowest percentage of residents with an advance directive, any year of NFI 2, and saw little change from FY 2014 to FY 2019 (1.1 percentage points) while OPTIMISTIC also showed little change (−0.9 percentage points) during this period (***Appendix CC***). RAVEN had the largest percentage point increase in the proportion of

[36] Multiple variables, including census of residents with advance directives, are integrated into our analytic file process from the CASPER database with RTI programs AF450, AF500, and AF600.

[37] AQAF is the only ECCP that did not show an increase in the percentage of C+P residents with at least one advance directive.

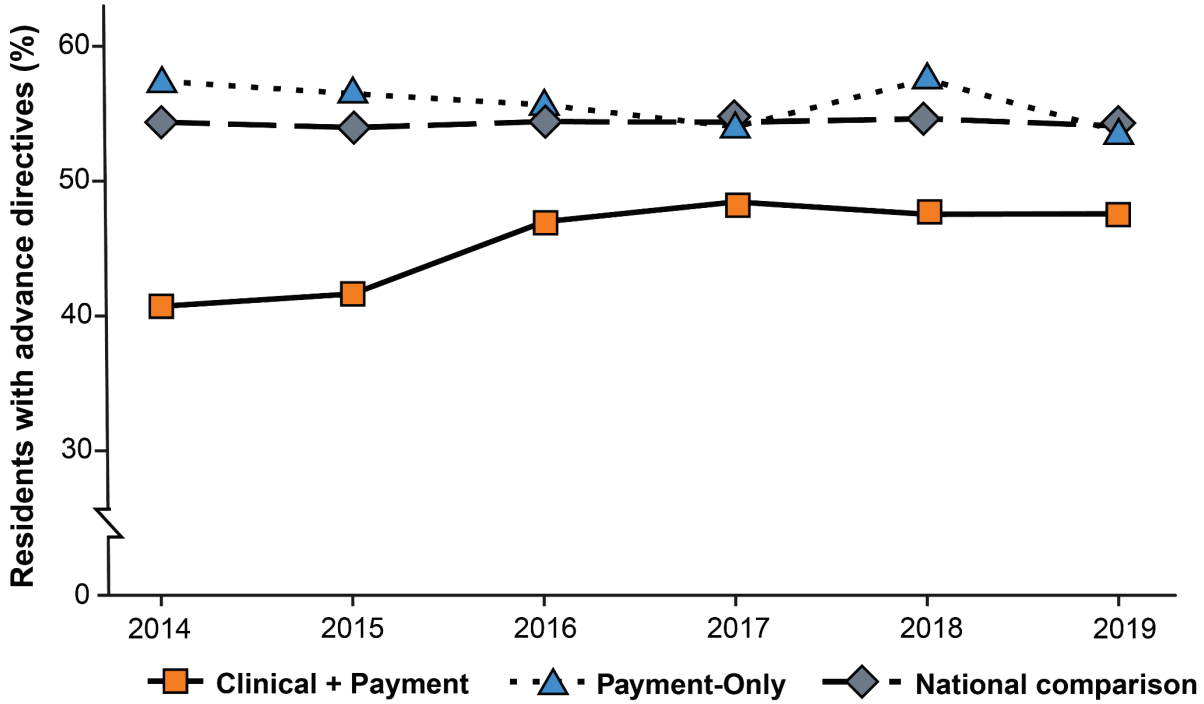
residents (17.2 percentage points) with an advance directive from FY 2014 to FY 2019, which could be a factor this ECCP's higher-than-expected mortality (***Appendix CC***).

Across all ECCPs, a higher percentage of residents in P-O facilities had an advance directive compared to C+P facilities. However, from FY 2014 through FY 2017 the percentage of residents in P-O facilities with an advanced directive declined. NY-RAH was the only P-O ECCP with a statistically significant higher-than-expected mortality rate (***Appendix CC***). The percentage of residents with an advance directive in NY-RAH's P-O facilities changed slightly from FY 2014 to FY 2019 (an increase of 3.1 percentage points); therefore, while this could possibly help explain the higher-than-expected mortality, it is likely too small to fully account for it (***Appendix CC***). All other ECCPs, with the exception of RAVEN, had a decrease in percentage of residents with an advance directive in P-O facilities.

We cannot conclude definitively whether the Initiative goals to increase the percent of residents with advance directives led to any observed differences in mortality for any ECCP or overall. As such, these findings should be considered cautiously, as additional exploration is warranted.

There is some limited evidence that ECCPs with an increase in residents with advance directives could have contributed favorably to more residents opting out of treatment, thereby increasing the mortality rate. However, because we cannot analyze the type of advance directive residents had, this possibility cannot be confirmed.

Figure II-30. Mean percent of residents with advance directives, FY 2014–FY 2019



SOURCE: RTI analysis of Medicare eligibility and enrollment data.

Chapter II.9 Subsequent Outcomes for Residents Treated On-Site for the Six Conditions

Key Takeaways

- *Residents treated on-site for any of the six conditions often required further treatment in the subsequent 30 days, either on-site or in the hospital.*
- *Residents treated on-site for one of the six conditions were less likely to require subsequent hospitalization or to die compared to residents treated in the hospital for one of the six conditions.*
- *The evaluation found no evidence that residents were adversely impacted by receiving treatment on-site for any of the six conditions, rather than treatment in the hospital.*

II.9.A. Overview and Methods

This chapter examines subsequent outcomes for residents who were treated on-site for the six conditions. The purpose of NFI 2 was to encourage on-site treatment as a substitute for hospitalization for residents who were diagnosed with one of the six conditions prioritized in NFI 2. Providing on-site treatment and avoiding unnecessary hospitalizations is considered to be an improvement in the quality of care, assuming that these on-site treatments are appropriate and the residents do not suffer any negative consequences for not being hospitalized. This chapter addresses these research questions:

- What outcomes were observed for residents following treatment on-site for one of the six conditions?

- How did these compare to outcomes for residents treated in the hospital for one of the six conditions?

This chapter describes outcomes for on-site treated residents to help health care providers and residents understand the trajectory of residents treated on-site for the six conditions. Additionally, we examine whether there is evidence that it is safe or even beneficial to treat residents on-site compared to in the hospital. In the case of pneumonia, there is literature, including a randomized controlled trial (Loeb et al., 2006) that examined and confirmed the safety of on-site treatment, and there are guidelines (Hutt & Kramer, 2002) to help clinicians decide whether to hospitalize residents. This chapter covers pneumonia as well as the other NFI 2 conditions.

Below we examine the trajectories for residents treated on-site for any of the six conditions. We examine events that occurred within 30 days following the end of the initial episode of treatment. The outcomes we examined include mortality, subsequent on-site treatment, and subsequent treatment in the hospital. We also assessed the differences in subsequent treatment in the hospital and mortality between residents initially treated on-site compared to those initially treated in the hospital, whether admitted as an inpatient or treated in the ED or as an observation stay. These analyses are based on on-site treatment episodes at Initiative facilities derived from Medicare claims data, and for simplicity, we present results combining the C+P and P-O groups, all ECCPs, and the years FY 2017–FY 2019. We excluded episodes with insufficient follow-up. For the analyses comparing on-site episodes to hospital episodes, we excluded episodes with insufficient data to assess whether the resident received other treatment prior to the episode. ***Appendix L*** details sample creation and provides additional findings.

For the comparison between residents initially treated on-site and those treated in the hospital, we present both descriptive results and odds ratios based on multivariate regression modeling, which are designed to account for some of the differences between the two groups. We provide additional methods details, and report our results using propensity score matching with regression modeling, in ***Appendix L***.

Our multivariate regression approach (as well as the propensity score matching plus regression approach) accounted for many observable differences between residents in their demographics, functional and cognitive status, and comorbidities. Additionally, we accounted for ECCP group (indicators for each combination of state and intervention group), year, and selected facility characteristics. We note an important study limitation that while we of course accounted for the specific one of the six conditions for which the residents were treated, we could not fully account for differences in severity of the acute illnesses, which would require clinical data. For example, we could not account for oxygen saturation or respiratory rate for pneumonia patients, or ejection fraction for CHF patients. Therefore, our findings must be interpreted with caution.

II.9.B. Residents Treated On-Site Were Less Likely to Experience Adverse Subsequent Events Compared to Residents Treated in the Hospital

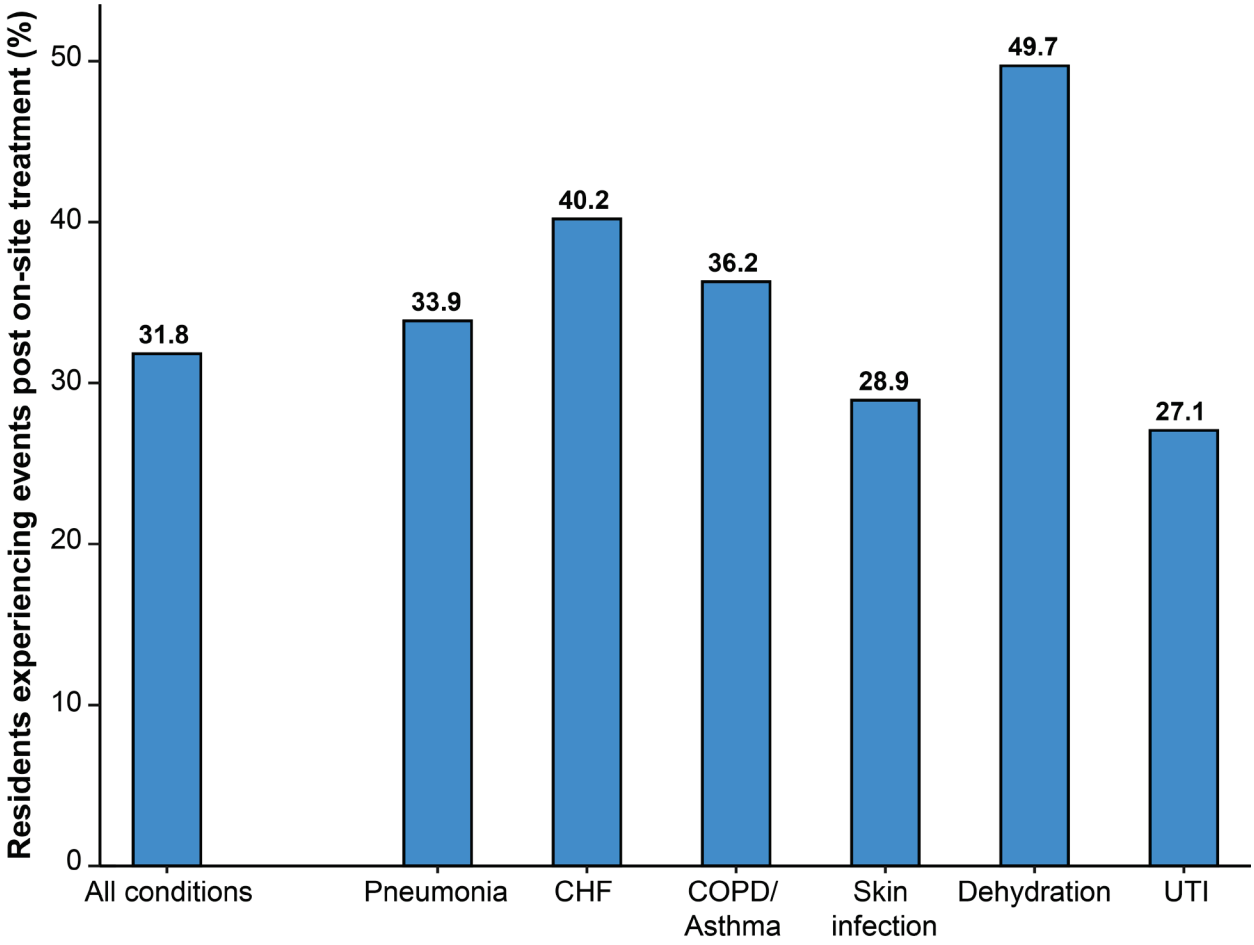
Figures II-31 and ***II-32*** display the percentage of resident on-site treatment episodes with a hospitalization, ED visit, death, or additional on-site treatment (not necessarily for the same condition) occurring within 30 days of the initial treatment. We present this for all conditions combined and each of the six qualifying conditions for FY 2017–FY 2019. Almost a third (31.8 percent) of residents treated on-site experienced a subsequent event within 30 days. Specifically, 15.8 percent residents treated on-site underwent additional on-site treatment, 9.9 percent experienced hospitalization, 7.7 percent died, and 4.8 percent had an ED visit within 30 days.

Residents experienced subsequent events differently across the conditions. Those treated on-site for dehydration experienced the most subsequent events (49.7 percent), almost twice as many as residents treated for UTI, who had the fewest post-treatment events (27.1 percent). Residents treated for dehydration also had the most subsequent deaths (21.0 percent). Residents treated on-site for CHF were the most likely to be treated again on-site (22.3 percent), whereas those treated for pneumonia were least likely (13.6 percent)**.** Residents treated for skin infection and UTI had the fewest deaths within 30 days (4.0 and 4.7 percent, respectively).

To have context for what these rates mean in practice, we remind the reader that the rate of billing for on-site treatment varied greatly by condition as described in ***Chapters II.3*** and ***II.4*** and ***Appendix K***. On-site treatment was most common for pneumonia and UTI, common for skin infection until FY 2019, and much less common for CHF, COPD/asthma, and dehydration.

Figure II-31. Percent of residents with any subsequent event following on-site treatment for six NFI 2 conditions, FY 2017–FY 2019

(events are within 30 days of initial treatment)



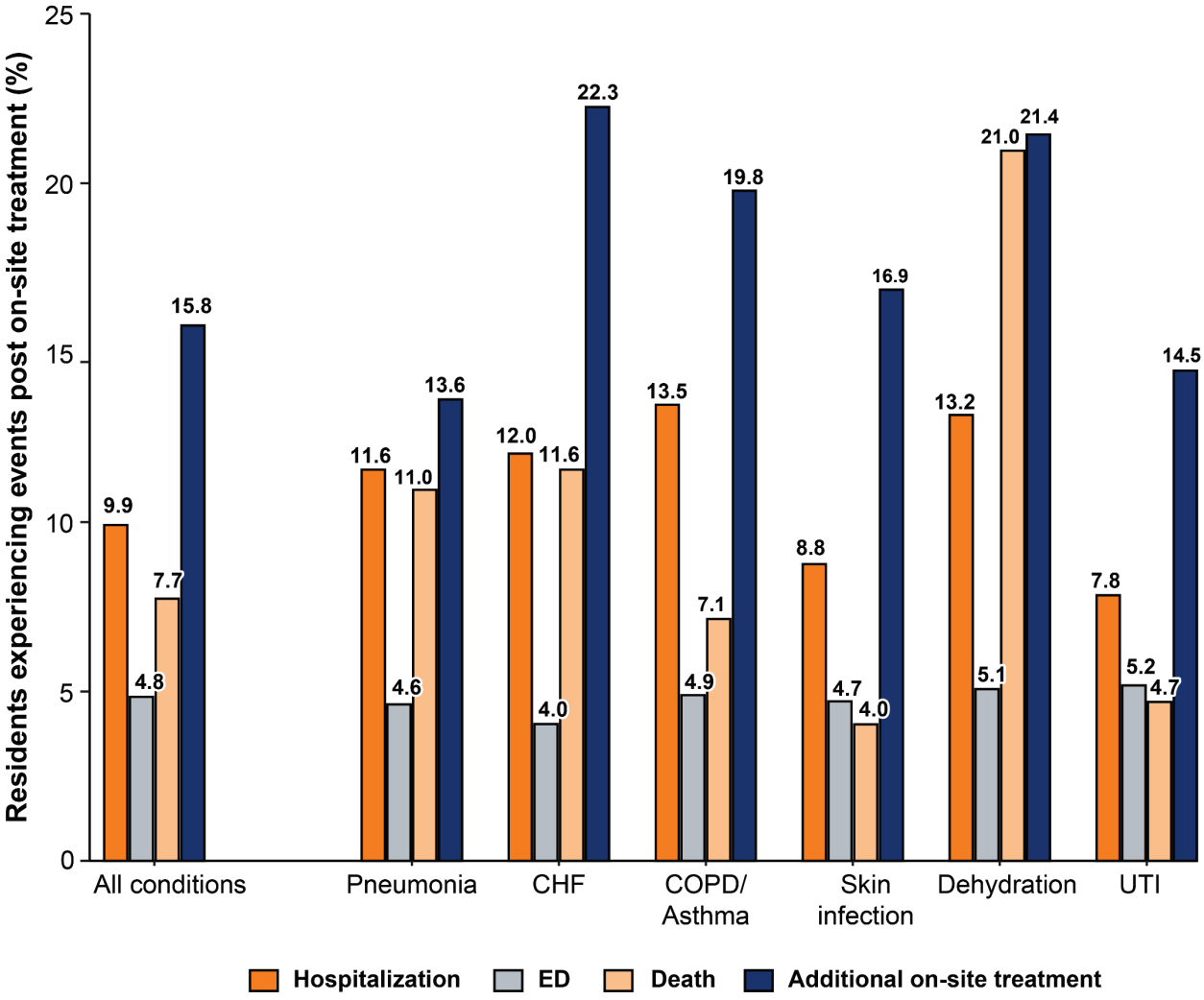
CHF = congestive heart failure; COPD = chronic obstructive pulmonary disease; UTI = urinary tract infection.

SOURCE: RTI analysis of Medicare claims data.

NOTE: Events include acute care transition (ACT), additional on-site treatment, or death.

Figure II-32. Percent of residents with specific subsequent events following on-site treatment for six NFI 2 conditions, FY 2017–FY 2019

(events are within 30 days of initial treatment)



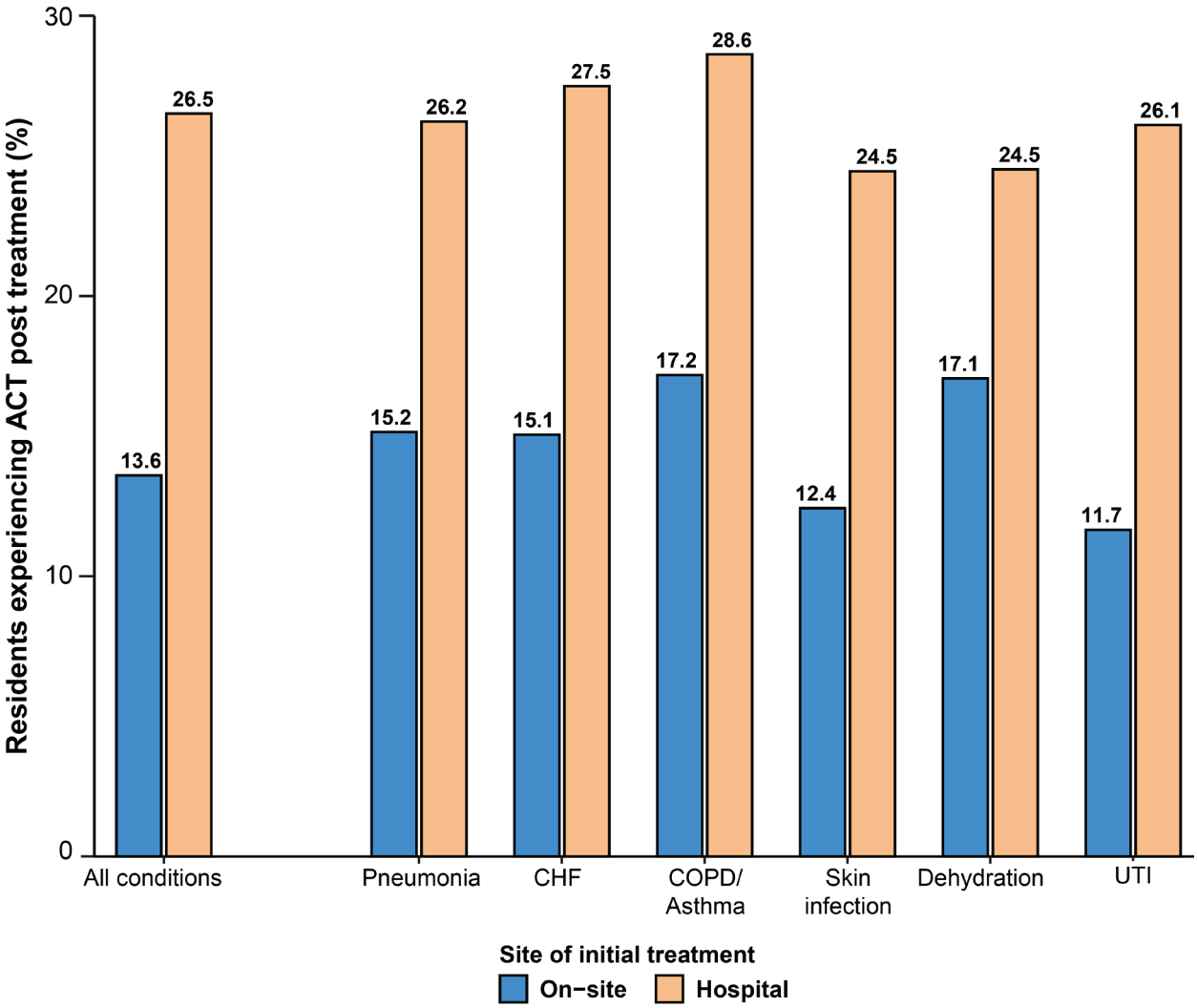
ED = emergency department visit or observation stay; CHF = congestive heart failure; COPD = chronic obstructive pulmonary disease; UTI = urinary tract infection.

SOURCE: RTI analysis of Medicare claims data.

Figures II-33 and ***II-34*** present the percent of residents experiencing subsequent ACTs or death within 30 days, and compares those initially treated on-site to those initially treated in the hospital (either an ED visit, observation stay, or inpatient hospitalization) for the six qualifying conditions. These are unadjusted results. Overall, those treated on-site underwent subsequent hospital treatment (13.6 percent) or died (7.8 percent) within 30 days of treatment far less often than those initially treated in the hospital (26.5 percent, and 17.0 percent, respectively). This pattern held for most of the conditions. For example, there were far fewer deaths among those treated on-site for CHF (11.9 percent) and pneumonia (10.9 percent) compared to those treated in the

hospital (24.2 percent and 23.8 percent, respectively). However, deaths within 30 days after treatment for dehydration were comparable across initial treatment settings.

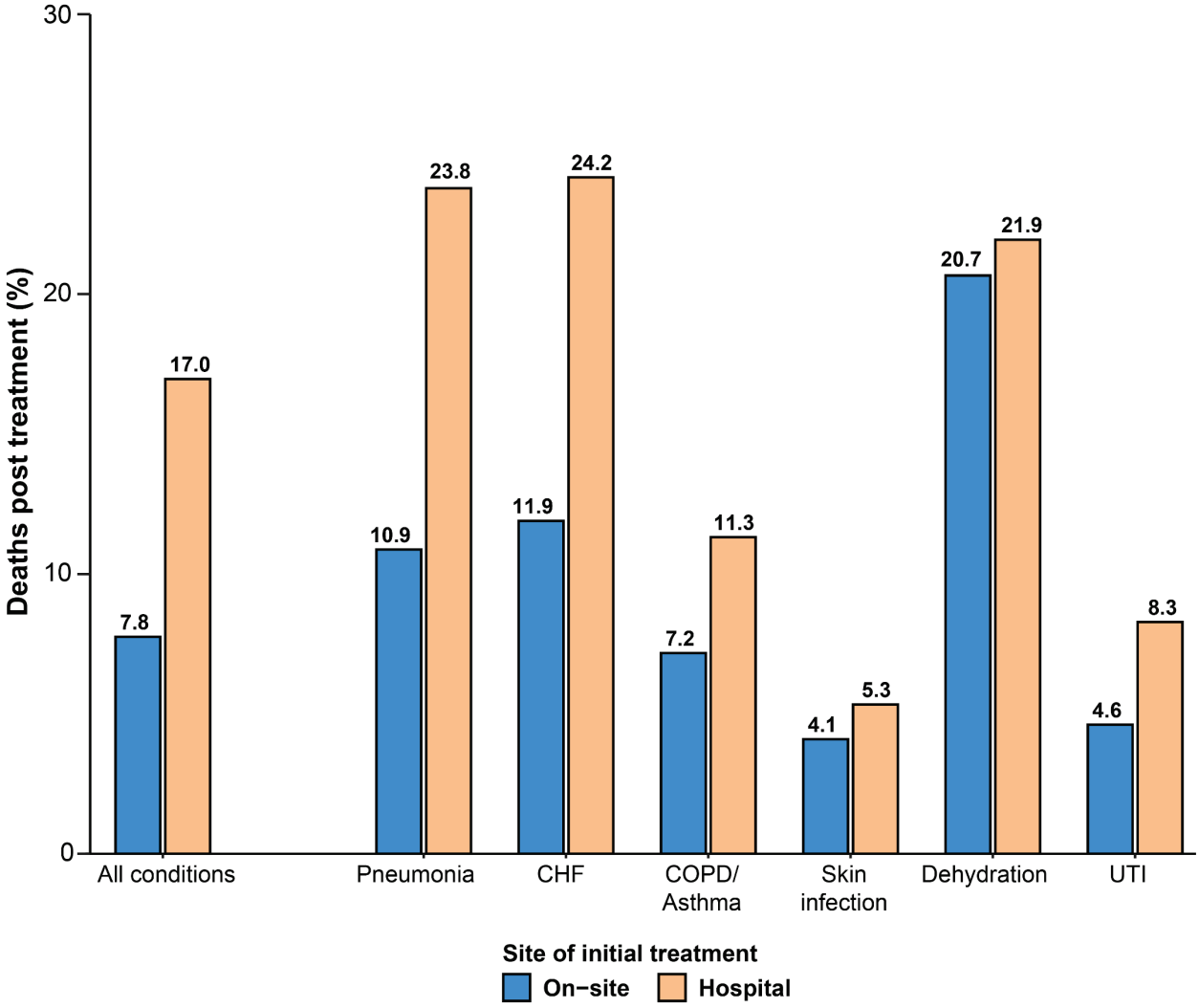
Figure II-33. Percent of residents with ACT within 30 days after treatment for six NFI 2 conditions, by site of initial treatment, FY 2017–FY 2019



ACT = acute care transition; CHF = congestive heart failure; COPD = chronic obstructive pulmonary disease; UTI = urinary tract infection.

