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

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Prepared for

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

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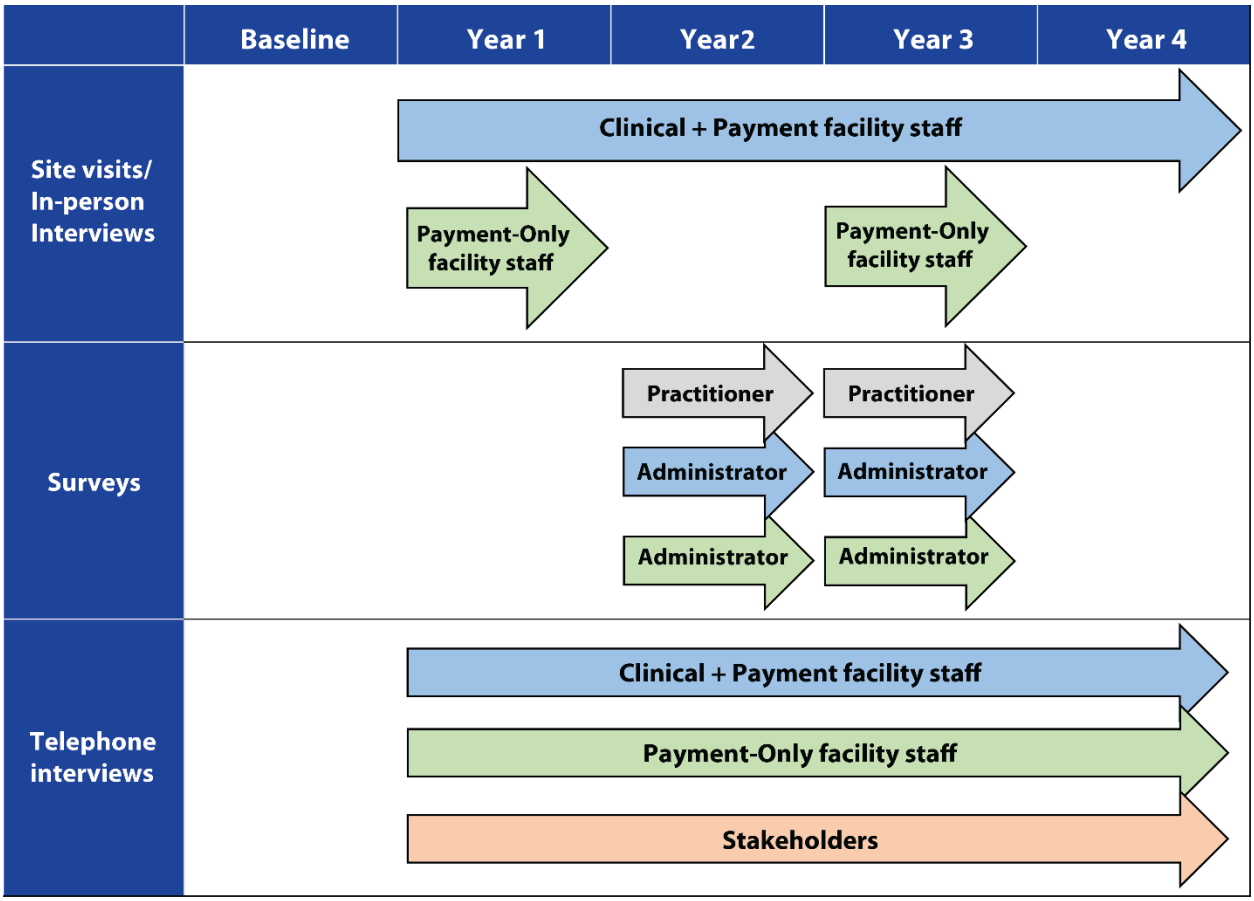
APPENDIX A
PRIMARY DATA COLLECTION METHODS AND ANALYSES

A.1 Introduction

Appendix A describes primary data collection methods and activities undertaken by RTI during NFI 2. RTI conducts a series of site visits to each Enhanced Care and Coordination Provider (ECCP) and a selection of their partnering facilities, both those facilities in the Clinical + Payment group and facilities in the Payment-Only group. When appropriate, findings from NFI 1 inform aspects of NFI 2 primary data collection, particularly with regard to Clinical + Payment facilities. We also conduct annual telephone interviews with all participating facilities; a biennial survey of nursing facility administrators in all participating facilities; a biennial survey of all participating practitioners (physicians, advanced practice registered nurses [APRNs], and physician assistants [PAs]); and a series of interviews with key stakeholders from each of the participating ECCP states.

All primary data collection efforts—site visits, telephone interviews, and surveys—complement each other. Analyses of the data collected during ECCP and participating facility site visits and telephone interviews provide a better understanding of how the new payment model is implemented, how it works in practice, and how NFI 1 clinical and educational interventions in participating facilities are evolving when combined with the NFI 2 payment model. Survey data provide standardized information about participating practitioners' buy-in and operational issues related to the payment model implementation—neither of which could be gleaned from the quantitative data analyses. The survey also provides quantifiable information on the payment model implementation in participating nursing facilities. Further supplementing other qualitative and quantitative data analysis findings, we conduct key stakeholder interviews to understand recent NFI 2-related activities underway in the states involved in NFI 2. Stakeholder and state policymaker interviews provide a greater understanding of the effect on potentially avoidable hospitalizations resulting from other state activities, state and federal reforms, and changes to usual care practices. These interviews also serve to expand our understanding of the context within which NFI 2 is taking place, providing guidance toward mitigating potential problems when considering scaling up the model in the real-world context. Together, these critical analyses describe the environment in which this new payment model is being implemented and help explain how and why it may be implemented differently across ECCPs and between Clinical + Payment and Payment-Only facilities. ***Figure A-1*** is a flowchart of our NFI 2 primary data collection activities.

Figure A-1. Primary data collection flowchart



NOTES: Clinical + Payment = clinical and educational intervention and payment model facilities; Payment-Only = payment model facilities only; Practitioners = physicians, advanced practice registered nurses (e.g., nurse practitioners), and physician assistants participating in both Clinical + Payment and Payment-Only facilities. Stakeholders = state administrators and policymakers interviewed about state policy and environmental changes.

A.2 Facility Site Visit and Telephone Interview Task Overview

Site visits and telephone interviews serve as a means of collecting qualitative data to monitor and evaluate NFI 2 implementation and outcomes for Clinical + Payment and Payment-Only facilities. RTI seeks to understand the context in which each ECCP delivers NFI 2 efforts toward improving resident health outcomes and reducing overall health care spending. In addition, NFI 2 site visits and telephone interviews explore the billing processes and financial components for the new payment model for facilities and practitioners, while also exploring how the financial components and focus on the specific six qualifying conditions may affect care management and related practices in the participating facilities.

To understand the variation in NFI 2 implementation experiences across facilities, RTI conducts a series of staggered site visits to a selection of both Clinical + Payment and Payment-Only facilities, supplemented by telephone interviews to the facilities that are not visited in person. Because implementation of the payment model alone does not involve all staff levels and is not as all-encompassing as the clinical/educational interventions in NFI 2, we conduct only two rounds of

site visits to Payment-Only facilities. This reduces burden on both ECCPs and facilities by limiting the number of in-person visits RTI conducts.

For NFI 2, RTI tries to visit some Clinical + Payment facilities that exhibited best practices or experienced particular challenges in NFI 1, as well as facilities that may not have been visited during NFI 1, were not interviewed by phone, or that have particular features of interest (e.g., ownership type, location, bed size, or five-star rating). We provide Centers for Medicare & Medicaid Services (CMS) with a list of facilities selected for site visits, and we also try to align our site visit timing and facility selection with the implementation contractor's efforts to minimize burden on ECCPs and participating facilities.

As shown in ***Figure A-1***, in Initiative Years 1 and 3 of implementation, RTI conducts site visits to the Payment-Only facilities. The first set of Payment-Only site visits focused on implementation, and the second site visits concentrated on financial outcomes, operational issues, leadership buy-in, successes, and challenges of the payment model. For each ECCP, we visit three to five Payment-Only facilities each in Initiative Years 1 and 3; we are conducting additional telephone interviews with Payment-Only facilities in all four data collection years. During Initiative Years 2 and 4 when we do not visit Payment-Only facilities in person, we aim to complete telephone interviews with key staff in at least half of the Payment-Only facilities.

A team of three RTI staff conducts each site visit, consisting of a senior state evaluation team lead with NFI 1 site visit leadership experience and two supporting staff members. This team structure allows RTI to capture detailed notes to inform later analyses, while generating assessments of engagement and other key domains. Site visits typically last between 4 and 5 days and include two separate data collection activities: (1) *ECCP component*—a visit to the ECCP headquarters and interviews with key ECCP leadership and other staff, and (2) *facility component*—a visit to participating facilities to interview facility staff and, in Clinical + Payment facilities, the ECCP nurse.

A.2.1 ECCP Component

RTI conducts interviews with all key staff in each ECCP, including facility-based ECCP staff in each facility we visit. The interview length is dependent on the staff type and the availability of the interviewees; some interviews take 1 hour, while others only require 5 or 10 minutes. Data collection includes information on model design changes related to payment component introduction; implementation timetable and experience; provider training and support; ECCP staffing changes; data collection; and detailed descriptions of the clinical interventions and how they were adapted for NFI 2. We interview ECCP leadership regarding any new supports or barriers that have emerged; changes in leadership structure or program model; communication pathways that have developed between ECCP staff and/or facility staff; internal and external data exchanges; and infrastructure modifications for data collection and project implementation. We are also interested in learning about efforts to improve communication with providers through NFI 2, particularly in the context of the NFI 2 six qualifying conditions.

During the ECCP interviews we also gather information regarding perceived barriers to implementation arising from policies or regulations of state, local, commercial, corporate leadership, and other entities, including hospitals, and any new challenges to accepting new practices (e.g., liability or family concerns). Other topics include data collection processes, billing and claims-related concerns, unintended consequences of the project and related spillover effects (positive and negative), lessons learned, sustainability efforts, and, if applicable, reasons for facilities withdrawing from the Initiative. When possible, we also interview ECCP partners, subcontractors, or on-site stakeholders.

A.2.2 Nursing Facility Clinical + Payment and Payment-Only Components

As described, for each ECCP, RTI will visit three to five Clinical + Payment facilities annually, and we will visit three to five Payment-Only facilities in each ECCP biennially. Across all years, RTI completes telephone interviews with Clinical + Payment and Payment-Only facilities not visited in person until saturation is reached. For Year 2, saturation was defined as approximately 50 percent of participating facilities. Selecting facilities will depends on several factors, including successes or challenges during NFI 1 (Clinical + Payment only), facility size, profit status, rural or urban location, five-star ratings, location, NFI 2 claims submission volume, resident demographics, and other factors that may arise through data collection (e.g., stakeholder interviews or survey results).

At each Clinical + Payment facility, the site visit team conducts multiple interviews, ranging in length by role from 5 to 60 minutes long, depending on interviewee type. The types of data collected include information on identification and treatment of the six qualifying conditions; billing process and related documentation; adjustments to model design; any changes to the clinical interventions that may have taken place; data on care transition activities; changes in policies/procedures required at the facility level; training; relationship with ECCP staff, as well as overall project successes, challenges, sustainability efforts, and lessons learned.

For Payment-Only facilities, the team conducts multiple interviews of similar length, but the focus is more on identification and treatment of the six qualifying conditions and the new billing processes in NFI 2. We are also interested in learning what kinds of processes and capabilities Payment-Only facilities had implemented to prepare for and maintain NFI 2.

Interviewees at both Clinical + Payment and Payment-Only facilities include nursing facility administrators (NFAs), directors of nursing (DONs), medical directors, primary care providers (PCPs) of record, advanced practice registered nurses (APRNs), as well as business office staff, MDS (Minimum Data Set) coordinators, and other relevant staff members involved with billing processes. RTI teams also talk to residents and families when appropriate. Special care is given to reaching practitioners, because they provide integral feedback regarding the payment processes and treatment of residents who have the six qualifying conditions. ***Table A-1*** presents types of staff interviewed by RTI in Initiative Year 2.

Table A-1. Types of staff interviewed across all facilities for Initiative Year 2 site visits

Facilities and staff	Clinical + Payment
Number of facilities participating	109
Number of site visit facilities	24
Total staff interviewed	136
NFAs	21
DONs	21
ADONs	5
Medical Directors	3
ECCP APRNs/RNs	25
Non-ECCP APRNs	4
Facility Nurses	20
MDS Nurses/RNACs	16
Billing/Finance Coordinators	16
Staff Educators	3
Other	2

NFA = nursing facility administrator; DON = director of nursing; ADON = assistant director of nursing; APRN = advanced practice registered nurse; RN = registered nurse; MDS = Minimum Data Set; RNAC = registered nurse assessment coordinator.

NOTES: Interviews were conducted between March and June 2018, and site visits were conducted between June and November 2018. "Other" staff include individuals said by facility lead to be integral to the success of NFI 2; examples include building social workers, practitioners who are not medical directors, or representatives from corporate offices.

RTI works with ECCPs and facilities to determine the best time to reach practitioners, as we know from experience that medical directors, attending physicians, and other practitioners have varied schedules. We coordinate timing that works best for these interviewees to minimize burden for facilities. This means that we might conduct interviews at unusual times of day (e.g., early morning), whenever the timing works best for facilities and practitioners. These interviews are important to understand practitioners' perspectives, and likewise, it is important for RTI to be flexible in obtaining the interviews to achieve high response rates.

For facilities not visited in person, we attempt to conduct interviews by telephone. We interview one or more staff members concurrently who are the most knowledgeable about the Initiative, such as a DON, NFA, or business office manager. At their discretion, ECCP evaluation leads may decide to conduct a second interview with additional staff, such as ECCP facility-based staff in Clinical + Payment facilities.

Through NFI 1, facility attrition was minimal. Understanding the reason for withdrawal remains very important for our evaluation, because leaving may point to potential challenges or barriers to implementation or sustainability. For NFI 1, we developed a protocol for open-ended telephone interviews with facilities that withdrew from the initiative. This protocol has been modified for

facilities that have left the Initiative during NFI 2. All exit interviews are limited to 15 minutes in length and are conducted as close to the time of facility withdrawal as possible.

All interviews conducted for NFI 2 are tracked in our existing Access database, which already contains contact information for all ECCPs and facilities that participated in NFI 1. This database also documents the response status on all NFI 1 and NFI 2 primary data collection activities for all participating facilities (Clinical + Payment); we implemented a similar system to track NFI 2 survey and interview response status throughout all years of the NFI 2 primary data collection.

A.2.3 Sharing Collaborative

CMS and its implementation contractor, SSS-T, lead activities in the Sharing Collaborative with all the ECCPs to share progress toward the Initiative's goals. During the Sharing Collaborative telephone meetings, ECCP staff discuss issues of common concern, including their successes, lessons learned, barriers encountered, and other findings that may be of interest to other ECCPs. RTI participates in these calls as a component of our evaluation.

RTI bases the evaluation of the Sharing Collaborative on observing and monitoring these activities in addition to analyzing the results of data collected during site visits and telephone interviews, which include questions about the Sharing Collaborative's impact and value. Specifically, our interview protocols include a series of questions to assess the impact of the Sharing Collaborative activities on ECCP's NFI 2 implementation efforts. For example, we aim to learn whether ECCPs report a change in practice, based on information obtained via Sharing Collaborative activities and the level of support the ECCPs receive in participating in these activities.

A.2.4 Protocol Development

RTI built on our existing NFI 1 interview protocol to develop three separate protocols (ECCP leadership, Payment-Only, and Clinical + Payment) for the NFI 2 activities, developing new process- and payment-related questions. We work closely with CMS to finalize protocols and related materials prior to conducting site visits and telephone interviews (e.g., recruitment materials or consent letters), as protocols are reviewed and tweaked slightly for each new Initiative year to reflect new developments or changes. Per CMS guidance to pilot-test our interview protocols, we conduct nursing facility telephone interviews in every ECCP prior to conducting site visits.

Our interview protocols in NFI 2 focus on exploring the role of the new payment component. Previous questions were concerned with implementation of the Initiative, relationship with the ECCP, processes for reducing avoidable hospitalizations, staff response to the Initiative, successes and challenges faced, and sustainability. Many of these issues are still present and tracked. New questions for NFI 2 focus on the following:

- Payment-Only facility screening and recruitment;
- Readiness assessments for NFI 2;
- Types of support provided by ECCPs to assist in implementation;

- Establishment of new participation agreements between Payment-Only facilities and ECCPs;
- Prior efforts to reduce avoidable hospitalizations;
- Variation in work plans;
- Screening and selection of practitioners;
- Training of facility staff and practitioners;
- Changes in facility practices related to the six qualifying conditions;
- Billing and documentation processes; and
- Technical assistance on payment processes throughout the project.

Other questions cover ongoing participation in Learning Community events and processes for reporting key data to CMS and its contractors. Per CMS request, RTI also asks about any resident disenrollment from Medicare Advantage plans to participate in NFI 2 and any shifting of fee-for-service (FFS) residents to institutional special needs plans (I-SNPs) or other managed care. We ask about managed care attrition rates and for interviewees' opinions as to the motives toward switching between NFI 2 and managed care.

RTI submits protocol drafts to CMS 2 months prior to the first telephone interview. We revise the protocols and interview guides according to the feedback we receive and submit the final version to CMS at least 2 weeks prior to the telephone interviews. We anticipate minor revisions to the protocols over time, based on any changes observed in the field; any revisions are discussed with CMS prior to conducting further interviews or site visits.

A.2.5 Analyzing Site Visit and Telephone Interview Data

RTI uses several strategies to organize and synthesize the large volume of qualitative data that are generated by this effort. RTI implemented rigorous procedures for standardized note-taking and analyses during NFI 1, and we revised our current NFI 1 high-level codebook to capture key study domains in NFI 2. RTI used NVivo software to analyze primary data in NFI 1, and the coding process has remained the same across years to facilitate longitudinal comparisons. For NFI 2, we built upon this existing codebook so that we can look back at how the Initiative has developed across years and across ECCPs. RTI also added new codes to target billing and documentation, implementation costs, effects of the six qualifying conditions on facility practice, and practitioner participation. It is important to note that we use only high-level NVivo codes to maximize efficiency. A modified content analysis approach is used to analyze the interview data, with codes or labels attached to portions of the interview notes. Although some labels emerge directly from the content of the interviews, others represent a priori categories reflecting the project aims. In this way, both unanticipated findings and anticipated areas of interest are captured during the coding process. For detailed reports by ECCP, please see ***Appendices B–G***.

A.3 Key Stakeholder Telephone Interviews

Another component of NFI 2 primary data collection, based on our experiences in NFI 1, is a series of interviews with key state administrators and other stakeholders to examine overlaps in potentially competing or complementary initiatives in the NFI 2 ECCP states (i.e., in addition to information from the CMS Master Data Management system [MDM]), as well as policy environment context for NFI 2. Multiple federal and state initiatives for reforming health care delivery and financing include the Partnership for Patients, Accountable Care Organizations (ACOs), State Innovation Models (SIM), the Financial Alignment Initiative, and Round Two of Health Care Innovation Awards. For example, our NFI 1 site visit findings from New York indicate that several competing initiatives, such as the Delivery System Reform Incentive Payment program and the state's demonstration under the Financial Alignment Initiative, focus on reducing hospitalizations.

Key stakeholder interviews explore similar issues across states and build upon our NFI 1 and NFI 2 site visit findings to understand the policy environment and the types of programs that affect avoidable hospitalization reduction apart from, or in conjunction with, this Initiative. Stakeholder interviews may provide data on Medicare rulemaking updates, changes in the Medicare Advantage program, association-sponsored initiatives, health provider or insurance plan efforts that are widespread, other initiatives sponsored by the Center for Medicare & Medicaid Innovation (CMMI), and/or changes in individual Medicaid State Plans and programs. These findings help us understand other factors that may affect project implementation and outcomes.

We aim to conduct between 5 and 10 key stakeholder telephone interviews per state in which the ECCP is operating, for a total of 35 to 70 interviews. Most interviews have already been conducted, but RTI also will conduct additional interviews as needed through Initiative Year 4. Stakeholders include officials from state departments of health, officials from state Medicaid offices, and state leads from nursing facility associations (e.g., the American Health Care Association [AHCA], Leading Age). Some states may have existing stakeholder groups or organizations that are partnering with the ECCPs. We draw stakeholders from a variety of other settings, and ask large healthcare chains, advocacy groups, state aging committees, and ACOs about their own organization's efforts to reduce hospitalizations among nursing facility residents. We also ask if they are aware of any similar efforts by other organizations. Because stakeholders come from a wide variety of organizations, questions are broad and seek to understand the state context from the perspective of the stakeholder. Seeking input from a range of stakeholders and allowing their perspectives to be the focus of the interviews allows us to paint a complete picture of the context within each state under which the Initiative is being implemented.

RTI relied on existing ECCP contacts and stakeholder networks for preliminary recruitment, and we used a snowball approach to recruit additional responses (i.e., asking interviewees to recommend other potential interviewees). We developed one general interview guide in conjunction with our consultants, which is adapted to the needs of each state. We worked closely with CMS to finalize protocols and any related materials prior to conducting the stakeholder interviews. For a summary of stakeholder interviews, please see ***Appendix H***.

A.4 Survey Task Overview

RTI conducts two web-based surveys as part of NFI 2 primary data collection activities: the NFA Survey and the Practitioner Survey. RTI administered both surveys in Initiative Years 2 and 3. Surveys provide standardized information from respondents in both Clinical + Payment and Payment-Only facilities. The core items in both surveys focus on the financial aspect of NFI 2, including how facilities and practitioners are paid, challenges related to billing, as well as attitudes toward the billing codes. The NFA Survey includes more specific items on facility-related barriers to implementation and facility policies/procedures. The Practitioner Survey also includes items on practitioner-specific barriers to billing as well as more clinically focused items, such as confidence in clinical staff.

Overall, the goal of these web-based surveys is to obtain consistent information from participating facilities' administrators and practitioners about the impact of the Initiative. The survey instrument is carefully designed to complement information captured from other primary data collection activities, all of which will inform the quantitative data analysis. Based on the successes of the NFI 1 survey, RTI continues web-based data collection to ensure easy access of the survey by respondents and a high response rate. RTI works closely with CMS to finalize the survey instrument and is responsible for all data collection and analysis. RTI also identifies and communicates any issues affecting sample frame design or data collection with the CMS, or through meetings as needed.

A.4.1 Instrument Development

RTI designed all survey instruments for the specific needs of this evaluation. Instrument development primarily focused on evaluating engagement with the NFI 2 billing process and factors that could affect this engagement from the perspective of NFAs and practitioners. Although the instrument development process is similar for both surveys, we solicited additional feedback from clinical experts when designing the Practitioner Survey, given the general challenges of obtaining responses from practitioners. For both surveys, we also prioritized designing a concise an instrument as possible to minimize respondent burden. We purposefully limited the overall length of the instrument and the number of questions, incorporating gate questions in the survey design to allow respondents to skip over inapplicable follow-up questions

Survey instrument design began with a review of relevant surveys, including prior NFI 1 NFA Surveys, and existing surveys of providers for the Practitioner Survey. We then narrowed the focus to domains most relevant for NFI 2, in consultation with input from the primary data collection teams who had gone on site visits and conducted phone interviews. We obtained substantial internal review of the survey instruments among our team members and RTI researchers with expertise in long-term care settings, health policy, and survey methods.

For the Practitioner Survey, RTI solicited additional feedback from consultants who had a similar background to potential respondents (i.e., a physician and APRN). RTI also consulted with CMS to obtain feedback on the survey domains. Furthermore, we conducted cognitive testing of the

Practitioner Survey by interviewing medical directors and participating practitioners from the majority of ECCPs. These practitioners provided information on the survey design, user testing, as well as guidance regarding item content and framing. This feedback helped reduce measurement error by ensuring the specific wording used in survey items matched the question intent. Testing also ensured that the format of the web survey was familiar and easy to use for practitioners, helping to improve response rate.

A major priority in developing the survey instruments was to minimize respondent burden. For instance, both surveys consisted primarily of close-ended questions with a very limited number of open-ended responses. The minimal use of open-ended items reduces response time and facilitates analysis across practitioners and facilities. Based on feedback from cognitive testing, we also emphasized having extremely concise surveys. Both surveys had an estimated completion time of less than 10 minutes. Furthermore, we tested the surveys on both mobile devices and tablets to ensure they were accessible and well-designed, an especially important consideration for practitioners. Finally, to facilitate the recall of respondents who were initially invited to complete the survey in March and April of 2019, the time frame used for the survey referred to the prior calendar year, 2018. Since there are two waves of this survey, the survey instruments were slightly revised to address issues and newly relevant domains between waves. For example, the second wave included items about recommended changes to the Initiative if it were implemented nationally. The majority of items and domains remained constant between the two waves to track changes over time.

In addition to the survey content and domain, draft versions of both survey instruments are submitted to CMS 2 months prior to the deployment of the survey. Final materials are submitted to the COR at least 2 weeks prior to data collection and incorporate any feedback received. Web versions of the survey are also shared with the COR prior to deployment.

A.4.2 Survey Frame Development

As in NFI 1, RTI received a complete sampling frame of NFAs from the ECCPs for the Clinical + Payment and Payment-Only facilities, consisting of, at a minimum, the names, e-mail addresses, and facility affiliations of potential respondents.

The sampling frame development process for the Practitioner Survey is more complex and included several steps outlined below. Because participating practitioners could be affiliated with multiple facilities, RTI's sample design for Initiative Year 2 allowed practitioners to complete separate surveys related to different facilities. RTI used two main files from CMS to design the initial practitioner sample frame: (1) list of participating practitioners from a monthly roster file from CMS, and (2) file of approved practitioners, including their contact information at the time of initial approval, which also had facility affiliation information. We were then able to link contact e-mails/phone numbers with the current list of practitioners at the practitioner-facility level.

We then excluded practitioners whose approval period did not overlap with the period of the survey for Initiative Year 2, 2017, as well as those affiliated with facilities that were not

participating in NFI 2. We followed up with CMS to obtain further clarification as needed regarding the file contents and accurate linking information for practitioners. Although most reminder e-mails were able to be automated, reaching out to practitioners affiliated with three or more facilities necessitated a more manual follow-up. To minimize the number of affiliated facilities for a given practitioner, we reviewed the case loads of practitioners affiliated with at least three facilities and removed the affiliations that represented less than 10 percent of a practitioner's total case load. Finally, we obtained contact information for practitioners directly from the ECCPs as a final update to our data files.

During data collection, RTI followed up by phone and e-mail to obtain updated contact information for any NFA and practitioner e-mail address that bounced back. This information was used to correct the sampling frame. In addition, RTI received communication via phone and e-mail during survey follow-up from practitioners and their affiliated facilities and medical groups regarding updates to the practitioners' participation status or current affiliation. Thus, aside from removing e-mail addresses that were designated as non-contact (e.g., bouncing back or other server errors), our sample frame also decreased after removing ineligible practitioners who were no longer participating or affiliated with a specific facility.

For Initiative Year 3, we decided to build on the sampling frame created in the prior year. For both NFAs and practitioners, we used information shared by the ECCPs to update contact information. We excluded practitioners who were no longer approved or affiliated with participating facilities in 2018 and added those who had newly joined in 2018. To simplify the sampling frame and response rate determination, we also limited practitioners to one affiliated facility. We continued to update contact information and eligibility based on communications received during data collection and follow-up.

A.4.3 Survey Administration

RTI is responsible for the full survey life cycle, including working with CMS to develop the instruments, programming the instruments into web applications, running the data collection effort, and performing all data processing and editing of survey data.

Prior to the start of data collection, to increase awareness among potential respondents, RTI communicated with ECCPs regarding the timing of the NFA and Practitioner Surveys. For Initiative Year 2, data collection largely occurred from January–February of 2018 for both surveys, continuing into early March. Potential respondents received hyperlinked e-mail invitations to complete the web-based surveys, removing the need for them to log in and use passwords. For Initiative Year 3, RTI collected data from the NFA Survey in January–February of 2019, and from the Practitioner Survey in March–April of 2019.

Surveys are administered in conjunction with RTI partners in the Survey Research Division and the Research Computing Division using a web-based application called Voxco, which provides the necessary flexibility for data collection but also offers data encryption to ensure data security. Respondents were also provided with a toll-free telephone number and e-mail contact

information for any technical or content-related questions. For our case management, we used RTI's Nirvana/Symphony system to keep track of the response status of NFAs and practitioner, and to send initial and follow-up e-mail reminders. Reminder e-mails were initially sent on a biweekly basis, increasing the frequency closer to survey due dates.

For Initiative Year 3, we used a combination of reminder e-mails and telephone calls to follow up with NFAs and practitioners. For NFAs, project staff conducted all follow-up communication. For practitioners, we partnered with RTI's Research Operations Center, who have call center employees with experience contacting physicians and medical staff, for all follow-up telephone communication. We utilized a computer-assisted telephone interviewing protocol that simulated the data collection process from prior years, with an added design complexity that automated scenarios where potential respondents had identical phone numbers (e.g., practitioners from the same medical practice). This approach allowed us to improve our determination of participant eligibility, increase our level of communication with nonrespondent practitioners, and employ a more efficient calling methodology.

Table A-2 presents the overall response rates for the NFA and Practitioner Surveys, using American Association for Public Opinion Research (AAPOR) response rate definition #6 which includes partial responses in the numerator and excludes undelivered e-mails from the denominator.[1] We counted a survey as a partial response if the first substantive question about billing status was answered.

Table A-2. Survey response rates for Initiative Year 3

Respondent group	NFA		Practitioner	
	N	Response rate (%)	N	Response rate (%)
All ECCPs combined	246	88.6	547	44.2
By ECCP				
AQAF	40	97.5	83	51.8
ATOP2	34	76.5	58	29.3
MOQI	40	90.0	71	39.4
NY-RAH	57	94.7	178	44.4
OPTIMISTIC	40	85.0	76	50.0
RAVEN	35	82.9	81	45.7
By intervention group				
Clinical + Payment	108	86.0	276	42.4
Payment-Only	141	90.6	271	46.1

SOURCE: RTI analysis of Nursing Facility Administrator and Practitioner Surveys (RTI program JW04).

[1] American Association for Public Opinion Research. Standard Definitions, various dates. Available at https://www.aapor.org/Standards-Ethics/Standard-Definitions-(1).aspx

Given the complex design of the sample frame for the Practitioner Survey, we also used another metric to evaluate the representativeness of the practitioner responses, beyond the practitioner-level response rate. The 547 unique practitioners were affiliated with a total of 214 unique facilities. The percentage of facilities with at least one eligible practitioner, where at least one practitioner responded, was 70.6 percent. This means that while over 40 percent of contacted practitioners responded to the survey, these surveys represent the practitioners' experiences for over two-thirds of participating facilities.

A.4.4 Analysis of Survey Data

RTI presents the full survey responses for all close-ended questions in ***Appendix I*** and has incorporated the survey findings into ***Section 2*** of this year's annual report. We will continue to analyze the survey data and incorporate findings into the project's mid-year and annual reports for Initiative Year 4, along with the Final Report.

This year's report includes full survey responses in aggregate for the NFA and Practitioner Surveys, as well as stratified responses by Clinical + Payment and Payment-Only intervention groups. ***Section 2*** reports the aggregated findings, highlighting notable differences where a particular respondent group's findings may depart from the overall results. In the future, RTI plans to analyze results longitudinally to examine changes over time and to evaluate the progress and impact of the Initiative. RTI may be able to further investigate whether different facility-level factors are related to engagement and billing.

A.5 Primary Data Collection Schedule in Initiative Year 2

Site visits to all six ECCPs were completed in the summer and early fall of Initiative Year 2. ***Table A-3*** provides the data collection timeline of site visits in Initiative Year 2.

Table A-3. RTI site visit schedule for Initiative Year 2

ECCP	State	Facility	Site visit dates
AQAF	Alabama	Clinical + Payment	July 30–August 3, 2018
ATOP2	Nevada	Clinical + Payment	June 25–29, 2018
MOQI	Missouri	Clinical + Payment	October 1–5, 2018
NY-RAH	New York	Clinical + Payment	October 1–5, 2018
OPTIMISTIC	Indiana	Clinical + Payment	June 18–22, 2018
RAVEN	Pennsylvania	Clinical + Payment	October 29–November 2, 2018

In addition, we administered the web-based NFA Survey to all facilities and the web-based Practitioner Survey to all participating practitioners. Both surveys were deployed on January 25, 2018, and data collection ended on March 2, 2018. RTI also conducted a series of interviews with key state administrators and other stakeholders between August 1, 2017, and March 1, 2018.

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APPENDIX B
ALABAMA QUALITY ASSURANCE FOUNDATION (AQAF)

B.1 Overview

2018 Alabama Site Visit and Telephone Interview Findings

Key Findings:

- AQAF is pivoting from their education-only design to a new hands-on care model in Clinical + Payment facilities, per their January 2018 CMS Programmatic Assistance Letter (PAL).
- Clinical + Payment facility interviewees said the model transition has been challenging, largely because of unclear expectations and timeline for the new model.
- Payment-Only facilities described a sharp decline in support from AQAF, as AQAF leadership focused on the new model in Clinical + Payment facilities.
- Many Clinical + Payment facilities, Payment-Only facilities, and practitioners reported low billing frequency or a reduction in billing since the first year of NFI 2 because of confusion over the model shift.
- Medicare Advantage (MA) plans (e.g., Simpra) have expanded statewide, reducing the number of NFI 2-eligible residents and threatening the viability of NFI 2 in some facilities.

Throughout NFI 1, AQAF's education-only model did not show significant reductions in avoidable hospitalizations or related expenditures, particularly compared to ECCP models that provided clinical care to residents. Consequently, CMS issued a PAL advising AQAF leadership to revise their model. Through spring and summer 2018, AQAF leadership planned two key changes: (1) shifting the AQAF RNs to a new hands-on role to provide resident assessments, and (2) adding nurse practitioners (NPs) to certify and treat residents for NFI 2 facility billing. The full model change was slated to take effect in summer 2018. ***Table B-1*** provides a summary of the 2018 data collection cycle.

Table B-1. 2018 data collection summary

Number of facilities participating as of site visit date (July 31, 2018)	41
Ownership changes since 2017 site visit	None
Facilities withdrawn or removed from Initiative since 2017 site visit	1

All data in this report were collected in calendar year 2018. The RTI team completed in-person interviews with AQAF leadership on July 31, 2018, two weeks after the launch of the new model. RTI also interviewed nursing facility administrators (NFAs), directors of nursing (DONs), assistant directors of nursing (ADONs), charge nurses, medical directors, non-ECCP APRNs, AQAF nurses, billing coordinators, and other key staff in four Clinical + Payment facilities, August 1-3, 2018. These visits followed April through June 2018 telephone interviews with NFAs, DONs, and other

key staff in 12 Clinical + Payment facilities and 13 Payment-Only facilities. ***Table B-2*** shows the site visit and telephone interview summary finding for facility staff buy-in and implementation.

Table B-2. Site visit and phone interview summary findings: 2018 facility staff buy-in and implementation

Facility Staff Buy-in and Implementation	Total	Clinical + Payment	Payment-Only
Interviewed facilities (by phone or in person)	29	16	13
Buy-in to NFI 2			
High	12	7	5
Medium	9	5	4
Low	6	2	4
No buy-in/Still in start-up phase	2	2	-
Number of facilities that hired new staff in 2018 because of NFI 2	4	2	2
Number of facilities with resident opt-outs in 2018	-	-	-
Number of facilities reporting that NFI 2 has been effective in reducing potentially avoidable hospitalizations	19	12	7

NOTES: Buy-in is based on interviewer perceptions using the following definitions: *High buy-in*: Facilities that are billing regularly, with staff that are aware and engaged; overall, the facility interviewees speak highly of the Initiative and its impact on reducing avoidable hospitalizations. *Medium buy-in*: Facilities that have begun to bill but are not doing so regularly; staff may recognize the Initiative and key components but may not be fully engaged. *Low buy-in*: Facilities that have not started billing and/or have not trained staff on the six qualifying conditions; generally limited engagement and limited participation in NFI 2.

Based on interviews with ECCP leadership and facility staff, RTI identified the following key findings:

- There are discrepancies in how the model transition is perceived. AQAF leadership described the new model transition as an opportunity for reinvention and improvement, shifting AQAF RNs (Coaches) to new roles as Delta RNs who provide clinical care. In contrast, facility leaders and staff often described this transition as difficult because of poor AQAF-to-facility communication about the forthcoming changes and challenges implementing the new clinical components with only part-time support from the new Delta RNs. Because of new model implementation challenges, some clinical activities were not yet in place as of RTI's August 2018 site visit.
- AQAF plans to partner with NPs who already work in the participating Clinical + Payment facilities, typically through managed care or facility corporate placement. These NPs will help assess residents and certify conditions for facility billing.
- Most Clinical + Payment facilities reported infrequent billing. Likewise, Payment-Only facilities and practitioners from both facility types were billing less frequently compared to the first year of NFI 2, reportedly in part because of poor communication from AQAF about expectations amidst the model overhaul.

- Facility leadership and staff turnover remain challenging, further compounding implementation challenges with the new AQAF model change.
- Some facility interviewees said NFI 2 has improved their skills to identify symptoms of the six qualifying conditions, respond to changes of condition, and treat residents in house. However, Clinical + Payment and Payment-Only interviewees generally were only somewhat confident that the Initiative has been responsible for reducing hospitalizations.
- Managed care, particularly the Simpra plan developed and owned by nursing facility companies in the state, has a huge presence and is enrolling large numbers of eligible NFI 2 residents. Facility leaders reported that Simpra was advertised as "just like AQAF," including a set of key conditions and a certification process. However, facility leaders added that Simpra is more prescriptive in condition treatment and more challenging to submit claims compared to NFI 2. Although facility leaders seemed to prefer NFI 2, Simpra is encouraged strongly by most facility corporate owners, thus posing further threat to the viability of NFI 2.

B.2 Changes to Model and Implementation in 2018

Throughout 2018, AQAF leadership focused on redesigning their NFI 2 model.

B.2.1 Changes to Structure and Model

In NFI 1 and early NFI 2, the AQAF model was education only. AQAF deployed one full-time RN Coach to each Clinical + Payment facility to train facility staff on key Initiative components, such as INTERACT tools, QAPI (quality assurance and performance improvement) teams, leadership training, and consistent staffing. The Coaches also collected data and served as AQAF–facility liaisons.

Following receipt of the CMS PAL in January 2018, AQAF reinvented the role of these RN Coaches, while also adding a role for NPs. AQAF spoke with ATOP2 (Nevada) and OPTIMISTIC (Indiana) leadership to learn how a clinical model might be operationalized. ATOP2 has a part-time schedule in which ATOP2 nurses split their time between a few facilities, rather than working full-time in just one facility. Both ATOP2 and OPTIMISTIC have RNs and NPs who work together to help assess and treat residents. Since the CMS PAL required a model change and did not provide any additional funding, AQAF leadership opted for a part-time assignment structure of RNs akin to ATOP2, in order to fund the addition of some NP coverage like ATOP2's and OPTIMISTIC's combined RN and NP models.

AQAF required all existing Coaches to reapply and be interviewed. Prior to the reapplication process, AQAF leadership held a "town hall" event with the existing Coaches to explain the model change. AQAF described that, under this new model, RNs would be expected to continue the facility training activities and data collection work that they were doing prior to the model change, but they also would have to assess residents and provide an additional set of eyes, ears, and hands to facility staff. Because of these new expectations, some RNs opted not to return, so AQAF also hired a few new RNs.

Delta RNs will be supported by NPs, but the details of that relationship had not been finalized as of the RTI site visit. Tentatively, AQAF planned to partner with contracted NPs already in place in Clinical + Payment facilities. These NPs generally provide in-facility assessment for managed care plans (e.g., Simpra); however, they are employed by a third-party organization, not paid by managed care plans. AQAF hoped to issue similar contracts with the third-party organization, allowing AQAF to pay a fee for NP services without taking on the malpractice liability coverage, practice agreement requirements, and related burden of hiring NPs directly. In addition, because the contracted NPs are in the facilities regularly already, they are familiar with facility staff and practices. AQAF estimated that NPs might start seeing AQAF residents in fall 2018, after the contracting details were finalized.

Although the PAL advised AQAF to add clinical care, CMS did not provide additional funding; AQAF trimmed some original model features to afford adding NPs. The INTERACT components from the original model are still a focus, but AQAF nurses are no longer supporting QAPI teams or helping facilities in implementing consistent assignment. AQAF leadership said that those two original model components should be entrenched enough after 5 years of NFI 1 and early NFI 2 for the facilities to take full ownership.

B.2.2 Learning Community Activities in 2018

Historically, AQAF has provided ongoing support to both Clinical + Payment and Payment-Only facilities through Learning Community conference calls on key topics of interest to participating facilities (e.g., billing processes for NFI 2, the six qualifying conditions, and best practices). AQAF also provided a series of facility leadership trainings through NFI 1 and early NFI 2, but because of costs, those activities have been discontinued with the switch to the clinical model.

As of 2018, interviewees reported generally low engagement with Learning Communities. Many Clinical + Payment facility interviewees were unclear whether AQAF still hosts Learning Community calls, and although Payment-Only facility staff seemed aware that calls exist, attendance was low. One interviewee noted that facilities receive little notice for these calls, recommending instead that calls be scheduled at consistent times (e.g., the third Wednesday of the month). Notably, AQAF leadership indicated that calls occur on a consistent schedule with email reminders for upcoming calls, though several facility interviewees seemed unaware of this schedule. Of the few interviewees who had attended Learning Community calls, Payment-Only facility staff found the content to be helpful, although Clinical + Payment facility interviewees said the information was redundant with that on prior AQAF calls.

B.2.3 New Developments with INTERACT Tools and Other Components

All Payment-Only facilities reported consistent use of the INTERACT tool suite, including SBAR, Stop and Watch, and Care Paths, and found the tools to be useful in caring for residents. Clinical + Payment facilities also continue to use INTERACT—the only model component still in place from NFI 1.

B.2.4 Changes in Role of ECCP Nurses in Clinical + Payment Facilities

In their new role, Delta RNs are expected to assess residents, including but not limited to, measuring vital signs, weighing residents, and completing wound care. During RTI's spring 2018 telephone interviews, most facility interviewees either were unaware of the model change or had heard only nonspecific rumors of imminent changes, likely because the model change had received CMS approval just two weeks prior to the start of interviews. The August site visit interviewees were more aware of the changes, with interviewees expressing frustration with the schedule change for the Delta RNs from full time to part time in each facility. Facility staff attributed earlier Initiative successes to full-time ECCP nurse support. One DON shared,

> ***We dislike whoever did that [changed to a part-time system]. This has been a challenge because we rely on [ECCP nurse] for a lot of things. She is a team member here. We don't see her as a consultant... That is a big adjustment for us. When she was always here, we could go ask [her] and now we are sharing her. We have to develop processes that she had been overseeing to cover for the days she isn't here, while also not kicking her out of the picture because she is still with us 3 days a week.***

Interviewees in the few facilities with frequent Coach turnover through NFI 1 and early NFI 2 reported the model change had little-to-no effect. These interviewees described their Coaches as having nominal roles, and likewise, they had low expectations for the Delta RNs. In these facilities, staff generally were unable to name their Delta RN, their RN's schedule, or their purpose in the facility. One NFA noted that their Delta RN "…comes by every now and then, and then disappears. We have not had a consistent AQAF nurse. We can't grasp [the Initiative] because [AQAF Coaches/Delta RNs] leave once they get here and are halfway established."

Regarding the role of Delta RNs, some facility staff interviewees appreciated the extra clinical support their Delta RNs would provide, especially in facilities with high rates of staff turnover and need for "extra hands" providing clinical care. In contrast, interviewees from other facilities were very opposed to the Delta RNs, particularly regarding liability. Multiple interviewees shared the example of resident abuse: if a resident makes an abuse claim against a facility staff nurse, facility leaders investigate the claim and suspend or terminate the nurse in question. Because the Delta RN is not a facility employee, facility leadership were very uncomfortable allowing the Delta RN to provide hands-on resident care.

Interviewed Delta RNs voiced similar concerns. For example, Delta RNs would potentially need to lift or move residents. Because moving residents can require two or more staff members or use of specific equipment (e.g., electric lifts), interviewed Delta RNs were hesitant to complete these activities alone and felt unable to pull facility staff away from their residents to help complete these duties. Interviewed Delta RNs worried about being liable for any unintentional resident injuries caused by using facility equipment without adequate support.

Beyond liability, interviewed Delta RNs also shared that they would need to purchase new equipment (e.g., stethoscopes, blood pressure cuffs) out-of-pocket because AQAF did not provide

these resources. The Delta RNs said that facilities were often short on equipment, so the Delta RNs did not feel that it would be appropriate to borrow these tools. Interviewed facility staff and Delta RNs reported that they had shared the staffing, liability, and equipment worries with AQAF leadership, though AQAF leadership indicated that none of the Delta RNs had raised concerns.

B.3 Sharing Collaborative Activities in 2018

AQAF leadership participates in the CMS Sharing Collaborative activities with other ECCPs. AQAF leadership reported that they appreciate hearing information from across ECCPs. AQAF also reported that CMS addresses their questions in a timely fashion, which is especially helpful in the wake of AQAF's PAL and subsequent model change.

B.4 Changes to Facility Staff and Practitioner Engagement in 2018

Interviewees reported similar or reduced facility staff and practitioner engagement compared to the first year of NFI 2.

B.4.1 Facility Staff

Amidst the AQAF model changes, interviewed Clinical + Payment facility leadership and staff described a sense of disconnection. When asked about all the changes, an interviewed NFA shared, "The whole project is floundering. They [AQAF leadership] don't know what direction they are going in and how to sustain the project. They can't seem to get out of the fog. We are spinning our wheels." While this comment was shared by only one interviewee, it represents confusion at the facility leadership level that was expressed across several telephone and site visit interviews between April and August 2018. Interviewees indicated that the model change has resulted in limited engagement of Clinical + Payment facility floor staff in Initiative activities.

Two factors seem to limit Clinical + Payment facility staff engagement. First, the NFI 1 activities (e.g., QAPI teams, consistent assignment) that had high facility staff engagement are no longer part of AQAF's model. Second, because the new model transitions have reduced NFI 2 billing frequency in many facilities, Clinical + Payment floor staff described limited-to-no involvement with current NFI 2 activities. When asked about AQAF, a majority of interviewed floor staff described their former AQAF Coach or mentioned INTERACT tools; these staff only acknowledged other Initiative activities (e.g., six qualifying conditions, billing) when prompted by interviewers.

In contrast, Payment-Only facilities largely fell into two evenly split groups: (1) engaged regardless of AQAF support or (2) disengaged because of limited support from AQAF. Engaged facilities had integrated NFI 2 into facility routines and were billing at rates similar to the first year of the Initiative. The second group of facility staff also were supportive of the Initiative and its goals in theory, but they attributed low engagement and infrequent billing to the Clinical + Payment model change and resultant AQAF communication breakdown with all participating facilities.

B.4.2 Practitioners

As in the first year of NFI 2, practitioner engagement varied. Some interviewees described practitioners eagerly encouraging staff to identify changes in condition so the practitioners could

certify and bill. Other facility interviewees reported that some practitioners were unwilling to participate in the Initiative.

Interviewees in rural facilities mentioned two primary practitioner concerns specific to geography. First, practitioners living far from their facilities or serving several rural facilities across a large distance have trouble certifying conditions within the Initiative-required time window. Second, many of the practitioners serving these facilities are billing as a Rural Health Clinic (RHC). Rural Health Clinics must bill for service delivery using designated rural health Medicare Part A billing codes, meaning they cannot use other billing codes, including NFI 2 codes, while serving in that rural health care capacity. For example, AQAF leadership described one practitioner who only visits an NFI 2 facility after hours to certify so that his NFI 2 billing opportunities do not overlap with his daytime rural health care duties. This practitioner, however, had to revamp his billing systems to accommodate two distinct billing streams. Other rural practitioners have not gone to such lengths, cannot bill for the Initiative during the day, and thus are not incentivized to participate. Without available and engaged practitioners, many rural facilities also have struggled to submit claims.

B.5 Updates for Documenting and Certifying Six Qualifying Conditions

As in the first year of NFI 2, most facilities across both Clinical + Payment and Payment-Only groups focus on the six qualifying conditions through refresher training for existing staff and orientation training for new hires. Many facilities also have systems in place (e.g., INTERACT) for recognizing and documenting a change in condition. Some have created supplemental tools (e.g., reference cards) to remind staff of NFI 2-eligible changes in condition. Many facilities also use tools developed by AQAF to help audit charts for accuracy of documentation prior to submitting claims for NFI 2. Four facilities—two Clinical + Payment, and two Payment-Only—also hired new staff to support documentation and certification processes. Three of these facilities hired NPs and one hired an Infection Control nurse. Pneumonia and UTI remain the most common qualifying conditions across facilities, with dehydration and cellulitis described as the least-billed conditions.

B.6 Updates to Existing Billing Practices

Billing among Clinical + Payment and Payment-Only facilities has either remained stable or declined in recent months, as has practitioner billing compared to the first year of NFI 2.

B.6.1 Facility Billing and Recoupment

In general, facilities are billing less frequently than they were in the first year of NFI 2, and facility interviewees attributed this lower billing to overall lower engagement because of the model change, as well as reduced ability to bill because of a high number of residents who moved onto managed care plans. One Clinical + Payment DON mentioned that the facility submitted claims regularly at the beginning of the Initiative, but because of the model change and recent staff turnover, he joked that they had submitted “approximately zero claims this year and made approximately zero dollars.” Clinical + Payment facilities seemed to be in a holding pattern with billing, waiting until the new AQAF model was implemented fully to resume NFI 2 billing. As noted, Payment-Only facilities that were already engaged and working fairly independently of AQAF still

submitted claims, but Payment-Only facilities that sought AQAF support reported fewer recent claims submissions.

Facilities expressed no worries about CMS recoupment. Early in NFI 2, AQAF provided a series of checklists for facilities to ensure accuracy in claims submission. Most facilities continue using those documents and, consequently, had no reported recoupment concerns.

B.6.2 Practitioner Billing

As in the first year of NFI 2, many participating practitioners billed infrequently, with a number of practitioners indicating that the effort required to submit claims is not worth the payment. Among those practitioners who were eager to submit claims, some said they have been limited because of facility challenges. For example, one Clinical + Payment DON shared, "Our Medical Director has been an advocate [for the Initiative]. He made a comment the other day about having no [NFI 2] folders to sign recently." The DON indicated growing pains with the new model were to blame for their lack of billing.

Although AQAF leadership had no facility recoupment concerns, they worried about practitioner recoupment. Practitioners received less training than facilities regarding NFI 2, creating concern over possible mistakes in practitioner claims and resultant recoupment. AQAF leadership feared widespread recoupment would erode already fragile practitioner buy-in.

B.7 Data Collection

Data collection has been stalled during the model overhaul this year. Clinical + Payment facilities that have had a consistent Coach or Delta RN are still submitting data regularly to AQAF, although facilities with Coach or Delta RN vacancies said they were behind on data collection efforts. According to interviews, several Payment-Only facilities did not submit data for several months in early 2018, as AQAF underwent the model overhaul and was not able to support data submission efforts from facilities. In mid-2018, AQAF hired a new staff member to help reinvigorate data collection in Payment-Only facilities.

B.8 Update on the Effectiveness of the Initiative in 2018

Most facility interviewees gave very general statements about the potential for improvement in hospitalizations, but some interviewees also indicated that they feel the Initiative is having very little effect.

B.8.1 Potentially Avoidable Hospitalizations in 2018

Both Clinical + Payment and Payment-Only facility interviewees said the Initiative has strong potential to reduce avoidable hospitalizations. However, these interviewees also acknowledged facility success is achieved with facility leadership buy-in, practitioner and staff engagement, low staff turnover, and, in Clinical + Payment facilities, a consistent Delta RN. Accordingly, facility interviewees with high facility buy-in perceived better outcomes in terms of reducing hospitalizations, and facilities with more NFI 2 challenges indicated the Initiative is not having much effect.

The majority of Payment-Only facility interviewees said the Initiative has helped reduce hospitalizations, though many added that the Initiative has not changed existing facility practices in a substantial way, suggesting that improved hospitalization rates may be unrelated to the Initiative.

Most Clinical + Payment interviewees indicated that hospitalizations have declined, though some clarified that they feel the reductions occurred in NFI 1, not recently. A few interviewees reported no change in avoidable hospitalization rates, attributing the lack of change to (1) family members insisting on hospitalizations, regardless of the facility's capabilities, and (2) staff and Delta RN turnover, preventing the Initiative from being implemented fully. One Clinical + Payment NFA noted that practitioners, who are often hospital-based and financially incentivized to care for residents in the hospital, sometimes seek resident transfers, saying "… our docs come here to shop [for residents to transfer]," thus thwarting facility efforts to keep residents in house. Although not shared widely across interviews, this statement suggests a possible need for more practitioner training and greater engagement with the Initiative.

B.8.2 Residents and Families in 2018

All facilities in both the Clinical + Payment and Payment-Only groups reported that no residents had opted out of the Initiative, although AQAF leadership reported an opt-out in the first year of NFI 2. Most interviewees said residents and families are aware that the facility tries to treat residents in house, but they are unable to name any specifics of NFI 2.

B.9 New Reports of Spillover and Contamination Effects

There were no reported changes in spillover within the facilities this Initiative year; across both groups, facility staff are treating all residents as if they are eligible for the Initiative.

Contamination is increasing, as Simpra Advantage (Simpra), a new Alabama-based Medicare Advantage product (described in further detail in ***Section B.10.3, State Policy Environment***), was rolled out in January 2018. Although the exact number of Simpra facilities is unclear, current estimates suggest that more than 50 percent of nursing facilities are offering the plan to their residents. This plan could contaminate a within-state comparison group because Simpra was modeled after the AQAF Initiative. Interviewees reported that the managed care plan was marketed to participating facilities as "expanded AQAF."

B.10 Updates to Policies and External Stakeholders

Hospitals are generally aware of NFI 2 in Alabama, and most are supportive of the Initiative. As stated earlier, managed care, particularly Simpra, is growing very rapidly and reducing the number of NFI 2-eligible residents across many facilities.

B.10.1 Hospital Engagement

As in the first year of NFI 2, most hospitals support the goals of NFI 2 and appreciate that reducing nursing facility hospitalizations has the potential to reduce rehospitalization and associated

penalties. In contrast, a few interviewees mentioned that rural hospitals are concerned NFI 2 will hurt business. These small hospitals rely on nursing facility transfers for consistent bed occupancy, and with fewer hospitalizations, smaller hospitals fear they may need to close. One Clinical + Payment NFA said the local hospital owner feels like their facility is "doing [their] best to put him out of business." However, this opinion seemed to be more of a concern in rural areas.

B.10.2 Competing or Similar Initiatives

There were no changes during this project year; a few hospitals have implemented targeted readmission efforts that include developing select lists of nursing facilities with fewer rehospitalizations. These efforts are ongoing and have mostly been in place since NFI 1.

B.10.3 State Policy Environment

Rapid Medicare Advantage (MA) plan growth represents the biggest shift in Alabama's policy environment since NFI 1. During the 2017 site visit, RTI learned about the growing presence of MA plans, like Optum, and the potential for more managed care penetration through Simpra. Simpra was created by state-based nursing facility companies to market to their own residents. Because of this aggressive marketing, many facilities have had considerable managed care penetration by Simpra and other managed care plans, leaving very few AQAF-eligible residents. Facility interviewees explained that because the plans are so similar, staff are confused as to which residents are part of NFI 2 or Simpra, making claims submission even more complicated. Since corporate offices are encouraging Simpra, the NFI 2 efforts are being deprioritized in a number of facilities. Facility leadership indicated that AQAF's requirements of the six qualifying conditions are more stringent, but Simpra's treatment expectations are much more complicated. Facility staff also reported that NFI 2 pays better and is timelier in dispersing payments than Simpra.

B.11 Next Steps

For the coming year of data collection, RTI will continue following:

- Documenting the effects of the model change and how the clinical components are being operationalized by both AQAF nurses and potential partner NPs;
- Noting the changes in relationship between facilities and AQAF, including changes to communication and activities, such as Learning Community events;
- Observing billing frequency among Clinical + Payment facilities in light of the model change;
- Observing billing frequency in Payment-Only facilities;
- Noting practitioner engagement and billing frequency;
- Documenting managed care penetration, particularly the growing presence of Simpra; and
- Evaluating the sustainability of NFI 2 model components.

APPENDIX C
ADMISSIONS AND TRANSITIONS OPTIMIZATION (ATOP2)

C.1 Overview

2018 ATOP2 Site Visit and Telephone Interview Findings

Key Findings:

- Eligibility for ATOP2 was reported to have decreased in Nevada in 2018 because of increased managed care enrollment, particularly in the northern part of the state. Colorado interviewees reported the State's high level of managed care did not increase in 2018.
- ECCP nurses were the driving force supporting all administrative and clinical aspects of ATOP2 in the majority of the Clinical + Payment facilities. This ECCP support, coupled with receipt of Initiative payments yielded generally high Clinical + Payment facility staff buy-in, compared to Payment-Only facility staff buy-in, which varied widely by facility.
- The ECCP continued to take steps to improve practitioner involvement, which lagged in both Payment-Only and Clinical + Payment facilities.
- After additional outreach and technical support from the ECCP, all Payment-Only facilities were billing by spring 2018. Previously, one third of the 21 facilities in that group were reluctant to bill, believing that the new codes would result in rejections or audits.
- Staff in a few Colorado facilities had not provided residents with an opportunity to opt out, believing that the Initiative was clinical and administrative in nature and that it did not affect resident decision making.

In 2018, HealthInsight, with its Colorado subcontractor Intermountain Quality Innovations (ImQI), continued to implement ATOP2 in 13 Clinical + Payment nursing facilities in Nevada and 21 Payment-Only facilities in Colorado (***Table C-1***). Progress continued in the Clinical + Payment facilities; all appeared to be engaged with ATOP2 and were billing regularly. By spring 2018, after seven Colorado Payment-Only nursing facilities began billing, all facilities in that group had submitted Initiative claims. During the June 2018 site visit to Nevada Clinical + Payment facilities, RTI learned that HealthInsight had merged with Qualis Health in April 2018. The combined organization, called Comagine Health, operates in 10 states and the District of Columbia.[2] The ATOP initiative was not to have been affected by this.

[2] The 10 states include Alabama, Alaska, California, Idaho, Kansas, Nevada, New Mexico, Oregon, Utah, and Washington.

Table C-1. 2018 data collection summary

Number of facilities participating as of site visit date (June 29, 2018)	Clinical + Payment (Nevada), 13; Payment-Only (Colorado), 21
Ownership changes since 2017 site visit	2
Facilities withdrawn or removed from Initiative since 2017 site visit	1

All data included in this report were collected in calendar year 2018. We conducted telephone interviews from April to July 2018. We spoke with staff who were most familiar with ATOP2, usually the nursing facility administrator (NFA), billing staff, and clinical staff. We contacted all 21 Colorado Payment-Only facilities for telephone interviews but were successful in interviewing 14; seven facilities declined our interviews, did not return our calls (five attempts), or were "no shows" for scheduled appointments.

RTI visited nursing facilities in four Nevada Clinical + Payment group facilities during the June 26–29, 2018 site visit and interviewed facility staff by telephone in six other Nevada Clinical + Payment facilities. We also spoke with ECCP nurses, ECCP staff, and ImQI staff who administer ATOP2 in Colorado. ***Table C-2*** shows the site visit and telephone interview summary finding for facility staff buy-in and implementation

Table C-2. Site visit and phone interview summary findings: 2018 facility staff buy-in and implementation

Facility staff buy-in and implementation	Total	Clinical + Payment	Payment-Only
Interviewed facilities (by phone and in person)	24	10	14
Buy-in to NFI2			
High	16	8	8
Medium	5	2	3
Low	3	0	3
Number of facilities that hired new staff in 2018 because of NFI 2	3	0	3
Number of facilities with resident opt-outs in 2018	2	1	1
Number of facilities reporting that NFI 2 has been effective in reducing potentially avoidable hospitalizations	16	9	7

NOTES: Buy-in is based on interviewer perceptions using the following definitions: *High buy-in*: Facilities that are billing regularly, with staff that are aware and engaged; overall, the facility interviewees speak highly of the Initiative and its impact on reducing avoidable hospitalizations. *Medium buy-in*: Facilities that have begun to bill but are not doing so regularly; staff may recognize the Initiative and key components but may not be fully engaged. *Low buy-in*: Facilities that have not started billing and/or have not trained staff on the six qualifying conditions; generally limited engagement and limited participation in NFI 2.

Based on interviews with ECCP leadership and facility staff, RTI identified the following key findings:

- Managed care organizations expanded in Nevada between 2017 and 2018. When asked about the frequency of billing for the six qualifying conditions in 2018, Nevada Clinical + Payment facility staff reported that they were increasingly finding that residents experiencing changes in condition were enrolled in managed care and ineligible for ATOP2. Some staff described this as frustrating or concerning, given that they were unable to bill in the Initiative. ECCP leadership and staff confirmed that managed care companies were actively recruiting in northern Nevada and to a lesser extent in southern Nevada.
- A few Nevada Clinical + Payment facilities had "taken ownership" of the Initiative and held primary responsibility for completing each step: from identifying a change in condition to collecting documentation for billing. The majority of facilities, however, continued to rely on the ECCP nurses to support administrative and clinical aspects of ATOP2 and drive the Initiative forward.
- In 2018, the ECCP was taking steps to improve practitioner involvement, which lagged in facilities in both Colorado Payment-Only and Nevada Clinical + Payment groups. Efforts included partnering with additional physician groups, collaborating with practice administrative staff, encouraging frequent physician contact with ECCP advanced practice registered nurses (APRNs), and hosting quarterly lunch-and-learn events for practitioners.
- In early 2018, the ECCP identified seven Colorado Payment-Only facilities that had not yet billed. These facilities cited concerns over rejections or audits as reasons to delay billing. After targeted outreach and support to these facilities, all Colorado Payment-Only facilities were billing after spring 2018. In some cases, Colorado Payment-Only facilities described developing additional checkpoints or tools to ensure they were billing correctly.
- Nevada Clinical + Payment facility staff described high buy-in, attributable to ECCP nurse support and receipt of Initiative payments. Colorado Payment-Only facility buy-in was mixed, with some interviewees citing preference for the Optum managed care model and some wary of possible audits precipitated by submitting claims.
- There have been few resident opt-outs since the beginning of 2018. However, in some Colorado Payment-Only facilities, it appeared that staff were not making residents and families aware of their participation in the Initiative. Those facility staff reported that ATOP2 did not change the way that residents would otherwise receive care.

C.2 Changes to Model and Implementation in 2018

Although there were no major changes to the ATOP2 model in 2018, the ECCP did restructure their Learning Community activities to engage more facility staff and practitioners. ECCP nurses played an integral role in their facilities, supporting a large portion of ATOP2 activities in Clinical + Payment facilities.

C.2.1 Changes to Structure and Model

There were no changes to the model in 2018 for either Initiative group.

C.2.2 Learning Community Activities in 2018

Since fall 2017, ATOP2 leadership has worked to reorganize Learning Community activities and engage more facility staff and practitioners. Previously, the ECCP provided bimonthly Learning Community webinars only to Nevada Clinical + Payment facilities. Facilities in both groups now have access to the same standardized webinars, with subjects chosen from topics suggested by the ECCP Learning Community committee, which includes the ECCP director, ImQI staff, and several ECCP nurses. Along with weekly newsletters from the ECCP, the ECCP also adjusted webinar frequency and timing; webinars are now monthly and are archived for facility staff who are unable to attend in real time. ECCP staff intended to track archived webinar attendance in fall 2018 after learning management software was slated to be in place. Recent webinar topics included infection prevention and control, nursing documentation, and resident and family end-of-life discussions.

Perhaps because of the delayed start of the joint Learning Community trainings, Colorado Payment-Only facilities have become accustomed to receiving one-on-one training from ImQI staff when ATOP2-specific issues arise. Interest in Learning Community webinars also may be low because of ongoing education provided by the Colorado Health Care Association and Center for Assisted Living. This well-established organization routinely provides education on topics similar to those covered by ECCP webinars.

Previously, HealthInsight held twice-yearly, in-person "collaboratives" in Nevada, often with trainings by the Perry Foundation trainers and including non-ATOP participants. In spring 2018 the ECCP held its first annual in-person collaborative for participating nursing facility staff in Colorado with 12 of the 21 facilities represented during which the Colorado Department of Health discussed changes to regulations and emergency preparedness. The annual in-person Nevada collaborative meeting attracted nine nursing facility representatives (three were virtual) from northern and southern Nevada and was also held in spring 2018. Topics in both collaboratives included practitioner engagement, documentation, and billing. Intending to use a wider range of subject matter experts, the ECCP ended its training contract with the Perry Foundation in fall 2018.

ATOP2 developed quarterly lunch-and-learn meetings to engage practitioners, although it was challenging to increase attendance to more than three or four practitioners per meeting, according to ECCP leadership.

C.2.3 New Developments with INTERACT Tools and Other Components

Facilities in both the Colorado Payment-Only and Nevada Clinical + Payment groups continue to use INTERACT tools regularly in ATOP2. Compared to last year, however, a greater number of facilities had the tools built into their electronic medical records (EMR) alert charting systems.

C.2.4 Changes in Role of ECCP Nurses

In the four visited facilities, it was evident that ECCP nurses were much more involved in shepherding the ATOP2 processes from the change in condition to the billing of qualifying conditions than were nursing facility staff. This theme was consistent with reports from ECCP nurses assigned to nonvisited facilities and with reports from facility staff.

ECCP nurses were regularly participating in morning stand-up, care planning, quality improvement, and other routine nursing facility meetings. This higher level of engagement and acceptance began in ATOP2 when most ECCP nurses were assigned to one facility, rather than rotating among facilities, as was the case in NFI 1. As Learning Community webinars have become standardized and archived, ECCP nurses have been conducting fewer trainings in their nursing facilities than in the past. However, they continue to do one-on-one mentoring and in-services on ATOP2 for new facility staff.

A theme frequently heard during the site visit was the difficulty in obtaining timely progress notes, necessitating additional effort by ECCP APRNs. Interviewees described that some notes were uploaded to physician practice websites inaccessible to the facility or ECCP nurses; others were delayed or insufficient for Initiative detail and time requirements, necessitating that the APRN visit facilities in the evening or on weekends to complete the required documentation within Initiative time limits for billing.

C.3 Sharing Collaborative Activities in 2018

ECCP staff found monthly check-in calls with MMCO staff and with CMS contractors to be more helpful than data-focused workgroup meetings perhaps because of differences in experience and needs of ECCP data analysts across the Initiative. ATOP2 staff suggested that one-on-one support from a data specialist or an experienced ECCP data analyst at another ECCP might be more effective than data workgroup meetings with mixed levels of expertise and limited visuals. Similarly, ATOP2 leadership said the workgroups at the annual ECCP meeting were particularly helpful when the ECCPs were able to share information among themselves. They also suggested that providing ECCPs with more time to talk together and share ideas and lessons learned would be fruitful in future meetings.

C.4 Changes to Facility Staff and Practitioner Engagement in 2018

C.4.1 Facility Staff

In addition to activities described in ***Section C.2.2, Learning Community Activities in 2018***, ATOP2 leadership engage nursing facility staff with monthly newsletters and e-mail announcements of ATOP2 activities. In Nevada, Clinical + Payment facility leadership was engaged, but it was clear that the ECCP nurses were the driving forces of the Initiative. A few nursing facility administrators had taken ownership of the Initiative in their facilities by ensuring changes in condition were monitored, completing the required documentation, and billing successfully, but most other facilities struggled to administer the ATOP2 processes, instead relying entirely on ECCP nurses.

Facility staff explained that staff turnover and lack of time prevented them from taking a stronger role in ATOP2. Some remarked that without the ECCP nurses, the Initiative would flounder.

Because many Colorado Payment-Only facilities had already been addressing avoidable hospitalizations before the Initiative began there, some administrators reported that they had easily incorporated the ATOP2 requirements into their daily routines. However, about one-third of the Colorado Payment-Only facilities had not fully engaged with ATOP2 until spring 2018. They had submitted their quarterly data and participated in site visits by ImQI, CMS, or CMS contractors, but they had not submitted claims. These facilities were reportedly reluctant to bill because of their concerns that Initiative claims might trigger an audit or a recoupment of funds. ImQI staff and, in some cases, the facilities' corporate offices encouraged participation and worked with facilities to resolve concerns and communication issues. By spring 2018, the ECCP reported all Colorado Payment-Only facilities were billing. Another reason for low engagement in some Colorado Payment-Only facilities may be because of fewer eligible residents. It should be noted that there are some facilities in both Nevada and Colorado that have not submitted claims regularly because they report that they successfully catch changes in condition early and treat residents before they reach the Initiative-required threshold for billing.

Facilities in both states that had received income as a result of the Initiative appeared to be more engaged. By 2018 most nursing facilities had seen income from the payment reform; leadership was generally using these new funds to improve their facilities and seemed positively inclined toward ATOP2. Facilities reported using Initiative income for the following: new clinical diagnostic equipment, improved lighting in resident quarters, and new mattresses for residents. Three Colorado Payment-Only facilities used the Initiative funds to hire new staff, including nursing staff, a new facility NP, a respiratory therapist, and a new infection preventionist. One Nevada Clinical + Payment facility that had experienced financial hardship was using Initiative income to buy wound care supplies.

However, in facilities with high leadership turnover, senior staff were unsure if Initiative income had been received, or if so, how it was used. None of the ATOP2 interviewees in either state said that corporate owners retained part or all of the Initiative facility income. Buy-in among floor staff was more mixed because some saw the Initiative as additional work that was beyond their capacity. Those who had seen positive effects of Initiative income, either in terms of more resources or better outcomes, voiced positive feedback about ATOP2.

C.4.2 Practitioners

There were no reports of practitioners withdrawing from the Initiative; however, interviewees said there were practitioners who had been certified for ATOP2 initially and who were inactive in 2018. At the time of the site visit, ECCP staff was nearing completion of a practitioner audit to identify the active practitioners who were certifying the six qualifying conditions. ATOP2 leadership planned to follow up with these practitioners to ensure that they were fully engaged and encourage them to act as Initiative champions. Without ECCP nurses or medical directors to provide support for practitioners, low practitioner engagement was more acute in the Payment-

Only group. In 2018, ImQI staff conducted outreach at statewide association meetings that attract practitioners, visited individual physician practices, and contacted corporate offices in corporations that have staff physicians. In both states, ATOP2 staff contacted practitioner billing offices to engage and educate them on the Initiative. The two medical directors in Nevada have continued to meet with large and small physician groups. They all agree engaging and educating practitioners on the Initiative is challenging.

C.5 Updates for Documenting and Certifying Six Qualifying Conditions

In late 2017 staff in Colorado Payment-Only facilities participated in self-audit exercises and began using the ATOP2's self-audit checklist provided to track documentation and ensure accuracy. Many Colorado Payment-Only interviewees cited the value of the checklist. An MDS nurse explained, "I think I have a better understanding, due to the self-audits we did at the end of last year. We got more information ….[we are able] to do the self-audit and submit information into the self-audit checklist for each diagnosis category. That's how I decide who is eligible each month, who makes the cut."

This nurse also captured the sentiment expressed by a number of Colorado Payment-Only staff about Initiative progress, saying,

> ***"…as far as understanding expectations, that's probably what's changed most for us [in 2018]. We understand more what the expectations are. I think that people are capturing more because supporting documents are better. I think that interventions are being done more timely." A Colorado Payment-Only administrator echoed this lesson learned by saying, "I think just educating staff up front about here's the tool, and here's how to use it. Do more on the six conditions. We didn't have a lot of tools starting out, not a lot of ATOP2 support in the group, not given everything right away."***

In contrast, Nevada Clinical + Payment facility interviewees rarely mentioned the checklist, perhaps because ECCP nurses often oversaw or reviewed ATOP2 tasks on site.

C.6 Updates to Existing Billing Practices

Facility billing practices in 2018 appeared to be more routinized than in the previous year, particularly in facilities with stable staffing. Practitioner billing remained low.

C.6.1 Facility Billing and Recoupment

All Nevada Clinical + Payment and Colorado Payment-Only facilities were billing by spring 2018. A few Nevada Clinical + Payment facilities and most Colorado Payment-Only facilities mentioned the helpfulness of the ECCP's self-audit checklist to facilitate the billing process and ensure accurate submission of claims. The ECCP also conducted regular audits of the facilities' records to ensure correct billing. These audits supplemented both the SSS-T audits and the review and

documentation support by ATOP2 nurses in Nevada Clinical + Payment facilities. The facilities generally described these activities as helpful; the ECCP noted that audits also provided an opportunity to discuss missed opportunities. Although there were a few reported instances of adjustments to claims as a result of incorrect billing, none of the facility interviewees reported CMS recoupment of funds from the nursing facilities at the time of the interviews.

C.6.2 Practitioner Billing

The RTI team interviewed several practitioners participating in ATOP2 during the June 2018 site visit; ECCP staff and nurse interviewees also spoke of practitioner involvement. Nevada practitioners said they did not receive funds directly from the Initiative reimbursement. Rather, their practice billed and received the practitioners' incentive payments. Part of their performance bonus payment during the year may have been affected by their ATOP2 participation, but interviewees could not be certain. All interviewed practitioners expressed support for the concept of reducing avoidable hospitalizations and enabling residents to be treated in facilities. One physician disagreed with the premise of additional compensation, citing that practitioners already should be working to ensure their residents avoided unnecessary hospitalizations. As the provider described, "I feel like I should be independent of that, having a financial incentive. I'm readmitting because I have to; if I'm not admitting it should be because I'm able to keep up with [the resident's condition]." It should be noted that unlike most other practitioners in Nevada nursing facilities, these interviewees were not hospitalists (who are incentivized when they treat residents in hospitals).

In the Colorado Payment-Only group, RTI did not have the opportunity to interview practitioners directly. Information regarding Colorado Payment-Only practitioner participation was reported by nursing facility staff during telephone interviews and, therefore, is limited. Facility staff generally could not comment on whether practitioners were submitting claims. Practitioner billing was typically handled outside of the facility, either by the practitioner or their practice, and facility staff were not aware of the details. However, one Colorado Payment-Only facility reported that a large Colorado nursing facility corporation was submitting claims "on behalf of its salaried practitioners" and the practitioners were not receiving any extra compensation.

Life Care Centers of America, which operates about half of the Colorado Payment-Only facilities, worked with ImQI staff to reprogram its practitioner billing and payment software to include Initiative billing codes. Despite the few codes involved and the evident interest of the corporate staff to accomplish this task, the effort took 3 months to complete because of the complexity of the practitioner payment software programming. Life Care physician and nurse practitioner staff participating in ATOP2 were able to submit Initiative claims after this task was completed.

C.7 Data Collection

The ECCP's new web portal was due to go live in October 2018. This new system allows facilities to enter resident information and changes in condition directly, replacing the ATOP2 Excel

spreadsheets facilities had been submitting monthly. The new portal is also designed to streamline the registry data used by ECCP nurses that previously had been prone to errors and glitches.

C.8 Update on the Effectiveness of the Initiative in 2018

Facility staff in both groups generally reported that the Initiative was effective in reducing rehospitalizations and garnered a positive response from residents and families.

C.8.1 Potentially Avoidable Hospitalizations in 2018

Nevada Clinical + Payment facility staff generally believed that ATOP2 was reducing unnecessary hospitalizations, with substantiating evidence from their corporate offices. Colorado Payment-Only administrators often noted that rehospitalizations in the long-stay population were not tracked by their corporate offices, but they believed that ATOP2 was having a positive impact. As one Colorado NFA said, "I certainly think [ATOP2] is helpful with [long-stay] patients that were frequent flyers to the hospital. But I haven't seen any hard data to say how we're doing now versus how we were doing before." Another explained, "I think it's helping to keep hospital rates down. I think we were going down that trend anyway. But [ATOP2] has helped bring more awareness to it. It kind of all happened at the same time." In general, facility staff indicated that hospitalizations were declining, but were not able to confirm that ATOP2 was the driving force.

C.8.2 Residents and Families in 2018

A few Colorado Payment-Only facility staff interviewees were surprised when asked about resident opt-outs in the past year. They explained that the Initiative was solely an administrative and clinical function that did not affect resident decision making. In some Colorado Payment-Only facilities, it was not clear who took responsibility for informing residents of their ATOP2 enrollment or what the standard processes were. All nursing facility staff in Nevada and the majority of staff in Colorado, however, were familiar with the resident opt-out protocol and reported that very few new residents had declined to participate. Facility staff reported that the few residents who had opted out were concerned about privacy or believed that the facility should be providing the same standard of care without the Initiative.

C.9 New Reports of Spillover and Contamination Effects

There were no reported changes to within facility spillover this Initiative year. Across both groups, facility staff stated that they treat all residents similarly. As expressed by a Nevada Clinical + Payment DON, "We don't treat anyone in in the building differently; nurses are able to use the six [qualifying] conditions and apply to everyone whether it's a billing opportunity or not. We've since improved documentation and definitely are better at critical thinking because we're trained on the six [qualifying conditions]." Interviewees did not report any spillover to facilities outside of the Initiative.

C.10 Updates to Policies and External Stakeholders

NFI 2 continues in Nevada and Colorado with increasing awareness, and in some instances, engagement of local hospitals. Although the managed care presence in Colorado remains the same, Optum's I-SNP product appeared to be gaining in popularity over other managed care contracts. Nevada's managed care presence grew in comparison to the previous year.

C.10.1 Hospital Engagement

Colorado Payment-Only NFAs generally informed hospitals about their work with ATOP2, with one saying that their participation in ATOP2 should be considered a positive marketing factor. He noted, "We use the pamphlets to show 'look how good we are with bounce-backs,' but there's no real notice." However, another administrator was able to partner with a regional hospital to obtain in-house respiratory therapy services overseen by the cardiopulmonary group of the hospital using ATOP2 reimbursement funds. Interviewees said this partnership also increased local hospital awareness of ATOP2.

Hospitals working with Nevada Clinical + Payment nursing facilities are generally aware of the evolution of ATOP2 because of the ECCP's presentations to hospitals during NFI 1 and the visibility of the ECCP and the medical director in the state. Nevada Clinical + Payment nursing facilities routinely referenced ATOP2 during their meetings with hospital staff when discussing hospital readmissions; however, much of the hospitals' focus is on the short-stay population.

C.10.2 Competing or Similar Initiatives

Nevada Clinical + Payment Group. In 2017, the RTI team visited nursing facilities in southern Nevada and found that managed care had little influence on the Initiative. This had changed dramatically in northern Nevada (Reno area) where we visited in 2018, and to lesser extent in the southern part of the state (Las Vegas area). Clinical + Payment facility staff frequently remarked during the 2018 interviews that the number of ATOP2-eligible residents was decreasing because of increased managed care. This finding was underscored by the ECCP medical director and ECCP nurses. One nurse remarked that some facilities were "… trying desperately to get [managed care] contracts…they're going wild." Managed care companies operating in the state include Aetna, Anthem, CareMore, Centene, Humana, and Optum.

Colorado Payment-Only Group. Similar to our 2017 interviews, many Colorado facility staff interviewees in 2018 were positive about the effectiveness of Optum's I-SNP in the state. Some explained that the presence of an experienced NP on site several days a week was valuable for identifying and addressing changes in condition early. They also noted that their Optum NP was a valued member of the nursing facility's team and that the daily reimbursement was higher than that of ATOP2. The Initiative's daily facility rate for one of the six qualifying conditions was reported to be 60 percent of Optum's daily payment rate. As one administrator put it, "Optum came in before ATOP. Quite honestly as an [administrator], I think Optum is a better program for residents."

ImQI staff confirmed that some facilities in Colorado were struggling with eligibility numbers because Optum was saturating the eligible resident population. Some Colorado Payment-Only facilities reported fewer than 10 eligible residents for ATOP2. Both ImQI and facility staff observed that Optum's I-SNP product gained popularity over other managed care contracts. Optum operates a Medicare managed care product in Nevada, but not as an I-SNP.

C.10.3 State Policy Environment

Staff in a few Colorado Payment-Only nursing facilities mentioned new "pop-up" nursing facilities that were funded and staffed by hospitals. These facilities catered to newly discharged short-stay Medicare patients. After 20 days, if the resident did not have private health insurance, these facilities transferred them to other nursing facilities that accepted Medicaid. NFAs became aware of these new facilities when their census was suddenly and adversely affected. Colorado is not a certificate-of-need state; therefore, such facilities can be developed without showing a need for new facilities. Although these pop-up facilities treat only short-stay residents, their presence highlights hospitals' focus on nursing facility populations. The RTI team will continue monitoring these activities to identify any potential impact on ATOP2.

C.11 Conclusions and Next Steps

In 2018, ATOP2 activities focused on increasing practitioner buy-in, supporting regular billing in facilities, and restructuring learning community events and data systems to better fit Initiative needs. Some challenges experienced this year, such as the growing managed care penetration, may continue to impact the Initiative in the future.

In the upcoming year of data collection, RTI will focus on following:

- Changes in communications and activities, including Learning Community events;
- Resident opt-out procedures;
- Billing frequency among both Payment-Only and Clinical + Payment facilities;
- Practitioner engagement and billing frequency in both groups; billing by corporations on behalf of practitioners versus billing by new practitioners;
- Managed care growth in both states and its effect on eligibility; and
- Sustainability of ATOP2 with or without an ECCP nurse to carry out the majority of ATOP2 components.

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APPENDIX D
MISSOURI QUALITY INITIATIVE (MOQI)

D.1 Overview

2018 MOQI Site Visit and Telephone Interview Findings

Key Findings:

- Clinical + Payment Facility interviewees stated that the Advanced Practice Registered Nurses (APRNs) facility presence continues to be a critical factor of Initiative progress.
- Interviewees from both the Payment-Only and Clinical + Payment facilities reported that more education is needed to increase clinical skills of existing staff (certified nursing assistants [CNA], licensed practical nurses [LPN]) and to provide frequent orientations because of continued high staff turnover.
- In both groups, facility leadership continuity and longevity and staff engagement are integral to support the Initiative.
- Interviewees from both facility types reported that MOQI is very involved and helpful.
- Since MOQI and the facilities have completed high-level Initiative tasks such as, learning new skills, tools, and objectives of the Initiative, the focus has turned to deeper analyses on smaller activities (e.g., more specific data collection) and team-building strategies to engage facility leadership staff.

The MOQI model did not change this Initiative year. The placement of an APRN in Clinical + Payment facilities remains the core of the model, and interviewees reported that the APRNs are critical to reduce avoidable hospitalizations. Facility staff shared that having a consistent facility-based ECCP APRN is essential to assist facility clinical staff in identifying early changes for any of the six qualifying conditions. These APRNS are also important in assuring that accompanying documentation supports the diagnoses and meets requirements as an NFI 2 claims submission. From the inception of the Initiative (NFI 1), APRNs in the second year of NFI 2 continue to provide and support clinical care (without writing orders), education and training, end-of-life care planning, quality improvement (QI) activities, and data collection. In NFI 2, Payment-Only facilities continue to be supported by ECCP billing experts who are readily available for questions, education, and trainings. ECCP staff reported providing more frequent in-person, facility-based consultations to Payment-Only facilities. ECCP staff also reported shifting the focus of their efforts in NFI 2 to implementing innovative strategies that will further the goals of the Initiative toward improving nursing facility resident care. ***Table D-1*** provides a summary of the 2018 data collection cycle.

Table D-1. 2018 data collection summary

Number of facilities participating as of site visit date (October 5, 2018)	40 (16 Clinical + Payment; 24 Payment-Only)
Ownership changes since 2017 site visit	None
Facilities withdrawn or removed from Initiative since 2017 site visit	None

This report reflects site visit and telephone interview data collected in 2018. The RTI team completed in-person interviews with MOQI leadership on October 1, 2018. In addition, RTI interviewed medical directors, directors of nursing (DONs), associate directors of nursing (ADONs), APRNs, nursing facility administrators (NFAs), facility nurses, billing coordinators, MDS (minimum data set) nurses, and other key staff in four Clinical + Payment facilities, October 2–October 5, 2018. These visits followed the April–June 2018 telephone interviews with DONs, NFAs, and other key staff in 7 Clinical + Payment facilities and 12 Payment-Only facilities. ***Table D-2*** shows the site visit and telephone interview summary finding for facility staff buy-in and implementation.

Table D-2. Site visit and phone interview summary findings: 2018 facility staff buy-in and implementation

Facility staff buy-in and implementation	Total	Clinical + Payment	Payment-Only
Interviewed facilities (by phone and in person)	23	11	12
Buy-in to NFI 2			
High	21	10	11
Medium	2	1	1
Low	0	0	0
Number of facilities that hired new staff in 2018 because of NFI 2	0	0	1
Number of facilities with resident opt-outs in 2018	4	0	4
Number of facilities reporting that NFI 2 has been effective in reducing potentially avoidable hospitalizations	21	10	11

NOTES: Buy-in is based on interviewer perceptions using the following definitions: *High buy-in*: Facilities that are billing regularly, with staff that are aware and engaged; overall, the facility interviewees speak highly of the Initiative and its impact on reducing avoidable hospitalizations. *Medium buy-in*: Facilities that have begun to bill but are not doing so regularly; staff may recognize the Initiative and key components but may not be fully engaged. *Low buy-in*: Facilities that have not started billing and/or have not trained staff on the six qualifying conditions; generally limited engagement and limited participation in NFI 2.

Based on interviews with ECCP leadership and facility staff, RTI identified the following key findings:

- MOQI APRNs in Clinical + Payment facilities continue to be viewed as a critical component to the success of the Initiative in the facility and in reducing potentially avoidable hospitalizations because of their contribution to residents' care and efforts in improving

the clinical skills of the nursing staff. APRNs continue to be integrated in their facilities, conducting most of the data collection and leading trainings and education for the staff. As noted, APRNs are involved in strengthening the clinical skills of the staff through one-to-one bedside education and offering training for the facility nurses. The APRNs also engage family members in meetings to conduct end-of-life conversations.

- Clinical + Payment and Payment-Only facility leadership staff indicated that in order to reduce potentially avoidable hospitalizations and catch symptoms earlier, more education is needed for facility staff (e.g., CNA, LPN). Leadership also stated that nurses are trained and made aware of the Initiative during their orientation period, but frequent follow-up education is lacking. Leadership staff indicated they would like to see more education or in the case of Clinical + Payment facilities, have APRN-led trainings conducted more frequently in their facilities.
- Facility leadership longevity and staff buy-in play key roles in achieving Initiative goals. Facilities with higher facility and clinical staff leadership turnover rates reportedly experienced more potentially avoidable hospitalizations. Likewise, interviewees noted that in the presence of high turnover, nurses are more likely to have Initiative knowledge gaps. High turnover of facility staff also creates missed opportunities to submit claims for qualifying conditions.
- Facility staff view the ECCP as being very involved and helpful in supporting Initiative implementation. In addition to visiting the facilities throughout the year, ECCP leaders spend time discussing facility trends with their respective APRNs. Facility staff also reported that when issues arise, the ECCP is very responsive to their concerns.
- In NFI 1, ECCP and facility staff focused on learning new skills, tools, and objectives of the Initiative. In NFI 2, Clinical + Payment staff reported applying knowledge gleaned from Phase 1 to enhance Initiative outcomes. Facility staff spoke of targeting their data collection efforts to address frequently occurring conditions, advocating for SBAR (Situation, Background, Assessment, and Recommendation) to be integrated into the electronic medical record (EMR) system, leading weekly Lunch-and-Learn meetings to discuss facility trends, training other staff to complete Stop and Watch forms, and conduct end-of-life conversations, including advance directives.

D.2 Changes to Model and Implementation in 2018

In 2018, there were no significant changes to the MOQI model. The Initiative has been implemented in the same manner as in the previous Initiative year.

D.2.1 Changes to Structure and Model

Interview findings indicate there have been no changes to the MOQI model in Clinical + Payment or Payment-Only facilities.

D.2.2 Learning Community Activities in 2018

In the second year of NFI 2, staff from both Clinical + Payment and Payment-Only facilities continued to report varying participation in Learning Community offerings. They reported two key participation barriers: difficulty in engaging staff interest in the topics and providing time to attend. Interview findings suggest that Learning Community activities continue to focus on how to integrate crucial conversations into resident care, use INTERACT tools, provide dementia care, and complete documentation required for billing for NFI 2. Staff who were able to attend these activities found them useful; facility leadership and clinical staff reported these topics helped them with problem solving and interactions with their facility teams and residents' family members.

D.2.3 New Developments with INTERACT Tools and Other Components

Clinical + Payment and Payment-Only facilities continue to use INTERACT tools, such as Stop and Watch and SBAR, regularly. Compared to last year, however, a few more Clinical + Payment facilities had the tools built into their EMR alert charting systems. Clinical + Payment facilities continue to provide their own staff education and trainings through Lunch-and-Learn meetings that emphasize specific topics, such as reeducation for identifying the six qualifying conditions, using INTERACT tools, understanding goals of the MOQI initiative, and reviewing clinical scenarios for frequently occurring resident conditions. Nursing facility leadership and staff noted that these frequent meetings improved staff communication, facilitated better understanding of the issues in the facility, and believed they helped reduce hospitalization rates.

End-of-life conversations continue to occur in Clinical + Payment facilities and are supported by the ECCP. Some leadership staff in these facilities noted that the frequency of these conversations has increased, and staff said that through the facility-wide Lunch-and-Learn meetings, they feel more equipped to have end-of-life conversations with family members. However, most Clinical + Payment facilities rely on the APRN when conducting end-of-life conversations.

In addition, Missouri recently passed legislation that allowed it to adopt the Transportable Physician Orders for Patient Preferences (TROPP), which through documentation, allows physicians and emergency care workers to honor patient's wishes at end of life. TROPP is modeled on the Physician Orders for Life-Sustaining Treatment (POLST), which other states have adopted. The ECCP staff believe more families will agree to the no code with TROPP and its use should help to avoid unnecessary hospitalizations.

D.2.4 Changes in Role of ECCP Nurses

ECCP leaders report that the APRNs have continued to build on NFI 1 skills, and "The APRN pool is steady and consistent," indicating low turnover since the start of NFI 2. During the second year of NFI 2, the ECCP offered several medical condition education modules (e.g., stroke, cardiovascular disease, polypharmacy, nephrology, and personality disorders) to improve the clinical skills of the APRNs. As the ECCP leader who provided the education modules stated, "The goal is to make the APRNs mini-geriatricians. We hope to pass knowledge on so they can become 'super' APRNs."

At the time of the site visit, there was one APRN vacancy. A former ECCP APRN was hired by the ECCP medical director for his practice. The goal of hiring this practice-specific former ECCP nurse is to disseminate care practices and knowledge learned from the Initiative to non-MOQI nursing facilities. The responsibilities for this position include having direct contact with residents, acting as liaisons between care coordinators to mitigate care gaps, and providing education and training. If other Missouri facilities using this APRN were in the comparison group, this development could affect the estimated impact of the Initiative.

D.3 Sharing Collaborative Activities in 2018

MOQI leadership continued to hold a few sharing collaborative activities with CMS and other ECCPs, however, participation is minimal. One MOQI staff member mentioned that occasional calls occur with other ECCP APRNs to discuss various clinical topics. At the facility level, when asked about participation in sharing collaborative activities, most facility leadership and staff were unaware of these activities or did not have time to participate.

D.4 Changes to Facility Staff and Practitioner Engagement in 2018

Interviewees reported similar or slightly increased facility staff and practitioner engagement compared to the first year of NFI 2.

D.4.1 Facility Staff

According to interview findings, the majority of Clinical + Payment and Payment-Only facility staff view the implementation of NFI 2 favorably. Facility leaders reported staff are "on board now," "see the benefit of the investment," and have incorporated NFI 2 into their resident care routines. In addition, Clinical + Payment facility staff reported there has been a change in philosophy and mindset about retaining residents in the nursing facility. Facility leaders attributed this change in mindset to the Initiative, as one DON stated, "The process changed the thinking and model of long-term care from being custodial to being more skilled than in the past and the Initiative helped the progression and changed the whole idea and practice."

Interviewed facility staff continue to feel supported by MOQI leadership. As in previous years, Clinical + Payment staff continue to attribute the success of the Initiative to the consistent and full-time presence of an APRN in their facilities. Interview findings from the Payment-Only group indicate that the three ECCP billing staff are readily available for site visits and telephone consultations to assist them with accurate billing and claims submission.

D.4.2 Practitioners

As in Year 1 of NFI 2, facility staff and the ECCP reported variable practitioner interaction with MOQI, with some having limited to no interaction and others highly engaged. One ECCP staff member explained, "There are doctors who regularly submit [claims] but some who are just not there yet." Interviewees noted three primary reasons for lower engagement: cumbersome billing; misunderstanding about documentation and detail required to submit claims; resistance to change

(e.g., using telehealth in rural facilities). In addition, some practitioners felt billing Medicare for extra fees felt inappropriate. One medical director shared, "For UTIs they [didn't bill] because they didn't think the patient was sick enough." Some practitioners felt that catching conditions early and treating them should not result in an additional billing opportunity.

D.5 Updates for Documenting and Certifying Six Qualifying Conditions

In Year 2 of NFI 2, facilities in both the Payment-Only and Clinical + Payment groups continued to bolster staff education and training to improve processes for the documentation and certification of the six qualifying conditions As one administrator in the Clinical + Payment group expressed, "[INTERACT Tool use] is now an automatic process." In addition, interviewees in several facilities commented that documentation is better facilitated with updates to their EMR. We learned that one corporation with several participating Payment-Only facilities has updated their EMR to accommodate MOQI and facilitate data collection. This new template in the EMR allows staff to document the onset of the resident's symptoms and the date of the visit. A DON in one of these Payment-Only facilities believes that this template also makes documentation easier for participating practitioners, in that "it is a good flow sheet to go by, allowing practitioners to write orders and sign off on progress notes."

In one Payment-Only facility, a staff role was added to help ensure that changes in condition were captured. The administrator of this facility emphasized that it "is important to have one key person looking at [qualifying residents]." Since having a nurse move into this new role, the administrator reported "more success capturing and covering" changes in condition. This emphasis on the need for adequate staffing was heard repeatedly across both groups, with facility staff frequently attributing documentation and certification challenges to a general lack of qualified floor staff.

Although interviewees reported fewer general challenges with identifying the six qualifying conditions and their criteria, several facility and MOQI staff members discussed specific challenges with documenting and certifying UTIs. As described further in ***Section D.6.1. Facility Billing and Recoupment***, facility staff would begin treatment for a UTI, but would not begin proper documentation until confirmation was received from the urinalysis results. For instance, as one APRN shared, "there are several UTIs that didn't get qualified because nurses don't do the correct documentation. [Staff] will notice a change, but they won't write specifics in the chart, so by the time that I see the urine analysis, it has been too far out. UTIs [are] something we have the most trouble with." Similar concerns were not described for the other conditions.

D.6 Updates to Existing Billing Practices

Interviewees in Clinical + Payment and Payment-Only facilities and ECCP staff reported that Initiative billing practices had improved during this Initiative year even though there was some confusion and lack of consensus about when to initiate billing.

D.6.1 Facility Billing and Recoupment

Billing Process. MOQI leadership reported that all participating facilities, regardless of group, are now billing. Although billing volume remains variable across Payment-Only and Clinical + Payment facilities, MOQI leadership finds that Clinical + Payment facilities are generally more successful with billing than those in the Payment-Only group. In one conversation with a MOQI staff member, it was noted that the Clinical + Payment facilities tend to be more successful with the embedded MOQI APRN that "follows up with the resident roster contact person on who is eligible and able to be billed for by the facility." Several Clinical + Payment facilities that were part of the same corporation also reported implementing proactive measures, such as targeted education and a self-auditing form, for billing accuracy. This self-auditing form, which was developed at the corporate level and includes information such as participating residents and corresponding diagnosis and treatment dates, is entered into a system matrix that generates claims and then is sent to CMS as part of MOQI data collection efforts. The Clinical + Payment facilities using this form also reported doing their own audits to compare their systems' information with that of MOQI's. Conversely, Payment-Only facility staff reported that without a designated person responsible for "putting proper data into the database," more time is needed to verify that appropriate and accurate billing information is collected. In addition, one MOQI staff member reported that corporate facilities, which are mostly found in the Payment-Only group, have greater challenges in billing accurately because the process is not completed within the facility and instead is done externally in the corporate office.

Billing Successes. Billing in Year 2 of NFI 2 continues to be on a learning curve. MOQI leadership believed that facilities with active engagement from clinical and administrative staff, as well as practitioners, tend to bill at higher volumes. In facilities where there was active engagement, reimbursement funds were often used to increase the facility's clinical capabilities. For example, two Clinical + Payment facilities that are actively billing reported that they were able to use reimbursement funds to purchase bladder scanners, which many floor staff requested. Another Clinical + Payment facility mentioned plans to use funds to hire additional staff, such as an in-house RN. Payment-Only facilities attributed their improvement in submitting claims to the support from the ECCP billing staff.

Billing Challenges. Facility interviewees generally agreed that the billing process was not very burdensome. However, a challenge heard frequently among interviewees, regardless of group, was the lack of consensus on when to initiate billing. Across all site visits and telephone interviews with facilities we heard facilities discussing three different billing start dates: (1) the start of treatment, (2) the start of the first symptom, and (3) the date of when the qualifying condition was confirmed. Interestingly, interviewees seemed unaware that they had not been using the correct start date for billing. One APRN in the Clinical + Payment group reported that they have always billed at the start of treatment and not when the condition is confirmed. Only recently had this facility learned that they should start billing at the onset of a change in condition. MOQI leadership confirmed that accurate documentation remains challenging in NFI 2, but they continue working toward their goal of finding no errors in their facility audits through increased education and support.

In addition to challenges knowing when to bill, some facilities in the Clinical + Payment group experienced missed billing opportunities. In one facility, these missed opportunities arose when the ECCP APRN's availability changed, as explained by the DON, "We went from a full time APRN to one who is now sharing two facilities. It is hard on us and now we have more missed opportunities on the program. I do see the damper on not having her here full time."

Recoupment of payments for faulty claims was new in Year 2 of NFI 2. At the time of interview, most facilities, regardless of group, reported that they had not been asked to return reimbursement payments. However, MOQI leadership was aware of one corporation where all participating facilities would soon be contacted for recoupment on paid claims. Half of these Payment-Only facilities were treating, but not correctly documenting, at the onset of UTIs in residents. While waiting for urinalysis results, these facilities often missed the 2-day requirement for physician confirmation but continued submitting claims for the initial treatment. In addition, we learned of one Clinical + Payment facility that was asked to return a reimbursement payment because they were unaware that residents who are veterans are not eligible for the Initiative.

D.6.2 Practitioner Billing

Practitioners' claims submissions in Year 2 of NFI 2 continue to vary across both Clinical + Payment and Payment-Only facilities. Half of facility leadership staff knowledgeable of their provider's billing practices, reported their practitioners were submitting claims, the other half reported their practitioners were not submitting claims, and a few were not sure. Providers who bill as a Rural Health Clinic (RHC) explained why providers in these facilities are not billing. As a provider reported, "I think [the reimbursements are] helpful; it doesn't affect me because I am a rural health clinician. If they change that so you can bill for rural health clinics, you would see more success in the program in rural area." Rural Health Clinics have their own billing requirements and are unable to submit bills with the NFI 2 practitioner codes.

D.7 Data Collection

NFI 2 data continue to be collected for the Initiative by the ECCP APRN or MDS nurse in the facilities. Some of the data elements mentioned include number of completed Stop and Watches and number of falls. Billing data for the Initiative continues to be collected by facility billing staff. Facility leadership noted that the feedback reports that the facilities receive from the Initiative are a critical component to determine how their facility is implementing the goals of the Initiative.

MOQI leadership experienced frustration regarding data collection that was conducted by the Initiative operations contractor, SSS-T. When the contractor shared the data with MOQI, they showed discrepancies with the number of enrollees by presenting nonmatches but did not give any specifics as to where the discrepancies originated. The ECCP staff reported that these discrepancies become larger every quarter. "Whenever we try to ask about the discrepancies, the issue is never resolved by SSS-T and CMS." The ECCPs also stated that previously the data that were shared with them were more specific and since Phase 2 have been less useful.

D.8 Update on the Effectiveness of the Initiative in 2018

Most facility interviewees believed the Initiative has been effective in reducing potentially avoidable hospitalizations.

D.8.1 Potentially Avoidable Hospitalizations in 2018

Most interviewees, across both Clinical + Payment and Payment-Only facilities, reported the Initiative remains effective in reducing potentially avoidable hospitalizations. A few interviewees were skeptical that in their facilities, the Initiative was independently responsible for all reductions in avoidable hospitalizations. As one NFA reported, "We didn't have a high hospitalization rate before. The program has helped us identify changes in condition earlier, and we are moving faster to get treatment in place." An NFA from a Payment-Only facility stated, "We have done a better job of identifying clinical conditions and realizing we can treat-in-house and the staff have been more confident and aware of what they can take on." Most facilities across both groups agreed that success is attained with facility leadership buy-in, staff retention, physician and staff engagement, consistent identification of the six qualifying conditions, and, in Clinical + Payment facilities, a supportive APRN. The majority of Clinical +Payment facilities highlighted that a consistent APRN is a critical component to the reduction of potentially avoidable hospitalizations. Interviewees from a Payment-Only facility suggested that having a champion also is critical to the success of the Initiative.

D.8.2 Residents and Families in 2018

In Year 2 of NFI 2, interviewees from both Clinical + Payment and Payment-Only groups, reported a shift on the part of some family members and residents who previously wanted to go to the hospital. A DON from a Payment-Only facility shared, "I think they have come onboard with the project with the education piece. There is no need any more to send someone to a hospital unless it is for an acute emergency. Now they [families] don't necessarily want to send [residents] to hospital but want us to come down and take another look. They [families and residents] are valuing our assessment skills." The majority of residents who are eligible for the Initiative, regardless of group, agree to participate. Notably, the Clinical + Payment facilities reported no opt-outs. Clinical + Payment staff interviewed attribute this success to the presence of the APRN, whose role fosters family and resident engagement. As one NFA from a Clinical + Payment facility stated, "Having an NP gives the family a sense of greater confidence and her education to the family has been key." Reasons for the relatively small number (i.e., only four) of opt outs in Payment-Only facilities include (1) family pressures, regardless of the facility's ability to treat in-house, and (2) general apprehension about the program.

D.9 New Reports of Spillover and Contamination Effects

There were no newly reported changes in spillover this Initiative year. Within-facility spillover continues since the prior year, as staff in both Clinical + Payment and Payment-Only facilities continue treating all residents as if they are eligible for the Initiative. Spillover to other facilities in

the state is described in the next section. This type of spillover could be problematic if other facilities in Missouri were used as comparisons.

D.10 Updates to Policies and External Stakeholders

In 2018, the Missouri policy environment continues to include high managed care penetration, expanding from one predominant metropolitan area (St. Louis) to two other metropolitan areas (Columbia and Springfield) and rural areas. The reported range of residents in facilities insured by Medicare Managed Care varies from little to none in some homes to as high as 60 to 70 percent in others. One facility staff member reported aggressive recruitment of residents to managed care and support of this trend from a large nursing facility corporation.

MOQI and the five local Accountable Care Organizations (ACOs) have formed a consortium with the goal of disseminating best practices from the Initiative to the nursing facility industry. The ECCP medical director is the consortium moderator: "It's great to have all five ACOs at the table and do common modality and agree to do SBAR and UTI." This will become standard of care hopefully in every St. Louis home. It standardizes best practice. When nurses go to a home A and then B, they will have the same expectations and responsibilities. The goal is to make this project a standard form of care, and you have the same standard expectations and knowledge base." In the coming year of the Initiative, the RTI team will continue gathering information about this consortium's next steps.

D.10.1 Hospital Engagement

Acute care hospitals continue to express a positive and supportive response to the Initiative. Several Clinical + Payment facilities described how they are continuing to establish relationships and form partnerships with their referring acute care hospitals to achieve their mutual goal of avoiding hospital readmissions. As one NFA of a Clinical + Payment facility expressed, "The hospitals are paying more attention. There is general knowledge that all health care facilities and providers are looking at ways to control the readmissions to hospitals and ERs." In one instance, a facility staff member described the challenge of engaging large hospitals to communicate with small nursing facilities and suggested increasing communication between hospitals and other health care providers such as dialysis and mental health facilities.

A few interviewees reported their facility belongs to an ACO group within a large U.S. health care system. Facility staff, in the latter, meet with hospital staff monthly to review admission rates and resident data of their facility physician who also works in their referring acute care hospital and emergency department. Facility staff reported meeting with their referring acute care hospital regularly to talk about the Initiative, inform hospital staff regarding the level of care they can provide in the nursing facility and review readmission rates: "The hospital sees us as a partner in health care that can handle some of the sicker people." Different strategies are used to identify residents who may be at high risk for a hospital admission. As an example, hospital staff go to the nursing facility to review residents who are at high risk for a readmission.

D.10.2 Competing or Similar Initiatives

In 2018, there were no new initiatives described with the goal of reducing avoidable hospitalizations. As reported in 2017, facility staff described the influx of insurance companies offering managed care and the services of APRNs to nursing facility residents. A Clinical + Payment facility reported a competing interest between the MOQI Initiative and Optum, a Medicare Managed Care Product from United Healthcare, because the facility is a member of a larger health system that is involved with Optum on a national scale.

D.10.3 State Policy Environment

The ECCP has continued its efforts to influence legislation to change the APRN scope of practice laws in Missouri. In 2018 legislation was passed increasing the number of APRN collaborative practice agreements for each physician from three to five, which opened additional opportunities for collaborative practice agreements. It also changed the radius of practice mileage restrictions with the collaborating physician from 50 miles to 75 miles. The ECCP has raised considerable support for a full practice bill in collaboration with several APRN specialty organizations and plans to submit a full bill to the legislature in the coming year.

Missouri nursing facilities continue to respond to the challenge of caring for residents covered by Medicaid given the 2017 proposed rollback of a three percent Medicaid reimbursement rate increase and restricted eligibility requirements for older adults and persons with disabilities who receive services in nursing facilities. In one Missouri nursing facility the administrator reported that more than 90 percent of his residents are covered by Medicaid and that the facility is losing $25 per day per resident as a result of the low Medicaid reimbursement. In 2018, the governor approved an increase to the Medicaid rate of $165.00 per day per resident by $8.

D.11 Next Steps

For the upcoming year of data collection RTI will focus attention on the following topics:

- Status/progress of APRN legislation
- Impact of facility-based APRN continuity in reducing hospitalizations and increasing staff clinical skills
- Status and impact of MOQI's goals to disseminate Initiative best practices and information learned from MOQI APRNs to other ECCPs, and all nursing facilities in the United States
- Assessment of consistent implementation of when to initiate billing
- Impact of ACOs with Initiative nursing facilities on reducing hospitalizations
- Managed care penetration in rural areas
- Assessment of sustaining the gains in reducing hospitalizations and implementation of INTERACT tools

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APPENDIX E
NEW YORK REDUCING AVOIDABLE HOSPITALIZATIONS (NY-RAH)

E.1 Overview

2018 NY-RAH Site Visit and Telephone Findings

Key Findings:

- The NY-RAH education-only model continued in Clinical + Payment facilities as it had been originally planned for part of Initiative Year 2. Midyear, NY-RAH announced a model format transition from the existing Registered Nurse Care Coordinator (RNCC) who provided Clinical +Payment facility education and training to a new Quality Improvement Specialist role, focusing solely on quality initiatives in the participating facilities.
- As result of the forthcoming change, NFAs were most concerned about shifting RNCC responsibilities to their own facility staff and predicted that without them that they would not be able to identify as many eligible conditions for billing nor maintain data collection responsibilities.
- Amidst the model change, almost all Clinical + Payment and Payment-Only facilities (not directly affected by the change) continued to successfully submit claims.
- Complete and accurate documentation, however, became a major implementation focus in Initiative Year 2 with the ECCP's introduction of a required self-audit of both Clinical + Payment and Payment-Only facilities in preparation for the SSS-T audits; a new chart audit tool was introduced to help both types of facilities self-audit potential qualifying conditions before submitting claims.
- Practitioner engagement remained moderate to high in the second year for certifying and documenting eligible conditions for the nursing facility to bill. But the practitioner billing code for the confirmation of diagnoses was underutilized, and the practitioner use of the care conference code remained almost nonexistent.

The NY-RAH model has remained consistent into NFI 2 with RNCCs who provide education and training to one or two Clinical + Payment facilities, depending on the eligible resident census size. However, a major programmatic change started to take place in the summer and concluded 2018 with the elimination of the RNCC position. The ECCP then shifted to a new version of their education-only model, introducing two new positions, Quality Improvement Specialists (QISs) and Clinical Project Specialists (CPSs). In addition, early in Initiative Year 2, the ECCP began their own internal audits of both Clinical + Payment and Payment-Only facilities, while introducing a new chart review tool to assist the facilities with claims submission accuracy. Practitioner engagement remained focused on certifying the changes in conditions for facility billing rather than using the practitioner's own billing codes. ***Table E-1*** provides a summary of the 2018 data collection cycle.

Table E-1. 2018 data collection summary

Number of facilities participating as of site visit date (October 1, 2018)	60*
Ownership changes since 2017	No ownership changes
Facilities withdrawn since 2017	0

* We were notified that a Payment-Only facility would be leaving the Initiative as of Initiative Year 3 (as of October 23, 2018). Therefore, this facility is included in the count for Initiative Year 2.

All data in this report were collected in calendar year 2018. The RTI team completed in-person interviews with ECCP leadership, as well as leadership and staff from four nursing facilities during the week of October 1, 2018. We interviewed a variety of staff at each facility, including four nursing facility administrators (NFAs), four directors of nursing (DONs), two assistant directors of nursing (ADONs), three minimum dataset (MDS) nurses, two RNCCs, two RNCC managers, two nurse managers, two nurse practitioners (NPs), and one corporate staff member who oversees billing for two of the facilities. In addition, the RTI team completed 27 telephone interviews with NFAs, DONs, ADONs, medical directors, and other facility staff in spring and summer 2018. ***Table E-2*** shows the site visit and telephone interview summary finding for facility staff buy-in and implementation.

Table E-2. Site visit and phone interview summary findings: 2018 facility staff buy-in and implementation

Facility staff buy-in and implementation	Total	Clinical + Payment	Payment-Only
Interviewed facilities (by phone and in person)	31	15	16
Buy-in to NFI 2			
High	16	6	10
Medium	13	7	6
Low	2	2	0
Number of facilities that hired new staff in 2018 because of NFI 2	6	0	6
Number of facilities with resident opt-outs in 2018	4	2	2
Number of facilities reporting that NFI 2 has been effective in reducing potentially avoidable hospitalizations	26	13	13

NOTES: Buy-in is based on interviewer perceptions using the following definitions: *High buy-in*: Facilities that are billing regularly, with staff that are aware and engaged; overall, the facility interviewees speak highly of the Initiative and its impact on reducing avoidable hospitalizations. *Medium buy-in*: Facilities that have begun to bill but are not doing so regularly; staff may recognize the Initiative and key components but may not be fully engaged. *Low buy-in*: Facilities that have not started billing and/or have not trained staff on the six qualifying conditions; generally limited engagement and limited participation in NFI 2.

Based on interviews with ECCP leadership and facility staff, RTI identified the following key findings:

- In spring 2018, NY-RAH first asked their Clinical + Payment facilities to identify a staff member as a payment liaison, to oversee all Initiative data collection tasks; this change was a result of facilities using the RNCCs frequently for payment activities rather than education and training.
- Following this request, NY-RAH announced a forthcoming program modification resulting in a new staffing model that would occur at the start of Initiative Year 3. The new model, remaining education-only, would eliminate the RNCC position in Clinical + Payment facilities, instead introducing an ECCP staff position of QIS to work with facilities on data interpretation and program improvement projects.
- Ahead of the change, leadership staff from Clinical + Payment facilities stated they were disappointed in this change and concerned about their staff taking on additional responsibilities and a potential reduction in the number of eligible conditions they could identify for claims submission.
- RNCC staff were also disappointed in this change because they were still not aware, at the end of Fiscal Year 2, if their applications to the new QIS positions had been accepted. Multiple RNCCs expressed dissatisfaction with the ECCPs lack of transparent communication about the role change. At least two RNCCs had resigned from their positions and would not continue in the new role.
- Outside of the model change, both Clinical + Payment and Payment-Only facilities continued identifying changes in condition and submitting claims.
- However, as a result of the SSS-T audits, the ECCP introduced a required internal audit of all facilities. Although many NFAs from Payment-Only facilities agreed that the self-audit process was taxing, many also agreed the new chart audit tool was helpful. Many nursing facilities both Clinical + Payment and Payment-Only, adopted the tool as their standard way to determine if identified qualifying conditions met all required billing criteria before submitting claims.
- Practitioners continued, as in Year 1 of NFI 2, to be willing to certify conditions for the nursing facility claims submission but not willing to bill using the NFI 2 practitioner billing codes. Both direct practitioner feedback and practitioner feedback reported by nursing facility leadership staff, continued to echo that the billing code documentation requirements were overly burdensome and a continued barrier to practitioner's use of the practitioner billing codes.

E.2 Changes to Model and Implementation in 2018

The NY-RAH model transitioned through the course of 2018 affecting the Clinical + Payment facilities only. By spring, the ECCP enacted new facility participation requirements followed by eliminating the RNCC position and adding QIS positions. By summer, the ECCP informed facilities

about the pending program modification and the forthcoming transition at the start of Initiative Year 3. The core of the model would remain education only.

E.2.1 Changes to Structure and Model

The ECCP, with CMS approval, enacted a program modification to transform their staffing model for their Clinical + Payment facilities as of Initiative Year 3; the official modification was set to take place on October 23, 2018. This change started with the ECCP requiring facilities in early spring 2018 to begin transitioning the RNCCs roles and responsibilities to facility staff; facilities were not made aware of the modification change until late summer. During our phone interviews in April and May 2018, we learned of these newly enacted ECCP participation requirements for the Clinical + Payment facilities. The ECCP started by asking each facility to assign at least one of their staff members as a payment liaison who would be responsible for all Initiative data collection responsibilities.[3] Most facilities reported being aware of this intended change. However, at the time of our site visit, in early October, most were only beginning to transition the RNCCs responsibilities to their facility staff most RNCCs continued in this role throughout October, ahead of the CMS program modification.

The main purpose of this change was to reduce the RNCC role in data collection and identification of eligible conditions for billing. ECCP leadership justified this change stating that the Payment-Only facilities, which rely solely on their own staff had better workflow, from identification of the six diagnoses to claims submission. According to ECCP leadership, use of the RNCCs in facilitating this process was not sustainable. To this point, ECCP leadership stated that the Clinical + Payment facilities, "are very dependent on RNCCs to do the billing process and some RNCCs don't understand it as well as we hoped. The facilities aren't really taking ownership, which we didn't expect."

As a result, the ECCP transitioned their model to focus on quality improvement by eliminating the RNCCs and using Quality Improvement Specialists (QIS).[4] ECCP leadership reported that QISs will have a stronger focus on data interpretation and the development of quality assurance (QA) and performance improvement projects (PIPs) with facilities. ECCP leadership stated that their hope was the staff who fill these positions would have strong data analytic skills, such as nurses with strong quality improvement backgrounds or epidemiologists. It was unclear at the time of our site visit how many RNCCs would be retained for the new QIS positions. The ECCP had interviewed several RNCCs but stated that many did not meet the requirements of the new role; the ECCP was still hiring for the QIS positions at the time of our site visit, which was only 3 weeks before the October model change deadline.

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[3] NY-RAH outlined the role facility staff must provide, in lieu of RNCCs providing information on admissions, discharges, and hospital transfers; recording advance directives; ensuring all data were correctly captured for billing, identifying documented changes in condition, and inputting information into the NY-RAH portal such maintaining the eligible resident roster.

[4] QIS Job Posting, source: https://www.indeed.com/viewjob?jk=a0043e0aad28ff90&tk=1d34u9iu241l0803&from=serp&vjs=3

In addition to the new QIS's role, ECCP leadership indicated they would add one additional staff role called Clinical Project Specialist (CPS).[5] Leadership described CPSs as having advanced clinical degrees (e.g., NPs, physician assistants, or medical doctors) with a focus on physician engagement. NY-RAH posted a hiring update in fall 2018, stating they had filled 8 of 12 QIS positions and one of 2 CPS positions.[6]

E.2.2 Learning Community Activities in 2018

Both groups of facilities reported they attend or listen later to recorded NY-RAH learning community webinars. Nursing facility leadership report continued participation but added that there were fewer webinars overall. The ECCP's webinars in the past year focused on education related to their own internal chart audits, SSS-T's chart review findings, and in Clinical + Payment facilities, the transition to the new staffing model. Most Initiative Year 2 NY-RAH webinars publicly available as they have been in the past.

E.2.3 New Developments with INTERACT Tools and Other Components

The NY-RAH model continued to focus on elements and tools that may facilitate reductions in avoidable hospitalizations. Those discussed most frequently by facility staff include use of the INTERACT tools, such as the Situation, Background, Assessment and Review (SBAR) and the Stop and Watch forms. Those implemented elements discussed less frequently *were* Medical Orders for Life-Sustaining Treatment (MOLST), ECCP QI projects, and electronic solutions (i.e., direct messaging from NFI 1).

INTERACT Tools. The NY-RAH model continues to focus on two INTERACT tools, SBAR and the Stop and Watch forms. As reported in Initiative Year 1, all facilities widely used both of these tools. There were no reported changes with using either tool, although staff turnover continues to impact tool use and necessitates continued re-education of staff. As we have found in the past, some facilities continue to report less frequent use of these tools because it is easier for their nursing staff to report changes directly to the nurse supervisor or practitioner; tools may be used more frequently on off-shifts if practitioners are not as present.

Other NFI Model Components Used in NFI2. NY-RAH's additional model components, quality improvement (QI), end-of-life (EOL) care, and electronic solutions (e.g., direct messaging), are interventions that may also reduce avoidable hospitalizations and were part of their initial NFI2 plans. However, most RCNSS and facility staff reported very little engagement with these elements.

- **Quality improvement**: The QI process continued to be a focus of the model but very few RNCSS described working with their facilities on specific projects. One RNCC shared how she had tried implementing a dehydration QI project to improve avoidable hospitalizations but encountered limited facility leadership buy-in, stating "Facilities are pretty engaged in

[5] CPS Job Posting, source: https://www.indeed.com/viewjob?jk=f158144c9dd16ca9&tk=1d34ulcf70g1u000&from=vjnewtab

[6] Source: https://www.nyrah.org/Newsletters/Newsletter21/NYRAHNewsletter21.html

the money aspect—not the [QI] aspect." Two this point, two RNCCs shared examples of creating retroactive chart review projects to assist facilities with billing. In both examples the facilities had not submitted claims for the prior 6 months to a year. Following these efforts, both facilities were successful with back-billing, received payment, and started submitting claims regularly.

- **End-of-life care:** The ECCP continued providing a quarterly palliative care report showing the numbers of eligible residents with a MOLST form completed or other "do not" orders in place (e.g., do not resuscitate, do not intubate, do not hospitalize). ECCP leadership noted NFI 2 has had less of a dedicated focus on EOL care compared to NFI 1. Most facilities reported participating in the National Health Care Decisions Day, which focused on education for residents, family and staff on the importance of advance directive completion; RNCCs facilitated events at 17 facilities.[7] Three facilities reported increasing the number of residents with a MOLST.
- **Electronic solutions:** A major focus in NFI 1 was to facilitate electronic solutions (e.g., Direct Messaging) and communications between nursing facilities and hospitals. Although it was intended to continue in NFI 2, little progress has been made. The ECCP employee who led this effort, left the ECCP in 2018. The ECCP stated the position was still vacant by the end of the fiscal year.

E.2.4 Changes in Role of ECCP Nurses

As reported previously in ***Section E.2.1***, the role of the ECCP nurses started evolving in spring 2018 and with an official staffing modification planned for October 23, 2018. This section includes facility leadership and RNCC reactions to this forthcoming change.

The new QIS position is a departure from the Clinical + Payment facility RNCC role and will no longer facilitate any part of NY-RAH data collection activities. Although nursing facilities were required to select at least one facility-based staff member to take over the data collection responsibilities as part of the change, most facilities parsed the role out to more than one nursing or administrative staff member. Also, some facilities had only just selected their responsible staff members close to the time of our site visit, giving them little time to learn the full process before RNCCs were eliminated. Typically, facilities selected MDS nurses or nurse managers for the role of identifying qualifying changes in condition for the Initiative, but selected administrative staff, such as those working in medical records, to replace the RNCCs role of inputting information into the NY-RAH portal.

NFAs and other key staff at all four site visit facilities expressed concern that the elimination of the RNCC role would be a potential burden and hardship on their staff. They were most concerned with how they were going to distribute the work of the RNCCs to their facility staff who already have specific roles and responsibilities. The following quotes highlight some of their concerns:

[7] Source: https://www.nyrah.org/Newsletters/Newsletter19/NYRAHNewsletter19.html

"They are taking [the RNCC] out of the facility. She was just a big help. We will have to do all the workflow [for the project], so I am concerned."

"We are adding more responsibilities to people who already have responsibilities [i.e., facility staff]. [The] RNCC has identified patients who qualify [and] helped us with billing issues."

"At this time, everyone is struggling with staffing. Our focus is having staff for services, not really doing paperwork."

Most nursing facility leaders also stated that having their own staff take on the RNCC's responsibilities would reduce their ability to identify as many qualifying changes in condition which would result in them submitting fewer claims. In one example, an NFA reported that their RNCC previously read the daily reports of changes in condition and would alert them to any that would qualify for a claim. Another NFA said as a result of the staffing change, "We might have fewer claims going in because you really have to stay on top [of it]." In another similar example, an NFA commented, "We [will] struggle with having the resources to maintain the program."

Two interviewed RNCCs were upset with the new role change and with the ECCP's communication about their transition to the new role. RNCCs had to reapply for the new position with no guaranteed they would be retained. We learned of two RNCCs who had already resigned at the time of our site visit (one as of September) while one was waiting to see if she would be reassigned to the QIS role and continue to maintain her assigned facility relationships. An RNCC noted that the staffing change would not stop facilities from submitting claims: "It will continue without the RNCCs although it may not be as effective. This was [our] job, [they] are tacking it on to other [facility] staff members' jobs but it won't be completely stopped." Following the staffing model change, facility engagement will be a key factor to assess in Year 3.

E.3 Sharing Collaborative Activities in 2018

For Initiative Year 2, as in previous years, ECCP staff reported that the CMS sharing collaboratives could improve with better meeting facilitation. ECCP staff reported CMS does little to engage ECCPs in the conversation, and as a result, there is little participation from some ECCP staff. ECCP staff also report, as in more recent years of NFI 1 and NFI 2, that leadership from all ECCPs are more comfortable contacting each other to directly ask questions.

E.4 Changes to Facility Staff and Practitioner Engagement in 2018

There have been few changes since NFI 1 with regard to facility staff and practitioner engagement. There is often moderate to high engagement among nursing facility leadership (e.g., NFAs and DONs and in-house medical directors). Nursing facility floor staff remain engaged in identifying changes in condition and completing documentation, but nursing facility leadership stated their participation is a result of facility policies and procedures, not directly because of the benefit of the

payment incentives. Practitioner engagement remained moderate to high for certifying for nursing facility claims but lower for submitting their own claims.

E.4.1 Facility Staff

Facility's leaders are typically the most engaged among all types of staff. This core group is composed of the NFA, DON, a nursing supervisor, an MDS nurse, or other administrative staff assigned who often track eligibility status. Leaders from all facilities frequently reported that their leadership staff are most engaged because they have made identifying and documenting changes in condition a priority for all residents, while not informing their floor staff about the payment incentives or resident eligibility.

E.4.2 Practitioners

Little has changed with practitioner engagement in Initiative Year 2 among facilities. Practitioners' engagement remains stable, but their engagement is higher for certifying conditions for nursing facility billing, rather than submitting claims using the practitioner codes. Both practitioners and facility leadership report their hesitance to use the practitioner codes as the result of the burdensome Initiative documentation requirements. One member of ECCP leadership added that practitioner's fear of audit is an additional concern. This same ECCP staff member noted that infrequent use of the care conference code was especially symptomatic of the burdensome documentation requirements adding that the ECCP had only recorded 50 uses of the care conference code through Initiative Year 2. As of our 2018 site visits, care conferences were still a component of NFI 2; care conferences were dropped from the Initiative in January 2019.

For facility billing, we assessed practitioner engagement as moderate to high. At least a few facilities reported low engagement: their challenges ranged from having few eligible practitioners (e.g., community-based practitioners) to frequent practitioner turnover. Other facilities, even with moderate engagement, reported having to frequently remind practitioners to complete the required documentation for the six qualifying conditions for nursing facility claims. A Clinical + Payment facility medical director shared how their facility focused on physician education and reminders following RNCC-led chart reviews of missed billing opportunities. In this example, the RNCC first started by gathering information on any new antibiotics ordered. If any new orders were found, the RNCCs conducted chart reviews to determine the associated diagnosis and if documented confirmation of one of the six qualifying conditions could be found in the chart. If a practitioner note was not found in the documentation, or was incomplete, the RNCC elevated this to the medical director. Both the RNCC and the medical director then followed up with the practitioner and provided education about the project purpose and the documentation requirements.

Some facilities continue to report challenges with physician coverage on nights or weekends. The largest of the facilities we visited had just hired a practitioner to cover their 3:00 to 11:00 pm shift but reported that coverage issues remained on weekends. During phone interviews five Payment-Only facilities reported adding at least one NP to their staff during off shifts including weekends. NY-RAH leadership stated that their most recent ECCP administrator survey, administered in 2018, found that 40 percent of facilities had hired new nurse practitioners since the start of NFI 2, who

can confirm the six qualifying conditions for the Initiatives in addition to other facility responsibilities.

E.5 Updates for Documenting and Certifying Six Qualifying Conditions

Most participating nursing facilities did not report many updates to their documentation and certification process for the six qualifying conditions. Consistently, they emphasized the use of morning report or 24-hour report and SBARs as the standard protocol for identifying residents with a change of condition. Payment Only facilities do not report many challenges with certification. As previously noted, the RNCC continued to be an integral part of the review process for identifying eligible residents, in Clinical + Payment facilities. Most administrators or DONs were asking MDS nurses to take on some of the responsibilities of the RNCCs, as a result of the ECCPS modification, such as reviewing eligibility criteria and identifying billing opportunities. Attending physicians and nurse practitioners continue to certify conditions for facilities with moderate to high engagement.

A few facilities cited their own health IT systems or diagnostic/clinical capabilities as major tools that help facilitate their ability to document and certify conditions. One Payment-Only facility using PointClickCare, a widely used EMR system, described their use of upgraded features such as auto-flagging and electronic SBARs and Stop and Watches as improvements to their process. ECCP leadership added that this facility and others within the same corporate group had a 100 percent pass rate on the SSS-T audits. The ECCP leadership indicated they are working with this group to help other facilities gain access to similar PointClickCare templates.

We also learned that some facilities have protocols in place for one of the six qualifying conditions that do not align with the Initiative clinical criteria. In one example, facility staff explained that their corporate office CFH policy allows them to catch changes in condition well in advance of meeting the NY-RAH billing criteria.

E.6 Updates to Existing Billing Practices

Although facilities reported overall better success with submitting claims, correct documentation of the billing criteria became a focal point of implementation in Initiative Year 2. Practitioner participating in claims submission remained low and mostly independent of facility billing and internal facility audits.

E.6.1 Facility Billing and Recoupment

Overall, facilities reported more successes in facility billing practices in Initiative Year 2. Although billing practices continue to vary across facilities, all facilities were billing at the time of our annual site visits. During phone interviews, most facilities reported billing between 20 to 30 claims within a 5- or 6-month period or at a rate of 6 to 10 claims per month. Few facilities reported submitting less than 10 since the inception of the Initiative. Of the few that did, it was often because of low counts of eligible residents. Facilities were more likely to report interruptions in billing because of staff turnover in facility leadership positions or turnover of RNCC staff in Clinical + Payment

facilities. According to those administrators who were able to share, the general fund or operating budget is the most common use for reimbursement funds.

E.6.2 Practitioner Billing

There are no major changes to practitioner billing for Initiative Year 2. Practitioners still indicate a high level of burden because of the documentation requirements. The potential for external CMS audits also continues to be a reported as barrier to practitioners using the G9685 billing code.

E.7 Data Collection

As briefly reported in ***Section E.6*** the ECCP introduced their own audits and a new tool to facilitate data collection and claims submissions, thereby reducing errors, the rejection of submitted claims, and potential recoupment. This section describes this process in more detail.

The ECCP rolled out their audits in two phases. The first phase occurred early in 2018 with one member of ECCP leadership visiting facilities to review charts associated with claims submitted for the six qualifying conditions. The ECCP presented findings from this audit to facilities ahead of the SSS-T site visits. The second phase focused on the findings from the first SSS-T audit, with 35 percent of NY-RAH facility claims rejected because the clinical criteria were not met, or documentation was missing. ECCP therefore enacted new data collection requirements requiring the use of a chart audit tool (described in detail in the next section). RNCCs were required to do retrospective and prospective audits of their Clinical + Payment facility claims (n=50 of each) using the tool, while Payment-Only facilities were only required to do a prospective audit of their submitted claims. The ECCP also required facilities to keep hard copies of the confirmatory information from each chart, for each of their reviews. Most Payment-Only facilities reported this process as burdensome. Clinical + Payment facilities did not report the audits as burdensome, likely because their RNCCs facilitated the process.

As mentioned previously, the ECCP provided a new NY-RAH Facility Chart Audit Tool to help facilities both verify if all clinical criteria had been met for past claims and if current, potential qualifying conditions also meet all requirements before claims are submitted. The data entry tool, set up in Excel, provides a grid with rows for entering details for each resident, including their name and qualifying condition while columns capture specific billing requirements (e.g., the documented first date of the acute change of condition, if a practitioner note exists to confirm the diagnosis, the date of the practitioner note). Preset logic in the spreadsheet alerts the staff member if the clinical criteria were not met or if a possible data entry error was made. One member of ECCP leadership noted this tool had been effective in preventing facilities from submitting faulty claims. Likewise, NFAs agreed that the tool had been helpful, such that most continued to use it well beyond the required audit period.

E.8 Update on the Effectiveness of the Initiative in 2018

Findings related to effectiveness of the Initiative were similar to those in previous years.

E.8.1 Potentially Avoidable Hospitalizations in 2018

Most nursing facility staff reported what they believed were slight reductions in hospitalizations. However, as in previous years, they were skeptical that these reductions were entirely because of NFI 2. Conversely, staff at some facilities reported that the Initiative had improved their processes for treating residents in house. Nursing facility staff at one facility shared how the Initiative has enhanced their ability to monitor patient changes in condition, "As soon as we see change, we are doing the assessment [and then] labs. We [can] do portable chest x-ray [also]. It is easier to monitor patients in-house. It helps us pinpoint things sooner than it becomes exacerbated."

Most facilities reported using multiple means to reduce both hospitalizations of long-stay residents and readmissions of short-stay residents. As NFI 1, several facilities reported tracking overall hospitalization rates only and not examining differences in rates between long- and short-stay. Some ECCP staff also reported that hospitalization rates have decreased slightly. However, they stated that results were quite variable across facilities with some performing much better than others. Other ECCP staff thought that clear results would not be seen until the end of the project.

E.8.2 Residents and Families in 2018

As in the previous year, facility staff reported that residents and their families were relatively unaware of the Initiative and that very few residents had opted out. Four facilities, two Clinical + Payment and two Payment-Only, reported residents disenrolling from the Initiative. Only one Clinical + Payment facility cited a reason, stating that two of their residents had opted out to enroll in a managed care plan.

E.8.3 Quality Measures and Survey Results in 2018

Neither ECCP nor facility leadership reported any changes to quality measures or survey results.

E.9 New Reports of Spillover and Contamination Effects

There are very few differences or new changes with regards to spillover or contamination in Year 3. As in the previous year, most facilities report no processes to distinguish eligible from non-eligible residents. Therefore, all documentation tools and processes to avoid hospitalizations for the six diagnoses are used with all residents. As in previous years, facilities also reported some amount of spillover to non-participating Initiative facilities that are often part of the same corporate system.

E.10 Updates to Policies and External Stakeholders

Similar to previous years, there are several state and federal initiatives that could be affecting the Initiative and facility efforts to reduce hospitalizations. Most participants again made little distinction between programs and policies aimed at reducing hospitalizations of long-stay residents and those aimed at reducing readmissions of short-stay patients.

E.10.1 Hospital Engagement

Facility staff reported that local hospitals are only vaguely aware of the Initiative and that they have had little success engaging with hospitals. One facility said that their ability to engage with a local hospital improved when ownership of that hospital changed. This has resulted in a better ability to communicate to the hospital when a resident should actually be admitted versus when they have been sent over only for tests or procedures and should not be admitted.

E.10.2 Competing or Similar Initiatives

When asked about similar initiatives, facilities cited local hospitals' focus on reducing readmissions. In addition, New York's Delivery System Reform Incentive Payment program (or (DSRIP program) was again mentioned as a similar initiative. However, interview participants stated that this program is focused primarily on reducing hospitalizations from the community, rather than facilities. As previously noted, The DSRIP program also uses INTERACT tools. One example is the Interact Hospital Transfer Form. This form allows NF staff to document the reason for a hospital transfer and indicate the need for out-patient service (e.g., dialysis). The information provided on the form is meant to keep hospital staff from unnecessarily hospitalizing residents. One nursing facility DON stated that they could not easily distinguish between their use of INTERACT for NY-RAH versus DSRIP.

E.10.3 State Policy Environment

Few changes have taken place in the state policy environment. However, several interviewees mentioned recent federal policy changes related to re-hospitalization penalties (i.e., the value-based purchasing program) as a main driver of facility efforts. One facility NFA emphasized this by saying, "There is not another initiative that is going to make us want to prevent re-hospitalizations more. There are already federal initiatives that penalize us." One interviewee mentioned a recent reduction in bed-hold payments in New York as driving corporate financial interests to keep residents on the facility.

E.11 Next Steps

In the coming year of data collection, RTI will monitor the following:

- Ongoing model changes, including the elimination of the RNCCs and introduction of the QIS role
- Role and responsibilities of the new CPS
- Perceived effect of the model change (and loss of RNCCs) on Initiative engagement and billing frequency in Clinical + Payment facilities
- Ongoing role and potential effect of the NY-RAH chart audits in Year 3.

APPENDIX F
OPTIMIZING PATIENT TRANSFERS, IMPACTING MEDICAL QUALITY, AND IMPROVING SYMPTOMS: TRANSFORMING INSTITUTIONAL CARE (OPTIMISTIC)

F.1 Overview

2018 Indiana Site Visit and Telephone Interview Findings

Key Findings:

- Interviewees from both the Payment-Only and Clinical + Payment facilities reported that the Initiative has been instrumental in decreasing potentially avoidable hospitalizations.
- Interviewers noted that clinical and administrative leadership in both Clinical + Payment and Payment-Only facilities displayed an increased awareness of what NFI 2 is compared to facility leadership during NFI 1.
- Mirroring Clinical + Payment facilities, two Payment-Only facilities had hired a nurse specifically for OPTIMISTIC. Several other facilities were planning to hire a nurse or were adding the role of "OPTIMISTIC champion" to a staff member such as the MDS coordinator to reduce avoidable hospitalizations.
- Interviewees from both facility types said the overall skill set of nurses improved in most facilities.
- OPTIMISTIC leadership used data to inform facilities and providers about such things as missed opportunities for certification and billing and the positive impact of using tools such as the SBAR in preventing avoidable hospitalizations.

The Indiana University **O**ptimizing **P**atient **T**ransfers, **I**mpacting **M**edical Quality, and **I**mproving **S**ymptoms: **T**ransforming **I**nstitutional **C**are (OPTIMISTIC) model did not change this Initiative Year. OPTIMISTIC continues to focus efforts on providing medical care support, palliative care support, and transitional care support to all participating long-stay nursing facility residents. The ECCP continues to support Clinical + Payment facilities with direct clinical care and education provided by the ECCP nurses, direct clinical care provided by ECCP nurse practitioners (NPs), and facilitation of Learning Community activities. OPTIMISTIC continues to support Payment-Only facilities with education and has incorporated a Payment-Only implementation team to increase practitioner engagement. No facilities have withdrawn since the 2017 site visit. ***Table F-1*** provides a summary of the 2018 data collection cycle.

Table F-1. 2018 data collection summary

Number of facilities participating as of site visit date (June 22, 2018)	40
Ownership changes since 2017 site visit	N/A
Facilities withdrawn or removed from the Initiative since 2017 site visit	0

This report highlights telephone interviews and site visit findings collected in 2018. The RTI team completed an on-site visit from June 19, 2018 to June 22, 2018. The team interviewed 10 members of the OPTIMISTIC leadership team and 18 facility staff members, including NFAs, directors of nursing (DONs), charge nurses/unit managers, minimum data set (MDS) nurses, and billing coordinators in four Clinical + Payment facilities.

From April to July 2018, the evaluation team completed a total of 19 telephone interviews with participating Clinical + Payment and Payment-Only facilities. Facility telephone interviews included NFAs, DONs, charge nurses/unit managers, MDS nurses, nurse navigators[8], care transitions nurses, quality assurance (QA) nurses, and facility billing coordinators. In addition, the team conducted a telephone interview with a representative from one facility's corporate billing office. ***Table F-2*** shows the site visit and telephone interview summary finding for facility staff buy-in and implementation.

Table F-2. Site visit and phone interview summary findings: 2018 facility staff buy-in and implementation

Facility staff buy-in and implementation	Total	Clinical + Payment	Payment-Only
Interviewed facilities (by phone and in person)	23	12	11
Buy-in to NFI 2			
High	13	7	6
Medium	8	4	4
Low	1	1	0
Number of facilities that hired new staff in 2018 because of NFI 2	2	1	1
Number of facilities with resident opt-outs in 2018	14	7	7
Number of facilities reporting that NFI 2 has been effective in reducing potentially avoidable hospitalizations	16	9	7

NOTES: Buy-in is based on interviewer perceptions using the following definitions: *High buy-in*: Facilities that are billing regularly, with staff that are aware and engaged; overall, the facility interviewees speak highly of the Initiative and its impact on reducing avoidable hospitalizations. *Medium buy-in*: Facilities that have begun to bill but are not doing so regularly; staff may recognize the Initiative and key components but may not be fully engaged. *Low buy-in*: Facilities that have not started billing and/or have not trained staff on the six qualifying conditions; generally limited engagement and limited participation in NFI 2.

Below is a summary of RTI's detailed key findings based on interviews with ECCP leadership and facility staff.

- Both the Payment-Only and Clinical + Payment facility interviewees reported that they felt the Initiative has been instrumental in decreasing potentially avoidable hospitalizations. The Clinical + Payment interviewees reported that the decrease in potentially avoidable

[8] Nurse navigators provide guidance on selection of services and transitions through the health system (e.g., transition from a long-term care facility to an acute care facility).

hospitalizations was more a result of the OPTIMISTIC interventions from NFI 1 than the financial incentives in NFI 2.