SOURCE: RTI analysis of Medicare claims data.

Figure II-34. Percent of residents who died within 30 days after treatment for six NFI 2 conditions, by site of initial treatment, FY 2017–FY 2019



ACT = acute care transition; CHF = congestive heart failure; COPD = chronic obstructive pulmonary disease; UTI = urinary tract infection.

SOURCE: RTI analysis of Medicare claims data.

We conducted multivariate regression analyses to compare subsequent outcomes among those treated on-site to those treated in the hospital. These results account for those differences in baseline health status that we were able to observe in our data, including comorbidities based on hierarchical condition categories (HCCs), demographics, functional status, cognitive status, and treatment during the previous 30 days. Based on combining all conditions, treatment in the hospital, as opposed to treatment on-site, was associated with a statistically significantly higher likelihood of experiencing an ACT within 30 days (OR = 1.664, p = <0.001), and with a statistically

significantly higher likelihood of dying within 30 days (OR = 2.250, p = <0.001).[38] For those treated for dehydration, there was essentially no difference between those treated in the hospital and those treated on-site for either of the outcomes. Similarly, there was no statistically significant difference for the likelihood of dying for those treated for skin infections. For almost all other conditions, there were large and statistically significant differences, with those treated in the hospital consistently more likely to experience subsequent ACT and subsequent death (***Figure II-35***).

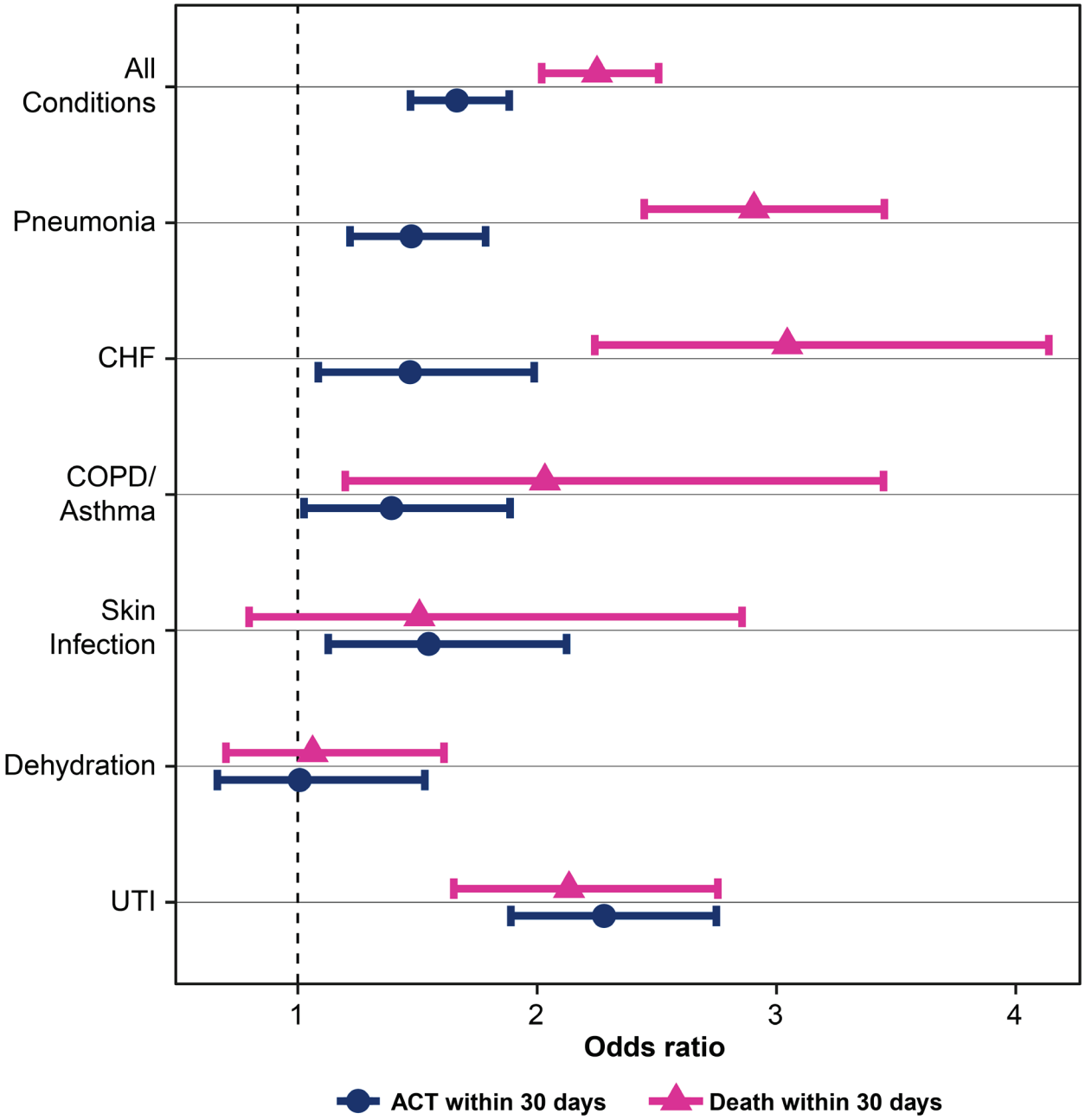
These results indicate that even after accounting for the observable differences between those treated for the six conditions on-site and those treated in the hospital, those treated in the hospital are substantially more likely to experience subsequent ACT and subsequent death for all conditions combined and most of the six conditions individually. There is no evidence that facilities are endangering residents by treating them on-site for the six NFI 2 conditions.

However, as already noted, this analysis does not account for differences in severity in the acute illnesses themselves. It is not clear to what degree the apparent advantage of being treated on-site reflects reduced risk of adverse outcomes due to avoiding a hospital stay and how much reflects unobserved differences in clinical severity between those treated on-site and those hospitalized. The differences we are observing presumably reflect the clinical judgment of physicians and nurses who are recommending hospitalization for those who are most sick in ways we cannot observe from claims data. Our results may indicate that in practice, on-site treatment is safe for those residents who are selected to be treated on-site instead of at the hospital. We provide additional details as well as the results based on propensity score matching in ***Appendix L*.**

[38] An OR of 1.00 indicates no difference in the estimated probabilities of a subsequent outcome between residents treated on-site and in the hospital.

Figure II-35. Odds ratio and confidence interval of an adverse event occurring following treatment for the six conditions: in-hospital compared to on-site

(corresponding numbers presented in ***Table L-13***)

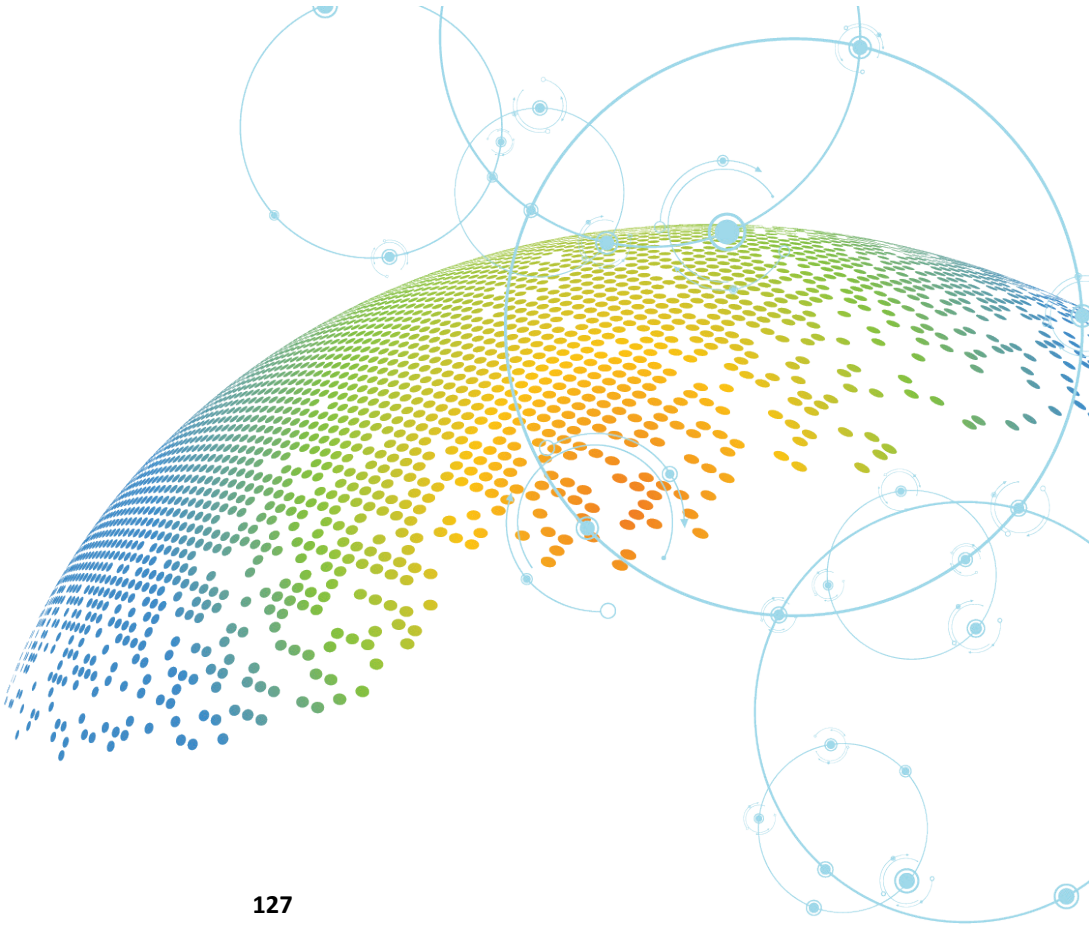


ACT = acute care transition; CHF = congestive heart failure; COPD = chronic obstructive pulmonary disease; UTI = urinary tract infection.

SOURCE: RTI analysis of Medicare claims data.

NOTE: Figure shows odds ratios and corresponding 95% Wald confidence intervals.

Section III. Simultaneously Assessing NFI 1 and NFI 2 Effects



Section III Summary

We performed a second set of difference-in-difference analyses on selected outcomes, where we simultaneously evaluated all three NFI interventions (Clinical-Only, Clinical + Payment, Payment-Only), and compared them to one another using a common baseline year. The results largely confirmed our previous findings from separate NFI 1 and NFI 2 analyses. However, unlike our original set of difference-in-difference analyses, this second set did not provide further evidence of any unfavorable increases in hospital-related utilization for the Clinical + Payment facilities.

Chapter III.1 Comparing NFI Interventions to Each Other

Key Takeaways

- *The results of simultaneously assessing the NFI 1 and NFI 2 effects on Initiative outcomes using a common baseline year confirmed our previous findings. Specifically, we found that the NFI 1 Clinical-Only intervention had a favorable impact on reducing hospital-related utilization and associated expenditures, and we did not find consistent evidence that the NFI 2 payment intervention in either group had an effect on reducing hospital-related utilization and associated expenditures.*
- *When comparing the total effect of Clinical + Payment to Payment-Only interventions, Clinical + Payment had a stronger effect on reducing hospitalizations and associated expenditures.*
- *Unlike our original set of analyses, the alternate set analyses described in this chapter did not provide further evidence of an unfavorable increase in hospital-related utilization for the Clinical + Payment facilities.*

III.1.A. Overview and Methods

In this section we present results of a difference-in-differences (DD) regression analysis that we designed in response to CMS's request to answer the following research question:

- Considering NFI intervention as a whole, how did the estimated effects of the three NFI intervention groups (NFI 1 Clinical-Only, NFI 2 Clinical + Payment, and NFI 2 Payment-Only) compare to each other?

We employed a DD analysis with a common comparison group and baseline (FY 2012) for all three NFI interventions (***Table III-1***): the Clinical-Only (C-O) intervention during FY 2014–FY 2016, the Clinical + Payment (C+P) intervention during FY 2017–FY 2019, and the Payment-Only (P-O) intervention during FY 2017–FY 2019. Note that although NFI 1 started in late 2012, it took time to "ramp up" the intervention. Therefore, we consider FY 2013 as a transition period and evaluate NFI 1 starting with FY 2014. Although we refer to the NFI 1 (FY 2014–FY 2016) intervention group as the C-O group, the intervention group included education-only interventions, and a combination of clinical and educational interventions. This DD analysis is similar to the analysis for our primary NFI 2 evaluation (***Chapter II.5***) and uses a national comparison group of residents in non-NFI states and controls for the same facility- and resident-level characteristics. However, the analysis differs from the primary NFI 2 analysis in the following important ways:

1. In the primary NFI 2 analysis we used FY 2014–FY 2016 as the baseline and incorporated linear trends into the models because of evidence that the parallel trends assumption did not hold. In the current analysis, we used FY 2012 as the baseline. We did not use data from years prior to FY 2012 so we could not test for parallel trends or incorporate linear trends.
2. We included data and corresponding model terms for both groups of Initiative facilities in the same model. In the primary NFI 2 analysis we ran separate models for the C+P and P-O groups.
3. In the same model we employed data and corresponding model terms for both Initiative periods (FY 2014–FY 2016 and FY 2017–FY 2019). Although we were also able to examine the effect during FY 2014–FY 2016 in the P-O facilities, we would not expect to detect any effect because no intervention took place during this time.

Table III-1. Overview of facility group definitions

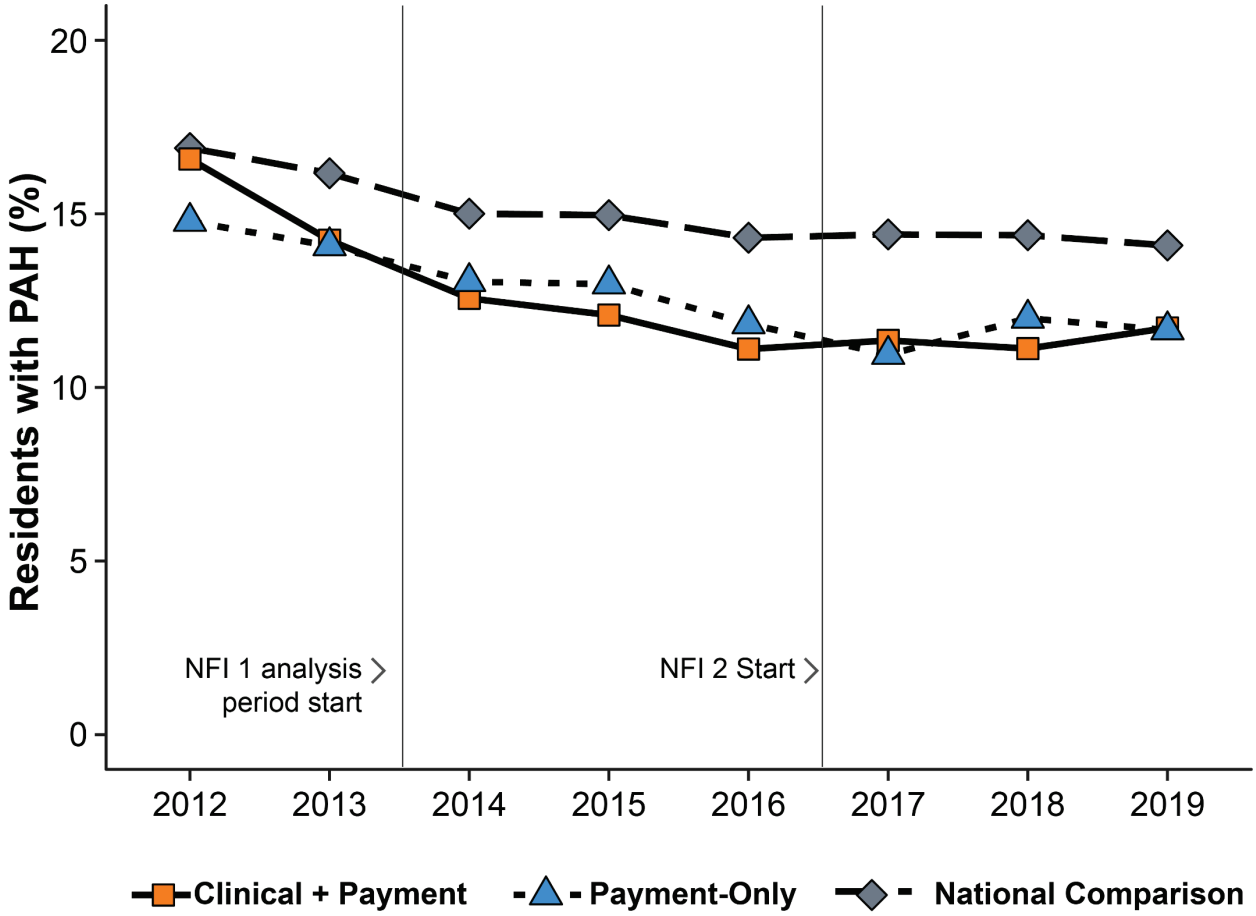
Clinical-Only	In NFI 1, also referred to as Phase 1 (FY 2012– FY 2016), participating (C-O) facilities, supported by Enhanced Care and Coordination Providers (ECCPs), implemented ECCP-specific clinical and/or educational interventions. After NFI 1 ended in 2016, CMS funded six of the original seven ECCPs to implement the payment reform in two nursing facility cohorts.
Clinical + Payment	C+P facilities were one of two Initiative groups during NFI 2, also referred to as Phase 2 (FY 2016–FY 2020). These facilities continued from NFI 1 and received NFI 2 payment incentives concurrently with many of the ECCP-specific clinical and educational interventions first implemented during NFI 1.
Payment-Only	P-O facilities were one of two Initiative groups during NFI 2. These facilities, recruited specifically for NFI 2, received only payment incentives and limited ECCP technical support.

Additional methodological details for this supplemental analysis are provided in ***Appendix X*** and ***Appendix Z*** provides an example of complete multivariate regression results for one of the models from this analysis***.*** We also performed a sensitivity analysis using a within-state reference group (WSRG) to account for state-level policy changes. These sensitivity analysis results are summarized below and presented in detail in ***Appendix Y***. Additionally, we will consider below and in ***Section V*** the relationship between the current set of analyses and the results we obtained from our main NFI 2 analysis using FY 2014–FY 2016 as the baseline period, as well as between these current results and the results obtained in the NFI 1 evaluation (RTI International, 2017).

III.1.B. NFI 1 and NFI 2 Initiative Impact on Utilization and Expenditure Outcomes Across All ECCPs

We calculated unadjusted descriptive statistics of utilization and expenditure outcome measures among Initiative-eligible residents in participating ECCP facilities and the national comparison group for FY 2012 through FY 2019 to provide context for the multivariate DD results below. ***Figure III-1*** illustrates the pattern over time for the percentage of residents with a potentially avoidable hospitalization and ***Figure III-2*** displays the pattern over time for potentially avoidable hospitalization expenditures per resident-year for each group. Full utilization descriptive results are presented in ***Appendix O*** (percentage) and ***Appendix P*** (rates), and full expenditure descriptive results are presented in ***Appendix Q***. During the FY 2012–FY 2019 period, a smaller percentage of intervention-eligible residents in both intervention groups were hospitalized than in the national comparison group. When comparing to FY 2012, most hospital-related utilization measures decreased more in the clinical intervention groups (C-O and C+P) in both intervention periods than in the national comparison group. In the case of the P-O group, most hospital-related utilization measures decreased more from FY 2012 to FY 2017–FY 2019 compared to the national comparison group. This unadjusted trend suggests that the Initiatives may have been effective in reducing, to differing degrees, potentially avoidable hospitalizations.

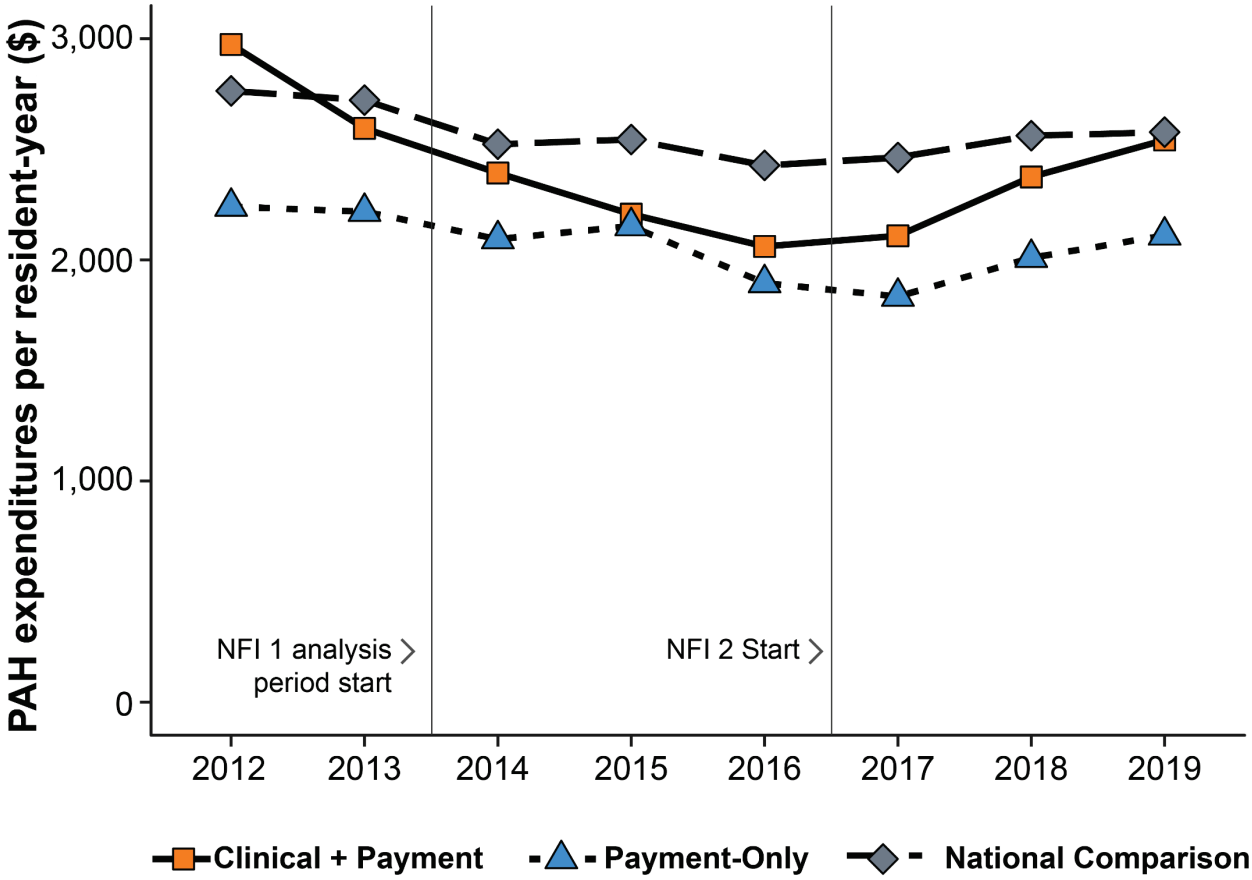
Figure III-1. All ECCPs: Percent of residents with a potentially avoidable hospitalization, FY 2012–FY 2019



PAH = potentially avoidable hospitalization.

SOURCE: RTI analysis of Medicare claims data.

Figure III-2. All ECCPs: Potentially avoidable hospitalization expenditures per resident-year, FY 2012–FY 2019



PAH = potentially avoidable hospitalization.

SOURCE: RTI analysis of Medicare claims data.

Our multivariate DD results confirm a favorable impact of the clinical interventions on reducing hospital-related utilization.