- The ability of facility management (corporate leadership, administrators, DONs, billing coordinators) and supervisory clinical staff to describe the Initiative was greater in NFI 2 than in NFI 1. Throughout NFI 1, few members of management could explain the Initiative and often deferred to the DON or OPTIMISTIC nurses to answer questions about the Initiative.
- Two Payment-Only facilities hired an individual to serve as OPTIMISTIC champion. At the time of the interviews, a few other facilities were planning to hire someone for this role. Other Payment-Only facilities assigned NFI 2 tasks (e.g., identifying certification opportunities, communicating with staff and providers, and ensuring appropriate documentation was in the medical record) to staff members who were already in place (e.g., nurse navigators, DONs, MDS coordinators).
- Both groups reported that nursing assessment and provider notification improved as a result of the Initiative. However, Clinical + Payment interviewees attributed the improvement to interventions implemented during NFI 1 and that the payment incentive introduced in NFI 2 was, according to one interviewee, "icing on the cake." Payment-Only facilities stated that as a result of the Initiative, identification of changes in resident condition and notification of physicians improved overall. This awareness was noted primarily at the nurse management level.
- OPTIMISTIC used data to improve participation of facilities and practitioners in NFI 2 and to analyze missed opportunities. For example, OPTIMISTIC nurses documented resident assessments in their electronic management database, REDcap, and compared what could have been certified and billed to what was certified and billed by the facility. OPTIMISTIC also compared the number of resident certifications to what practitioners have billed.

F.2 Changes to Model and Implementation in 2018

The OPTIMISTIC model is fundamentally unchanged since the prior Initiative year, with only minor modifications to NFI 2 implementation and continuing efforts to improve outcomes related to NFI 1 Initiative components.

F.2.1 Changes to Structure and Model

In spring 2018, OPTIMISTIC incorporated a Payment-Only implementation team to increase facility and physician engagement. The four-person team includes a research manager, research assistant, program administrator, and clinical supervisor. This team does site visits and provides training to facilities regarding NFI 2 on an as needed basis (e.g., when a facility experience NFA turnover) and does not include the clinically related components provided to the Clinical + Payment facilities. A member of the team also conducts monthly calls with facilities to answer questions and address any concerns facilities might have or that OPTIMISTIC has identified. The team attempts to address issues that arise related to how physicians are reimbursed within their practice structures and problems within the billing process. In addition, the team attempts to foster relationships between

practitioners and facility nurses who must work together to certify and bill for resident episodes. Finally, the team is attempting to improve coordination between corporate offices and nursing facilities. One member of the implementation team stated, “We are working to get the billing piece connected to the health care piece.” Corporate billing offices are typically off site from the facility, and communication between clinical and billing personnel is imperative to ensure accurate billing of certifications under NFI 2.

F.2.2 Learning Community Activities in 2018

OPTIMISTIC continues to use web-based training for many of their Learning Community activities. They also have three quarterly meetings and one annual stakeholder meeting. In the past year, OPTIMISTIC has resumed regional meetings to facilitate attendance by rural facilities, most of which are Payment-Only facilities. Over 150+ individual attend the annual stakeholder meeting, which includes facility-developed poster sessions on successful practices and efforts to implement OPTIMISTIC. OPTIMISTIC also has included presentations from other ECCPs at the annual meeting to highlight successes within their organizations.

OPTIMISTIC has aimed at improving attendance at Learning Community activities by

- offering CME (Continuing Medical Education) credits for three of the four practitioner sessions offered
- using a listserv to track who opens e-mails and attends training activities
- tracking facility billing activity to target educational activities
- establishing an annual curriculum that allows participants to know in advance what topics are being covered.

Most facility staff members interviewed by phone and in person reported participating in Learning Community activities. Some facility staff members valued attending the stakeholder meetings and quarterly board meetings, while others took advantage of the webinars. One interviewed Clinical + Payment NFA shared the resourcefulness of the webinars, stating that “[It] was good to learn best practices from other facilities. It was nice to look at trending data for others participating in [NFI 2].” However, as facility staff became more comfortable with NFI 2, some found attending the webinars less necessary. An administrator at one facility expressed, “I go to the quarterly board meetings, which are very informative. The webinars and e-learning—we participated in some of them and only went to support the program... We generally don’t go as much because we understand it now and don’t need to go into it anymore.” Rather than having many staff attend the webinars, one Payment-Only facility informs their nurses about the educational materials from the webinars and places relevant items on a share drive within an OPTIMISTIC-specific folder. Staff members can access materials as needed, rather than coordinating schedules to attend all of the webinars at their designated times.

F.2.3 New Developments with INTERACT Tools and Other Components

At the time of the June 2018 site visit OPTIMISTIC reported they had several pilot projects to enhance implementation and improve efficiencies of interventions from NFI 1 in Clinical + Payment facilities.

INTERACT Tools. OPTIMSITIC uses its own shortened version of the SBAR (Situation, Background, Assessment, Review and Notify) tool. A pilot with a few facilities provided an intense focus on use of the tool, retrospectively studying whether staff use the tool appropriately and correlating certifications of the NFI 2 conditions with use of the OPTIMISTIC SBAR. One OPTIMISTIC RN reported, "[One facility] went from using them 0 percent of the time with the six qualifying conditions to 72 percent. I in-serviced them on it… the DON [set] this as expectation... Now it's become habit." The pilot was set to be rolled out to all facilities within the 6–12 months of implementation following the June 2018 site visit.

Polypharmacy/Medication Management. OPTIMISTIC continues to conduct pilot studies to improve the efficacy of their polypharmacy intervention. The intervention initially provided medication reviews of individual resident charts. These reviews were effective in identifying and resolving polypharmacy concerns but were not efficient. In a recent pilot, OPTIMISTIC focused on polypharmacy issues for residents who had congestive heart failure (CHF), one of the six qualifying conditions. The goal was to develop an algorithm that could be used to help identify an appropriate medication regimen and thereby avoid the prescription of unnecessary medications; however, OPTIMISTIC found medications ordered to manage CHF were too dissimilar between residents to develop an algorithm, and the pilot was discontinued. A new pilot will aim to reduce medications in each facility based on medication class (e.g., Proton pump inhibitors [PPI] and calcium channel blockers), incorporating the most common medications used by that facility.

Symptom Assessment. In another pilot, OPTIMSTIC is focusing on residents who have one of the six qualifying conditions and are treated in the facilities. OPTIMISTIC nurses will conduct a symptom assessment at the beginning and end of a certification period using an amended version of the SATISFIE (Symptom Assessment to Improve Symptom Control for Institutionalized Elderly) tool.[9] This tool is used to assess symptoms such as pain, nausea and constipation which are symptoms that may be associated with but not necessarily assessed as part of the NFI 2 six qualifying conditions. A data collection component will also assess the quality of advance care plans for these residents.

F.2.4 Changes in Role of ECCP Nurses

OPTIMISTIC leadership emphasized that the process of obtaining certifications and billing is on the facility and not the responsibility of the OPTIMISTIC nurses. OPTIMISTIC nurses were to focus on

[9] De Roo, M.L., Tanghe, M.F., Van Den Noortgate, N.J., and Piers, R.D. Development and validation of the symptom assessment to improve symptom control for institutionalized elderly scale. Journal of the American Medical Directors Association. 19(2):148-153, 2018.

sustaining interventions introduced in NFI 1. OPTIMISTIC RN interviewees noted they are now more consultative and can relinquish the clinical assessment work to facility staff. One OPTIMISTIC RN reported that overall clinical skills of staff nurses are improving because of the education provided related to the six qualifying conditions. An OPTIMISTIC RN reported she had more time to identify residents with changes in condition, stating, "[Previously] I would wait for someone to get sick or let me know [someone was sick]. Now I print orders and notes and review them and determine candidates [for certification]."

OPTIMISTIC NPs reported that with implementation of NFI 2, nursing staff are calling the NPs earlier when an eligible resident has a change in condition. One OPTIMISTIC NP said, "Before [NFI 2], the resident would be septic by the time I was called." OPTIMISTIC NPs now visit facilities based on need, rather than following a set schedule. This has improved the efficient utilization of the NPs and continues to work well for the facilities.

F.3 Sharing Collaborative Activities in 2018

OPTIMISTIC leadership reported having good relationships with other ECCPS, noting that sharing successes and challenges with them on an individual basis is helpful. OPTIMISTIC has discussed with MOQI how to share data with other facilities to allow them to compare themselves with other participating facilities. OPTIMISTIC also has plans to work with NY-RAH on strategies to improve use of the care coordination billing code. (This billing code and the care coordination conference were subsequently eliminated from the Initiative elements.)

F.4 Changes to Facility Staff and Practitioner Engagement in 2018

The RTI team found that, in general, both Clinical + Payment and Payment-Only facilities were more actively engaged in the Initiative compared to the prior Initiative year. This finding was noted primarily in mid-level to upper management positions. OPTIMISTIC also has been improving practitioner engagement through more communication and the use of data to show the benefits of participating in NFI 2.

F.4.1 Facility Staff

The increased facility-level engagement is demonstrated with the following examples:

- Many administrators were able to identify the six qualifying conditions and the processes involved in certification and billing. This contrasts with NFI 1 where administrators often deferred to DONs to provide status updates.
- One DON in a Clinical + Payment facility related that the facility started its own polypharmacy initiative based on lessons learned during its participation in the OPTIMISTIC CHF polypharmacy pilot (described in ***Section F.2.3***).
- Several Payment-Only facilities have either added a transitions nurse/nurse navigator to their staff or have added the role of oversight of the OPTIMISTIC program to a designated individual, such as the DON or MDS coordinator. One business office manager emphasized

that having this person to communicate with the business office and ensure that documentation is present to justify certifications and billing is important for accuracy.

- Several DONs stated that bed-side nurses were performing better resident assessments (based on the training materials provided by OPTIMISTIC related to the six qualifying conditions) but those nurses were not necessarily intimately knowledgeable about NFI 2.

As in previous years, evaluators noted that facilities with stable staff had greater success in implementing NFI 2. Facilities with high turnover or with other issues such as poor survey performance, found it difficult to devote resources to the Initiative.

F.4.2 Practitioners

According to interviewees, the number of certified practitioners for NFI 2 is unchanged for this Initiative year. One member of the leadership team remarked, "All of our providers are billing… The ones who aren't have a rural health contract and are excluded." Providers who bill as a Rural Health Clinic use specific Medicare billing codes, which prevent them from also using the NFI 2 codes while serving in a designated rural health capacity.

Some Payment-Only facilities are recognizing the benefit of having their own NPs. One administrator stated, "We attended an OPTIMISTIC board meeting. At that meeting, [another OPTIMISTIC facility] explained the importance of a nurse practitioner and how that enables high utilization of the program… Starting in June, we will have a full-time nurse practitioner." A few other Payment-Only facilities also reported interest in hiring their own NPs.

One MDS coordinator in a Payment-Only facility reported that physicians are visiting their patients more often and patient outcomes have improved, "We have seen hospitalizations drop. We have seen faster outcomes. I think the biggest outcome was getting physicians engaged more and in the facility more.... I think one lady pulled through so many times simply because of those enhanced set of doctors' eyes on her." A few facilities in both groups identified an increase in practitioner visits and interviewees felt that this presence facilitated NP communication.

F.5 Updates for Documenting and Certifying Six Qualifying Conditions

OPTIMISTIC has not made changes to their documentation and certification processes. Initially facilities across ECCPs were not clear on whether catheter-associated urinary tract infections (CAUTIs) were included in the urinary tract infection condition. CMS later clarified that CAUTIs were included. As OPTIMISTIC had included them from the beginning of NFI 2, they did not need to make changes to certification and billing processes.

F.6 Updates to Existing Billing Practices

F.6.1 Facility Billing & Recoupment

RTI found minimal changes to billing processes. The way in which facilities gather information and ready bills for submission to CMS varies by facility and corporation. Some, though not all, facilities

were aware that recoupment activities were forthcoming, and OPTIMISTIC leadership anticipated facilities would be receiving recoupment letters within 2 weeks of RTI's June 2018 site visit. One facility administrator stated, "My only concern… [is that] they [facilities] aren't sure whether or not they [CMS] are taking the money back. It would be nice to know all the repercussions from the start." Most other facility interviewees did not mention recoupment. (Actual recoupment did not start until Spring 2019.)

Two facilities reported the revenue generated by NFI 2 did not offset the decreased reimbursement they would have received had residents been hospitalized and returned to the facility as skilled Medicare. The administrator of one facility stated that because the profit margin of that facility was already low, the decrease in revenue had a significant negative impact on that facility. The administrator of the other facility remarked that the ability for the residents to be treated in place outweighed the loss in revenue.

F.6.2 Practitioner Billing

OPTIMISTIC is working to increase practitioner billing, stating there are more facility certifications than practitioner bills. The implementation team is using these data to demonstrate to practitioners how many billing opportunities have been missed. A member of the OPTIMISTIC leadership team stated, "[The main reason physicians aren't billing is because they have] too much to do, too much to learn, not enough reimbursement."

Practitioners articulated these additional reasons why they are not billing:

- Documentation requirements are not in line with the complexity of the visit.
- The new Medicare non-initiative palliative care code pays more than the care coordination code and has requirements that are less onerous. As of the 2018 site visit, care conferences were still a component of NFI 2; care conferences were dropped from the initiative in January 2019.
- Some electronic medical record systems used by physicians are not structured to accommodate NFI 2 requirements.

These statements were common across practitioners in both Clinical + Payment and Payment-Only facilities.

F.7 Data Collection

In October 2017, OPTIMISTIC changed data collection processes for facilities. Previously, facilities entered data on spreadsheets that were then transmitted to OPTIMISTIC. The new system allows facilities to use a portal and enter data directly into REDCap. This not only decreases the number of opportunities for errors but also allows for entry errors to be corrected in real time.

OPTIMISTIC continues to increase and improve data and reporting systems for internal use. For example, facilities receive a dashboard that includes how many opportunities for billing were

missed. This system compares resident assessments that OPTIMISTIC nurses document in the OPTIMISTIC REDCap system with resident assessments that facility staff document in the resident medical records. The dashboard also allows facilities to compare themselves with other facilities anonymously. This encourages facilities to evaluate whether they are fully appreciating the opportunities of OPTIMISTIC. One business office manager stated, "We get useful numbers. We're like smack dab in the middle of every facility in that region, and we know with the size of our facility we should be a little bit higher."

In addition, OPTIMISTIC uses data they have collected to show how Initiative components, such as use of the OPTIMISTIC SBAR and advance care planning, positively impacted prevention of avoidable hospitalizations. OPTIMISTIC RNs reinforce and encourage use of these tools in their facilities.

The data received from SSS-T are also valuable. One member of OPTIMISTIC leadership explained, "In [NFI 1], we would get these data reports. We didn't use them. Now we use the data that Telligen gives us. We use it [as soon as we get them]. We have specific meetings and a process around it. We translate it to dashboards that we review at specific meetings. Now we have hospitalization rates, which is the new thing. We had to explicitly ask for that." OPTIMISTIC leadership generally described the SSS-T data as helpful, particularly as new components are included, such as the recent addition of hospitalization rates.

F.8 Update on the Effectiveness of the Initiative in 2018

Interviewees across facilities in both groups reported that NFI 2 is effective in reducing hospitalizations. Most interviewees attribute the perceived reduction in hospitalizations to facility leadership support, effective communication systems, and development of caregiving and billing processes compatible with NFI 2. Nearly all interviewees from the site visit facilities believe that the Initiative is effective in reducing hospitalizations.

F.8.1 Potentially Avoidable Hospitalizations in 2018

Payment-Only facility respondents reported that the Initiative is reducing hospitalizations more decisively than they noted in the prior Initiative year. More respondents from Payment-Only facilities indicated that their respective central offices are tracking reimbursement from the Initiative and consequently are tracking readmissions rates for the six qualifying conditions. These respondents generally believe that the Initiative is reducing hospitalizations primarily because of the clinical systems put in place to track the six qualifying conditions and capture billing episodes, rather than the financial incentives. One administrator from a Payment-Only facility stated, "I think [hospitalizations] have slightly decreased. It's created even more of a focus of preventing the hospitalizations. It's almost exponential. We prevent, get extra reimbursement, we have more hands-on-deck and better things happen. What we got reimbursed last year was the equivalent of a full-time RN." These opinions were shared widely across Payment-Only facilities.

Clinical + Payment facility interviewees also perceived NFI 2 to be effective in reducing potentially avoidable hospitalizations. However, they believe the reductions are more a result of the

interventions implemented in NFI 1. Particularly, respondents in the Clinical + Payment group indicated that the uptick in EOL interventions done by the OPTIMISTIC clinical staff has had a considerable effect on the reduction of hospitalizations. Respondents typically reported that payment by itself did not dramatically impact hospitalization rates. Although they reported that the financial incentive is helpful, respondents emphasized that it is not the primary factor driving down hospitalization rates.

Facility staff and leadership in both the Clinical + Payment and Payment-Only facilities have noticed a decline in certification volume because facility staff are capturing changes in conditions sooner. Facility staff members in the Clinical + Payment group emphasized the presence of the OPTIMISTIC RN as a critical component to the reduction of potentially avoidable hospitalizations. Facility staff members in the Payment-Only group suggested that having a point person or champion is critical to the success of the Initiative.

F.8.2 Residents and Families in 2018

As in previous years of the Initiative, many facilities have at least one resident who chooses not to participate in the Initiative. The residents who opt out of the program typically do so because of fears that the resident will not be hospitalized when hospitalization is necessary. Some residents and families were said to opt out because they do not understand the program. In both groups, some family members continue to insist sending sick loved ones to hospitals, regardless of information provided about NFI 2.

F.9 New Reports of Spillover and Contamination Effects

Two key OPTIMISTIC goals produce a degree of within-facility spillover. First, OPTIMISTIC has provided training related to identification, assessment, and documentation requirements for the six qualifying conditions. This improvement in skills can now be used for any condition that the resident may have. Second, several facilities have assigned the goal of preventing avoidable hospitalizations either to a nurse hired specifically for that role or to a current staff member. This person is engaged with all residents, not just those enrolled in OPTIMISTIC.

OPTIMISTIC also has a degree of spillover statewide, partly because of corporate chains including some Initiative components, such as nurse education and nurse navigators, in their non-NFI 2 facilities. OPTIMISTIC also completes two to three publications or presentations per month and has published approximately 10 academic papers. According to OPTIMISTIC leadership, "[We] get at least one inquiry per month from someone wanting to participate in the program." This interest in and public awareness of OPTIMISTIC could have a contamination effect on other non-OPTIMISTIC facilities in Indiana, which is why the evaluation does not use comparison facilities within the Initiative states.

In addition, OPTIMISTIC is in the process of developing and marketing their model to the long-term care industry. Information about the model, including the various training tools (e.g., diagnostic and treatment cards for the six qualifying conditions) is available to the public on the OPTIMISTIC website (www.optimistic-care.org).

F.10 Updates to Policies and External Stakeholders

F.10.1 Hospital Engagement

Despite efforts by OPTIMISTIC physicians to increase the level of hospital participation, engagement continues to be low through this Initiative Year.

F.10.2 Competing or Similar Initiatives

Two efforts in Indiana may affect OPTIMISTIC in the coming Initiative Year. First, the Indiana SMART Campaign (Indiana University and Purdue) provided support and education on polypharmacy to some Indiana nursing facilities, including some who are participating in the Initiative. OPTIMISTIC perceives this as similar to the polypharmacy intervention implemented in NFI 1.

Second, managed care remains a potential concern in Indiana, though penetration varied substantially by facility. NFAs reported the percentage of managed care residents in a facility can be as high as 40 percent, though not all facilities have managed care contracts. Some NFAs that do have some managed care penetration in their facilities reported growth in the number of managed care residents, while other facility interviewees reported that growth has been flat since the prior Initiative year.

F.10.3 State Policy Environment

Lastly, public policy efforts also may have an effect on OPTIMISTIC in the coming years. State and federal antibiotic stewardship programs may have a potential impact on treatment of at least three of the six qualifying conditions (i.e., urinary tract infection, pneumonia, and skin infections). Related to the NFI 1 end-of-life Initiative components, the Indiana Medicaid value-based purchasing model recently added 5 points for advance care plan training. This may enhance advance care planning in all Indiana facilities, not just those participating in OPTIMISTIC. Similarly, effective July 1, 2018, after the RTI site visit, the Indiana Physicians Order for Scope of Treatment (POST) form can be signed by an NP or physician assistant. OPTIMISTIC provided education to facilities on this change, which may lead to increased end-of-life efforts across OPTIMISTIC facilities.

F.11 Next Steps

For the next Initiative year of data collection, RTI will continue to monitor:

- Facility consideration to hire a NP and/or a champion who will continue OPTIMISTIC interventions.
- Continued facility involvement in pilots related to OPTIMISTIC SBAR use, polypharmacy, infection control, and medication reconciliation.
- Facility and practitioner engagement and the interventions that impact the number of certifications and bills that are submitted.

- The impact of model interventions on the clinical skills of facility staff.
- Use of reimbursement realized from the Initiative incentives.

APPENDIX G
UNIVERSITY OF PITTSBURGH MEDICAL CENTER COMMUNITY PROVIDER SERVICES PROGRAM TO REDUCE AVOIDABLE HOSPITALIZATIONS (RAVEN)

G.1 Overview

2018 Pennsylvania Site Visit and Telephone Interview Findings

Key Findings:

- Most Clinical + Payment and Payment-Only facility staff and practitioners were submitting Initiative claims; however, most were unsure of the number of submitted claims or the magnitude of payment.
- Practitioners reported mixed feedback on the NFI 2 clinical criteria, with some believing criteria are appropriate and others saying the criteria do not align with practitioners' clinical judgement.
- Telemedicine use is increasing in Clinical + Payment facilities because of the improved Curavi carts. There is also indication that the use of telemedicine is also increasing in Payment-Only facilities.
- In both groups, staff turnover was the most commonly cited barrier to Initiative success.
- Managed care penetration is increasing across Pennsylvania, largely because of Community HealthChoices, a new Pennsylvania-based mandatory managed care program for dual eligibles.

The University of Pittsburgh Medical Center (UPMC) Community Provider Services Program to Reduce Avoidable Hospitalizations (RAVEN) model did not change substantially this Initiative year. The Initiative operates similarly to the previous Initiative year, with the ECCP supporting Clinical + Payment facilities in multiple ways, including, but not limited to, clinical care and education provided by ECCP nurses, educational support provided by the Jewish Health Foundation, medication management provided by RxPartners, and telemedicine services provided by Curavi. RAVEN leadership, particularly the RAVEN Nursing Facility Liaison, also continues supporting Payment-Only facilities through education and training.

Table G-1. 2018 data collection summary

Number of facilities participating as of site visit date (October 30, 2018)	35
Ownership changes since 2017 site visit	2
Facilities withdrawn or removed from Initiative since 2017 site visit	0

This report includes data collected during calendar year 2018. The RTI team completed in-person interviews with RAVEN leadership on October 30, 2018. RTI also interviewed nursing facility administrators (NFAs), directors of nursing (DONs), assistant directors of nursing (ADONs), charge nurses, medical directors, facility nurse practitioners (NPs), RAVEN nurses, billing coordinators, and

other key staff in four Clinical + Payment facilities from October 31 to November 2, 2018. These visits followed May to July 2018 telephone interviews with NFAs, DONs, and other key staff in 7 Clinical + Payment facilities and 11 Payment-Only facilities. ***Table G-2*** shows the site visit and telephone interview summary finding for facility staff buy-in and implementation.

Table G-2. Site visit and phone interview summary findings: 2018 facility staff buy-in and implementation

Facility staff buy-in and implementation	Total	Clinical + Payment	Payment-Only
Interviewed facilities (by phone and in person)	22	11	11
Buy-in to NFI 2			
High	9	4	5
Medium	10	4	6
Low	2	2	0
None	1	1	0
Number of facilities that hired new staff in 2018 because of NFI 2	0	0	0
Number of facilities with resident opt-outs in 2018	4	2	2
Number of facilities reporting that NFI 2 has been effective in reducing potentially avoidable hospitalizations	15	8	7

NOTES: Buy-in is based on interviewer perceptions using the following definitions: *High buy-in*: Facilities that are billing regularly, with staff that are aware and engaged; overall, the facility interviewees speak highly of the Initiative and its impact on reducing avoidable hospitalizations. *Medium buy-in*: Facilities that have begun to bill but are not doing so regularly; staff may recognize the Initiative and key components but may not be fully engaged. *Low buy-in*: Facilities that have not started billing and/or have not trained staff on the six qualifying conditions; generally limited engagement and limited participation in NFI 2.

Based on interviews with ECCP leadership and facility staff, RTI identified the following detailed key findings:

- A majority of interviewed facility staff shared that their facilities were billing for NFI 2 and believed that they were receiving resultant payments; however, most staff could not share how many claims they had submitted or how much payment they had received. Practitioner billing was lower; practitioners also reported a similar lack of knowledge about the number of submitted claims or the reimbursement amounts.
- This Initiative year, some interviewed practitioners and facility staff shared that the six qualifying conditions' clinical criteria differed from practitioners' clinical judgement. For example, interviewees shared that they had residents who met the NFI 2 clinical criteria for pneumonia, but practitioners would not certify the condition for facility billing because it did not meet the practitioners' criteria for a pneumonia diagnosis.
- RAVEN transferred all telemedicine components to Curavi in NFI 2 Initiative Year 1. Curavi begun rolling out new, more user-friendly telemedicine carts to Clinical + Payment facilities. This Initiative year, all Clinical + Payment facilities now have these new carts and most interviewed staff appreciated them and found them easier to use. This year, the

evaluation team also heard that Payment-Only facilities were beginning to use telemedicine to support the RAVEN Initiative. Some facilities used NFI 2 reimbursements to purchase telemedicine carts, with one Payment-Only facility contracting with Curavi to provide the same type of telemedicine services offered in RAVEN Clinical + Payment facilities.

- Staff turnover continues to be a barrier to Initiative success. A majority of interviewed staff reported that they had to invest time and resources to continuously train new staff, significantly hampering Initiative implementation. In some cases, facility leadership, instead of the floor staff, drove the Initiative to prevent the Initiative from falling off because of staff turnover.
- Community HealthChoices (CHC), a Pennsylvania-based mandatory managed care program for dual eligibles, rolled out in January 2018. As such, many participating facilities, particularly Clinical + Payment facilities, are dealing with a large increase in managed care residents, which is only expected to grow as the program matures and expands. As such, CHC was unpopular with interviewed facility staff, who shared that they would like these residents to return to the RAVEN program because of difficulties coordinating care with the managed care company, particularly coordinating resident transport to and from the nursing facility.

G.2 Changes to Model and Implementation in 2018

There were no significant changes to the RAVEN model in 2018. The Initiative runs in a manner similar to the previous Initiative year.

G.2.1 Changes to Structure and Model

Interview findings indicate that there has been no change to the RAVEN model in Clinical + Payment and Payment-Only facilities.

G.2.2 Learning Community Activities in 2018

All facility staff members interviewed by phone, regardless of group, and in-person reported participating in some Learning Community activities; however, few staff members reported regular attendance. Staff from both Clinical + Payment and Payment-Only facilities were divided in opinion about the usefulness of the Learning Community calls and webinars. Some appreciated hearing programmatic updates and best practices on these calls. One interviewed Clinical + Payment NFA shared, “I find it a breath of fresh air listening to what other facilities are doing, so I might have a more global perspective [of RAVEN].” Others found the calls redundant and difficult to fit into their schedules. Some interviewees also reported that the information shared on these calls were not relevant to their facilities or practice patterns.

G.2.3 New Developments with INTERACT Tools and Other Components in Clinical + Payment Facilities

INTERACT Tools. Both Clinical + Payment and Payment-Only facilities continue to use INTERACT tools. Interviewees shared that staff regularly used the tools for a period, generally following education efforts. However, staff reported that tool use tapered off with time.

End-of-life Planning. RAVEN nurses continue to participate in end-of-life care planning and engage residents and families in discussions about end-of-life wishes in Clinical + Payment facilities. Interview findings show no change in this effort since the prior year.

Medication Management. RxPartners continues medication review, focusing primarily on the Interdisciplinary Review Teams (IDT). These teams are now in place in eight Clinical + Payment facilities. Originally, these teams focused on reducing antipsychotic use. Because of facility requests, RxPartners has expanded their focus to look at antibiotics and pain medications in select facilities. The opioid epidemic does not seem to have had an impact on RAVEN facilities, although several have reported taking in residents with a history of opioid use.

G.2.4 Changes in Role of ECCP Nurses

Similar to the previous year, interview findings indicate that the ECCP nurse remains heavily involved in the payment component, oftentimes certifying changes in condition, completing clinical documentation, and compiling billing documentation for NFI 2 facility billing. Many interviewed Clinical + Payment facilities indicated that the Initiative would not be sustainable without the heavy support they receive from the ECCP nurses, although a select few facilities, who had part-time ECCP nurse support, appeared to utilize their ECCP nurses infrequently.

G.2.5 Telemedicine

During Initiative Year 1, RAVEN transferred all telemedicine components, including technical support, management, and education, to Curavi, a privately held company. Curavi implemented improvements, including a smaller and more mobile cart; a more intuitive, user-friendly interface that does not require a log-in; a scanner for sharing documentation; and an electronic medical record (EMR) system that has integrated documentation for the six qualifying conditions and automates communication of the encounter to both physicians and nursing facilities. This Initiative year, all interviewed Clinical + Payment facilities had Curavi carts in place. Facility staff commented that these improved carts were much better than those they had previously. One interviewed DON from a very rural facility shared that the new carts have “revolutionized” their care for RAVEN residents by increasing their connectivity to resources, like cardiograms and bladder scans, not available in their rural area. Many staff from Clinical + Payment facilities mentioned that the carts’ EKG capabilities were the most useful. A DON from another facility said, “We have a telemedicine cart and, honestly, the thing we use most often and the thing that saves hospital transfers is the EKG machine. The fact that it’s read by a cardiologist within an hour, it’s the biggest thing.” The built-in EKG can be used for both RAVEN and non-RAVEN residents.

Despite progress made by Curavi, challenges remain to using telemedicine in Clinical + Payment facilities. As in NFI 1, interviewed staff commented that some practitioners and floor staff still mistrust the technology and the on-call practitioners. Some facilities reported that their practitioners were unwilling to work with the on-call practitioners and preferred that the floor staff and/or on-site RAVEN nurses assess residents. Staff also reported time as a barrier to use of telemedicine. Facility staff shared that getting the cart, connecting, and assessing the patient can take more time than simply calling the practitioner. ECCP leadership is aware of these challenges and is in process of developing solutions. For example, ECCP leadership is considering using one of their staff members, an RN, as a "telemedicine presenter," where this staff member would travel to a nearby facility when a telemedicine consult is required. This staff member would then facilitate the consult, thereby reducing burden on facility staff.

A new finding this Initiative year is the use of telemedicine in Payment-Only facilities. Although not widespread, staff in multiple Payment-Only facilities in rural areas reported use of telemedicine to support NFI 2 activities. One such facility is receiving telemedicine services from Curavi, the same organization that provides telemedicine to Clinical + Payment facilities. At the time of the phone interviews, telemedicine implementation was in the beginning phases in these facilities. As such, these facilities had yet to use telemedicine to confirm an NFI 2 diagnosis, but they planned to do so soon.

G.3 Sharing Collaborative Activities in 2018

There are no changes to ECCP involvement in or perception of Sharing Collaborative Activities since the previous Initiative year. According to ECCP leadership, use of CMS's Connect portal has declined since the start of the Initiative.

G.4 Changes to Facility Staff and Practitioner Engagement in 2018

Interviewees reported similar or slightly increased facility staff and practitioner engagement compared to the first year of NFI 2.

G.4.1 Facility Staff

According to interview findings, Clinical + Payment facility floor staff understanding of and engagement in the Initiative has increased since the previous Initiative year. Clinical + Payment interviewees indicated that it took facility staff time to understand the documentation required and the importance of this documentation in receiving reimbursements. Interviewees shared that, now that the payment component has been in place for 2 years, facility staff have grown accustomed to NFI 2 and its requirements.

Although facility staff are showing more engagement with NFI 2, the Initiative continues to be championed by nursing facility leadership or, in Clinical + Payment facilities, the RAVEN nurse. Interviewees in both Clinical + Payment and Payment-Only facilities reported that while floor staff identify changes in condition and begin documentation using INTERACT tools, the onus of completing documentation, contacting practitioners, and collecting information for billing falls to

facility leadership or the RAVEN nurse. One NFA from a Payment-Only facility shared that facility leadership made the decision to drive the Initiative because of their high staff turnover rates saying, "We've had a high turnover rate in our staff, so I think as a center we identified that it'd be a whole lot easier if the managers picked it up… staff were focused on their daily stuff. It's like 'You guys are handling that thing [RAVEN].' It's mostly the managers."

The effect of ownership changes on staff engagement is unclear. Two facilities changed ownership this Initiative year. Staff from one facility, where the NFI 2 was running smoothly, reported that the ownership change had little-to-no effect on NFI 2 and staff engagement. In another facility, impending ownership change delayed NFI 2 activities to the extent that the facility was not billing for NFI 2 and staff seemed unaware of the Initiative.

Interviewed facility staff said they felt very supported by RAVEN leadership. As in previous years, Clinical + Payment staff relied heavily on their RAVEN nurses and valued the support the nurses provided. Payment-Only staff appreciated the support the RAVEN nursing facility liaison provided to their facilities, sharing that having someone come monthly for in-person visits to answer questions or do trainings was very valuable. Along with providing in-person support, the liaison was also available to Payment-Only facilities as needed by phone. The liaison was also beginning to do mock chart-audits for both Payment-Only and Clinical + Payment facilities at the time of our site visit.

G.4.2 Practitioners

Practitioner engagement remains variable, with some practitioners having limited interaction with the Initiative and others being moderately or highly engaged. Practitioner engagement in Payment-Only facilities appears to be higher than in Clinical + Payment facilities, similar to findings from the previous Initiative year. At the start of the Initiative, ECCP leadership introduced the role of the physician liaison in an effort to improve practitioner engagement. At the time of the evaluation team's visit, the impact of this new role was unclear at the time of our site visit.

G.5 Updates for Documenting and Certifying Six Qualifying Conditions

Interview findings related to documenting and certifying the six qualifying conditions indicate little-to-no change since the previous Initiative year. One notable exception is, in the previous Initiative year, interviewees shared that clinical criteria for payment were too severe, but this Initiative year a few interviewees shared that their practitioners believed the clinical criteria were not severe enough. Interviewees from at least two facilities reported that practitioners were unwilling to confirm a qualifying diagnosis because they believed the symptoms the resident was exhibiting, which met the NFI 2 clinical criteria, were not severe enough for condition diagnosis. This was especially true for pneumonia. One practitioner shared that a pneumonia diagnosis is a "clinical determination" based on practitioner judgement, not based on the criteria set forth by NFI 2. An interviewed DON shared a similar sentiment, saying "Sometimes we are identifying changes so early that they meet symptom criteria, but [the practitioner] doesn't yet feel it's a pneumonia so I cannot bill for that... The clinical criteria are present, but the physician diagnosis

doesn't match since they don't feel it meets full-blown pneumonia or CHF." Interviewees did not indicate similar concerns for the other NFI 2 conditions.

G.6 Updates to Existing Billing Practices

Interviewees in Clinical + Payment and Payment-Only facilities and interviewed practitioners reported that NFI 2 billing remained stable this Initiative year, even if interviewees could not recall their precise billing volume.

G.6.1 Facility Billing and Recoupment

Interviews indicate that both Clinical + Payment and Payment-Only facilities are billing successfully for NFI 2. Similar to last year, knowledge of the volume of claims submitted was variable. Generally, more Payment-Only interviewees seemed to be aware of the number of claims submitted compared to their peers in Clinical + Payment facilities. Although interviewees had limited knowledge of the number of claims submitted, most believed that their facilities had been paid for submitted claims. Yet, interviewees were generally unaware of the magnitude of payment. This was especially true in facilities where corporate offices handled billing and reimbursements. In many cases, in both Clinical + Payment and Payment-Only facilities, corporate billing practices were considered a figurative "black box," wherein facilities would submit NFI 2 billing paperwork to the corporate offices with no communication after submission. Facilities had no indication whether the corporate offices were actually submitting claims or if there had been any issues with any claims the facilities had submitted.

In part because of this communication breakdown between facilities and corporate offices, interviewed facility staff were generally unaware of any recoupment. ECCP leadership shared that CMS had begun recoupment procedures, and the RAVEN team anticipated that some facilities would have to pay back at least some reimbursements. However, facility staff, including billing staff, did not mention any recoupment concerns to the evaluation team. Actual recoupment would not start until 2019.

G.6.2 Practitioner Billing

Most interviewed facility leaders were confident that their practitioners were submitting some Initiative claims. Interviewed staff from Payment-Only facilities reported that their practitioners were billing more often than Clinical + Payment facility interviewees. As in the previous Initiative year, most practitioners were billing for confirming a qualifying diagnosis but were not completing and billing for Initiative care conferences. Some interviewed facility staff and practitioners were unaware that practitioners could complete and bill for care conferences under the Initiative. As of our 2018 site visits, care conferences were still a component of NFI 2; care conferences were dropped from the initiative in January 2019.

Although facility interviewees said the practitioners were billing, interviewed practitioners did not voice much enthusiasm for the incentive payments. In some cases, practitioners were salaried and, therefore, did not receive the reimbursements from submitted claims. In other cases, the

practitioners contracted with outside billing services that would take a cut of the reimbursements, thereby reducing the net payment to the practitioner. Beyond payment structure challenges, practitioners shared that they were motivated more by providing high-quality care and preventing hospitalizations than by extra payments. Taken together, it appears that practitioner engagement in the Initiative is more often self-driven, rather than driven by financial incentives. ECCP leadership posited that practitioners may be more induced by the incentive payments if they were allowed to bill at the NFI 2 rate for the entire change in condition episode (e.g., the initial certification and any follow-up visits).

G.7 Data Collection

Interview findings yielded no change in data collection activities in either Clinical + Payment or Payment-Only facilities since the previous Initiative year.

G.8 Update on the Effectiveness of the Initiative in 2018

Most facility interviewees believed the Initiative has been effective in reducing potentially avoidable hospitalizations.

G.8.1 Potentially Avoidable Hospitalizations in 2018

Most interviewed Clinical + Payment and Payment-Only staff believed the Initiative was effective in reducing hospitalization rates for their long-stay residents. A majority of Clinical + Payment facilities attributed the decrease in hospitalizations to the support provided by the RAVEN nurse, rather than the payment model. Most facility interviewees across both groups agreed that the Initiative had sharpened clinical skills and improved communication. One DON from a Clinical + Payment facility shared that the Initiative, "helped transform this facility. We've been in this program for a little over 5 years, and we've never regretted it. [ECCP RNs] as well as the two CRNPs have done amazing work. More of my nurses are skilled in IVs. Our rehospitalization rates are low. On the whole, we're doing super."

Of those facilities that did not believe the Initiative had been effective in reducing hospitalization rates, most said that because their baseline hospitalization rates were already low, there was little room for further improvement. An interviewee from a Clinical + Payment facility shared that the effectiveness of NFI 1 made it difficult for them to see further reductions in hospitalization rates in NFI 2. Although these opinions were not voiced frequently, some facility interviewees worried that their already-low hospitalization rates would make it extremely challenging to achieve additional reductions in hospitalization rates.

G.8.2 Residents and Families in 2018

Interview findings indicate that there has been no change in resident and family perception of the Initiative since the previous Initiative year. Two Clinical + Payment and two Payment-Only facilities reported that residents had opted out of the Initiative since last year. These opt-outs were largely attributed to resident and family preferences for residents to be sent to the hospital. One facility

staff member shared that a resident had opted out because of concerns that participation in RAVEN would "exploit" her insurance plan or change the level of care provided by her insurance. Even after facility and RAVEN staff explained that this was not the case the resident decided not to participate.

G.9 New Reports of Spillover and Contamination Effects

Similar to Initiative Year 1, Clinical + Payment facility staff believed that NFI 2 had caused a cultural change in their facilities, wherein the Initiative was improving standards for care throughout the facility. Payment-Only facility interviewees did not report spillover from the Initiative to noneligible residents as often as their Clinical + Payment facility peers. There were no reports of contamination to non-NFI facilities this Initiative Year.

G.10 Updates to Policies and External Stakeholders

Reports of competing or NFI 2-like initiatives decreased this Initiative year; however, reports of managed care threatening Initiative enrollment increased this year.

G.10.1 Hospital Engagement

Clinical + Payment facility interviewees continued to report that hospitals were aware of their facilities' involvement in NFI 2, but that this did not affect their relationships with these hospitals. Payment-Only facility interviewees were unsure if hospitals were aware of their involvement in NFI 2, indicating no change in hospital engagement in the Initiative since the previous Initiative year.

G.10.2 Competing or Similar Initiatives

Unlike the previous Initiative year, very few interviewed facilities reported having other programs or policies in place related to reducing hospitalization rates for long-stay residents. Most interviewees in both groups said their facilities track hospitalization rates and complete root-cause analysis, but do not have any formal programs in place.

Although not a distinct initiative from NFI 2, one corporation that operates many Payment-Only facilities, created a SharePoint site to support facilities in completing NFI 2 activities. This SharePoint helps facilities review their RAVEN eligible residents and any changes in condition these residents may have had. Facility staff can use this information to ensure all documentation is in place to bill for these residents. This site also allows facilities to review RAVEN residents that were transferred to the hospital to identify missed opportunities.

G.10.3 State Policy Environment

As describe in last year's annual report, managed care is a growing presence across Pennsylvania. Although 2018 ECCP leadership interviews described managed care expansion as fairly stable, a majority of facility staff indicated that they anticipated an increase in the number of residents on managed care in the coming months or years. There were two reasons given for this prediction. First, many interviewees commented that they were seeing an increase in new managed care

admissions to their facilities. As these residents had not yet met the 101-day eligibility requirement for RAVEN, these residents did not impact the RAVEN-eligible population. However, interviewees believed that once these residents begin meeting that length of stay requirement, there may be an increase in the facility's total number of managed care long-stay residents.

Second, many interviewees pointed to changes at the state level, particularly the advent of a mandatory managed care program for dual eligibles called Community HealthChoices (CHC). This program is being phased-in by region, starting in January 2018, and statewide roll-out is expected to be complete by January 2020. Although staff interviewed by phone in spring 2018 were not very familiar with this new managed care program, many commented on how upcoming changes would impact their eligible population in the near future. Staff interviewed in person in fall 2018 were very familiar with CHC, as it had already rolled-out in their facilities. Facility staff generally had poor opinions of this program, citing forced resident conversions from traditional Medicare to CHC's managed Medicare plans and large-scale resident transport issues. Interviewees shared, that while residents were supposed to have the option to remain on traditional FFS Medicare while receiving their Medicaid benefits from CHC, many residents were automatically enrolled in one of CHC's partner Medicare managed care plans. Facility staff also mentioned that they had to use the transportation company stipulated by the managed care plan for non-emergency transport to and from the facility, yet this company often was unavailable or required that facilities book transportation days to weeks in advance, which is often impossible in a nursing facility setting. If the company was unavailable, staff reported that the managed care company would send a ride-share service to transport residents in cars not equipped to handle many nursing home residents (e.g., no wheelchair lift) and drivers untrained to move residents safely. Staff reported that drivers would sometimes leave their residents sitting on the curb outside destination facilities. Because of the challenges with this new managed care program, facility staff interviewees said they wished these residents could be moved off managed care and back to RAVEN.

G.11 Next Steps

For the coming year of data collection, RTI will continue following:

- Changes to the telemedicine component in Clinical + Payment facilities and growth of telemedicine in Payment-Only facilities
- Role of practitioner liaison and potential effect on practitioner engagement
- Facility and practitioner billing processes, including the relationship with corporate billing offices
- Practitioner perception of clinical criteria
- Managed care penetration, particularly the growing presence of CHC
- Sustainability of NFI 2 model components.

APPENDIX H
STAKEHOLDER SUMMARIES

H.1 Alabama

H.1.1 Stakeholder 1

This stakeholder noted that the greatest challenge faced by nursing facilities in Alabama is reimbursement, specifically the growth of managed care. She said that her facility sees a lot of HMO patients and that care for these patients is reimbursed at $30–50/day less than Medicare. She mentioned that some nursing facilities in her state have stopped accepting these patients. She also mentioned that one of their referral hospitals has recently become an accountable care organization (ACO) and that, although they are hoping to become a preferred partner, they are worried about the hit to their revenue because of the hospital's desire to reduce length of stay. She also mentioned being part of a bundled payment program and reported that most bundle patients go home, but those that do go to a nursing facility have a lot of comorbidities. That means they are taking care of sicker patients for less money. In terms of hospitalizations, she mentioned meeting quarterly with the hospitals that refer to them to review all rehospitalizations. They also monitor their quality measures (QMs) using data available on the Agency for Health Care Administration's (AHCA's) website.

H.1.2 Stakeholder 2

This stakeholder remained focused on her office's role in getting people certified for Medicaid and their attempts to speed up that process, including instituting an online system. She did mention being on the Impact board. This is a group that is working to reduce hospitalization in the River Region (i.e., Birmingham). She also mentioned that the state began a managed long-term care (LTC) program in January, and they are trying to encourage people in nursing facilities to sign-up. She believes that the program is going to greatly reduce rehospitalizations.

H.1.3 Stakeholder 3

This stakeholder reported that the biggest challenge for nursing facilities in Alabama is the low Medicaid rate. She also noted that most urban areas are over-bedded and that competition for Medicare patients is high. She predicts that facilities will be closing. Another challenge that she discussed was a shortage of physicians in nursing facilities. She noted that many nursing facility MDs are in their 70s and 80s and nearing retirement. There are no younger MDs willing to take their place. In the meantime, nursing schools are pumping out nurse practitioners (NPs), but they have no training or experience in LTC and there is no one to train them. These older MDs and untrained NPs are not very well versed in treating residents in the nursing facility. Relatedly, she expressed a wish that Alabama have med techs so that licensed practical nurses (LPNs) could spend less time passing meds and more time assessing and caring for residents. In terms of policies affecting LTC, she reported that the SIMPRA program began in January. This is a managed LTC program similar to Optum, but not capitated. This program was begun by a coalition of nursing facility owners in Alabama and leaves out the chains from out of state. She was not aware of any

quality improvement efforts beyond what the quality improvement organization (QIO) is doing, although most corporations are paying attention to rehospitalizations and there is an ACO forming in the Birmingham area.

H.1.4 Stakeholder 4

This stakeholder stated that the biggest challenge to nursing facilities in Alabama, and elsewhere, is the rollout of the new regulations that took place in November 2017. She said that while she agrees with the regulations, and even thinks that some do not go far enough, the number of new things that nursing facilities have to deal with is simply overwhelming. That combined with the changes in payer source (i.e., increased managed care) and a focus on short-term rehab has left her little time to look at the big picture. She reported that the Alabama culture change coalition has not provided as much education as she would like and, in fact, has recently concentrated on training dementia caregivers in the community. She said that this was because the Alabama Health Care Association (ALHCA) has a lock on nursing facility training. However, she also said that ALHCA has not been providing enough training, especially in rural areas. When it comes to hospitalizations, she reported that nursing facilities are at the mercy of MD orders and regardless of how hard they try to persuade MDs to treat residents in the nursing facility, most MDs in Alabama simply want the residents sent out. She said that they are dealing with old school country physicians that are not willing to come to the nursing facility to evaluate residents. They have similar issues in trying to get MDs to prescribe fewer antipsychotics. Other than AQAF, she could not name any quality improvement efforts happening in the state.

H.1.5 Stakeholder 5

In describing the LTC environment in Alabama, this stakeholder reported that the state had resisted for years using the QIS survey system and worked with CMS to develop a survey system that worked for them. This has now put facilities behind in being able to respond to the new Phase 2 regulations that were instituted in November 2017. This has also resulted in Alabama being behind the rest of the country in terms of implementing cutting edge programs. He believes there is more regulatory red tape in Alabama. In terms of reducing hospitalizations, he reported that many facilities in Alabama now have NPs. These NPs are not employed by the nursing facilities but are provided by an NP company and the NPs bill Medicare directly. He also discussed the Simpra plan that was begun by 23 Alabama nursing facilities. This plan provides I-SNPs and D-SNPs. As for other quality initiatives, he reported that the ALHCA is focusing on QAPI. He could not name any other efforts around quality improvement or hospitalizations in the state.

H.2 Nevada

H.2.1 Stakeholder 1

This stakeholder reported that the biggest challenge facing nursing facilities in Nevada is staffing, including finding staff (there is a nursing shortage) and turnover. She thought that much of the turnover problem was caused by the much lower pay offered in nursing facilities compared to hospitals. In terms of hospitalizations, her organization has a few collaborative projects with

hospitals around things like sepsis and antibiotic stewardship. She also reported that hospitals that own nursing facilities have used monthly meetings involving root cause analysis to try to determine the common reasons for hospitalizations and reduce these. She also mentioned meetings between geriatricians in her region and hospitalists to try to educate the hospitalists. She thought that hospitalizations in the state could be reduced with a greater presence of MDs or NPs in nursing facilities.

H.2.2 Stakeholder 2

This stakeholder thought that the greatest challenge facing nursing facilities in Nevada is their nursing shortage combined with a recent nursing facility construction boom. The state has recently gone from 52 nursing facilities to 61 and they do not have enough nurses or nursing assistants to fill open positions. In addition, he reported that Assisted Living Facilities are siphoning off certified nursing assistants (CNAs) because they are easier to hold accountable than the patient care assistants (PCAs) that were previously used because CNAs are licensed by the nursing board. He is hoping that one remedy to the staffing shortage will be a change in legislation that makes it feasible for nursing facilities to utilize medication aides. Apparently, med aides are on the books in Nevada, but were not utilized because poor wording in the legislation made the model unaffordable. He stated that a barrier to reducing hospitalizations in Nevada is old-school thinking and a reluctance on the part of hospitals and nursing facilities to speak to one another. He also said that Nevada is very behind other states in terms of technology and other very commonly accepted nursing facility practices, such as person-centered care. An interesting policy change that he mentioned is one that allows nursing facilities to be reimbursed at a higher rate for caring for individuals with behavioral issues. He said that some nursing facilities are actually changing their business model to care for these types of patients.

H.2.3 Stakeholder 3

This stakeholder stated that nursing facilities in Nevada face reimbursement challenges as the Medicaid, and even Medicare, rates do not cover costs. She believes this results in an inability of nursing facilities to adequately staff facilities and that most nursing facilities have one RN and one LPN and then CNAs. She also thought that the presence of MDs is too low and that they are seen only as a resource and, therefore, can't address emergent issues and this results in hospitalizations. She did not, however, describe any ways that hospitals are engaging with skilled nursing facilities (SNFs) to address these issues. She did state that re-hospitalizations are a problem in the state, especially in the south. She thought that SNFs often "bite off more than they can chew" in terms of patient acuity, but also felt that insurance companies were partly responsible for pushing patients out of hospitals too soon. She mentioned an interesting program that began as an Innovation grant where EMS companies triage people before transporting them to determine the best level of care and even determine whether the person should go to the hospital at all.

H.2.4 Stakeholder 4

These stakeholders reported that the biggest challenge facing nursing facilities in Nevada is inability to find staff. An opportunity they reported was the recently developed Behaviorally

Complex Care Program (BCCP) that pays nursing facilities a supplemental rate for caring for residents with behavioral issues. The program includes three tiers, based on the complexity of the behavioral issues that the resident has, and the facility is paid an extra $100, $200, or $300 per day on top of the usual Medicaid rate for providing care to these residents. This program was developed to try to keep these types of residents in the state because previously they were often placed in out-of-state nursing facilities. Nursing facilities do not have to do anything extra to qualify for these payments as the payments are based entirely on the resident's condition/behaviors. However, the extra payment is intended to allow the facility to provide special interventions for the resident. They reported that Nevada Medicaid has been primarily focused on issues around behavioral health the past few years and the BCCP program is the result of that for nursing facilities.

H.3 Colorado

H.3.1 Stakeholder 1

This stakeholder reported that Colorado nursing facilities are ahead of the curve on hospitalizations and other measures primarily because of the medical culture in Colorado, which is supported by a strong AMDA chapter. The AMDA chapter meets monthly and provides a lot of education to MDs. In addition, two nursing facility chains also sponsor monthly journal clubs to ensure MDs are up to date on best practices. He thought that the biggest barriers to reducing hospitalizations were a lack of aligned incentives and nursing facility staff turnover.

H.3.2 Stakeholder 2

This stakeholder stated that the biggest challenge for nursing facilities in Colorado is a lack of communication and coordination between nursing facilities, hospitals and providers, especially in terms of EHR interoperability. She also reported an oversupply of ALFs and nursing facilities and an expectation of attrition of nursing facilities from the market. In terms of quality initiatives, her group is working on antibiotic stewardship and opioids and have put procedures and protocols in place for these because of lack of support from pharmacists. For example, they have decided to put MDs in charge of opioids, so that their midlevel practitioners cannot be asked by patients to reinstate meds that the MD is weaning. They have also implemented a rule that does not allow antibiotics or narcotics to be ordered by anyone on call (unless it is an emergency). They had some pushback from nursing facilities about this because nursing facilities are worried about keeping patients and families happy. A state policy she mentioned was one where the state has said that a new nursing facility patient must be seen by an MD within 7 days, where the CMS regulation is within 30 days.

H.3.3 Stakeholder 3

This stakeholder stated that the biggest challenges for nursing facilities in Colorado are payment, the regulatory environment and workforce. However, she did note that Colorado has better Medicaid payment rates than many other states and that the regulatory environment is not adversarial. Nursing facilities can work with the surveyors to correct issues. In terms of workforce,

nursing facilities are competing with Amazon for workers and CNAs cannot afford to live in Colorado on what they are paid because of high housing costs. She also noted that Colorado is about to change their payment system somewhat. It is an acuity and cost-based system that was previously based on unaudited cost reports. In July 2019, they began using audited cost reports that are 2 years old. She said that nursing facilities find this change scary, but that she doesn't believe it will result in actual changes in payments. She stated that while hospitalizations are a focus in Colorado because of CMS's focus on these, they are not a primary focus. She said that there is a much larger focus on dementia, behavioral issues, and antipsychotic medication use. Telligen, the Colorado QIO, is leading a behavioral group around these issues. She did mention that the Colorado Hospital Association had an accountable care collaborative that focused on keeping Medicaid enrollees out of the hospital, but that group did not include nursing facilities until recently.

H.3.4 Stakeholder 4

These stakeholders reported that the biggest challenge for nursing facilities in Colorado is the very low unemployment rate, which makes it difficult for nursing facilities to find staff. They also said that nursing facilities have had a hard time dealing with all of the new regulations that went into effect in November 2017. Another difficulty mentioned was the increase in the younger mental health population in nursing facilities. One stakeholder complained that she does not know what nursing facilities are expected to be because they are expected to be a person's home and are also expected to provide med-surg level care to keep people out of hospitals. In terms of opportunities, they reported that Colorado is quite unique in that the QIO, AHCA, and AMDA are very collaborative and work together on several topics, including reducing antipsychotic medication use and antibiotic stewardship. With regard to hospitalizations, they reported that the QIO community program (which has eight communities in Colorado) is very much focused on reducing hospitalizations. Some communities have focused on reducing infections in order to reduce hospitalizations. The DOH and AHCA partnered to offer free infection control training to nursing facilities. The Center for Value in Health Care (CVHC) is also focused on reducing readmissions.

H.4 Missouri

H.4.1 Stakeholder 1

This stakeholder reported that the biggest challenge for nursing facilities in Missouri is the low Medicaid reimbursement rate, which is only $152/day and has been reduced recently. She also mentioned that this low reimbursement results in low pay for staff, which contributes to high turnover rates. Her organization is not directly involved in reducing hospitalizations of nursing facility residents or any other nursing facility quality initiatives. She reported thinking that communication between hospitals and nursing facilities has improved recently, since hospitals are interested in reducing their 30-day rehospitalization rates. In terms of state policies that could affect nursing facilities, she mentioned that Missouri is seriously working toward a managed LTSS system. The options are being discussed and researched and this is strongly supported by the director of the Department of Health. She said that all interested parties, such as AHCA and Leading Age, are involved in these discussions.

H.4.2 Stakeholder 2

This stakeholder reports that the biggest challenge for nursing facilities in Missouri is reimbursement. They simply do not have enough money to always provide quality care. He also stated that hospitals are primarily to blame for rehospitalizations because of poor communication and discharging patients too soon. He stated that nursing facility hospitalizations are primarily because of short staffing and not enough RN staffing. He also thought that having an advanced practice nurse in each facility would go a long way to alleviating this issue. However, most nursing facilities cannot afford an APRN, there are not enough APRNs with nursing facility experience, and most MDs are against the idea of independent APRNs because they see them as competition. He did not know of any quality initiatives beyond MOQI. He reported that the governor is trying to push through legislation that would force most Medicaid beneficiaries into ALFs, though he was not sure how people on Medicaid would be expected to pay for that (since almost no ALFs accept Medicaid).

H.4.3 Stakeholder 3

This stakeholder stated that the biggest challenge facing nursing facilities in Missouri is staffing and turnover and that Missouri's Medicaid reimbursement rate was a barrier to quality. She mentioned a few programs aimed at improving quality, including MC5 (a nursing facility culture change coalition), QUIPMO (a University of Missouri program to help nursing facilities address issues like pressure ulcers) and Primaris (who oversees CHIP and is working on antipsychotic medication reduction). She also mentioned the new federal regulation that requires nursing facilities to provide the Ombudsman's office with a list of transfers each month. The goal of this is to ensure that nursing facilities are not dumping people at hospitals.

H.4.4 Stakeholder 4

This stakeholder stated that the biggest barrier to quality in Missouri nursing facilities is staff turnover. He blamed turnover on the low wages that nursing facilities pay CNAs. In terms of hospitalizations, he mentioned that nursing facilities now have to report all hospitalizations to the Ombudsman's Office. He also stated believing that the Ombudsman's Office should have more power to approve transfers to the hospital and claimed that other states have given that authority. In terms of quality more generally, there is now legislation that requires nursing facilities to report sexual assaults and a push for legislation that would allow families to put cameras in resident rooms.

H.4.5 Stakeholder 5

This stakeholder stated that the biggest challenge for nursing facilities in Missouri is the low Medicaid reimbursement rate of $161. He stated that that combined with the huge growth in ALF in Missouri has and will lead to nursing facility closures. He blamed this growth on their certificate of need process, which he described as "toothless." He also mentioned Missouri's regulation related to APRN scope of practice. He stated that getting the restrictions removed around APRN practice is a major focus of his organization. In terms of reducing hospitalizations, he described a group being organized by the Missouri Hospital Association called the Care Coordination

Collaboration. The group is just forming and includes Leading Age, AHCA, Alliance for Home Care, Department of HHS, some ambulance organizations and others. A key goal seems to be developing a way for ambulance companies to take people to the most appropriate level of care rather than just hospitals. He also mentioned Lutheran Senior Services in the St. Louis area becoming their own I-SNP. In terms of quality improvement more generally, he thought that was mostly driven by the QIO.

H.5 New York

H.5.1 Stakeholder 1

This stakeholder stated that it is very difficult to find good staff, especially in rural areas, and that the Medicaid rate has not had an inflation increase since 2008. Beginning in 2011, New York began to move to a managed LTC system and all permanent nursing facility residents were expected to be on one of these plans beginning in 2015. He reported that rather than allow large insurance companies to provide these plans, as is the case in most other states, New York decided to open the field to provider-sponsored plans. This was positive in that providers with experience caring for frail elderly are running many of these plans, but negative because it has resulted in New York having over 50 different managed care plans. This large number of plans makes management of this system very complicated and costly for nursing facilities. That, combined with the lack of Medicaid increase, has led to many nonprofit nursing facilities selling to for-profits and single owners selling to chains to take advantage of economies of scale. He also discussed the many programs and waivers aimed at reducing hospitalizations and rehospitalizations in New York and said that each is using different measures. This means that nursing facilities do not know how to best measure their hospitalizations or where to focus their efforts. It also means that although there have been reductions in hospitalizations and rehospitalizations, it is impossible to know which program to attribute this to. In terms of policy, he mentioned that New York has removed payment for bed-hold, while still expecting the bed to be held.

H.5.2 Stakeholder 2

This stakeholder reported that rural areas in New York tend to have some of the same problems as other rural areas of the country, especially staff shortages. Finding staff is not as big an issue in urban and suburban areas in New York. However, he disputed industry claims that staffing levels are low because of low reimbursement. He thought that a big problem in LTC is the lack of transparency about where the money goes, especially in the case of for-profit corporations. He stated that New York is in the bottom quintile of states in terms of staffing levels. He reported that there is a lot of self-dealing in New York. He also reported a trend where downstate operators are buying upstate operators and immediately reducing staffing, which has resulted in worse quality outcomes and lower star ratings. He stated that the biggest impediment to improved nursing facility quality is poor enforcement, lack of substantial penalties, and few consequences for repeated deficiencies. He is against value-based purchasing, especially with regard to hospitalization, because he feels it will disincentivize sending people to the hospital when they really need to go. In terms of other quality initiatives in the state, he spoke of the Gold Stamp program, which is focused on reducing pressure ulcers. However, he didn't think this program was

having much effect. He stated that the best way to improve care quality and reduce hospitalizations is through better care planning and resident assessment. Finally, he thought that New York's move toward managed LTSS would result in people being "dumped" in nursing facilities when home care became too expensive.

H.6 Indiana

H.6.1 Stakeholder 1

These stakeholders reported that a key challenge in Indiana is the fact that the state has 520 nursing facilities and an average occupancy rate of 74 percent to 75 percent. They also noted a shortage of both nurses and doctors in the state. They discussed the state's value-based purchasing program and the ability of nursing facilities to earn an extra $14.30/resident/day for good performance. There are going to be changes to the program to include staffing at all levels in the facility (management and not just frontline) and better build-in the CMS QMs. Thanks to the OPTIMISTIC project, nursing facilities will now also get points for having someone on staff who is well versed in advance care planning. Another change they noted was an "end of therapy" program. Under this program, nursing facilities cannot conduct their quarterly MDS assessment on a patient who is undergoing short-duration therapy. The patient will need to be reevaluated at the end of therapy to establish a post-therapy RUGS score so that the nursing facilities case mix index is not driven up. They were not able to describe any quality initiatives in the stat, other than OPTIMISTIC and stated that the Medicaid office is not very concerned with hospitalizations, especially rehospitalizations since those are a Medicare issue. They reported it was not surprising that nursing facilities would hospitalize Medicaid patients because that results in a temporary increase in reimbursement when the person returns on Medicare. They did mention that the state is working on changing home health reimbursement and that this change is aimed at getting people out of nursing facilities and allowing them to remain in the community longer.

H.6.2 Stakeholder 2

This stakeholder reported that Indiana represents an anomaly related to a loophole in nursing facility funding whereby nursing facilities owned by county hospitals can draw down higher rates for Medicaid residents. This has resulted in almost all nursing facilities being affiliated with a county hospital. She stated that this results in better funding for those nursing facilities but has led to an imbalance in their LTSS system. She also reported that many nursing facilities are trying to expand their corporate umbrellas and diversify into ALFs and home health. She could not say much about hospitalizations but said that the state has a contract with the University of Indianapolis focused on other quality initiatives. This work has led to the formation of regional quality collaboratives that AAAs often act as the convener for. She also thought the Indiana Hospital Association has a patient safety coalition.

H.7 Pennsylvania

H.7.1 Stakeholder 1

This stakeholder noted that Pennsylvania Medicaid has an institutional bias that she hopes will be changed by the Community Health Initiative, which is a program for dual eligibles that provides managed LTSS. She blamed the issue of hospitalizations on financial misalignment and nursing facilities desire to focus on Medicare funding. She believes that introduction of managed care will help with these issues. However, she also discussed how complicated this system will be in that beneficiaries will have to manage this plan, D-SNP, behavioral health and Part D separately. She has some doubt about the ability of those who are nursing facility eligible to be able to do that. She also mentioned that acuity in nursing facilities has increased greatly, while nursing facilities are short staffed. She also discussed the issue of racial disparities in Pennsylvania and the fact that there are not enough nursing facilities in the Philadelphia area. She stated that no one wants to open nursing facilities in Philadelphia because most residents would be on Medicaid. As a result, hospitals in the Philadelphia area are discharging patients to nursing facilities in Montgomery county where nursing facilities have available beds.

H.7.2 Stakeholder 2

This stakeholder reported that the biggest challenge for LTC in Pennsylvania is funding and the inability to attract a quality workforce for such low pay. She felt this was a bigger issue in rural areas where staff do not have access to public transportation making it difficult for them to get to facilities. She also discussed big differences in the state Medicaid system in terms of people getting into facilities or being able to get home care. She stated that it is very easy for someone to be placed in a facility, but the process for receiving home care takes months. This gives the state an institutional bias that she believes has been getting worse. However, she is hopeful that the recent move to managed LTSS would change that. In terms of quality improvement and reducing hospitalization, she mentioned that Pennsylvania has a coalition of 52 AAAs in the state called P4A that meets monthly to discuss reducing readmissions. She also reported that hospital systems in Pittsburgh and Philadelphia have been focused on reducing rehospitalizations.

H.7.3 Stakeholder 3

This stakeholder feels an important issue for nursing facilities is that they do not provide enough behavioral health care and that this is because of their limited funding. She is hopeful that the introduction of the state's new MLTSS system will help this situation. She also stated that many nursing facilities are not innovating because of organizational cultures that are afraid of change. She reported believing that many nursing facility administrators are satisfied with the status quo and that CNAs are overworked and under-appreciated. She was not aware of any efforts to reduce hospitalization or improve quality but was hopeful that managed care organizations running the MLTSS program would push improvements in those areas because they'll demand that certain measures be met.

H.7.4 Stakeholder 4

This stakeholder reported that thanks to high-profile media coverage of several nursing facility quality issues, state regulators have responded by taking more punitive action against nursing facilities. He stated that despite no real drop in quality among nursing facilities, nursing facilities are being hit with many more civil monetary penalties. He expressed a desire for the state regulatory agency to work in ways similar to neighboring Ohio where, rather than punishing nursing facilities, the regulatory agency is working with nursing facilities to improve quality and reduce deficiencies. He also mentioned difficulties attracting and retaining good staff as a challenge in rural areas of the state. In terms of reducing hospitalizations, he reports that Pennsylvania Health Care Association is assisting nursing facilities by providing data for tracking their rates, so they know if interventions are working. He said that one challenge when it comes to reducing rehospitalizations in Pennsylvania is the tort climate. He stated that the Philadelphia court system is known for providing payouts to plaintiffs and this has resulted in a lot of cases against nursing facilities. This has led some corporations to make hospitalization decisions based more on a fear of litigation (i.e., it is safer to hospitalize than to be sued). Finally, he noted that Pennsylvania is in the process of updating their nursing facility regulations and a draft set should be ready in 3-6 months.

H.7.5 Stakeholder 5

This stakeholder noted that workforce and low Medicaid reimbursement are big challenges for Pennsylvania. He also noted that the media has been very focused on nursing facility scandals and this has led to the licensing agency issuing more citations and beginning to institute civil monetary penalties. He also noted that nursing facilities are overwhelmed by all of the new federal regulations that have gone into effect in the past year. He stated that the new MLTSS and the administration's push for more HCBS has led to nursing facility worries about referral sources. On a positive note, he mentioned that there is a strong culture change coalition (PA VOICE) in Pennsylvania. Groups are also trying to promote POLST legislation in Pennsylvania. He also noted that the Hospital and Healthcare Association of Pennsylvania (HAP) has an initiative called the Hospital Improvement Innovation Network that helps hospitals and their partners reduce readmissions. His organization worked with HAP to develop a universal transfer form to help improve communication at transfers.

APPENDIX I
SURVEY FINDINGS, INITIATIVE YEAR 2

Appendix I presents the full survey responses of all close-ended questions from the NFA and Practitioner Surveys. Respondents were asked to focus on their experiences with NFI 2 at a specific facility during the 2018 calendar year, which largely overlaps with Initiative Year 2. Data collection occurred from January through April of 2019. All responses are stratified by intervention group, and include the number of respondents for each group, along with a **percentage** distribution of answers to each survey question.

I.1 NFA Survey

Table I-1. Role in facility

Intervention group	N	Percent			
		NFA/ED	DON	Billing staff	Other
Overall	217	88.0	6.0	2.3	3.7
Clinical + Payment	92	90.2	4.3	2.2	3.3
Payment-Only	125	86.4	7.2	2.4	4.0

DON = director of nursing; ED = emergency department; NFA = nursing facility administrator.

Table I-2. Started working at facility

Question	N	Percent		
		Before September 2012	Between September 2012 and <month> 2016	<month> 2016 or later
Overall	217	36.9	30.0	33.2
Clinical + Payment	92	34.8	34.8	30.4
Payment-Only	125	38.4	26.4	35.2

<month> = go-live month; date varied by ECCP.

Table I-3. Number of practitioners in facility

Question	N	Mean	SD	Minimum	Maximum
Practitioners who care for eligible long-stay residents*					
Overall	217	5.9	4.9	0.0	50.0
Clinical + Payment	92	6.8	6.6	0.0	50.0
Payment-Only	125	5.3	3.0	0.0	20.0
Practitioners approved to participate in the Initiative					
Overall	217	3.8	2.5	0.0	14.0
Clinical + Payment	92	4.5	3.0	0.0	14.0
Payment-Only	125	3.2	2.0	0.0	11.0
Approved practitioners salaried by facility/corporation					
Overall	217	0.7	1.6	0.0	13.0
Clinical + Payment	92	0.7	1.8	0.0	13.0
Payment-Only	125	0.7	1.3	0.0	7.0

* = Excluding the <ECCP Nurse> for Clinical + Payment (not AQAF/NY-RAH) facilities.

Table I-4. Presence of full-time practitioner

Intervention group	N	Percent	
		Yes	No
Full-time physician, NP, or PA at facility*			
Overall	217	48.8	51.2
Clinical + Payment	92	51.1	48.9
Payment-Only	125	47.2	52.8

* = Excluding the <ECCP Nurse> for Clinical + Payment (not AQAF/NY-RAH) facilities.

Table I-5. Facility used billing codes

Intervention group	N	Percent		
		Yes	No	Unsure
Overall	217	87.1	6.0	6.9
Clinical + Payment	92	89.1	5.4	5.4
Payment-Only	125	85.6	6.4	8.0

Table I-6. Frequency ECCP nurse confirmed a qualifying diagnosis

Intervention group	N*	Percent				
		Never	Rarely	Sometimes	Often	Always
Overall	48	0.0	6.3	25.0	31.3	37.5
Clinical + Payment	48	0.0	6.3	25.0	31.3	37.5
Payment-Only	—	—	—	—	—	—

* = skip pattern. Respondents were Clinical + Payment (not AQAF/NY-RAH).

— = data not applicable.

Table I-7. How facility submits billing codes

Intervention group	N*	Percent			
		Directly by facility	Via corporate/ chain office	Independent billing contractor	Other
Overall	187	49.2	46.5	4.3	0.0
Clinical + Payment	81	50.6	43.2	6.2	0.0
Payment-Only	106	48.1	49.1	2.8	0.0

* = skip pattern. Respondents were using billing codes.

Table I-8. How facility receives payments

Question	N*	Percent	
		Directly from Medicare	From corporate/ chain office
Overall	187	54.0	46.0
Clinical + Payment	81	56.8	43.2
Payment-Only	106	51.9	48.1

* = skip pattern. Respondents were using billing codes.

Table I-9. Amount of payment facility receives from corporation

Question	N*	Percent		
		All payment	Some payment	No payment
Overall	88	72.7	8.0	19.3
Clinical + Payment	35	77.1	5.7	17.1
Payment-Only	53	69.8	9.4	20.8

* = skip pattern. Respondents indicated their facility's corporate/chain administrative office received payment.

Table I-10. Types of support received for the Initiative

Question	N	Support (percent)		
		Sufficient	Insufficient	Not received
Educational materials and training (e.g., toolkits, webinars)				
Overall	216	93.5	4.6	1.9
Clinical + Payment	91	91.2	5.5	3.3
Payment-Only	125	95.2	4.0	0.8
Help with data collection and reporting				
Overall	216	82.4	9.3	8.3
Clinical + Payment	91	79.1	14.3	6.6
Payment-Only	125	84.8	5.6	9.6
Guidance on documentation requirements				
Overall	216	88.4	7.4	4.2
Clinical + Payment	91	83.5	12.1	4.4
Payment-Only	125	92.0	4.0	4.0
On-call support (phone, e-mail, or on-site) for questions about billing				
Overall	216	84.7	6.5	8.8
Clinical + Payment	91	80.2	11.0	8.8
Payment-Only	125	88.0	3.2	8.8
Quality control and review prior to billing				
Overall	216	74.5	8.3	17.1
Clinical + Payment	91	74.7	14.3	11.0
Payment-Only	125	74.4	4.0	21.6

Table I-11. Received sufficient overall support about using facility billing codes

Intervention group	N	Percent	
		Yes	No
Overall	216	91.2	8.8
Clinical + Payment	91	86.8	13.2
Payment-Only	125	94.4	5.6

Table I-12. Importance of treating residents on site

Intervention group	N	Percent				
		Not at all important	Somewhat important	Moderately important	Very important	Extremely important
Overall	216	0.0	0.5	0.0	15.3	84.3
Clinical + Payment	91	0.0	1.1	0.0	14.3	84.6
Payment-Only	125	0.0	0.0	0.0	16.0	84.0

Table I-13. Initiative effectiveness

Statement	N	Percent			
		Strongly agree	Agree	Disagree	Strongly disagree
Overall, it was easy to integrate the *facility* billing codes into my facility's existing processes.					
Overall	215	37.7	53.5	7.4	1.4
Clinical + Payment	91	35.2	57.1	6.6	1.1
Payment-Only	124	39.5	50.8	8.1	1.6
It makes financial sense for my facility to use the *facility* billing codes.					
Overall	215	57.7	38.1	2.8	1.4
Clinical + Payment	91	53.8	41.8	4.4	0.0
Payment-Only	124	60.5	35.5	1.6	2.4
<ECCP> has improved the quality/outcomes of resident care at my facility.					
Overall	215	45.6	44.2	8.4	1.9
Clinical + Payment	91	48.4	42.9	7.7	1.1
Payment-Only	124	43.5	45.2	8.9	2.4
The Initiative has reduced the number of potentially avoidable hospitalizations among eligible long-stay residents in my facility					
Overall	215	38.6	52.6	6.0	2.8
Clinical + Payment	91	47.3	47.3	5.5	0.0
Payment-Only	124	32.3	56.5	6.5	4.8

Table I-14. Facility-level changes and factors

Question	N	Percent	
		Agree	Disagree
Documentation aids added to facilitate Initiative implementation			
Overall	215	84.7	15.3
Clinical + Payment	91	84.6	15.4
Payment-Only	124	84.7	15.3
Other non-<Initiative>-related practices already in place to reduce avoidable hospitalizations			
Overall	215	85.6	14.4
Clinical + Payment	91	89.0	11.0
Payment-Only	124	83.1	16.9
Payments from facility billing codes reimburse my facility for care practices my staff were already performing			
Overall	215	69.3	30.7
Clinical + Payment	91	68.1	31.9
Payment-Only	124	70.2	29.8
<Initiative> enrollment could decline in the coming months due to increasing resident enrollment in managed care			
Overall	215	74.0	26.0
Clinical + Payment	91	75.8	24.2
Payment-Only	124	72.6	27.4

Table I-15. Frequency facility missed opportunity to bill

Intervention group	N	Percent				
		Never	Rarely	Sometimes	Often	Always
Overall	215	6.0	29.3	51.6	12.6	0.5
Clinical + Payment	91	8.8	28.6	54.9	6.6	1.1
Payment-Only	124	4.0	29.8	49.2	16.9	0.0

Table I-16. Reason facility did not bill

Question	N*	Percent		
		Major reason	Somewhat of a reason	Not a reason
Staff did not realize resident was eligible for <Initiative>				
Overall	202	9.9	41.6	48.5
Clinical + Payment	83	12.0	42.2	45.8
Payment-Only	119	8.4	41.2	50.4
Staff did not recognize the resident's change in condition				
Overall	202	3.5	33.7	62.9
Clinical + Payment	83	6.0	37.3	56.6
Payment-Only	119	1.7	31.1	67.2
Practitioner did not confirm the qualifying diagnosis in the required time window				
Overall	202	21.8	49.5	28.7
Clinical + Payment	83	19.3	49.4	31.3
Payment-Only	119	23.5	49.6	26.9
Documentation of the change in condition was incomplete				
Overall	202	17.8	53.0	29.2
Clinical + Payment	83	16.9	61.4	21.7
Payment-Only	119	18.5	47.1	34.5
Claims not submitted due to concern about auditing				
Overall	202	1.5	13.4	85.1
Clinical + Payment	83	2.4	13.3	84.3
Payment-Only	119	0.8	13.4	85.7

* = skip pattern. Respondents indicated their facility missed an opportunity to bill.

Table I-17. Challenge experienced by facility

Question	N	Percent		
		Major challenge	Somewhat of a challenge	Not a challenge
Lack of corporate/chain buy-in				
Overall	215	2.3	3.7	94.0
Clinical + Payment	91	0.0	3.3	96.7
Payment-Only	124	4.0	4.0	91.9
Lack of buy-in from residents and family members				
Overall	215	2.3	15.8	81.9
Clinical + Payment	91	0.0	20.9	79.1
Payment-Only	124	4.0	12.1	83.9
Lack of buy-in from nursing facility staff				
Overall	215	4.7	34.4	60.9
Clinical + Payment	91	3.3	30.8	65.9
Payment-Only	124	5.6	37.1	57.3
Lack of buy-in from practitioners				
Overall	215	11.2	26.0	62.8
Clinical + Payment	91	8.8	24.2	67.0
Payment-Only	124	12.9	27.4	59.7
Lack of resources (e.g., equipment, lab capabilities, or diagnostic testing response time)				
Overall	215	3.7	12.6	83.7
Clinical + Payment	91	4.4	12.1	83.5
Payment-Only	124	3.2	12.9	83.9
Not enough eligible residents				
Overall	215	4.7	30.7	64.7
Clinical + Payment	91	2.2	28.6	69.2
Payment-Only	124	6.5	32.3	61.3
Inadequacy of payments				
Overall	215	0.9	9.3	89.8
Clinical + Payment	91	1.1	14.3	84.6
Payment-Only	124	0.8	5.6	93.5
Turnover of nursing facility staff				
Overall	215	10.7	44.2	45.1
Clinical + Payment	91	4.4	49.5	46.2
Payment-Only	124	15.3	40.3	44.4
Turnover of nursing facility leadership				
Overall	215	9.3	21.4	69.3
Clinical + Payment	91	4.4	20.9	74.7
Payment-Only	124	12.9	21.8	65.3
Too much time needed for practitioners to travel to facility to conduct <Initiative> activities				
Overall	215	4.2	22.8	73.0
Clinical + Payment	91	2.2	17.6	80.2
Payment-Only	124	5.6	26.6	67.7

Table I-18. Changes that would be most likely to increase billing (*Select up to three)*

Response	Percent		
	Overall	Clinical + Payment	Payment-Only
N	215	91	124
Longer time window to confirm a qualifying diagnosis	43.7	35.2	50.0
Better communication among nursing staff about a qualifying change in condition	40.5	39.6	41.1
Reduced requirements for **documentation** of change in condition	31.2	35.2	28.2
More **education and training** about the Initiative	30.7	36.3	26.6
Additional practitioners to confirm a qualifying diagnosis	21.4	22.0	21.0
Better recognition of **resident eligibility** for the Initiative	18.6	19.8	17.7
Additional nursing staff to identify qualifying changes in condition	18.1	20.9	16.1
Changes to the **clinical criteria**	16.7	20.9	13.7
Higher payment amount for using the billing codes	13.5	13.2	13.7
None of these changes	7.0	5.5	8.1
Better **technical support** for submitting claims	3.3	5.5	1.6
Direct receipt of payments for using the billing codes	3.3	5.5	1.6

I.2 Practitioner Survey

Table I-19. Provider role

Intervention group	N	Percent		
		Physician	NP	PA
Overall	240	63.8	31.7	4.6
Clinical + Payment	115	60.9	33.0	6.1
Payment-Only	125	66.4	30.4	3.2

NP = nurse practitioner; PA = physician's assistant.

Table I-20. Physician role

Intervention group	N*	Percent	
		Yes	No
Attending physician			
Overall	153	89.5	10.5
Clinical + Payment	70	90.0	10.0
Payment-Only	83	89.2	10.8
Medical director			
Overall	153	47.7	52.3
Clinical + Payment	70	40.0	60.0
Payment-Only	83	54.2	45.8

* = skip pattern. Respondents were physicians.

Table I-21. Physician/medical group employ NPs or PAs

Intervention group	N*	Percent	
		Yes	No
Overall	148	64.9	35.1
Clinical + Payment	67	62.7	37.3
Payment-Only	81	66.7	33.3

* = skip pattern. Respondents were physicians.

Table I-22. Primary employment status

Intervention group	N	Percent		
		Salaried by facility or corporate chain	Independent practitioner/ part of a small medical group	Part of a large medical group
Overall	240	18.3	55.4	26.3
Clinical + Payment	115	18.3	56.5	25.2
Payment-Only	125	18.4	54.4	27.2

Table I-23. Frequency delivering patient care at facility

Intervention group	N	Percent				
		Less than once per month	Once per month	2–3 times per month	1–2 times per week	3 or more times per week
Overall	240	3.8	3.8	10.4	33.3	48.8
Clinical + Payment	115	1.7	4.3	8.7	28.7	56.5
Payment-Only	125	5.6	3.2	12.0	37.6	41.6

Table I-24. Hours delivering patient care at facility per week

Question	N*	Mean	SD	Minimum	Maximum
Overall	197	16.9	12.73	1.00	60.00
Clinical + Payment	98	17.2	12.95	1.00	60.00
Payment-Only	99	16.6	12.57	2.00	50.00

* = skip pattern. Respondents were in facility at least once a week.

Table I-25. Use of Initiative practitioner billing codes

Intervention group	N	Percent				
		Yes, confirmation for any of the six qualifying conditions only	Yes, care coordination conferences only	Yes, both	No, neither	Unsure
Overall	240	46.3	1.3	22.1	28.8	1.7
Clinical + Payment	115	47.0	1.7	15.7	34.8	0.9
Payment-Only	125	45.6	0.8	28.0	23.2	2.4

Table I-26. Confirmed a diagnosis for a facility billing code without corresponding practitioner billing code

Question	N	Percent		
		Yes	No	Unsure
Overall	237	53.6	38.8	7.6
Clinical + Payment	114	62.3	33.3	4.4
Payment-Only	123	45.5	43.9	10.6

Table I-27. Method for receiving payments

Intervention group	N*	Percent			
		Directly by Medicare	Indirectly receive payments	Do not receive payments	Uncertain of how I get paid
Overall	163	28.2	15.3	23.9	32.5
Clinical + Payment	71	19.7	18.3	23.9	38.0
Payment-Only	92	34.8	13.0	23.9	28.3

* = skip pattern. Respondents were using billing codes.

Table I-28. Method for receiving indirect payments

Question	N*	Percent	
		Tied to initiative billing codes	Compensation is tied to total billing
Overall	26	26.9	73.1
Clinical + Payment	13	7.7	92.3
Payment-Only	13	46.2	53.8

* = skip pattern. Respondents indicated receiving indirect payments.

Table I-29. Why are you not paid for using practitioner billing codes?

Question	N*	Percent		
		Because I am salaried	Because of billing challenges	Other
Overall	39	69.2	20.5	10.3
Clinical + Payment	17	82.4	11.8	5.9
Payment-Only	22	59.1	27.3	13.6

* = skip pattern. Respondents indicated not receiving payments.

Table I-30. Received sufficient education and training related to confirming a diagnosis for the six qualifying conditions

Question	N*	Support (percent)		
		Sufficient	Insufficient	Not received
Overall	237	68.4	11.4	20.3
Clinical + Payment	114	66.7	14.0	19.3
Payment-Only	123	69.9	8.9	21.1

Table I-31. Importance of treating residents on-site in the nursing facility

Intervention group	N	Percent				
		Not at all important	Somewhat important	Moderately important	Very important	Extremely important
Overall	237	0.4	2.1	4.6	30.0	62.9
Clinical + Payment	114	0.0	1.8	6.1	27.2	64.9
Payment-Only	123	0.8	2.4	3.3	32.5	61.0

Table I-32. Initiative effectiveness

Statement	N	Percent			
		Strongly agree	Agree	Disagree	Strongly disagree
Overall, the clinical criteria for the six qualifying conditions for the Initiative are appropriate.					
Overall	233	48.1	48.5	1.3	2.1
Clinical + Payment	113	44.2	51.3	2.7	1.8
Payment-Only	120	51.7	45.8	0.0	2.5
I am notified in a timely manner of any qualifying resident's change in condition.					
Overall	233	33.9	53.2	8.6	4.3
Clinical + Payment	113	29.2	56.6	8.8	5.3
Payment-Only	120	38.3	50.0	8.3	3.3
<Initiative> has improved the quality/outcomes of resident care at <FACILITY_NAME>.					
Overall	232	36.2	50.9	9.5	3.4
Clinical + Payment	113	31.0	55.8	10.6	2.7
Payment-Only	119	41.2	46.2	8.4	4.2
<Initiative> has reduced the number of potentially avoidable hospitalizations among eligible long-stay residents at <FACILITY_NAME>.					
Overall	224	29.9	54.0	12.9	3.1
Clinical + Payment	110	23.6	60.0	12.7	3.6
Payment-Only	114	36.0	48.2	13.2	2.6

Table I-33. Initiative financial and billing factors

Statement	N	Percent			
		strongly agree	Agree	Disagree	Strongly disagree
Makes financial sense to use the practitioner billing code for *confirmation* of the six qualifying conditions					
Overall	232	40.9	41.8	12.9	4.3
Clinical + Payment	112	33.0	44.6	17.9	4.5
Payment-Only	120	48.3	39.2	8.3	4.2
Makes financial sense to use the practitioner billing code for *care coordination* conferences					
Overall	231	21.2	50.2	21.6	6.9
Clinical + Payment	111	18.0	46.8	27.0	8.1
Payment-Only	120	24.2	53.3	16.7	5.8
Easy to integrate the Initiative practitioner billing codes into practice's existing processes					
Overall	162	37.0	45.7	14.2	3.1
Clinical + Payment	71	28.2	49.3	18.3	4.2
Payment-Only	91	44.0	42.9	11.0	2.2
Confident that billing staff/service are submitting claims using the practitioner billing codes					
Overall	162	32.7	50.0	13.6	3.7
Clinical + Payment	71	26.8	54.9	12.7	5.6
Payment-Only	91	37.4	46.2	14.3	2.2
Payments from the Initiative practitioner billing codes reimburse for care practices already being performed					
Overall	162	28.4	48.8	18.5	4.3
Clinical + Payment	71	22.5	56.3	15.5	5.6
Payment-Only	91	33.0	42.9	20.9	3.3

Table I-34. Clinical confidence

Statement	N	Percent			
		Strongly agree	Agree	Disagree	Strongly disagree
Confidence in clinical staff to assess and treat residents for the six qualifying conditions during…					
The day					
Overall	230	47.4	47.8	3.5	1.3
Clinical + Payment	111	40.5	54.1	4.5	0.9
Payment-Only	119	53.8	42.0	2.5	1.7
The evening					
Overall	230	31.7	55.2	10.4	2.6
Clinical + Payment	111	21.6	64.9	12.6	0.9
Payment-Only	119	41.2	46.2	8.4	4.2
Nights/weekends					
Overall	230	27.4	54.3	14.3	3.9
Clinical + Payment	111	19.8	60.4	18.0	1.8
Payment-Only	119	34.5	48.7	10.9	5.9
Clinical staff are able to communicate the key information needed to make important clinical decisions					
Overall	229	34.5	55.9	8.7	0.9
Clinical + Payment	111	26.1	64.0	9.9	0.0
Payment-Only	118	42.4	48.3	7.6	1.7

Table I-35. Challenge experienced related to confirmation

Question	N	Percent		
		Major challenge	Somewhat of a challenge	Not a challenge
Completing the amount of clinical documentation required				
Overall	228	9.2	42.1	48.7
Clinical + Payment	111	10.8	41.4	47.7
Payment-Only	117	7.7	42.7	49.6
Confirming the diagnosis within the required time window				
Overall	228	8.3	45.2	46.5
Clinical + Payment	111	7.2	45.0	47.7
Payment-Only	117	9.4	45.3	45.3
Inadequacy of payment				
Overall	228	12.7	21.5	65.8
Clinical + Payment	111	14.4	22.5	63.1
Payment-Only	117	11.1	20.5	68.4

Table I-36. Challenge experienced related to care coordination

Question	N	Percent		
		Major challenge	Somewhat of a challenge	Not a challenge
Fulfilling specific requirements of the care coordination conferences				
Overall	228	21.5	33.8	44.7
Clinical + Payment	111	22.5	32.4	45.0
Payment-Only	117	20.5	35.0	44.4
Inadequacy of payment				
Overall	228	17.1	24.1	58.8
Clinical + Payment	111	20.7	21.6	57.7
Payment-Only	117	13.7	26.5	59.8

Table I-37. Challenge experienced related to initiative

Question	N	Percent		
		Major challenge	Somewhat of a challenge	Not a challenge
Not enough eligible residents				
Overall	224	8.0	24.1	67.9
Clinical + Payment	110	9.1	24.5	66.4
Payment-Only	114	7.0	23.7	69.3
Time needed to travel to <FACILITY_NAME>				
Overall	224	4.9	16.5	78.6
Clinical + Payment	110	5.5	11.8	82.7
Payment-Only	114	4.4	21.1	74.6
Medical/legal concerns about treating <ECCP> Initiative residents on site				
Overall	224	5.4	23.7	71.0
Clinical + Payment	110	5.5	21.8	72.7
Payment-Only	114	5.3	25.4	69.3
Hearing about other practitioners' reimbursement challenges with the <ECCP> Initiative practitioner billing codes				
Overall	224	8.0	18.3	73.7
Clinical + Payment	110	6.4	20.0	73.6
Payment-Only	114	9.6	16.7	73.7

Table I-38. Reason practitioner did not bill

Question	N	Percent		
		Major reason	Somewhat of a reason	Not a reason
Practitioner would not receive any payments from the <ECCP> Initiative practitioner billing codes*				
Overall	66	13.6	10.6	75.8
Clinical + Payment	40	10.0	7.5	82.5
Payment-Only	26	19.2	15.4	65.4
Practitioner billing staff/service would not use the <ECCP> Initiative practitioner billing codes*				
Overall	66	12.1	27.3	60.6
Clinical + Payment	40	10.0	32.5	57.5
Payment-Only	26	15.4	19.2	65.4
Practitioner billing staff/service could not integrate the <ECCP> Initiative practitioner billing codes into our existing processes*				
Overall	66	18.2	22.7	59.1
Clinical + Payment	40	20.0	27.5	52.5
Payment-Only	26	15.4	15.4	69.2
Practitioner medical group would not endorse the use of the <ECCP> Initiative practitioner billing codes^				
Overall	21	9.5	14.3	76.2
Clinical + Payment	8	25.0	0.0	75.0
Payment-Only	13	0.0	23.1	76.9

* = skip pattern. Respondents indicated they were not or were unsure if they were using billing codes.

^ = skip pattern. Respondents indicated they were not or were unsure if they were using billing codes and were also part of a large medical group.

Table I-39. Changes that would be most likely to increase billing (*Select up to three)*

Response	Percent		
	Overall	Clinical + Payment	Payment-Only
N	224	110	114
Better communication from nursing staff about a qualifying change in condition	43.8	44.5	43.0
More **education and training** about confirming a qualifying diagnosis	35.7	37.3	34.2
Clearer guidelines and identification **of resident eligibility** for the Initiative	29.5	34.5	24.6
Longer time window to confirm a qualifying diagnosis	28.6	20.0	36.8
Reduced requirements for **clinical documentation**	27.2	27.3	27.2
Higher payment amount for using the billing codes	18.3	12.7	23.7
Direct receipt of payments for using the billing codes	14.3	16.4	12.3
Changes to the **clinical criteria**	14.3	11.8	16.7
Better **technical support** for submitting claims	10.3	12.7	7.9
None of these changes	9.4	11.8	7.0
Additional practitioners to confirm a qualifying diagnosis	4.5	4.5	4.4

APPENDIX J
ANALYSIS OF CLAIMS WITH NEW BILLING CODES

We conducted a descriptive analysis of the new billing code data to help address several questions:

- How extensively did the participating nursing facilities and practitioners use the new billing codes?
- How much did the use of the new billing codes vary across the ECCPs?
- How much did the use of the new billing codes vary within each ECCP?
- How did the use of the new billing codes differ between the Clinical + Payment facilities and the Payment-Only facilities?

In this appendix, we explain the technical details of how we conducted this analysis and present some additional results beyond those that appear in ***Section 2*** of the main report. The Healthcare Common Procedure Coding System (HCPCS) codes corresponding to the six qualifying conditions that we analyzed are listed in ***Table J-1*** below.

Table J-1. Listing of new billing codes for use in NFI 2

HCPCS code[1]	Service
G9679	On-site acute care treatment of a nursing facility resident with pneumonia
G9680	On-site acute care treatment of a nursing facility resident with congestive heart failure (CHF)
G9681	On-site acute care treatment of a nursing facility resident with chronic obstructive pulmonary disease (COPD)/asthma
G9682	On-site acute care treatment of a nursing facility resident with a skin infection
G9683	On-site acute care treatment of a nursing facility resident with fluid/electrolyte disorder or dehydration
G9684	On-site acute care treatment of a nursing facility resident with a urinary tract infection (UTI)
G9685	Practitioner payment for the confirmation and treatment of conditions on site at nursing facility
G9686	Practitioner payment for care coordination conference

NFI = Nursing Facility Initiative; HCPCS = Healthcare Common Procedure Coding System.

[1] The first six codes are for facility use; the last two are for practitioners.

We identified practitioner visits for the confirmation and treatment of conditions and for care coordination conferences from claims in the carrier file (claim type code 71) with HCPCS codes G9685 and G9686, respectively. Each claim line with one of these codes corresponds to a single visit with a practitioner.

We identified nursing facility payments for providing acute care from claims in the outpatient file (claim type code 40, facility type code 2, service classification type code 2 or 3) with HCPCS codes

G9679–G9684. Each claim line represents an acute care day—a day that acute care was provided in the nursing facility. Using these claim lines, we created episodes that consist of consecutive days (each day corresponding to a claim line) with the same HCPCS code billed. Episodes can span multiple claims (claims consist of multiple claim lines).

In our analyses, we considered both acute care days and episodes, as well as practitioner visits. We focused on acute care days, episodes, and visits that we were able to attribute to individuals that met our study inclusion criteria,[10] which took place fully within the individual's Initiative-eligible period (see ***Appendix K*** for descriptions of the inclusion criteria and the Initiative-eligible period). Over 90 percent of episodes met these criteria.[11]

We calculated the rates of episodes, days, and visits, per 1,000 Initiative-eligible resident-days.[12] We calculated rates separately for the Clinical + Payment group and Payment-Only group, for each ECCP and for all ECCPs combined. For nursing facility payments, we calculated these rates for codes G9679–G9684 separately and for all of them combined. The major takeaways from these results are presented in ***Section 2*** of the main report.

Complete results for use of nursing facility new billing codes for the Clinical + Payment facilities are presented in ***Tables J-2*** and ***J-3***, for 2017 and 2018, respectively. Results for the Payment-Only facilities are presented in ***Tables J-4*** and ***J-5***, for 2017 and 2018, respectively. For related graphical representations, see ***Figures 2-2***, ***2-3***, ***2-4***, and ***2-5***. Complete results for use of practitioner new billing codes are presented in ***Tables J-6*** and ***J-7***, with related graphics in ***Figures 2-7*** and ***2-8***.

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[10] Examples of where the criteria were not met include instances where the resident could not be matched to the file of Initiative-eligible residents that we created from the MDS, because the resident did not meet the FFS requirement or had not yet met the 101-day requirement before the first day that acute nursing facility treatment was billed (though they may have met it for a subsequent day), or was associated with a facility that was not included in the RTI quantitative evaluation as an intervention facility.

[11] For nursing facility payments for providing acute care, we began with 52,460 claim lines, which includes duplicates where the same person met the 101-day requirement for two different facilities. After eliminating claim lines for residents in nonparticipating facilities (these are typically but not always the duplicates referenced above) and for those who did not match to the file of Initiative-eligible residents that we created from the MDS, there were 50,670 claim lines that we used to create 8,100 episodes. After eliminating episodes that were not fully within the resident's Initiative-eligible exposure period, or where the resident did not meet the eligibility criteria (such as the FFS requirement), we were left with 7,528 episodes that were used in the analysis. For practitioner visits (G9685), we began with 4,523 claim lines and after applying similar exclusions as with nursing facility payments, we had a total of 4,048 visits in the analysis. For 2017, the respective numbers were 58,010 claim lines and 55,600 after applying exclusions. These were used to create 8,443 episodes, and after exclusions, we were left with 7,883 episodes. For practitioner visits (G9685), we began with 4,883 claim lines and used 4,298 visits in the analysis.

[12] For each group, the numerator is the number of episodes (or days or visits) among all residents in the group. The denominator is the number of Initiative-eligible days among all eligible residents in the group divided by 1,000. It includes eligible days in October and/or November in states where the NFI 2 payment intervention did not begin until November 1 or December 1. Thus, the FY 2017 results may include 1-2 months without actual billing of new NFI 2 codes before the payment reform intervention took effect.

Table J-2. Clinical + Payment: Use of nursing facility billing codes, number of events reported per 1,000 Initiative-eligible resident-days, FY 2017

Nursing facility billing codes (G9679–G9684)	All ECCPs (all states)	AQAF (AL)	ATOP2 (NV)	MOQI (MO)	NY-RAH (NY)	OPTIMISTIC (IN)	RAVEN (PA)
Number of residents meeting eligibility criteria	12,088	2,272	1,169	1,500	3,654	1,908	1,585
Mean exposure period (days)	239.42	250.98	238.32	249.90	221.48	228.31	268.46
On-site acute treatment for any of the six qualifying conditions, combined (days)	10.03	8.53	11.15	13.11	9.31	9.54	10.44
On-site acute treatment for each of the six qualifying conditions, separately							
Pneumonia (G9679)	2.67	2.64	2.39	3.76	2.27	2.86	2.53
CHF (G9680)	0.48	0.26	0.12	1.05	0.33	0.71	0.54
COPD/asthma (G9681)	0.43	0.44	0.30	0.27	0.43	0.48	0.60
Skin infection (G9682)	2.64	1.60	4.21	3.35	2.90	2.02	2.51
Dehydration (G9683)	0.46	0.21	0.45	0.43	0.59	0.37	0.69
UTI (G9684)	3.34	3.38	3.67	4.26	2.79	3.10	3.57
On-site acute treatment for any of the six qualifying conditions, combined (episodes)	1.51	1.30	1.59	2.02	1.35	1.49	1.64
On-site acute treatment for each of the six qualifying conditions, separately							
Pneumonia (G9679)	0.40	0.38	0.33	0.57	0.33	0.44	0.38
CHF (G9680)	0.08	0.04	0.02	0.17	0.05	0.11	0.09
COPD/asthma (G9681)	0.07	0.06	0.05	0.04	0.07	0.08	0.09
Skin infection (G9682)	0.37	0.22	0.54	0.49	0.38	0.31	0.37
Dehydration (G9683)	0.10	0.05	0.11	0.09	0.12	0.08	0.16
UTI (G9684)	0.51	0.54	0.54	0.67	0.40	0.46	0.54

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS 08; csaur\output\pah2_ar2_nbc_1).

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

Each individual resident contributes their count of events to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator.

Table J-3. Clinical + Payment: Use of nursing facility billing codes, number of events reported per 1,000 Initiative-eligible resident-days, FY 2018

Nursing facility billing codes (G9679–G9684)	All ECCPs (all states)	AQAF (AL)	ATOP2 (NV)	MOQI (MO)	NY-RAH (NY)	OPTIMISTIC (IN)	RAVEN (PA)
Number of residents meeting eligibility criteria	11,284	1,601	1,174	1,428	3,781	1,763	1,537
Mean exposure period (days)	234.08	222.09	242.54	246.48	222.38	226.54	266.04
On-site acute treatment for any of the six qualifying conditions, combined (days)	9.04	7.25	9.04	11.94	7.63	8.77	11.28
On-site acute treatment for each of the six qualifying conditions, separately							
Pneumonia (G9679)	2.64	2.37	2.16	3.88	2.45	2.53	2.63
CHF (G9680)	0.43	0.13	0.07	0.80	0.26	0.27	1.11
COPD/asthma (G9681)	0.33	0.39	0.41	0.30	0.22	0.19	0.58
Skin infection (G9682)	2.40	1.76	2.71	2.83	1.94	2.51	3.19
Dehydration (G9683)	0.31	0.06	0.20	0.15	0.36	0.38	0.56
UTI (G9684)	2.95	2.53	3.49	3.98	2.40	2.89	3.21
On-site acute treatment for any of the six qualifying conditions, combined (episodes)	1.46	1.15	1.38	2.01	1.25	1.39	1.80
On-site acute treatment for each of the six qualifying conditions, separately							
Pneumonia (G9679)	0.41	0.35	0.33	0.59	0.39	0.39	0.41
CHF (G9680)	0.07	0.02	0.01	0.13	0.05	0.04	0.17
COPD/asthma (G9681)	0.05	0.06	0.06	0.05	0.04	0.03	0.10
Skin infection (G9682)	0.36	0.26	0.39	0.43	0.29	0.37	0.47
Dehydration (G9683)	0.07	0.01	0.06	0.04	0.09	0.08	0.12
UTI (G9684)	0.50	0.45	0.53	0.78	0.39	0.47	0.52

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS NBC 08; csaur\output\pah2_ar3_nbc_2).

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

Each individual resident contributes their count of events to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator.

Table J-4. Payment-Only: Use of nursing facility billing codes, number of events reported per 1,000 Initiative-eligible resident-days, FY 2017

Nursing facility billing codes (G9679–G9684)	All ECCPs (all states)	AQAF (AL)	ATOP2 (CO)	MOQI (MO)	NY-RAH (NY)	OPTIMISTIC (IN)	RAVEN (PA)
Number of residents meeting eligibility criteria	13,974	1,874	1,682	1,987	4,252	2,231	1,768
Mean exposure period (days)	243.33	253.59	232.16	257.12	241.60	231.69	246.42
On-site acute treatment for any of the six qualifying conditions, combined (days)	6.79	5.45	6.15	6.26	7.18	7.94	7.22
On-site acute treatment for each of the six qualifying conditions, separately							
Pneumonia (G9679)	1.88	1.54	1.53	1.64	1.78	2.60	2.25
CHF (G9680)	0.45	0.26	0.32	0.36	0.44	0.88	0.40
COPD/asthma (G9681)	0.44	0.33	0.48	0.42	0.53	0.27	0.53
Skin infection (G9682)	1.60	1.35	1.46	1.59	2.03	1.07	1.62
Dehydration (G9683)	0.20	0.12	0.15	0.11	0.31	0.22	0.15
UTI (G9684)	2.22	1.85	2.20	2.14	2.09	2.90	2.27
On-site acute treatment for any of the six qualifying conditions, combined (episodes)	1.04	0.97	0.87	0.96	1.06	1.20	1.16
On-site acute treatment for each of the six qualifying conditions, separately							
Pneumonia (G9679)	0.29	0.27	0.22	0.24	0.26	0.38	0.37
CHF (G9680)	0.07	0.04	0.05	0.06	0.06	0.13	0.06
COPD/asthma (G9681)	0.07	0.05	0.06	0.06	0.08	0.04	0.09
Skin infection (G9682)	0.23	0.25	0.17	0.24	0.28	0.15	0.25
Dehydration (G9683)	0.05	0.03	0.04	0.02	0.07	0.05	0.03
UTI (G9684)	0.34	0.33	0.32	0.34	0.31	0.44	0.35

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS 08; csaur\output\pah2_ar2_nbc_1).

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

Each individual resident contributes their count of events to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator.

Table J-5. Payment-Only: Use of nursing facility billing codes, number of events reported per 1,000 Initiative-eligible resident-days, FY 2018

Nursing facility billing codes (G9679–G9684)	All ECCPs (all states)	AQAF (AL)	ATOP2 (CO)	MOQI (MO)	NY-RAH (NY)	OPTIMISTIC (IN)	RAVEN (PA)
Number of residents meeting eligibility criteria	12,706	1,466	1,603	1,853	4,034	2,033	1,717
Mean exposure period (days)	241.83	248.18	236.33	246.10	240.14	233.95	250.22
On-site acute treatment for any of the six qualifying conditions, combined (days)	7.52	4.49	7.87	4.17	8.51	8.61	9.86
On-site acute treatment for each of the six qualifying conditions, separately							
Pneumonia (G9679)	2.02	1.15	2.03	0.71	2.19	2.78	2.96
CHF (G9680)	0.50	0.19	0.82	0.07	0.40	0.78	0.88
COPD/asthma (G9681)	0.46	0.09	0.45	0.24	0.46	0.42	1.10
Skin infection (G9682)	1.68	1.50	1.59	1.55	1.78	1.36	2.18
Dehydration (G9683)	0.27	0.01	0.11	0.14	0.45	0.19	0.44
UTI (G9684)	2.57	1.56	2.86	1.45	3.23	3.08	2.30
On-site acute treatment for any of the six qualifying conditions, combined (episodes)	1.20	0.71	1.17	0.68	1.35	1.35	1.66
On-site acute treatment for each of the six qualifying conditions, separately							
Pneumonia (G9679)	0.32	0.19	0.31	0.12	0.33	0.43	0.51
CHF (G9680)	0.08	0.03	0.13	0.02	0.07	0.11	0.14
COPD/asthma (G9681)	0.07	0.01	0.06	0.04	0.07	0.07	0.18
Skin infection (G9682)	0.26	0.23	0.23	0.23	0.27	0.20	0.36
Dehydration (G9683)	0.06	0.00	0.03	0.03	0.10	0.05	0.10
UTI (G9684)	0.40	0.24	0.41	0.25	0.51	0.49	0.38

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS NBC 08; csaur\output\pah2_ar3_nbc_2).

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

Each individual resident contributes their count of events to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator.

Table J-6. Use of practitioner billing codes: Number of events reported per 1,000 Initiative-eligible resident-days, FY 2017

Practitioner billing codes (G9685–G9686)	Practitioner services: confirmation and treatment of conditions (G9685)	Practitioner services: care coordination conference (G9686)
All ECCPs (6 states) – Clinical + Payment	0.74	0.01
All ECCPs (6 states) – Payment-Only	0.64	0.04
AQAF (Alabama) – Clinical + Payment	1.35	0.01
AQAF (Alabama) – Payment-Only	0.87	0.00
ATOP2 (Nevada) – Clinical + Payment	0.18	0.00
ATOP2 (Colorado) – Payment-Only	0.24	0.00
MOQI (Missouri) – Clinical + Payment	0.28	0.01
MOQI (Missouri) – Payment-Only	0.41	0.00
NY-RAH (New York) – Clinical + Payment	1.07	0.01
NY-RAH (New York) – Payment-Only	0.55	0.04
OPTIMISTIC (Indiana) – Clinical + Payment	0.65	0.00
OPTIMISTIC (Indiana) – Payment-Only	0.83	0.09
RAVEN (Pennsylvania) – Clinical + Payment	0.13	0.01
RAVEN (Pennsylvania) – Payment-Only	1.05	0.11

SOURCE: RTI analysis of Medicare claims data (RTI program MS 08; csaur\output\pah2_ar2_nbc_1).

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

Each individual resident contributes their count of events to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator.

Table J-7. Use of practitioner billing codes: Number of events reported per 1,000 Initiative-eligible resident-days, FY 2018

Practitioner billing codes (G9685–G9686)	Practitioner services: confirmation and treatment of conditions (G9685)	Practitioner services: care coordination conference (G9686)
All ECCPs (6 states) – Clinical + Payment	0.49	0.02
All ECCPs (6 states) – Payment-Only	0.89	0.02
AQAF (Alabama) – Clinical + Payment	0.92	0.00
AQAF (Alabama) – Payment-Only	0.45	0.00
ATOP2 (Nevada) – Clinical + Payment	0.40	0.00
ATOP2 (Colorado) – Payment-Only	0.52	0.00
MOQI (Missouri) – Clinical + Payment	0.16	0.00
MOQI (Missouri) – Payment-Only	0.31	0.00
NY-RAH (New York) – Clinical + Payment	0.49	0.05
NY-RAH (New York) – Payment-Only	1.13	0.03
OPTIMISTIC (Indiana) – Clinical + Payment	0.73	0.01
OPTIMISTIC (Indiana) – Payment-Only	1.15	0.02
RAVEN (Pennsylvania) – Clinical + Payment	0.26	0.00
RAVEN (Pennsylvania) – Payment-Only	1.40	0.06

SOURCE: RTI analysis of Medicare claims data (RTI program MS NBC 08; csaur\output\pah2_ar3_nbc_2).

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

Each individual resident contributes their count of events to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator.

In ***Tables J-8*** and ***J-9*** (Clinical + Payment) and ***Tables J-10*** and ***J-11*** (Payment-Only) below, we present results of a facility-level analysis for codes G9679–G9684 combined, for 2017 and 2018, respectively. Instead of calculating rates at the aggregate group level as we reported above, for the current tables we calculate rates at the facility level and present the distribution of these rates across facilities. This allows us to see to what extent the use of the new billing codes varies across facilities within the same states. In fact, there is substantial within-state variation. With all states combined, the facility-level rate of billing, for providing acute care for any of the qualifying conditions, is over five times greater at the 75th percentile than at the 25th percentile in the Clinical + Payment facilities (2.11 episodes per 1,000 Initiative-eligible resident days vs. 0.40 episodes per 1,000 Initiative-eligible resident days) in 2018. It is also more than five times greater (1.61 vs. 0.29) in the Payment-Only facilities.

Table J-8. Clinical + Payment: Facility-level distribution of total nursing facility acute care events (all six qualifying conditions combined) per 1,000 Initiative-eligible resident-days, FY 2017

Nursing facility billing codes (G9679-G9684 combined)	Number of facilities	Mean	SD	Min	5th percentile	10th percentile	25th percentile	50th percentile	75th percentile	90th percentile	95th percentile	Max
All ECCPs (6 states), *days*	112	9.83	7.23	0.00	0.00	0.74	4.45	9.13	13.77	19.73	22.74	37.09
AQAF (Alabama)	23	7.66	7.39	0.00	0.00	0.00	0.00	7.20	12.26	19.73	21.75	22.74
ATOP2 (Nevada)	14	10.45	6.72	0.13	0.13	2.17	5.81	8.21	17.99	19.75	21.07	21.07
MOQI (Missouri)	16	12.77	6.62	2.44	2.44	2.55	9.32	13.03	16.48	21.64	27.18	27.18
NY-RAH (New York)	25	10.04	8.67	0.00	2.33	2.79	4.39	7.33	12.56	23.74	28.17	37.09
OPTIMISTIC (Indiana)	19	8.75	6.05	0.00	0.00	0.00	4.00	9.25	13.08	17.26	18.71	18.71
RAVEN (Pennsylvania)	15	10.43	6.64	1.58	1.58	3.18	5.88	9.00	14.43	21.83	25.36	25.36
All ECCPs (6 states), *episodes*	112	1.48	1.06	0.00	0.00	0.13	0.66	1.38	2.17	2.86	3.62	4.26
AQAF (Alabama)	23	1.18	1.15	0.00	0.00	0.00	0.00	1.09	1.95	2.86	3.48	3.64
ATOP2 (Nevada)	14	1.51	0.95	0.13	0.13	0.34	0.82	1.33	2.46	2.77	3.00	3.00
MOQI (Missouri)	16	1.98	1.02	0.37	0.37	0.51	1.39	2.03	2.52	3.35	4.22	4.22
NY-RAH (New York)	25	1.42	1.16	0.00	0.33	0.34	0.62	1.05	1.69	3.85	4.15	4.26
OPTIMISTIC (Indiana)	19	1.36	0.95	0.00	0.00	0.00	0.57	1.45	2.13	2.84	2.89	2.89
RAVEN (Pennsylvania)	15	1.62	0.94	0.24	0.24	0.56	0.94	1.53	2.27	3.05	3.62	3.62

SOURCE: RTI analysis of Medicare claims data (RTI program MS 08; csaur\output\pah2_ar2_nbc_1).

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

Each individual resident contributes their count of events to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator.

Table J-9. Clinical + Payment: Facility-level distribution of total nursing facility acute care events (all six qualifying conditions combined) per 1,000 Initiative-eligible resident-days, FY 2018

Nursing facility billing codes (G9679-G9684 combined)	Number of facilities	Mean	SD	Min	5th percentile	10th percentile	25th percentile	50th percentile	75th percentile	90th percentile	95th percentile	Max
All ECCPs (6 states), *days*	111	8.71	7.48	0.00	0.00	0.00	2.58	7.49	12.73	17.84	23.10	40.44
AQAF (Alabama)	23	7.08	8.60	0.00	0.00	0.00	0.00	3.46	10.98	22.00	26.28	26.31
ATOP2 (Nevada)	14	8.41	6.97	0.00	0.00	0.00	4.08	6.91	10.45	20.38	23.10	23.10
MOQI (Missouri)	16	11.35	5.13	1.99	1.99	2.75	9.04	12.38	14.61	17.21	18.69	18.69
NY-RAH (New York)	24	7.67	6.47	0.80	1.35	1.38	3.11	5.08	11.39	17.71	17.84	26.08
OPTIMISTIC (Indiana)	19	8.27	6.48	0.00	0.00	0.00	2.19	7.56	14.23	19.37	20.82	20.82
RAVEN (Pennsylvania)	15	10.91	10.38	0.48	0.48	2.02	3.16	9.60	11.46	26.16	40.44	40.44
All ECCPs (6 states), *episodes*	111	1.41	1.20	0.00	0.00	0.00	0.40	1.26	2.11	3.09	3.66	6.14
AQAF (Alabama)	23	1.13	1.38	0.00	0.00	0.00	0.00	0.76	1.60	3.66	3.80	4.16
ATOP2 (Nevada)	14	1.28	1.01	0.00	0.00	0.00	0.65	1.15	1.53	2.67	3.54	3.54
MOQI (Missouri)	16	1.93	0.90	0.35	0.35	0.38	1.53	2.10	2.51	3.09	3.32	3.32
NY-RAH (New York)	24	1.28	1.10	0.12	0.22	0.23	0.45	0.85	1.87	2.78	3.31	4.41
OPTIMISTIC (Indiana)	19	1.31	1.02	0.00	0.00	0.00	0.31	1.27	2.27	3.09	3.29	3.29
RAVEN (Pennsylvania)	15	1.74	1.57	0.06	0.06	0.27	0.74	1.53	1.89	4.03	6.14	6.14

SOURCE: RTI analysis of Medicare claims data (RTI program MS NBC 08; csaur\output\pah2_ar3_nbc_2)

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

Each individual resident contributes their count of events to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator.

Table J-10. Payment-Only: Facility-level distribution of total nursing facility acute care events (all six qualifying conditions combined) per 1,000 Initiative-eligible resident-days, FY 2017

Nursing facility billing codes (G9679-G9684 combined)	Number of facilities	Mean	SD	Min	5th percentile	10th percentile	25th percentile	50th percentile	75th percentile	90th percentile	95th percentile	Max
All ECCPs (6 states), *days*	148	6.87	7.46	0.00	0.00	0.00	1.40	4.72	10.45	15.34	20.64	53.61
AQAF (Alabama)	22	5.55	6.48	0.00	0.00	0.00	1.29	3.22	8.29	13.13	20.64	22.14
ATOP2 (Colorado)	24	4.93	6.03	0.00	0.00	0.00	0.00	2.52	10.10	15.12	16.47	17.98
MOQI (Missouri)	24	6.69	4.67	0.26	0.99	1.02	2.63	6.54	10.44	13.48	13.69	15.19
NY-RAH (New York)	33	8.18	6.70	0.00	0.00	0.56	3.64	6.29	11.09	17.08	19.70	29.94
OPTIMISTIC (Indiana)	25	8.11	12.16	0.00	0.00	0.00	0.24	3.54	10.45	22.43	27.38	53.61
RAVEN (Pennsylvania)	20	7.20	6.25	0.00	0.41	1.49	3.20	4.62	9.97	16.60	22.61	23.43
All ECCPs (6 states), *episodes*	148	1.05	1.12	0.00	0.00	0.00	0.23	0.79	1.46	2.29	3.33	7.69
AQAF (Alabama)	22	0.98	1.17	0.00	0.00	0.00	0.19	0.64	1.39	2.10	3.33	4.59
ATOP2 (Colorado)	24	0.69	0.84	0.00	0.00	0.00	0.00	0.34	1.28	1.90	2.31	2.74
MOQI (Missouri)	24	1.02	0.69	0.04	0.16	0.17	0.43	0.95	1.51	2.06	2.14	2.22
NY-RAH (New York)	33	1.20	0.99	0.00	0.00	0.08	0.58	0.96	1.54	2.47	3.32	4.22
OPTIMISTIC (Indiana)	25	1.22	1.78	0.00	0.00	0.00	0.16	0.55	1.58	3.51	4.01	7.69
RAVEN (Pennsylvania)	20	1.14	0.95	0.00	0.07	0.27	0.56	0.85	1.47	2.58	3.50	3.66

SOURCE: RTI analysis of Medicare claims data (RTI program MS 08; csaur\output\pah2_ar2_nbc_1).

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

Each individual resident contributes their count of events to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator.

Table J-11. Payment-Only: Facility-level distribution of total nursing facility acute care events (all six qualifying conditions combined) per 1,000 Initiative-eligible resident-days, FY 2018

Nursing facility billing codes (G9679-G9684 combined)	Number of facilities	Mean	SD	Min	5th percentile	10th percentile	25th percentile	50th percentile	75th percentile	90th percentile	95th percentile	Max
All ECCPs (6 states), *days*	148	7.25	7.32	0.00	0.00	0.00	1.84	6.09	9.57	17.03	20.57	46.35
AQAF (Alabama)	22	4.30	5.32	0.00	0.00	0.00	0.00	2.14	6.51	13.25	14.98	17.03
ATOP2 (Colorado)	24	6.37	7.94	0.00	0.00	0.00	0.36	4.88	8.66	13.54	24.57	32.31
MOQI (Missouri)	24	4.64	4.49	0.00	0.00	0.45	1.37	2.71	7.27	11.12	13.86	17.03
NY-RAH (New York)	33	9.12	6.35	0.00	0.00	0.76	5.46	9.01	12.27	18.54	20.57	24.33
OPTIMISTIC (Indiana)	25	8.43	9.71	0.00	0.00	0.00	2.69	6.22	8.47	18.86	21.54	46.35
RAVEN (Pennsylvania)	20	10.11	7.72	1.42	1.57	2.24	5.07	8.72	12.45	20.55	29.56	32.55
All ECCPs (6 states), *episodes*	148	1.15	1.13	0.00	0.00	0.00	0.29	0.95	1.61	2.58	3.26	6.88
AQAF (Alabama)	22	0.67	0.85	0.00	0.00	0.00	0.00	0.32	1.06	2.15	2.46	2.58
ATOP2 (Colorado)	24	0.94	1.19	0.00	0.00	0.00	0.08	0.73	1.25	2.17	3.98	4.61
MOQI (Missouri)	24	0.76	0.72	0.00	0.00	0.07	0.25	0.48	1.12	1.80	2.14	2.84
NY-RAH (New York)	33	1.45	1.02	0.00	0.00	0.15	0.86	1.29	1.83	3.01	3.68	3.70
OPTIMISTIC (Indiana)	25	1.32	1.44	0.00	0.00	0.00	0.47	0.97	1.39	2.76	3.09	6.88
RAVEN (Pennsylvania)	20	1.69	1.18	0.28	0.33	0.39	0.86	1.49	2.17	3.26	4.47	4.98

SOURCE: RTI analysis of Medicare claims data (RTI program MS NBC 08; csaur\output\pah2_ar3_nbc_2).

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

Each individual resident contributes their count of events to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator.

In ***Tables J-12*** and ***J-13*** (for 2017) and ***Tables J-14*** and ***J-15*** (for 2018) below, we present total Medicare payments for the new billing codes. Unlike the prior analysis where we applied exclusion criteria as explained above, here we include all claim lines in the Medicare data with no exclusions applied. In 2018, Medicare paid over $11M to facilities and slightly under $1M to practitioners under the Initiative.

Table J-12. Medicare payments specific to NFI 2 six qualifying conditions to facilities, FY 2017

Facility payments	HCPCS code	Number of claim lines	Total Medicare payment
Acute care pneumonia	G9679	15,611	$3,296,472
Acute care CHF	G9680	3,261	$694,582
Acute care COPD/asthma	G9681	3,011	$634,891
Acute care skin infection	G9682	14,479	$3,071,409
Acute care dehydration	G9683	2,236	$472,720
Acute care UTI	G9684	19,411	$4,130,327
Total for facilities		**58,009**	**$12,300,401**

CHF = congestive heart failure; COPD = chronic obstructive pulmonary disease; HCPCS = Healthcare Common Procedure Coding System; UTI = urinary tract infection.

SOURCE: RTI analysis of Medicare claims data (RTI program MS 08 Part 2; csaur\output\pah2_ar2_nbc_1; csaur\output\pah2_ar3_nbc_3).

Table J-13. Medicare payments specific to NFI 2 six qualifying conditions to practitioners, FY 2017

Practitioner payments	HCPCS code	Number of claim lines	Total Medicare payment
Confirmation and treatment of conditions	G9685	4,883	$907,836
Care coordination conference	G9686	172	$11,907
Total for practitioners		**5,055**	**$919,743**

HCPCS = Healthcare Common Procedure Coding System.

SOURCE: RTI analysis of Medicare claims data (RTI program MS 08 Part 2; csaur\output\pah2_ar2_nbc_1; csaur\output\pah2_ar3_nbc_3).

Table J-14. Medicare payments specific to NFI 2 six qualifying conditions to facilities, FY 2018

Facility payments	HCPCS code	Number of claim lines	Total Medicare payment
Acute care pneumonia	G9679	14,840	$3,145,773
Acute care CHF	G9680	2,872	$611,553
Acute care COPD/asthma	G9681	2,496	$530,242
Acute care skin infection	G9682	12,849	$2,725,516
Acute care dehydration	G9683	1,771	$369,170
Acute care UTI	G9684	17,632	$3,739,165
Total for facilities		**52,460**	**$11,121,419**

CHF = congestive heart failure; COPD = chronic obstructive pulmonary disease; HCPCS = Healthcare Common Procedure Coding System; UTI = urinary tract infection.

SOURCE: RTI analysis of Medicare claims data (RTI program MS NBC 08; csaur\output\pah2_ar3_nbc_2; csaur\output\pah2_ar3_nbc_3).

Table J-15. Medicare payments specific to NFI 2 six qualifying conditions to practitioners, FY 2018

Practitioner payments	HCPCS code	Number of claim lines	Total Medicare payment
Confirmation and treatment of conditions	G9685	4,523	$818,526
Care coordination conference	G9686	131	$9,886
Total for practitioners		**4,654**	**$828,411**

HCPCS = Healthcare Common Procedure Coding System.

SOURCE: RTI analysis of Medicare claims data (RTI program MS NBC 08; csaur\output\pah2_ar3_nbc_2; csaur\output\pah2_ar3_nbc_3).

APPENDIX K
DATA AND METHODS FOR DIFFERENCE-IN-DIFFERENCES ANALYSES

K.1 Introduction

In this third annual report we present results from multivariate regression models that enable us to estimate the Initiative effect. Specifically, we use difference-in-differences (DD) models, risk-adjusted for resident- and facility-level characteristics, to calculate the effect of the payment component in the Clinical + Payment and Payment-Only interventions on participating nursing facility residents, relative to comparison group residents. The key resident-level outcomes evaluated are utilization of hospital-related Medicare-covered services and associated expenditures. This report covers a 5-year period from 2014 to 2018 (all years are Medicare fiscal years, from October 1 of the prior calendar year through September 30 of the named calendar year). We use data from 2014 to 2016 as baseline years.

In this technical appendix, we first provide an overview of our quantitative approach to annual evaluation analyses (***Section K.2***) and a description of secondary data sources, which are necessary for defining both the Initiative-eligible population as well as the outcome measures (***Section K.3***). We then document our approach to identifying the population of Initiative-eligible nursing facility residents in each year who are included in the evaluation analyses (***Section K.4***), and we detail our approach to selecting a comparison group (***Section K.5***) and creating our analytic file (*Section K.6*). In subsequent sections we describe how the outcome measures are operationalized annually (***Sections K.7*** and ***K.8***), how we select covariates (i.e., independent or control variables) associated with the outcome measures (***Section K.9***), how we specify the statistical models used to perform multivariate regression analyses and calculate marginal effects (***Section K.10***), and what are some future planned refinements (***Section K.13***).

Descriptive statistics on the final set of model covariates, including percentages for categorical variables and means and standard deviations for continuous variables, are presented in ***Appendix L***. Descriptive results on the outcome measures are presented in ***Appendix M*** (utilization, measured as percentage of individuals using a given type of service), ***Appendix N*** (utilization, measured as utilization rate per 1,000 Initiative-eligible resident-days), ***Appendix O*** (expenditures, by type of service, measured in dollars per Initiative-eligible resident-year), and ***Appendix P*** (MDS-based quality measures, measured as percent of observed quarters with each event). The key multivariate results are presented in ***Section 4*** of the main report and sensitivity analyses are presented in ***Appendix Q***.

K.2 Analytic Approach to Annual Evaluation: Overview

Regression-based models were used to estimate the effects of the ECCP interventions (see ***Section K.10***, for specifications). We used one general model form to provide the framework for the evaluation of all outcomes defined at the resident level. The model follows a DD design with multiple annual observation periods before the intervention (2014 through 2016) and two post-intervention observation periods (2017 and 2018) (in future annual reports, we plan to report

findings based on additional post-intervention periods). The model includes indicator variables for a facility being in the intervention (either Clinical + Payment or Payment-Only) or comparison group for periods during the intervention and marks those same facilities during the pre-intervention years.

Several caveats should be noted on the quantitative analyses presented in the current report:

1. Only fee-for-service (FFS) Medicare enrollees who meet eligibility criteria for participation in the Initiative or those in the comparison group who would be eligible for the Initiative are included in the multivariate analyses (see ***Section K.4*** for detailed criteria and procedures used to identify Initiative-eligible residents). The majority are dually eligible for Medicare and Medicaid.
2. Relatedly, only Medicare utilization and expenditures are analyzed and reported in the multivariate analyses. Because the measures of interest are mainly reflected in Medicare claims, the limitation is not substantive. However, we will include analyses of Medicaid utilization and expenditures once the new versions of the Transformed Medicaid Statistical Information System (T-MSIS) Analytic Files (TAF) are available.
3. There are additional outcomes of interest for evaluation that are not included in this report. These include end-of-life related measures of patient experience. Analyses of these outcomes will be conducted and included in future reports.

K.3 Secondary Data Used in Quantitative Analyses

Secondary data are data used to administer CMS programs; these data play a central role in this analysis. They are used for identifying Initiative-eligible residents, selecting the comparison group, measuring the outcomes, and defining covariates for inclusion in multivariate analysis as risk-adjusters.

RTI obtained Medicare data (eligibility, enrollment, claims, and assessments) from the CMS Integrated Data Repository (IDR). We expect to obtain Medicaid data in the TAF form in the future. Resident assessment data come from the Minimum Data Set (MDS) 3.0. The following sections briefly describe these files and additional data sources used in our analyses.

K.4 Resident Assessment Data—Minimum Data Set 3.0

RTI uses MDS 3.0 as the main data source for identifying Initiative-eligible residents and Initiative-related exposure periods; defining the resident-level and MDS-based quality outcomes; and identifying some of the resident-level characteristics (used in comparison group selection and multivariate modeling) associated with these outcomes. We use a 6-week runout time for MDS data; that is, we request MDS data through about 6 weeks after the end of each observation period (fiscal year) so that almost all data for the observation period have been submitted.

Examining the MDS data stream for each resident allows the identification of the resident's time residing in or out of the facility. All Medicare- and Medicaid-certified nursing facilities are required

to collect and submit MDS data to CMS for every resident in a certified bed (regardless of payment sources) on admission, quarterly, and annually, as well as upon a significant change in resident status, and to submit any significant corrections to prior comprehensive or quarterly assessments. In addition, facilities are required to submit assessments when residents are discharged from the facility, regardless of plan for returning. The data collection and submission requirements are intended to encourage facilities to base a given resident's care planning on a comprehensive set of health and functional information. In addition, providers must complete and submit assessments for Medicare FFS beneficiaries who receive Medicare Part A–covered post-acute care. These assessments are completed at 5, 14, 30, 60, and 90 days of the Medicare Part A stay and upon readmission or return to the facility.

MDS items evaluate each resident's demographic characteristics, physical health (e.g., chronic diseases, infections, and skin conditions), mental health (e.g., mood and psychological status), and functional and cognitive status (e.g., activities of daily living [ADL] and cognitive performance) and give a multidimensional view of their health and functional status. MDS 3.0 has excellent to very good reliability, or reproducibility of measurement, when assessments by research nurses are compared to assessments by facility nurses.[13]

K.4.1 Medicare Claims and Eligibility

RTI uses Medicare claims, through the CMS IDR system, as the data source for tracking outcomes on service utilization (e.g., hospitalizations, emergency department [ED] visits) and expenditures. With data updated on a weekly (or at least monthly) basis, the IDR provides timely and complete data that meet CMS's timeline for our reports. The IDR also provides up-to-date indicators for dual-eligible status, which we use to identify dual-eligible residents in our analyses, and for FFS status, which we use to exclude those who were enrolled in Medicare Advantage.

RTI creates Medicare utilization and expenditure measures per beneficiary in each observation period (fiscal year). We allow 3 months for claims runout from the end of the observation period. A longer runout period would allow more time for late submissions or adjustments; however, it would leave inadequate time for processing and analyzing those claims for our reports.

In addition to using Medicare data to track outcomes (utilization events and expenditures), we use Medicare data to capture resident-level health characteristics for use in multivariate modeling. For this purpose, we use Medicare Hierarchical Condition Categories (HCCs), which are updated by CMS annually and are derived from ICD-9-CM and ICD-10-CM codes on principal hospital inpatient, secondary hospital inpatient, hospital outpatient, physician, and clinically trained nonphysician claims. HCCs are clinically meaningful groupings of ICD-9 or ICD-10 diagnosis codes maintained by CMS to risk adjust capitation payments to Medicare Advantage insurance plans. HCCs are binary variables: a given Medicare beneficiary is designated as having or not having a condition or

[13] Saliba, D., and Buchanan, J. Making the investment count: Revision of the Minimum Data Set for Nursing Homes, MDS 3.0. J Am Med Dir Assoc. 13(7):602–610, 2012. doi: 10.1016/j.jamda.2012.06.002.

diagnosis contained in a given HCC cluster. HCCs have been used to predict readmissions and mortality in the Medicare hospital quality models used for Hospital Compare. They are also used in the CMS readmissions models for skilled nursing facilities (SNFs), inpatient rehabilitation facilities (IRFs), and long-term care hospitals (LTCHs). CMS first implemented the RTI-designed HCC model for capitation in 2004.

K.4.2 Nursing Facility Data

We use data from the CMS CASPER (Certification and Survey Provider Enhanced Reports) system, and Nursing Home Compare (NHC), to identify facility characteristics. These characteristics, including inspection survey-based measures of quality and staffing levels, are then used for selecting comparison groups. Selected characteristics are also included in multivariate analyses of individual-level outcomes.

CASPER (formerly known as OSCAR, or Online Survey Certification and Reporting) is a data system maintained by CMS in cooperation with the state long-term care survey agencies. CASPER includes a compilation of data collected by surveyors during the on-site inspection surveys conducted at nursing facilities for certification and continued participation in the Medicare and Medicaid programs. CASPER is the most comprehensive source of facility-level information on the operations, patient census, and regulatory compliance of nursing facilities.

Staffing data from CASPER are considered to be less than accurate, with the potential for gaming staffing schedules by facilities. There is an alternative source, the new Payroll-Based Journal (PBJ) system, which is designed to be more precise and to feed from facility payroll systems. PBJ staffing data were not used in the comparison group selection analysis because these data were unavailable or incomplete for the baseline years and for the first Initiative year.

NHC, which is part of public reporting, provides quality of resident care and staffing information for more than 15,000 Medicare- and Medicaid-certified nursing facilities across the country. It includes a compilation of nursing facility inspection results, staffing levels, federal penalties, and quality ratings in specific areas of care. The star rating feature gives each facility a rating between one and five stars, from poor to excellent, based on health inspection, staffing, and quality of resident care measures. Each facility receives a star rating for each of the three domains along with an overall star rating. Data about staffing, penalties, nursing facility characteristics, and health deficiencies are reported from CMS's health inspection database. Some of these variables were used in the propensity score models for comparison group selection.

K.4.3 MDM Data

Of interest to CMS is the potential for unrelated initiatives and interventions to mask or otherwise distort the estimated effects of this Initiative. RTI's survey of comparison facilities in NFI 1 indicated that a majority of responding facilities had introduced Initiative-analogous practices to reduce potentially avoidable hospitalizations among their long-stay residents. Another potential source of confounding is participation in other CMS initiatives and demonstration projects. To control for overlapping enrollment, RTI utilizes the MDM (Master Data Management) system to

identify enrollment in selected CMS initiatives in each year. The MDM, however, does not provide information on enrollment in all CMS initiatives that can alter utilization of health services. MDM enrollment information often lags behind because during the designated periods of the year demonstration programs and initiatives may not be able to enter beneficiary and provider information in a timely manner.

In our analysis, we control for enrollment in the following CMS demonstrations from information obtained from the MDM:

- Community-Based Care Transition Program (CCTP);
- Comprehensive ESRD Care (CEC);
- Comprehensive Primary Care Initiative (CPCI);
- Comprehensive Primary Care Plus (CPC+), non-Shared Saving Program (SSP) Participants;
- Comprehensive Primary Care Plus (CPC+), SSP participants;
- Financial Alignment Initiative;
- Next Generation Accountable Care Organization (NGACO);
- Pioneer Accountable Care Organization; and
- Medicare Shared Savings Program.

Because information is lacking on other CMS demonstrations in the MDM, including Bundled Payment Care Initiatives (BPCI) and State Innovation Models (SIM), we are unable to control for the potential impacts of these programs on NFI 2 in our models. We did not control for participation in the Multi-Payer Advanced Primary Care Practice (MAPCP) demonstration, which ended in 2016. Although we account for enrollment in the above national demonstrations systematically through the MDM, we are unable to account for impacts of other changes to usual care that may take place at the state or facility level.

K.5 Identification of Initiative-Eligible Residents and Initiative-Related Exposure Periods

Here we describe how we identified Initiative-eligible residents using both facility- and resident-level characteristics. At the individual level, the same eligibility criteria were applied to residents in Clinical + Payment facilities, Payment-Only facilities, and comparison facilities in each year. We selected the Initiative-eligible residents, and defined their Initiative-eligible exposure period, for each year (including the baseline years 2014 through 2016).

Please note that throughout this report, we use the terms “Initiative-eligible period,” “Initiative-eligible exposure period,” “Initiative-eligible days,” “Initiative-eligible resident-days,” and “exposure period” interchangeably. All refer to the period of time during which the resident has satisfied the eligibility criteria. In some cases, it includes short periods of time when the individual is not in the nursing facility as described below.

Initially, there were 263 facilities in the Initiative—115 facilities in the Clinical + Payment model and 148 in the Payment-Only model. There were CMS-imposed requirements for the facilities to be able to participate in the Initiative, including that facilities could not be on the list of Special Focus Facilities (SFFs) and must be Medicare and Medicaid certified. For the newly recruited facilities that form the Payment-Only group, there were additional requirements including that facilities must have an average daily census of 80 residents with greater than 40 percent of the facility residents defined as long-stay and enrolled in traditional FFS Medicare, have no survey deficiencies for immediate jeopardy to resident health or safety within the last 12 months, and have at least a three-star overall rating on NHC.

In general, based on an intent-to-treat approach, all facilities that participated in the Initiative were included in our quantitative evaluation even if they dropped out of the Initiative.[14] However, certain categories of facilities (and all their residents) were excluded.[15] These included veterans homes, because we do not have the ability to track utilization in the Veterans Health Administration system, and facilities that focus on HIV/AIDS patients, because the population is so different from the population in other facilities. For the DD analyses presented in this report, 259 intervention facilities, including 148 facilities in the Payment-Only group, and 111 facilities in the Clinical + Payment group, were included.

Next, in ***Table K-1***, we present the individual-level eligibility criteria for NFI 2 that were prescribed by CMS and then describe how we implemented these criteria in our secondary data analysis. ***Table K-1*** also compares these criteria with those applied to NFI 1: whether they were the same, different, or new to NFI 2.

[14] Note that facilities that withdrew prior to September 30, 2017, were excluded from primary data collection activities even though they were included in the DD analyses. Note also that there were some facilities that were in the Initiative in NFI 1 but did not continue in NFI 2, and these were excluded from all analyses. Finally, one of the facilities withdrew before the Initiative even began and was excluded from all analyses.

[15] Note that these facility-level exclusions were made for quantitative data analysis. These facilities were still included for primary data collection activities.

Table K-1. Comparison of NFI 2 and NFI 1 resident eligibility criteria

NFI 2 criteria	Comparison to NFI 1 criteria
▪ Not enrolled in a Medicare managed care (Medicare Advantage) plan	▪ Same criteria
▪ Have resided in the long-term care facility for 101 cumulative days or more starting from the resident's date of admission to the long-term care facility	▪ Different—in NFI 1 only, could also be eligible by not having an active discharge plan
▪ Enrolled in Medicare (Part A and Part B FFS) and Medicaid, or Medicare (Part A and Part B FFS) only	▪ Different—in NFI 1 only, also included Medicaid only and Medicare (Part A or Part B FFS)
▪ Not receiving Medicare through Railroad Retirement Board	▪ New—NFI 2 criterion only
▪ Have not elected Medicare Hospice ▪ Days spent in hospice are not counted toward 101 cumulative days or more for eligibility (exception if patient discontinues hospice, can reaccumulate 101 days for eligibility)	▪ New—NFI 2 criteria only

FFS = fee-for-service.

To be eligible, residents must have Medicare Part A and Part B FFS status throughout their Initiative-related exposure periods during a reporting period (fiscal year, from October to September, for annual evaluation). We identified Initiative-eligible residents in Medicare enrollment data to determine their Medicare Advantage and FFS status. Residents in Medicaid managed care were included if they are also enrolled in FFS Medicare (Part A and Part B) and meet all other Initiative eligibility criteria during each reporting period.