Our multivariate DD results indicate a favorable impact of the clinical interventions on reducing hospital-related utilization, which aligns with our NFI 1 evaluation results noted in ***Chapter I.1*** and described in detail in the NFI 1 final report (RTI International, 2017). This consistency holds despite some important differences between the methodology we employed here and the NFI 1 evaluation (***Appendix X***). Consistently, NFI 1 interviewees believed the Initiative had reduced avoidable hospitalizations in their facilities and attributed this success to the presence of the ECCP nurses who provided an "extra set of hands" in facilities. Whether these nurses provided clinical care and education or only education, the facility interviewees strongly supported the role of the ECCP nurses and their ability to enhance resident care.

As seen in ***Figures III-3***, ***III-5***, and ***III-7***, we found statistically significant reductions for all effect estimates for hospitalizations, emergency department (ED) visits, and acute care transitions (ACTs)

among residents in the NFI 1 C-O group. For example, for eligible residents in the C-O group, the probability of experiencing an all-cause hospitalization during FY 2014–FY 2016 decreased by 3.2 percentage points, which is statistically significant, from a predicted probability of 30.3 percent absent the NFI 1 clinical interventions as compared to the national comparison group. This is a significant decrease and corresponded to a 10.4 percent relative reduction in their predicted probability, as shown in ***Figure III-3***. We also found statistically significant reductions for almost all the corresponding expenditure categories, as well as for total Medicare expenditures (***Figure III-9, Figure III-11, Figure III-13***). The NFI 1 clinical intervention was associated with a 4.2 percent relative reduction in total Medicare expenditures.

We did not find consistent evidence that the NFI 2 payment incentive had a favorable impact on hospital-related utilization or associated expenditures in either the P-O group or the C+P group.

We did not find consistent evidence that the NFI 2 payment incentive had a favorable impact on hospital-related utilization or associated expenditures in either the P-O group or the C+P group.

Although the P-O group in Phase 2 (FY 2017–FY 2019) was associated with statistically significant favorable reductions in many utilization and expenditure outcomes, this should be interpreted cautiously and, in our opinion, is not evidence of a favorable Initiative impact. First, the magnitude of the effect tended to be much smaller than the effect associated with the clinical interventions. Second and more importantly, there were statistically significant favorable reductions in many utilization outcomes and one expenditure outcome for the P-O group in Phase 1 (FY 2014–FY 2016) as well, when no intervention took place. During NFI 1, we surveyed comparison facilities in ECCP states, finding that many non-NFI 1 facilities were engaged in separate efforts to reduce hospitalizations; it is possible that some of these facilities may have joined the P-O group for NFI 2. Although the magnitude of the effects was slightly stronger in Phase 2, none of the differences between the Phase 1 and Phase 2 effects were statistically significant. This is displayed in ***Figures III-4, III-6,*** and ***III-8*** for utilization outcomes and ***Figures III-10, III-12,*** and ***III-14*** for expenditure outcomes. For illustration, among residents in the P-O group in Phase 1, the Initiative was associated with a 0.9 percentage point reduction in the probability of having an all-cause hospitalization, and in Phase 2, the payment intervention was associated with a 1.9 percentage point reduction in the probability of having an all-cause hospitalization. This is a difference of 1.0 percentage point and we found that this difference was not statistically significantly different from zero ($p = 0.206$), indicating a lack of evidence that the Phase 2 payment intervention further reduced the probability of having an all-cause hospitalization.

There is also little evidence that adding a payment incentive in the facilities that participated in the NFI 1 clinical intervention reduced hospital-related utilization or associated expenditures beyond the reductions already achieved during NFI 1 (***Chapter II.2.C***). We found no meaningful differences between the Phase 1 (C-O) and Phase 2 (C+P) effects for almost all utilization and expenditure

measures. For example, both the clinical interventions alone and the clinical and payment interventions combined were associated with a 2.3 percentage point reduction in the probability of a potentially avoidable hospitalization (***Figure III-3***). However, we did find a meaningful difference for one outcome. The reduction in the probability of having an all-cause hospitalization did appear to strengthen by 1.6 percentage points in Phase 2 after the addition of the payment intervention, from a 3.2 percentage point reduction to a 4.8 percentage point reduction. As shown in ***Figure III-4***, the difference between the Phase 1 and Phase 2 estimated effects was statistically significant for this single outcome measure (p = 0.087). As the Initiative would be expected to impact hospitalizations for the six conditions more than all-cause hospitalizations, and as this was the only indication of an impact, we would be cautious about interpreting this an Initiative effect.

When making a direct comparison, the clinical interventions introduced in NFI 1 and continued throughout NFI 2 appear to have had more of an impact than the payment interventions alone on reducing hospital use. We found a number of statistically significant differences between the effect estimates from the NFI 2 C+P intervention and the NFI 2 P-O intervention, for both utilization and expenditures. For example, the NFI 2 C+P intervention was associated with a $1,711 reduction in all-cause hospitalization expenditures per resident-year, while the NFI 2 P-O intervention was associated with a $596 reduction per resident year (***Figure III-9***). This is a difference of $1,115 per resident-year and we found that this difference was statistically significantly different from zero (p = 0.012), indicating that the NFI 2 C+P intervention was associated with a greater reduction in all-cause hospitalization expenditures than the NFI 2 P-O intervention (***Figure III-10***). Additionally, there were some statistically significant differences between the NFI 1 C-O intervention and NFI 2 P-O intervention, despite the fact that the NFI C-O intervention took place during FY 2014–FY 2016, and in both groups the reductions strengthened in FY 2017–FY 2019 compared to FY 2014–FY 2016. For example, the NFI 1 C-O effect was statistically significantly stronger than the NFI 2 P-O intervention effect for reducing potentially avoidable hospitalizations (by 1.5 percentage points, p = 0.030) (***Figure III-4***).

With our DD analysis using FY 2014–FY 2016 as the baseline, we found no clear evidence that adding a payment incentive in NFI 2, whether in the C+P group or the P-O group, attained the NFI 2 goal of reducing potentially avoidable hospital-related utilization and associated costs in FY 2017–FY 2019. The analyses we performed using FY 2012 as the baseline year was consistent in also not providing evidence for reductions in potentially avoidable hospital utilization and associated costs.

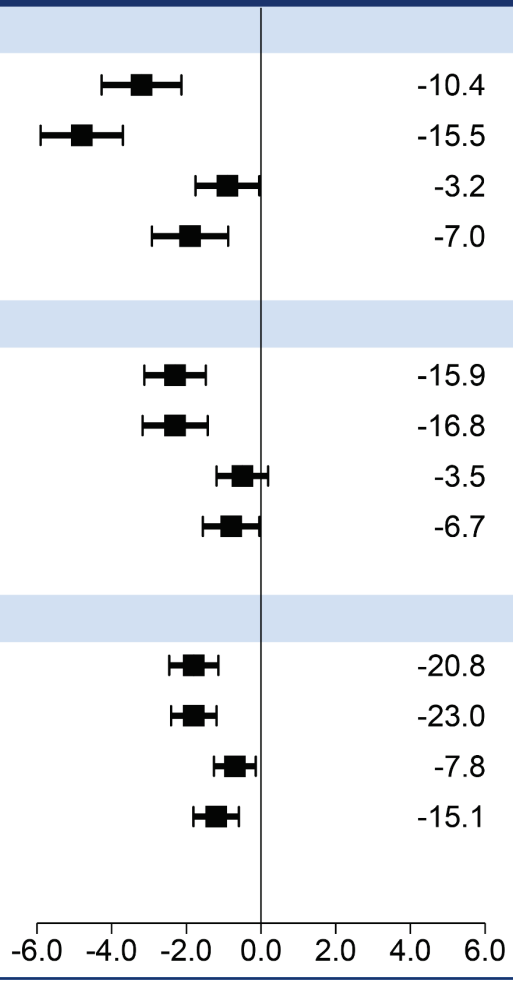
We also noted in ***Chapter II.5*** that there is some evidence based on our DD analysis using FY 2014–FY 2016 as the baseline that NFI 2 could have increased hospital-related utilization and associated costs for eligible residents in the C+P group. Our analysis using FY 2012 as the baseline year did not provide further evidence of an increase in utilization or expenditures for the C+P group. When comparing C+P to C-O, there was no indication that outcomes worsened.

As shown in detail in ***Appendix Y***, we conducted a sensitivity analysis using a WSRG, a comparison group consisting of non-Initiative nursing facilities in the same states as the Initiative facilities, instead of a national comparison group. For the NFI 1 C-O and the NFI 2 C+P groups, the sensitivity analysis results were very similar to the main analysis results. For the P-O group, the sensitivity analysis results were favorable but not as strongly favorable as the main analysis results. Overall, this sensitivity analysis confirms the findings of our main analysis—the clinical interventions appear to have had the desired effect, and we did not see evidence that the payment interventions reduced hospital-related utilization or associated expenditures.

Figure III-3. All ECCPs: Initiative effect on inpatient hospital utilization (2012 baseline), by NFI Intervention, FY 2014–FY 2016 and FY 2017–FY 2019

(probability of any utilization, per resident)

Measure	Predicted probability absent the Initiative (percent)	Initiative effect (percentage points)	Relative effect (percent)
All-cause			
Phase 1 C-O	30.3	-3.2	-10.4
Phase 2 C+P	30.7	-4.8	-15.5
Phase 1 P-O (no intervention)	27.1	-0.9	-3.2
Phase 2 P-O	27.2	-1.9	-7.0
Potentially avoidable			
Phase 1 C-O	14.6	-2.3	-15.9
Phase 2 C+P	14.0	-2.3	-16.8
Phase 1 P-O (no intervention)	13.3	-0.5	-3.5
Phase 2 P-O	12.5	-0.8	-6.7
Six qualifying conditions			
Phase 1 C-O	8.6	-1.8	-20.8
Phase 2 C+P	7.9	-1.8	-23.0
Phase 1 P-O (no intervention)	8.4	-0.7	-7.8
Phase 2 P-O	7.6	-1.2	-15.1

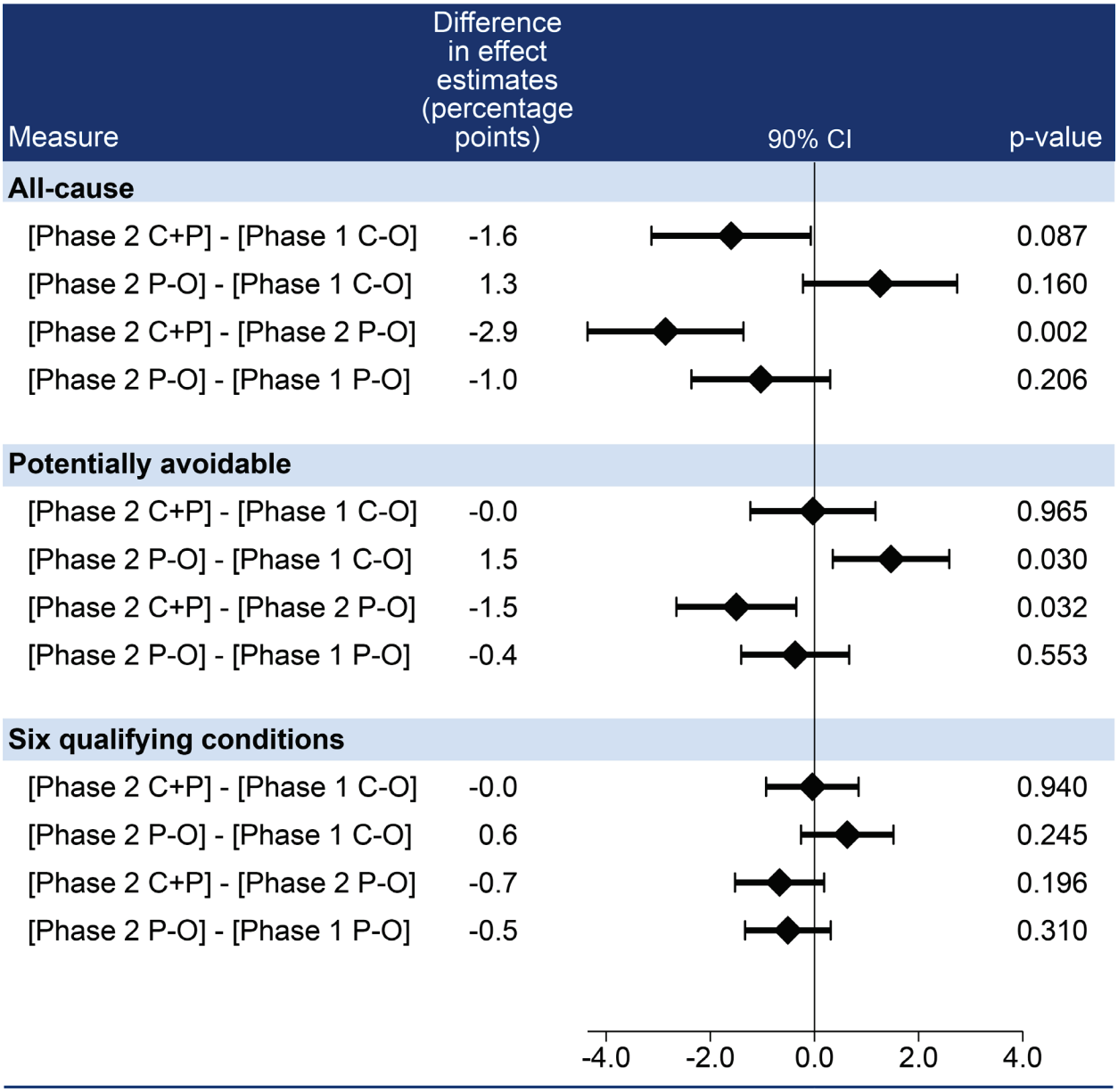


SOURCE: RTI analysis of Medicare claims data.

NOTES: 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) calculated using unrounded values; calculating the relative Initiative effect using the rounded values in this table will yield different values than those reported here. The magnitude of a relative Initiative effect could be large when the underlying denominator—the predicted level of the measure—is small. In such cases, the relative Initiative effect should be interpreted with caution.

Figure III-4. All ECCPs: Comparing the NFI intervention groups' effects on inpatient hospital utilization (2012 baseline), FY 2014–FY 2016 and FY 2017–FY 2019

(probability of any utilization, per resident)



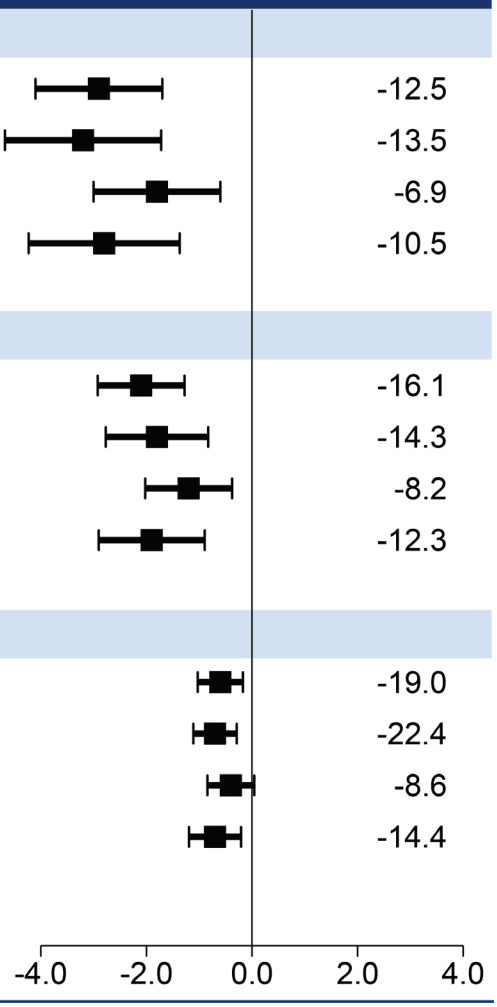
SOURCE: RTI analysis of Medicare claims data.

NOTES: The *difference in effect estimates* is the *Initiative effect* of the first group listed minus the *Initiative effect* of the second group listed. The Initiative effects of the different groups are displayed in ***Figure III-3***. The differences were calculated before any of the Initiative effects were rounded, so there may be slight differences between the differences listed in this table and the differences you would expect given the rounded values in ***Figure III-3***.

Figure III-5. All ECCPs: Initiative effect on ED utilization (2012 baseline), by NFI Intervention, FY 2014–FY 2016 and FY 2017–FY 2019

(probability of any utilization, per resident)

Measure	Predicted probability absent the Initiative (percent)	Initiative effect (percentage points)	Relative effect (percent)
All-cause			
Phase 1 C-O	23.0	-2.9	-12.5
Phase 2 C+P	23.4	-3.2	-13.5
Phase 1 P-O (no intervention)	25.8	-1.8	-6.9
Phase 2 P-O	26.6	-2.8	-10.5
Potentially avoidable			
Phase 1 C-O	12.8	-2.1	-16.1
Phase 2 C+P	12.8	-1.8	-14.3
Phase 1 P-O (no intervention)	14.9	-1.2	-8.2
Phase 2 P-O	15.1	-1.9	-12.3
Six qualifying condtions			
Phase 1 C-O	3.2	-0.6	-19.0
Phase 2 C+P	3.2	-0.7	-22.4
Phase 1 P-O (no intervention)	4.4	-0.4	-8.6
Phase 2 P-O	4.5	-0.7	-14.4



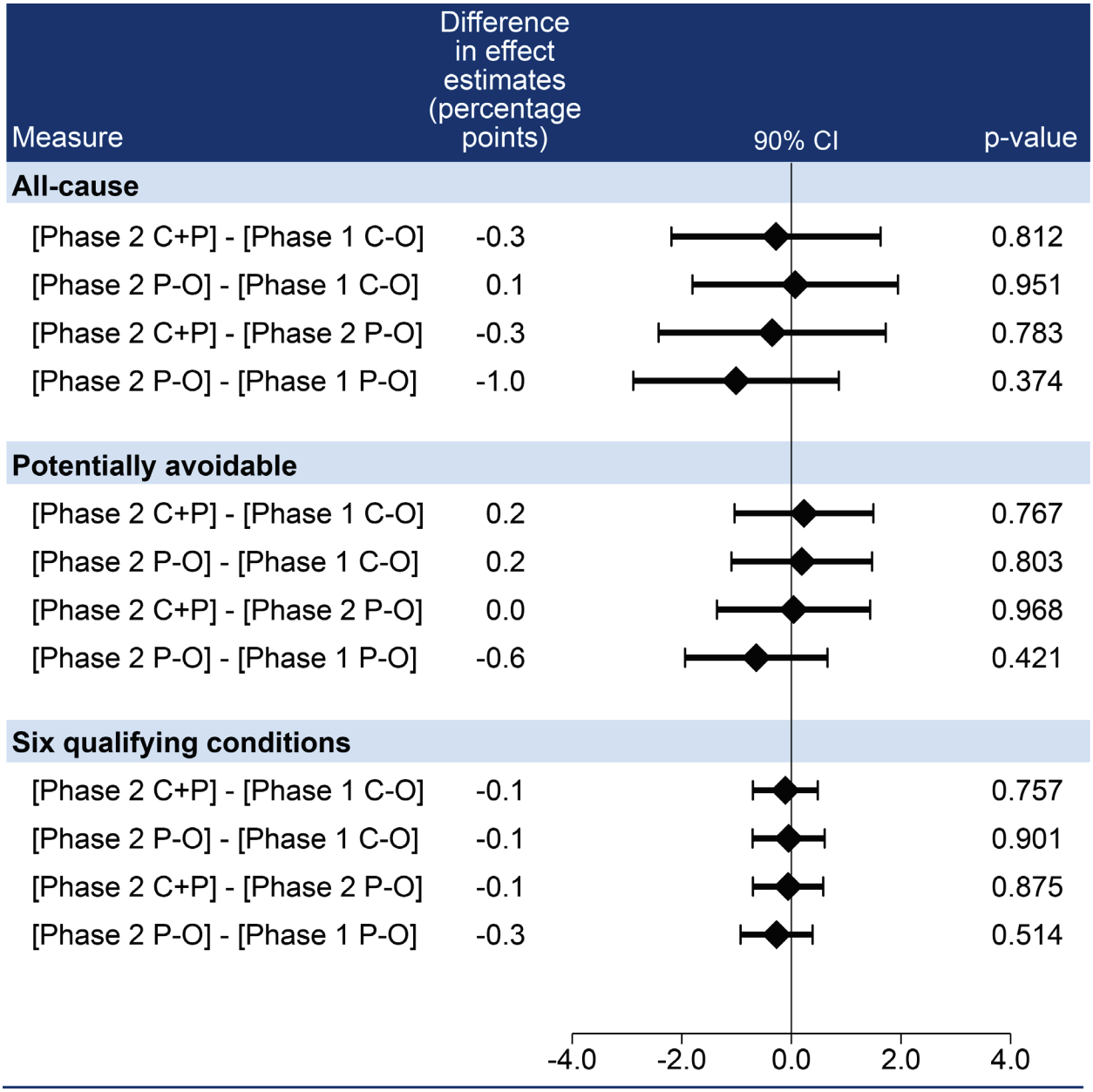
ED = emergency department

SOURCE: RTI analysis of Medicare claims data.

NOTES: 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) calculated using unrounded values; calculating the relative Initiative effect using the rounded values in this table will yield different values than those reported here. The magnitude of a relative Initiative effect could be large when the underlying denominator—the predicted level of the measure—is small. In such cases, the relative Initiative effect should be interpreted with caution.

Figure III-6. All ECCPs: Comparing the NFI intervention groups' effects on ED utilization (2012 baseline), FY 2014–FY 2016 and FY 2017–FY 2019

(probability of any utilization, per resident)



ED = emergency department

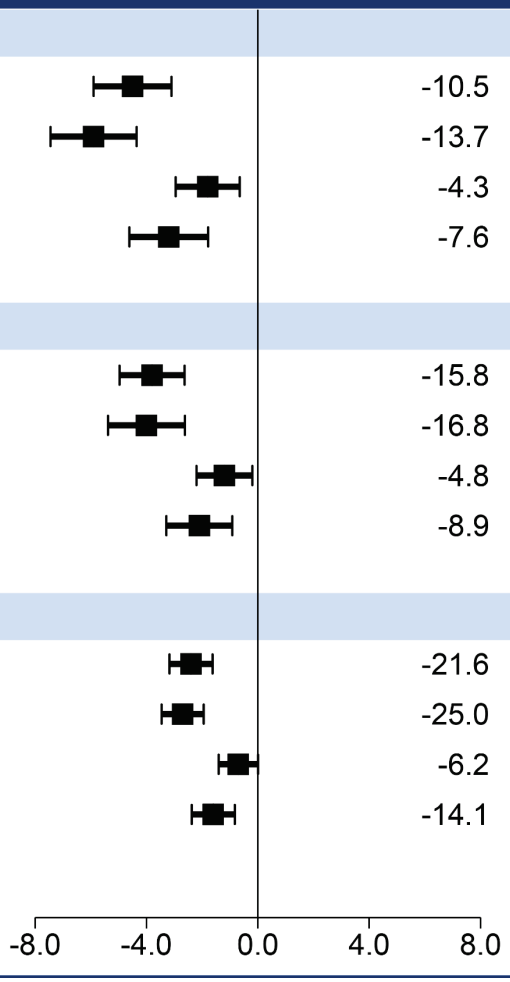
SOURCE: RTI analysis of Medicare claims data.

NOTES: The *difference in effect estimates* is the *Initiative effect* of the first group listed minus the *Initiative effect* of the second group listed. The Initiative effects of the different groups are displayed in ***Figure III-5***. The differences were calculated before any of the Initiative effects were rounded, so there may be slight differences between the differences listed in this table and the differences you would expect given the rounded values in ***Figure III-5***.