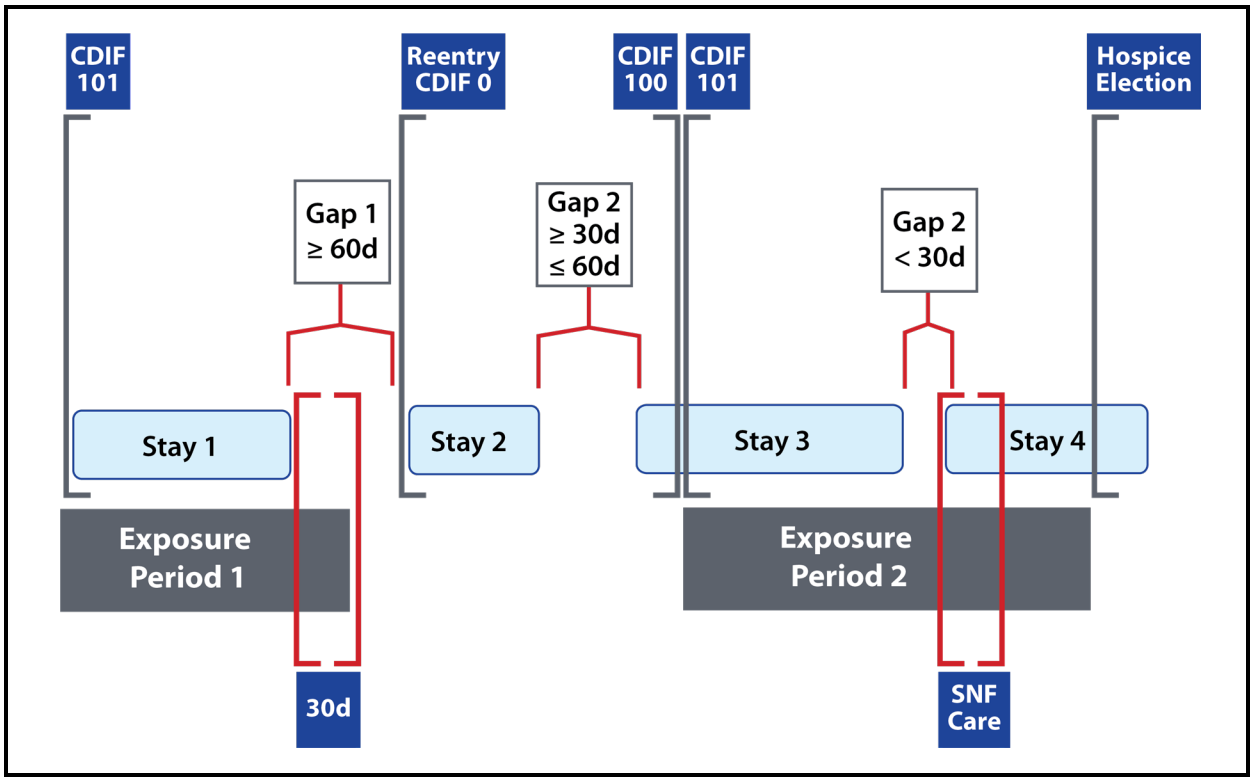
Residents were eligible for the Initiative only if they have resided in the nursing facility for 101 cumulative days or more starting from their date of admission to the facility. We used MDS assessments and Medicare enrollment and claims data to identify Initiative-eligible residents and Initiative-related exposure periods. This allows a uniform approach to determine the periods during which a resident would be eligible for the clinical and/or payment interventions, whether in a participating facility or in a comparison facility. The diagram in ***Figure K-1*** shows a hypothetical resident's nursing facility use that can be depicted using the resident's MDS data stream. We use this hypothetical resident to illustrate the 101 days Initiative eligibility criteria. Elements of the diagram are defined below:

- A stay is a period between a resident's entry (either admission or re-entry) into a nursing facility and either a discharge (with or without anticipation of return) or death. During a stay, a resident is physically in the nursing facility.
- A gap is a period between two stays. During a gap, a resident is temporarily out of the nursing facility.

The exposure period starts on the 101st day and may span across stays and brief gaps (shorter than 30 days) between them. The resident's health care utilization, events, spending, and quality outcomes are measured for the evaluation only if they occur during the exposure periods. For a gap that is 30 days or longer and adjacent to a stay in the exposure period, the exposure period also contains the first 30 days in the gap (illustrated by Exposure Period 1 in ***Figure K-1***). Thus, the inclusion of brief gaps and the first 30 days in longer gaps ensures that the hospitalizations or ED visits that trigger these gaps are captured in the evaluation analysis. A resident may have multiple Initiative-related nursing facility exposure periods if they have one or more gaps 30 days or longer.

Note that a gap of 60 days or longer breaks the continuity of the exposure period. If a former resident is readmitted 60 days or longer after discharge from a previous stay, the resident will not be eligible until an additional 101 days of residence are reached (i.e., the resident would become eligible again on the 101st cumulative day, as illustrated by Exposure Period 2 in ***Figure K-1***).

Figure K-1. A hypothetical resident's nursing facility use and Initiative-related exposure periods



CDIF=cumulative day in facility; SNF=skilled nursing facility.

NOTE: A stay is a period between a resident's entry (either admission or re-entry) into a facility and either a discharge (with or without anticipation of return) or death. During a stay, a resident is physically in the nursing facility. A gap is a period between two stays. During a gap, a resident is temporarily out of the nursing facility.

Finally, an eligible resident who elects the Medicare hospice benefit is no longer eligible for NFI 2. Thus, the Initiative-related exposure period ends with hospice enrollment (illustrated by Exposure Period 2 in ***Figure K-1***). If the resident opts out of hospice status or is discharged alive from

hospice, the hospice enrollment period is treated as a gap. In that case, the number of days spent under hospice care plays a key role in determining the re-eligibility of the resident for NFI 2.

- If the resident opts out of hospice within 60 days of enrollment, the time spent in hospice will be considered as a *short gap* and the resident will be eligible for NFI 2 from the day after the discharge from hospice.
- If the resident opts out after spending 60 days or longer under hospice care, the time spent under hospice care was considered as a *long gap* and the resident has to reaccumulate 101 days in the nursing facility to be eligible again for NFI 2.

A narrative of the hypothetical resident's nursing facility use and Initiative-related exposure periods illustrated in ***Figure K-1*** further clarifies our approach. It shows how exposure periods are defined for a resident with different types of gaps in residency. With cumulative days in facility reaching 101, an exposure period starts (which overlaps with Stay 1). Stay 1 ends when the resident leaves the facility. The resident later returns to the facility, but because the gap is longer than 60 days, the gap will reset the cumulative day counter to zero. For our evaluation of the Initiative, we consider the exposure period includes Stay 1, plus the 30 days following, to capture any utilization related to the facility.

Upon return to the facility the cumulative day counter starts anew for Stay 2. The resident has not been in the facility for 101 cumulative days when there is another gap, of fewer than 60 days, which ends Stay 2. The day counter is frozen while the resident is absent fewer than 60 days and resumes when the resident returns for Stay 3. Because the reset counter has not reached 101 days, this period of absence is not part of an exposure period. During Stay 3 the counter reaches 101 cumulative days and a new period of eligibility for the Initiative starts, as does a second exposure period. Stay 3 ends when the resident again leaves the facility, for fewer than 30 days this time. The 30-day gap is included in Exposure Period 2, so we can capture hospitalizations or other utilization that may occur during this short gap. The resident returns for Stay 4, still in Exposure Period 2. This stay continues, but the exposure period is terminated when the resident elects Medicare hospice care while remaining a resident.

Two additional considerations are worth noting:

1. A resident may have Initiative-related exposure periods in more than one nursing facility; the Initiative-related exposure in each nursing facility was determined as previously mentioned. When a resident transfers from one nursing facility directly to another (i.e., both the end of the Initiative-related exposure period in the first facility and the start of the Initiative-related exposure period in the second facility fall on the day of transfer), we count utilization, events, and spending starting on the day of transfer against the first facility, because it is more likely to be responsible for these occurrences. This would include the entire cost of a hospital stay with an admission on that day.

2. By including stays and brief gaps, the exposure periods may contain SNF care episodes following hospitalizations that are covered under Medicare Part A (illustrated by the SNF care period in Exposure Period 2 in ***Figure K-1***). Although nursing facilities are not eligible for the Initiative-related payment during these SNF episodes because they are already paid at the higher SNF rate (compared to the Medicaid or private pay nursing facility rate), practitioners participating in the Initiative are eligible for the higher Initiative-related payment and in some Clinical + Payment facilities, the resident would remain subject to the clinical interventions. Thus, there are Initiative-related incentives, albeit smaller than the rest of the exposure period, to reduce hospitalizations during these SNF episodes.

Identifying Initiative-eligible residents and their Initiative-related exposure periods was the first step to forming the analytic sample and preparing analytic files to support both comparison group selection and data analyses. We then extracted key covariates capturing demographics, functional status, diagnosis, and enrollment in other federal initiatives or demonstrations from the data sources described in ***Section K.3***. The final analytic files included initiative-eligible residents who were successfully linked with Medicare enrollment and claims data, MDM, and who had non-missing values for all the covariates.

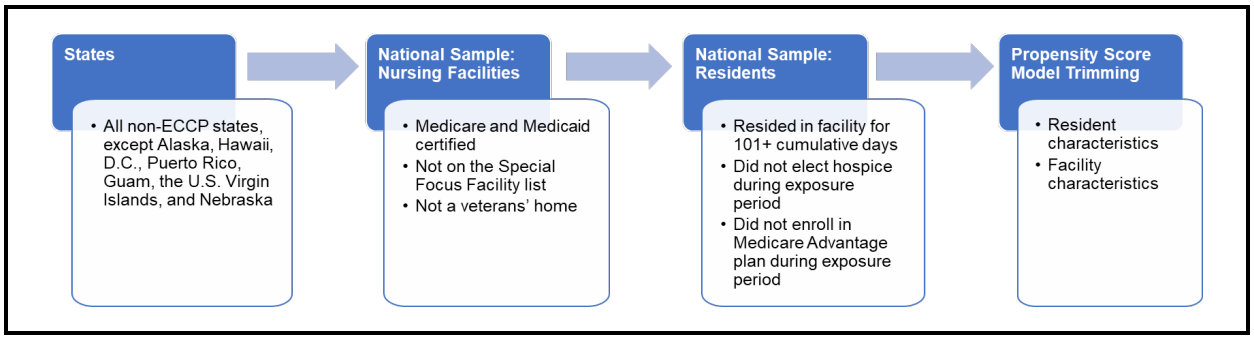
K.6 National Comparison Group Selection

As described in ***Section 3*** in the main report, to address the spillover concerns related to ECCP activities, we created a uniform national comparison group for all ECCPs. The national comparison group was selected from the national sample of residents in non-ECCP states. In this section, we describe how the comparison group was constructed.

We first defined a baseline period for the evaluation. To identify the appropriate baseline years to include in the analysis, we examined trends over time for utilization and Medicare expenditures. Based on these trends, and in consultation with CMS, it was determined that FY 2014–FY 2016 would be used as the baseline years. These years reflect changes that occurred during NFI 1 for the Clinical + Payment group. This is discussed in greater detail in ***Section K.10***.

Figure K-2 depicts our analytic approach to selecting comparison group residents, nationally. To construct a national comparison group, we first selected states from which the national sample frame was drawn. The national sample was selected from all non-ECCP states, with a few exceptions. Facilities and residents in Alaska; Hawaii; Washington, D.C.; Puerto Rico; Guam; and the U.S. Virgin Islands were excluded from the national sample because of differences in their nursing facility resident populations compared to those in the 48 contiguous states. We also excluded Nebraska from the national sample, because Nebraska had participated in NFI 1 and did not continue into NFI 2.

Figure K-2. Analytic approach to selecting national comparison group residents



The national sample was drawn in each year for FY 2014–FY 2016 (three baseline years) and for FY 2017 (Initiative Year 1) and FY 2018 (Initiative Year 2) for evaluation analyses in the current report. From all the states included in the national sample in each year, we then selected facilities using the following criteria:

- Medicare and Medicaid certified,
- not an SFF, and
- not a veterans' home.

After identifying all facilities meeting the inclusion criteria above, we next selected residents in those facilities who would meet the following criteria for inclusion in the national sample frame, consistent with the NFI 2 eligibility criteria for residents in participating facilities:

- resided in the nursing facility for 101 cumulative days or longer starting from the resident's date of admission to the nursing facility,
- did not receive benefits through Railway Retirement Board,
- enrolled in Medicare (Part A and Part B) FFS and Medicaid or Medicare (Part A and Part B) FFS only,
- did not elect the Medicare hospice benefit, and
- did not enroll in a Medicare Advantage plan.

Residents meeting these criteria during each year comprise the national sample frame from which the final national comparison group of residents was constructed using propensity score models.

National Comparison Group Construction—Propensity Score Models to Exclude Outliers. In each year, we combined all eligible residents of the intervention group facilities (both Clinical + Payment and Payment-Only) into one single intervention group. For each of the preintervention years (FY 2014–FY 2016), we selected residents of the intervention group based on the intervention eligibility requirements (even though obviously the intervention had not begun at that time). Then, using a combined file that included all residents from the single intervention group and all

residents from the national sample frame, separately for each year, we ran a propensity score model to predict the probability of a resident being in the intervention group as opposed to being in the national sample frame. From this model, propensity scores were computed for all intervention group residents and for all residents in the national sample frame. The propensity scores were not used to match individuals, but to exclude individuals very different from the study population.

Our use of propensity scores to trim outliers from a national comparison group of would-be eligible nursing facility residents, rather than to match specific individuals (or facilities), is different from the typical comparison group selection methods used in some other CMS evaluations. The principal approach used here to control for differences in residents in the intervention and comparison groups is the use of extensive risk adjustment in the modeling. We included an extensive list of resident characteristics (demographics and heath characteristics measured by HCCs) as risk adjusters in all regression models of outcomes. We believe this approach is appropriate and serves our analytic purposes well. The "light-touch" approach to trimming cases with out-of-range propensity scores helped to identify and retain a large-sized national comparison group that ensures stable and robust parameter estimates from DD regressions models for impact analysis.

Both resident- and facility-level characteristics were included in a logistic regression model to calculate the propensity score, which is the predicted probability of being in the intervention group. For the most part, the variables included in the propensity score models were the same as those included in the DD analytical models. The main differences were that the analytical models included a few additional health conditions, and the propensity score model included additional facility-level variables, such as several of the facility's rating variables from NHC.[16]

Within-State Reference Groups. To capture possible changes in state policies and local market conditions, we created a within-state reference group (WSRG) to use in a sensitivity analysis. For each year, the WSRG includes all would-be eligible residents from all nonparticipating facilities within current ECCP states meeting the facility inclusion criteria (e.g., never an SFF, always Medicare and Medicaid certified). Facilities that were active participants at any point in NFI 1 but are no longer participating in NFI 2 were excluded from the WSRG.

K.7 Final Counts After Exclusions: FY 2018 Analytical File

After applying NFI 2 eligibility criteria to create our initial sample, we defined our national comparison group, and then applied a final set of exclusion criteria specific to various outcomes of interest. ***Table K-2*** below displays the counts before and after exclusions for the two intervention

[16] The complete list of variables included in the DD models, along with descriptive statistics, is in ***Appendix L***. Propensity models did not include neurogenic bladder, obstructive uropathy, or ESRD post-transplant status. DD models did not include staffing rating, star rating, survey rating (all from Nursing Home Compare), or presence of an on-site clinical lab or x-ray. There were slight differences between the two models in how profit status and rurality were measured.

groups and for the national comparison group, for each year separately. We initially began with the sample of nursing facility residents that had resided in a facility for 101 cumulative days or more starting from their date of admission to the facility. The table describes some of the specific exclusions we applied and provides the total number of beneficiaries remaining in the sample after all exclusions had been applied. Although the specific exclusions listed in the table were at the resident level, there were both resident- and facility-level exclusions applied to the initial sample as described above.

Table K-3 explains additional exclusions we applied to derive the final analytic samples for each of the analyses we performed, including the exclusions based on propensity scores. The largest number of beneficiaries were included in the utilization analyses, with slightly smaller numbers in the expenditure and quality measure analyses.

Table K-2. Table of counts of eligible residents in the analytical file

Sample overview	2014			2015			2016			2017			2018		
	C + P	PO	NCG	C + P	PO	NCG	C + P	PO	NCG	C + P	PO	NCG	C + P	PO	NCG
Initial sample	24,074	24,429	1,396,974	24,035	24,401	1,390,946	24,257	23,905	1,357,696	24,158	23,994	1,344,998	24,158	23,880	1,344,218
Selected exclusion criteria (exclusions are not mutually exclusive)															
Not enrolled in FFS Medicare	*4,663*	*3,758*	*189,170*	*5,020*	*4,143*	*232,584*	*5,687*	*4,390*	*235,864*	*5,870*	*5,028*	*248,100*	*6,398*	*5,886*	*263,678*
Not enrolled in Medicare A and B	*2,699*	*2,047*	*137,346*	*2,811*	*2,008*	*140,096*	*2,999*	*2,077*	*146,084*	*3,056*	*1,930*	*141,542*	*3,120*	*1,894*	*143,632*
No overlapping exposure period	*2,186*	*1,981*	*113,965*	*1,913*	*1,853*	*108,033*	*1,750*	*1,681*	*102,040*	*1,766*	*1,718*	*103,553*	*1,860*	*1,837*	*105,704*
No matching Medicare data	*1,701*	*1,236*	*90,781*	*1,813*	*1,231*	*95,019*	*2,113*	*1,330*	*105,285*	*2,212*	*1,321*	*106,694*	*2,265*	*1,335*	*108,773*
Total number of excluded beneficiaries	**10,845**	**9,296**	**623,443**	**11,042**	**9,507**	**656,031**	**11,752**	**9,590**	**653,137**	**12,070**	**10,200**	**659,863**	**12,874**	**11,174**	**680,366**
Total number of eligible beneficiaries	**13,229**	**15,133**	**773,531**	**12,993**	**14,894**	**734,915**	**12,505**	**14,315**	**704,559**	**12,088**	**13,794**	**685,135**	**11,284**	**12,706**	**663,852**

C + P = Clinical + Payment; FFS = fee-for-service; NCG = national comparison group; PO = Payment-Only.

NOTE: This table shows only selected exclusions. Exclusions are not mutually exclusive.

SOURCE: RTI analysis of Medicare claims data (RTI program pah2_ar3_fix_2).

Table K-3. Table of counts of residents used for specific analyses

Sample overview	2014			2015			2016			2017			2018		
	Clinical + Payment	Payment-Only	National comparison group	Clinical + Payment	Payment-Only	National comparison group	Clinical + Payment	Payment-Only	National comparison group	Clinical + Payment	Payment-Only	National comparison group	Clinical + Payment	Payment-Only	National comparison group
Total number of eligible beneficiaries	**13,229**	**15,133**	**773,531**	**12,993**	**14,894**	**734,915**	**12,505**	**14,315**	**704,559**	**12,088**	**13,794**	**685,135**	**11,284**	**12,706**	**663,852**
Overall exclusions applied for analytic sample															
Excluded because of out-of-range propensity scores	—	—	*4,111*	—	—	*11,539*	—	—	*979*	—	—	*2,679*	—	—	*288*
Excluded because of missing covariate	*648*	*629*	*40,704*	*647*	*707*	*40,256*	*718*	*620*	*37,426*	*594*	*694*	*35,531*	*662*	*720*	*38,371*
Total number used for utilization analyses	**12,581**	**14,504**	**728,716**	**12,346**	**14,187**	**683,120**	**11,787**	**13,695**	**666,154**	**11,494**	**13,100**	**646,925**	**10,622**	**11,986**	**625,193**
Exclusions applied for expenditure analyses															
Excluded because of outlier expenditures	*56*	*34*	*1,917*	*48*	*36*	*1,612*	*53*	*33*	*1,645*	*44*	*35*	*1,461*	*34*	*26*	*1,290*
Excluded because of negative expenditures	—	—	*10*	—	—	*7*	—	—	*10*	—	—	*12*	*1*	*1*	*6*
Total number used for expenditure analyses	**12,525**	**14,470**	**726,789**	**12,298**	**14,151**	**681,501**	**11,734**	**13,662**	**664,499**	**11,450**	**13,065**	**645,452**	**10,587**	**11,959**	**623,897**
Exclusions applied for quality measure analyses															
Excluded because of missing quality measure outcome data	*226*	*262*	*13,272*	*227*	*239*	*12,951*	*207*	*232*	*12,249*	213	250	11,893	134	100	8,160
Total number used for quality measures	**12,355**	**14,242**	**715,444**	**12,119**	**13,948**	**670,169**	**11,580**	**13,463**	**653,905**	**11,281**	**12,850**	**635,032**	**10,488**	**11,886**	**617,033**

— = data not available.

NOTE: The total number of beneficiaries used for quality measures is based on missing quality measure outcome variables for a majority of the quality measures. Several measures have additional exclusion criteria applied.

SOURCE: RTI analysis of Medicare claims data (RTI program AF600).

K.8 Defining Outcome Measures

The outcome measures we consider in this report fall into the following three broad categories: service utilization,[17] Medicare expenditures, and MDS-based quality outcomes. These include both resident-level outcome variables that are used in multivariate regression analyses and aggregated outcome variables used for descriptive analyses. Below are a few general notes on these measures, followed by a more detailed description of them.

- Unless otherwise specified, measures are calculated per reporting period, which is a fiscal year.
- All measures are based on the portion of the reporting period during which the individual is Initiative eligible (Initiative-eligible exposure period[18]) so that events that occurred (or dollars that were spent) are only counted if they occurred during this period.
- We account for the length of the individual's Initiative-eligible exposure period in several ways, with differences between the measures, as detailed below. Techniques include annualizing the outcome variable, incorporating exposure as a covariate in the regression model, and using weights in the regression model, as explained in ***Section K.9***.
- Descriptive results, calculated at the aggregate level, are presented for the following groups of nursing facility residents (see ***Appendices M–O***) (WSRG tables are available upon request):
  - National comparison group residents
  - Clinical + Payment group residents, all ECCPs combined
  - Clinical + Payment group residents, each ECCP separately
  - Payment-Only group residents, all ECCPs combined
  - Payment-Only group residents, each ECCP separately

K.8.1 Medicare Utilization

As described in ***Table K-4*** below, we track the utilization of Medicare-covered services and report the following descriptive measures in each year:

- the percentage of residents who experienced an event during their Initiative-eligible exposure period
- the rate of events (e.g., hospitalizations) per 1,000 Initiative-eligible resident-days

[17] This includes hospitalizations, ED visits, and acute care transitions (which includes hospitalizations, ED visits, and observation stays).

[18] The Initiative-eligible exposure period could be the entire reporting period or some portion thereof.

These measures are calculated at the aggregate level, for each of the groups of residents defined above. They are reported in tables of descriptive statistics (in ***Appendices M*** and ***N***) that are not adjusted for resident characteristics.

For multivariate regression analyses, we define a series of individual resident-level utilization measures two ways, as either a probability or a count, as described in ***Table K-4*** below.

- For the probability model, a dichotomous (1/0) variable indicates whether a resident experienced an event over her/his Initiative-eligible period in each year.
- For the count model, we use the count of events during the resident's Initiative-eligible period in each year.

Table K-4. Utilization measures used for descriptive and multivariate analyses

Outcome measure	Specifications	Descriptive/ multivariate
Aggregate level: percentage of residents who experienced an event[1]	Sum (residents who experienced the event) / Sum (all residents), per reporting period. Only events that occur during the Initiative-eligible exposure period are counted. This measure does not account for length of exposure period.	Descriptive
Aggregate level: rate of events[1] per 1,000 resident-days	Sum (events)*1,000 / Sum (Initiative-eligible resident-days), per reporting period. Only events that occur during the Initiative-eligible exposure period are counted. Each individual resident contributes their count of events to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator.	Descriptive
Individual level: whether an event[1] occurred	Dichotomous (1/0) variable indicating whether a resident experienced an event during their Initiative-eligible exposure period.	Multivariate[2]
Individual level: count of events[1]	Number of events experienced by the individual during reporting period. Only events that occur during the Initiative-eligible exposure period are counted.	Multivariate[2]

[1] Includes each of the types of hospital-related events (hospitalizations, ED visits, observation stays, and any of these acute care transitions), whether all-cause, potentially avoidable, potentially avoidable because of any of the six qualifying conditions, or potentially avoidable because of each of the six qualifying conditions separately.

[2] Potentially avoidable utilization because of each of the six qualifying conditions separately are not included in multivariate analyses because of the relatively low frequency of events related to each individual condition.

Complete multivariate results are shown in ***Appendix R***.

The utilization measures of Medicare-covered services referred to above include hospitalizations, ED visits, observation stays, and any of these acute care transitions, all defined using Medicare claims. These hospital-related events are described further in ***Table K-5***.

Table K-5. Identifying types of hospital-related utilization events in claims

Outcome	Specifications	Data source
Hospitalizations	Hospitalizations are identified based on FFS inpatient bills.	Medicare inpatient claims
ED visits	Includes ED visits that did not result in inpatient admission identified from institutional outpatient claims, as Revenue Center Code (RCC) = 045X or 0981 or CPT code = 99281–99285.	Medicare hospital outpatient (institutional) claims
Acute care transitions	Includes hospitalizations, ED visits, or observation stays. Hospitalizations and ED visits identified as above. Observation stays are identified in the outpatient claims as RCC = 0760 or 0762 and HCPCS = G0378 or G0379. In general, outpatient visits that result in inpatient admissions are billed only as inpatient claims so there will be no double counting. We count just once those claims that would be considered both ED visits and observation stays. Note that because of the unique billing practices of critical access hospitals (CAH), there could be some double counting of events in CAH. This occurrence is rare.	Medicare inpatient claims; Medicare hospital outpatient (institutional) claims

ED = emergency department; FFS = fee-for-service.

For the hospital-related utilization events just described, we examine all-cause events, potentially avoidable events, potentially avoidable events because of any of the six qualifying conditions, and potentially avoidable events because of each of the six qualifying conditions separately, described in further detail in ***Table K-6***. Note that events because of each of the six qualifying conditions separately are not included in multivariate analysis—only descriptive results are presented. The classification of these events as all-cause, potentially avoidable, etc., is determined by the diagnoses on the hospital claim, in most cases the principal diagnosis. We provide additional details on identifying potentially avoidable events and potentially avoidable events because of the six qualifying conditions in ***Section K.7*** of this appendix.

Table K-6. Types of hospital-related utilization events

Outcome	Specifications
All-cause event[1]	Event is counted regardless of primary discharge diagnosis.
Potentially avoidable event[1]	We started from the definition of potentially avoidable hospitalization diagnoses as developed by Walsh et al. (2010; 2012) in their study of high-cost dually eligible populations.[2] The list was converted from ICD-9 to ICD-10 for use with data beginning October 1, 2015, and refinements were made because of the increased specificity of ICD-10. Events were considered as potentially avoidable if the primary discharge diagnosis had any of the ICD-9/ICD-10 codes considered potentially avoidable or if the event had one of a group of specified combinations of primary and secondary ICD-10 diagnoses (the list of primary diagnoses and combinations is lengthy and is available upon request).
Potentially avoidable event[1] because of any of the six qualifying conditions as a group	An event is considered attributable to any of the six qualifying conditions if its primary discharge diagnosis had any of the ICD-9/ICD-10 codes deemed to be associated with these conditions, or if the event had one of a group of specified ICD-10 combinations of primary and secondary diagnoses, which indicate these six qualifying conditions (list available upon request).

(continued)

Table K-6. Types of hospital-related utilization events (continued)

Outcome	Specifications
Potentially avoidable event[1] because of each of the six qualifying conditions[3]	An event is considered attributable to one of the six qualifying conditions if its primary discharge diagnosis had any of the ICD-9/ICD-10 codes associated with this condition, or if the event had one of a group of specified ICD-10 combinations of primary and secondary diagnoses, which indicate this condition (list available upon request). Note that this measure is calculated separately for each condition.

[1] Applies to hospitalizations, ED visits, observation stays, or any of these acute care transitions.

[2] Walsh et al. (2010, 2012).

[3] Events because of each of the six qualifying conditions separately are not included in multivariate analyses.

K.8.2 Medicare Expenditures

Expenditures are reported both as a total and for select service categories. Total expenditure is the sum of Medicare paid amounts, including the following types of Medicare claims: inpatient, outpatient (institutional), SNF, hospice, home health, durable medical equipment, carrier file services (e.g., professional, lab), and total payments for Part D drugs. For reporting expenditures for specific categories, we closely mirrored the categories we used for utilization measures, described above. We annualized the measures used for multivariate analyses based on the length of each resident's Initiative-eligible exposure period (weights related to exposure time were also applied as was the case with the multivariate analyses for utilization measures as well). All expenditures are counted only if the service dates on the claim fall within a resident's Initiative-eligible exposure period (based on the admission date of the claim).

Measures are calculated per beneficiary per year. We calculated measures at the aggregate level to display descriptive results, and at the individual level for use in multivariate models, as we describe in ***Table K-7***.

Table K-7. Expenditure measures used for descriptive and multivariate analyses

Outcome measure	Specifications	Descriptive/ multivariate
Aggregate level: Total Medicare expenditures per resident-year	Sum (Medicare-paid dollar amount for all covered services) * 365 / Sum (Initiative-eligible days), per reporting period. The numerator counts Medicare payments for all services included in the following types of Medicare claims: inpatient, outpatient (institutional), SNF, hospice, home health, durable medical equipment (DME), Carrier file, and Part D drugs. Only payments that are incurred during the Initiative-eligible exposure period are counted. Each individual resident contributes their count of dollars to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator.	Descriptive

(continued)

Table K-7. Expenditure measures used for descriptive and multivariate analyses (continued)

Outcome measure	Specifications	Descriptive/ multivariate
Aggregate level: Medicare expenditures per resident-year for a specific expenditure category[1]	Sum (Medicare-paid dollar amount for a specific category of service) * 365 / Sum (Initiative-eligible days), per reporting period. Only payments that are incurred during the Initiative-eligible exposure period are counted. Each individual resident contributes their count of dollars to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator.	Descriptive
Individual level: Total Medicare expenditures per resident-year	(Medicare-paid dollar amount for all covered services * 365) / Count (Initiative-eligible days[2]), per reporting period. Medicare payments for all services included in the following types of Medicare claims: inpatient, outpatient (institutional), SNF, hospice, home health, DME, Carrier file, and Part D drugs. Only payments that are incurred during the Initiative-eligible exposure period are counted.	Multivariate[3]
Individual level: Medicare expenditures per resident-year for a specific expenditure category[1]	(Medicare-paid dollar amount for a specific category of service) * 365 / Count (Initiative-eligible days[2]), per reporting period. Only payments that are incurred during the Initiative-eligible exposure period are counted.	Multivariate[3]

[1] Includes each of the types of hospital-related events (hospitalizations, ED visits, observation stays, and any of these acute care transitions), whether all-cause, potentially avoidable, potentially avoidable because of any of the six qualifying conditions, or potentially avoidable because of each of the six qualifying conditions separately.

[2] If the count of Initiative-eligible days was < 30, the denominator was equal to 30.

[3] Events because of each of the six qualifying conditions separately are not included in multivariate analyses.

K.8.3 MDS-Based Quality Measures

Resident-level quality measures are defined using the nursing home resident assessment Minimum Data Set, Version 3.0 (hereinafter referred to as MDS-based quality measures). MDS-based measures assess quality of care, health, and functional outcomes, which we refer to broadly as MDS-based quality measures. We selected quality measures based on two major criteria: (1) clinical relevance to potentially avoidable hospitalizations and the six qualifying conditions, and (2) alignment with other CMS initiatives (e.g., Nursing Home Compare, the Nursing Home Value-Based Purchasing Program, and the Five-Star Quality Rating system) or partnering initiatives (e.g., Advancing Excellence in America's Nursing Homes). These measures are presented in ***Table K-8***.

Table K-8. MDS-based quality measures used for descriptive and multivariate analyses

Measure	Definition	Variable type	Multivariate analysis
Catheter inserted and left in bladder	The proportion of observed quarters with data on the presence of indwelling catheters.	Proportion	Yes
One or more falls with injury	The proportion of observed quarters with data on the presence of one or more look-back scan assessments that indicate one or more falls that resulted in injury.	Proportion	Yes
Self-report moderate to severe pain	The proportion of observed quarters with data on the presence of either (1) almost constant or frequent moderate to severe pain in the last 5 days or (2) any very severe/horrible pain in the last 5 days.	Proportion	Yes
Pressure ulcers stage II or higher	The proportion of observed quarters with data on the presence of Stage II–IV pressure ulcers.	Proportion	Yes
Decline in ADLs	The proportion of observed quarters with indicating that a resident's need for help with late-loss ADLs has increased. An increase is defined as an increase in two or more coding points in one late-loss ADL item or one-point increase in coding points in two or more late-loss ADL items.	Proportion	Yes
Urinary tract infection	The proportion of observed quarters with data on the presence of urinary tract infection within the last 30 days.	Proportion	Yes
Antipsychotic medication use	The proportion of observed quarters with data indicating that a resident received an antipsychotic medication.	Proportion	Yes
Antianxiety or hypnotic medication use	The proportion of observed quarters with data indicating that a resident received antianxiety or hypnotic medications.	Proportion	No
Weight loss	The proportion of observed quarters with data indicating that a resident has a weight loss of 5 percent or more in the last month or 10 percent or more in the last 6 months and was not on a physician prescribed weight-loss regimen.	Proportion	No
Physically restrained	The proportion of observed quarters with data on the presence of daily physical restraints (trunk restraint used in bed, limb restraint used in bed, trunk restraint used in chair or out of bed, limb restraint used in chair or out of bed, or chair prevents rising used in chair or out of bed).	Proportion	No

ADL = activity of daily living; MDS = Minimum Data Set.

We defined each MDS-based quality measure as the proportion of observed quarters with the presence of each adverse event for each resident, producing an annual score for each resident ranging from 0 to 1. We present these proportions as percentages in descriptive tables (***Tables P-1*** to ***P-8***) in ***Appendix P***. Because Initiative-eligible residents can be observed for different lengths of

time depending on their residence and eligibility in the nursing facilities, the measures were weighted by their exposure as a proportion of a year. The weighted values were reported in our descriptive analysis and included in the multivariate analyses.

K.9 Definition of Potentially Avoidable Hospitalizations and Identification of Six Qualifying Conditions

Our starting point for defining potentially avoidable hospitalizations (and potentially avoidable ED visits and potentially avoidable acute care transitions) was the list of potentially avoidable hospitalization conditions and corresponding ICD-9-CM diagnosis codes developed by Walsh et al.[19,20] in their study of high-cost Medicare-Medicaid dually eligible populations. We have updated this initial list to reflect subsequent updates to the coding system and ongoing evaluation of codes clinically appropriate for inclusion in the list. Also, as previously explained, under NFI 2, the payment incentives are specifically targeted for the in-house treatment of acute changes in six qualifying conditions that are a subset of conditions deemed potentially avoidable for hospital admissions. We thus developed a shorter list of ICD-CM codes, a subset of the original list for all potentially avoidable conditions, to capture hospitalizations for the six qualifying conditions.

K.9.1 Sets of Potentially Avoidable Hospitalizations (ICD-9-CM and ICD-10-CM)

Initial lists of potentially avoidable hospitalization conditions have undergone a series of revisions since the start of the base period used in the evaluation. The transition to ICD-10-CM diagnosis codes effective October 1, 2015, necessitated mapping previously identified ICD-9-CM codes for potentially avoidable hospitalization conditions to the new code system. One-to-many relationships were identified by mapping ICD-9-CM codes to ICD-10-CM codes, as well as by mapping ICD-10-CM codes to ICD-9-CM codes.

An updated list of ICD-9-CM codes reflecting potentially avoidable hospitalizations was created in spring 2018 to capture additional ICD-9-CM codes identified in

- ICD-9-CM code files, updated for FY 2014, available on the CMS website;
- one-to-many relationships of ICD-10-CM codes to ICD-9-CM (e.g., the ICD-10 code for Essential [primary] hypertension [I10] maps to ICD-9 codes for Malignant essential hypertension [401.0] and Benign essential hypertension [401.1]); and
- ongoing evaluation for codes clinically appropriate for inclusion in the potentially avoidable hospitalization list (e.g., addition to the list of ICD-9-CM code for Methicillin-susceptible *Staphylococcus aureus* in conditions classified elsewhere and of unspecified site [041.11]).

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[19] Walsh, E.G., Freiman, M.P., Haber, S., et al. Cost drivers for dually eligible beneficiaries: Potentially avoidable hospitalizations from long-term and post-acute care settings. Report for the Centers for Medicare & Medicaid Services. Waltham, MA: RTI International, 2010.

[20] Walsh, E.G., Wiener, J.M., Haber, S., et al. Potentially avoidable hospitalizations of dually eligible Medicare and Medicaid beneficiaries from nursing facility and home- and community-based services waiver programs. J Amer Geriatrics Soc. 60(5): 821–829, 2012.

RTI clinicians, including physician Dr. Christopher Beadles, provided clinical input and decisional support on appropriateness of codes.

Listings of ICD-10-CM codes for potentially avoidable hospitalizations were created/updated in spring 2018, and updated again in fall 2018, to reflect the following:

- Mapping of ICD-9-CM potentially avoidable hospitalization codes to ICD-10-CM code files for FY 2016.
- Mapping of ICD-9-CM potentially avoidable hospitalization codes to ICD-10-CM annual update code files for FY 2017 and FY 2018. The mapping captures codes added, deleted, and modified in FY 2017 and FY 2018 ICD-10-CM code files, as well as the clinical appropriateness of including such changes in the list of potentially avoidable hospitalization conditions.
- One-to-many relationships of ICD-9-CM codes to ICD-10-CM (e.g., the ICD-9-CM code for Closed fracture of acetabulum [808.0] maps to 54 unique ICD-10-CM codes that describe closed fractures of the acetabulum in terms such as anatomy of the acetabulum, displaced/non-displaced, and laterality).
- Ongoing evaluation for codes clinically appropriate for inclusion in the potentially avoidable hospitalization conditions list (e.g., addition to the list of ICD-10-CM code for Periorbital cellulitis [L03.213]). RTI clinicians, including physician Dr. Beadles, provided clinical input and decisional support on appropriateness of codes. All clinical concepts identified as additional potentially avoidable hospitalization conditions were incorporated into ICD-10-CM lists for FY 2016 through FY 2018 as well as the ICD-9-CM lists.

Several overarching considerations have been applied across the ICD-9-CM and ICD-10-CM lists of potentially avoidable hospitalization conditions, including the following:

- Only valid ICD-9-CM and ICD-10-CM code numbers are included on the lists. Header codes are not included.
- ICD-10-CM “subsequent encounter” and “sequela” codes have been determined to be inappropriate for the lists. ICD-9-CM “late effect” codes were in the original list of potentially avoidable hospitalization conditions developed by Walsh et al. (2010, 2012). Because there is no specified look-back period for late effect (sequela) codes, these are not good indicators of the recency of the incident conditions and they do not specify the nature of the sequela. Based on clinical review and consultant recommendations, we did not include ICD-10-CM “subsequent encounter” or “sequela” codes for any conditions (including those that are mapped to ICD-9-CM “late effect” codes). We did include any ICD-10-CM “initial encounter” codes related to conditions for which an ICD-9-CM “late effect” was originally listed.
- Certain conditions requiring more than one ICD-9 or ICD-10 code have special treatment. Coding manuals provide instructions such as “code first” and “code also.” In addition, RTI clinical experts have advised that certain combinations of codes are indicative of

potentially avoidable hospitalization conditions (e.g., nonchronic pressure ulcer code in combination with cellulitis code). Examples include:

- For certain codes related to fractures that are identified as the principal diagnosis in the ICD-9-CM list of potentially avoidable conditions, the ICD-10-CM instructions for the parallel codes are to *code first* any spinal cord injury—including injury of nerves and spinal cord at neck level or at thorax level, and injury of lumbar and sacral spinal cord and nerves at abdomen, lower back, or pelvis level—if it occurred. To properly identify these codes, it is necessary to detect the spinal cord lesion in the principal diagnosis (e.g., S14.XXXX, S24.XXXX, S34.XXXX) *and* detect one of the fracture codes in the secondary diagnosis (e.g., S12.XXXX, S22.XXXX, S32.XXXX). We added such combinations of codes to our updated ICD-10-CM list of potentially avoidable hospitalization conditions. The fractures may also occur as a principal diagnosis if there is no spinal cord lesion.
- Certain electrolyte disorder codes reflect dehydration if they appear in combination with codes indicating volume depletion. To identify these codes, it is necessary to detect the electrolyte disorder in the principal diagnosis (e.g., E87.X) *and* detect one of the codes for volume depletion in secondary diagnosis (e.g., E86.X). We added such combinations of codes to our updated ICD-10-CM list of potentially avoidable hospitalization conditions. The volume depletion may also occur as a principal diagnosis.

The finalized set of **ICD-9-CM** codes for potentially avoidable hospitalization conditions, applicable for claims services during FY 2013, FY 2014, and FY 2015, contains a total of 1,930 standalone principal diagnosis codes. An additional 29 principal diagnosis codes, each to be identified in conjunction with one appropriate secondary diagnosis code, are also included in the set. The full list of these ICD-9-CM codes can be provided upon request (not included in this report for reasons of space).

The finalized set of **FY 2016 ICD-10-CM** codes for potentially avoidable hospitalization conditions—with codes updated through September 2016—contains a total of 11,408 standalone principal diagnosis codes and 104 additional principal diagnosis codes each to be identified in conjunction with one appropriate secondary diagnosis code. The full list of these FY 2016 ICD-10-CM codes can be provided upon request (not included in this report for reasons of space).

The finalized set of **FY 2017 ICD-10-CM** codes for potentially avoidable hospitalization conditions—with codes updated through September 2017—contains a total of 11,584 standalone principal diagnosis codes and 104 additional principal diagnosis codes each to be identified in conjunction with one appropriate secondary diagnosis code. The full list of these FY 2017 ICD-10-CM codes can be provided upon request (not included in this report for reasons of space).

The finalized set of **FY 2018 ICD-10-CM** codes for potentially avoidable hospitalization conditions—with codes updated through September 2018—contains a total of 11,655 standalone principal diagnosis codes and 104 additional principal diagnosis codes each to be identified in conjunction

with one appropriate secondary diagnosis code. The full list of these FY 2018 ICD-10-CM codes can be provided upon request (not included in this report for reasons of space).

Because of the transition from ICD-9-CM to ICD-10-CM, there could be a potential issue with comparability of the codes for potentially avoidable conditions between the two coding systems. We exercised diligence in the mapping process, including clinicians, to ensure both completeness and accuracy in the code sets across all years. This was for the transition to ICD-10 and the updates that followed. All longitudinal studies must accommodate coding system revisions. We did not observe any unusual fluctuations or irregularities in the rates of potentially avoidable hospitalizations before and after the transition to ICD-10-CM.

K.9.2 Identifying Subsets of ICD-10-CM Codes Specific to the Six Qualifying Conditions

Each of the six qualifying conditions has qualifying criteria defining the clinical or diagnostic conditions of a beneficiary that could trigger the benefit. Although CMS specified the clinical criteria for each of the six qualifying conditions, as described in ***Section 1***, it has provided no guidance on which specific ICD-10-CM codes should be used to identify those conditions. Although the final list of potentially avoidable hospitalization conditions identified by the RTI team contains subsets of ICD-10-CM codes that generally match each of the six broadly categorized qualifying conditions—pneumonia, CHF, COPD/Asthma, skin infection, dehydration, and UTI—there is not always exact correspondence between those codes, the categorization of each condition, and the clinical criteria for each condition as specified by CMS. The symptoms of acute change in each condition, as described in the clinical criteria, are observable to the clinicians who treat a resident in the facility and may be in the medical record; they are not available in the claims. With clinical guidance from our consultant, Dr. Beadles, the RTI team has identified, reviewed, and finalized a subset of ICD-10-CM codes for potentially avoidable hospitalization conditions that for practical purposes matches the CMS-specified clinical criteria for each qualifying condition, briefly summarized below. Details are available upon request.

- *Pneumonia*: The symptomatic and treatment guidance specified by CMS suggests that bacterial pneumonia is the focus here, not viral pneumonia. Thus, we removed any ICD-10-CM codes for viral pneumonia.
- *CHF*: The qualifying diagnosis, symptoms, and treatment guidance, as specified by CMS, are not limiting to a type of CHF.
- *COPD/Asthma*: The qualifying diagnosis, symptoms, and treatment guidance, as specified by CMS, are not limiting in the type of asthma.
- *Skin Infection*: The qualifying diagnosis, as specified by CMS, focuses on "new onset of painful, warm and/or swollen/indurated skin infection requiring oral or parenteral antibiotic or antiviral therapy." It further clarifies that "if associated with a skin ulcer or wound there is an acute change in condition with signs of infection such as purulence, exudate, fever, new onset of pain, and/or induration." Therefore, the presence of skin ulcers alone but without infection does not meet the clinical criteria for the qualifying condition. We identified cellulitis, acute lymphadenitis, and other specified local infections

of the skin that meet the qualifying criteria. However, certain skin ulcer codes reflect infection if they appear in combination with codes indicating cellulitis, acute lymphadenitis, and other specified local infections of the skin. These codes are identified by the presence of skin ulcers in the principal diagnosis in conjunction with a secondary diagnosis code for cellulitis, acute lymphadenitis, or other specified skin infections.

- *Dehydration*: The qualifying diagnosis and treatment guidance, as specified by CMS, pertain to fluid or electrolyte disorder or dehydration, and the focus is on dehydration or volume depletion. As noted earlier, certain electrolyte disorder codes reflect dehydration if they appear in combination with codes indicating volume depletion. These codes are identified by the presence of electrolyte disorder in the principal diagnosis *and* presence of volume depletion in the secondary diagnosis.
- *UTI*: The symptomatic and treatment guidance provided by CMS focuses on dysuria, frequency, new incontinence, altered mental status, hematuria, and costovertebral angle tenderness. As with the other conditions, all the possible signs and symptoms related to the diagnosis of the condition are not observed in the codes.

K.10 Independent Variables

The selection of covariates (i.e., independent or control variables) as risk adjusters in our final regression models is guided by literature review and is also shaped by limitations of the administrative data used in our analyses. Descriptive statistics on the final set of model covariates, including percentages for categorical variables and means and standard deviations for continuous variables, are summarized in ***Appendix L***.

Resident-Level Characteristics. Selected covariates at the individual level include residents' demographic characteristics, and health and functional status derived from the MDS and Medicare claims. Age and sex are combined to create groupings by 5-year age brackets (except for the under-65 group and 95-or-older group) for both sexes. Resident race/ethnicity is coded in five categories, including non-Hispanic White (reference category), non-Hispanic Black, non-Hispanic Asian, Hispanic, and all other racial/ethnic groups. In all models, we included an indicator for Medicare-Medicaid dual eligible status (any episode month), and whether their original Medicare eligibility was because of a disability.

Comorbidities are included as clustered by the CMS HCCs as described in ***Section K.3.*** In a few cases, we aggregated HCC groups that were clinically related because one of the groups has a very small number of residents with that characteristic. Combining clinically related HCC groups when some groups have very few residents makes these groups more stable. We also excluded a few HCC categories from the model where the prediction was counterintuitive, and we believed the relationship may be spurious. Finally, we excluded variables in a model if the number of residents with the characteristic is zero or very small and aggregation with another variable was not appropriate.

We included several additional diagnoses documented in the MDS: anemia (which is one of the potentially avoidable conditions for hospitalization), dementia (Alzheimer's or other types),

neurogenic bladder, and obstructive neuropathy. There are a few additional MDS-based covariates, including a 4-level categorical variable for degree of ADL dependence; a 4-level categorical variable for body mass index (BMI); a 4-level Cognitive Function Scale[21] capturing cognitive function; and depression status measured by Patient Health Questionnaire (PHQ)-9 (either self-report or staff assessment scores), which are included as risk adjusters. We included flags for patients with end-stage renal disease (ESRD) with dialysis and ESRD after receiving a transplant, both derived from the IDR.

It is important to note that all resident-level covariates from the MDS are based on the first MDS assessment (limiting to certain types such as admission, quarterly, annual, discharge, and PPS) starting from middle of the year *prior* to the one containing a resident's Initiative-eligible episode. This way, we use lagged individual-level risk factors to predict current outcome variables in each year, thereby mitigating potential endogeneity in the relationship between them. In a similar way, we use HCCs that are defined using diagnoses documented in Medicare claims from the *previous* year.

Facility-Level Characteristics. In addition to resident-level risk factors specified above, we further control for two facility-level variables that may have an impact on hospital use and the quality of care provided nursing facility residents: the profit status of the facility and whether the facility was hospital based. For the propensity score analysis described in ***Section K.6*** that we performed to aid the selection of national comparison group residents, we included additional facility-level variables. For risk adjustment purposes in our regression models of resident outcomes, facility-level factors are less important than individual-level characteristics specified above.

K.11 Statistical Methods for Multivariate Analyses

A regression-based model was used to assess the effects of the payment incentive within the Clinical + Payment and the Payment-Only interventions separately. The main outcome variables of interest, including hospital-related utilization and Medicare expenditures, have been described in ***Section K.6***. The study population included in these regression models, including both the Initiative eligible residents and the comparison group residents, have been described in ***Sections K.4*** and ***K.5***. The covariates included in the models have been described in ***Section K.8***.

We first present a general form of the model, followed by specifications suitable for each of the types of outcome variables. It is a DD design with multiple observation periods before the NFI 2 Initiative began (FY 2014–FY 2016) and the observation period FY 2018 for this report.

Differences between residents in their exposure times within a reporting period were dealt with in several ways. First, we modified the outcome variable where appropriate. For expenditure outcomes, as indicated in ***Section K.6***, measures were annualized. This assumes the expenditure

[21] Thomas, K., Dosa, D., Wysocki, A., et al. The Minimum Data Set 3.0 Cognitive Function Scale. Medical Care. 55(9):e68-e72, 2017. doi: 10.1097/MLR.0000000000000334

patterns would be the same for the full 365-day period as they were for the shorter period during which residents were observed. Second, in the probability and count models, exposure time was used as a control variable. Because nonlinearity was observed in the relationship between exposure and hospitalization,[22] we used categories of exposure time. Third, we used weights in the regression models, weighting observations based on exposure time (with a floor of 30 days so even individuals with less than 30 days of exposure time were considered to have 30 days), so that residents with longer exposure times exerted greater impact on the coefficient estimates.

Note that in the models we describe, adjustments to standard errors are made to account for correlations among observations from each facility. We account for the "clustering" effect, as specified in more detail below. In addition, residents may differ greatly in their exposure times to the Initiative, especially because of the day counting requirements described in ***Section K.4***. Finally, we included indicator variables for each of the states in the national comparison group (California was left as the reference group and there were no dummies for the individual ECCP states in the model combining all the ECCPs together) but did not include any interactions with these state dummies. Thus, the changes we are capturing over time that we use to estimate the effect of the Initiative is based on an average of all the residents in the national comparison group regardless of state.

K.11.1 Multivariate Regression Model: General Specification

We begin with a simplified model and then explain how we adapted the simplified model to specific analytic considerations. The simplest DD model we could use for each payment model would be the following:

$$\textbf{Model 1: } Y_{ijt} = \beta_0 + \beta_x * X_{ijt} + \beta_z * Z_{jt} + \beta_{IG} * IG + \beta_p * Post + \beta_{IG,p} * (IG * Post) + \varepsilon_{ijt}$$

In this model, Y_{ijt} represents an outcome variable measured for individual *i* in facility *j* for year *t*. The X_{ijt} are resident characteristics, such as age, sex, clinical characteristics, and participation in other initiatives that may impact the outcome. Z_{jt} are selected facility characteristics (e.g., for-profit status). The term β_{IG}*IG accounts for baseline differences between the intervention group (IG) and the national comparison group that are based on the average differences during the entire base period, consisting of multiple years (FY 2014– FY 2016). The term β_p*Post is used to account for changes over time common to all groups and not because of the intervention.

Using this statistical model requires us to make a key assumption. We assume that in the absence of the intervention, the difference between the respective means of the outcome variable in the intervention and comparison groups, controlling for the differences in the covariates, remains the same over time (the "parallel trends" assumption). In other words, the effect on the outcome

[22] Increasing exposure time was associated with increased hospitalizations (both proportion of residents with a hospitalization and number of hospitalizations per resident) for those with less than a full year of exposure time. However, those with a full year of exposure time had reduced hospitalizations compared to those in several of the categories with less than a year of exposure time.

variable of being in the intervention group as opposed to the comparison group, absent the intervention itself, would not change over time. Given this assumption the effect of the intervention itself is captured by $\beta_{IG,p}$*(IG*Post), which is the difference between the change in the intervention group relative to its baseline and the change in the national comparison group relative to its baseline. The last term ε_{ijt} in the equation is a resident-level residual term that represents error in the prediction.

K.11.2 Adjusting for Baseline Trends

The assumption we have described may be questionable under some circumstances. An alternative approach is to explicitly allow for the possibility that there could be different linear trends in the intervention group and in the comparison group. We could use multiple years (as in analyses presented in RTI's second annual report) in the preintervention period with the following model:

$$\textbf{Model 2: } Y_{ijt} = \beta_0 + \beta_x * X_{ijt} + \beta_z * Z_{jt} + \beta_{IG} * IG + \beta_t * YC_t + \beta_{t\_IG} * YC_t * IG + \beta_p * Post + \beta_{IG,p} * (IG * Post) + \varepsilon_{ijt}$$

The variable YC is a count of the years since the first baseline year, FY 2014 (thus, YC = 0 for 2014, YC = 1 for 2015, and so on). The term β_t*YC_t represents the linear trend in the comparison group and the term β_{t_IG}*YC_t*IG allows for a different baseline trend in the intervention group. The term $\beta_{IG,p}$*(IG*Post) estimates the difference in the outcome in the intervention group in the post-intervention period from its expected value. Note that the expected value incorporates the different preintervention trends in the intervention group and in the comparison group. The Clinical + Payment group, which was in NFI 1, could be expected to have trends related to the specifics of each ECCP intervention.

In Annual Report 2 for 2017, we argued based on empirical evidence (Annual Report 2, Appendix K) that it was appropriate to use a model that allows for different linear trends. We estimated the coefficient for the term β_{t_IG}*YC_t*IG in the model above, respectively for each intervention group. This term represents the difference in linear trends over the baseline years FY 2014–FY 2016 between the national comparison group and the intervention group. These coefficients were mostly negative in the Clinical + Payment group and often statistically significant, indicating a decline in the intervention groups relative to the national comparison group. This was particularly apparent in three ECCPs: MOQI, RAVEN, and NY-RAH. (We also reexamined these coefficients based on the FY 2018 models and found a similar pattern). These findings led us to adopt the structure of the model above for our primary analysis, with 3 years (FY 2014–FY 2016) of baseline data and different linear trends in the intervention and comparison groups.

However, as we noted in Annual Report 2, this model also requires an assumption that the intervention and comparison groups would continue to change by the amount indicated by their own baseline trends. One reason to challenge this assumption is that the impact of the NFI 1 interventions could have plateaued in 2015 or 2016, in which case the trends from the baseline period would differ going forward. Another related reason is that rates had declined to a point

where further reductions would be difficult. We argue that while still plausible for 2017, it is not plausible to assume that the relatively high rate of reductions in the Clinical + Payment group would continue indefinitely.

For our present analysis of 2018 data, we have applied an approach that incorporates our assumption that the past trends would continue—but only up until a point in time. Specifically, we use the trend in projecting the expected outcome value in 2017 and then no further influence from the prior trend for 2018. Thus, the projected trendline for 2018 is now horizontal. In terms of the model equation above, we assign YC for 2014 = 0; YC for 2015 = 1; YC for 2016 = 2; YC for 2017 = 3; and YC for 2018 = 3 instead of 4.

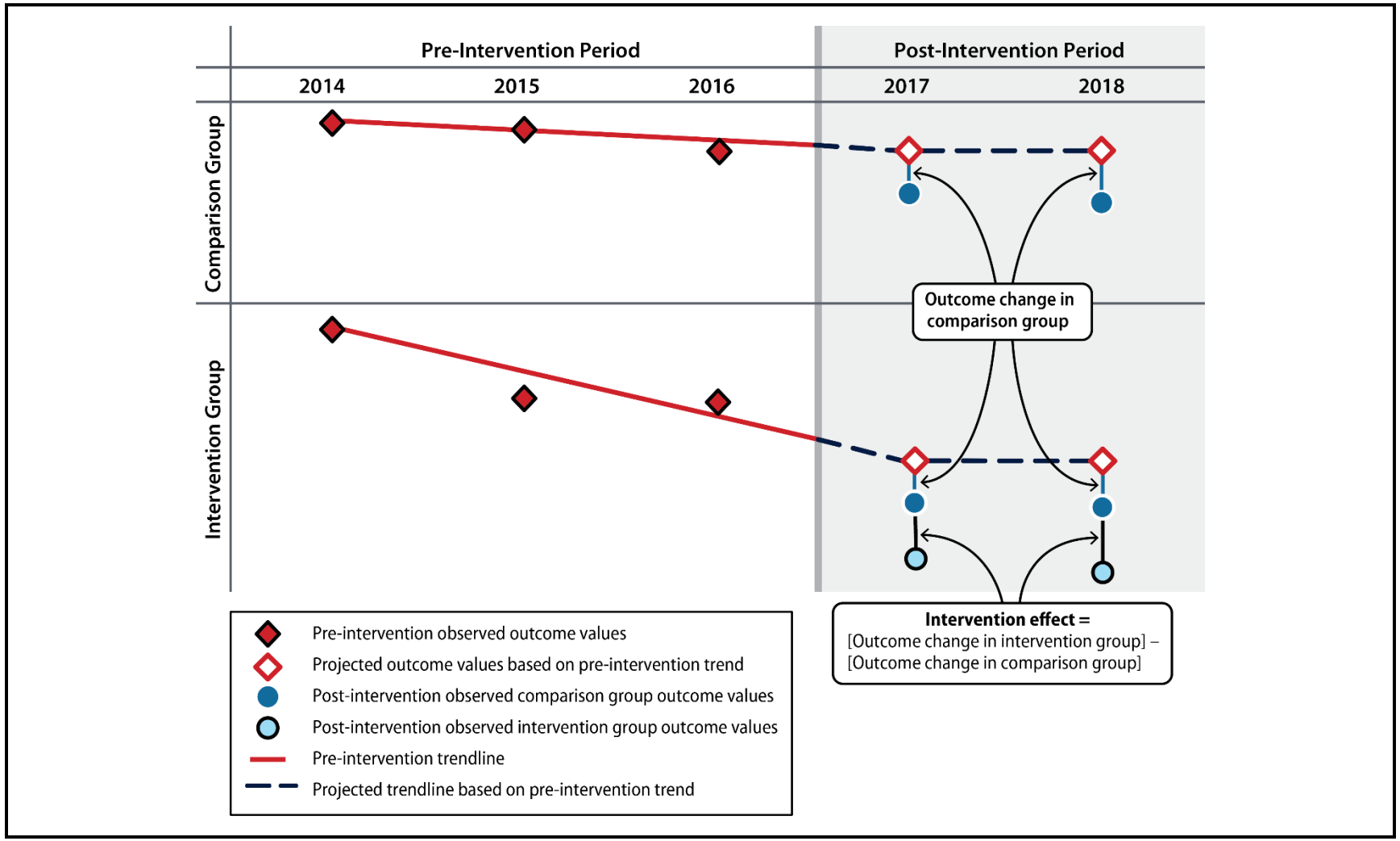
Figure K-3 illustrates the evaluation concept underlying our analyses. Solid red diamonds represent hypothetical outcome values for both comparison and intervention groups for the pre-intervention period (FY 2014–FY 2016). We use these data points to create trendlines: the solid line depicts the trendline for the pre-intervention period and the dashed line depicts the projected trendline for the post-intervention period (FY 2017–FY 2018).

Open red diamonds denote predicted values for both comparison and intervention groups for the post-intervention period. These values were derived using the trends established in the pre-intervention period. The solid blue circles for the comparison group represent the observed values for the post-intervention period. We are specifically interested in the difference between predicted and observed values.

The vertical solid blue lines, or the difference between predicted and observed values in the comparison group, signifies the change that occurred, which is not due to the Initiative. The light blue circles represent the observed values for the post-intervention period in the intervention group. The vertical solid black lines depict the difference in the intervention group between predicted and observed values for the post-intervention period minus the nonintervention change in outcome (the solid blue line). In other words, the vertical solid black line shows the intervention effect: the change in outcome because of the Initiative.

In addition to the main analysis just described, we conducted a sensitivity analysis, shown in ***Appendix Q***, with 2016 alone used as the baseline period (this is essentially Model 1 above with 2016 as the baseline) and parallel trends assumed. We consider the analysis with three baseline years and a linear trend to be primary because this approach is realistic and more conservative.

Figure K-3. Depiction of use of baseline trend in calculating difference-in-differences estimates



K.11.3 Incorporating a Within-State Reference Group

As explained in ***Section 3*** of the main report, a disadvantage of using the national comparison group is that we would not be able to account for possible state-specific factors that may impact our outcomes of interest—such as concurrent within-state efforts (which are unrelated to NFI) to reduce hospitalizations. This concern can be addressed with the use of a WSRG. This group is larger and less subject to random fluctuation than the WSRG of matched facilities used in NFI 1. It includes all the potentially eligible residents in eligible nonparticipating facilities in a state. One way to incorporate a WSRG, consisting of would-be eligible residents in nonintervention group facilities in the seven states, is to use this model

$$\textbf{Model 3: } Y_{ijt} = \beta_0 + \beta x^* X_{ijt} + \beta_z^* Z_{jt} + \beta_{state}^* state + \beta_{IG}^* IG + \beta_t^* YC_t + \beta_{t\_state}^* YC_t^* state + \beta_{t\_IG}^* YC_t^* IG + \beta_p^* Post + \beta_{state,p}^* (state^* Post) + \beta_{IG,p}^* (IG^* Post) + \varepsilon_{ijt}$$

The indicator variable, state, equals 1 for all eligible and would-be eligible residents in the given Initiative-participating state, whether they reside in an intervention facility or in a WSRG facility. The term $\beta_t^* YC_t$ represents the linear trend in the national comparison group and the terms $\beta_{t_state}^* YC_t^*$state and $\beta_{t\_IG}^* YC_t^* IG$ allow for different baseline trends in the state and in the intervention group, respectively. The term $\beta_{state,p}^*$(state*Post) would indicate if following the intervention there was a change in the state relative to the national comparison group, because of state-specific factors, including possible concurrent within-state efforts, unrelated to NFI, to reduce hospitalizations. The term $\beta_{IG,p}^*$(IG*Post) captures the effect of the NFI intervention above and beyond the effect of other state-specific factors. It is the Initiative effect relative to the WSRG.

Note that we view the Initiative effect relative to the WSRG as a sensitivity analysis. Our primary analysis is calculated with respect to the national comparison group. In fact, there is an important advantage to calculating the Initiative effect relative to the national comparison group. There could be a spillover effect from NFI that leads to reductions in hospitalizations of nursing home residents within the same state where the ECCP is operating. If this is occurring, it would not make sense to try to capture the effect of the NFI intervention above and beyond the effect of being in the specific state, which is the goal of the above formulation. Thus, our primary analysis is based on this model[23]:

$$\textbf{Model 4: } Y_{ijt} = \beta_0 + \beta_x^* X_{ijt} + \beta_z^* Z_{jt} + \beta_{WSRG}^* WSRG + \beta_{IG}^* IG + \beta_t^* YC_t + \beta_{t\_WSRG}^* YC_t^* WSRG + \beta_{t\_IG}^* YC_t^* IG + \beta_p^* Post + \beta_{WSRG,p}^* (WSRG^* Post) + \beta_{IG,p}^* (IG^* Post) + \varepsilon_{ijt}$$

This model is analogous to the prior model except that an indicator for WSRG instead of an indicator for the whole state is used. The indicator variable, WSRG, equals 1 for would-be eligible residents in non-intervention group facilities in an Initiative-participating state and WSRG = 0 both for residents in intervention group facilities and residents in other states (from the national

[23] In theory, we could use Model 3 and simply sum the terms $\beta_{IG,p} + \beta_{state,p}$. Note also that Model 4 and Model 2 both obtain the effect of the Initiative relative to the national sample. The only difference is whether nursing facility residents in the WSRG are included in the analysis (Model 4) or altogether omitted (Model 2).

comparison group). Here, $\beta_{IG,p}$*(IG*Post) functions like a standard DD coefficient, identifying the effect of the intervention as the difference between change in the intervention group relative to its baseline and the change in the national comparison group relative to its baseline, and not accounting for the effect of being in the specific state. It is the effect relative to the national comparison group. In ***Appendix Q***, we present the effect relative to the WSRG. In the main report, we present only the effect relative to the national comparison group.

Thus, to summarize, we present three different regression analyses, considering the first one primary and the others to be sensitivity analyses:

1. Adjusting for baseline trends and using a national comparison group (Model 4)
2. Adjusting for baseline trends and using a WSRG (Model 3)
3. Using 2016 as the baseline year and using a national comparison group (Model 1 except that the members of the WSRG are included in the analytical sample as they are in Model 4)

K.11.4 Utilization Probability Models

For the probability of discrete events, such as the probability of a hospitalization, we used the general equation above to fit a logistic regression model that predicts the probability of the event. We estimated robust standard errors that accounted for clustering at the nursing facility level.

As a sensitivity analysis based on data from 2017, we ran two other models that addressed the clustering issue differently:

- We employed a Generalized Estimating Equation model approach, with the binomial distribution and the logit link function specified. An exchangeable working correlation structure was further specified, which allowed us to obtain parameter estimates and standard errors that account for within-facility correlation of observations. Robust standard errors were estimated, which are valid even if the correlation structure is not exactly as specified. This approach corrects the standard errors of the coefficients in the models and impacts the parameter estimates themselves.
- A model with nursing facility-level random effects.

With these models, weighting the observations based on exposure time was not possible. Since results were similar in these sensitivity analyses to the original logistic regression model, we used the original model in the final analysis.

K.11.5 Utilization Count Models

To account for the fact that some residents used a given type of service more than once during their Initiative-eligible period in a year, we also estimated a parallel set of models whereby the dependent variable was defined as the count of utilization events. We considered both a Poisson model and a negative binomial model. Since preliminary analysis suggested that the simple

Poisson models were inadequate, given the overdispersion of the data—that is, greater variability in the data set than would be expected from a Poisson model—we ultimately used negative binomial models. We estimated robust standard errors that accounted for clustering at the nursing facility level.

K.11.6 Medicare Expenditure Models

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

For specific subcategories of service utilization such as all-cause hospitalizations, many residents have zero utilization and expenditure for these services. To overcome this issue, we employed a two-part model rather than a simple GLM model. The first part predicted the probability of service utilization, whereby the outcome equals 1 if a resident had any positive expenditure and zero otherwise. The second part was conditional on having any positive expenditure and incorporates a GLM model (log link function and Gamma distribution) for service users only that predicts their expected spending. For both parts of the model, we adjusted the standard errors to account for facility-level clustering. Then, using predicted values obtained from these two models, the predicted expenditure per resident was calculated by multiplying the probability of having any positive expenditure (from the part-one model) by the expected amount of expenditure (from the part-two model). At the end of this process, the two-part model yielded a predicted amount of spending for all residents included in the first part of the model, including both actual users and nonusers.

Note that a small number of observations with negative expenditures were deleted in this analysis. Furthermore, we deleted observations where we considered the expenditures to be an outlier, using a cutoff of $500,000 in 2014 for total Medicare expenditures, adjusting for yearly inflation. See ***Table K-3*** above for the number excluded for each of these reasons.

K.11.7 Estimation of Initiative Effects

For presentation of multivariate regression model results, we calculated and reported the Initiative effect, or the marginal effect of the intervention, on each outcome in meaningful units, such as dollars or percentage points. (The estimated values of coefficients in the models were often not in easily interpretable units). Conceptually, the marginal effect is the effect of a change in a given predictor variable on the conditional mean of the dependent variable. In a linear regression model, the marginal effect for a given covariate equals the slope coefficient for that covariate (or an incremental change if a binary 1/0 variable is used). In the DD context with a linear model, the intervention effect is equal to the slope of the IG*Post term. However, for nonlinear models, such

as those in our analyses, it is not as straightforward to obtain the marginal effects in useful units; this form of an effect can be different for each observed case.[24]

Various methods exist to calculate the average marginal effects; we followed a widely adopted method. We compute the predicted outcome and the marginal effect for each observation in the treatment group in the post period with respect to a predictor variable of primary interest (which in our case is IG*Post). More specifically, we follow these steps, using Medicare expenditure as an example outcome:

1. For each observation with IG = 1 and Post = 1, we forced the term IG*Post to equal zero, leaving the values for all other independent variables as is, and we used the inverse link function to compute the predicted expenditure. This is the expected expenditure in the absence of the intervention.
2. For the same observation, we repeated everything in the first step, except resetting IG*Post to 1, to compute the predicted amount of expenditure after accounting for the intervention.
3. We took the difference between the two predicted expenditure amounts obtained in steps 1 and 2. This is the marginal effect for that observation.
4. We repeated the two steps above for all observations with IG = 1 and Post = 1.
5. We computed the average of all the marginal effects, which was the average marginal effect related to IG*Post. We are comparing two populations that have the same values on all the independent variables in the model except IG*Post. Because the only difference between them was whether the intervention effect was included in the prediction, the difference in their expected expenditure amounts can be attributed to the effect of the intervention.
6. Going back to step 1, we computed the average of all the predicted values for all observations with IG = 1 and Post = 1 to obtain the group-level average predicted expenditure.
7. We divide the marginal effect by the predicted mean to obtain the relative effect. Thus, if the predicted mean expenditure in the absence of the intervention was $10,000 and the marginal effect was a reduction in expenditure of $1,000, the relative effect would be a 10 percent reduction in expenditure.

K.12 Interpreting the Initiative Effects

The marginal effect for the interaction term IG*Post indicates the average effect of the intervention on the outcome. For a dichotomous utilization outcome, the marginal effect is the difference in the predicted probabilities of the outcome event with and without the intervention. It represents the

[24] Karaca-Mandic, P., Norton, E., and Dowd, B. Interaction Terms in Nonlinear Models. HSR. 47(1):255-274, 2012.

average effect of the Initiative on the probability of the event occurring during the resident's Initiative-eligible period, which on average is less than 365 days (about 250 days).

For count outcomes, the Intervention effect represents the average effect of the Initiative on the count of events per resident during their Initiative-eligible period.

For expenditure outcomes, the Intervention effect represents the average effect of the Initiative on expenditures per resident-year. This is the anticipated effect of the Initiative if all residents were eligible for all 365 days in an intervention year, for example, FY 2018 (and assuming their expenditure patterns would be the same for the 365 days as they were for the shorter period during which we observed them).

For the presentation of multivariate regression results in ***Appendix R***, we reported the average marginal effect of the ECCP intervention on each outcome as well as its 90 percent confidence interval and the p-value (obtained using the delta method).

Furthermore, we divided the average marginal effect for each outcome by its overall predicted mean value for the intervention group in the post period of interest (herein, FY 2018) so that the magnitude of the effect can be interpreted as a percent change from the mean value, which also facilitates comparison of effect sizes across outcomes and states.

K.13 Future Planned Refinements

We will continue to interview key state administrators and other stakeholders to develop an understanding of the local policy environment and any other potentially competing initiatives (see ***Appendix H***). These interviews will also keep RTI up to date on changes in Medicare rulemaking, the MA program, other initiatives sponsored by CMS, and/or changes in individual Medicaid state plans and programs. The presence of these federal- and state-level programs will likely affect both the Initiative and the comparison groups, but perhaps not to the same degree. We have also added questions to our site visit protocol to assess the impact of managed care, particularly I-SNP penetration, as well as other activities that may have overlapping effects with the Initiative, including interventions to reduce hospital readmissions during post-acute periods that coincide with SNF coverage.

To further track and explore the impact of MA/I-SNP penetration over time, we plan to use Medicare MA enrollment data. We could then incorporate this information into our analyses, including possibly using the information as a covariate and/or including this information in subgroup analyses.

APPENDIX L
DESCRIPTIVE STATISTICS OF VARIABLES USED AS REGRESSION COVARIATES

Appendix L presents descriptive statistics on the final set of resident- and facility-level model covariates, including annual percentages for categorical variables and means and standard deviations for continuous variables, from FY 2014–2018. These descriptive statistics are summarized separately for each of the following groups:

- ***Table L-1***: The national comparison group
- ***Table L-2***: The Clinical + Payment group, combining all ECCPs
- ***Table L-3***: The Payment-Only group, combining all ECCPs

Table L-1. Resident and facility characteristics: Annual percentages (categorical variables) or means and standard deviations (continuous variables), FY 2014–2018, national comparison group

Characteristic	2014	2015	2016	2017	2018
Resident-level characteristics:					
Basic information					
Residents meeting eligibility criteria	728,716	683,120	666,154	646,925	625,193
Mean exposure (days)	246.89 (132.62)	241.76 (133.47)	245.62 (133.21)	242.92 (133.08)	242.48 (133.16)
Exposure days 1–89	20.33	21.16	20.51	20.81	20.87
Exposure days 90–179	14.17	15.25	14.55	15.15	15.31
Exposure days 180–269	10.59	10.58	10.67	10.67	10.57
Exposure days 270–364	9.35	9.11	9.40	9.30	9.18
Exposure days 365/366	45.56	43.91	44.87	44.07	44.07
Male, < 65	5.81	5.75	5.99	6.11	6.25
Male, 65–69	3.43	3.56	3.85	4.16	4.38
Male, 70–74	4.06	4.16	4.28	4.48	4.72
Male, 75–79	4.60	4.66	4.73	4.80	4.95
Male, 80–84	5.07	5.05	5.04	5.07	5.10
Male, 85–89	4.89	4.95	4.83	4.76	4.64
Male, 90–94	2.90	2.96	2.96	2.92	2.89
Male, 95+	0.88	0.92	0.96	0.97	0.97
Female, < 65	4.84	4.83	4.97	5.04	5.13
Female, 65–69	3.79	3.91	4.18	4.37	4.43
Female, 70–74	5.33	5.51	5.69	5.84	6.14
Female, 75–79	7.90	7.86	7.80	7.87	8.00
Female, 80–84	12.00	11.63	11.34	11.12	10.93
Female, 85–89	15.65	15.25	14.68	14.09	13.49
Female, 90–94	12.67	12.74	12.43	12.09	11.66
Female, 95+	6.19	6.27	6.27	6.32	6.30
White, non-Hispanic	77.60	77.71	77.46	76.94	76.26
Black, non-Hispanic	12.95	12.80	12.96	13.17	13.46
Asian	1.64	1.59	1.75	1.87	1.98
Hispanic	5.16	5.01	5.03	5.20	5.42
Other race/ethnicity	2.64	2.89	2.80	2.82	2.87
Full dual eligibility	80.61	79.98	80.71	80.97	81.73
Original eligibility because of disability	16.13	16.49	17.24	18.04	18.96
Health status					
Dementia	53.81	53.37	52.82	52.90	52.24
Anemia	30.31	30.26	29.81	29.65	29.85
BMI <18.5	6.99	7.05	7.01	6.93	6.86
BMI = 18.5–24.9	37.91	37.71	37.51	36.99	36.63
BMI = 25–29.9	28.51	28.28	28.11	28.09	27.90
BMI >= 30	26.59	26.96	27.37	27.99	28.62
ADL score= 0–7	12.39	11.82	11.62	11.63	11.89
ADL score= 8–14	17.15	16.82	16.86	17.03	17.34
ADL score= 15–21	50.45	52.37	53.47	54.31	54.50
ADL score= 22–28	20.02	18.98	18.04	17.03	16.28
Resident's mood assessment (PHQ)	2.57 (3.64)	2.44 (3.55)	2.29 (3.42)	2.15 (3.32)	2.03 (3.24)

(continued)

Table L-1. Resident and facility characteristics: Annual percentages (categorical variables) or means and standard deviations (continuous variables), FY 2014–2018, national comparison group (continued)

Characteristic	2014	2015	2016	2017	2018
CFS= 3 (Severely impaired)	11.12	10.68	10.29	9.90	9.61
CFS= 2 (Moderately impaired)	34.82	34.36	33.62	33.21	32.71
CFS= 1 (Mildly impaired)	22.79	22.94	23.24	23.13	23.65
CFS= 0 (Cognitively intact)	31.27	32.02	32.85	33.76	34.03
Neurogenic bladder	2.40	2.47	2.69	3.07	3.29
Obstructive uropathy	0.78	0.85	1.00	1.29	1.59
ESRD patient with dialysis status	2.53	2.61	2.70	2.76	2.85
ESRD patients after transplant who are not on dialysis after transplant	0.09	0.09	0.10	0.10	0.10
Hierarchical Condition Categories					
HIV/AIDS (HCC 1)	0.27	0.29	0.31	0.35	0.35
Septicemia, Sepsis, Systemic Inflammatory Response Syndrome/Shock (HCC 2)	12.20	12.95	14.15	14.49	15.33
Opportunistic Infections (HCC 6)	0.56	0.53	0.59	0.65	0.64
Metastatic Cancer and Acute Leukemia (HCC 8)	0.98	0.98	1.01	1.02	1.08
Lung and Other Severe Cancers (HCC 9)	1.14	1.14	1.20	1.13	1.16
Lymphoma and Other Cancers (HCC 10)	1.22	1.23	1.26	1.16	1.17
Colorectal, Bladder, and Other Cancers (HCC 11)	1.75	1.75	1.78	1.69	1.67
Breast, Prostate, and Other Cancers and Tumors (HCC 12)	3.80	3.78	3.85	3.73	3.74
Diabetes with Acute Complications (HCC 17)	1.10	1.09	1.28	1.26	1.42
Diabetes with Chronic Complications (HCC 18)	21.22	21.77	25.29	28.72	30.49
Diabetes without Complication (HCC 19)	17.86	17.57	14.51	11.41	10.09
Protein-Calorie Malnutrition (HCC 21)	10.55	10.52	10.88	11.10	11.90
Other Significant Endocrine and Metabolic Disorders (HCC 23)	4.54	4.63	5.10	5.35	5.79
End-Stage Liver Disease (HCC 27)	0.79	0.82	0.88	0.87	0.92
Cirrhosis of Liver (HCC 28)	0.73	0.77	0.80	0.82	0.92
Chronic Hepatitis (HCC 29)	0.42	0.45	0.51	0.58	0.66
Intestinal Obstruction/Perforation (HCC 33)	4.24	4.22	4.22	4.19	4.26
Chronic Pancreatitis (HCC 34)	0.31	0.32	0.33	0.33	0.35
Inflammatory Bowel Disease (HCC 35)	0.85	0.85	0.91	0.92	0.91
Bone/Joint/Muscle Infections/Necrosis (HCC 39)	3.11	3.22	3.36	3.31	3.45
Rheumatoid Arthritis and Inflammatory Connective Tissue Disease (HCC 40)	4.89	5.07	5.29	5.52	5.56
Severe Hematological Disorders (HCC 46)	0.89	0.79	0.84	0.86	0.80
Disorders of Immunity (HCC 47)	1.63	1.64	1.81	1.79	1.87
Coagulation Defects and Other Specified Hematological Disorders (HCC 48)	8.56	8.40	8.71	8.81	9.28
Drug/Alcohol Psychosis (HCC 54)	1.64	1.66	1.52	0.84	0.86
Drug/Alcohol Dependence (HCC 55)	1.75	1.94	2.51	3.42	3.63
Schizophrenia (HCC 57)	7.21	7.14	7.96	8.64	9.22
Major Depressive, Bipolar, and Paranoid Disorders (HCC 58)	17.90	18.32	21.80	26.93	29.99

(continued)

Table L-1. Resident and facility characteristics: Annual percentages (categorical variables) or means and standard deviations (continuous variables), FY 2014–2018, national comparison group (continued)

Characteristic	2014	2015	2016	2017	2018
Quadriplegia (HCC 70)	1.37	1.58	1.86	2.08	2.32
Paraplegia (HCC 71)	1.07	1.12	1.18	1.22	1.26
Spinal Cord Disorders/Injuries (HCC 72)	1.29	1.29	1.30	1.10	1.06
Amyotrophic Lateral Sclerosis and Other Motor Neuron Disease (HCC 73)	0.18	0.18	0.18	0.17	0.17
Cerebral Palsy (HCC 74)	0.88	0.91	1.00	1.09	1.10
Myasthenia Gravis/Myoneural Disorders and Guillain-Barre Syndrome/Inflammatory and Toxic Neuropathy (HCC 75)	1.25	1.27	1.38	1.35	1.53
Muscular Dystrophy (HCC 76)	0.15	0.14	0.17	0.16	0.16
Multiple Sclerosis (HCC 77)	1.60	1.61	1.66	1.68	1.70
Parkinson's and Huntington's Diseases (HCC 78)	7.50	7.47	7.60	7.80	7.83
Seizure Disorders and Convulsions (HCC 79)	11.99	12.15	12.43	12.54	12.90
Coma, Brain Compression/Anoxic Damage (HCC 80)	1.30	1.33	1.47	1.67	2.08
Respiratory Arrest (HCC 83)	0.18	0.17	0.16	0.15	0.13
Cardio-Respiratory Failure and Shock (HCC 84)	9.92	10.45	11.32	11.91	12.84
Congestive Heart Failure (HCC 85)	31.86	31.78	32.15	31.96	32.62
Acute Myocardial Infarction (HCC 86)	3.04	3.01	3.43	4.32	4.69
Unstable Angina and Other Acute Ischemic Heart Disease (HCC 87)	2.65	2.63	2.55	1.87	2.05
Angina Pectoris (HCC 88)	1.91	1.85	2.22	2.84	2.97
Specified Heart Arrhythmias (HCC 96)	26.54	26.93	27.51	27.49	27.95
Cerebral Hemorrhage (HCC 99)	2.32	2.39	2.56	2.52	2.62
Ischemic or Unspecified Stroke (HCC 100)	14.72	14.53	14.44	12.27	12.98
Hemiplegia/Hemiparesis (HCC 103)	8.42	8.50	9.31	10.45	10.87
Monoplegia, Other Paralytic Syndromes (HCC 104)	0.48	0.45	0.47	0.41	0.48
Atherosclerosis of the Extremities with Ulceration or Gangrene (HCC 106)	2.79	2.80	2.99	3.17	3.28
Vascular Disease with Complications (HCC 107)	3.98	4.01	4.16	4.21	4.38
Vascular Disease (HCC 108)	44.39	44.68	45.96	44.35	44.94
Cystic Fibrosis or Chronic Obstructive Pulmonary Disease (HCC 110 or HCC 111)	25.83	25.68	26.09	26.26	26.64
Fibrosis of Lung and Other Chronic Lung Disorders (HCC 112)	0.83	0.79	0.81	0.72	0.75
Aspiration and Specified Bacterial Pneumonias (HCC 114)	6.95	6.77	7.15	7.14	7.40
Pneumococcal Pneumonia, Empyema, Lung Abscess (HCC 115)	0.72	0.63	0.78	1.21	2.51
Proliferative Diabetic Retinopathy and Vitreous Hemorrhage (HCC 122)	1.21	1.22	1.27	1.27	1.37
Exudative Macular Degeneration (HCC 124)	2.01	2.09	2.19	2.27	2.27
Acute Renal Failure (HCC 135)	15.28	15.99	16.84	17.39	18.25

(continued)

Table L-1. Resident and facility characteristics: Annual percentages (categorical variables) or means and standard deviations (continuous variables), FY 2014–2018, national comparison group (continued)

Characteristic	2014	2015	2016	2017	2018
Chronic Kidney Disease, Stage 5 (HCC 136)	0.88	0.84	0.75	0.67	0.62
Chronic Kidney Disease, Severe (Stage 4) (HCC 137)	1.07	1.09	1.21	1.35	1.41
Pressure Ulcer of Skin with Necrosis Through to Muscle, Tendon, or Bone (HCC 157)	1.75	1.82	2.12	2.48	2.54
Pressure Ulcer of Skin with Full Thickness Skin Loss (HCC 158)	3.37	3.52	4.16	4.81	5.16
Chronic Ulcer of Skin, Except Pressure (HCC 161)	6.71	6.65	6.56	6.06	6.65
Severe Head Injury or Major Head Injury (HCC 166 or HCC 167)	2.46	2.52	2.59	2.44	2.52
Vertebral Fractures without Spinal Cord Injury (HCC 169)	2.98	3.08	3.08	2.82	2.93
Hip Fracture/Dislocation (HCC 170)	6.75	6.83	6.76	5.78	5.73
Complications of Specified Implanted Device or Graft (HCC 176)	4.68	4.85	5.53	5.91	6.06
Artificial Openings for Feeding or Elimination (HCC 188)	5.79	5.76	5.98	6.13	6.27
Amputation Status, Lower Limb/Amputation Complications (HCC 189)	1.45	1.49	1.64	1.76	1.88
Participation in other initiatives					
Community-based Care Transition Program (CCTP)	0.69	0.89	0.70	0.24	0.0
Comprehensive ESRD Care (CEC)	0.0	0.0	0.09	0.23	0.39
Comprehensive Primary Care Initiative (CPCI)	0.32	0.29	0.22	0.10	0.0
Comprehensive Primary Care Plus (CPC+), non-SSP Participants	0.0	0.0	0.0	0.58	0.85
Comprehensive Primary Care Plus (CPC+), SSP Participants	0.0	0.0	0.0	0.66	0.79
MMCO Financial Alignment Demonstration (Duals) (DEMME)	0.26	0.36	0.39	0.57	0.65
Next Generation Accountable Care Organization (NGACO)	0.0	0.0	1.42	3.34	4.18
Pioneer Accountable Care Organization Model	3.03	2.49	1.98	0.55	0.0
Medicare Shared Savings Program	16.01	20.27	23.35	23.16	21.63
Facility-level characteristics					
Hospital based	2.05	1.38	2.47	2.10	2.30
For profit	76.49	75.84	75.36	75.77	75.89
Metropolitan	73.69	73.11	72.34	72.45	72.38
Urban nonmetropolitan	23.18	23.68	24.38	24.25	24.34
Rural	3.13	3.20	3.27	3.30	3.28
N (Facilities)	10,917	10,917	11,004	11,038	11,196

ADL = activities of daily living; BMI = body mass index; CFS = cognitive function scale; ESRD = end-stage renal disease; PHQ = Patient Health Questionnaire.

SOURCE: RTI analysis of MDS 3.0, Medicare claims data, and CASPER data (RTI program: MS125).

NOTES: Number in parentheses are standard deviations for continuous variables.

Table L-2. Resident and facility characteristics: Annual percentages (categorical variables) or means and standard deviations (continuous variables), FY 2014–2018, Clinical + Payment

Characteristic	2014	2015	2016	2017	2018
Resident-level characteristics:					
Basic information					
Residents meeting eligibility criteria	12,581	12,346	11,787	11,494	10,622
Mean exposure (days)	248.95 (132.84)	245.56 (133.58)	247.99 (133.41)	244.06 (133.24)	238.31 (134.48)
Exposure days 1–89	20.38	20.65	20.11	20.93	21.86
Exposure days 90–179	13.35	14.91	14.50	14.73	16.02
Exposure days 180–269	10.33	10.02	10.07	10.65	10.25
Exposure days 270–364	9.14	8.25	8.78	8.60	8.47
Exposure days 365/366	46.81	46.18	46.54	45.08	43.39
Male, < 65	5.98	6.50	6.54	6.80	6.78
Male, 65–69	3.39	3.56	4.16	4.68	4.86
Male, 70–74	4.31	4.43	4.48	4.44	4.83
Male, 75–79	4.68	4.80	4.47	5.11	5.30
Male, 80–84	4.77	5.11	4.83	4.80	5.27
Male, 85–89	4.59	4.79	4.43	4.45	4.45
Male, 90–94	2.34	2.34	2.33	2.26	2.48
Male, 95+	0.72	0.75	0.71	0.79	0.85
Female, < 65	4.98	5.14	5.58	5.32	5.33
Female, 65–69	3.86	4.12	4.15	4.38	4.55
Female, 70–74	5.72	6.09	5.98	5.97	6.38
Female, 75–79	8.53	8.27	8.20	7.93	7.96
Female, 80–84	12.17	11.63	11.80	11.02	10.43
Female, 85–89	15.60	14.88	14.50	13.83	12.89
Female, 90–94	12.51	11.96	11.98	12.06	11.51
Female, 95+	5.84	5.63	5.86	6.15	6.14
White, non-Hispanic	74.04	73.28	73.71	72.71	71.68
Black, non-Hispanic	18.45	18.57	18.21	18.73	19.10
Asian	1.23	1.44	1.72	1.94	2.43
Hispanic	4.46	4.14	4.03	4.22	4.60
Other race/ethnicity	1.82	2.57	2.33	2.40	2.18
Full dual eligibility	85.06	85.29	85.38	85.85	85.80
Original eligibility because of disability	16.79	17.31	17.44	18.88	19.04
Health status					
Dementia	55.50	54.89	54.18	53.35	52.39
Anemia	30.95	32.97	31.93	31.36	31.67
BMI <18.5	7.14	6.76	7.63	8.01	8.03
BMI = 18.5–24.9	39.20	38.38	37.41	37.45	37.95
BMI = 25–29.9	28.22	28.37	28.12	27.15	26.54
BMI >= 30	25.44	26.50	26.84	27.38	27.48
ADL score= 0–7	9.43	9.88	10.30	9.83	8.83
ADL score= 8–14	15.03	14.73	14.30	14.90	14.98
ADL score= 15–21	51.56	53.02	54.05	54.81	56.17
ADL score= 22–28	23.98	22.36	21.35	20.45	20.02
Resident's mood assessment (PHQ)	2.31 (3.41)	2.43 (3.49)	2.58 (3.65)	2.59 (3.64)	2.26 (3.34)

(continued)

Table L-2. Resident and facility characteristics: Annual percentages (categorical variables) or means and standard deviations (continuous variables), FY 2014–2018, Clinical + Payment (continued)

Characteristic	2014	2015	2016	2017	2018
CFS= 3 (Severely impaired)	12.42	11.64	10.93	10.46	10.60
CFS= 2 (Moderately impaired)	32.42	32.12	33.32	32.21	31.60
CFS= 1 (Mildly impaired)	22.14	22.40	22.20	22.56	22.96
CFS= 0 (Cognitively intact)	33.03	33.84	33.55	34.77	34.83
Neurogenic bladder	2.49	2.75	2.83	2.92	3.07
Obstructive uropathy	0.74	0.94	1.09	1.55	1.81
ESRD patient with dialysis status	3.36	3.43	3.66	3.61	4.10
ESRD patients after transplant who are not on dialysis after transplant	0.12	0.12	0.16	0.17	0.17
Hierarchical Condition Categories					
HIV/AIDS (HCC 1)	0.67	0.69	0.77	0.76	0.95
Septicemia, Sepsis, Systemic Inflammatory Response Syndrome/Shock (HCC 2)	13.65	13.73	14.38	15.11	16.07
Opportunistic Infections (HCC 6)	0.59	0.53	0.60	0.59	0.58
Metastatic Cancer and Acute Leukemia (HCC 8)	1.07	1.09	1.20	1.19	1.31
Lung and Other Severe Cancers (HCC 9)	1.31	1.37	1.19	1.29	1.21
Lymphoma and Other Cancers (HCC 10)	1.36	1.43	1.32	1.17	1.34
Colorectal, Bladder, and Other Cancers (HCC 11)	1.66	1.80	1.91	1.72	1.98
Breast, Prostate, and Other Cancers and Tumors (HCC 12)	3.99	4.13	4.13	3.80	3.91
Diabetes with Acute Complications (HCC 17)	1.20	1.04	1.50	1.47	1.72
Diabetes with Chronic Complications (HCC 18)	19.37	20.57	23.48	27.68	29.34
Diabetes without Complication (HCC 19)	20.02	19.30	17.42	13.02	11.89
Protein-Calorie Malnutrition (HCC 21)	11.37	11.46	11.18	10.84	12.65
Other Significant Endocrine and Metabolic Disorders (HCC 23)	4.86	4.48	5.00	5.66	6.25
End-Stage Liver Disease (HCC 27)	0.86	0.62	0.70	0.77	0.77
Cirrhosis of Liver (HCC 28)	0.69	0.66	0.76	0.73	0.86
Chronic Hepatitis (HCC 29)	0.51	0.58	0.65	0.71	0.86
Intestinal Obstruction/Perforation (HCC 33)	4.80	4.53	4.49	4.60	4.86
Chronic Pancreatitis (HCC 34)	0.29	0.33	0.37	0.39	0.39
Inflammatory Bowel Disease (HCC 35)	1.21	0.79	0.98	1.06	1.12
Bone/Joint/Muscle Infections/Necrosis (HCC 39)	3.75	3.73	3.93	3.73	4.10
Rheumatoid Arthritis and Inflammatory Connective Tissue Disease (HCC 40)	4.49	4.67	5.19	4.76	5.15
Severe Hematological Disorders (HCC 46)	1.02	0.88	0.76	0.89	0.90
Disorders of Immunity (HCC 47)	1.72	1.53	1.80	1.69	1.91
Coagulation Defects and Other Specified Hematological Disorders (HCC 48)	10.19	9.59	9.76	9.75	10.12
Drug/Alcohol Psychosis (HCC 54)	1.61	1.81	1.65	1.11	0.75
Drug/Alcohol Dependence (HCC 55)	1.75	1.89	2.21	2.98	3.74
Schizophrenia (HCC 57)	6.10	6.63	6.91	8.18	9.25
Major Depressive, Bipolar, and Paranoid Disorders (HCC 58)	17.34	19.42	23.33	26.84	31.13

(continued)

Table L-2. Resident and facility characteristics: Annual percentages (categorical variables) or means and standard deviations (continuous variables), FY 2014–2018, Clinical + Payment (continued)

Characteristic	2014	2015	2016	2017	2018
Quadriplegia (HCC 70)	1.80	2.18	2.08	2.33	2.61
Paraplegia (HCC 71)	1.03	1.17	1.02	1.38	1.41
Spinal Cord Disorders/Injuries (HCC 72)	1.54	1.64	1.22	1.03	0.99
Amyotrophic Lateral Sclerosis and Other Motor Neuron Disease (HCC 73)	0.17	0.23	0.26	0.19	0.26
Cerebral Palsy (HCC 74)	1.20	1.20	1.23	1.33	1.20
Myasthenia Gravis/Myoneural Disorders and Guillain-Barre Syndrome/Inflammatory and Toxic Neuropathy (HCC 75)	1.47	1.51	1.59	1.54	1.58
Muscular Dystrophy (HCC 76)	0.21	0.15	0.17	0.19	0.20
Multiple Sclerosis (HCC 77)	1.95	2.11	2.42	2.36	2.43
Parkinson's and Huntington's Diseases (HCC 78)	7.31	7.76	7.53	7.83	8.17
Seizure Disorders and Convulsions (HCC 79)	14.17	14.56	14.80	14.33	14.61
Coma, Brain Compression/Anoxic Damage (HCC 80)	1.44	1.66	1.55	1.77	2.57
Respiratory Arrest (HCC 83)	0.22	0.22	0.18	0.12	0.12
Cardio-Respiratory Failure and Shock (HCC 84)	9.93	10.88	11.08	12.01	13.22
Congestive Heart Failure (HCC 85)	33.63	33.61	34.13	34.74	34.30
Acute Myocardial Infarction (HCC 86)	3.46	2.96	3.63	4.61	4.83
Unstable Angina and Other Acute Ischemic Heart Disease (HCC 87)	3.13	3.28	3.11	2.22	2.94
Angina Pectoris (HCC 88)	1.49	1.49	2.10	2.92	3.15
Specified Heart Arrhythmias (HCC 96)	26.32	26.74	27.24	26.74	26.93
Cerebral Hemorrhage (HCC 99)	2.48	2.75	2.87	2.86	3.10
Ischemic or Unspecified Stroke (HCC 100)	16.06	15.27	15.34	12.84	13.70
Hemiplegia/Hemiparesis (HCC 103)	9.39	9.82	10.08	10.39	11.18
Monoplegia, Other Paralytic Syndromes (HCC 104)	0.61	0.43	0.36	0.40	0.38
Atherosclerosis of the Extremities with Ulceration or Gangrene (HCC 106)	2.91	3.12	3.64	3.76	3.99
Vascular Disease with Complications (HCC 107)	4.55	4.02	4.07	4.21	4.59
Vascular Disease (HCC 108)	45.82	44.34	44.35	46.35	44.49
Cystic Fibrosis or Chronic Obstructive Pulmonary Disease (HCC 110 or HCC 111)	25.86	25.92	26.71	26.81	26.79
Fibrosis of Lung and Other Chronic Lung Disorders (HCC 112)	0.79	0.80	0.75	0.75	0.67
Aspiration and Specified Bacterial Pneumonias (HCC 114)	6.99	7.10	6.98	6.95	8.19
Pneumococcal Pneumonia, Empyema, Lung Abscess (HCC 115)	0.82	0.69	0.80	1.00	2.22
Proliferative Diabetic Retinopathy and Vitreous Hemorrhage (HCC 122)	1.14	1.27	1.26	1.19	0.95
Exudative Macular Degeneration (HCC 124)	1.63	1.77	1.70	1.83	1.94
Acute Renal Failure (HCC 135)	15.70	16.65	16.61	17.39	18.44

(continued)

Table L-2. Resident and facility characteristics: Annual percentages (categorical variables) or means and standard deviations (continuous variables), FY 2014–2018, Clinical + Payment (continued)

Characteristic	2014	2015	2016	2017	2018
Chronic Kidney Disease, Stage 5 (HCC 136)	1.18	1.13	0.82	0.95	0.73
Chronic Kidney Disease, Severe (Stage 4) (HCC 137)	0.90	1.01	1.04	1.35	1.39
Pressure Ulcer of Skin with Necrosis Through to Muscle, Tendon, or Bone (HCC 157)	2.43	2.29	2.60	3.26	3.25
Pressure Ulcer of Skin with Full Thickness Skin Loss (HCC 158)	4.00	4.54	5.37	6.75	7.07
Chronic Ulcer of Skin, Except Pressure (HCC 161)	8.04	7.92	7.54	5.72	6.45
Severe Head Injury or Major Head Injury (HCC 166 or HCC 167)	2.36	2.35	2.32	2.49	2.25
Vertebral Fractures without Spinal Cord Injury (HCC 169)	2.37	2.49	2.71	2.31	2.65
Hip Fracture/Dislocation (HCC 170)	6.33	6.36	6.07	5.54	5.23
Complications of Specified Implanted Device or Graft (HCC 176)	4.80	5.22	5.94	6.13	6.90
Artificial Openings for Feeding or Elimination (HCC 188)	6.98	7.16	6.66	6.66	7.04
Amputation Status, Lower Limb/Amputation Complications (HCC 189)	1.39	1.63	1.45	1.71	1.83
Participation in other initiatives					
Community-based Care Transition Program (CCTP)	0.25	0.47	0.62	0.30	0.0
Comprehensive ESRD Care (CEC)	0.0	0.0	0.03	0.44	1.06
Comprehensive Primary Care Initiative (CPCI)	0.02	0.02	0.0	0.0	0.0
Comprehensive Primary Care Plus (CPC+), non-SSP Participants	0.0	0.0	0.0	0.03	0.05
Comprehensive Primary Care Plus (CPC+), SSP Participants	0.0	0.0	0.0	0.03	0.02
MMCO Financial Alignment Demonstration (Duals) (DEMME)	0.06	0.0	0.0	0.0	0.0
Next Generation Accountable Care Organization (NGACO)	0.0	0.0	0.02	1.83	4.20
Pioneer Accountable Care Organization Model	5.17	1.61	1.36	0.77	0.0
Medicare Shared Savings Program	9.07	14.57	18.99	18.74	19.82
Facility-level characteristics					
Hospital based	0.95	0.90	0.92	0.84	1.10
For profit	67.67	63.36	62.38	63.65	64.65
Metropolitan	89.08	89.04	88.63	88.94	91.20
Urban nonmetropolitan	10.17	10.15	10.55	10.22	7.96
Rural	0.76	0.81	0.82	0.84	0.85
N (Facilities)	112	112	112	112	111

ADL = activities of daily living; BMI = body mass index; CFS = cognitive function scale; ESRD = end-stage renal disease; PHQ = Patient Health Questionnaire.

SOURCE: RTI analysis of MDS 3.0, Medicare claims data, and CASPER data (RTI program: MS125).

NOTES: Number in parentheses are standard deviations for continuous variables.

Table L-3. Resident and facility characteristics: Annual percentages (categorical variables) or means and standard deviations (continuous variables), FY 2014–2018, Payment-Only

Characteristic	2014	2015	2016	2017	2018
Resident-level characteristics:					
Basic information					
Residents meeting eligibility criteria	14,504	14,187	13,695	13,100	11,986
Mean exposure (days)	247.99	245.71	251.39	247.25	244.86
	(132.42)	(132.21)	(131.60)	(132.65)	(132.17)
Exposure days 1–89	20.02	19.72	19.27	20.11	19.96
Exposure days 90–179	14.27	15.73	13.87	14.69	15.58
Exposure days 180–269	10.67	10.19	10.69	10.27	10.66
Exposure days 270–364	8.55	9.15	9.51	8.85	9.13
Exposure days 365/366	46.48	45.21	46.67	46.08	44.68
Male, < 65	4.74	4.76	5.02	5.04	4.99
Male, 65–69	3.13	3.26	3.49	3.42	3.45
Male, 70–74	3.59	3.54	3.61	4.02	4.33
Male, 75–79	4.54	4.63	4.35	4.34	4.53
Male, 80–84	5.10	5.04	5.08	5.05	4.86
Male, 85–89	5.04	5.06	5.07	5.02	5.07
Male, 90–94	3.03	3.12	3.14	3.39	3.30
Male, 95+	0.97	1.02	0.96	1.06	0.98
Female, < 65	3.85	3.90	3.92	4.31	4.41
Female, 65–69	2.92	3.29	3.53	3.53	3.57
Female, 70–74	5.14	5.04	5.21	5.33	4.96
Female, 75–79	7.77	7.83	7.86	7.78	7.96
Female, 80–84	12.35	12.24	11.78	11.16	11.17
Female, 85–89	16.45	15.93	15.42	15.07	14.65
Female, 90–94	14.37	14.10	14.37	14.03	14.05
Female, 95+	7.01	7.24	7.18	7.45	7.72
White, non-Hispanic	81.82	81.96	82.12	81.65	82.30
Black, non-Hispanic	11.67	11.78	12.06	12.12	11.61
Asian	0.71	0.84	1.00	1.20	1.18
Hispanic	3.53	3.40	3.11	3.31	3.35
Other race/ethnicity	2.27	2.02	1.70	1.72	1.56
Full dual eligibility	81.31	82.00	82.80	82.74	82.65
Original eligibility because of disability	15.86	16.04	16.17	16.66	17.49
Health status					
Dementia	56.16	56.31	56.33	55.31	54.91
Anemia	28.25	28.88	29.19	28.18	27.60
BMI <18.5	6.87	7.05	6.66	6.22	6.57
BMI = 18.5–24.9	38.04	38.13	37.78	37.24	36.03
BMI = 25–29.9	29.34	28.46	28.67	28.13	28.16
BMI >= 30	25.75	26.37	26.89	28.40	29.23
ADL score= 0–7	10.09	10.34	10.68	11.05	11.51
ADL score= 8–14	14.71	15.15	14.98	15.31	15.76
ADL score= 15–21	56.49	58.05	58.99	58.53	57.84
ADL score= 22–28	18.70	16.46	15.35	15.12	14.88

(continued)

Table L-3. Resident and facility characteristics: Annual percentages (categorical variables) or means and standard deviations (continuous variables), FY 2014–2018, Payment-Only (continued)

Characteristic	2014	2015	2016	2017	2018
Resident's mood assessment (PHQ)	2.82 (3.90)	2.79 (3.96)	2.71 (3.94)	2.42 (3.62)	2.23 (3.37)
CFS= 3 (Severely impaired)	11.29	11.11	10.87	10.50	9.69
CFS= 2 (Moderately impaired)	34.71	34.05	34.02	34.01	33.61
CFS= 1 (Mildly impaired)	23.04	22.52	22.62	22.79	24.40
CFS= 0 (Cognitively intact)	30.96	32.32	32.49	32.71	32.29
Neurogenic bladder	2.05	2.19	2.45	2.55	2.94
Obstructive uropathy	1.12	1.25	1.20	1.46	1.80
ESRD patient with dialysis status	2.23	2.37	2.55	2.75	2.83
ESRD patients after transplant who are not on dialysis after transplant	0.06	0.10	0.15	0.13	0.10
Hierarchical Condition Categories					
HIV/AIDS (HCC 1)	0.23	0.22	0.29	0.27	0.36
Septicemia, Sepsis, Systemic Inflammatory Response Syndrome/Shock (HCC 2)	11.58	11.42	13.52	12.94	14.50
Opportunistic Infections (HCC 6)	0.43	0.37	0.47	0.59	0.53
Metastatic Cancer and Acute Leukemia (HCC 8)	0.91	1.04	1.10	1.06	1.13
Lung and Other Severe Cancers (HCC 9)	1.49	1.33	1.12	1.13	1.24
Lymphoma and Other Cancers (HCC 10)	1.32	1.24	1.37	1.42	1.29
Colorectal, Bladder, and Other Cancers (HCC 11)	1.64	1.50	1.68	1.65	1.74
Breast, Prostate, and Other Cancers and Tumors (HCC 12)	3.92	3.82	4.05	3.73	3.80
Diabetes with Acute Complications (HCC 17)	1.11	0.94	1.18	1.15	1.36
Diabetes with Chronic Complications (HCC 18)	18.90	18.71	21.77	25.70	27.47
Diabetes without Complication (HCC 19)	18.48	19.28	15.60	12.58	11.55
Protein-Calorie Malnutrition (HCC 21)	8.00	8.61	9.16	8.76	8.75
Other Significant Endocrine and Metabolic Disorders (HCC 23)	4.05	4.21	4.86	4.85	5.04
End-Stage Liver Disease (HCC 27)	0.65	0.73	0.69	0.67	0.77
Cirrhosis of Liver (HCC 28)	0.57	0.49	0.56	0.69	0.71
Chronic Hepatitis (HCC 29)	0.33	0.40	0.53	0.53	0.52
Intestinal Obstruction/Perforation (HCC 33)	3.91	3.95	4.14	3.66	3.98
Chronic Pancreatitis (HCC 34)	0.30	0.27	0.22	0.29	0.27
Inflammatory Bowel Disease (HCC 35)	1.15	0.94	1.01	0.98	0.93
Bone/Joint/Muscle Infections/Necrosis (HCC 39)	3.07	3.15	3.34	3.11	3.14
Rheumatoid Arthritis and Inflammatory Connective Tissue Disease (HCC 40)	4.84	4.97	5.25	5.57	5.71
Severe Hematological Disorders (HCC 46)	0.73	0.79	0.71	0.90	0.80
Disorders of Immunity (HCC 47)	1.39	1.48	1.62	1.43	1.74
Coagulation Defects and Other Specified Hematological Disorders (HCC 48)	8.90	7.93	8.76	8.24	8.59
Drug/Alcohol Psychosis (HCC 54)	1.52	1.64	1.45	0.57	0.63
Drug/Alcohol Dependence (HCC 55)	1.09	1.42	1.79	2.31	2.45
Schizophrenia (HCC 57)	6.51	6.53	7.00	7.49	7.43
Major Depressive, Bipolar, and Paranoid Disorders (HCC 58)	14.46	14.66	19.16	23.80	25.71

(continued)

Table L-3. Resident and facility characteristics: Annual percentages (categorical variables) or means and standard deviations (continuous variables), FY 2014–2018, Payment-Only (continued)

Characteristic	2014	2015	2016	2017	2018
Quadriplegia (HCC 70)	0.99	1.17	1.47	1.73	1.90
Paraplegia (HCC 71)	0.74	0.94	0.96	0.81	0.93
Spinal Cord Disorders/Injuries (HCC 72)	1.45	1.30	1.28	0.99	0.78
Amyotrophic Lateral Sclerosis and Other Motor Neuron Disease (HCC 73)	0.19	0.16	0.19	0.15	0.09
Cerebral Palsy (HCC 74)	1.07	1.11	1.15	1.31	1.23
Myasthenia Gravis/Myoneural Disorders and Guillain-Barre Syndrome/Inflammatory and Toxic Neuropathy (HCC 75)	1.12	1.39	1.53	0.98	1.12
Muscular Dystrophy (HCC 76)	0.14	0.11	0.17	0.11	0.14
Multiple Sclerosis (HCC 77)	1.55	1.59	1.53	1.59	1.54
Parkinson's and Huntington's Diseases (HCC 78)	7.99	7.81	8.51	8.41	8.31
Seizure Disorders and Convulsions (HCC 79)	11.33	11.91	11.92	11.91	12.29
Coma, Brain Compression/Anoxic Damage (HCC 80)	1.03	1.17	1.20	1.47	1.84
Respiratory Arrest (HCC 83)	0.23	0.20	0.16	0.21	0.17
Cardio-Respiratory Failure and Shock (HCC 84)	9.98	10.21	11.30	11.67	12.62
Congestive Heart Failure (HCC 85)	32.18	32.25	32.95	31.69	32.96
Acute Myocardial Infarction (HCC 86)	2.87	2.64	3.39	4.44	4.90
Unstable Angina and Other Acute Ischemic Heart Disease (HCC 87)	2.71	2.78	2.71	2.28	2.34
Angina Pectoris (HCC 88)	1.43	1.49	1.85	2.32	2.63
Specified Heart Arrhythmias (HCC 96)	26.83	26.93	27.93	27.56	28.37
Cerebral Hemorrhage (HCC 99)	2.20	2.09	2.27	2.30	2.70
Ischemic or Unspecified Stroke (HCC 100)	14.11	14.21	13.37	11.44	12.06
Hemiplegia/Hemiparesis (HCC 103)	7.72	7.87	8.68	9.03	9.76
Monoplegia, Other Paralytic Syndromes (HCC 104)	0.45	0.41	0.37	0.30	0.30
Atherosclerosis of the Extremities with Ulceration or Gangrene (HCC 106)	2.83	2.55	2.71	2.94	3.07
Vascular Disease with Complications (HCC 107)	4.34	3.95	4.26	4.15	4.62
Vascular Disease (HCC 108)	48.60	49.21	47.30	45.51	45.69
Cystic Fibrosis or Chronic Obstructive Pulmonary Disease (HCC 110 or HCC 111)	26.11	25.80	25.83	25.78	26.76
Fibrosis of Lung and Other Chronic Lung Disorders (HCC 112)	0.72	0.62	0.66	0.72	0.83
Aspiration and Specified Bacterial Pneumonias (HCC 114)	6.18	5.80	6.05	6.03	6.38
Pneumococcal Pneumonia, Empyema, Lung Abscess (HCC 115)	0.77	0.60	0.84	0.99	3.01
Proliferative Diabetic Retinopathy and Vitreous Hemorrhage (HCC 122)	1.03	1.12	1.27	1.13	1.00
Exudative Macular Degeneration (HCC 124)	2.20	2.17	2.41	2.52	2.65
Acute Renal Failure (HCC 135)	14.02	14.08	15.55	15.69	16.27

(continued)

Table L-3. Resident and facility characteristics: Annual percentages (categorical variables) or means and standard deviations (continuous variables), FY 2014–2018, Payment-Only (continued)

Characteristic	2014	2015	2016	2017	2018
Chronic Kidney Disease, Stage 5 (HCC 136)	0.65	0.63	0.75	0.82	0.64
Chronic Kidney Disease, Severe (Stage 4) (HCC 137)	1.11	1.23	1.21	1.37	1.56
Pressure Ulcer of Skin with Necrosis Through to Muscle, Tendon, or Bone (HCC 157)	1.57	1.46	1.77	1.95	1.99
Pressure Ulcer of Skin with Full Thickness Skin Loss (HCC 158)	3.44	3.01	3.66	4.80	4.98
Chronic Ulcer of Skin, Except Pressure (HCC 161)	7.07	6.60	6.43	5.82	6.13
Severe Head Injury or Major Head Injury (HCC 166 or HCC 167)	2.42	2.69	2.63	2.26	2.36
Vertebral Fractures without Spinal Cord Injury (HCC 169)	2.83	3.09	3.46	2.76	2.89
Hip Fracture/Dislocation (HCC 170)	6.41	6.14	6.38	5.83	5.58
Complications of Specified Implanted Device or Graft (HCC 176)	4.31	4.14	5.25	5.73	6.06
Artificial Openings for Feeding or Elimination (HCC 188)	4.94	4.65	5.05	5.13	5.23
Amputation Status, Lower Limb/Amputation Complications (HCC 189)	1.25	1.18	1.40	1.60	1.56
Participation in other initiatives					
Community-based Care Transition Program (CCTP)	0.16	0.35	0.53	0.31	0.0
Comprehensive ESRD Care (CEC)	.	.	0.08	0.37	0.58
Comprehensive Primary Care Initiative (CPCI)	1.37	1.40	0.91	0.31	0.0
Comprehensive Primary Care Plus (CPC+), non-SSP Participants	0.0	0.0	0.0	1.43	2.84
Comprehensive Primary Care Plus (CPC+), SSP Participants	0.0	0.0	0.0	0.93	0.44
MMCO Financial Alignment Demonstration (Duals) (DEMME)	0.07	3.06	4.64	5.33	4.40
Next Generation Accountable Care Organization (NGACO)	0.0	0.0	0.04	1.67	3.42
Pioneer Accountable Care Organization Model	1.03	0.51	1.06	0.57	0.0
Medicare Shared Savings Program	11.25	15.94	18.66	19.25	20.15
Facility-level characteristics					
Hospital based	0.0	0.0	0.0	0.67	0.79
For profit	64.66	64.85	64.41	66.72	67.26
Metropolitan	73.30	72.53	72.49	72.11	71.59
Urban nonmetropolitan	24.37	24.99	25.02	25.31	26.11
Rural	2.33	2.48	2.49	2.57	2.29
N (Facilities)	148	148	148	148	148

ADL = activities of daily living; BMI = body mass index; CFS = cognitive function scale; ESRD = end-stage renal disease; PHQ = Patient Health Questionnaire.

SOURCE: RTI analysis of MDS 3.0, Medicare claims data, and CASPER data (RTI program: MS125).

NOTES: Number in parentheses are standard deviations for continuous variables.

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APPENDIX M
DESCRIPTIVE ANALYSIS OF UTILIZATION (PERCENTAGE)

In this section, we present summary results from a descriptive analysis of utilization measures, reporting the annual percentage of residents who were hospitalized, visited the ED, or experienced an acute care transition, for all-cause, potentially avoidable, and the six qualifying conditions aggregated and separately. ***Table M-1*** presents the results from the national comparison group. ***Tables M-2*** through ***M-8*** present the results by intervention group (Clinical + Payment and Payment-Only), combined across all ECCPs, and then separately for each ECCP.

Table M-1. Annual percentage of residents who used each type of service, FY 2014–2018, national comparison group

Event	National comparison group				
	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	728,716	683,120	666,154	646,925	625,193
Mean exposure (days)	246.89	241.76	245.62	242.92	242.48
Any hospitalization (all-cause)	29.36	30.20	29.38	30.03	30.39
Any potentially avoidable hospitalization	15.00	14.96	14.31	14.41	14.38
Any potentially avoidable hospitalization (all six qualifying conditions)	9.64	9.51	8.98	8.98	8.90
Any hospitalization (pneumonia)	4.37	4.32	3.80	3.24	3.63
Any hospitalization (CHF)	1.77	1.80	1.74	1.94	1.96
Any hospitalization (COPD/asthma)	0.94	0.93	0.82	1.30	0.86
Any hospitalization (skin infection)	0.72	0.69	0.60	0.59	0.57
Any hospitalization (dehydration)	0.30	0.25	0.45	0.45	0.45
Any hospitalization (UTI)	2.43	2.38	2.34	2.25	2.18
Any ED visit (all-cause)	25.44	26.26	26.53	26.71	27.38
Any potentially avoidable ED visit	14.40	15.06	15.13	15.15	15.44
Any potentially avoidable ED visit (all six qualifying conditions)	4.91	5.34	5.24	5.39	5.51
Any ED visit (pneumonia)	1.00	1.13	1.02	1.02	1.06
Any ED visit (CHF)	0.48	0.52	0.51	0.56	0.58
Any ED visit (COPD/asthma)	0.55	0.60	0.59	0.60	0.63
Any ED visit (skin infection)	0.47	0.47	0.38	0.39	0.41
Any ED visit (dehydration)	0.49	0.51	0.54	0.55	0.54
Any ED visit (UTI)	2.24	2.46	2.55	2.64	2.67
Any acute care transition (all-cause)	42.83	43.85	43.36	43.91	44.46
Any potentially avoidable acute care transition	25.20	25.62	25.15	25.22	25.40
Any potentially avoidable acute care transition (all six qualifying conditions)	12.99	13.17	12.62	12.75	12.77
Any acute care transition (pneumonia)	4.94	4.96	4.41	3.87	4.28
Any acute care transition (CHF)	2.10	2.14	2.08	2.31	2.35
Any acute care transition (COPD/asthma)	1.38	1.40	1.29	1.76	1.36
Any acute care transition (skin infection)	1.13	1.10	0.93	0.92	0.91
Any acute care transition (dehydration)	0.77	0.74	0.95	0.97	0.96
Any acute care transition (UTI)	4.38	4.53	4.57	4.57	4.54

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS 109).

NOTES: Percentages are based on counting each individual once without regard to the length of their exposure period. Acute care transitions include hospitalizations, ED visits, and observation stays.

Table M-2. Annual percentage of residents who used each type of service, FY 2014–2018, all ECCPs (all states)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	12,581	12,346	11,787	11,494	10,622	14,504	14,187	13,695	13,100	11,986
Mean exposure (days)	248.95	245.56	247.99	244.06	238.31	247.99	245.71	251.39	247.25	244.86
Any hospitalization (all-cause)	27.88	27.78	26.67	26.70	26.96	26.43	27.45	26.05	24.66	26.24
Any potentially avoidable hospitalization	12.57	12.08	11.11	11.35	11.12	13.04	12.98	11.83	10.95	11.99
Any potentially avoidable hospitalization (all six qualifying conditions)	7.19	6.67	6.06	6.15	6.07	7.90	8.06	7.04	6.31	6.67
Any hospitalization (pneumonia)	3.24	2.96	2.28	2.11	2.31	3.53	3.86	2.91	2.06	2.70
Any hospitalization (CHF)	1.35	1.31	1.17	1.45	1.41	1.80	1.68	1.61	1.63	1.80
Any hospitalization (COPD/asthma)	0.58	0.53	0.44	0.80	0.52	0.75	0.64	0.64	0.91	0.57
Any hospitalization (skin infection)	0.52	0.49	0.42	0.33	0.35	0.47	0.59	0.41	0.31	0.42
Any hospitalization (dehydration)	0.16	0.19	0.38	0.35	0.34	0.25	0.22	0.39	0.28	0.27
Any hospitalization (UTI)	1.84	1.70	1.62	1.53	1.53	1.70	1.66	1.53	1.41	1.37
Any ED visit (all-cause)	18.62	18.57	17.81	18.24	18.40	21.48	22.41	21.47	20.86	21.75
Any potentially avoidable ED visit	9.42	9.61	9.45	9.48	9.47	11.53	12.61	12.12	11.16	12.00
Any potentially avoidable ED visit (all six qualifying conditions)	2.31	2.32	2.39	2.24	2.09	3.50	3.77	3.57	3.18	3.55
Any ED visit (pneumonia)	0.37	0.34	0.30	0.38	0.38	0.55	0.73	0.57	0.54	0.53
Any ED visit (CHF)	0.18	0.26	0.18	0.20	0.22	0.33	0.30	0.39	0.34	0.39
Any ED visit (COPD/asthma)	0.22	0.21	0.25	0.20	0.18	0.48	0.41	0.42	0.34	0.36
Any ED visit (skin infection)	0.26	0.21	0.18	0.17	0.13	0.37	0.33	0.31	0.19	0.23
Any ED visit (dehydration)	0.16	0.16	0.28	0.17	0.13	0.34	0.41	0.31	0.32	0.38
Any ED visit (UTI)	1.16	1.18	1.28	1.17	1.10	1.61	1.74	1.80	1.55	1.80

(continued)

Table M-2. Annual percentage of residents who used each type of service, FY 2014–2018, all ECCPs (all states) (continued)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Any acute care transition (all-cause)	37.85	38.01	36.51	36.92	36.88	38.15	39.92	38.17	36.89	38.31
Any potentially avoidable acute care transition	19.72	19.53	18.59	18.70	18.51	21.57	22.42	21.03	19.59	20.97
Any potentially avoidable acute care transition (all six qualifying conditions)	8.89	8.48	8.03	7.87	7.73	10.58	10.85	9.75	8.85	9.25
Any acute care transition (pneumonia)	3.50	3.22	2.49	2.39	2.58	3.90	4.34	3.36	2.40	3.08
Any acute care transition (CHF)	1.45	1.54	1.32	1.61	1.57	2.03	1.84	1.86	1.92	2.09
Any acute care transition (COPD/asthma)	0.75	0.72	0.67	0.96	0.68	1.18	0.97	0.96	1.21	0.83
Any acute care transition (skin infection)	0.76	0.67	0.59	0.50	0.47	0.81	0.87	0.67	0.47	0.63
Any acute care transition (dehydration)	0.31	0.36	0.64	0.52	0.47	0.57	0.62	0.69	0.60	0.65
Any acute care transition (UTI)	2.85	2.75	2.83	2.60	2.57	3.19	3.27	3.22	2.88	3.04

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS 109).

NOTES: Percentages are based on counting each individual once without regard to the length of their exposure period. Acute care transitions include hospitalizations, ED visits, and observation stays.

Table M-3. Annual percentage of residents who used each type of service, FY 2014–2018, AQAF (Alabama)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	2,391	2,425	2,411	2,218	1,532	2,072	2,001	1,950	1,814	1,403
Mean exposure (days)	265.39	259.09	261.71	253.28	225.54	252.88	258.71	259.13	257.49	251.15
Any hospitalization (all-cause)	28.11	30.35	30.24	29.44	29.50	33.25	32.53	29.38	28.39	28.72
Any potentially avoidable hospitalization	14.26	15.26	13.52	13.57	13.45	18.39	16.59	13.64	13.34	14.61
Any potentially avoidable hospitalization (all six qualifying conditions)	8.70	8.82	7.30	7.12	7.31	12.11	10.89	8.56	7.72	8.34
Any hospitalization (pneumonia)	4.06	4.12	2.61	2.43	2.94	5.79	5.45	3.13	2.81	3.06
Any hospitalization (CHF)	1.71	2.02	1.29	1.76	1.63	2.56	1.80	1.79	1.38	2.00
Any hospitalization (COPD/asthma)	0.84	0.91	0.75	1.04	0.46	1.21	0.90	0.87	1.43	1.00
Any hospitalization (skin infection)	0.50	0.33	0.29	0.27	0.20	0.77	0.65	0.41	0.44	0.43
Any hospitalization (dehydration)	0.21	0.41	0.46	0.45	0.52	0.58	0.30	0.41	0.17	0.43
Any hospitalization (UTI)	2.09	1.69	2.28	1.89	2.02	2.56	2.65	2.26	2.04	2.07
Any ED visit (all-cause)	23.09	23.34	22.40	21.64	22.00	25.48	26.14	24.72	23.48	24.73
Any potentially avoidable ED visit	11.84	13.40	12.77	11.77	13.19	13.71	13.94	14.00	12.24	13.26
Any potentially avoidable ED visit (all six qualifying conditions)	3.22	3.92	4.02	2.80	3.52	3.86	3.95	4.31	3.14	4.28
Any ED visit (pneumonia)	0.42	0.37	0.50	0.41	0.72	0.19	0.50	0.46	0.44	0.43
Any ED visit (CHF)	0.42	0.70	0.41	0.32	0.39	0.53	0.40	0.56	0.39	0.78
Any ED visit (COPD/asthma)	0.21	0.37	0.41	0.45	0.20	0.77	0.35	0.67	0.50	0.57
Any ED visit (skin infection)	0.21	0.45	0.17	0.14	0.13	0.43	0.30	0.36	0.11	0.14
Any ED visit (dehydration)	0.13	0.37	0.54	0.32	0.33	0.48	0.35	0.21	0.17	0.57
Any ED visit (UTI)	1.88	1.77	2.12	1.35	1.89	1.54	2.10	2.26	1.54	2.07

(continued)

Table M-3. Annual percentage of residents who used each type of service, FY 2014–2018, AQAF (Alabama) (continued)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Any acute care transition (all-cause)	40.90	42.35	41.56	40.26	40.86	45.95	46.98	42.97	41.57	40.70
Any potentially avoidable acute care transition	23.21	24.91	23.19	22.00	23.24	27.85	26.49	24.36	22.38	23.52
Any potentially avoidable acute care transition (all six qualifying conditions)	11.13	11.79	10.66	9.38	10.05	14.96	14.04	11.74	10.36	11.12
Any acute care transition (pneumonia)	4.35	4.37	2.99	2.84	3.46	5.94	5.75	3.54	3.09	3.42
Any acute care transition (CHF)	1.92	2.68	1.62	1.98	1.96	2.90	2.00	2.26	1.71	2.57
Any acute care transition (COPD/asthma)	0.96	1.20	1.12	1.44	0.59	1.93	1.20	1.38	1.87	1.43
Any acute care transition (skin infection)	0.71	0.78	0.46	0.41	0.33	1.21	0.90	0.72	0.50	0.57
Any acute care transition (dehydration)	0.33	0.78	1.00	0.77	0.85	1.06	0.65	0.62	0.33	1.00
Any acute care transition (UTI)	3.76	3.26	4.15	3.11	3.85	4.01	4.65	4.41	3.53	4.06

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS 109).

NOTES: Percentages are based on counting each individual once without regard to the length of their exposure period. Acute care transitions include hospitalizations, ED visits, and observation stays.

Table M-4. Annual percentage of residents who used each type of service, FY 2014–2018, ATOP2 (Nevada/Colorado)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	1,142	1,118	1,058	1,082	1,093	1,786	1,722	1,645	1,601	1,506
Mean exposure (days)	228.23	238.47	248.09	243.49	246.92	244.97	230.81	240.81	235.47	237.86
Any hospitalization (all-cause)	28.02	29.70	29.77	26.80	29.37	17.81	18.35	18.42	18.36	18.99
Any potentially avoidable hospitalization	12.78	12.08	10.49	10.35	11.62	8.12	7.78	7.72	7.81	7.50
Any potentially avoidable hospitalization (all six qualifying conditions)	6.83	5.90	4.91	5.36	5.95	4.93	4.47	4.56	4.25	3.39
Any hospitalization (pneumonia)	3.42	3.22	1.89	2.13	2.84	2.18	2.21	2.25	1.81	1.26
Any hospitalization (CHF)	0.44	0.27	0.57	1.02	1.19	1.12	0.75	0.73	1.19	0.93
Any hospitalization (COPD/asthma)	0.44	0.18	0.38	0.55	0.55	0.62	0.52	0.12	0.62	0.33
Any hospitalization (skin infection)	0.61	0.27	0.66	0.28	0.46	0.39	0.41	0.30	0.06	0.33
Any hospitalization (dehydration)	0.00	0.18	0.09	0.28	0.27	0.06	0.12	0.61	0.19	0.13
Any hospitalization (UTI)	2.01	2.15	1.42	1.66	1.10	0.73	0.81	0.73	0.56	0.73
Any ED visit (all-cause)	17.08	20.48	16.92	20.89	19.85	19.93	20.67	21.52	20.49	21.25
Any potentially avoidable ED visit	9.46	10.82	8.70	10.91	9.79	10.92	12.14	12.04	10.62	11.49
Any potentially avoidable ED visit (all six qualifying conditions)	2.01	2.33	2.27	2.87	2.29	4.03	4.24	5.11	3.81	3.52
Any ED visit (pneumonia)	0.70	0.18	0.19	0.37	0.27	1.01	1.10	0.85	1.19	1.00
Any ED visit (CHF)	0.09	0.27	0.00	0.28	0.55	0.39	0.29	0.36	0.62	0.20
Any ED visit (COPD/asthma)	0.09	0.45	0.19	0.00	0.27	0.39	0.46	0.55	0.31	0.53
Any ED visit (skin infection)	0.18	0.18	0.28	0.28	0.27	0.67	0.70	0.55	0.31	0.27
Any ED visit (dehydration)	0.09	0.18	0.19	0.18	0.00	0.11	0.23	0.73	0.25	0.13
Any ED visit (UTI)	0.88	1.16	1.42	1.76	1.01	1.57	1.68	2.49	1.44	1.53

(continued)

Table M-4. Annual percentage of residents who used each type of service, FY 2014–2018, ATOP2 (Nevada/Colorado) (continued)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Any acute care transition (all-cause)	37.74	41.50	39.60	39.56	39.07	30.85	32.52	32.52	31.86	32.20
Any potentially avoidable acute care transition	19.53	21.11	17.67	19.04	19.30	16.97	17.89	17.69	16.30	17.00
Any potentially avoidable acute care transition (all six qualifying conditions)	8.41	7.69	6.90	7.49	7.69	8.17	7.90	8.81	7.31	6.44
Any acute care transition (pneumonia)	3.94	3.40	1.98	2.31	2.93	2.91	2.90	2.86	2.56	2.12
Any acute care transition (CHF)	0.53	0.54	0.57	1.29	1.65	1.46	0.93	0.97	1.75	1.06
Any acute care transition (COPD/asthma)	0.53	0.63	0.57	0.55	0.82	0.90	0.87	0.67	0.87	0.80
Any acute care transition (skin infection)	0.79	0.36	0.95	0.55	0.73	1.06	1.05	0.85	0.31	0.60
Any acute care transition (dehydration)	0.09	0.36	0.28	0.46	0.27	0.17	0.35	1.22	0.44	0.27
Any acute care transition (UTI)	2.80	3.22	2.84	3.23	2.10	2.24	2.56	3.16	2.00	2.19

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS 109).

NOTES: Percentages are based on counting each individual once without regard to the length of their exposure period. Acute care transitions include hospitalizations, ED visits, and observation stays.

Table M-5. Annual percentage of residents who used each type of service, FY 2014–2018, MOQI (Missouri)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	1,548	1,604	1,513	1,442	1,357	2,187	2,179	2,056	1,928	1,790
Mean exposure (days)	260.29	248.00	257.78	254.62	249.34	252.51	247.97	261.81	259.21	250.32
Any hospitalization (all-cause)	29.20	27.93	24.19	25.87	27.19	29.04	31.21	28.89	29.20	30.06
Any potentially avoidable hospitalization	13.24	13.59	10.77	11.51	10.61	15.09	16.20	14.59	14.83	14.86
Any potentially avoidable hospitalization (all six qualifying conditions)	7.36	7.67	6.61	6.73	5.90	8.96	10.19	9.05	9.23	9.33
Any hospitalization (pneumonia)	2.91	3.55	2.78	2.08	1.92	4.53	5.69	4.09	2.96	3.97
Any hospitalization (CHF)	1.74	2.12	1.92	2.01	1.62	1.83	1.88	1.99	2.59	2.46
Any hospitalization (COPD/asthma)	0.52	0.31	0.40	0.49	0.66	0.55	0.69	0.92	1.04	0.61
Any hospitalization (skin infection)	0.65	0.81	0.59	0.55	0.29	0.27	0.92	0.63	0.47	0.67
Any hospitalization (dehydration)	0.26	0.12	0.13	0.35	0.44	0.27	0.28	0.39	0.31	0.34
Any hospitalization (UTI)	1.68	1.31	1.32	1.53	1.55	2.06	1.51	1.99	2.28	2.18
Any ED visit (all-cause)	20.87	16.27	16.85	17.41	17.69	27.62	26.62	26.51	27.28	28.21
Any potentially avoidable ED visit	10.66	7.67	8.92	9.02	8.47	16.42	16.48	16.05	17.01	16.42
Any potentially avoidable ED visit (all six qualifying conditions)	2.00	1.68	1.92	1.87	1.92	5.53	5.28	4.72	6.33	6.09
Any ED visit (pneumonia)	0.26	0.37	0.26	0.42	0.37	1.10	1.06	0.97	1.35	1.17
Any ED visit (CHF)	0.13	0.00	0.00	0.07	0.22	0.50	0.46	0.63	0.57	0.73
Any ED visit (COPD/asthma)	0.26	0.25	0.20	0.07	0.15	1.01	0.78	0.49	0.83	0.61
Any ED visit (skin infection)	0.26	0.19	0.26	0.21	0.15	0.32	0.32	0.58	0.21	0.45
Any ED visit (dehydration)	0.06	0.19	0.26	0.21	0.15	0.46	0.64	0.39	0.93	0.61
Any ED visit (UTI)	1.16	0.81	0.93	0.97	0.88	2.61	2.39	2.14	2.80	2.91

(continued)

Table M-5. Annual percentage of residents who used each type of service, FY 2014–2018, MOQI (Missouri) (continued)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Any acute care transition (all-cause)	40.57	36.85	33.97	36.06	36.85	44.12	45.30	42.85	44.61	45.25
Any potentially avoidable acute care transition	21.32	19.70	17.78	18.31	17.46	27.07	28.13	25.78	27.59	26.59
Any potentially avoidable acute care transition (all six qualifying conditions)	8.79	9.04	7.93	8.04	7.44	13.21	14.00	12.31	14.06	13.02
Any acute care transition (pneumonia)	3.10	3.80	2.97	2.43	2.28	5.17	6.52	4.86	3.73	4.64
Any acute care transition (CHF)	1.81	2.12	1.92	2.08	1.69	2.15	2.11	2.43	3.11	2.96
Any acute care transition (COPD/asthma)	0.78	0.56	0.59	0.55	0.74	1.42	1.33	1.22	1.76	0.95
Any acute care transition (skin infection)	0.90	1.00	0.79	0.76	0.44	0.59	1.19	1.02	0.67	1.06
Any acute care transition (dehydration)	0.26	0.31	0.40	0.55	0.59	0.69	0.92	0.78	1.19	0.95
Any acute care transition (UTI)	2.71	2.06	2.25	2.43	2.36	4.44	3.67	3.79	4.72	4.64

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS 109).

NOTES: Percentages are based on counting each individual once without regard to the length of their exposure period. Acute care transitions include hospitalizations, ED visits, and observation stays.

Table M-6. Annual percentage of residents who used each type of service, FY 2014–2018, NY-RAH (New York)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	3,906	3,598	3,328	3,403	3,499	4,424	4,284	4,101	3,912	3,696
Mean exposure (days)	243.42	239.56	231.71	226.70	227.54	248.09	246.79	251.03	246.76	242.31
Any hospitalization (all-cause)	30.65	29.54	28.22	27.80	28.24	26.18	27.57	26.04	23.77	26.30
Any potentially avoidable hospitalization	12.93	11.12	10.88	10.67	10.86	11.57	11.76	10.10	9.20	10.96
Any potentially avoidable hospitalization (all six qualifying conditions)	7.37	6.31	6.46	6.05	5.89	7.14	7.21	6.14	5.09	5.60
Any hospitalization (pneumonia)	2.79	2.53	2.37	1.91	2.09	2.71	2.96	2.41	1.51	2.27
Any hospitalization (CHF)	1.61	1.00	1.32	1.38	1.40	1.88	1.56	1.51	1.46	1.54
Any hospitalization (COPD/asthma)	0.64	0.69	0.36	0.82	0.46	0.68	0.58	0.41	0.61	0.30
Any hospitalization (skin infection)	0.74	0.69	0.45	0.26	0.40	0.47	0.56	0.44	0.33	0.43
Any hospitalization (dehydration)	0.23	0.11	0.51	0.50	0.20	0.25	0.26	0.41	0.31	0.27
Any hospitalization (UTI)	1.95	1.67	1.71	1.50	1.63	1.54	1.68	1.27	1.12	1.06
Any ED visit (all-cause)	15.59	16.65	14.78	16.16	16.78	18.20	20.49	17.82	17.08	17.94
Any potentially avoidable ED visit	7.12	7.84	7.06	7.96	7.95	8.93	11.25	9.75	8.79	9.66
Any potentially avoidable ED visit (all six qualifying conditions)	1.51	1.22	1.44	1.41	1.00	2.06	2.57	2.12	1.87	2.27
Any ED visit (pneumonia)	0.13	0.17	0.09	0.24	0.20	0.25	0.54	0.22	0.13	0.24
Any ED visit (CHF)	0.03	0.11	0.03	0.00	0.09	0.20	0.12	0.12	0.13	0.22
Any ED visit (COPD/asthma)	0.18	0.06	0.12	0.12	0.06	0.20	0.21	0.22	0.13	0.14
Any ED visit (skin infection)	0.28	0.08	0.12	0.12	0.03	0.20	0.23	0.10	0.20	0.16
Any ED visit (dehydration)	0.20	0.11	0.21	0.09	0.11	0.20	0.37	0.24	0.15	0.41
Any ED visit (UTI)	0.69	0.69	0.90	0.85	0.51	1.08	1.14	1.22	1.12	1.14

(continued)

Table M-6. Annual percentage of residents who used each type of service, FY 2014–2018, NY-RAH (New York) (continued)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Any acute care transition (all-cause)	38.43	38.77	35.97	37.14	37.15	36.28	38.98	36.19	34.10	36.58
Any potentially avoidable acute care transition	18.46	17.57	16.68	17.19	17.06	18.58	20.52	17.92	16.72	18.80
Any potentially avoidable acute care transition (all six qualifying conditions)	8.47	7.34	7.57	7.23	6.66	8.79	9.20	7.83	6.75	7.49
Any acute care transition (pneumonia)	2.92	2.70	2.43	2.09	2.26	2.92	3.38	2.63	1.61	2.49
Any acute care transition (CHF)	1.64	1.08	1.32	1.38	1.49	2.06	1.63	1.61	1.58	1.70
Any acute care transition (COPD/asthma)	0.79	0.75	0.45	0.91	0.51	0.88	0.75	0.56	0.74	0.41
Any acute care transition (skin infection)	0.97	0.78	0.57	0.38	0.43	0.63	0.75	0.51	0.51	0.57
Any acute care transition (dehydration)	0.44	0.22	0.72	0.59	0.31	0.43	0.63	0.66	0.46	0.68
Any acute care transition (UTI)	2.53	2.25	2.58	2.32	2.09	2.55	2.64	2.44	2.20	2.16

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS 109).

NOTES: Percentages are based on counting each individual once without regard to the length of their exposure period. Acute care transitions include hospitalizations, ED visits, and observation stays.