Figure III-7. All ECCPs: Initiative effect on ACT utilization (2012 baseline), by NFI intervention, FY 2014–FY 2016 and FY 2017–FY 2019

(probability of any utilization, per resident)

Measure	Predicted probability absent the Initiative (percent)	Initiative effect (percentage points)	Relative effect (percent)
All-cause			
Phase 1 C-O	42.6	-4.5	-10.5
Phase 2 C+P	43.1	-5.9	-13.7
Phase 1 P-O (no intervention)	41.6	-1.8	-4.3
Phase 2 P-O	41.9	-3.2	-7.6
Potentially avoidable			
Phase 1 C-O	24.4	-3.8	-15.8
Phase 2 C+P	23.9	-4.0	-16.8
Phase 1 P-O (no intervention)	24.3	-1.2	-4.8
Phase 2 P-O	23.9	-2.1	-8.9
Six qualifying conditions			
Phase 1 C-O	11.2	-2.4	-21.6
Phase 2 C+P	10.7	-2.7	-25.0
Phase 1 P-O (no intervention)	11.5	-0.7	-6.2
Phase 2 P-O	11.0	-1.6	-14.1



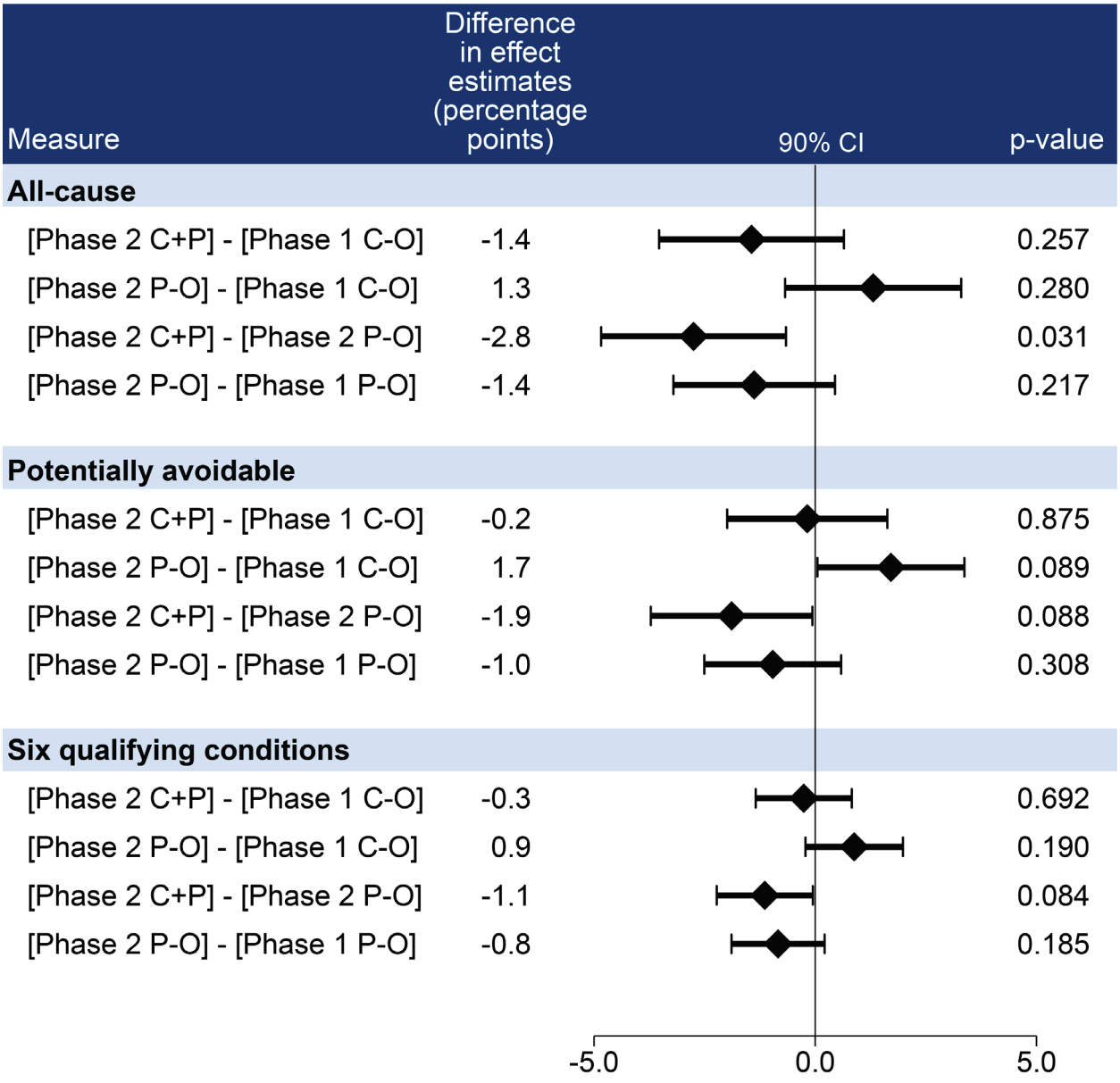
ACT= acute care transition

SOURCE: RTI analysis of Medicare claims data.

NOTES: 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) calculated using unrounded values; calculating the relative Initiative effect using the rounded values in this table will yield different values than those reported here. The magnitude of a relative Initiative effect could be large when the underlying denominator—the predicted level of the measure—is small. In such cases, the relative Initiative effect should be interpreted with caution. Acute care transitions include hospitalizations, ED visits, or observation stays.

Figure III-8. All ECCPs: Comparing the NFI intervention groups' effects on ACT utilization (2012 baseline), FY 2014–FY 2016 and FY 2017–FY 2019

(probability of any utilization, per resident)



ACT= acute care transition

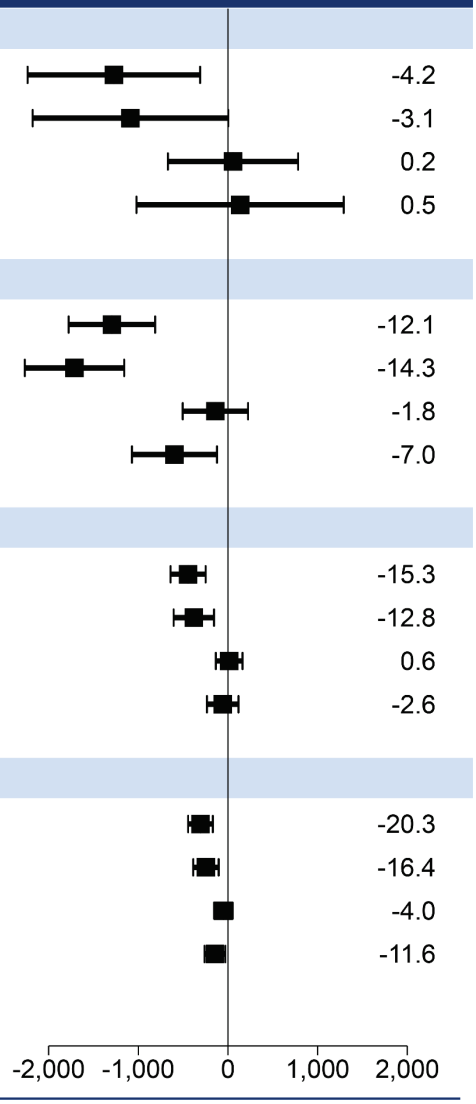
SOURCE: RTI analysis of Medicare claims data.

NOTES: The *difference in effect estimates* is the *Initiative effect* of the first group listed minus the *Initiative effect* of the second group listed. The Initiative effects of the different groups are displayed in ***Figure III-7***. The differences were calculated before any of the Initiative effects were rounded, so there may be slight differences between the differences listed in this table and the differences you would expect given the rounded values in ***Figure III-7***.

Figure III-9. All ECCPs: Initiative effect on total Medicare expenditures and inpatient hospitalization expenditures (2012 baseline), by NFI Intervention, FY 2014–FY 2016 and FY 2017–FY 2019

(dollars, per resident-year)

Measure	Predicted expenditure absent the Initiative (dollars)	Initiative effect (dollars)	Relative effect (percent)
Total Medicare			
Phase 1 C-O	30,094	-1,272	-4.2
Phase 2 C+P	34,542	-1,087	-3.1
Phase 1 P-O (no intervention)	25,153	57	0.2
Phase 2 P-O	28,526	136	0.5
All-cause hospitalizations			
Phase 1 C-O	10,691	-1,294	-12.1
Phase 2 C+P	11,965	-1,711	-14.3
Phase 1 P-O (no intervention)	7,777	-140	-1.8
Phase 2 P-O	8,523	-596	-7.0
Potentially avoidable hospitalizations			
Phase 1 C-O	2,900	-444	-15.3
Phase 2 C+P	2,964	-380	-12.8
Phase 1 P-O (no intervention)	2,250	14	0.6
Phase 2 P-O	2,267	-58	-2.6
Six qualifying conditions hospitalizations			
Phase 1 C-O	1,508	-306	-20.3
Phase 2 C+P	1,493	-245	-16.4
Phase 1 P-O (no intervention)	1,289	-51	-4.0
Phase 2 P-O	1,244	-145	-11.6



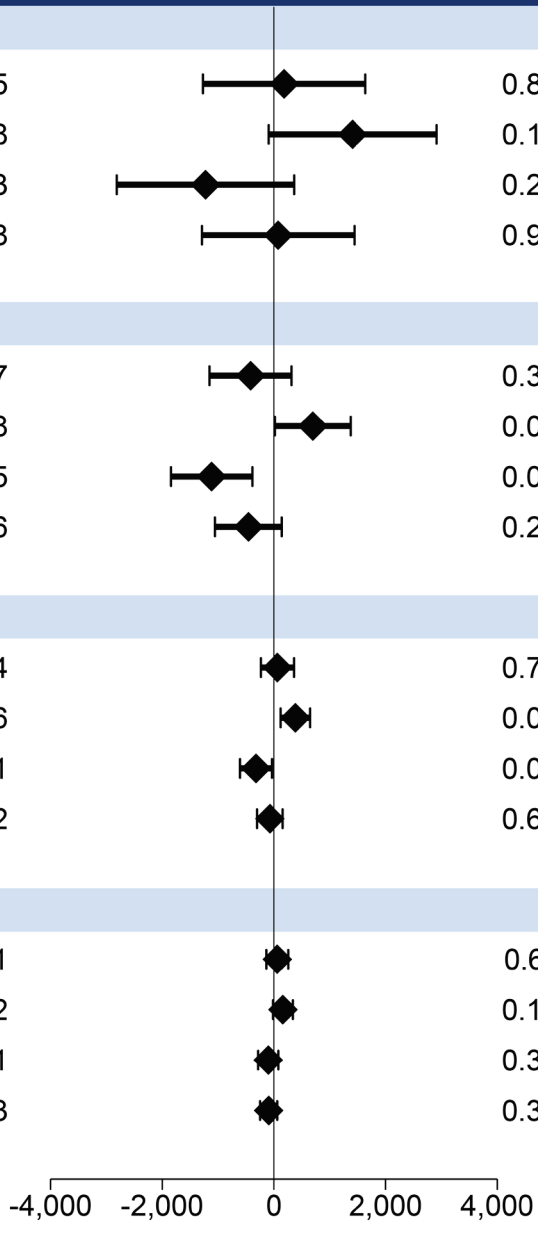
SOURCE: RTI analysis of Medicare claims data.

NOTES: The *predicted expenditure absent the Initiative* is the mean of the predicted expenditures, for the resident 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) calculated using unrounded values; calculating the relative Initiative effect using the rounded values in this table will yield different values than those reported here. The magnitude of a relative Initiative effect could be large when the underlying denominator—the predicted level of the measure—is small. In such cases, the relative Initiative effect should be interpreted with caution. 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.

Figure III-10. All ECCPs: Comparing the NFI intervention groups' effects on total Medicare and inpatient hospitalization expenditures (2012 baseline), FY 2014–FY 2016 and FY 2017–FY 2019

(dollars, per resident-year)

Measure	Difference in effect estimates (dollars)	90% CI	p-value
Total Medicare			
[Phase 2 C+P] - [Phase 1 C-O]	185		0.834
[Phase 2 P-O] - [Phase 1 C-O]	1,408		0.123
[Phase 2 C+P] - [Phase 2 P-O]	-1,223		0.205
[Phase 2 P-O] - [Phase 1 P-O]	78		0.925
All-cause hospitalizations			
[Phase 2 C+P] - [Phase 1 C-O]	-417		0.351
[Phase 2 P-O] - [Phase 1 C-O]	698		0.090
[Phase 2 C+P] - [Phase 2 P-O]	-1,115		0.012
[Phase 2 P-O] - [Phase 1 P-O]	-456		0.210
Potentially avoidable hospitalizations			
[Phase 2 C+P] - [Phase 1 C-O]	64		0.723
[Phase 2 P-O] - [Phase 1 C-O]	386		0.016
[Phase 2 C+P] - [Phase 2 P-O]	-321		0.064
[Phase 2 P-O] - [Phase 1 P-O]	-72		0.607
Six qualifying conditions hospitalizations			
[Phase 2 C+P] - [Phase 1 C-O]	61		0.611
[Phase 2 P-O] - [Phase 1 C-O]	162		0.139
[Phase 2 C+P] - [Phase 2 P-O]	-101		0.367
[Phase 2 P-O] - [Phase 1 P-O]	-93		0.323



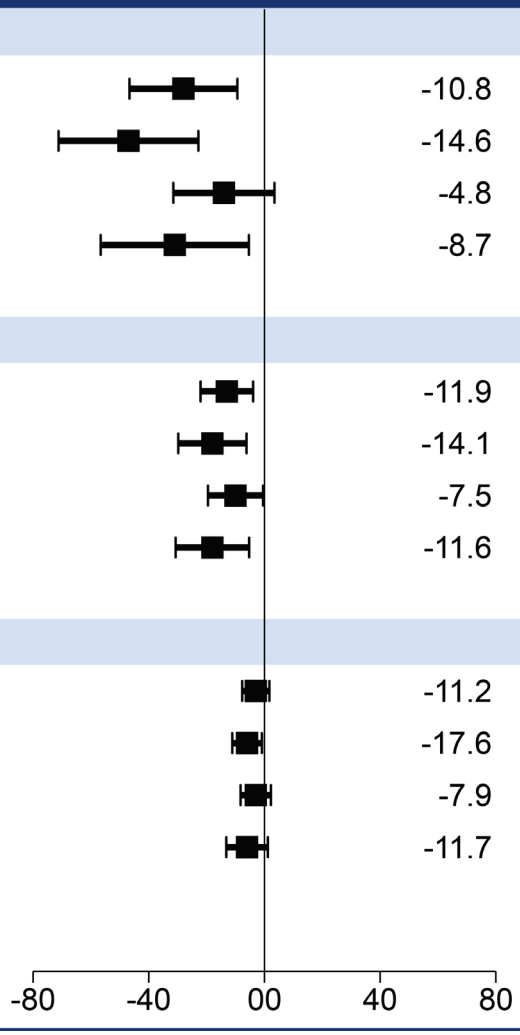
SOURCE: RTI analysis of Medicare claims data.

NOTES: The *difference in effect estimates* is the *Initiative effect* of the first group listed minus the *Initiative effect* of the second group listed. The Initiative effects of the different groups are displayed in ***Figure III-9***. The differences were calculated before any of the Initiative effects were rounded, so there may be slight differences between the differences listed in this table and the differences you would expect given the rounded values in ***Figure III-9***.

Figure III-11. All ECCPs: Initiative effect on ED visit expenditures (2012 baseline), by NFI Intervention, FY 2014–FY 2016 and FY 2017–FY 2019

(dollars, per resident-year)

Measure	Predicted expenditure absent the Initiative (dollars)	Initiative effect (dollars)	Relative effect (percent)
All-cause			
Phase 1 C-O	263	-28	-10.8
Phase 2 C+P	318	-47	-14.6
Phase 1 P-O (no intervention)	290	-14	-4.8
Phase 2 P-O	352	-31	-8.7
Potentially avoidable			
Phase 1 C-O	109	-13	-11.9
Phase 2 C+P	127	-18	-14.1
Phase 1 P-O (no intervention)	131	-10	-7.5
Phase 2 P-O	154	-18	-11.6
Six qualifying conditions			
Phase 1 C-O	27	-3	-11.2
Phase 2 C+P	32	-6	-17.6
Phase 1 P-O (no intervention)	41	-3	-7.9
Phase 2 P-O	49	-6	-11.7



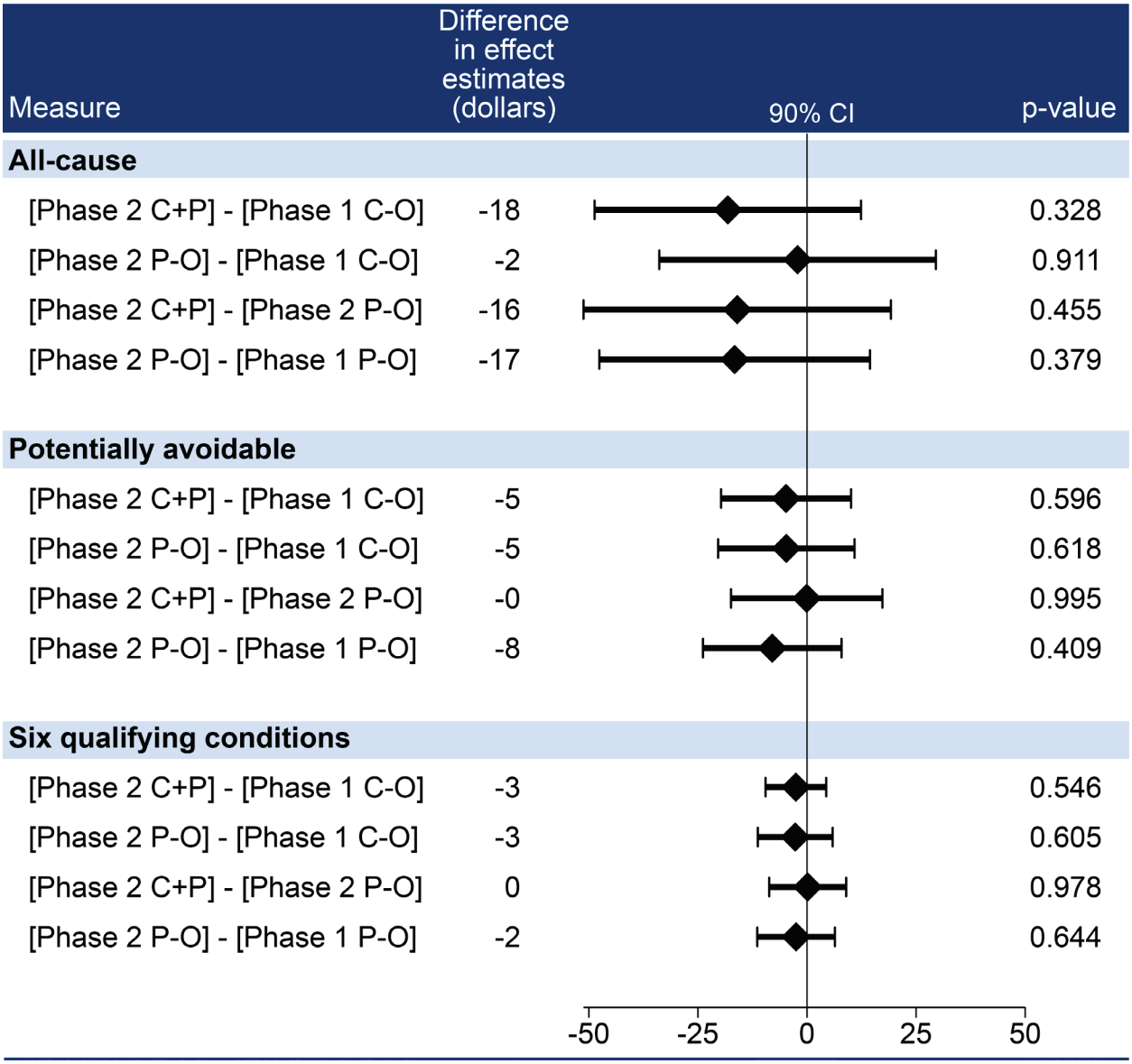
ED = emergency department

SOURCE: RTI analysis of Medicare claims data.

NOTES: The *predicted expenditure absent the Initiative* is the mean of the predicted expenditures, for the resident 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) calculated using unrounded values; calculating the relative Initiative effect using the rounded values in this table will yield different values than those reported here. The magnitude of a relative Initiative effect could be large when the underlying denominator—the predicted level of the measure—is small. In such cases, the relative Initiative effect should be interpreted with caution.

Figure III-12. All ECCPs: Comparing the NFI intervention groups' effects on ED visit expenditures (2012 baseline), FY 2014–FY 2016 and FY 2017–FY 2019

(dollars, per resident-year)



ED = emergency department

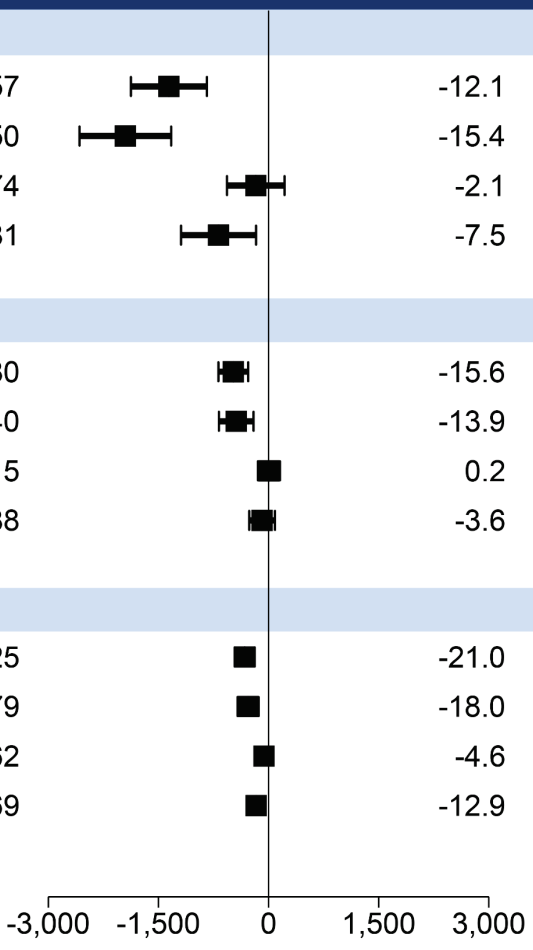
SOURCE: RTI analysis of Medicare claims data.

NOTES: The *difference in effect estimates* is the *Initiative effect* of the first group listed minus the *Initiative effect* of the second group listed. The Initiative effects of the different groups are displayed in ***Figure III-11***. The differences were calculated before any of the Initiative effects were rounded, so there may be slight differences between the differences listed in this table and the differences you would expect given the rounded values in ***Figure III-11***.

Figure III-13. All ECCPs: Initiative effects on ACT expenditures, by NFI Intervention (2012 baseline), FY 2014–FY 2016 and FY 2017–FY 2019

(dollars, per resident-year)

Measure	Predicted expenditure absent the Initiative (dollars)	Initiative effect (dollars)	Relative effect (percent)
All-cause			
Phase 1 C-O	11,235	-1,357	-12.1
Phase 2 C+P	12,653	-1,950	-15.4
Phase 1 P-O (no intervention)	8,179	-174	-2.1
Phase 2 P-O	9,030	-681	-7.5
Potentially avoidable			
Phase 1 C-O	3,066	-480	-15.6
Phase 2 C+P	3,157	-440	-13.9
Phase 1 P-O (no intervention)	2,402	5	0.2
Phase 2 P-O	2,450	-88	-3.6
Six qualifying conditions			
Phase 1 C-O	1,551	-325	-21.0
Phase 2 C+P	1,549	-279	-18.0
Phase 1 P-O (no intervention)	1,344	-62	-4.6
Phase 2 P-O	1,312	-169	-12.9



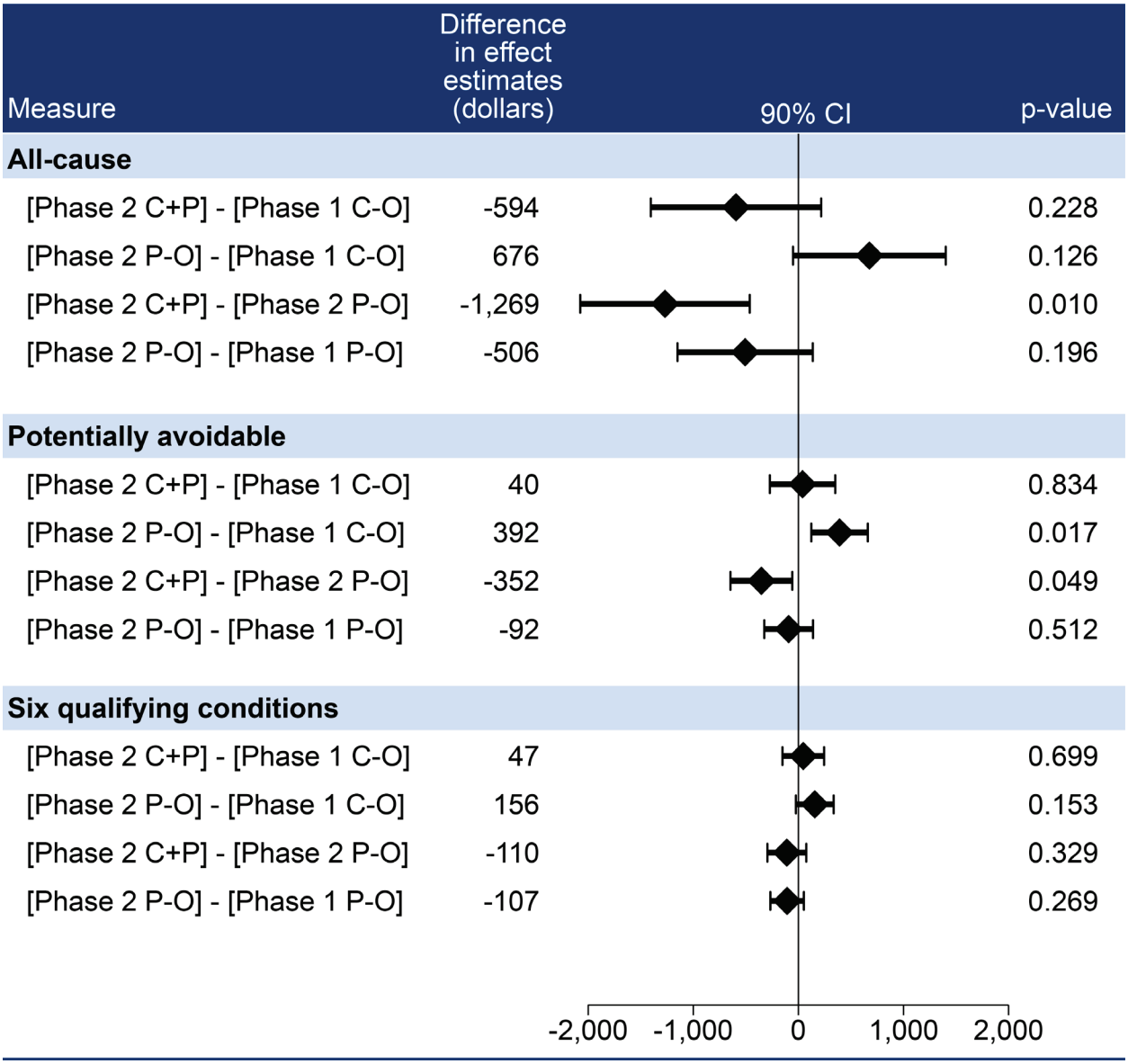
ACT = acute care transition

SOURCE: RTI analysis of Medicare claims data.