Table M-7. Annual percentage of residents who used each type of service, FY 2014–2018, OPTIMISTIC (Indiana)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	1,987	1,979	1,877	1,813	1,656	2,264	2,242	2,154	2,149	1,966
Mean exposure (days)	233.64	225.47	229.34	234.00	230.77	239.03	236.37	244.13	236.37	237.81
Any hospitalization (all-cause)	24.26	23.85	23.02	25.10	25.48	24.47	26.09	25.02	23.22	26.25
Any potentially avoidable hospitalization	10.17	10.36	10.55	11.75	10.99	12.59	13.20	12.40	10.84	12.46
Any potentially avoidable hospitalization (all six qualifying conditions)	5.03	5.05	5.11	6.07	5.80	6.67	7.54	7.01	6.00	6.97
Any hospitalization (pneumonia)	2.47	2.02	1.92	2.10	1.93	3.14	3.75	2.79	1.77	2.80
Any hospitalization (CHF)	0.81	1.01	1.07	1.32	1.33	1.50	1.74	1.72	1.68	1.98
Any hospitalization (COPD/asthma)	0.40	0.25	0.21	0.99	0.54	0.57	0.58	1.07	1.02	0.92
Any hospitalization (skin infection)	0.25	0.35	0.32	0.39	0.30	0.31	0.49	0.23	0.28	0.25
Any hospitalization (dehydration)	0.05	0.25	0.32	0.17	0.60	0.09	0.13	0.09	0.28	0.20
Any hospitalization (UTI)	1.31	1.67	1.33	1.43	1.33	1.41	1.52	1.53	1.30	1.32
Any ED visit (all-cause)	18.52	17.79	19.50	16.16	18.78	22.79	21.90	23.03	21.96	24.26
Any potentially avoidable ED visit	10.47	9.85	10.44	8.55	10.08	12.54	12.53	13.74	11.73	14.24
Any potentially avoidable ED visit (all six qualifying conditions)	2.87	2.43	2.34	2.15	2.42	4.55	4.28	4.13	2.84	3.56
Any ED visit (pneumonia)	0.40	0.35	0.32	0.39	0.24	0.93	0.94	0.84	0.33	0.41
Any ED visit (CHF)	0.10	0.20	0.27	0.11	0.06	0.35	0.58	0.70	0.33	0.41
Any ED visit (COPD/asthma)	0.35	0.10	0.27	0.33	0.30	0.53	0.58	0.60	0.14	0.41
Any ED visit (skin infection)	0.35	0.15	0.11	0.11	0.24	0.53	0.36	0.37	0.23	0.25
Any ED visit (dehydration)	0.10	0.05	0.16	0.22	0.18	0.53	0.36	0.28	0.33	0.41
Any ED visit (UTI)	1.61	1.57	1.28	1.10	1.39	1.90	1.65	1.67	1.49	1.83

(continued)

Table M-7. Annual percentage of residents who used each type of service, FY 2014–2018, OPTIMISTIC (Indiana) (continued)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Any acute care transition (all-cause)	34.78	34.26	35.54	34.47	36.65	36.57	37.51	37.74	35.78	39.88
Any potentially avoidable acute care transition	18.52	17.99	19.13	18.75	19.08	21.64	21.86	22.38	19.31	23.14
Any potentially avoidable acute care transition (all six qualifying conditions)	7.25	6.97	7.30	7.83	7.91	10.03	10.12	9.89	8.19	9.61
Any acute care transition (pneumonia)	2.72	2.32	2.24	2.43	2.17	3.71	4.15	3.30	1.95	3.00
Any acute care transition (CHF)	0.86	1.21	1.33	1.43	1.39	1.68	2.05	2.09	1.86	2.29
Any acute care transition (COPD/asthma)	0.55	0.30	0.48	1.16	0.85	1.10	1.03	1.53	1.12	1.22
Any acute care transition (skin infection)	0.55	0.51	0.43	0.50	0.48	0.80	0.76	0.60	0.47	0.51
Any acute care transition (dehydration)	0.15	0.30	0.48	0.39	0.79	0.62	0.49	0.37	0.60	0.61
Any acute care transition (UTI)	2.72	3.03	2.56	2.43	2.66	3.22	3.08	3.11	2.79	3.05

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS 109).

NOTES: Percentages are based on counting each individual once without regard to the length of their exposure period. Acute care transitions include hospitalizations, ED visits, and observation stays.

Table M-8. Annual percentage of residents who used each type of service, FY 2014–2018, RAVEN (Pennsylvania)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	1,607	1,622	1,600	1,536	1,485	1,771	1,759	1,789	1,696	1,625
Mean exposure (days)	260.66	265.60	273.72	271.54	268.82	250.92	252.01	250.24	248.76	254.21
Any hospitalization (all-cause)	23.96	23.37	22.69	22.92	21.01	27.10	27.40	27.39	25.35	26.46
Any potentially avoidable hospitalization	11.33	10.11	9.31	9.77	9.56	13.50	12.62	13.75	11.08	12.49
Any potentially avoidable hospitalization (all six qualifying conditions)	7.28	5.80	4.69	5.08	5.79	8.13	8.41	7.43	6.60	7.45
Any hospitalization (pneumonia)	4.23	2.59	1.81	2.15	2.56	3.56	3.75	3.24	2.12	3.20
Any hospitalization (CHF)	1.12	1.23	0.50	1.11	1.28	1.75	2.44	1.84	1.59	2.09
Any hospitalization (COPD/asthma)	0.44	0.43	0.50	0.65	0.54	1.02	0.63	0.50	1.00	0.55
Any hospitalization (skin infection)	0.12	0.25	0.38	0.33	0.40	0.62	0.51	0.39	0.24	0.37
Any hospitalization (dehydration)	0.06	0.06	0.50	0.13	0.13	0.23	0.17	0.50	0.41	0.25
Any hospitalization (UTI)	1.93	1.91	1.19	1.11	1.28	1.98	1.65	1.57	1.36	1.23
Any ED visit (all-cause)	18.42	17.63	16.69	19.27	17.64	17.28	19.95	18.61	18.46	18.15
Any potentially avoidable ED visit	8.90	8.69	9.25	10.09	9.23	8.81	10.18	9.11	8.61	9.11
Any potentially avoidable ED visit (all six qualifying conditions)	2.74	2.84	2.50	3.26	2.83	2.26	3.52	2.68	2.48	3.02
Any ED visit (pneumonia)	0.75	0.74	0.50	0.65	0.67	0.11	0.40	0.45	0.35	0.31
Any ED visit (CHF)	0.44	0.25	0.31	0.65	0.27	0.11	0.11	0.17	0.29	0.25
Any ED visit (COPD/asthma)	0.25	0.25	0.31	0.13	0.27	0.17	0.23	0.17	0.41	0.18
Any ED visit (skin infection)	0.25	0.25	0.25	0.33	0.13	0.23	0.23	0.11	0.06	0.12
Any ED visit (dehydration)	0.31	0.06	0.25	0.07	0.00	0.34	0.51	0.11	0.24	0.12
Any ED visit (UTI)	0.87	1.29	1.06	1.50	1.62	1.41	2.16	1.73	1.30	2.09

(continued)

Table M-8. Annual percentage of residents who used each type of service, FY 2014–2018, RAVEN (Pennsylvania) (continued)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Any acute care transition (all-cause)	33.17	33.17	31.56	33.46	30.77	35.69	37.81	37.79	35.67	36.31
Any potentially avoidable acute care transition	17.67	16.46	16.38	17.32	16.77	19.48	20.52	20.51	17.57	18.58
Any potentially avoidable acute care transition (all six qualifying conditions)	9.09	7.89	6.69	7.29	7.95	9.77	11.14	9.73	8.49	9.66
Any acute care transition (pneumonia)	4.67	3.08	2.06	2.41	2.90	3.61	4.04	3.63	2.42	3.38
Any acute care transition (CHF)	1.37	1.36	0.81	1.56	1.41	1.86	2.44	1.90	1.77	2.34
Any acute care transition (COPD/asthma)	0.68	0.68	0.81	0.78	0.81	1.13	0.85	0.67	1.42	0.68
Any acute care transition (skin infection)	0.37	0.37	0.63	0.65	0.54	0.79	0.74	0.50	0.29	0.49
Any acute care transition (dehydration)	0.37	0.12	0.63	0.20	0.13	0.56	0.63	0.61	0.65	0.37
Any acute care transition (UTI)	2.61	3.14	2.25	2.41	2.83	3.16	3.70	3.24	2.59	3.14

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS 109).

NOTES: Percentages are based on counting each individual once without regard to the length of their exposure period. Acute care transitions include hospitalizations, ED visits, and observation stays.

APPENDIX N
DESCRIPTIVE ANALYSIS OF UTILIZATION (RATE)

In this section, we present summary results from a descriptive analysis of utilization rates, reporting the number of events per 1,000 Initiative-eligible resident-days, including hospitalizations, ED visits, and acute care transitions, for all-cause, potentially avoidable, and the six qualifying conditions aggregated and separately. ***Table N-1*** presents the results from the national comparison group. ***Tables N-2*** through ***N-8*** present the results by intervention group (Clinical + Payment and Payment-Only), combined across all ECCPs, and then separately for each ECCP. ***Figures N-1*** through ***N-7*** are descriptive trend graphs for the all-cause acute care transitions measure. Each graph shows the Clinical + Payment and Payment-Only for each ECCP, along with the national comparison group.

Table N-1. Number of events per 1,000 Initiative-eligible resident-days, FY 2014–2018, national comparison group

Event	National comparison group				
	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	728,716	683,120	666,154	646,925	625,193
Mean exposure (days)	246.892	241.756	245.624	242.917	242.483
Hospitalizations (all-cause)	1.878	1.971	1.890	1.957	1.987
Potentially avoidable hospitalizations	0.777	0.786	0.734	0.745	0.746
Potentially avoidable hospitalizations (all six qualifying conditions)	0.479	0.481	0.443	0.447	0.442
Hospitalizations (pneumonia)	0.201	0.202	0.173	0.147	0.166
Hospitalizations (CHF)	0.084	0.087	0.083	0.094	0.095
Hospitalizations (COPD/asthma)	0.044	0.044	0.038	0.061	0.040
Hospitalizations (skin infection)	0.032	0.031	0.027	0.026	0.025
Hospitalizations (dehydration)	0.012	0.011	0.019	0.019	0.019
Hospitalizations (UTI)	0.107	0.107	0.103	0.100	0.097
ED visits (all-cause)	1.600	1.719	1.722	1.762	1.826
Potentially avoidable ED visits	0.753	0.812	0.805	0.815	0.837
Potentially avoidable ED visits (all six qualifying conditions)	0.232	0.256	0.249	0.258	0.266
ED visits (pneumonia)	0.044	0.051	0.045	0.045	0.047
ED visits (CHF)	0.021	0.023	0.023	0.025	0.027
ED visits (COPD/asthma)	0.025	0.028	0.028	0.028	0.030
ED visits (skin infection)	0.020	0.021	0.016	0.017	0.018
ED visits (dehydration)	0.020	0.022	0.023	0.023	0.023
ED visits (UTI)	0.101	0.111	0.114	0.119	0.121
Acute care transitions (all-cause)	3.502	3.711	3.634	3.742	3.836
Potentially avoidable acute care transitions	1.538	1.605	1.545	1.566	1.590
Potentially avoidable acute care transitions (all six qualifying conditions)	0.713	0.739	0.694	0.707	0.711
Acute care transitions (pneumonia)	0.246	0.253	0.219	0.192	0.214
Acute care transitions (CHF)	0.105	0.111	0.107	0.120	0.123
Acute care transitions (COPD/asthma)	0.069	0.072	0.066	0.090	0.070
Acute care transitions (skin infection)	0.052	0.052	0.043	0.043	0.043
Acute care transitions (dehydration)	0.033	0.033	0.042	0.043	0.042
Acute care transitions (UTI)	0.208	0.219	0.218	0.219	0.219

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS 109).

NOTES: Each individual resident contributes their count of events to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator. Acute care transitions include hospitalizations, ED visits, and observation stays.

Table N-2. Number of events per 1,000 Initiative-eligible resident-days, FY 2014–2018, all ECCPs (all states)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	12,581	12,346	11,787	11,494	10,622	14,504	14,187	13,695	13,100	11,986
Mean exposure (days)	248.949	245.556	247.988	244.058	238.306	247.989	245.714	251.385	247.254	244.856
Hospitalizations (all-cause)	1.744	1.707	1.623	1.658	1.765	1.621	1.688	1.528	1.488	1.599
Potentially avoidable hospitalizations	0.629	0.593	0.539	0.547	0.570	0.648	0.651	0.565	0.538	0.584
Potentially avoidable hospitalizations (all six qualifying conditions)	0.338	0.318	0.279	0.285	0.296	0.377	0.390	0.320	0.291	0.318
Hospitalizations (pneumonia)	0.144	0.135	0.103	0.091	0.107	0.158	0.175	0.125	0.090	0.118
Hospitalizations (CHF)	0.062	0.060	0.055	0.065	0.068	0.083	0.080	0.070	0.074	0.086
Hospitalizations (COPD/asthma)	0.026	0.024	0.020	0.036	0.026	0.033	0.030	0.027	0.042	0.026
Hospitalizations (skin infection)	0.022	0.020	0.018	0.015	0.015	0.021	0.025	0.017	0.014	0.017
Hospitalizations (dehydration)	0.006	0.008	0.016	0.014	0.014	0.010	0.009	0.016	0.012	0.011
Hospitalizations (UTI)	0.079	0.072	0.068	0.065	0.065	0.072	0.071	0.064	0.060	0.060
ED visits (all-cause)	1.039	1.039	1.026	1.056	1.105	1.256	1.349	1.246	1.236	1.314
Potentially avoidable ED visits	0.457	0.468	0.449	0.461	0.482	0.573	0.635	0.594	0.553	0.604
Potentially avoidable ED visits (all six qualifying conditions)	0.101	0.100	0.103	0.101	0.094	0.157	0.171	0.160	0.140	0.159
ED visits (pneumonia)	0.015	0.014	0.012	0.016	0.016	0.024	0.032	0.024	0.023	0.023
ED visits (CHF)	0.008	0.011	0.008	0.009	0.010	0.014	0.012	0.017	0.015	0.016
ED visits (COPD/asthma)	0.010	0.009	0.011	0.009	0.008	0.021	0.021	0.018	0.015	0.015
ED visits (skin infection)	0.011	0.009	0.007	0.007	0.007	0.016	0.014	0.013	0.008	0.010
ED visits (dehydration)	0.007	0.007	0.012	0.007	0.006	0.014	0.017	0.012	0.013	0.016
ED visits (UTI)	0.050	0.051	0.054	0.052	0.048	0.069	0.075	0.076	0.067	0.078

(continued)

Table N-2. Number of events per 1,000 Initiative-eligible resident-days, FY 2014–2018, all ECCPs (all states) (continued)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Acute care transitions (all-cause)	2.799	2.764	2.667	2.724	2.878	2.891	3.050	2.787	2.736	2.925
Potentially avoidable acute care transitions	1.090	1.070	0.996	1.009	1.053	1.225	1.290	1.160	1.094	1.191
Potentially avoidable acute care transitions (all six qualifying conditions)	0.439	0.419	0.382	0.385	0.390	0.534	0.562	0.480	0.432	0.477
Acute care transitions (pneumonia)	0.160	0.148	0.115	0.107	0.123	0.182	0.207	0.149	0.113	0.141
Acute care transitions (CHF)	0.069	0.071	0.062	0.073	0.078	0.097	0.092	0.088	0.089	0.102
Acute care transitions (COPD/asthma)	0.035	0.033	0.030	0.045	0.033	0.054	0.051	0.045	0.056	0.041
Acute care transitions (skin infection)	0.033	0.029	0.025	0.022	0.022	0.037	0.040	0.030	0.022	0.028
Acute care transitions (dehydration)	0.013	0.015	0.027	0.022	0.020	0.024	0.026	0.028	0.025	0.027
Acute care transitions (UTI)	0.129	0.122	0.122	0.117	0.113	0.141	0.147	0.141	0.128	0.138

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS 109).

NOTES: Each individual resident contributes their count of events to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator. Acute care transitions include hospitalizations, ED visits, and observation stays.

Table N-3. Number of events per 1,000 Initiative-eligible resident-days, FY 2014–2018, AQAF (Alabama)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	2,391	2,425	2,411	2,218	1,532	2,072	2,001	1,950	1,814	1,403
Mean exposure (days)	265.386	259.086	261.713	253.282	225.539	252.883	258.712	259.134	257.493	251.148
Hospitalizations (all-cause)	1.625	1.709	1.712	1.809	2.046	2.038	1.864	1.666	1.666	1.711
Potentially avoidable hospitalizations	0.689	0.723	0.648	0.650	0.758	0.928	0.807	0.613	0.638	0.701
Potentially avoidable hospitalizations (all six qualifying conditions)	0.386	0.401	0.314	0.333	0.394	0.588	0.510	0.366	0.343	0.400
Hospitalizations (pneumonia)	0.164	0.180	0.111	0.098	0.148	0.263	0.238	0.139	0.116	0.125
Hospitalizations (CHF)	0.080	0.083	0.054	0.077	0.101	0.113	0.083	0.069	0.058	0.094
Hospitalizations (COPD/asthma)	0.035	0.038	0.029	0.050	0.023	0.048	0.042	0.038	0.062	0.051
Hospitalizations (skin infection)	0.019	0.013	0.011	0.011	0.009	0.036	0.025	0.016	0.017	0.017
Hospitalizations (dehydration)	0.008	0.018	0.019	0.018	0.023	0.023	0.012	0.016	0.006	0.017
Hospitalizations (UTI)	0.080	0.070	0.090	0.080	0.090	0.105	0.110	0.089	0.083	0.096
ED visits (all-cause)	1.201	1.240	1.233	1.175	1.464	1.498	1.518	1.334	1.295	1.388
Potentially avoidable ED visits	0.548	0.614	0.588	0.536	0.773	0.670	0.664	0.645	0.576	0.650
Potentially avoidable ED visits (all six qualifying conditions)	0.132	0.159	0.162	0.126	0.168	0.166	0.166	0.182	0.126	0.187
ED visits (pneumonia)	0.016	0.014	0.019	0.016	0.035	0.008	0.021	0.018	0.017	0.017
ED visits (CHF)	0.016	0.029	0.017	0.014	0.017	0.021	0.015	0.022	0.017	0.031
ED visits (COPD/asthma)	0.011	0.014	0.016	0.020	0.009	0.032	0.017	0.028	0.019	0.023
ED visits (skin infection)	0.008	0.018	0.006	0.005	0.009	0.017	0.012	0.016	0.004	0.006
ED visits (dehydration)	0.005	0.014	0.021	0.014	0.014	0.019	0.014	0.008	0.006	0.023
ED visits (UTI)	0.077	0.070	0.082	0.057	0.084	0.069	0.087	0.091	0.062	0.088

(continued)

Table N-3. Number of events per 1,000 Initiative-eligible resident-days, FY 2014–2018, AQAF (Alabama) (continued)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Acute care transitions (all-cause)	2.871	2.997	2.994	2.992	3.528	3.563	3.400	3.018	2.974	3.119
Potentially avoidable acute care transitions	1.258	1.367	1.263	1.186	1.537	1.605	1.476	1.261	1.218	1.359
Potentially avoidable acute care transitions (all six qualifying conditions)	0.520	0.563	0.475	0.459	0.561	0.756	0.678	0.550	0.471	0.587
Acute care transitions (pneumonia)	0.181	0.194	0.130	0.114	0.182	0.271	0.259	0.156	0.133	0.142
Acute care transitions (CHF)	0.096	0.113	0.071	0.091	0.119	0.136	0.099	0.093	0.075	0.125
Acute care transitions (COPD/asthma)	0.046	0.054	0.044	0.069	0.032	0.080	0.060	0.065	0.081	0.074
Acute care transitions (skin infection)	0.027	0.030	0.017	0.016	0.017	0.053	0.037	0.032	0.021	0.023
Acute care transitions (dehydration)	0.013	0.032	0.040	0.032	0.038	0.042	0.027	0.024	0.013	0.040
Acute care transitions (UTI)	0.158	0.140	0.173	0.137	0.174	0.174	0.197	0.180	0.148	0.184

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS 109).

NOTES: Each individual resident contributes their count of events to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator. Acute care transitions include hospitalizations, ED visits, and observation stays.

Table N-4. Number of events per 1,000 Initiative-eligible resident-days, FY 2014–2018, ATOP2 (Nevada/Colorado)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	1,142	1,118	1,058	1,082	1,093	1,786	1,722	1,645	1,601	1,506
Mean exposure (days)	228.233	238.470	248.086	243.494	246.919	244.968	230.811	240.812	235.470	237.856
Hospitalizations (all-cause)	1.888	1.984	1.852	1.780	1.964	1.019	1.069	1.030	1.157	1.061
Potentially avoidable hospitalizations	0.633	0.604	0.488	0.501	0.593	0.384	0.395	0.374	0.393	0.371
Potentially avoidable hospitalizations (all six qualifying conditions)	0.315	0.281	0.210	0.243	0.267	0.224	0.229	0.204	0.210	0.173
Hospitalizations (pneumonia)	0.153	0.150	0.080	0.087	0.119	0.096	0.106	0.098	0.085	0.056
Hospitalizations (CHF)	0.019	0.011	0.023	0.042	0.052	0.050	0.038	0.030	0.061	0.053
Hospitalizations (COPD/asthma)	0.023	0.008	0.015	0.023	0.022	0.025	0.025	0.005	0.029	0.014
Hospitalizations (skin infection)	0.031	0.011	0.030	0.011	0.019	0.021	0.018	0.015	0.003	0.014
Hospitalizations (dehydration)	0.000	0.008	0.004	0.011	0.011	0.002	0.005	0.025	0.008	0.006
Hospitalizations (UTI)	0.088	0.094	0.057	0.068	0.044	0.030	0.038	0.030	0.024	0.031
ED visits (all-cause)	1.078	1.328	1.059	1.207	1.223	1.150	1.223	1.328	1.321	1.270
Potentially avoidable ED visits	0.541	0.589	0.450	0.528	0.500	0.530	0.609	0.654	0.552	0.595
Potentially avoidable ED visits (all six qualifying conditions)	0.096	0.109	0.099	0.129	0.096	0.185	0.199	0.245	0.180	0.162
ED visits (pneumonia)	0.031	0.008	0.008	0.019	0.011	0.050	0.048	0.038	0.050	0.042
ED visits (CHF)	0.004	0.011	0.000	0.011	0.022	0.016	0.013	0.023	0.027	0.008
ED visits (COPD/asthma)	0.008	0.019	0.011	0.000	0.011	0.016	0.020	0.025	0.013	0.022
ED visits (skin infection)	0.012	0.008	0.011	0.011	0.011	0.032	0.033	0.023	0.013	0.020
ED visits (dehydration)	0.004	0.008	0.011	0.008	0.000	0.005	0.010	0.030	0.011	0.006
ED visits (UTI)	0.038	0.056	0.057	0.080	0.041	0.066	0.075	0.106	0.066	0.064

(continued)

Table N-4. Number of events per 1,000 Initiative-eligible resident-days, FY 2014–2018, ATOP2 (Nevada/Colorado) (continued)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Acute care transitions (all-cause)	2.981	3.334	2.937	2.999	3.198	2.192	2.310	2.380	2.504	2.353
Potentially avoidable acute care transitions	1.174	1.197	0.949	1.029	1.093	0.917	1.014	1.027	0.950	0.971
Potentially avoidable acute care transitions (all six qualifying conditions)	0.411	0.390	0.309	0.372	0.363	0.409	0.430	0.449	0.390	0.335
Acute care transitions (pneumonia)	0.184	0.158	0.088	0.106	0.130	0.146	0.153	0.136	0.135	0.098
Acute care transitions (CHF)	0.023	0.023	0.023	0.053	0.074	0.066	0.050	0.053	0.088	0.061
Acute care transitions (COPD/asthma)	0.031	0.026	0.027	0.023	0.033	0.041	0.045	0.030	0.042	0.036
Acute care transitions (skin infection)	0.042	0.019	0.042	0.023	0.030	0.053	0.050	0.038	0.016	0.033
Acute care transitions (dehydration)	0.004	0.015	0.015	0.019	0.011	0.007	0.015	0.056	0.019	0.011
Acute care transitions (UTI)	0.127	0.150	0.114	0.148	0.085	0.096	0.116	0.136	0.090	0.095

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS 109).

NOTES: Each individual resident contributes their count of events to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator. Acute care transitions include hospitalizations, ED visits, and observation stays.

Table N-5. Number of events per 1,000 Initiative-eligible resident-days, FY 2014–2018, MOQI (Missouri)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	1,548	1,604	1,513	1,442	1,357	2,187	2,179	2,056	1,928	1,790
Mean exposure (days)	260.287	248.001	257.777	254.617	249.341	252.511	247.970	261.814	259.213	250.317
Hospitalizations (all-cause)	1.737	1.677	1.438	1.465	1.637	1.722	1.899	1.622	1.713	1.752
Potentially avoidable hospitalizations	0.658	0.661	0.533	0.517	0.505	0.750	0.787	0.676	0.714	0.714
Potentially avoidable hospitalizations (all six qualifying conditions)	0.333	0.370	0.310	0.283	0.281	0.416	0.481	0.414	0.408	0.437
Hospitalizations (pneumonia)	0.132	0.156	0.121	0.084	0.077	0.206	0.252	0.169	0.128	0.163
Hospitalizations (CHF)	0.074	0.106	0.092	0.084	0.074	0.081	0.089	0.084	0.112	0.116
Hospitalizations (COPD/asthma)	0.025	0.015	0.015	0.019	0.038	0.024	0.028	0.039	0.042	0.025
Hospitalizations (skin infection)	0.025	0.035	0.023	0.022	0.012	0.011	0.039	0.024	0.022	0.029
Hospitalizations (dehydration)	0.010	0.005	0.005	0.014	0.018	0.011	0.011	0.015	0.012	0.016
Hospitalizations (UTI)	0.067	0.053	0.054	0.060	0.062	0.083	0.063	0.084	0.092	0.089
ED visits (all-cause)	1.072	0.825	0.936	0.921	0.966	1.709	1.675	1.577	1.751	1.743
Potentially avoidable ED visits	0.474	0.357	0.385	0.400	0.366	0.875	0.872	0.825	0.878	0.839
Potentially avoidable ED visits (all six qualifying conditions)	0.087	0.075	0.074	0.079	0.080	0.254	0.255	0.217	0.282	0.283
ED visits (pneumonia)	0.012	0.015	0.010	0.016	0.015	0.047	0.046	0.041	0.058	0.056
ED visits (CHF)	0.005	0.000	0.000	0.003	0.012	0.022	0.019	0.024	0.024	0.029
ED visits (COPD/asthma)	0.010	0.010	0.008	0.003	0.006	0.043	0.046	0.019	0.036	0.027
ED visits (skin infection)	0.010	0.008	0.010	0.008	0.006	0.013	0.013	0.024	0.008	0.018
ED visits (dehydration)	0.002	0.008	0.010	0.008	0.006	0.018	0.028	0.015	0.036	0.025
ED visits (UTI)	0.047	0.035	0.036	0.041	0.035	0.110	0.104	0.095	0.120	0.129

(continued)

Table N-5. Number of events per 1,000 Initiative-eligible resident-days, FY 2014–2018, MOQI (Missouri) (continued)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Acute care transitions (all-cause)	2.829	2.511	2.387	2.421	2.619	3.451	3.583	3.218	3.490	3.513
Potentially avoidable acute care transitions	1.134	1.021	0.920	0.923	0.875	1.633	1.660	1.503	1.601	1.560
Potentially avoidable acute care transitions (all six qualifying conditions)	0.419	0.447	0.385	0.362	0.361	0.670	0.738	0.632	0.694	0.721
Acute care transitions (pneumonia)	0.144	0.171	0.131	0.101	0.092	0.254	0.298	0.210	0.186	0.219
Acute care transitions (CHF)	0.079	0.106	0.092	0.087	0.086	0.103	0.107	0.108	0.138	0.145
Acute care transitions (COPD/asthma)	0.035	0.028	0.023	0.022	0.044	0.067	0.074	0.058	0.078	0.051
Acute care transitions (skin infection)	0.035	0.043	0.033	0.030	0.018	0.024	0.054	0.048	0.030	0.047
Acute care transitions (dehydration)	0.012	0.013	0.015	0.022	0.024	0.029	0.039	0.030	0.048	0.040
Acute care transitions (UTI)	0.114	0.088	0.090	0.101	0.098	0.194	0.167	0.178	0.214	0.219

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS 109).

NOTES: Each individual resident contributes their count of events to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator. Acute care transitions include hospitalizations, ED visits, and observation stays.

Table N-6. Number of events per 1,000 Initiative-eligible resident-days, FY 2014–2018, NY-RAH (New York)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	3,906	3,598	3,328	3,403	3,499	4,424	4,284	4,101	3,912	3,696
Mean exposure (days)	243.418	239.558	231.711	226.703	227.544	248.091	246.792	251.027	246.760	242.311
Hospitalizations (all-cause)	2.040	1.915	1.914	1.880	1.953	1.675	1.736	1.544	1.448	1.697
Potentially avoidable hospitalizations	0.661	0.559	0.564	0.552	0.575	0.574	0.584	0.488	0.444	0.535
Potentially avoidable hospitalizations (all six qualifying conditions)	0.361	0.305	0.329	0.297	0.296	0.337	0.341	0.272	0.233	0.262
Hospitalizations (pneumonia)	0.128	0.116	0.117	0.091	0.103	0.119	0.132	0.103	0.063	0.105
Hospitalizations (CHF)	0.075	0.050	0.069	0.066	0.068	0.091	0.076	0.066	0.066	0.068
Hospitalizations (COPD/asthma)	0.026	0.032	0.022	0.039	0.024	0.030	0.027	0.017	0.029	0.012
Hospitalizations (skin infection)	0.033	0.030	0.021	0.012	0.019	0.021	0.024	0.017	0.015	0.018
Hospitalizations (dehydration)	0.009	0.005	0.022	0.022	0.009	0.011	0.010	0.017	0.012	0.011
Hospitalizations (UTI)	0.089	0.072	0.079	0.067	0.074	0.065	0.072	0.051	0.048	0.048
ED visits (all-cause)	0.878	0.934	0.901	1.038	1.089	1.019	1.207	1.034	0.956	1.163
Potentially avoidable ED visits	0.342	0.384	0.354	0.438	0.435	0.424	0.566	0.458	0.421	0.488
Potentially avoidable ED visits (all six qualifying conditions)	0.062	0.051	0.066	0.069	0.044	0.091	0.109	0.088	0.078	0.096
ED visits (pneumonia)	0.005	0.007	0.004	0.010	0.009	0.010	0.022	0.009	0.005	0.010
ED visits (CHF)	0.001	0.005	0.001	0.000	0.004	0.008	0.005	0.006	0.005	0.009
ED visits (COPD/asthma)	0.007	0.002	0.006	0.005	0.003	0.009	0.009	0.009	0.005	0.006
ED visits (skin infection)	0.012	0.003	0.005	0.005	0.001	0.009	0.009	0.004	0.008	0.007
ED visits (dehydration)	0.008	0.005	0.009	0.004	0.005	0.008	0.015	0.010	0.006	0.018
ED visits (UTI)	0.028	0.029	0.040	0.044	0.023	0.046	0.048	0.051	0.048	0.047

(continued)

Table N-6. Number of events per 1,000 Initiative-eligible resident-days, FY 2014–2018, NY-RAH (New York) (continued)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Acute care transitions (all-cause)	2.919	2.849	2.818	2.919	3.042	2.697	2.944	2.579	2.406	2.862
Potentially avoidable acute care transitions	1.002	0.943	0.918	0.990	1.010	1.000	1.151	0.946	0.866	1.023
Potentially avoidable acute care transitions (all six qualifying conditions)	0.423	0.356	0.396	0.366	0.340	0.428	0.450	0.360	0.311	0.358
Acute care transitions (pneumonia)	0.134	0.123	0.121	0.101	0.112	0.129	0.154	0.112	0.068	0.115
Acute care transitions (CHF)	0.076	0.055	0.070	0.066	0.072	0.099	0.080	0.072	0.071	0.077
Acute care transitions (COPD/asthma)	0.034	0.035	0.029	0.044	0.026	0.039	0.037	0.026	0.034	0.018
Acute care transitions (skin infection)	0.044	0.034	0.026	0.017	0.020	0.030	0.033	0.021	0.023	0.025
Acute care transitions (dehydration)	0.018	0.009	0.031	0.026	0.014	0.019	0.026	0.026	0.019	0.029
Acute care transitions (UTI)	0.118	0.101	0.119	0.111	0.097	0.111	0.120	0.103	0.095	0.095

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS 109).

NOTES: Each individual resident contributes their count of events to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator. Acute care transitions include hospitalizations, ED visits, and observation stays.

Table N-7. Number of events per 1,000 Initiative-eligible resident-days, FY 2014–2018, OPTIMISTIC (Indiana)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	1,987	1,979	1,877	1,813	1,656	2,264	2,242	2,154	2,149	1,966
Mean exposure (days)	233.643	225.474	229.336	234.001	230.766	239.027	236.370	244.128	236.368	237.810
Hospitalizations (all-cause)	1.465	1.477	1.364	1.501	1.599	1.500	1.668	1.485	1.410	1.651
Potentially avoidable hospitalizations	0.534	0.536	0.511	0.573	0.573	0.626	0.696	0.609	0.567	0.650
Potentially avoidable hospitalizations (all six qualifying conditions)	0.252	0.262	0.246	0.292	0.288	0.325	0.392	0.333	0.297	0.357
Hospitalizations (pneumonia)	0.123	0.103	0.095	0.092	0.097	0.142	0.185	0.120	0.085	0.133
Hospitalizations (CHF)	0.037	0.045	0.051	0.061	0.065	0.068	0.083	0.086	0.077	0.103
Hospitalizations (COPD/asthma)	0.022	0.011	0.012	0.047	0.026	0.030	0.032	0.046	0.053	0.043
Hospitalizations (skin infection)	0.013	0.016	0.014	0.021	0.013	0.013	0.021	0.010	0.012	0.011
Hospitalizations (dehydration)	0.002	0.011	0.014	0.007	0.026	0.004	0.006	0.004	0.012	0.009
Hospitalizations (UTI)	0.056	0.076	0.060	0.064	0.060	0.068	0.066	0.068	0.059	0.060
ED visits (all-cause)	1.167	1.100	1.185	1.006	1.065	1.356	1.396	1.335	1.305	1.491
Potentially avoidable ED visits	0.549	0.527	0.530	0.453	0.510	0.626	0.657	0.685	0.587	0.764
Potentially avoidable ED visits (all six qualifying conditions)	0.136	0.114	0.107	0.104	0.118	0.209	0.206	0.196	0.124	0.165
ED visits (pneumonia)	0.017	0.016	0.014	0.016	0.010	0.041	0.045	0.036	0.014	0.017
ED visits (CHF)	0.004	0.011	0.012	0.005	0.005	0.017	0.025	0.032	0.014	0.017
ED visits (COPD/asthma)	0.015	0.004	0.012	0.016	0.013	0.024	0.028	0.029	0.006	0.017
ED visits (skin infection)	0.015	0.007	0.005	0.005	0.016	0.022	0.017	0.015	0.012	0.011
ED visits (dehydration)	0.004	0.002	0.007	0.009	0.008	0.022	0.015	0.011	0.014	0.017
ED visits (UTI)	0.080	0.074	0.058	0.052	0.065	0.083	0.075	0.072	0.065	0.086

(continued)

Table N-7. Number of events per 1,000 Initiative-eligible resident-days, FY 2014–2018, OPTIMISTIC (Indiana) (continued)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Acute care transitions (all-cause)	2.639	2.600	2.562	2.520	2.677	2.873	3.098	2.841	2.725	3.161
Potentially avoidable acute care transitions	1.083	1.069	1.041	1.030	1.083	1.257	1.361	1.293	1.154	1.416
Potentially avoidable acute care transitions (all six qualifying conditions)	0.388	0.377	0.353	0.396	0.406	0.534	0.600	0.529	0.421	0.522
Acute care transitions (pneumonia)	0.140	0.119	0.109	0.108	0.107	0.183	0.230	0.156	0.098	0.150
Acute care transitions (CHF)	0.041	0.056	0.063	0.066	0.071	0.085	0.108	0.118	0.091	0.120
Acute care transitions (COPD/asthma)	0.037	0.016	0.023	0.064	0.039	0.054	0.060	0.074	0.059	0.060
Acute care transitions (skin infection)	0.028	0.022	0.019	0.026	0.029	0.035	0.040	0.025	0.024	0.021
Acute care transitions (dehydration)	0.006	0.013	0.021	0.016	0.034	0.026	0.021	0.015	0.026	0.026
Acute care transitions (UTI)	0.136	0.150	0.118	0.115	0.126	0.152	0.142	0.141	0.124	0.145

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS 109).

NOTES: Each individual resident contributes their count of events to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator. Acute care transitions include hospitalizations, ED visits, and observation stays.

Table N-8. Number of events per 1,000 Initiative-eligible resident-days, FY 2014–2018, RAVEN (Pennsylvania)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	1,607	1,622	1,600	1,536	1,485	1,771	1,759	1,789	1,696	1,625
Mean exposure (days)	260.659	265.601	273.723	271.544	268.822	250.924	252.012	250.235	248.762	254.209
Hospitalizations (all-cause)	1.480	1.381	1.265	1.297	1.280	1.607	1.692	1.716	1.510	1.530
Potentially avoidable hospitalizations	0.540	0.462	0.402	0.429	0.431	0.659	0.638	0.670	0.529	0.557
Potentially avoidable hospitalizations (all six qualifying conditions)	0.332	0.258	0.187	0.218	0.251	0.389	0.395	0.351	0.292	0.320
Hospitalizations (pneumonia)	0.181	0.109	0.073	0.089	0.108	0.146	0.160	0.141	0.088	0.128
Hospitalizations (CHF)	0.045	0.049	0.021	0.046	0.050	0.079	0.111	0.083	0.071	0.092
Hospitalizations (COPD/asthma)	0.017	0.016	0.018	0.024	0.023	0.047	0.025	0.020	0.047	0.027
Hospitalizations (skin infection)	0.005	0.009	0.014	0.014	0.018	0.025	0.023	0.018	0.009	0.015
Hospitalizations (dehydration)	0.002	0.002	0.018	0.005	0.005	0.009	0.009	0.022	0.019	0.010
Hospitalizations (UTI)	0.081	0.072	0.043	0.041	0.048	0.083	0.068	0.067	0.057	0.048
ED visits (all-cause)	0.957	0.910	0.849	1.000	0.904	0.979	1.148	1.061	1.043	0.949
Potentially avoidable ED visits	0.406	0.392	0.395	0.420	0.383	0.428	0.474	0.411	0.405	0.392
Potentially avoidable ED visits (all six qualifying conditions)	0.117	0.111	0.105	0.122	0.115	0.097	0.158	0.114	0.111	0.126
ED visits (pneumonia)	0.029	0.028	0.018	0.024	0.025	0.005	0.018	0.018	0.014	0.012
ED visits (CHF)	0.019	0.009	0.011	0.024	0.010	0.005	0.005	0.007	0.012	0.010
ED visits (COPD/asthma)	0.010	0.009	0.011	0.005	0.010	0.007	0.014	0.007	0.017	0.010
ED visits (skin infection)	0.010	0.009	0.009	0.012	0.005	0.011	0.009	0.004	0.002	0.005
ED visits (dehydration)	0.014	0.002	0.009	0.002	0.000	0.014	0.020	0.004	0.009	0.005
ED visits (UTI)	0.036	0.053	0.046	0.055	0.065	0.056	0.092	0.074	0.057	0.085

(continued)

Table N-8. Number of events per 1,000 Initiative-eligible resident-days, FY 2014–2018, RAVEN (Pennsylvania) (continued)

Event	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Acute care transitions (all-cause)	2.449	2.300	2.121	2.302	2.187	2.595	2.847	2.781	2.553	2.489
Potentially avoidable acute care transitions	0.945	0.857	0.799	0.849	0.814	1.089	1.114	1.083	0.934	0.949
Potentially avoidable acute care transitions (all six qualifying conditions)	0.449	0.369	0.292	0.340	0.366	0.486	0.553	0.467	0.403	0.445
Acute care transitions (pneumonia)	0.210	0.137	0.091	0.113	0.133	0.151	0.178	0.159	0.102	0.140
Acute care transitions (CHF)	0.064	0.058	0.032	0.070	0.060	0.083	0.115	0.089	0.083	0.102
Acute care transitions (COPD/asthma)	0.026	0.026	0.030	0.029	0.033	0.054	0.038	0.027	0.064	0.036
Acute care transitions (skin infection)	0.014	0.019	0.023	0.026	0.023	0.036	0.032	0.022	0.012	0.019
Acute care transitions (dehydration)	0.017	0.005	0.027	0.007	0.005	0.023	0.029	0.027	0.028	0.015
Acute care transitions (UTI)	0.117	0.125	0.089	0.096	0.113	0.140	0.160	0.143	0.114	0.133

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS 109).

NOTES: Each individual resident contributes their count of events to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator. Acute care transitions include hospitalizations, ED visits, and observation stays.

Figure N-1. Number of all-cause acute care transitions, per 1,000 Initiative-eligible resident-days, FY 2014-2018, all ECCPs (all states)

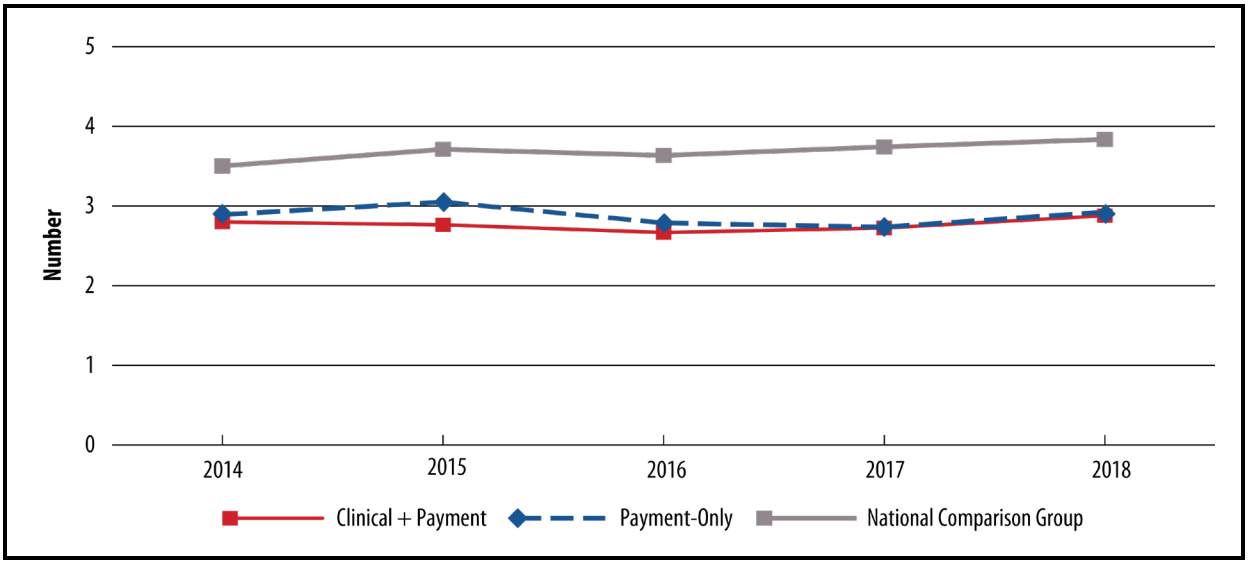


Figure N-2. Number of all-cause acute care transitions, per 1,000 Initiative-eligible resident-days, FY 2014-2018, AQAF (Alabama)

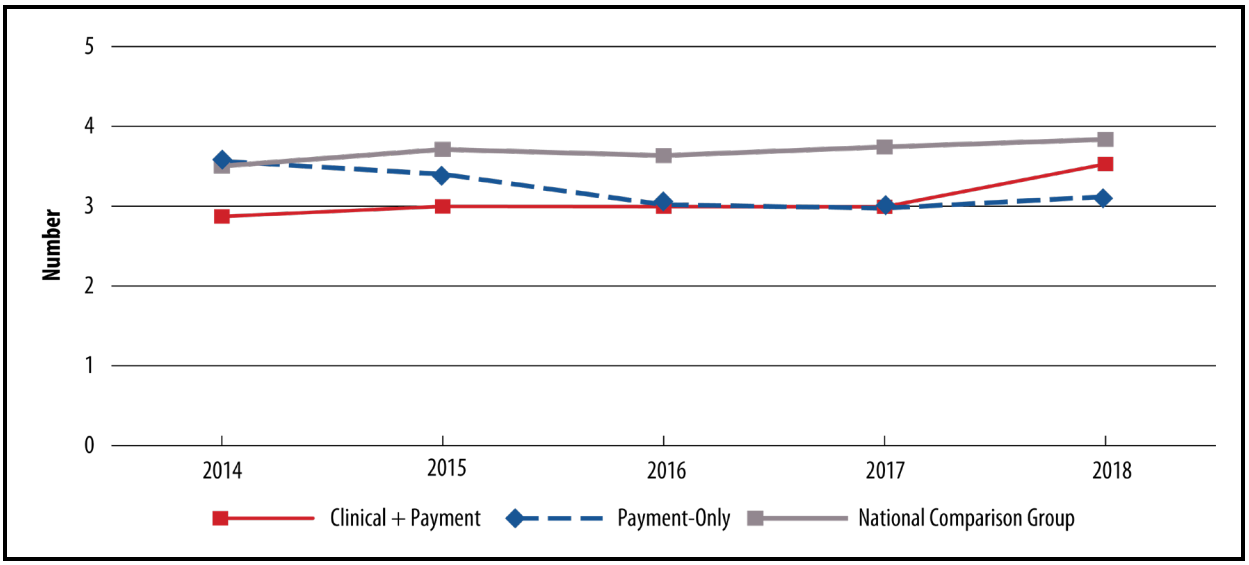


Figure N-3. Number of all-cause acute care transitions, per 1,000 Initiative-eligible resident-days, FY 2014-2018, ATOP2 (Nevada/Colorado)

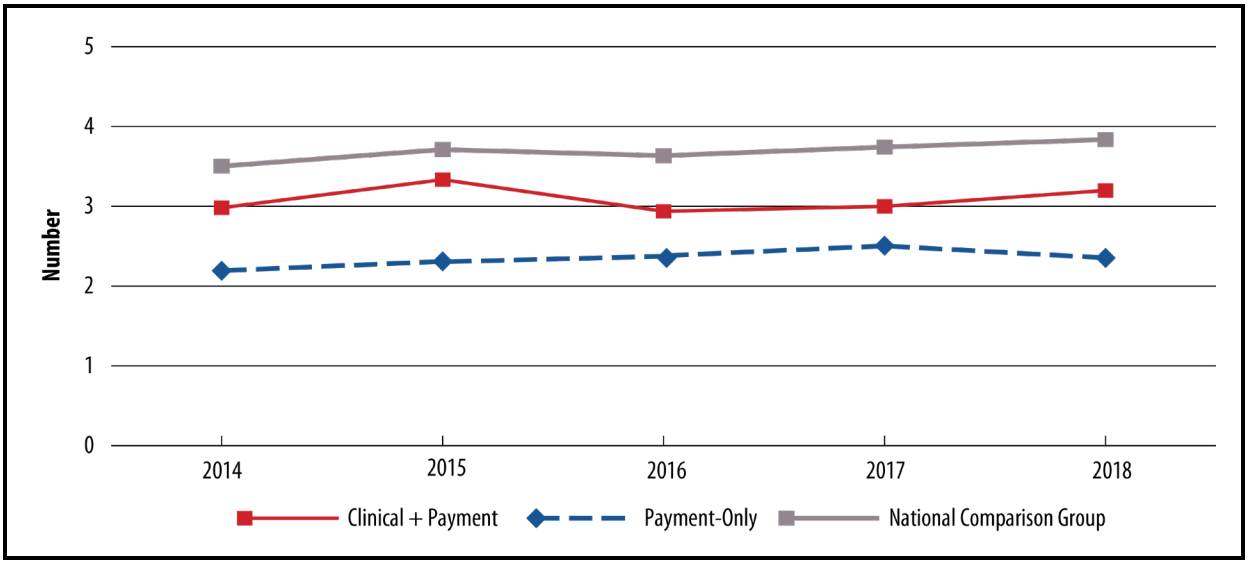


Figure N-4. Number of all-cause acute care transitions, per 1,000 Initiative-eligible resident-days, FY 2014-2018, MOQI (Missouri)

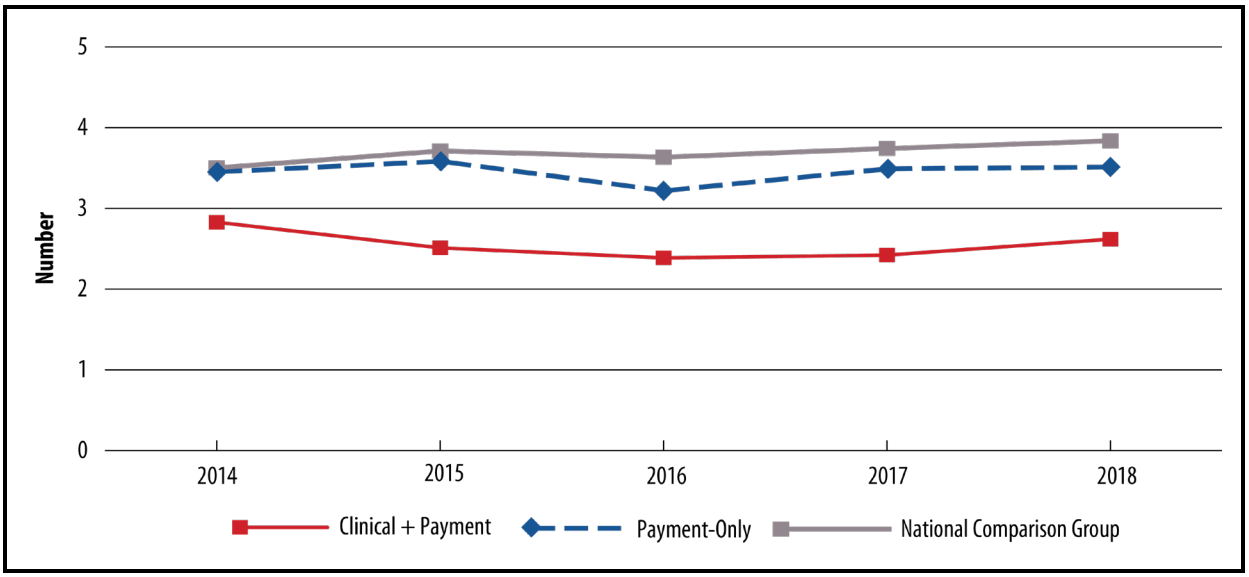


Figure N-5. Number of all-cause acute care transitions, per 1,000 Initiative-eligible resident-days, FY 2014-2018, NY-RAH (New York)

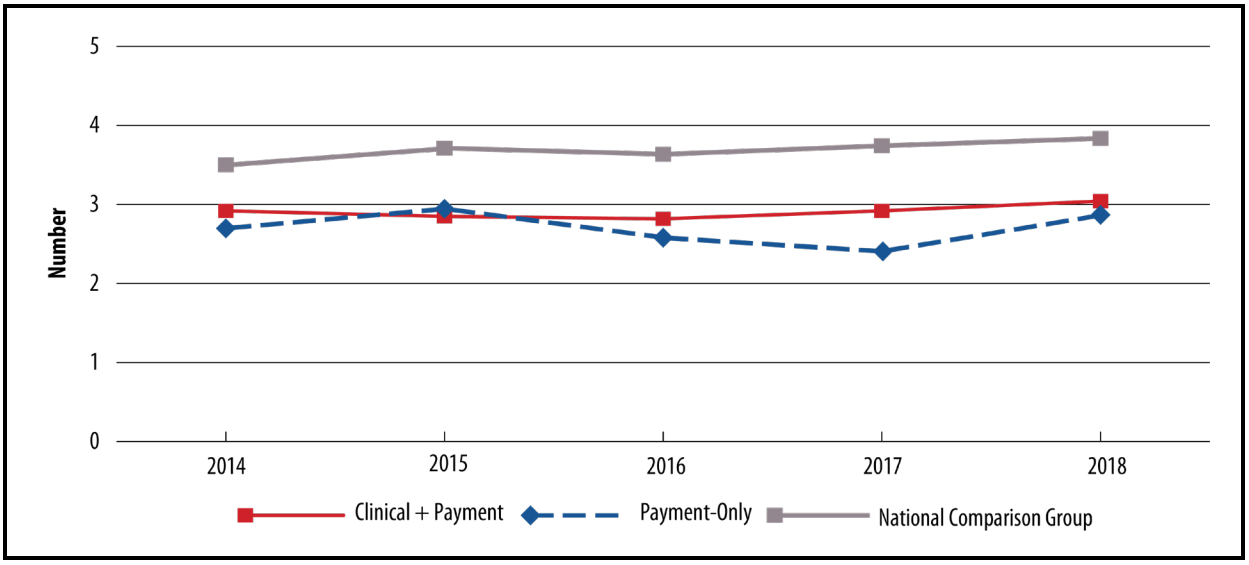


Figure N-6. Number of all-cause acute care transitions, per 1,000 Initiative-eligible resident-days, FY 2014-2018, OPTIMISTIC (Indiana)

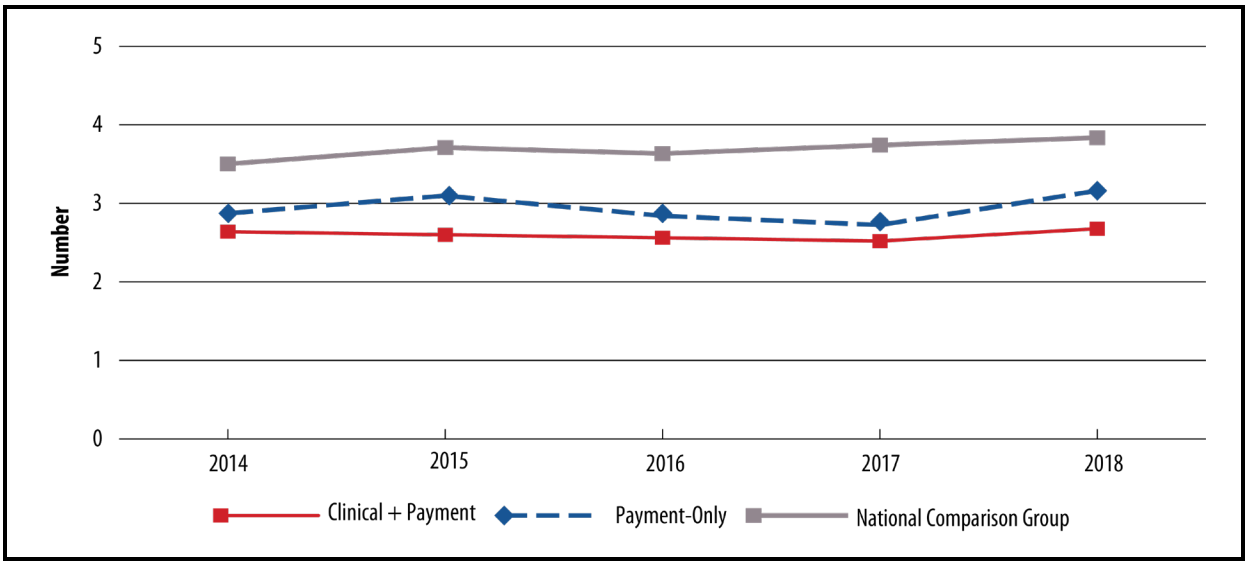
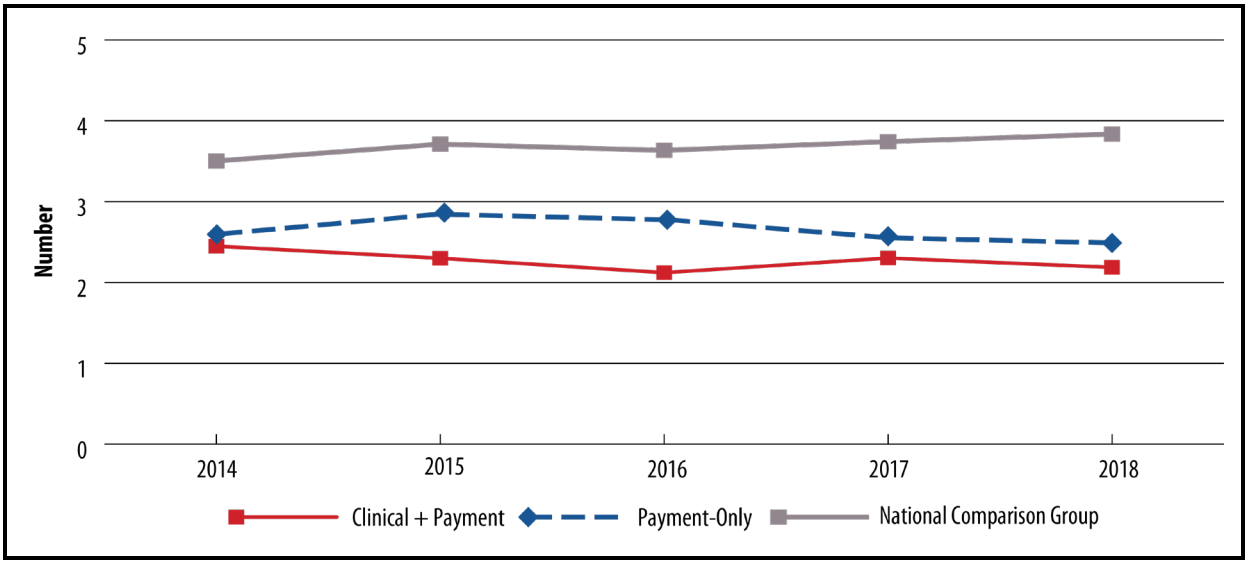


Figure N-7. Number of all-cause acute care transitions, per 1,000 Initiative-eligible resident-days, FY 2014-2018, RAVEN (Pennsylvania)



APPENDIX O
DESCRIPTIVE ANALYSIS OF EXPENDITURES

In this section, we present summary results from a descriptive analysis of Medicare expenditures per resident-year, reporting on total Medicare expenditures and expenditures associated with hospitalizations, ED visits, and acute care transitions, for all-cause, potentially avoidable, and the six qualifying conditions aggregated and separately). 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 O-1*** presents the results from the national comparison group. ***Tables O-2*** through ***O-8*** present the results by intervention group (Clinical + Payment and Payment-Only), combined across all ECCPs, and then separately for each ECCP.

Table O-1. Medicare expenditure (in dollars) per resident-year, FY 2014–2018, national comparison group

Measure	National comparison group				
	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	726,789	681,501	664,499	645,452	623,897
Mean exposure (days)	247.40	242.20	246.10	243.34	242.87
Total Medicare expenditures	26,560.88	28,144.85	28,247.48	29,596.91	31,161.17
Hospitalizations (all-cause)	7,484.60	7,873.46	7,808.44	8,082.90	8,529.88
Potentially avoidable hospitalizations	2,523.08	2,544.40	2,427.31	2,463.07	2,561.51
Potentially avoidable hospitalizations (all six qualifying conditions)	1,471.31	1,469.40	1,370.12	1,374.59	1,422.12
Hospitalizations (pneumonia)	722.35	705.58	627.36	529.34	615.07
Hospitalizations (CHF)	258.12	272.41	267.21	318.71	334.42
Hospitalizations (COPD/asthma)	116.83	118.24	106.01	175.29	114.96
Hospitalizations (skin infection)	102.86	106.92	88.65	81.54	78.72
Hospitalizations (dehydration)	26.27	22.42	44.18	44.97	48.69
Hospitalizations (UTI)	244.88	243.83	236.71	224.75	230.26
ED visits (all-cause)	341.48	374.46	387.46	415.51	456.77
Potentially avoidable ED visits	153.74	168.20	171.44	181.17	198.60
Potentially avoidable ED visits (all six qualifying conditions)	54.86	61.46	63.20	67.60	75.13
ED visits (pneumonia)	12.47	14.70	13.46	13.85	15.69
ED visits (CHF)	6.28	6.85	7.09	7.87	9.09
ED visits (COPD/asthma)	6.31	6.70	6.85	7.38	8.49
ED visits (skin infection)	3.04	3.43	3.11	3.39	3.83
ED visits (dehydration)	5.16	5.51	6.12	6.58	6.88
ED visits (UTI)	21.59	24.27	26.57	28.53	31.16
Acute care transitions (all-cause)	7,847.46	8,267.13	8,215.54	8,519.91	9,009.50
Potentially avoidable acute care transitions	2,681.88	2,717.34	2,602.50	2,648.48	2,764.69
Potentially avoidable acute care transitions (all six qualifying conditions)	1,527.58	1,532.14	1,434.61	1,443.80	1,499.02
Acute care transitions (pneumonia)	735.00	720.45	640.95	543.39	630.98
Acute care transitions (CHF)	264.99	279.77	274.73	327.37	344.30
Acute care transitions (COPD/asthma)	123.22	125.04	112.99	182.79	123.57
Acute care transitions (skin infection)	106.09	110.45	91.91	84.99	82.64
Acute care transitions (dehydration)	31.61	28.07	50.47	51.72	55.77
Acute care transitions (UTI)	266.68	268.36	263.55	253.54	261.75

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS 109).

NOTES: Each individual resident contributes their expenditure to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator. Acute care transitions include hospitalizations, ED visits, and observation stays.

Table O-2. Medicare expenditure (in dollars) per resident-year, FY 2014–2018, all ECCPs (all states)

Measure	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	12,525	12,298	11,734	11,450	10,587	14,470	14,151	13,662	13,065	11,959
Mean exposure (days)	249.80	246.29	248.84	244.77	238.89	248.45	246.16	251.84	247.76	245.23
Total Medicare expenditures	27,678.67	28,885.45	28,883.06	30,742.65	33,647.65	24,376.11	26,248.84	25,480.21	26,632.61	28,614.36
Hospitalizations (all-cause)	8,663.61	8,380.45	8,199.46	8,465.17	9,564.00	6,819.23	7,120.45	6,575.80	6,365.02	7,178.86
Potentially avoidable hospitalizations	2,392.87	2,206.63	2,060.81	2,108.79	2,375.12	2,093.90	2,152.84	1,895.19	1,833.87	2,009.53
Potentially avoidable hospitalizations (all six qualifying conditions)	1,233.94	1,110.96	999.02	1,056.95	1,182.43	1,132.73	1,217.23	976.68	924.50	996.33
Hospitalizations (pneumonia)	583.00	549.99	451.95	445.85	543.74	522.82	643.90	441.58	312.23	422.66
Hospitalizations (CHF)	222.65	207.57	193.17	232.65	285.67	272.17	249.22	235.38	297.63	296.63
Hospitalizations (COPD/asthma)	88.73	81.58	58.99	123.06	87.20	83.74	79.87	73.16	117.59	60.34
Hospitalizations (skin infection)	95.89	71.99	68.23	50.34	51.35	60.59	69.05	50.06	37.37	55.58
Hospitalizations (dehydration)	24.22	18.70	47.20	39.96	39.01	24.22	16.96	38.64	31.68	31.79
Hospitalizations (UTI)	219.45	181.14	179.50	165.09	175.47	169.20	158.23	137.87	127.99	129.33
ED visits (all-cause)	210.17	224.37	218.09	234.00	256.79	250.39	266.13	265.29	273.00	313.65
Potentially avoidable ED visits	90.02	91.89	90.86	91.98	105.34	111.83	119.54	117.81	114.73	139.20
Potentially avoidable ED visits (all six qualifying conditions)	22.25	21.12	22.19	22.04	22.70	33.35	34.63	37.60	33.42	43.89
ED visits (pneumonia)	4.13	3.25	3.04	3.88	3.97	5.78	7.69	6.07	6.10	7.20
ED visits (CHF)	2.43	3.15	1.68	2.30	2.46	3.54	2.73	5.43	3.70	4.54
ED visits (COPD/asthma)	2.76	1.75	2.40	2.01	2.38	5.06	4.11	4.18	3.63	4.22
ED visits (skin infection)	1.81	1.60	1.12	1.29	1.70	2.23	2.21	2.81	1.40	2.08
ED visits (dehydration)	1.28	1.13	2.85	1.52	1.34	2.94	3.72	3.17	3.55	4.52
ED visits (UTI)	9.84	10.22	11.10	11.05	10.84	13.80	14.18	15.94	15.05	21.33
Acute care transitions (all-cause)	8,885.65	8,621.47	8,435.53	8,706.86	9,829.99	7,090.75	7,403.92	6,854.15	6,649.38	7,508.54
Potentially avoidable acute care transitions	2,484.29	2,302.54	2,154.30	2,201.23	2,481.15	2,214.33	2,277.16	2,013.29	1,949.61	2,151.44
Potentially avoidable acute care transitions (all six qualifying conditions)	1,256.23	1,132.35	1,021.22	1,078.99	1,205.13	1,168.85	1,252.35	1,014.47	958.11	1,040.22
Acute care transitions (pneumonia)	587.17	553.24	454.98	449.73	547.71	528.60	651.58	447.65	318.33	429.85
Acute care transitions (CHF)	225.08	210.81	194.86	234.95	288.13	278.47	251.95	240.95	301.39	301.17

(continued)

Table O-2. Medicare expenditure (in dollars) per resident-year, FY 2014–2018, all ECCPs (all states) (continued)

Measure	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Acute care transitions (COPD/ asthma)	91.49	83.52	61.39	125.07	89.58	88.80	83.98	77.34	121.22	64.56
Acute care transitions (skin infection)	97.70	73.59	69.35	51.63	53.05	62.82	71.52	52.87	38.77	57.66
Acute care transitions (dehydration)	25.49	19.83	50.05	41.48	40.35	27.16	20.85	41.81	35.23	36.31
Acute care transitions (UTI)	229.29	191.36	190.59	176.14	186.31	183.00	172.47	153.85	143.17	150.65

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS 109).

NOTES: Each individual resident contributes their expenditure to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator. Acute care transitions include hospitalizations, ED visits, and observation stays.

Table O-3. Medicare expenditure (in dollars) per resident-year, FY 2014–2018, AQAF (Alabama)

Measure	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	2,387	2,423	2,408	2,216	1,531	2,069	1,999	1,948	1,811	1,403
Mean exposure (days)	265.78	259.28	261.98	253.48	225.66	253.19	258.93	259.36	257.82	251.15
Total Medicare expenditures	21,483.07	23,597.42	24,405.93	25,715.68	29,161.49	23,672.23	24,225.20	23,540.60	25,182.73	25,206.78
Hospitalizations (all-cause)	5,150.01	5,676.80	5,777.62	6,106.51	7,595.87	6,386.22	6,057.46	5,559.36	5,261.03	5,657.36
Potentially avoidable hospitalizations	1,768.76	1,869.20	1,767.50	1,702.05	2,296.29	2,379.26	2,089.89	1,553.00	1,548.64	1,747.68
Potentially avoidable hospitalizations (all six qualifying conditions)	833.98	932.22	714.08	766.18	1,018.03	1,402.97	1,172.69	806.74	756.39	911.47
Hospitalizations (pneumonia)	389.12	469.24	289.29	270.85	427.99	701.27	598.27	355.51	312.12	324.06
Hospitalizations (CHF)	194.04	211.72	135.46	205.07	299.96	299.48	237.27	186.80	132.86	237.82
Hospitalizations (COPD/asthma)	63.40	86.86	56.40	96.95	46.70	97.81	83.04	73.57	122.38	95.41
Hospitalizations (skin infection)	38.67	21.27	21.95	15.43	15.01	92.23	51.48	29.14	51.86	48.56
Hospitalizations (dehydration)	11.93	37.88	58.02	46.64	42.46	35.59	16.21	23.73	9.87	26.11
Hospitalizations (UTI)	136.82	105.24	152.96	131.23	185.92	176.58	186.41	137.98	127.32	179.51
ED visits (all-cause)	210.01	213.92	217.18	220.74	256.04	231.92	248.98	223.21	201.74	249.34
Potentially avoidable ED visits	93.71	97.80	92.96	80.37	124.45	98.31	98.14	95.80	94.33	109.93
Potentially avoidable ED visits (all six qualifying conditions)	23.56	28.05	25.17	20.76	30.74	27.86	25.78	34.14	24.78	35.91
ED visits (pneumonia)	2.44	2.27	3.09	2.41	7.29	1.33	4.30	2.05	2.82	3.68
ED visits (CHF)	5.57	8.61	3.74	2.93	4.24	4.12	2.40	7.32	4.14	6.31
ED visits (COPD/asthma)	2.30	2.37	2.29	3.79	1.04	6.16	2.93	4.80	2.75	4.00
ED visits (skin infection)	0.97	2.09	0.72	1.24	0.95	1.55	1.53	3.39	0.61	0.58
ED visits (dehydration)	0.59	2.06	3.36	1.99	2.25	3.38	1.89	1.68	1.81	4.82
ED visits (UTI)	11.69	10.66	11.97	8.39	14.97	11.32	12.74	14.91	12.67	16.52
Acute care transitions (all-cause)	5,391.10	5,913.90	6,019.08	6,332.91	7,856.60	6,646.04	6,312.83	5,787.32	5,473.03	5,910.85
Potentially avoidable acute care transitions	1,869.21	1,978.08	1,867.32	1,782.42	2,423.92	2,498.79	2,189.27	1,649.81	1,645.17	1,859.29
Potentially avoidable acute care transitions (all six qualifying conditions)	857.71	961.13	739.25	786.94	1,048.77	1,449.79	1,199.63	841.89	782.04	947.38
Acute care transitions (pneumonia)	391.73	471.51	292.37	273.26	435.29	702.61	602.57	357.56	314.94	327.74
Acute care transitions (CHF)	199.61	220.74	139.21	208.01	304.20	322.56	239.67	195.13	136.99	244.13

(continued)

Table O-3. Medicare expenditure (in dollars) per resident-year, FY 2014–2018, AQAF (Alabama) (continued)

Measure	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Acute care transitions (COPD/ asthma)	65.70	89.67	58.69	100.74	47.73	103.97	85.97	78.37	125.13	99.41
Acute care transitions (skin infection)	39.64	23.36	22.67	16.67	15.96	93.78	53.01	32.53	52.46	49.14
Acute care transitions (dehydration)	12.52	39.94	61.38	48.63	44.71	38.97	19.27	25.41	11.67	30.93
Acute care transitions (UTI)	148.51	115.91	164.93	139.62	200.89	187.90	199.15	152.89	140.85	196.03

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS 109).