NOTES: The *predicted expenditure absent the Initiative* is the mean of the predicted expenditures, for the resident 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) calculated using unrounded values; calculating the relative Initiative effect using the rounded values in this table will yield different values than those reported here. The magnitude of a relative Initiative effect could be large when the underlying denominator—the predicted level of the measure—is small. In such cases, the relative Initiative effect should be interpreted with caution. Acute care transitions include hospitalizations, ED visits, or observation stays.

Figure III-14. All ECCPs: Comparing the NFI intervention groups' effects on ACT expenditures (2012 baseline), FY 2014–FY 2016 and FY 2017–FY 2019

(dollars, per resident-year)



ACT = acute care transition

SOURCE: RTI analysis of Medicare claims data.

NOTES: The *difference in effect estimates* is the *Initiative effect* of the first group listed minus the *Initiative effect* of the second group listed. The Initiative effects of the different groups are displayed in ***Figure III-13***. The differences were calculated before any of the Initiative effects were rounded, so there may be slight differences between the differences listed in this table and the differences you would expect given the rounded values in ***Figure III-13***.

Chapter III.2 NFI 1 and NFI 2 Initiative Impact on Utilization and Expenditure Outcomes for Individual ECCPs

Key Takeaways

- *We found that the NFI 1 Clinical-Only interventions had a favorable impact on reducing hospital-related utilizations and associated costs in five of the six individual ECCPs. However, we did not find consistent evidence that the NFI 2 payment intervention in either group had any impact in any of these individual ECCPs.*

We examined the impact of NFI 1 and NFI 2 for each ECCP individually using FY 2012 as the baseline. ***Table III-2*** displays relative Initiative effects for probability of hospitalization measures, total Medicare expenditures, and expenditures associated with the different hospitalization measures by ECCP. The full ECCP-specific results, using the FY 2012 baseline and employing the same model to compare all three interventions simultaneously to the national sample, are shown in ***Appendix X***.

The NFI 1 C-O interventions reduced hospital-related utilization and related expenditures in some of the individual ECCPs. Based on the full results presented in ***Appendix X***, we observed the strongest and most consistent favorable reductions in hospital-related utilization and expenditure measures, with many statistically significant reductions, for MOQI and RAVEN. Both of these ECCPs provided full-time nurses and advanced practice registered nurses (APRNs) who supported facility staff with both education and direct resident assessment and care. For OPTIMISTIC, which also provided full-time nurses and part-time APRNs to assist with resident care, there was a consistent

pattern of favorable reductions, with only a few of the reductions being statistically significant. For AQAF there was a consistent pattern of favorable reductions in utilization and expenditure measures, and most of the reductions were statistically significant. In NY-RAH there were consistent reductions, with a few statistically significant, although there was also one statistically significant increase. Both AQAF and NY-RAH provided full-time ECCP nurses to support participating facilities, but these ECCP staff delivered only facility staff education and training, no direct resident care. In ATOP, there was no evidence for any favorable reductions in either utilization or expenditure measures, with a couple of statistically significant increases. ATOP deployed part-time staff to provide some facility staff education and some limited resident care. These results described above are based on all 19 utilization and expenditure measures which are presented fully in ***Appendix X***, while ***Table III-2*** below only displays 7 of the 19 outcome measures.

As described more fully in ***Appendix X,*** we used somewhat different methods for these analyses than in the NFI 1 evaluation. The most important difference was that that in the NFI 1 evaluation we used within-state nursing facility residents as a comparison group and for the present evaluation we used a national comparison group of nursing facility residents. Generally, our findings align with our earlier results, but not in all cases. In our earlier NFI 1 evaluation (RTI International, 2017), the most consistent evidence of reductions in hospital-related utilization and expenditures was found for MOQI, OPTIMISTIC, and RAVEN.

Consistent with what we reported above for all ECCPs combined, our results show that the NFI 2 C+P interventions for each ECCP individually typically had similar effects as the respective NFI 1 C-O interventions. The NFI 2 C+P interventions in MOQI, RAVEN, and AQAF were associated with statistically significant reductions in several hospital-related utilization and expenditure outcomes; for NY-RAH, the NFI 2 C+P interventions were associated with many favorable reductions but also a few unfavorable increases; the OPTIMISTIC NFI 2 C+P intervention was associated with a few favorable reductions; and for ATOP2, NFI 2 C+P was associated with a few unfavorable increases (***Appendix X***). However, there were no statistically significant differences between the effects of the NFI 2 C+P intervention and the NFI 1 C-O intervention for any of the individual ECCPs, except for three outcomes for NY-RAH, where the NFI 2 C+P intervention was more favorable than the NFI 1 C-O intervention (results not shown). It is reasonable therefore to attribute the favorable impact of the NFI 2 C+P interventions to the ongoing NFI 1 clinical interventions, not to the NFI 2 payment intervention. This finding aligns with C+P facility interviewees' feedback that NFI 1 seemed to have more of an effect on hospitalization rates than NFI 2.

The P-O interventions were associated with consistent reductions in hospital-related utilization and, in some cases, expenditures, with some statistically significant reductions, in AQAF, OPTIMISTIC, NY-RAH, and RAVEN. As we stated above for all ECCPs combined, we believe this should be attributed mostly to changes that took place before the payment intervention was initiated, not to the payment intervention itself. In fact, there were no statistically significant differences between the effects of the NFI 2 P-O intervention and the Phase 1 P-O group effect, when no intervention took place (results not shown).

Table III-2. Relative Initiative effect (percentage change) on inpatient hospital-related utilization and expenditures by ECCP and NFI Intervention (2012 baseline), FY 2014–FY 2016 and FY 2017–FY 2019

Measure	All ECCPs (all states)	AQAF (AL)	ATOP2 (NV/CO)	MOQI (MO)	NY-RAH (NY)	OPTIMISTIC (IN)	RAVEN (PA)
Utilization per resident (probability of inpatient hospital utilization)							
NFI 1 C-O							
All-cause	−10.4***	−6.5	3.7	−20.1***	−7.8**	−1.0	−23.2***
Potentially avoidable	−15.9***	−8.3	−4.4	−29.9***	−12.2*	−7.4	−27.7***
Six qualifying conditions	−20.8***	−15.1	−6.5	−41.5***	−4.3	−21.6*	−37.0***
NFI 2 C+P							
All-cause	−15.5***	−7.5	−0.6	−24.7***	−18.4***	−2.9	−25.1***
Potentially avoidable	−16.8***	−6.4	−1.8	−34.9***	−21.0***	1.0	−21.5**
Six qualifying conditions	−23.0***	−19.0**	−2.3	−41.5***	−19.2**	−9.7	−33.2**
NFI 2 P-O							
All-cause	−7.0***	−3.7	−6.4	−1.0	−13.9***	0.8	−10.2**
Potentially avoidable	−6.7*	3.5	−11.1	−1.3	−14.7*	4.1	−16.9*
Six qualifying conditions	−15.1***	−9.4	−12.0	−9.3	−21.8*	−8.9	−23.2**
P-O during FY 2014–FY 2016 (no intervention)							
All-cause	−3.2*	−0.3	−7.8	1.7	−7.3**	2.3	−5.9
Potentially avoidable	−3.5	3.9	−7.6	−0.6	−8.3	6.7	−13.9**
Six qualifying conditions	−7.8*	−2.1	1.2	−8.4	−7.0	−6.5	−20.0***
Expenditures per resident-year							
NFI 1 C-O							
Total Medicare	−4.2**	−6.5**	−1.8	−2.3	1.9	0.4	−14.6***
All-cause	−12.1***	−16.2***	−7.5	−15.0***	−5.8	−2.9	−20.3***
Potentially avoidable	−15.3***	−11.4	−13.2	−16.8**	−11.6	−9.0	−25.6**
Six qualifying conditions	−20.3***	−23.0*	−3.0	−32.7***	−1.4	−26.3*	−34.2**
NFI 2 C+P							
Total Medicare	−3.1	−1.5	3.9	−0.1	1.6	−4.6	−12.9*
All-cause	−14.3***	−10.8*	−7.7	−16.8**	−15.1***	−7.0	−18.0*
Potentially avoidable	−12.8***	−3.2	0.0	−28.6***	−17.1**	2.1	−15.0
Six qualifying conditions	−16.4***	−15.6	20.4	−39.1***	−10.5	−5.4	−28.0*
NFI 2 P-O							
Total Medicare	0.5	−1.8	−1.4	−1.1	6.4	1.3	−5.2
All-cause	−7.0**	−10.4	−11.7	−2.6	−13.2	7.1	−5.4
Potentially avoidable	−2.6	−8.6	−4.6	7.4	−8.4	+19.4*	−18.0
Six qualifying conditions	−11.6**	−13.5	−10.4	−7.7	−11.4	1.1	−24.9**
P-O during FY 2014–FY 2016 (no intervention)							
Total Medicare	0.2	−3.9	−6.9**	−1.2	5.7	+5.4**	−3.9
All-cause	−1.8	−4.5	−6.7	−0.1	−4.6	10.4	−3.1
Potentially avoidable	0.6	−2.9	−0.3	4.4	−1.3	13.6	−8.5
Six qualifying conditions	−4.0	−8.0	3.6	−1.9	0.4	5.6	−20.6**

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

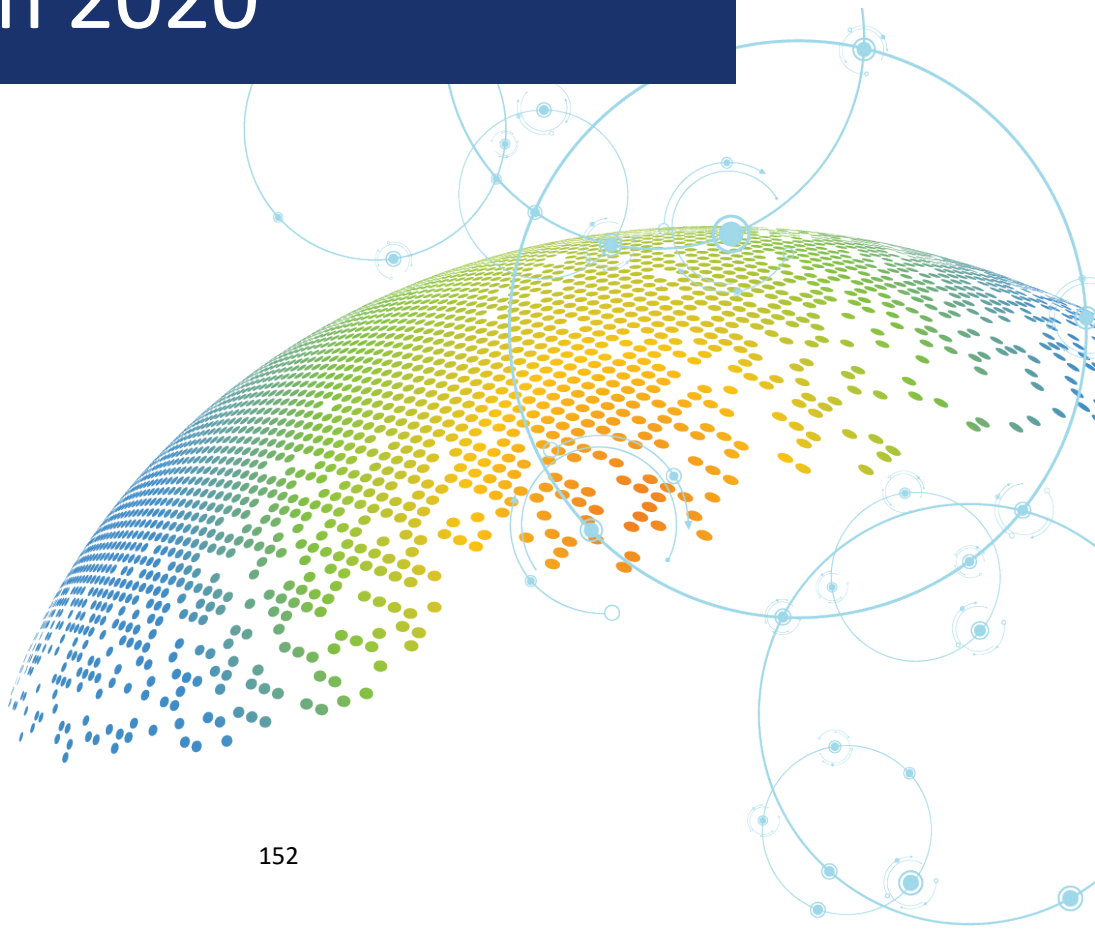
SOURCE: RTI analysis of Medicare claims data.

NOTES: ATOP2 consists of a C+P group in Nevada and P-O 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. The magnitude of a relative Initiative effect could be large when the underlying denominator—the predicted level of the measure—is small. In such cases, the relative Initiative effect should be interpreted with caution. All predictions are based on a difference-in-differences regression model with a national comparison group and adjusted for resident- and facility-level characteristics.

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.

Section IV. NFI 2 Implementation and Facility and Resident Outcomes During the COVID-19 Pandemic in 2020



Section IV Summary

The COVID-19 pandemic had a devastating impact on nursing facilities and created facility-wide operational challenges, impeding NFI 2 implementation in the final Initiative year. During the pandemic, facility NFI 2 billing declined considerably. The pandemic resulted in large increases in Medicare expenditures across Initiative and comparison group facilities, largely due to increases in hospital and skilled nursing facility expenditures. In contrast, many facilities experienced decreases in potentially avoidable hospitalizations. We also observed related undesirable increases for many MDS-based quality measures, as well as elevated mortality in both Initiative groups and the national comparison group.

Chapter IV.1 Policy Changes Impacting Nursing Facilities During the COVID-19 Pandemic in 2020

Key Takeaways

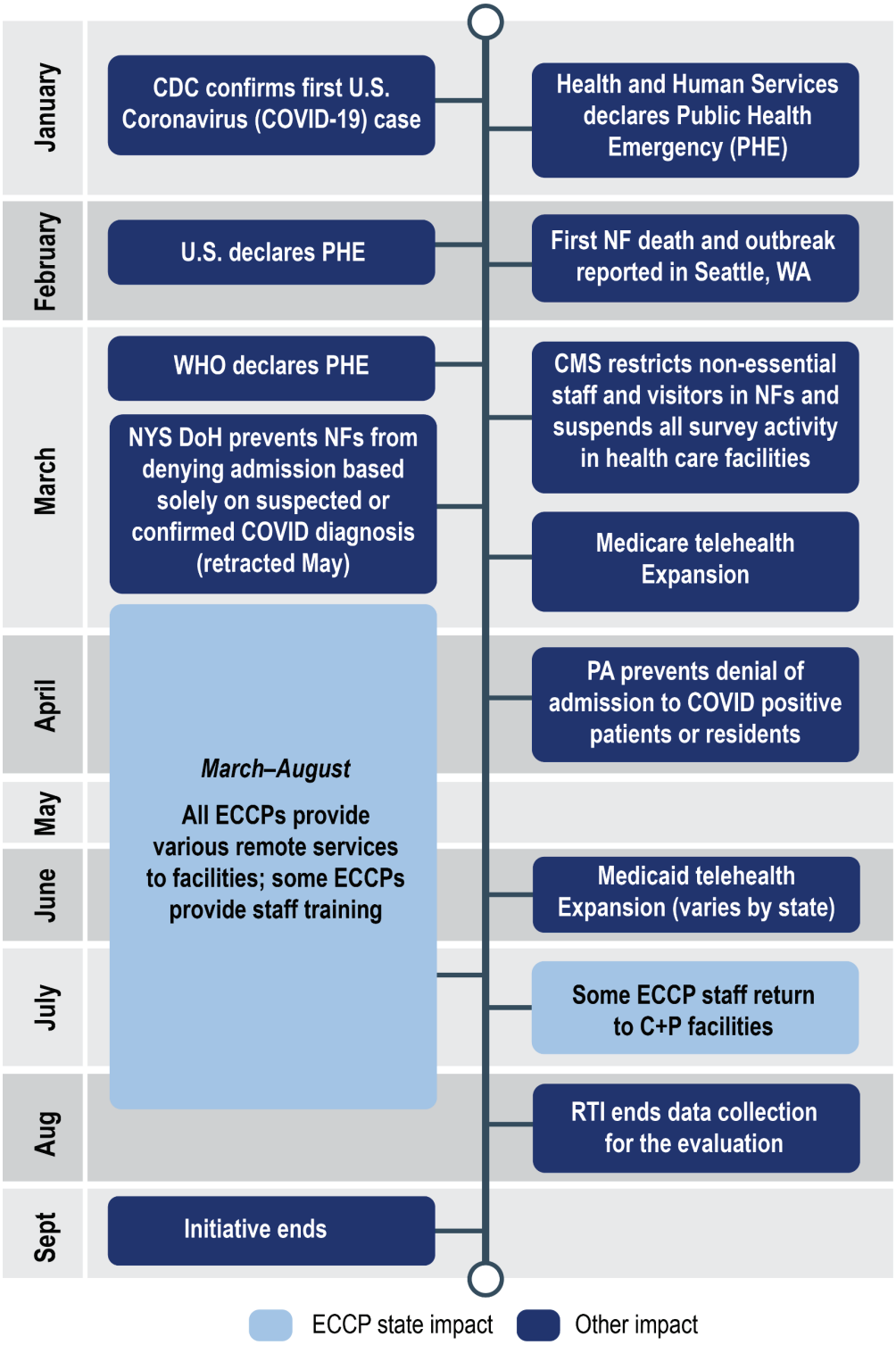
- *The COVID-19 pandemic created numerous challenges for nursing facility staff and residents, reducing facilities' focus on NFI 2 implementation in the final Initiative year.*

IV.1.A. Overview and Methods

Effective January 27, 2020, CMS declared a public health emergency in response to the growing COVID-19 pandemic. Nursing facilities faced numerous challenges related to COVID-19 throughout 2020, including rapid spread of the virus and substantial loss of life among facility residents. Because of these challenges, all ECCPs and participating facilities experienced difficulty maintaining implementation of NFI 2 through 2020 (***Figure IV-1***).

The COVID-19 pandemic spread quickly in March 2020 and affected Initiative implementation midway through the final year of NFI 2. Also, in March, CMS introduced a policy change in response to the pandemic, limiting nursing facilities to allow only essential facility staff into their buildings. As a result, ECCPs removed embedded ECCP nurses and staff in Clinical + Payment (C+P) facilities and halted in-person assessments, clinical care, education, and assistance with NFI 2 billing.

Figure IV-1. Timeline of COVID-19 NF Federal and State Policy Changes, ECCP Responses, and End of RTI Evaluation Data Collection



NOTE: NF= nursing facility; NYS DoH= New York State Department of Health

Participating nursing facilities experienced many challenges during the pandemic, including both residents and staff who tested positive for COVID-19, affecting morale and presenting staffing challenges. Unprecedented numbers of resident deaths (AARP, 2021; Chidambaram, 2020), along with staff deaths, also contributed to pandemic grief, making it nearly impossible for facilities to cope with anything beyond the daily struggle of managing the basics of resident care. Facilities also struggled with infection control, including shortages of personal protective equipment (PPE) for residents and staff. These factors contributed to an unstable environment, reducing Initiative engagement and resulting in very infrequent facility and practitioner NFI 2 billing. Additionally, for a period of time the pandemic precluded both facilities and ECCPs from working toward NFI 2 sustainability.

The following subsections describe how the pandemic limited NFI 2 engagement and reduced Initiative billing. We document ECCP efforts to maintain facility engagement and support facilities, with most ECCPs offering facility assistance during the pandemic that went beyond the types of facility support associated with NFI 2. We describe the challenges facilities experienced during March–August 2020 and outline differences in state responses to regulating COVID-19–positive resident admissions. We also include reports of improvements in end-of-life care resulting from the pandemic experience, as shared by three ECCPs.

During the pandemic, the RTI evaluation team, with CMS approval, limited our contact with participating facilities to avoid causing additional burden. Therefore, our understanding of what these facilities experienced is limited to interviews only with ECCP leadership about the broad impact of COVID-19 on participating facilities, not direct facility staff or leadership interviews.

COVID-19 Impact on Facility NFI 2 Engagement

Although most ECCP interviewees said they were unsure about NFI 2 claim volume changes due to COVID-19, two ECCPs, MOQI and NY-RAH, reported a decrease in claim volume. MOQI leaders shared that the pandemic "derailed a lot of energy with the facilities," and that Payment-Only (P–O) facilities had pushed the Initiative to "the back burner." Consequently, MOQI leadership felt a growing disconnect with facilities, stating that COVID-19 "so disrupted [their] relationship," and that "[they] could only do so much over [video]." Likewise, NY-RAH leadership explained that the ECCP reduced communication with facilities, "to give them the time they needed to focus on this emergency." Leadership additionally described how the pandemic had resulted in loss of contact with two C+P facilities.

IV.1.B. Strategies to Address COVID-19-Related Challenges

C+P

In response to the CMS policy changes restricting most non-essential staff access to all Medicare-Medicaid certified facilities, ECCPs removed embedded ECCP nurses and other ECCP staff from C+P facilities. ECCPs then pivoted to providing services remotely via an electronic chart system—a function they had already set up with most facilities, pre-pandemic. All ECCPs shared that facility-based ECCP staff were able to continue their remote access to most facilities' electronic medical records (EMRs). AQAF, ATOP, MOQI, and RAVEN advanced practice registered nurses (APRNs) were also able to provide clinical consultations, review charts, and track resident changes in condition telephonically. NY-RAH's quality improvement specialists (QISs) used their remote chart access for a special project to assess the prevalence of advance directives among Initiative-eligible residents who were COVID-19-positive.

ECCP strategies during the COVID-19 pandemic

- Remote chart reviews via facility access to electronic chart systems
- Telemedicine support
- Telephonic consultations

CMS also granted more widespread use of telehealth, including telemedicine, during the pandemic. Previously telehealth billing had been restricted to facilities and practitioners who served designated rural areas. Although it was unclear if any ECCPs outside Pennsylvania converted to using telehealth to certify resident condition changes for NFI 2, RAVEN C+P facilities were able to take advantage of Curavi telemedicine services, which were part of their intervention design prior to the pandemic. This telemedicine platform allowed RAVEN to pivot to a fully virtual support mode during 2020.

State Policies and Facility Responses

Policies enacted by ECCP states were among the many factors beyond the control of the ECCPs that affected nursing facility operations during the pandemic. On March 25, 2020, New York was the first state to prevent nursing facilities from using COVID-19 testing as a prerequisite for admission; the following month, in April, Pennsylvania also required facilities to accept residents discharged from hospitals with a COVID-19 diagnosis. Changes to participating facilities' units and protocols continued throughout spring 2020. An OPTIMISTIC facility became COVID-only, relocating non-COVID residents to other facilities, and all P-O facilities in ATOP2 reserved dedicated COVID-19 isolation units. Various other facilities across ECCPs also reported specific COVID-19 isolation units. Participating NY-RAH facilities had dedicated COVID-19 units from very early in the pandemic.

Timing of ECCP Staff Return

During the summer of 2020, some ECCPs reported diminishing COVID-19 cases and reengagement with NFI 2 prior to the end of the Initiative in September 2020. However, this reengagement was handled differently by each ECCP. In June, RAVEN leadership reported zero COVID-19 cases across all of University of Pittsburgh Medical Center's (UPMC's) facilities. Despite the positive news, RAVEN made the decision not to phase clinical staff back into facilities as leadership believed,

"It would be disruptive to try to … get people back into the facility while also having to pull out at the end of September."

– Interviewed NFA, AQAF

In July, NY-RAH reported that two QISs were permitted to return to their facilities, but all other C+P facilities continued to prevent ECCP staff access in response to the CMS restrictions on non-essential workers and visitors.

ECCP COVID-19 Support Beyond NFI 2

Because ECCP interviews focused on NFI 2 efforts during COVID-19, interviewees shared only limited details about other non-Initiative activities they or their facilities accomplished during the pandemic. Some ECCPs reported that they provided pandemic assistance to participating facilities that extended outside their NFI 2 responsibilities. MOQI leadership worked alongside their state's Quality Improvement Program for Missouri (QIPMO) to create a COVID-19–specific Situation Background Assessment and Recommendation (SBAR), which is now "circulating nationally" according to ECCP leadership. MOQI, also partnering with QIPMO, aided more than the 500 nursing facilities in Missouri with the distribution of 3,000 face shields. ATOP2's parent organization in Nevada, created a community forum for hospital and skilled nursing facilities/nursing facility representatives to discuss issues related to COVID-19; leadership shared that these forums forced the two entities to collaborate "in ways they haven't before," thus benefiting residents. NY-RAH leadership also described how one of their team members was temporarily used in support of the ECCP's organizational mission and assisted hospitals and nursing homes in New York City by helping with facility management, surge space, and supporting hospital surveys during the pandemic.

ECCP Achievements During the Pandemic

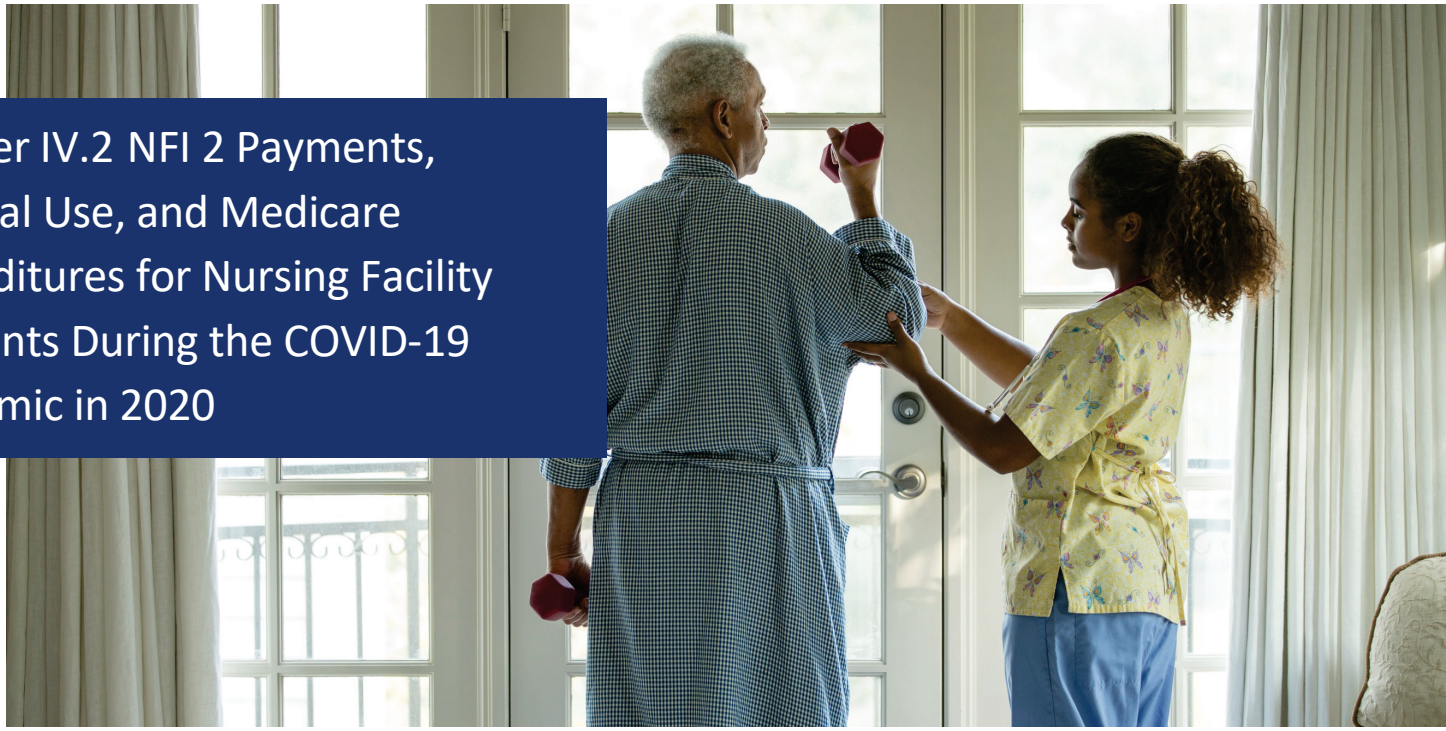
Given the speed with which COVID-19 spread throughout nursing facilities and affected resident mortality, two ECCPs reported improvements in end-of-life care. MOQI leadership shared that because of pandemic precautions that prohibited family nursing facility visits, pressure to be transferred to the hospital, versus receiving hospice care on-site, was lifted, thus increasing the number of residents choosing hospice care. NY-RAH leadership reported that as a result of QISs' remote review of resident advance directives, they found that advance directives were more often respected during the pandemic. Similarly, OPTIMISTIC nurses in C+P facilities supported improved

end-of-life outcomes by having end-of-life discussions with residents to identify whether the residents wanted to be hospitalized, given the pandemic environment. The OPTIMISTIC nurses incorporated facility staff in those conversations, increasing their comfort level with these end-of-life discussions.

IV.1.C. NFI 2 Sustainability

Prior to the pandemic, most ECCPs reported that they would provide training, printed materials, and other guidance to participating facilities to support continued efforts to identify resident changes in condition, facilitate facility and practitioner communication, and prevent avoidable hospitalizations, even beyond the end of the Initiative. However, numerous pandemic-associated Initiative challenges delayed or cancelled these sustainability plans. AQAF and ATOP2 noted that in the early months of 2020, the pandemic put a halt to sustainability education in facilities, with AQAF leadership stating that they, "didn't get to take [sustainability efforts] any further than the planning phase." However, both ECCPs noted that eventually, they were able to continue model sustainability education virtually. Four ECCPs (AQAF, MOQI, NY-RAH, and OPTIMISTIC) requested no-cost extensions to continue their sustainability plans beyond the original end of NFI 2 and to make up for lost time from March to August. Overall, ECCPs were hopeful that aspects of the Initiative, such as use of communication tools (e.g., INTERACT) and a focus on the six NFI 2 conditions, would still be maintained in facilities after the demonstration ended in September 2020.

Chapter IV.2 NFI 2 Payments, Hospital Use, and Medicare Expenditures for Nursing Facility Residents During the COVID-19 Pandemic in 2020



Key Takeaways

- *Recognizing the COVID-19 pandemic impact on NFI 2 implementation in FY 2020, the evaluation only included descriptive analysis of FY 2020 data.*
- *NFI 2 billing for on-site treatment largely declined in FY 2020.*
- *Across all groups, all-cause hospitalizations, and total Medicare expenditures were much higher in FY 2020 compared to other years. Much of the increase in expenditures is due to increased hospitalization and skilled nursing facility expenditures.*

IV.2.A. Overview and Methods

In this chapter and the following chapter, we address how NFI 2 was implemented during the COVID-19 pandemic and how our study outcomes of interest changed during this time. NFI 2 formally ended at the end of FY 2020 and therefore although the COVID-19 pandemic continued, we do not follow study outcomes past this point. In the current chapter, we describe the extent to which, in FY 2020, eligible residents in the Initiative facilities were treated in the hospital and on-site and describe Medicare expenditures. Our goal was to address the following questions:

- How did rates of facility and practitioner billing for on-site treatment change during FY 2020?

- How did utilization outcomes and Medicare expenditures differ for residents in FY 2020 compared to other Initiative years?

The analyses presented here are based on Medicare claims and MDS data from the FY 2017–FY 2020 period. These analyses only cover the period through September 2020 (end of FY 2020) and do not describe the experience of nursing facilities during later phases of the COVID-19 pandemic. We provide more details about the FY 2020 measures of in-hospital treatment and additional analytical details in ***Appendix J***. We constructed the sample population differently for FY 2020 than for other years because we did not perform any multivariate analyses for FY 2020 (see ***Appendix J*** for more detail).

We carefully considered whether it was appropriate to use MDS data for FY 2020 for the research purposes we described given that CMS granted flexibility to facilities regarding submission of MDS assessments because of the COVD-19 pandemic. Our conclusion was that we were comfortable using the MDS data, but there were some caveats; further details on data quality considerations are in ***Appendix J***.

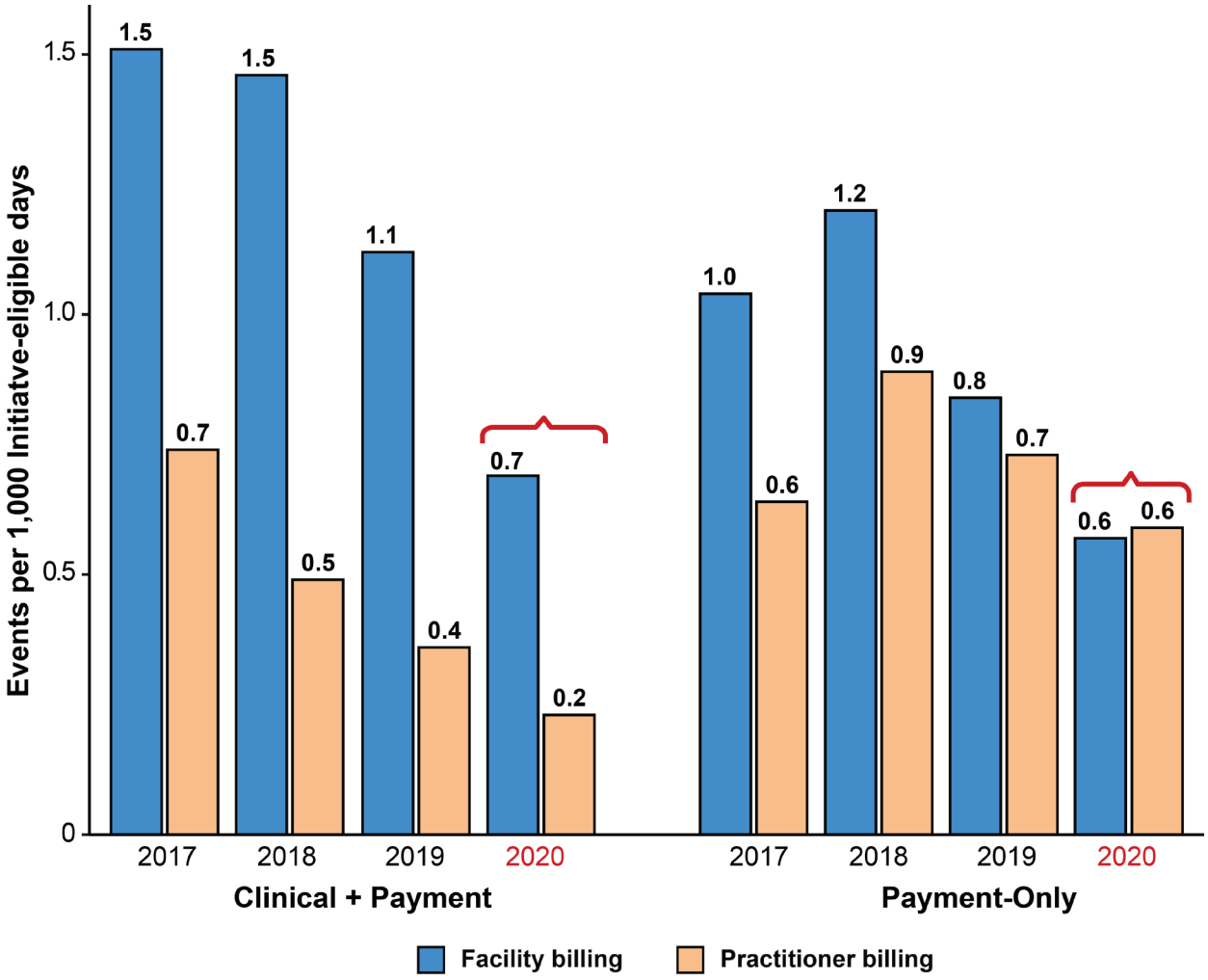
IV.2.B. Facility Billing for On-site Treatment in FY 2020

P-O

NFI 2 billing for providing on-site treatment continued until the end of FY 2020 (September 2020). As noted in ***Chapter II.4,*** facility and practitioner billing rates fell consistently throughout the Initiative period for the C+P group, and from FY 2018 to FY 2019 in the P-O group. In FY 2020, facility and practitioner billing declined substantially. In C+P facilities, billing decreased by nearly half, from an average 1.12 episodes per 1,000 Initiative-eligible resident-days in FY 2019 to 0.69 episodes in FY 2020. For P-O facilities, billing decreased from 0.84 episodes in FY 2019 to 0.57 episodes in FY 2020 (***Figure IV-2***). As in previous years, a small percent of facilities accounted for a disproportionate amount of total facility billing. In FY 2020, 50.7 percent of P-O facilities and 28 percent of C+P facilities did not bill for NFI 2 at all, and the top 10 percent of facilities accounted for most on-site billing expenditures: 54.5 percent for C+P facilities and 56.5 percent for P-O facilities (***Table IV-1***).

C+P

Figure IV-2. Facility and practitioner billing for all ECCPs combined, FY 2017–FY 2020



SOURCE: RTI analysis of Medicare claims data.

NOTES: The sample used here includes all residents meeting NFI 2 eligibility requirements. This sample is slightly larger than the final analytic sample used in this report's multivariate analyses, which further excludes any resident with a missing covariate of interest. For further details on the sample selection process, see ***Table I-3*** in ***Appendix I***.

Table IV-1. All ECCPs: Non-billing facilities and episodes billed by the top 10 percent of facilities, FY 2017–FY 2020

Year	Number of Facilities		Number of Non-Billing Facilities (% of Total Facilities)		% of Total Billing by Top 10% of Facilities	
	C+P	P-O	C+P	P-O	C+P	P-O
2017	112	148	9 (8.0)	23 (15.5)	24.0	31.0
2018	111	148	12 (10.8)	22 (14.9)	26.7	29.9
2019	111	148	17 (15.3)	49 (33.1)	29.5	39.1
2020	**111**	**148**	**32 (28.8)**	**75 (50.7)**	**54.5**	**56.5**

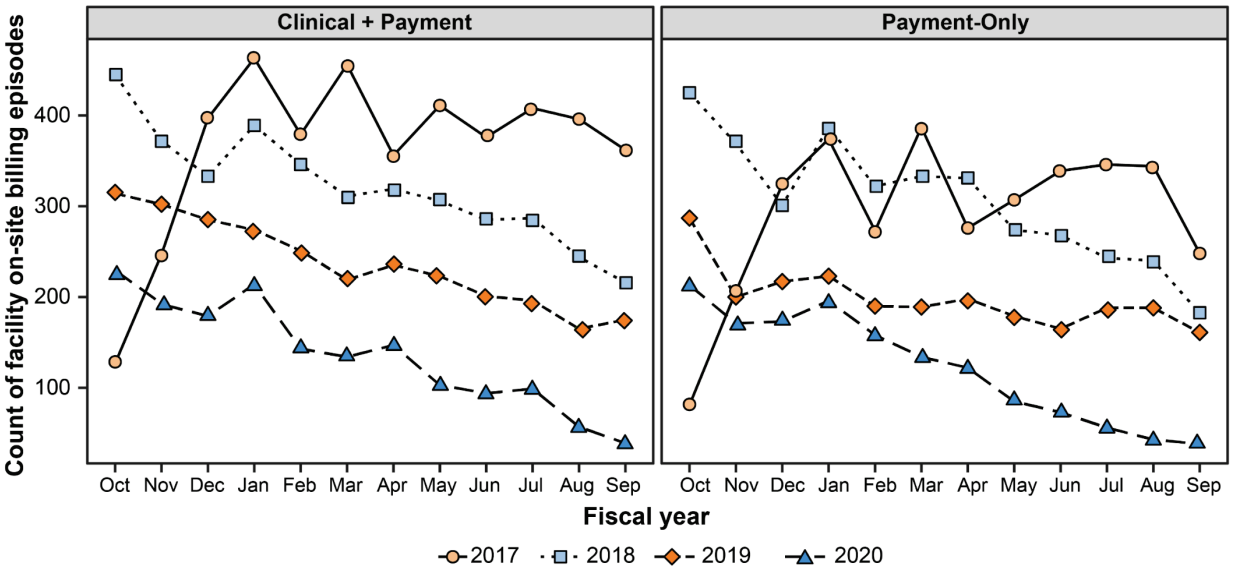
SOURCE: RTI analysis of Medicare claims data.

NOTES: Billing was measured based on the rate per 1,000 Initiative-eligible resident-days for all six qualifying conditions combined. The top 10 percent of facilities across all ECCPs were identified separately for each year, for each of the C+P and P-O groups. For example, for the C+P group in 2017, we selected the 12 facilities with the highest billing based on the rate of per 1,000 Initiative-eligible resident-days.

Billing for on-site treatment declined substantially in both groups during the COVID-19 pandemic. ECCP interviews suggested that facilities were largely unengaged with the Initiative due to other priorities during the COVID-19 pandemic.

We also examined monthly trends in billing throughout FY 2020 to understand how facility behavior changed over the course of the year (***Figure IV-3***). NFI 2 facilities were spread across seven geographically separated states and so experienced the pandemic differently. Our results show that billing declined consistently and steeply during FY 2020 for overall ECCPs combined. For specific ECCPs, there were some interesting patterns. For example, in April 2020 when the COVID-pandemic was at its worst in New York state, on-site billing increased in C+P facilities in NY-RAH, perhaps reflecting a potential increase in efforts to keep residents out of hospitals (***Appendix J***).

Figure IV-3 All ECCPs: Monthly count of on-site billing episodes, FY 2017–FY 2020



SOURCE: RTI analysis of Medicare claims data.

NOTES: The sample construction method used in FY 2020 differs from other Initiative years in that it does not exclude residents based on propensity score or missing covariates. For further details on the sample creation process, see ***Appendix J*** and ***Table I-3*** in ***Appendix I***.

This figure uses raw counts of billing episodes and does not adjust for the relative sizes of facilities or resident populations over time.

IV.2.C. Resident Outcomes During FY 2020

We examined resident hospitalization rates during the COVID-19 pandemic. In addition to measuring events that were all-cause, potentially avoidable, and related to the six qualifying conditions, as we reported for earlier years in ***Sections II*** and ***III*** and ***Appendices O*** through ***Q,*** we also identified events due to COVID-19 (see ***Appendix J*** for details).

Table IV-2 compares the hospitalization rates in FY 2020 against FY 2019. All-cause hospitalizations increased considerably in C+P facilities, with a 12 percent increase from FY 2019 to FY 2020; however, the P-O group had similar rates of all-cause hospitalization in both years. All-cause hospitalizations also increased modestly in the national comparison group. Potentially avoidable hospitalizations and hospitalizations due to the six conditions decreased in FY 2020. The increases in all-cause hospitalizations appear to be due to COVID hospitalizations. Additional descriptive results are available in ***Appendix O***.

Table IV-2. All ECCPs: Change in inpatient hospitalizations, FY 2019–FY 2020

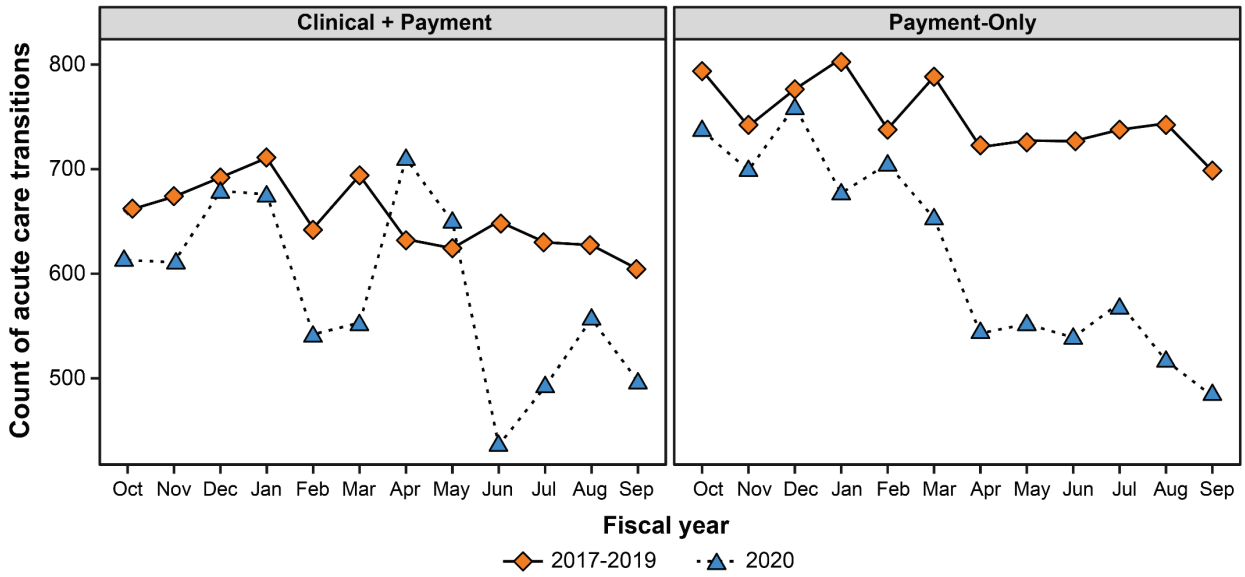
Group	FY 2019 (%)	FY 2020 (%)	Percent Change FY 2019–FY 2020 (%)
Percent Residents Hospitalized, All Cause			
P-O	26.1	26.2	0
C+P	26.1	29.5	12
National Comparison	30.1	32.1	6
Percent Residents Hospitalized, Potentially Avoidable Conditions			
P-O	11.7	10.5	−10
C+P	11.7	10.4	−12
National Comparison	14.1	13.0	−8
Percent Residents Hospitalized, Six Qualifying Conditions			
P-O	6.6	5.5	−16
C+P	6.2	4.9	−22
National Comparison	8.6	7.6	−11
Percent Residents Hospitalized, COVID			
P-O	—	3.7	—
C+P	—	6.6	—
National Comparison	—	5.8	—

SOURCE: RTI analysis of Medicare claims data.

NOTES: The sample construction method used in FY 2020 differs from other Initiative years in that it does not exclude residents based on propensity score or missing covariates. For further details on the sample creation process, see ***Appendix J*** and ***Table I-3*** in ***Appendix I***.

Figure IV-4 shows the monthly counts of acute care transitions (ACTs) in Initiative facilities. The counts for each month in FY2017–FY 2019 have been combined into a single monthly average to compare with the counts of ACTs from FY2020.

Figure IV-4. All ECCPs: Monthly count of acute care transitions, FY 2017–FY 2020



SOURCE: RTI analysis of Medicare claims data.

NOTES: The sample construction method used when we calculated monthly measures for all the years paralleled the sample construction used for FY 2020 analyses. See ***Appendix J***.
This figure uses raw counts of billing episodes and does not adjust for the relative sizes of facilities or resident populations over time.

IV.2.D. Medicare Expenditures During FY 2020

C+P & P-O

We examined total Medicare expenditures and specific categories of Medicare expenditures to understand spending patterns throughout the COVID-19 pandemic. Consistent with elsewhere in this report (except where noted), results reported in this section are annualized by resident eligible days (see ***Appendix I, Table I-7*** for more detail).

Table IV-3 shows unadjusted yearly mean total Medicare expenditures for both C+P and P-O in comparison to the national sample for 2019 and 2020. Overall, we observed a substantial increase in total Medicare expenditures across all groups in FY 2020. The increases were as high as a 35 percent increase in the C+P group for total Medicare expenditures. These increases were largely due to increases in expenditures for hospitalizations and skilled nursing facilities (SNFs). The increase in expenditures for SNFs is likely at least partly attributable to the relaxation of the requirement that Medicare does not pay for SNF care unless the beneficiary first had a 3-day inpatient hospital stay and the relaxation of the requirement that Medicare only pays for a limited number of SNF days (100) per benefit period. These requirements were relaxed to address

emergent needs surrounding the pandemic.[39] Additional descriptive results are available in ***Appendix Q***.

Table IV-3. All ECCPs: Change in unadjusted Medicare expenditures, FY 2019–FY 2020

Group	FY 2019 ($)	FY 2020 ($)	Percent Change FY 2019–FY 2020 (%)
Mean annualized total Medicare expenditures			
P-O	29,966	37,635	26
C+P	34,265	46,140	35
National Comparison	32,572	41,819	28
Mean annualized all-cause hospitalization expenditures			
P-O	7,551	8,854	17
C+P	9,680	13,121	36
National Comparison	8,806	10,813	23
Mean annualized potentially avoidable hospitalization expenditures			
P-O	2,111	2,074	−2
C+P	2,542	2,481	−2
National Comparison	2,578	2,544	−1
Mean annualized six qualifying condition hospitalization expenditures			
P-O	1,057	927	−12
C+P	1,220	1,041	−15
National Comparison	1,401	1,332	−5
Mean annualized SNF expenditures			
P-O	3,606	8,862	146
C+P	3,723	11,010	196
National Comparison	4,886	11,038	126
Mean COVID hospitalization expenditures			
P-O	—	1,512	—
C+P	—	2,968	—
National Comparison	—	1,998	—

SOURCE: RTI analysis of Medicare claims data.

NOTES: The sample construction method used in FY 2020 differs from other Initiative years in that it does not exclude residents based on propensity score or missing covariates. For further details on the sample creation process, see ***Appendix J*** and ***Table I-3*** in ***Appendix I***.

[39] For more information, see "Findings concerning Section 1812(f) of the Social Security Act in response to the effects of the 2019-novel coronavirus (COVID-19) outbreak" (memo dated March 13, 2020). Available from https://www.cms.gov/files/document/coronavirus-snf-1812f-waiver.pdf.

Chapter IV.3 Nursing Facility Quality Measure Performance and Mortality During the COVID-19 Pandemic in 2020

Key Takeaways

- *Six MDS-based quality measures showed increases in undesirable events in most groups (Clinical + Payment, Payment-Only, and the national comparison group) in FY 2020, and four remained in line with previous trends. These increases can be attributed to the COVID-19 pandemic.*
- *Resident mortality increased sharply in FY 2020 in all groups compared with previous years.*

IV.3.A. Overview and Methods

In this chapter, we describe the trends in facility performance on MDS-based quality measures and resident mortality for FY 2020. We examined the same set of 10 MDS-based quality measures described in ***Chapter II.7*** using descriptive statistics. Mortality is examined using descriptive statistics, using the same methods as described in ***Chapter II.8***.

The analysis addresses the following questions:

- How did quality of care outcomes differ in FY 2020 from other Initiative years?
- How did resident mortality differ in FY 2020 from other Initiative years?

The analyses presented here show unadjusted MDS-based quality outcomes and mortality from FY 2012 to FY 2020, ending September 2020, while COVID-19 infection rates were still high.

MDS measures examined (Lower scores indicate better quality):

- One or more falls with injury
- Self-reported moderate to severe pain
- Pressure ulcers Stage II or higher
- Urinary tract infection (UTI)
- Catheter inserted and left in bladder
- Decline in activities of daily living (ADLs)
- Antipsychotic medication use
- Antianxiety or hypnotic medication use
- Weight loss
- Physical restraint

IV.3.B. Patterns in Unadjusted MDS-Based Quality Outcomes in FY 2020

The descriptive statistics illustrate patterns in outcomes among Initiative-eligible residents in participating ECCP facilities (i.e., C+P and P-O, separately) and the national comparison group. We present descriptive statistics for FY 2014 through FY 2020.

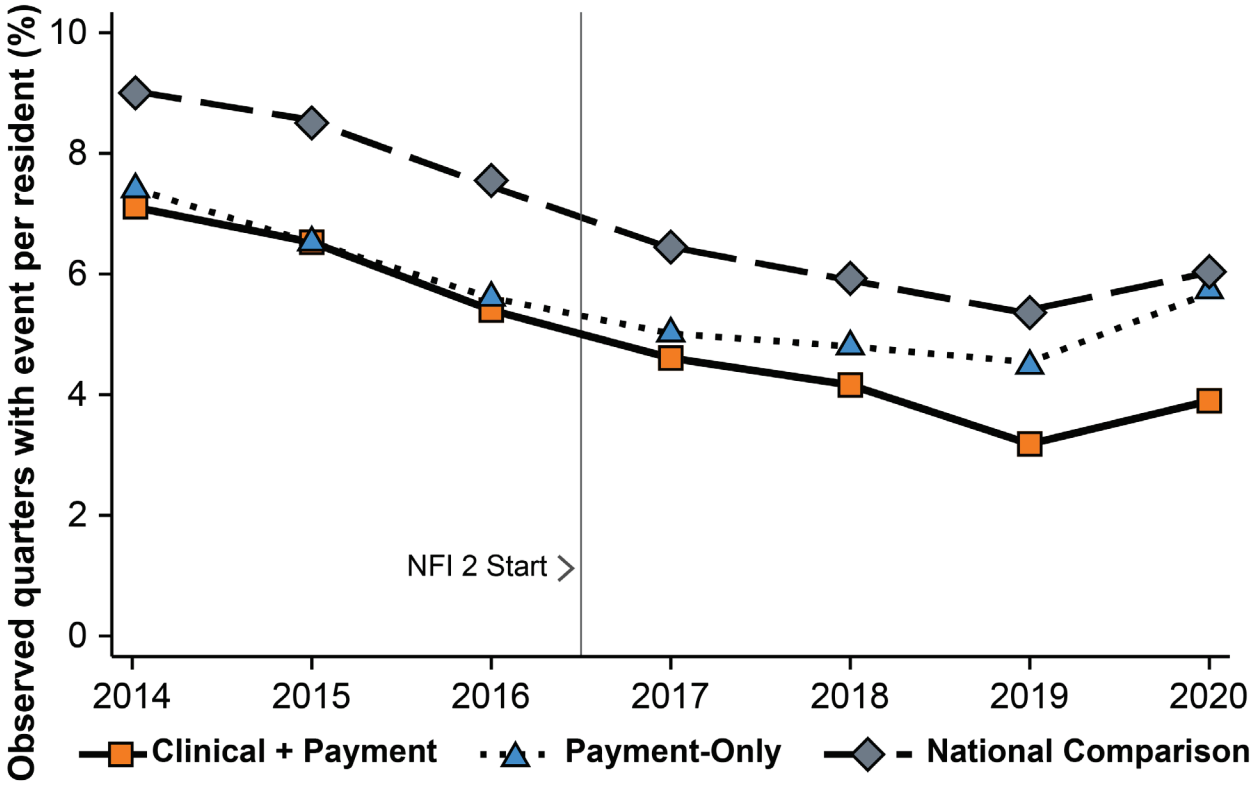
For most MDS-based quality measures, residents in both NFI 2 facility groups and the national comparison group had more undesirable events in FY 2020, compared to FY 2019 results within the same group. This increase in undesirable events was seen for self-reported moderate to severe pain, pressure ulcers Stage II or higher, catheter inserted and left in bladder, decline in ADLs, weight loss, and UTI (though the P-O group did not see an increase in UTI). As an example, ***Figure IV-5*** shows the patterns over time in resident self-reported moderate to severe pain.

Examining trends separately for C+P, P-O, and the national comparison group, the remaining measures showed quality performance in FY 2020 that was in line with previous trends: falls with injury (though there was an increase for P-O group), antipsychotic medication use, antianxiety or hypnotic medication use, and physical restraint. As an example, ***Figure IV-6*** shows patterns over time in resident receipt of antipsychotic medications. The full descriptive results are available in ***Appendix R***.

There were staffing shortages during the COVID-19 pandemic (Denny-Brown et al., 2020), and many of the measures that showed an increase in undesirable events in FY 2020 are outcomes that we would expect to be affected by staff availability and time. For example, pressure ulcer prevention includes regularly turning residents, and a staffing shortage could restrict preventative measures and result in an increase in pressure ulcers. Similarly, staffing shortages could be

expected to lead to weight loss, for example due to a decrease in therapeutic services for swallowing or limited assistance available for residents needing help with eating.

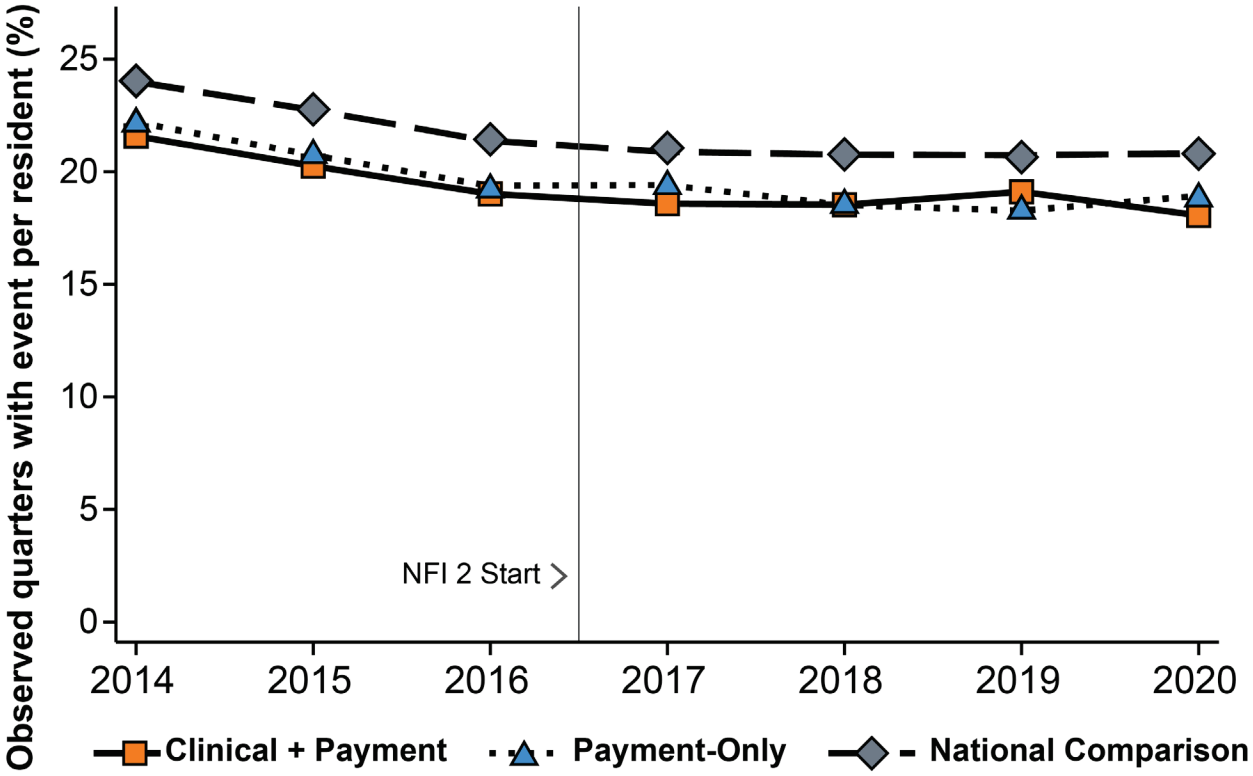
Figure IV-5. All ECCPs: Resident-reported moderate to severe pain, FY 2014–FY 2020



SOURCE: RTI analysis of MDS data.

NOTE: The sample construction method used in FY 2020 differs from other Initiative years in that it does not exclude residents based on propensity score or missing covariates. For further details on the sample creation process, see ***Appendix J*** and ***Table I-3*** in ***Appendix I***.

Figure IV-6. All ECCPs: Use of antipsychotic medication, FY 2014–FY 2020



SOURCE: RTI analysis of MDS data.

NOTE: The sample construction method used in FY 2020 differs from other Initiative years in that it does not exclude residents based on propensity score or missing covariates. For further details on the sample creation process, see ***Appendix J*** and ***Table I-3*** in ***Appendix I***.

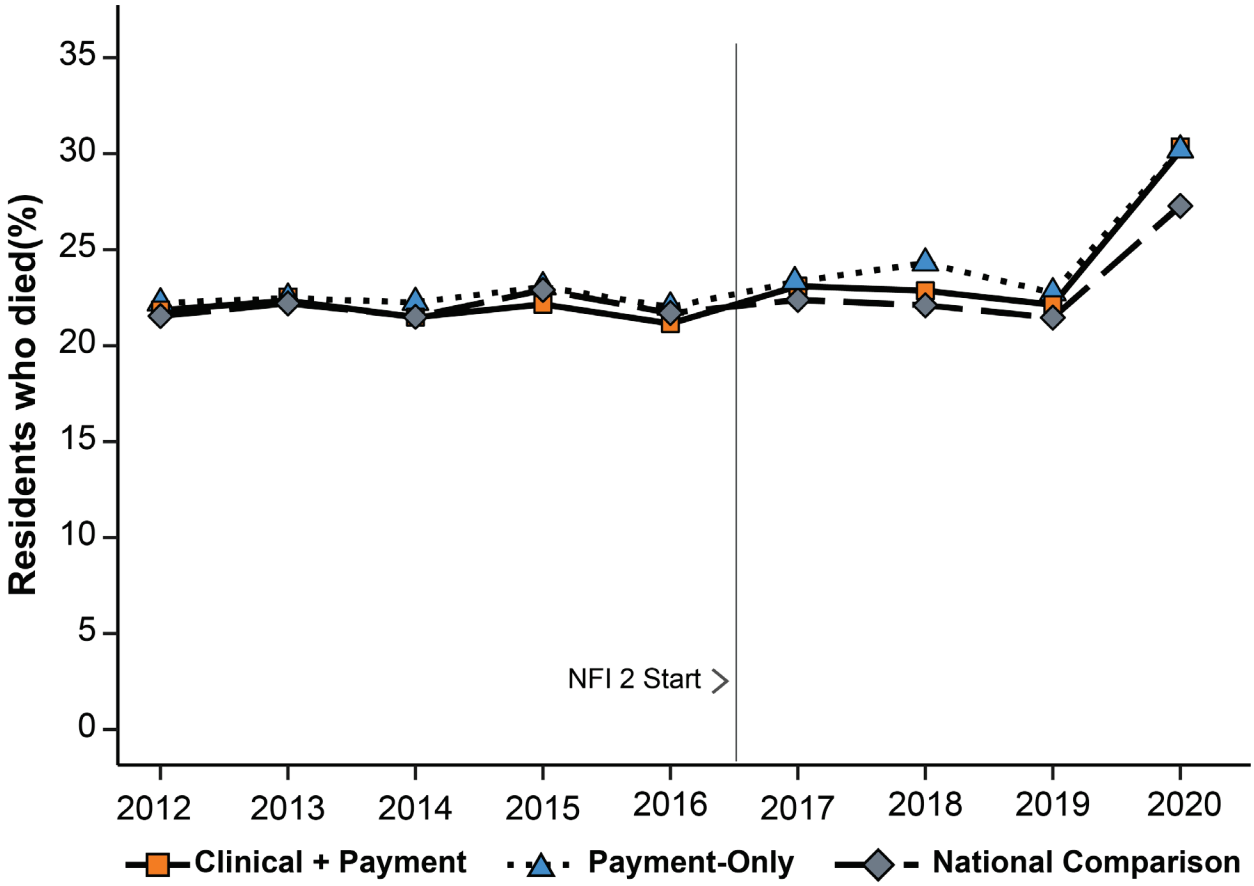
IV.3.C. Patterns in Unadjusted Resident Mortality Rates from FY 2012 to FY 2020

We conducted descriptive analyses to understand the mortality patterns over time for Initiative-eligible residents in each intervention group and in the national comparison group. We examined mortality within the fiscal year to compare the patterns from other Initiative years to FY 2020.

Figure IV-7 shows the unadjusted mortality rate from FY 2012 to FY 2020 for the P-O and the C+P groups for all ECCPs combined and the national comparison group. ***Figures S-1*** through ***S-6*** in ***Appendix S*** show the patterns for each ECCP individually.

The mortality rates in all groups increased from FY 2019 to FY 2020, and the rates are multiple percentage points higher than in any previous Initiative year. Mortality in the C+P and P-O groups was higher than in the national comparison group in FY 2020, which continues a trend from previous years. The large increase in mortality in all groups in FY 2020 can be attributed to the COVID-19 pandemic.

Figure IV-7. All ECCPs: Percent of residents who died each year, FY 2012–FY 2020



SOURCE: RTI analysis of Medicare eligibility and enrollment data.

NOTE: The sample construction method used in FY 2020 differs from other Initiative years in that it does not exclude residents based on propensity score or missing covariates. For further details on the sample creation process, see ***Appendix J*** and ***Table I-3*** in ***Appendix I***.

Section V. Summary and Discussion

Chapter V.1 Summary of Findings

In designing NFI 2, CMS posited that offering a financial incentive to facilities for activities related to reducing avoidable hospitalizations would result in both lower hospital utilization and lower Medicare expenditures. The Payment-Only (P-O) intervention tested this hypothesis in its pure form. The NFI 2 financial incentives potentially also could achieve further hospitalization reductions in Clinical + Payment (C+P) facilities, beyond what they achieved as Clinical-Only (C-O) facilities in NFI 1. Although NFI 1 reduced hospitalizations for most ECCPs, the Initiative did not achieve net savings to the Medicare program after accounting for implementation costs, which included the cost of placing ECCP staff in participating facilities, as well as the cost of operating each ECCP and its additional staffing. With NFI 2, CMS tested whether they could achieve the same reduction in hospitalizations but with a lower Medicare investment (i.e., investing in less expensive facility financial incentives, rather than costly ECCP structure).

Based on our evaluation findings across FY 2017–FY 2019,[40] we conclude that there is no clear evidence that the NFI 2 payment incentives achieved desired reductions in hospital utilization or Medicare expenditures for residents in either the C+P or the P-O facilities. While the C-O facilities in NFI 1 did achieve favorable reductions, there was no clear evidence that adding the payment component provided incremental improvement.

[40] Although the Payment Reform Initiative began in October 2016 and ran through September 2020, we base our evaluation conclusions on evidence from the impact analyses during FY 2017–FY 2019 because the COVID-19 pandemic had severely affected Initiative implementation and outcomes of interest.

In this chapter we review and synthesize our main evaluation findings. In the next chapter, we discuss the aspects of the real-world environment that hindered the effectiveness of the Initiative and reflect on lessons learned from the design and implementation of NFI 2.

There is no clear evidence that the NFI 2 payment incentives were associated with reductions in hospital-related utilization and expenditures

We have stated throughout this report that there is no clear evidence that the NFI 2 payment incentives had a favorable impact by substituting for and reducing hospital-related utilization. We reached this conclusion by synthesizing all available evidence, both from secondary data analyses and analysis of collected primary data. We conducted two sets of difference-in-differences (DD) analyses to examine the impact of the payment intervention to incentivize both facilities and practitioners to provide on-site treatment for the six qualifying conditions. The first set of DD analyses examined the impact of the intervention by comparing it to the period (FY 2014–FY 2016) immediately prior to the start of NFI 2, accounting for different trends for the intervention and comparison groups (***Chapter II.5***). The second set of DD analyses examined both phases of NFI by comparing them to FY 2012, prior to the start of NFI 1, and assumed parallel trends given that there were no NFI interventions in place before 2012 (***Chapter III.1***). Neither set of results showed a consistent impact of the payment intervention in either the C+P or P-O group. We also tested both sets of DD analyses to determine their sensitivity to our specific methodological approach, including our choice of comparison group and strategy for addressing different trends between the intervention and comparison groups (see ***Appendix W*** and ***Appendix Y***). Although one of the sensitivity analyses did indicate favorable reductions in several hospital-related utilization and expenditure measures, this appears to be due to trends in the pre-intervention period and not due to the Initiative itself. Taking our main and sensitivity analyses together, we conclude there is no clear evidence that the payment intervention had the favorable impact of reducing avoidable hospitalizations.

Furthermore, examining on-site and hospital treatment trends, we found evidence that, although residents were treated on-site for the six conditions through the NFI 2 billing mechanism, many of these residents would not have been hospitalized, even absent the Initiative. Most likely, lower-acuity residents, who would not have been hospitalized, received on-site treatment billed for NFI 2. In fact, on average, the residents treated on-site had fewer comorbid conditions than residents treated in the hospital (***Chapter II.3***). Many interviewees confirmed that NFI 2 had not motivated substantial changes in care practices or reductions in potentially avoidable hospitalizations in their facilities. Many P-O facilities also noted that the focus on keeping residents on-site for care preceded NFI 2. Additionally, we did not find indications for substantial substitution of on-site treatment for hospitalization based on the weak correlation between billing for on-site treatment and hospitalization. Based on all of these findings, we conclude that under NFI 2 facilities were often paid for activities already in place prior to the Initiative.

We found additional evidence that the NFI 1 clinical interventions had a favorable impact, confirming previous NFI 1 evaluation findings.

In comparing interventions within NFI (***Chapter III.1***), we found that clinical and educational interventions were associated with reducing avoidable hospitalizations and related Medicare expenditures, providing new evidence that corroborated the findings originally presented in the NFI 1 final report (RTI International, 2017). There were several differences between the approach taken in this report and the one adopted in the original NFI 1 evaluation, which add to the robustness of our current findings. The most important difference relates to the comparison group selection. While the earlier evidence was based on a comparison to nursing facility residents in the same states as intervention group residents, the new evidence was based on comparing participating NFI residents to a national comparison group of nursing facility residents. Both used FY 2012 as the baseline year and relied on the assumption that in the absence of the Initiative, the intervention and comparison groups would follow parallel trends.

There is mixed evidence whether the NFI 2 payment incentives were associated with unfavorable impacts on hospital-related utilization and expenditures.

Besides a lack of favorable reductions in key outcomes, our analyses indicate increases in some hospital-related utilization and expenditure measures, which are both unfavorable and counterintuitive. For reasons explained earlier in this report, we conducted several analyses with alternate specifications to examine the Initiative impact. These analyses produced somewhat different results on the question of whether there were unfavorable Initiative effects. The primary DD analysis we used to evaluate NFI 2 used FY 2014–FY 2016 as the baseline, allowed for different linear trends, and employed a national comparison group. This analysis indicated unfavorable increases in the C+P group. We did not find evidence of unfavorable increases in the P-O group. Sensitivity analyses that we conducted using an alternative within-state reference group (WSRG), instead of the national comparison group, and alternatively using a parallel trends assumption, were generally less unfavorable. The analysis we conducted using FY 2012 as the baseline year and assuming parallel trends did not indicate unfavorable impacts of the payment intervention in either the C+P or the P-O group.

When interpreting these conflicting results, it is important to keep in mind two methodological considerations that further mitigate concern about the unfavorable results. First, both C+P and P-O facilities started off at baseline (FY 2014–FY 2016) with lower levels of most hospital-related utilization and expenditures than the national comparison group.[41] For C+P facilities, the lower utilization rate is partly the result of NFI 1 interventions. Our DD regression models measured

[41]There were exceptions, C+P facilities actually had higher total Medicare expenditures and expenditures for all-cause hospitalizations compared to the national comparison group.

changes in the outcomes relative to *baseline levels*. They did not account for the fact that it may be easier to reduce an outcome from a high level to a medium level than from a medium level to a low level. While the main reason for using the WSRG was to account for state-level policy changes, it also helps address this concern about different baseline levels. Residents in the WSRG generally had utilization levels that were closer to those in the intervention facilities, rather than the national comparison group (results not shown). Therefore, the more favorable sensitivity analysis findings using the WSRG can be understood partly as a result of having more similar baseline levels.

The second methodological consideration is that our correction for differences in prior trends may have been too strong when projecting into the first year of NFI 2. We could not capture whether the true trend was flattening. This projection would make it more difficult for Initiative facilities to show improvement. This especially impacts the C+P group, where several ECCPs had strong reductions in utilization or expenditures during FY 2014–FY 2016 due to NFI 1. A more detailed discussion of this point is presented in our second annual report (RTI International, 2019). This is the main reason that our sensitivity test results, which use a parallel trends assumption instead of accounting for the different baseline trend, show more favorable results.

While some of the unfavorable effect patterns were diminished with these alternative specifications, our analyses do not provide consistent evidence for reductions in hospital-related utilization or expenditures. Synthesizing our different analyses, we conclude that while the finding of unfavorable increases shows some variation based on the method used, the lack of association of the Initiative with favorable decreases in utilization and expenditures is highly consistent. Thus, we are more confident asserting that the Initiative was not associated with a favorable impact and consider the evidence for unfavorable impacts to be mixed.

There is mixed evidence that the NFI 2 payment incentives were associated with some unfavorable changes in quality of care

The Initiative may have affected the quality of care for eligible residents, even though improving performance on MDS-based quality measures was not a specific goal of NFI 2. Some MDS-based quality measures may overlap with pathways related to resident hospitalizations, and thus quality might have improved as a result of the Initiative. It is also possible that quality could have declined if facilities diverted attention to Initiative activities at the expense of other aspects of resident care, or inappropriately avoided needed hospitalizations. We evaluated the association between NFI 2 and quality of care outcomes during FY 2017–FY 2019 by examining 10 MDS-based quality measures, as well as resident mortality.

This analysis yielded mixed evidence about the impact of NFI 2 on MDS-based quality measures. There were a few favorable and statistically significant effects in individual ECCPs in the C+P group, and several unfavorable and statistically significant effects both in individual ECCPs and across all

ECCPs combined. For residents in P-O facilities, we found unfavorable and statistically significant effects on four MDS-based quality measures in pooled analyses combining all ECCPs.

Descriptive analyses of trends in the 10 MDS-based quality measures over time added context to the multivariate analysis results. The unadjusted prevalence of most of these undesirable outcomes was generally decreasing in the national comparison group from FY 2014 to FY 2019 (***Appendix S***). These trends indicated an overall improvement in quality over time, unrelated to the Initiative. The intervention groups also decreased in these undesirable outcomes over time in many of the quality measures, though the pattern was not as strong as in the national comparison group.

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 relatively high quality of care at Initiative facilities at baseline, together with quality improvements over time in the national comparison group, may have made it harder for NFI 2 facilities to achieve further quality improvement relative to the national comparison group.

We also explored the relationship between NFI 2 and mortality among Initiative-eligible residents in several ways. We conducted descriptive analyses and two sets of DD analyses, including additional sensitivity analyses, analogous to how we approached the utilization and expenditure outcomes (***Chapter II.8*** and ***Appendix S***). Finally, we followed and compared residents treated on-site to residents treated in the hospital for the six conditions (***Chapter II.9***).

Overall, there was weak evidence from the DD results for an association between Initiative participation and changes in mortality. Accounting for different trends for the intervention and comparison groups and using FY 2014–FY 2016 as the baseline, the Initiative was associated with higher-than-expected mortality in all ECCPs combined, for both the C+P group (statistically significant) and P-O group (not statistically significant), and in multiple individual ECCPs (***Chapter II.8***). The finding of higher mortality for all ECCPs combined held for both the C+P and P-O groups in multiple sensitivity analyses. These included using a WSRG as the comparison group, as well as assuming parallel trends for the intervention and comparison groups and employing either FY 2016 or FY 2014–FY 2016 as the baseline period. However, there were no statistically significant changes in mortality based on the model that assumed parallel trends and used FY 2012 as the baseline year (***Appendix S***). Additionally, based on comparing residents treated on-site to those treated in the hospital, we did not find any indication that residents treated on-site suffered any harm in terms of increased mortality or increased subsequent hospital treatment. Finally, since we argued that, to a large degree, the residents who were treated on-site were not likely to be hospitalized in any case, it seems unlikely that necessary hospitalizations were avoided (***Chapter II.9***).

Factors other than the Initiative may account for these unfavorable mortality results. Although our analyses adjusted for potential confounders that were observable, it is possible that the elevated mortality risk among those Initiative residents, relative to the national comparison group, was driven by factors that were unrelated to the Initiative. These factors may include unmeasured selection bias toward a sicker or higher-acuity case-mix among the Initiative-eligible resident population because of other unobserved mortality risk factors or confounders not captured in our current models. Another possible reason for selection bias is increased Medicare Advantage (MA) penetration, as discussed below. Also, disease severity is not always captured by ICD-10 codes.

Further, we do not have resident-level data to quantify and control for changes in advance care planning practices, which may lead to selection of palliative care treatment, affecting resident outcomes. Increased advance care planning and selection of more palliative care and less curative care may improve resident quality of care and quality of life, while simultaneously leading to a higher mortality rate. For example, an acute event might trigger advance care planning discussions with a resident, potentially leading to selection of life-limiting treatment options. In that case, mortality in the facility would demonstrate that facility staff followed resident wishes, which is a favorable outcome. Some ECCP advanced practice registered nurses (APRNs) in C+P facilities reported working with eligible residents and their families on updating residents' advance directives on admission or after major health changes. Our analysis of percentage of residents with advance directives was limited by a lack of resident-level data on the specific choices reflected in the advance directives (***Chapter II.8***). With these data, we may have been able to ascertain a relationship between specific advance directive preferences and resident mortality. Absent these resident-specific data, our analysis of total volume of advance directives by ECCP did not yield consistent evidence of a relationship between advance directive prevalence and increased rates of mortality.

Increased Medicare Advantage enrollment may help account for some of the findings of unintended consequences

During the time that NFI was implemented, there were changes in the larger policy context that may have had an impact on both the implementation and evaluation of NFI. Growth in MA affected the eligible population for NFI 2 by progressively decreasing the number of eligible fee-for-service (FFS) residents who could participate in the Initiative. MA penetration increased over time for each group, but with larger increases in the Initiative groups than in the comparison group. C+P facilities had the highest MA penetration, followed by P-O. The national comparison group had the lowest MA penetration across FY 2017–FY 2019 (***Appendix T***). MA penetration increased to a greater extent in Initiative facilities, largely because ECCPs were located in states with more rapid MA growth compared to the national average.

MA growth eroded the NFI 2 eligible resident population. Interviewees indicated increased MA penetration in most ECCP states in recent years and shared stories of MA plans recruiting enrollees

by partnering with facilities and developing relationships to help identify residents for enrollment. MA plan features, such as additional care coordination or APRN care, sharing in plan revenues, or additional per diem payments, served as incentives to facilities to increase MA enrollment and competed with NFI. When fewer residents were eligible, facilities became less engaged in the Initiative, as the potential for the NFI 2 financial incentives diminished. Exit interviews with opt-out facilities also indicated that small numbers of eligible residents were a primary reason for facilities discontinuing NFI 2 participation.

MA growth may have also impacted NFI evaluation results by causing selection bias. This is especially relevant for our mortality findings since previous research suggests that a disproportionate share of MA enrollees disenroll at the end of life, instead enrolling in FFS Medicare (GAO, 2021). Selection bias could occur if healthier beneficiaries enrolled in MA plans, resulting in more clinically complex residents remaining among the eligible Medicare FFS population; this might also have occurred differentially in the Initiative and comparison groups. Three findings supported this hypothesis:

- In comparing mortality rates between Initiative-eligible FFS residents and similar MA residents, we found that the (unadjusted) mortality rate was generally lower among MA enrollees than among Initiative-eligible residents (***Appendix T***). This difference could potentially be the result of "cherry picking" of lower-acuity residents by MA plans, leading to an increase in the relative risk of mortality among Initiative-eligible FFS residents.
- MA penetration increased more in the Initiative groups than the comparison group. Taken with the first finding, this could mean that the Initiative-eligible FFS residents left in ECCP facilities after MA "cherry picking" were higher acuity than the Initiative-eligible FFS residents in the comparison group. This could present as higher mortality among Initiative-eligible residents in ECCP facilities, compared to the base period and to the national comparison group. We attempted to address the potential selection bias in our analyses for all the outcomes examined by adjusting for the facility-level percentage of residents in MA plans in the DD models. However, this adjustment may not account fully for the selection bias, and there may be other related unobserved risk factors that were not measurable in available administrative data.
- In models predicting resident mortality, higher MA penetration in a facility was significantly associated with higher resident mortality for the FFS Initiative-eligible residents in that facility (results not shown). This result is consistent with selection bias, suggesting that the remaining FFS population is more clinically complex in ways that are not accounted for by the hierarchical conditions category (HCC) and disease indicators available for control variables in our model.

Chapter V.2 Lessons Learned

There are several lessons learned from the lack of favorable impact of the NFI 2 payment intervention in contrast to the more favorable NFI 1 evaluation results. During NFI 1, the Initiative resulted in statistically significant reductions in 10 of the 13 Medicare utilization and expenditure measures, relative to the comparison group; these favorable results were attributed largely to the consistent presence of ECCP nurses who provided nursing facilities with education and, in some ECCPs, clinical care.

Priorities of multiple stakeholders were not always aligned with NFI 2.

NFI 1 success was attributable largely to relationships built between participating facility staff, residents, and on-site ECCPs nurses. ECCP nurses championed a holistic approach to resident care in the facilities by educating and supporting facility staff at all levels, as well as resident families. In some ECCPs, they also assessed and treated residents on-site, often working alongside facility staff and non-ECCP practitioners to care for residents.

In contrast, NFI 2 implementation required much less involvement from facility staff and greater engagement from practitioners and other external stakeholders, as described in the inner, mid, and outer settings of the CFIR framework (Damschroder et al., 2009). At the inner setting, practitioners were essential to NFI 2 success as practitioner engagement was critical to NFI 2 facility billing. Facilities with low practitioner buy-in were less able to benefit from NFI 2 financial incentives. Corporate and physician groups' business structures posed barriers to billing and receiving NFI 2 reimbursement. At the mid setting, ECCPs tried multiple approaches to support NFI

2 implementation, but variation in buy-in within and between facilities, as well as intervention design changes for two ECCPs, created substantial Initiative implementation challenges. At the outer setting, facilities received minimal support from other stakeholders, such as hospitals, and faced ongoing reductions to NFI 2 billing opportunities due to MA plan growth eroding the Initiative-eligible population. Under NFI 1, ECCP staff worked on educating families about the Initiative goals and the consequences of hospitalizations, while under NFI2, their focus shifted to helping facilities implement payment incentives. In summary, the NFI 2 structure was challenging to implement and sustain due to its reliance on engaged practitioners, the presence of two separate facility groups with differing levels of ECCP support, and a host of outside influences (e.g., corporate finance structures or MA plans) that affected facilities' abilities to implement the Initiative fully.

The NFI 2 design did not motivate substantial changes in facility and practitioner care practices.

At its core, the design of the NFI 2 financial incentives was not effective in achieving the desired utilization and expenditure outcomes, given the diverse facility and practitioner environment in which it was implemented. Many facilities never received the financial incentives for their submitted NFI 2 claims. Instead, CMS payments often went to centralized corporate offices on behalf of facilities that were part of larger corporate chains. Sometimes these payments were then disbursed to participating facilities, but in many cases, the facilities never received their NFI 2 financial incentives directly and did not have autonomy to determine how the funds might be used. This led to lower engagement with the Initiative and less motivation to submit additional NFI 2 claims. Facility staff were more engaged when they could see firsthand how NFI 2 benefited their residents (e.g., purchase of new clinical equipment or hiring additional staff).

For practitioners, the financial incentive did not motivate change in care practices. Practitioner engagement was an essential component in the nursing facility efforts to manage resident changes in condition. Practitioners have the clinical decision-making authority to decide whether residents are treated in the facility or transferred to a hospital. While facility nursing staff perform initial clinical assessments and document changes in resident condition, practitioners oversee care and write orders for tests and treatment in the facility, as well as transfers to the emergency department or hospital. Thus, practitioner support was critical for successful implementation. Many practitioners certified conditions to support facility NFI 2 claims submissions, but they submitted their own NFI 2 claims much less frequently, citing various barriers to participation. Physician practices also vary in how they submit claims and divide revenue among the members; thus, some practices never implemented the NFI 2 billing codes, and others may have submitted NFI 2 claims without receiving the full payment.

The financial incentive was not sizable enough for many practitioners to undergo the described "hassle" of directing their billing offices to add new NFI 2 codes and not worth the significant effort

of trying to visit sick residents in the NFI-specified time window for diagnosis. Of the two NFI 2 codes offered to practitioners as incentives, one (G9686: NFI 2-specific care coordination conference) was discontinued at the end of calendar year 2018. Analyses of NFI 2 practitioner survey data showed a lack of education or adequate training and support were the most important reported factors that impacted practitioner billing. Some practitioners also feared recoupment or Medicare audits and felt safer without introducing the new NFI 2 codes into their practice billing structures.

Under NFI 2, facilities delivered on-site treatment to many residents at low risk for hospitalization

The evaluation found that facilities were not necessarily successful at targeting residents most at risk for hospitalization, since most residents who were treated on-site would not have been hospitalized even absent the Initiative. To target these residents proactively, it is important to conduct more in-depth analyses of the characteristics that increase their likelihood of hospitalization. Our analyses showed that residents who are hospitalized for the six conditions also tend to accrue higher care costs than other residents, providing another reason to focus on early identification of those residents who are most likely to require hospitalization. These investigations are often hampered by data limitations: codes in administrative data do not always provide enough information on the severity of comorbidities.

NFI 2 had a limited scope and did not align with existing facility workflows.

Interviewees from C+P facilities reported that, compared to NFI 2, NFI 1 had been more effective because it engaged the entire facility, with training and education provided to all facility staff. Therefore, the facility-wide care practice changes (e.g., better communication through tools like INTERACT) had the potential to benefit all residents. NFI 1 also targeted all types of avoidable hospitalizations. In contrast, NFI 2 focused on financial incentives associated with claims submission for only a limited group of residents (long-stay, non-hospice) suffering from specific health concerns (one of the six NFI 2 conditions) and engaged a small number of key facility leaders and business staff involved in NFI 2 documentation and billing.

Interviewees also described NFI 1 as being effective because the “whole-house” structure aligned with the existing facility workflows and processes. In contrast, NFI 2 did not fit within participating facility or practitioner workflows; it created extra work for facilities to identify, track, and document treatment for a specific set of health conditions for a small group of residents. Facilities created new structures and processes to identify the right residents with the right conditions, rather than applying their efforts broadly, as they had with NFI 1. For many facilities, the potential payment was simply not worth this investment.

In C+P facilities, ECCP staff took the ownership for much of the NFI 2 workflow. For P-O facilities that did not have the assistance of on-site ECCP staff, the effort required to document and submit NFI 2 claims fell to existing staff—staff who already had full schedules. Facility interviewees described this extra documentation and billing effort as burdensome, especially when they observed their peer C+P facilities enjoying extra ECCP-provided staff support for NFI 2 implementation.

NFI 2 design modifications created implementation challenges.

For facilities that engaged in NFI 2, Initiative changes resulted in disruptions to implementation. In 2019, CMS updated the clinical criteria for the six conditions. Many facility interviewees across ECCPs reported that these revised criteria were more stringent, leading to fewer residents qualifying for facility NFI 2 billing. With fewer residents meeting NFI 2 billing requirements and, thus, fewer potential claims, many facilities became less engaged. Additionally, two ECCPs, AQAF and NY-RAH, changed their intervention designs during NFI 2, disrupting whatever processes had been established in facilities prior to these changes.

C+P on-site ECCP staff refocused from providing educational and clinical work to supporting NFI 2 documentation and billing.

Even though C+P facilities retained on-site ECCP staff, the NFI 2 focus on billing reduced the prior NFI 1 emphasis on clinical support, improving care practices, and increasing staff education. During NFI 1, facility staff interviewees reported that the ECCP staff, particularly APRNs who could assess residents and order tests or treatments, had the biggest impact on reducing avoidable hospitalizations. The “extra set of hands” on-site to deliver clinical care made a difference in both care delivery and the speed with which facilities were able to treat resident changes in condition. In contrast, NFI 2 shifted some ECCP staff focus away from educating staff and assessing residents. Rather than reviewing general changes in condition, their focus was narrowed to the six conditions, and some of their time in the facilities was directed toward NFI 2 documentation and support for facilities’ Initiative claims submissions.

Facilities found it difficult to improve on low hospitalization rates

Many C+P facilities made substantial progress in reducing avoidable hospitalizations during NFI 1 and reported that it was hard for their facilities to make further reductions in NFI 2. The care practice changes achieved in NFI 1 were well established by the time NFI 2 began, so interviewees noted that further reductions in hospitalization rates seemed challenging, particularly as the focus shifted away from the clinical intervention and toward the billing components in NFI 2. P-O facilities also reported being engaged in other pre-NFI 2 efforts to reduce avoidable hospitalizations.

Increasing Medicare Advantage penetration eroded the pool of residents eligible for NFI 2

Further compounding other challenges, many facilities experienced substantial losses of NFI 2-eligible residents over the life of the Initiative, typically due to residents changing from FFS Medicare to Medicare managed care plans. Loss of eligible residents shifted facility priorities further away from NFI 2, eroded the potential to benefit from financial incentives, and decreased facility staff engagement with the Initiative.

There are important cost implications of MA plans implementing hospitalization reduction programs instead of the Medicare FFS program. MA plans, particularly I-SNPs, which specialize in long-term residents, operate similarly to the NFI 1 intervention by placing APRNs in nursing facilities. In both cases, the APRNs are not facility staff; they are paid by Medicare indirectly—either through MA plan capitation or through the ECCPs. When these I-SNP nurses help reduce acute care utilization, the cost savings accrue to the plan, whereas in NFI 1, the savings went to the Medicare program.

Across eight years of combined NFI interventions, the nursing facility landscape shifted in ways that deprioritized the Initiative.

Combined, NFI 1 and NFI 2 spanned nearly a decade, during which numerous changes affected the long-term care landscape. Growth in APRN employment at facilities, increasing facility staff and leadership turnover, and shifts in resident acuity all affected the Initiative environment.

First, more facilities had non-ECCP APRNs on-site at the end of NFI 2 compared to the start of NFI 1. Nationally, the number of APRNs has more than doubled in the past decade (Auerbach et al., 2020), and according to interviewees, their increased facility presence led to substantial improvements in the efficiency of care delivery, unrelated to the Initiative. These practitioners were direct facility hires or worked either through contracts with staffing agencies or as extenders to medical directors or physician group care teams. At the start of NFI 1, few facilities reported a consistent practitioner presence on-site, mostly relying on physicians visiting residents once or a few times per month. This infrequent visiting schedule resulted in low practitioner interaction with residents and staff, leading to both low practitioner confidence in facility staff abilities to treat residents on-site and high likelihood of resident hospitalization, even for minor condition changes.

With the recent increase in practitioner presence, especially APRNs, facility interviewees reported that they catch resident condition changes more quickly, administer needed testing, and provide treatment much faster than they could early in NFI 1. Whereas C-O facilities in NFI 1 and C+P facilities in NFI 2 had ECCP nurses, including APRNs in some ECCPs, these staff members were not hired or paid by the nursing facilities or their practitioners. Facility staff knew these ECCP nurses would be present in facilities temporarily—only for the life of the Initiative. Facility interviewees stated clearly that they prefer to have permanent APRNs on staff.

Second, although practitioner presence increased during NFI, many facilities reported critical shortages of nursing staff. Staff turnover among facility leaders, nurses, and direct care workers created numerous disruptions to full Initiative implementation and distracted from NFI 2 goals. A recent study of Payroll Based Journal (PBJ) data reported almost 100 percent turnover in some nursing facilities nationwide; without staff continuity, nursing facility resident care quality suffers (Gandi et al., 2021).

Lastly, interviewees believed that resident acuity had increased in recent years, adding that hospitals move hospitalized nursing facility residents back to nursing facilities for care—sometimes before the facility staff feel the residents are ready to return. Additionally, more older adults are remaining in their homes and communities longer, deferring facility-based care until they are older and in poorer health. From a policy standpoint, this shift is positive because it means older adults are able to enjoy community-based care longer, but it also means facilities are caring for more critical residents than they were in earlier decades. States also have increased the availability of home- and community-based services (HCBS), primarily through Medicaid waiver programs, over the past two decades. These programs have been found to delay nursing facility placement and result in higher acuity among nursing facility residents (Hahn et al., 2011; Segelman et al., 2017).

With higher-acuity residents and facility staffing shortages, facilities face additional challenges in avoiding resident hospitalizations, even with more APRNs on-site. In short, the facility environment has changed since the start of NFI 1, with more facilities taking in sicker residents but with less staff consistency. Those critical priorities may have diminished the focus on NFI 2 in many facilities.

Despite not showing favorable utilization and expenditure results, NFI 2 may have positively impacted resident care in other ways.

It is critical to note that although facilities did not show substantial reductions in hospitalization rates or Medicare expenditures, they may have improved resident care in other ways. The design of NFI 2 offered a financial incentive only for residents who met specific CMS criteria for the six conditions, leaving residents with fewer or less severe symptoms ineligible for NFI 2 billing. Facilities likely still identified and treated these less severe cases, with the residents being provided timely care that prevented exacerbation, even if the facilities were unable to receive NFI 2 financial incentives for these events.

Several C+P interviewees noted that they were catching resident condition changes and treating them much more quickly than they had prior to NFI. P-O interviewees shared that the increased focus on the six conditions allowed some staff to improve their skills (e.g., administering IV antibiotics) in early identification of resident condition changes. Facility interviewees also reported an increased focus on advance directives and advance care planning in some ECCPs–both positive changes that support resident and family wishes.

We conclude with two interrelated NFI 2 lessons learned. First, Medicare payment incentives alone did not change care practices enough to lead to significantly reduce hospitalizations. Hospital transfer reductions among long-stay nursing facility residents hinge upon clinical staff stability and presence, such as APRNs who can deliver facility staff education and resident condition monitoring, assessment, and management. Without adequate and consistent staffing levels and capacity to manage resident acute care needs in the facility, further hospitalization reductions would be challenging to achieve.

Second, prioritizing on-site care for all residents may work better than focusing on residents with a limited set of strictly defined specific conditions. Identifying residents at higher risk of hospitalization is challenging, especially for nursing facilities, which are generally not involved in analyzing resident data. Again, such a holistic approach and emphasis on reducing avoidable hospitalizations is only possible with sufficient staffing, appropriate levels of clinical expertise and support, and consistent assignment of nursing staff.

Further consideration might also be given to better integration of existing models, such as alternative or value-based payment models that seek to achieve similar goals of reducing care delivery costs within Medicare and Medicaid. Medicare managed care growth (e.g., I-SNPs and D-SNPs) also offers an opportunity to improve care quality, especially as these models also prioritize on-site treatment and reduction in resident hospitalizations. However, under the current rate structure, these capitated models are unlikely to yield savings to the Medicare program.

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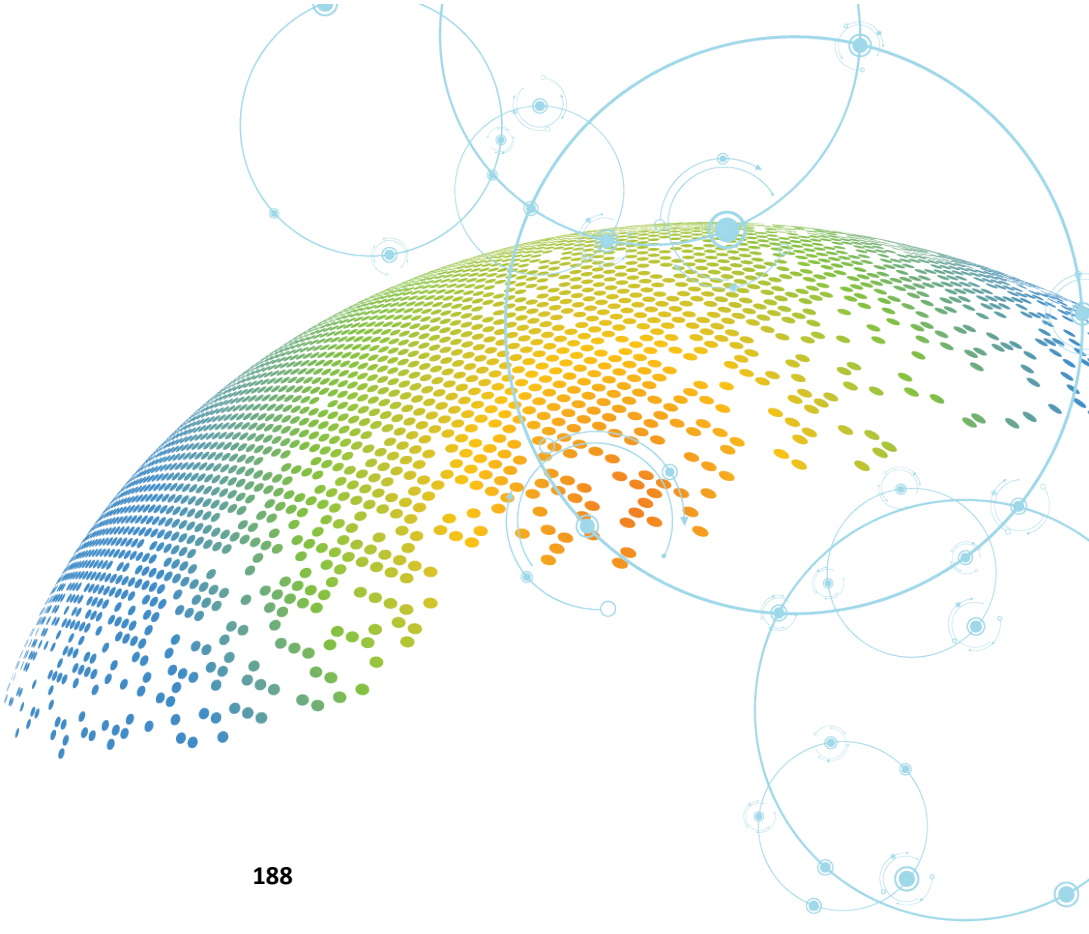

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