NOTES: Each individual resident contributes their expenditure to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator. Acute care transitions include hospitalizations, ED visits, and observation stays.

Table O-4. Medicare expenditure (in dollars) per resident-year, FY 2014–2018, ATOP2 (Nevada/Colorado)

Measure	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	1,129	1,108	1,048	1,075	1,085	1,784	1,719	1,643	1,601	1,505
Mean exposure (days)	230.25	240.14	249.83	244.61	248.19	245.17	231.03	241.07	235.47	238.00
Total Medicare expenditures	28,362.32	30,263.75	31,268.01	32,482.52	32,942.30	18,019.62	18,549.54	19,726.24	21,537.90	22,975.85
Hospitalizations (all-cause)	9,863.88	9,747.97	11,378.23	10,145.37	10,891.06	4,287.95	4,002.88	4,641.07	4,846.56	4,405.78
Potentially avoidable hospitalizations	2,393.65	2,174.50	1,910.68	1,884.47	2,427.76	1,282.09	1,315.59	1,400.06	1,451.45	1,263.87
Potentially avoidable hospitalizations (all six qualifying conditions)	1,168.73	1,000.93	814.33	802.59	1,117.84	673.96	713.63	722.21	659.25	553.23
Hospitalizations (pneumonia)	633.39	669.69	319.32	340.90	600.53	302.28	391.68	396.97	276.07	202.22
Hospitalizations (CHF)	48.68	40.23	59.50	133.39	245.88	134.91	129.94	84.64	209.65	206.83
Hospitalizations (COPD/asthma)	75.44	23.58	34.34	87.20	54.22	85.57	66.75	24.55	91.60	29.48
Hospitalizations (skin infection)	203.23	38.49	199.43	62.56	88.87	65.15	41.79	63.04	12.85	39.10
Hospitalizations (dehydration)	0.00	10.98	10.57	18.86	33.15	2.84	9.47	71.00	27.93	12.58
Hospitalizations (UTI)	207.99	217.96	191.17	159.68	95.19	83.23	74.00	82.01	41.15	63.02
ED visits (all-cause)	321.20	418.78	274.96	370.93	340.33	263.80	268.82	361.79	363.48	344.25
Potentially avoidable ED visits	140.82	146.04	104.28	128.70	121.47	113.41	131.58	182.31	153.22	146.94
Potentially avoidable ED visits (all six qualifying conditions)	33.62	24.59	21.24	36.07	23.65	44.06	43.19	75.24	58.09	50.12
ED visits (pneumonia)	13.99	1.17	3.11	4.25	1.49	16.28	14.68	11.89	17.36	13.90
ED visits (CHF)	2.49	4.17	0.00	3.12	2.58	3.24	2.96	8.02	8.08	1.66
ED visits (COPD/asthma)	2.61	3.78	2.35	0.00	5.68	4.81	3.23	6.23	4.47	7.61
ED visits (skin infection)	2.23	1.08	1.77	3.51	4.07	5.16	5.80	8.12	2.52	5.54
ED visits (dehydration)	2.46	1.64	2.37	3.67	0.00	1.08	1.86	8.72	3.54	0.78
ED visits (UTI)	9.84	12.75	11.64	21.53	9.84	13.49	14.66	32.25	22.11	20.63
Acute care transitions (all-cause)	10,196.09	10,239.00	11,673.10	10,529.06	11,271.12	4,587.86	4,314.55	5,044.50	5,226.07	4,777.90
Potentially avoidable acute care transitions	2,534.48	2,320.87	2,020.25	2,013.16	2,549.23	1,401.63	1,473.64	1,582.37	1,606.75	1,424.13
Potentially avoidable acute care transitions (all six qualifying conditions)	1,202.34	1,025.51	835.57	838.66	1,141.49	718.02	757.30	797.45	717.35	603.35
Acute care transitions (pneumonia)	647.38	670.86	322.43	345.15	602.02	318.55	406.36	408.86	293.43	216.12
Acute care transitions (CHF)	51.17	44.40	59.50	136.50	248.46	138.15	132.90	92.66	217.73	208.49

(continued)

Table O-4. Medicare expenditure (in dollars) per resident-year, FY 2014–2018, ATOP2 (Nevada/Colorado) (continued)

Measure	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Acute care transitions (COPD/ asthma)	78.05	27.36	36.69	87.20	59.89	90.38	69.99	30.78	96.07	37.08
Acute care transitions (skin infection)	205.46	39.57	201.20	66.07	92.94	70.31	47.59	71.16	15.38	44.64
Acute care transitions (dehydration)	2.46	12.62	12.94	22.53	33.15	3.92	11.33	79.72	31.47	13.37
Acute care transitions (UTI)	217.83	230.71	202.81	181.21	105.03	96.72	89.14	114.27	63.26	83.65

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS 109).

NOTES: Each individual resident contributes their expenditure to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator. Acute care transitions include hospitalizations, ED visits, and observation stays.

Table O-5. Medicare expenditure (in dollars) per resident-year, FY 2014–2018, MOQI (Missouri)

Measure	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	1,547	1,603	1,511	1,441	1,355	2,185	2,178	2,052	1,927	1,788
Mean exposure (days)	260.42	248.14	258.09	254.77	249.60	252.69	248.05	262.26	259.33	250.38
Total Medicare expenditures	23,617.44	25,517.79	24,095.83	26,119.85	27,548.81	22,080.88	24,485.79	22,213.30	23,919.78	25,610.63
Hospitalizations (all-cause)	5,990.54	6,307.65	5,401.73	5,753.56	6,332.52	5,691.70	6,757.21	5,333.25	5,714.81	6,177.96
Potentially avoidable hospitalizations	1,999.87	2,105.13	1,760.74	1,610.81	1,514.10	2,139.88	2,327.63	1,917.90	2,060.50	2,197.12
Potentially avoidable hospitalizations (all six qualifying conditions)	881.46	1,188.74	980.62	749.71	765.15	1,101.85	1,398.06	1,070.70	1,064.09	1,185.58
Hospitalizations (pneumonia)	470.17	601.76	387.67	275.62	278.12	600.92	872.79	525.32	375.17	491.85
Hospitalizations (CHF)	174.72	312.76	263.48	260.61	247.84	243.66	223.43	213.43	321.59	370.54
Hospitalizations (COPD/asthma)	56.44	30.86	75.97	44.91	76.66	48.30	71.50	88.10	98.00	50.25
Hospitalizations (skin infection)	48.22	122.91	76.86	36.73	20.62	18.74	93.43	45.87	54.63	70.98
Hospitalizations (dehydration)	16.55	8.93	15.20	20.37	32.62	26.51	17.26	28.49	22.02	28.63
Hospitalizations (UTI)	115.36	111.52	161.45	111.47	109.28	163.71	119.66	169.48	192.68	173.34
ED visits (all-cause)	215.52	168.10	220.41	209.24	253.72	346.87	352.65	333.20	355.50	414.75
Potentially avoidable ED visits	84.09	67.64	77.73	82.35	85.05	171.62	169.74	153.07	158.66	184.09
Potentially avoidable ED visits (all six qualifying conditions)	17.87	15.77	18.46	12.50	24.73	53.98	51.70	49.01	59.53	72.76
ED visits (pneumonia)	3.26	5.61	1.65	3.46	5.00	8.30	11.22	13.07	13.59	16.45
ED visits (CHF)	0.87	0.00	0.00	0.36	2.79	4.85	4.73	7.43	5.37	8.47
ED visits (COPD/asthma)	2.07	1.75	0.75	0.67	3.66	13.83	10.47	3.41	8.59	6.30
ED visits (skin infection)	1.23	0.75	2.21	0.63	2.38	2.49	2.04	3.18	1.48	2.55
ED visits (dehydration)	0.28	1.19	5.41	1.32	2.35	3.07	6.86	3.40	9.76	7.55
ED visits (UTI)	10.15	6.48	8.43	6.07	8.55	21.45	16.38	18.51	20.74	31.44
Acute care transitions (all-cause)	6,228.71	6,490.51	5,643.26	5,980.70	6,595.18	6,081.94	7,115.14	5,688.40	6,098.38	6,611.91
Potentially avoidable acute care transitions	2,084.20	2,173.44	1,841.91	1,695.24	1,601.01	2,331.20	2,498.85	2,071.57	2,220.89	2,385.65
Potentially avoidable acute care transitions (all six qualifying conditions)	899.33	1,205.18	999.08	762.22	789.87	1,155.83	1,451.25	1,119.71	1,124.05	1,258.33
Acute care transitions (pneumonia)	473.43	607.37	389.32	279.08	283.12	609.23	884.01	538.39	388.76	508.30
Acute care transitions (CHF)	175.59	312.76	263.48	260.97	250.64	248.51	228.16	220.87	327.31	379.00

(continued)

Table O-5. Medicare expenditure (in dollars) per resident-year, FY 2014–2018, MOQI (Missouri) (continued)

Measure	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Acute care transitions (COPD/ asthma)	58.51	33.28	76.72	45.58	80.32	62.13	81.97	91.51	106.59	56.55
Acute care transitions (skin infection)	49.46	123.66	79.07	37.36	22.99	21.23	96.95	49.05	56.11	73.53
Acute care transitions (dehydration)	16.83	10.12	20.61	21.68	34.97	29.58	24.12	31.90	31.78	36.17
Acute care transitions (UTI)	125.51	117.99	169.88	117.54	117.83	185.16	136.04	187.99	213.49	204.78

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS 109).

NOTES: Each individual resident contributes their expenditure to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator. Acute care transitions include hospitalizations, ED visits, and observation stays.

Table O-6. Medicare expenditure (in dollars) per resident-year, FY 2014–2018, NY-RAH (New York)

Measure	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	3,880	3,573	3,297	3,372	3,479	4,401	4,258	4,078	3,886	3,674
Mean exposure (days)	244.64	240.78	233.29	228.26	228.51	249.11	247.85	252.01	247.99	243.31
Total Medicare expenditures	34,490.72	35,459.94	37,028.17	38,695.10	42,229.93	28,046.65	30,646.55	29,614.55	30,792.57	34,259.31
Hospitalizations (all-cause)	13,909.87	13,067.65	13,350.70	13,507.61	14,199.53	9,539.15	9,850.44	8,859.82	8,614.38	10,132.87
Potentially avoidable hospitalizations	3,507.82	2,972.22	2,996.24	3,106.22	3,290.28	2,384.57	2,443.96	2,102.90	2,057.09	2,392.09
Potentially avoidable hospitalizations (all six qualifying conditions)	1,940.60	1,570.27	1,699.80	1,766.78	1,715.50	1,349.15	1,357.01	1,087.10	1,092.37	1,135.34
Hospitalizations (pneumonia)	768.70	712.87	802.84	797.75	821.04	545.88	663.85	462.06	323.95	521.71
Hospitalizations (CHF)	415.04	273.63	353.17	334.90	373.71	394.06	268.12	314.62	409.80	310.91
Hospitalizations (COPD/asthma)	150.13	164.70	86.86	213.61	131.10	91.71	103.64	55.17	131.44	42.85
Hospitalizations (skin infection)	194.73	126.29	99.34	64.64	70.58	62.39	77.83	66.89	40.98	77.91
Hospitalizations (dehydration)	56.34	16.19	82.24	84.53	36.97	38.55	26.50	45.91	38.17	53.17
Hospitalizations (UTI)	355.67	276.61	275.35	271.34	282.11	216.56	217.08	142.45	148.01	128.80
ED visits (all-cause)	176.09	215.17	211.01	228.83	249.52	201.03	240.60	215.20	219.56	279.31
Potentially avoidable ED visits	72.36	90.86	86.15	98.97	109.53	83.41	112.86	93.38	90.40	120.68
Potentially avoidable ED visits (all six qualifying conditions)	14.01	13.63	17.30	17.78	12.15	18.84	24.46	21.46	19.40	30.99
ED visits (pneumonia)	0.94	1.93	1.06	3.51	2.00	2.97	5.12	2.14	1.97	3.67
ED visits (CHF)	0.30	1.46	0.19	0.00	1.71	2.06	1.07	2.30	1.26	3.04
ED visits (COPD/asthma)	3.09	0.64	1.23	1.21	0.69	1.46	1.95	3.31	1.12	1.16
ED visits (skin infection)	2.38	1.70	0.87	0.88	0.32	1.17	1.44	1.27	1.49	1.65
ED visits (dehydration)	1.32	0.90	2.49	0.61	1.37	1.79	4.37	2.67	1.84	5.44
ED visits (UTI)	5.98	7.01	11.45	11.57	6.06	9.39	10.50	9.78	11.72	16.03
Acute care transitions (all-cause)	14,085.96	13,282.81	13,562.89	13,737.77	14,449.06	9,745.20	10,091.72	9,076.25	8,834.66	10,413.41
Potentially avoidable acute care transitions	3,580.18	3,063.07	3,082.39	3,205.19	3,399.81	2,471.83	2,557.50	2,196.28	2,148.10	2,512.77
Potentially avoidable acute care transitions (all six qualifying conditions)	1,954.62	1,583.90	1,717.10	1,784.56	1,727.66	1,367.99	1,381.47	1,108.56	1,111.77	1,166.33
Acute care transitions (pneumonia)	769.64	714.79	803.90	801.26	823.04	548.85	668.96	464.20	325.92	525.38
Acute care transitions (CHF)	415.34	275.08	353.36	334.90	375.42	396.12	269.19	316.92	411.06	313.95

(continued)

Table O-6. Medicare expenditure (in dollars) per resident-year, FY 2014–2018, NY-RAH (New York) (continued)

Measure	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Acute care transitions (COPD/ asthma)	153.22	165.33	88.10	214.82	131.79	93.16	105.59	58.47	132.57	44.01
Acute care transitions (skin infection)	197.11	127.99	100.21	65.53	70.91	63.56	79.27	68.16	42.47	79.55
Acute care transitions (dehydration)	57.66	17.09	84.73	85.15	38.34	40.34	30.87	48.58	40.02	58.61
Acute care transitions (UTI)	361.65	283.61	286.80	282.91	288.17	225.95	227.58	152.23	159.73	144.82

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS 109).

NOTES: Each individual resident contributes their expenditure to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator. Acute care transitions include hospitalizations, ED visits, and observation stays.

Table O-7. Medicare expenditure (in dollars) per resident-year, FY 2014–2018, OPTIMISTIC (Indiana)

Measure	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	1,982	1,975	1,873	1,810	1,653	2,261	2,240	2,153	2,147	1,966
Mean exposure (days)	234.09	225.85	229.76	234.28	231.11	239.29	236.53	244.23	236.55	237.81
Total Medicare expenditures	28,448.99	29,479.04	28,499.31	30,089.15	32,506.74	24,221.57	26,756.85	25,617.60	26,513.54	28,164.65
Hospitalizations (all-cause)	6,821.41	6,542.21	6,285.07	6,666.74	7,240.52	5,477.18	6,158.48	5,623.11	5,328.60	6,458.24
Potentially avoidable hospitalizations	1,926.49	2,025.64	2,015.16	2,031.23	2,149.69	1,806.04	2,206.83	1,942.67	1,819.33	2,140.65
Potentially avoidable hospitalizations (all six qualifying conditions)	849.01	768.12	804.35	920.07	1,075.27	875.84	1,236.83	966.18	829.79	1,018.99
Hospitalizations (pneumonia)	487.45	340.55	412.82	341.59	412.67	437.17	706.71	430.23	260.23	421.32
Hospitalizations (CHF)	106.02	155.57	154.78	227.25	294.74	182.70	248.14	253.79	276.24	320.87
Hospitalizations (COPD/asthma)	62.57	23.51	34.71	150.51	106.99	67.82	74.02	113.37	143.16	106.37
Hospitalizations (skin infection)	33.86	52.04	39.13	44.37	61.08	43.68	67.26	21.12	24.26	25.91
Hospitalizations (dehydration)	6.35	22.12	37.06	11.78	57.26	6.39	7.06	17.27	21.25	17.46
Hospitalizations (UTI)	152.76	174.33	125.84	144.57	142.54	138.08	133.63	130.39	104.64	127.06
ED visits (all-cause)	231.97	226.21	246.12	212.21	256.77	292.89	271.98	281.87	289.29	369.74
Potentially avoidable ED visits	102.92	89.53	112.08	84.23	115.05	136.31	119.56	133.04	128.75	187.00
Potentially avoidable ED visits (all six qualifying conditions)	29.05	22.74	25.22	24.12	29.44	46.02	41.91	44.89	29.39	52.35
ED visits (pneumonia)	5.28	2.56	4.85	3.87	3.36	8.81	10.06	8.59	4.09	6.64
ED visits (CHF)	0.95	1.85	1.90	2.08	0.52	5.12	5.65	8.91	2.86	5.39
ED visits (COPD/asthma)	3.30	0.96	4.73	3.66	4.12	5.73	5.35	6.30	1.88	5.78
ED visits (skin infection)	2.13	1.04	0.64	0.75	4.19	3.47	2.83	2.71	1.95	1.79
ED visits (dehydration)	1.11	0.28	1.00	2.29	1.91	5.09	2.16	3.19	3.90	5.46
ED visits (UTI)	16.28	16.06	12.10	11.47	15.34	17.80	15.85	15.19	14.71	27.29
Acute care transitions (all-cause)	7,058.33	6,786.36	6,577.65	6,893.55	7,517.01	5,784.85	6,492.52	5,929.03	5,640.01	6,859.64
Potentially avoidable acute care transitions	2,029.41	2,123.94	2,127.24	2,116.69	2,264.75	1,943.33	2,330.48	2,075.71	1,948.08	2,328.96
Potentially avoidable acute care transitions (all six qualifying conditions)	878.06	790.86	829.58	944.18	1,104.71	921.85	1,278.96	1,011.06	859.17	1,071.34
Acute care transitions (pneumonia)	492.73	343.11	417.68	345.46	416.03	445.98	716.77	438.82	264.33	427.96
Acute care transitions (CHF)	106.98	157.42	156.68	229.33	295.25	187.82	253.79	262.70	279.10	326.26

(continued)

Table O-7. Medicare expenditure (in dollars) per resident-year, FY 2014–2018, OPTIMISTIC (Indiana) (continued)

Measure	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Acute care transitions (COPD/ asthma)	65.86	24.47	39.44	154.17	111.11	73.55	79.37	119.68	145.04	112.15
Acute care transitions (skin infection)	35.99	53.08	39.77	45.12	65.27	47.15	70.32	23.83	26.22	27.69
Acute care transitions (dehydration)	7.46	22.40	38.07	14.08	59.17	11.48	9.22	20.45	25.15	22.92
Acute care transitions (UTI)	169.04	190.39	137.94	156.03	157.88	155.88	149.48	145.58	119.34	154.35

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS 109).

NOTES: Each individual resident contributes their expenditure to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator. Acute care transitions include hospitalizations, ED visits, and observation stays.

Table O-8. Medicare expenditure (in dollars) per resident-year, FY 2014–2018, RAVEN (Pennsylvania)

Measure	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	1,600	1,616	1,597	1,536	1,484	1,770	1,757	1,788	1,693	1,623
Mean exposure (days)	261.48	266.36	274.11	271.54	268.98	251.02	252.25	250.33	249.13	254.47
Total Medicare expenditures	24,250.39	25,107.80	24,239.21	26,473.42	27,173.10	25,446.85	26,581.22	27,035.06	26,643.94	27,958.83
Hospitalizations (all-cause)	5,960.31	5,933.14	5,111.66	5,492.11	6,101.72	6,145.58	6,247.58	6,804.03	5,823.25	6,388.99
Potentially avoidable hospitalizations	1,704.90	1,470.13	1,241.91	1,474.47	1,530.49	2,132.78	2,005.81	2,159.59	1,730.39	1,699.82
Potentially avoidable hospitalizations (all six qualifying conditions)	1,044.04	805.24	496.59	708.53	762.71	1,082.92	1,143.82	1,039.43	912.78	921.36
Hospitalizations (pneumonia)	639.03	437.51	244.86	354.14	403.82	479.83	521.58	443.78	305.93	410.09
Hospitalizations (CHF)	113.15	129.62	50.29	124.54	148.15	218.70	357.80	246.41	299.77	286.23
Hospitalizations (COPD/asthma)	56.22	50.67	37.22	54.60	47.06	109.11	48.55	91.82	96.29	53.90
Hospitalizations (skin infection)	6.37	31.79	22.68	81.32	35.92	86.93	65.52	62.59	30.36	44.45
Hospitalizations (dehydration)	12.23	5.94	30.38	7.88	31.99	15.39	13.29	47.41	68.36	26.66
Hospitalizations (UTI)	217.04	149.71	111.16	86.05	95.77	172.97	137.08	147.42	112.08	100.03
ED visits (all-cause)	189.43	187.92	168.18	219.03	218.19	209.13	232.09	241.28	275.73	243.21
Potentially avoidable ED visits	84.32	76.73	78.92	87.91	77.46	92.27	88.44	81.41	89.57	94.76
Potentially avoidable ED visits (all six qualifying conditions)	28.59	27.06	27.41	29.09	27.93	24.04	32.01	22.96	26.86	32.36
ED visits (pneumonia)	7.38	7.17	5.83	6.66	6.40	0.79	4.35	3.11	2.62	2.60
ED visits (CHF)	5.59	2.20	3.63	7.09	3.94	3.24	0.91	1.69	3.91	3.58
ED visits (COPD/asthma)	2.88	2.65	3.83	1.86	1.96	1.23	2.17	2.10	5.81	4.07
ED visits (skin infection)	1.77	2.41	1.24	1.83	0.51	0.93	1.04	0.65	0.28	1.12
ED visits (dehydration)	2.61	0.76	2.58	0.59	0.00	4.30	4.00	0.83	1.61	1.20
ED visits (UTI)	8.35	11.87	10.29	11.06	15.12	13.56	19.54	14.57	12.62	19.78
Acute care transitions (all-cause)	6,157.24	6,127.54	5,286.41	5,714.03	6,320.82	6,372.93	6,487.86	7,046.05	6,098.98	6,659.03
Potentially avoidable acute care transitions	1,789.21	1,549.06	1,322.22	1,562.38	1,607.96	2,228.34	2,098.34	2,241.38	1,819.96	1,794.57
Potentially avoidable acute care transitions (all six qualifying conditions)	1,072.63	832.30	524.00	737.62	790.65	1,106.96	1,175.84	1,062.77	939.64	953.72
Acute care transitions (pneumonia)	646.41	444.68	250.69	360.80	410.22	480.62	525.93	446.90	308.56	412.70
Acute care transitions (CHF)	118.74	131.82	53.92	131.63	152.10	221.94	358.71	248.10	303.67	289.81

(continued)

Table O-8. Medicare expenditure (in dollars) per resident-year, FY 2014–2018, RAVEN (Pennsylvania) (continued)

Measure	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Acute care transitions (COPD/ asthma)	59.11	53.33	41.06	56.46	49.02	110.33	50.72	93.92	102.10	57.97
Acute care transitions (skin infection)	8.14	34.19	23.92	83.16	36.43	87.86	66.56	63.24	30.64	45.58
Acute care transitions (dehydration)	14.84	6.70	32.96	8.47	31.99	19.68	17.29	48.25	69.97	27.86
Acute care transitions (UTI)	225.39	161.58	121.45	97.11	110.89	186.52	156.62	162.37	124.70	119.81

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

SOURCE: RTI analysis of Medicare claims data (RTI program MS 109).

NOTES: Each individual resident contributes their expenditure to the aggregated numerator and their count of Initiative-eligible days to the aggregated denominator. Acute care transitions include hospitalizations, ED visits, and observation stays.

APPENDIX P
MDS-BASED QUALITY MEASURES

In this section, we present summary results from a descriptive analysis of Minimum Data Set (MDS)-based quality measures, reporting the percentage of observed quarters with each event. ***Table P-1*** presents the summary results for the national comparison group. ***Tables P-2*** through ***P-8*** present the results by intervention group (Clinical + Payment and Payment-Only), combined across all ECCPs, and then separately for each ECCP.

Table P-1. MDS-based quality measures: Percent of observed quarters with each event, FY 2014–2018, national comparison group

Measure	National comparison group				
	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	769,420	723,376	703,580	682,456	663,564
Mean exposure (days)	242	236	240	238	239
Catheter inserted and left in bladder	5.0	5.1	5.1	5.1	5.1
One or more fall with injury	11.9	12.2	12.4	12.5	12.5
Self-reported moderate to severe pain	9.1	8.6	7.6	6.5	6.0
Pressure ulcer Stage II or higher	4.0	4.1	4.0	4.0	4.0
Decline in ADLs	15.3	15.4	15.0	14.7	14.7
Urinary tract infection	5.8	5.3	4.4	3.7	2.9
Antipsychotic medication use	24.0	22.7	21.4	21.0	20.7
Antianxiety or hypnotic medication use	1.3	1.0	0.7	0.5	0.3
Weight loss	6.2	6.5	6.1	6.1	6.0
Physically restrained	24.4	24.3	24.0	23.4	21.8

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

Source: RTI analysis of MDS data (RTI program ID117).

Table P-2. MDS-based quality measures: Percent of observed quarters with each event, FY 2014–2018, all ECCPs (all states)

Measure	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	13,229	12,993	12,505	12,088	11,284	15,133	14,894	14,315	13,794	12,706
Mean exposure (days)	245	241	242	239	234	244	242	247	243	242
Catheter inserted and left in bladder	4.9	5.1	4.6	5.1	4.7	4.6	4.6	4.9	4.8	5.1
One or more fall with injury	11.0	11.9	12.1	12.6	12.2	12.3	12.4	12.9	13.4	13.6
Self-reported moderate to severe pain	7.2	6.6	5.5	4.6	4.2	7.4	6.5	5.6	5.0	4.8
Pressure ulcer Stage II or higher	4.8	4.6	4.4	4.5	4.7	3.5	3.7	3.5	3.5	3.6
Decline in ADLs	12.9	12.5	12.6	13.1	13.2	13.0	12.9	13.2	12.9	13.7
Urinary tract infection	4.6	4.2	3.2	2.8	2.3	5.1	4.2	3.5	3.1	2.9
Antipsychotic medication use	21.5	20.1	18.9	18.5	18.5	22.1	20.7	19.1	19.2	18.5
Antianxiety or hypnotic medication use	0.9	0.6	0.4	0.2	0.2	0.8	0.7	0.4	0.3	0.3
Weight loss	6.4	6.4	6.2	6.5	6.6	5.8	5.9	5.6	5.9	6.2
Physically restrained	20.5	20.0	20.2	19.4	18.2	21.0	20.8	19.9	19.3	18.6

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

Source: RTI analysis of MDS data (RTI program ID117).

Table P-3. MDS-based quality measures: Percent of observed quarters with each event, FY 2014–2018, AQAF (Alabama)

Measure	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	2,453	2,513	2,485	2,272	1,601	2,116	2,061	1,997	1,874	1,466
Mean exposure (days)	262	256	258	251	222	252	255	256	254	248
Catheter inserted and left in bladder	4.0	3.8	3.3	3.9	3.2	4.4	4.2	4.1	3.9	3.9
One or more fall with injury	11.2	12.1	13.9	14.2	14.3	11.5	11.2	10.6	11.4	11.1
Self-reported moderate to severe pain	8.3	6.8	6.1	3.9	3.3	7.3	6.7	5.8	4.7	5.1
Pressure ulcer Stage II or higher	2.4	2.7	2.6	2.7	3.1	3.0	3.3	3.3	3.6	3.3
Decline in ADLs	12.5	12.4	12.9	14.3	13.4	11.0	12.4	11.3	12.5	13.4
Urinary tract infection	3.8	4.0	4.0	3.5	3.6	4.3	3.5	3.1	2.0	2.5
Antipsychotic medication use	24.0	23.6	20.6	21.0	22.2	24.3	23.7	22.6	24.4	23.8
Antianxiety or hypnotic medication use	0.5	0.4	0.3	0.2	0.1	0.8	0.5	0.3	0.1	0.0
Weight loss	6.1	7.1	7.1	7.3	8.2	7.1	5.6	5.4	6.6	6.9
Physically restrained	29.2	29.3	29.0	28.8	27.6	32.5	33.8	31.8	29.3	26.5

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

Source: RTI analysis of MDS data (RTI program ID117).

Table P-4. MDS-based quality measures: Percent of observed quarters with each event, FY 2014–2018, ATOP2 (Nevada/Colorado)

Measure	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	1,246	1,220	1,188	1,169	1,174	1,869	1,798	1,711	1,682	1,603
Mean exposure (days)	221	234	239	238	243	240	226	237	232	236
Catheter inserted and left in bladder	8.4	9.3	8.8	9.2	7.7	5.7	6.0	6.1	6.1	7.1
One or more fall with injury	10.7	12.6	11.8	12.6	12.3	14.9	14.5	14.7	16.0	17.4
Self-reported moderate to severe pain	12.9	16.9	14.5	13.5	8.9	8.8	8.0	7.3	6.5	6.7
Pressure ulcer Stage II or higher	6.2	5.6	4.6	5.3	5.9	2.7	2.6	2.9	2.6	2.6
Decline in ADLs	16.0	14.2	14.7	14.3	14.3	13.1	13.8	14.4	13.1	12.2
Urinary tract infection	4.8	5.3	2.4	2.3	2.1	5.3	3.8	3.8	3.0	2.6
Antipsychotic medication use	20.9	18.1	18.1	18.9	21.5	16.9	17.1	16.5	16.5	15.8
Antianxiety or hypnotic medication use	0.2	0.1	0.3	0.0	0.1	0.3	0.4	0.7	0.3	0.2
Weight loss	6.9	7.2	4.7	5.4	5.8	5.1	5.7	4.7	5.1	5.4
Physically restrained	26.5	24.4	23.8	22.4	20.9	15.3	14.5	14.2	14.6	13.5

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

Source: RTI analysis of MDS data (RTI program ID117).

Table P-5. MDS-based quality measures: Percent of observed quarters with each event, FY 2014–2018, MOQI (Missouri)

Measure	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	1,608	1,664	1,568	1,500	1,428	2,257	2,257	2,112	1,987	1,853
Mean exposure (days)	257	246	254	250	246	250	246	258	257	246
Catheter inserted and left in bladder	4.7	5.8	5.0	5.2	5.3	3.7	3.3	3.7	3.8	3.7
One or more fall with injury	15.9	17.2	16.4	16.9	14.9	17.2	16.2	17.3	16.2	18.2
Self-reported moderate to severe pain	8.4	7.3	4.4	4.2	5.4	9.8	8.9	7.4	6.9	7.0
Pressure ulcer Stage II or higher	3.2	3.2	3.3	3.5	3.5	2.7	2.6	2.0	2.9	3.3
Decline in ADLs	11.6	12.7	10.1	10.9	13.7	12.5	14.0	13.0	12.2	13.3
Urinary tract infection	6.9	5.5	3.7	3.2	2.6	6.2	5.3	3.7	4.6	4.2
Antipsychotic medication use	19.7	18.5	17.1	18.2	17.8	23.2	21.9	20.3	20.4	20.8
Antianxiety or hypnotic medication use	0.8	0.5	0.1	0.1	0.3	0.6	0.4	0.4	0.2	0.0
Weight loss	5.0	5.5	5.9	6.1	5.2	6.4	7.3	6.2	6.7	5.6
Physically restrained	24.3	22.9	22.5	22.7	22.7	24.9	25.2	23.3	23.9	23.1

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

Source: RTI analysis of MDS data (RTI program ID117).

Table P-6. MDS-based quality measures: Percent of observed quarters with each event, FY 2014–2018, NY-RAH (New York)

Measure	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	4,149	3,848	3,657	3,654	3,781	4,705	4,577	4,389	4,252	4,034
Mean exposure (days)	239	234	225	221	222	244	243	248	242	240
Catheter inserted and left in bladder	4.4	4.3	4.1	4.8	4.4	4.8	4.7	5.2	5.3	5.7
One or more fall with injury	7.7	8.1	7.9	8.7	9.9	8.7	9.7	10.3	10.4	11.3
Self-reported moderate to severe pain	3.1	2.1	2.2	2.1	2.3	5.4	5.0	3.6	2.7	2.2
Pressure ulcer Stage II or higher	6.7	6.6	6.4	6.6	6.8	5.0	5.2	4.7	4.7	4.8
Decline in ADLs	10.9	9.7	9.4	10.1	10.0	12.3	11.2	11.2	11.1	11.8
Urinary tract infection	4.2	3.9	2.8	2.5	2.1	5.1	4.3	3.2	2.8	2.7
Antipsychotic medication use	18.3	16.5	15.2	13.0	12.3	24.2	22.8	21.1	20.4	19.2
Antianxiety or hypnotic medication use	1.3	1.0	0.7	0.4	0.4	1.4	1.2	0.7	0.5	0.7
Weight loss	6.3	5.4	5.5	5.6	6.8	4.7	5.6	5.2	5.3	6.3
Physically restrained	13.6	13.1	13.0	12.5	11.5	16.7	16.5	16.0	15.4	16.0

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

Source: RTI analysis of MDS data (RTI program ID117).

Table P-7. MDS-based quality measures: Percent of observed quarters with each event, FY 2014–2018, OPTIMISTIC (Indiana)

Measure	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	2,120	2,086	1,950	1,908	1,763	2,328	2,333	2,237	2,231	2,033
Mean exposure (days)	229	219	224	228	227	234	231	239	232	234
Catheter inserted and left in bladder	4.4	4.5	4.1	4.8	4.7	4.4	4.6	4.8	4.9	4.7
One or more fall with injury	12.9	15.7	14.9	14.8	13.1	13.9	14.9	15.3	17.5	16.6
Self-reported moderate to severe pain	6.9	3.6	4.0	3.1	2.6	8.7	5.9	5.4	5.2	4.4
Pressure ulcer Stage II or higher	4.3	4.4	3.9	4.3	3.8	2.9	3.0	3.2	2.9	3.2
Decline in ADLs	13.1	12.5	12.7	13.4	14.1	15.8	14.6	15.0	16.3	16.9
Urinary tract infection	3.7	3.2	2.7	1.8	1.3	5.1	4.2	3.9	3.3	3.1
Antipsychotic medication use	19.8	17.7	18.6	18.0	17.0	22.2	20.3	16.9	16.2	16.8
Antianxiety or hypnotic medication use	0.5	0.4	0.4	0.2	0.2	0.3	0.1	0.1	0.1	0.1
Weight loss	7.6	7.8	7.0	8.6	8.1	6.4	5.9	6.4	5.9	6.7
Physically restrained	14.4	13.7	15.4	15.3	14.6	19.3	18.3	18.5	16.9	17.4

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

Source: RTI analysis of MDS data (RTI program ID117).

Table P-8. MDS-based quality measures: Percent of observed quarters with each event, FY 2014–2018, RAVEN (Pennsylvania)

Measure	Clinical + Payment					Payment-Only				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Number of residents meeting eligibility criteria	1,653	1,662	1,657	1,585	1,537	1,858	1,868	1,869	1,768	1,717
Mean exposure (days)	258	265	270	268	266	246	247	247	246	250
Catheter inserted and left in bladder	6.2	6.2	4.8	4.7	4.3	4.8	5.4	5.2	4.6	5.0
One or more fall with injury	11.7	10.3	10.4	11.7	12.0	11.3	10.8	11.6	12.2	9.1
Self-reported moderate to severe pain	11.0	10.6	7.2	6.4	5.7	6.4	6.4	6.5	6.9	6.8
Pressure ulcer Stage II or higher	5.2	4.3	4.5	3.8	3.1	2.7	3.3	3.3	2.9	2.8
Decline in ADLs	16.9	16.6	18.1	17.8	17.1	13.4	13.2	16.0	13.6	15.6
Urinary tract infection	5.1	4.4	3.6	3.0	2.3	4.9	3.7	3.6	2.6	2.1
Antipsychotic medication use	28.9	27.5	25.4	26.1	27.8	17.8	14.5	14.2	14.9	14.1
Antianxiety or hypnotic medication use	1.4	0.9	0.4	0.2	0.2	0.5	0.7	0.3	0.0	0.2
Weight loss	6.6	6.6	6.6	5.7	5.4	6.5	5.7	5.9	6.3	6.2
Physically restrained	23.1	22.0	20.9	19.7	22.0	21.0	20.0	19.5	19.1	18.5

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

Source: RTI analysis of MDS data (RTI program ID117).

Appendix Q
Sensitivity Analyses

As explained in Section 3, we conducted two sensitivity analyses to confirm the robustness of our results. A side-by-side comparison of the effect estimates from the main analysis and those from the sensitivity analyses using the WSRG and using FY 2016 as the baseline year is presented in ***Tables Q-1*** (for probability of utilization), ***Q-2*** (for count of utilization events), and ***Q-3*** (for expenditure measures). Complete results for the sensitivity analysis using the WSRG for both the Clinical + Payment and Payment-Only facilities are presented below in ***Tables Q-4, Q-5,*** and ***Q-6*** for the probability, count, and expenditure models, respectively. Complete results for the sensitivity analysis using FY 2016 as the baseline year for both the Clinical + Payment and Payment-Only facilities are displayed in ***Tables Q-7, Q-8,*** and ***Q-9*** for the probability, count, and expenditure models, respectively. Results are presented by intervention group, combined across all ECCPs.

When comparing to the WSRG instead of the national comparison group, the pattern of increases that we observed in utilization and expenditure measures in the Clinical + Payment facilities moderately weakened. The only increase that remained statistically significant was total Medicare expenditures, and there were even a couple of statistically significant reductions. In the Payment-Only facilities, there was a more consistent pattern of reductions, including a statistically significant reduction in the probability of all-cause acute care transitions.

When using FY 2016 as the baseline year instead of using FYs 2014–2016 with a linear trend, we found that the pattern of increases that we observed in utilization and expenditure measures in the Clinical + Payment facilities moderately weakened and there were no longer any statistically significant increases. There were even a couple of statistically significant decreases, including the probability and count of ED visits for the six qualifying conditions. In the Payment-Only facilities, there was a more consistent pattern of reductions. However, none of the reductions were statistically significant.

Table Q-1. Comparison of the main analysis, the sensitivity analysis using the within-state reference group, and the sensitivity analysis using 2016 as the baseline year: Initiative effect on probability of hospital-related utilization per resident, FY 2018

Measure	Relative effect (percent) Main analysis	Relative effect (percent) Sensitivity analysis using within-state reference group	Relative effect (percent) Sensitivity analysis using 2016 as baseline year
Clinical + Payment			
Hospitalizations			
All-cause	−2.1	−3.2	**−5.2**
Potentially avoidable	4.4	1.5	−0.5
Six qualifying conditions	9.0	6.0	0.9
ED visits			
All-cause	**7.4**	3.9	1.1
Potentially avoidable	5.2	0.9	1.2
Six qualifying conditions	−16.7	**−21.6**	**−19.6**
Acute care transitions			
All-cause	0.7	−1.3	−2.9
Potentially avoidable	3.9	0.6	−0.3
Six qualifying conditions	−0.8	−4.0	−6.3
Payment-Only			
Hospitalizations			
All-cause	−1.4	−2.5	−1.7
Potentially avoidable	5.9	3.0	3.2
Six qualifying conditions	−3.1	−5.7	−4.7
ED visits			
All-cause	−0.7	−3.7	−2.3
Potentially avoidable	−2.6	−6.3	−2.5
Six qualifying conditions	1.0	−5.0	−3.4
Acute care transitions			
All-cause	-2.7	**−4.4**	−2.6
Potentially avoidable	0.0	−3.0	−0.9
Six qualifying conditions	-3.2	−6.3	−6.3

ED = emergency department.

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

NOTES: 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. All predictions are based on a difference-in-differences regression model with a nationally selected comparison group and adjusted for resident-level and facility-level characteristics. *Acute care transitions* include hospitalizations, ED visits, or observation stays.

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

Table Q-2. Comparison of the main analysis, the sensitivity analysis using the within-state reference group, and the sensitivity analysis using 2016 as the baseline year: Initiative effect on count of hospital-related utilization events per resident, FY 2018

Measure	Relative effect (percent) Main analysis	Relative effect (percent) Sensitivity analysis using within-state reference group	Relative effect (percent) Sensitivity analysis using 2016 as baseline year
Clinical + Payment			
Hospitalizations			
All-cause	−0.6	−3.1	−5.4
Potentially avoidable	8.1	5.3	0.7
Six qualifying conditions	11.8	8.6	3.1
ED visits			
All-cause	**9.0**	4.3	1.6
Potentially avoidable	**10.9**	5.1	4.6
Six qualifying conditions	−15.4	**−20.4**	**−19.0**
Acute care transitions			
All-cause	3.6	−0.1	−2.5
Potentially avoidable	8.7	4.2	2.0
Six qualifying conditions	3.4	−0.6	−4.3
Payment-Only			
Hospitalizations			
All-cause	0.2	−2.3	−0.9
Potentially avoidable	6.0	3.3	2.8
Six qualifying conditions	0.4	−2.5	−1.6
ED visits			
All-cause	2.4	−2.0	−0.9
Potentially avoidable	−1.9	−7.0	−2.4
Six qualifying conditions	−2.4	−8.1	−5.9
Acute care transitions			
All-cause	1.3	−2.2	−0.8
Potentially avoidable	1.7	−2.5	0.0
Six qualifying conditions	−1.4	−5.2	−4.0

ED = emergency department.

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

NOTES: The relative Initiative effect is the absolute Initiative effect (counts of events) divided by the mean predicted count of events under the scenario that the intervention did not occur. All predictions are based on a difference-in-differences regression model with a nationally selected comparison group and adjusted for resident-level and facility-level characteristics. *Acute care transitions* include hospitalizations, ED visits, or observation stays.

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

Table Q-3. Comparison of the main analysis, the sensitivity analysis using the within-state reference group, and the sensitivity analysis using 2016 as the baseline year: Initiative effect on Medicare expenditures, FY 2018

Measure	Relative effect (percent) Main analysis	Relative effect (percent) Sensitivity analysis using within-state reference group	Relative effect (percent) Sensitivity analysis using 2016 as baseline year
Clinical + Payment			
Total Medicare expenditures	**5.3**	**4.4**	2.7
Hospitalization expenditures			
All-cause	7.6	5.6	1.3
Potentially avoidable	**14.6**	10.2	6.4
Six qualifying conditions	**20.7**	17.3	10.8
ED visit expenditures			
All-cause	3.3	−1.0	−1.1
Potentially avoidable	6.3	−0.5	0.9
Six qualifying conditions	−6.5	−12.9	−14.0
Acute care transition expenditures			
All-cause	6.2	4.5	−0.4
Potentially avoidable	**13.2**	9.4	4.8
Six qualifying conditions	**18.7**	15.7	8.7
Payment-Only			
Total Medicare expenditures	2.8	1.9	3.2
Hospitalization expenditures			
All-cause	3.7	1.7	2.4
Potentially avoidable	1.9	−2.0	1.9
Six qualifying conditions	−3.0	−5.7	−0.4
ED visit expenditures			
All-cause	4.5	0.4	0.3
Potentially avoidable	5.5	−1.1	2.2
Six qualifying conditions	−0.2	−7.0	−4.1
Acute care transition expenditures			
All-cause	2.9	1.4	1.7
Potentially avoidable	1.1	−2.1	0.9
Six qualifying conditions	−3.7	−6.0	−1.5

ED = emergency department.

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

NOTES: The relative Initiative effect is the absolute Initiative effect (dollars) divided by the mean predicted expenditures under the scenario that the intervention did not occur. All predictions are based on a difference-in-differences regression model with a nationally selected comparison group and adjusted for resident-level 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.

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

Table Q-4. Sensitivity analysis using within-state reference group: Initiative effect on probability of hospital-related utilization per resident, FY 2018

Measure	Predicted probability absent the initiative (percent)	Absolute initiative effect (percentage points)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
Any hospitalization						
All-cause	27.2	−0.9	−2.3	0.6	0.318	−3.2
Potentially avoidable	11.3	0.2	−1.0	1.3	0.809	1.5
Six qualifying conditions	5.8	0.4	−0.4	1.1	0.452	6.0
Any ED visit						
All-cause	19.2	0.8	−0.6	2.1	0.364	3.9
Potentially avoidable	10.6	0.1	−0.9	1.1	0.872	0.9
Six qualifying conditions	**2.8**	**−0.6**	**−1.1**	**−0.1**	**0.06**	**−21.6**
Any acute care transition						
All-cause	37.6	−0.5	−2.2	1.3	0.655	−1.3
Potentially avoidable	19.7	0.1	−1.4	1.6	0.898	0.6
Six qualifying conditions	8.3	−0.3	−1.3	0.6	0.57	−4.0
Payment-Only						
Any hospitalization						
All-cause	26.6	−0.7	−2.1	0.7	0.436	−2.5
Potentially avoidable	11.9	0.4	−0.6	1.3	0.547	3.0
Six qualifying conditions	6.9	−0.4	−1.2	0.4	0.423	−5.7
Any ED visit						
All-cause	24.9	−0.9	−2.4	0.6	0.303	−3.7
Potentially avoidable	14.5	−0.9	−2.1	0.3	0.196	−6.3
Six qualifying conditions	4.2	−0.2	−0.9	0.4	0.593	−5.0
Any acute care transition						
All-cause	**40.9**	**−1.8**	**−3.3**	**−0.3**	**0.048**	**−4.4**
Potentially avoidable	23.1	−0.7	−2.1	0.7	0.412	−3.0
Six qualifying conditions	10.1	−0.6	−1.6	0.3	0.279	−6.3

ED = emergency department.

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

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 nationally selected comparison group and adjusted for resident-level and facility-level characteristics. It is the difference between the predicted probabilities of the event with and without the intervention. The *relative effect* = (absolute Initiative effect) / (predicted probability absent the Initiative). *Acute care transitions* include hospitalizations, ED visits, or observation stays.

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

Table Q-5. Sensitivity analysis using within-state reference group: Initiative effect on count of hospital-related utilization events per resident, FY 2018

Measure	Predicted count absent the initiative (events per year)	Absolute initiative effect (events per year)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
Hospitalizations						
All-cause	0.443	−0.014	−0.045	0.017	0.459	−3.1
Potentially avoidable	0.135	0.007	−0.009	0.023	0.458	5.3
Six qualifying conditions	0.066	0.006	−0.004	0.015	0.327	8.6
ED visits						
All-cause	0.285	0.012	−0.013	0.038	0.433	4.3
Potentially avoidable	0.125	0.006	−0.007	0.020	0.433	5.1
Six qualifying conditions	**0.030**	**−0.006**	**−0.012**	**0.000**	**0.086**	**−20.4**
Acute care transitions						
All-cause	0.726	0.000	−0.047	0.046	0.988	−0.1
Potentially avoidable	0.263	0.011	−0.012	0.034	0.430	4.2
Six qualifying conditions	0.096	−0.001	−0.013	0.012	0.943	−0.6
Payment-Only						
Hospitalizations						
All-cause	0.416	−0.009	−0.039	0.020	0.6	−2.3
Potentially avoidable	0.144	0.005	−0.009	0.019	0.56	3.3
Six qualifying conditions	0.080	−0.002	−0.012	0.008	0.747	−2.5
ED visits						
All-cause	0.375	−0.008	−0.041	0.025	0.705	−2.0
Potentially avoidable	0.182	−0.013	−0.029	0.003	0.187	−7.0
Six qualifying conditions	0.048	−0.004	−0.012	0.004	0.414	−8.1
Acute care transitions						
All-cause	0.796	−0.018	−0.071	0.036	0.588	−2.2
Potentially avoidable	0.327	−0.008	−0.032	0.015	0.57	−2.5
Six qualifying conditions	0.128	−0.007	−0.021	0.008	0.45	−5.2

ED = emergency department.

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

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

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

Table Q-6. Sensitivity analysis using within-state reference group: Initiative effect on Medicare expenditures, FY 2018

Measure	Predicted expenditure absent the initiative (dollars)	Absolute initiative effect (dollars)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
Total Medicare expenditures	**33,667**	**1,480**	**73**	**2,886**	**0.084**	**4.4**
Hospitalization expenditures						
All-cause	10,076	564	−328	1,457	0.298	5.6
Potentially avoidable	2,385	243	−66	552	0.195	10.2
Six qualifying conditions	1,096	190	−5	384	0.109	17.3
ED visit expenditures						
All-cause	280	−3	−32	27	0.871	−1.0
Potentially avoidable	112	−1	−16	15	0.953	−0.5
Six qualifying conditions	28	−4	−11	4	0.427	−12.9
Acute care transition expenditures						
All-cause	10,683	484	−466	1,434	0.402	4.5
Potentially avoidable	2,528	238	−78	554	0.215	9.4
Six qualifying conditions	1,133	177	−26	380	0.151	15.7
Payment-Only						
Total Medicare expenditures	28,841	559	−516	1,633	0.393	1.9
Hospitalization expenditures						
All-cause	7,982	136	−430	702	0.693	1.7
Potentially avoidable	2,323	−46	−282	190	0.747	−2.0
Six qualifying conditions	1,204	−68	−240	103	0.513	−5.7
ED visit expenditures						
All-cause	331	1	−33	35	0.953	0.4
Potentially avoidable	147	−2	−19	16	0.88	−1.1
Six qualifying conditions	49	−3	−13	6	0.564	−7.0
Acute care transition expenditures						
All-cause	8,461	120	−461	702	0.734	1.4
Potentially avoidable	2,526	−54	−300	193	0.721	−2.1
Six qualifying conditions	1,270	−77	−252	99	0.472	−6.0

ED = emergency department.

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

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). *Acute care transitions* include hospitalizations, ED visits, or observation stays. Total expenditures cover all categories of Medicare spending: hospital, physician, SNF, home health, DME, lab and other providers and suppliers, hospice, and Part D drugs.

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

Table Q-7. Sensitivity analysis using 2016 as baseline year: Initiative effect on probability of hospital-related utilization per resident, FY 2018

Measure	Predicted probability absent the initiative (percent)	Absolute initiative effect (percentage points)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
Any hospitalization						
All-cause	**27.8**	**−1.4**	**−2.6**	**−0.3**	**0.037**	**−5.2**
Potentially avoidable	11.6	−0.1	−1.0	0.8	0.910	−0.5
Six qualifying conditions	6.1	0.1	−0.6	0.7	0.887	0.9
Any ED visit						
All-cause	19.8	0.2	−0.8	1.3	0.726	1.1
Potentially avoidable	10.6	0.1	−0.6	0.9	0.786	1.2
Six qualifying conditions	**2.7**	**−0.5**	**−0.9**	**−0.2**	**0.018**	**−19.6**
Any acute care transition						
All-cause	38.3	−1.1	−2.4	0.2	0.178	−2.9
Potentially avoidable	19.9	−0.1	−1.2	1.1	0.929	−0.3
Six qualifying conditions	8.5	−0.5	−1.3	0.3	0.262	−6.3
Payment-Only						
Any hospitalization						
All-cause	26.3	−0.4	−1.6	0.7	0.529	−1.7
Potentially avoidable	11.9	0.4	−0.5	1.2	0.457	3.2
Six qualifying conditions	6.9	−0.3	−1.0	0.3	0.401	−4.7
Any ED visit						
All-cause	24.6	−0.6	−1.7	0.6	0.423	−2.3
Potentially avoidable	14.0	−0.4	−1.2	0.5	0.509	−2.5
Six qualifying conditions	4.1	−0.1	−0.6	0.4	0.647	−3.4
Any acute care transition						
All-cause	40.1	−1.0	−2.3	0.2	0.158	−2.6
Potentially avoidable	22.6	−0.2	−1.3	0.9	0.762	−0.9
Six qualifying conditions	10.1	−0.6	−1.4	0.1	0.170	−6.3

ED = emergency department.

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

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). *Acute care transitions* include hospitalizations, ED visits, or observation stays.

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

Table Q-8. Sensitivity analysis using 2016 as baseline year: Initiative effect on count of hospital-related utilization events per resident, FY 2018

Measure	Predicted count absent the initiative (events per year)	Absolute initiative effect (events per year)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
Hospitalizations						
All-cause	0.454	−0.025	−0.049	0.000	0.101	−5.4
Potentially avoidable	0.141	0.001	−0.012	0.014	0.904	0.7
Six qualifying conditions	0.070	0.002	−0.006	0.010	0.658	3.1
ED visits						
All-cause	0.292	0.005	−0.016	0.025	0.714	1.6
Potentially avoidable	0.126	0.006	−0.005	0.017	0.374	4.6
Six qualifying conditions	**0.029**	**−0.006**	**−0.010**	**−0.002**	**0.024**	**−19.0**
Acute care transitions						
All-cause	0.744	−0.019	−0.055	0.017	0.390	−2.5
Potentially avoidable	0.269	0.005	−0.013	0.023	0.628	2.0
Six qualifying conditions	0.100	−0.004	−0.014	0.006	0.482	−4.3
Payment-Only						
Hospitalizations						
All-cause	0.410	−0.004	−0.027	0.020	0.795	−0.9
Potentially avoidable	0.144	0.004	−0.008	0.016	0.578	2.8
Six qualifying conditions	0.079	−0.001	−0.009	0.007	0.801	−1.6
ED visits						
All-cause	0.371	−0.003	−0.033	0.027	0.855	−0.9
Potentially avoidable	0.174	−0.004	−0.016	0.008	0.576	−2.4
Six qualifying conditions	0.047	−0.003	−0.009	0.003	0.446	−5.9
Acute care transitions						
All-cause	0.784	−0.006	−0.053	0.040	0.823	−0.8
Potentially avoidable	0.319	0.000	−0.019	0.019	0.996	0.0
Six qualifying conditions	0.126	−0.005	−0.016	0.006	0.461	−4.0

ED = emergency department.

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

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

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

Table Q-9. Sensitivity analysis using 2016 as baseline year: Initiative effect on Medicare expenditures, FY 2018

Measure	Predicted expenditure absent the initiative (dollars)	Absolute initiative effect (dollars)	90% CI		p-value	Relative effect (percent)
Clinical + Payment						
Total Medicare expenditures	34,232	918	−193	2,029	0.174	2.7
Hospitalization expenditures						
All-cause	10,502	139	−577	855	0.749	1.3
Potentially avoidable	2,471	157	−93	407	0.301	6.4
Six qualifying conditions	1,161	125	−41	292	0.217	10.8
ED visit expenditures						
All-cause	281	−3	−26	20	0.822	−1.1
Potentially avoidable	110	1	−11	13	0.897	0.9
Six qualifying conditions	28	−4	−9	1	0.231	−14.0
Acute care transition expenditures						
All-cause	11,209	−42	−838	754	0.931	−0.4
Potentially avoidable	2,639	127	−118	373	0.394	4.8
Six qualifying conditions	1,205	105	−66	275	0.313	8.7
Payment-Only						
Total Medicare Expenditures	28,480	920	−4	1,843	0.101	3.2
Hospitalization Expenditures						
All-cause	7,924	194	−258	645	0.481	2.4
Potentially avoidable	2,233	43	−144	230	0.704	1.9
Six qualifying conditions	1,141	−5	−133	124	0.954	−0.4
ED visit expenditures						
All-cause	332	1	−26	29	0.946	0.3
Potentially avoidable	142	3	−10	16	0.688	2.2
Six qualifying conditions	47	−2	−9	6	0.669	−4.1
Acute care transition expenditures						
All-cause	8,438	144	−299	586	0.593	1.7
Potentially avoidable	2,451	21	−170	213	0.854	0.9
Six qualifying conditions	1,212	−18	−146	110	0.819	−1.5

ED = emergency department.

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

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). *Acute care transitions* include hospitalizations, ED visits, or observation stays. Total expenditures cover all categories of Medicare spending: hospital, physician, SNF, home health, DME, lab and other providers and suppliers, hospice, and Part D drugs.

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

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APPENDIX R
COMPLETE MULTIVARIATE REGRESSION RESULTS OF EXAMPLE MODEL

Appendix R-1 shows parameter estimates from the complete model of a key example outcome, the probability of having any potentially avoidable hospitalization. This illustrates an example model used in this report: a logistic model of the probability of utilization. For illustration, we use the data from the pooled model combining all ECCPs for the Payment-Only group.

Table R-1. Complete multivariate regression results of probability of potentially avoidable hospitalization per resident, all ECCPs (6 states), Payment-Only: Estimated coefficients with standard errors and p-values

Parameter	Any potentially avoidable hospitalizations		
	β	SE	p
Intervention group	−0.159	0.050	0.001
Within-state reference group (WSRG)	−0.104	0.027	<0.001
Year count (2014 = 0, 2015 = 1, 2016 = 2, 2017 = 3, 2018 = 3)	−0.047	0.003	<0.001
Year count * Intervention group	−0.039	0.021	0.060
Year count * WSRG	−0.012	0.007	0.110
FY 2017	0.053	0.011	<0.001
FY 2018	0.022	0.011	0.047
FY 2017 * Intervention group	−0.049	0.049	0.324
FY 2018 * Intervention group	0.068	0.057	0.230
FY 2017 * WSRG	0.022	0.019	0.227
FY 2017 * WSRG	0.033	0.019	0.082
Exposure days 1–89	−0.437	0.006	<0.001
Exposure days 90–179	0.212	0.005	<0.001
Exposure days 180–269	0.376	0.005	<0.001
Exposure days 270–364	0.562	0.005	<0.001
Male, <65	−0.079	0.011	<0.001
Female, 65–69	0.055	0.012	<0.001
Male, 65–69	−0.001	0.013	0.968
Female, 70–74	0.129	0.011	<0.001
Male, 70–74	0.058	0.012	<0.001
Female, 75–79	0.173	0.011	<0.001
Male, 75–79	0.139	0.012	<0.001
Female, 80–84	0.197	0.011	<0.001
Male, 80–84	0.202	0.012	<0.001
Male, 85–89	0.206	0.011	<0.001
Male, 85–89	0.257	0.012	<0.001
Female, 90–94	0.170	0.011	<0.001
Male, 90–94	0.271	0.014	<0.001
Female, 95+	0.066	0.013	<0.001
Male, 95+	0.203	0.021	<0.001
Black, non-Hispanic	0.044	0.007	<0.001
Asian	0.031	0.022	0.147
Hispanic	0.103	0.017	<0.001

(continued)

Table R-1. Complete multivariate regression results of probability of potentially avoidable hospitalization per resident, all ECCPs (6 states), Payment-Only: Estimated coefficients with standard errors and p-values (continued)

Parameter	Any potentially avoidable hospitalizations		
	β	SE	p
Other race/ethnicity	−0.030	0.013	0.021
Dementia	0.006	0.004	0.197
Anemia	0.088	0.004	<0.001
BMI <18.5	−0.090	0.008	<0.001
BMI = 25–29.9	0.003	0.004	0.459
BMI ≥30	0.065	0.005	<0.001
ADL score = 8–14	0.073	0.007	<0.001
ADL score = 15–21	−0.024	0.007	<0.001
ADL score = 22–28	−0.105	0.009	<0.001
CFS= 2 (Moderately impaired)	−0.041	0.005	<0.001
CFS= 1 (Mildly impaired)	−0.057	0.005	<0.001
CFS= 0 (Cognitively intact)	−0.128	0.008	<0.001
Urban Non-Metropolitan	0.154	0.010	<0.001
Rural	0.346	0.024	<0.001
Resident's mood assessment (PHQ)	0.004	0.001	<0.001
Neurogenic Bladder	0.094	0.011	<0.001
Obstructive Uropathy	−0.011	0.017	0.507
Community Based Care Transition Program (CCTP)	0.533	0.033	<0.001
Comprehensive ESRD Care (CEC)	−0.029	0.039	0.455
Comprehensive Primary Care Initiative (CPCI)	−0.269	0.041	<0.001
Comprehensive Primary Care Plus (CPC+), non-SSP Participants	−0.313	0.036	<0.001
Comprehensive Primary Care Plus (CPC+), SSP Participants	−0.269	0.039	<0.001
Financial Alignment Initiative	−0.089	0.035	0.011
Next Generation Accountable Care Organization (NGACO)	0.036	0.015	0.018
Pioneer Accountable Care Organization	−0.020	0.016	0.234
Medicare Shared Savings Program	−0.010	0.007	0.118
Pre period * HIV/AIDS (HCC 1)	−0.078	0.040	0.051
Post period * HIV/AIDS (HCC 1)	0.075	0.043	0.081
Pre period * Septicemia, Sepsis, Systemic Inflammatory Response Syndrome/Shock (HCC 2)	0.045	0.007	<0.001
Post period * Septicemia, Sepsis, Systemic Inflammatory Response Syndrome/Shock (HCC 2)	0.014	0.009	0.129
Pre period * Opportunistic Infections (HCC 6)	0.042	0.025	0.097
Post period * Opportunistic Infections (HCC 6)	0.027	0.036	0.457
Pre period * Metastatic Cancer and Acute Leukemia (HCC 8)	0.034	0.022	0.122
Post period * Metastatic Cancer and Acute Leukemia (HCC 8)	0.001	0.027	0.968
Pre period * Lung and Other Severe Cancers (HCC 9)	0.090	0.018	<0.001
Post period * Lung and Other Severe Cancers (HCC 9)	0.042	0.024	0.085
Pre period * Lymphoma and Other Cancers (HCC 10)	0.096	0.018	<0.001
Post period * Lymphoma and Other Cancers (HCC 10)	0.056	0.024	0.021
Pre period * Colorectal, Bladder, and Other Cancers (HCC 11)	0.028	0.015	0.065
Post period * Colorectal, Bladder, and Other Cancers (HCC 11)	0.000	0.020	0.988

(continued)

Table R-1. Complete multivariate regression results of probability of potentially avoidable hospitalization per resident, all ECCPs (6 states), Payment-Only: Estimated coefficients with standard errors and p-values (continued)

Parameter	Any potentially avoidable hospitalizations		
	β	SE	p
Pre period * Breast, Prostate, and Other Cancers and Tumors (HCC 12)	0.016	0.011	0.124
Post period * Breast, Prostate, and Other Cancers and Tumors (HCC 12)	0.017	0.014	0.221
Pre period * Diabetes with Acute Complications (HCC 17)	0.216	0.018	<0.001
Post period * Diabetes with Acute Complications (HCC 17)	0.349	0.022	<0.001
Pre period * Diabetes with Chronic Complications (HCC 18)	0.232	0.006	<0.001
Post period * Diabetes with Chronic Complications (HCC 18)	0.220	0.006	<0.001
Pre period * Diabetes without Complication (HCC 19)	0.125	0.006	<0.001
Post period * Diabetes without Complication (HCC 19)	0.081	0.009	<0.001
Pre period * Protein-Calorie Malnutrition (HCC 21)	0.024	0.008	0.002
Post period * Protein-Calorie Malnutrition (HCC 21)	0.066	0.010	<0.001
Pre period * Other Significant Endocrine and Metabolic Disorders (HCC 23)	0.079	0.010	<0.001
Post period * Other Significant Endocrine and Metabolic Disorders (HCC 23)	0.100	0.011	<0.001
Pre period * End-Stage Liver Disease (HCC 27)	0.059	0.024	0.013
Post period * End-Stage Liver Disease (HCC 27)	0.058	0.030	0.051
Pre period * Cirrhosis of Liver (HCC 28)	0.042	0.023	0.071
Post period * Cirrhosis of Liver (HCC 28)	0.085	0.027	0.002
Pre period * Chronic Hepatitis (HCC 29)	0.084	0.030	0.005
Post period * Chronic Hepatitis (HCC 29)	0.076	0.032	0.017
Pre period * Intestinal Obstruction/Perforation (HCC 33)	0.081	0.010	<0.001
Post period * Intestinal Obstruction/Perforation (HCC 33)	0.061	0.013	<0.001
Pre period * Chronic Pancreatitis (HCC 34)	0.113	0.034	0.001
Post period * Chronic Pancreatitis (HCC 34)	0.064	0.042	0.126
Pre period * Inflammatory Bowel Disease (HCC 35)	0.117	0.021	<0.001
Post period * Inflammatory Bowel Disease (HCC 35)	0.060	0.026	0.020
Pre period * Bone/Joint/Muscle Infections/Necrosis (HCC 39)	0.013	0.012	0.270
Post period * Bone/Joint/Muscle Infections/Necrosis (HCC 39)	0.017	0.015	0.261
Pre period * Rheumatoid Arthritis and Inflammatory Connective Tissue Disease (HCC 40)	0.078	0.009	<0.001
Post period * Rheumatoid Arthritis and Inflammatory Connective Tissue Disease (HCC 40)	0.082	0.011	<0.001
Pre period * Severe Hematological Disorders (HCC 46)	0.180	0.021	<0.001
Post period * Severe Hematological Disorders (HCC 46)	0.120	0.027	<0.001
Pre period * Disorders of Immunity (HCC 47)	0.096	0.016	<0.001
Post period * Disorders of Immunity (HCC 47)	0.128	0.019	<0.001
Pre period * Coagulation Defects and Other Specified Hematological Disorders (HCC 48)	0.048	0.008	<0.001
Post period * Coagulation Defects and Other Specified Hematological Disorders (HCC 48)	0.039	0.010	<0.001

(continued)

Table R-1. Complete multivariate regression results of probability of potentially avoidable hospitalization per resident, all ECCPs (6 states), Payment-Only: Estimated coefficients with standard errors and p-values (continued)

Parameter	Any potentially avoidable hospitalizations		
	β	SE	p
Pre period * Drug/Alcohol Psychosis (HCC 54)	−0.062	0.017	<0.001
Post period * Drug/Alcohol Psychosis (HCC 54)	−0.080	0.030	0.007
Pre period * Drug/Alcohol Dependence (HCC 55)	0.017	0.015	0.255
Post period * Drug/Alcohol Dependence (HCC 55)	−0.008	0.015	0.586
Pre period * Schizophrenia (HCC 57)	0.099	0.011	<0.001
Post period * Schizophrenia (HCC 57)	0.133	0.013	<0.001
Pre period * Major Depressive, Bipolar, and Paranoid Disorders (HCC 58)	0.106	0.006	<0.001
Post period * Major Depressive, Bipolar, and Paranoid Disorders (HCC 58)	0.109	0.007	<0.001
Pre period * Quadriplegia (HCC 70)	0.200	0.017	<0.001
Post period * Quadriplegia (HCC 70)	0.249	0.019	<0.001
Pre period * Paraplegia (HCC 71)	0.195	0.019	<0.001
Post period * Paraplegia (HCC 71)	0.194	0.023	<0.001
Pre period * Spinal Cord Disorders/Injuries (HCC 72)	0.046	0.018	0.011
Post period * Spinal Cord Disorders/Injuries (HCC 72)	0.051	0.026	0.047
Pre period * Amyotrophic Lateral Sclerosis and Other Motor Neuron Disease (HCC 73)	0.036	0.049	0.462
Post period * Amyotrophic Lateral Sclerosis and Other Motor Neuron Disease (HCC 73)	0.138	0.061	0.025
Pre period * Cerebral Palsy (HCC 74)	−0.023	0.023	0.305
Post period * Cerebral Palsy (HCC 74)	−0.026	0.026	0.322
Pre period * Myasthenia Gravis/Myoneural Disorders and Guillain-Barre Syndrome/Inflammatory and Toxic Neuropathy (HCC 75)	0.008	0.019	0.678
Post period * Myasthenia Gravis/Myoneural Disorders and Guillain-Barre Syndrome/Inflammatory and Toxic Neuropathy (HCC 75)	−0.038	0.022	0.091
Pre period * Muscular Dystrophy (HCC 76)	0.032	0.053	0.538
Post period * Muscular Dystrophy (HCC 76)	0.108	0.066	0.103
Pre period * Multiple Sclerosis (HCC 77)	0.134	0.017	<0.001
Post period * Multiple Sclerosis (HCC 77)	0.076	0.022	<0.001
Pre period * Parkinson's and Huntington's Diseases (HCC 78)	0.086	0.008	<0.001
Post period * Parkinson's and Huntington's Diseases (HCC 78)	0.098	0.010	<0.001
Pre period * Seizure Disorders and Convulsions (HCC 79)	0.222	0.006	<0.001
Post period * Seizure Disorders and Convulsions (HCC 79)	0.228	0.008	<0.001
Pre period * Coma, Brain Compression/Anoxic Damage (HCC 80)	−0.165	0.019	<0.001
Post period * Coma, Brain Compression/Anoxic Damage (HCC 80)	−0.101	0.021	<0.001
Pre period * Respiratory Arrest (HCC 83)	0.200	0.046	<0.001
Post period * Respiratory Arrest (HCC 83)	0.153	0.064	0.017
Pre period * Cardio-Respiratory Failure and Shock (HCC 84)	0.289	0.007	<0.001

(continued)

Table R-1. Complete multivariate regression results of probability of potentially avoidable hospitalization per resident, all ECCPs (6 states), Payment-Only: Estimated coefficients with standard errors and p-values (continued)

Parameter	Any potentially avoidable hospitalizations		
	β	SE	p
Post period * Cardio-Respiratory Failure and Shock (HCC 84)	0.318	0.009	<0.001
Pre period * Congestive Heart Failure (HCC 85)	0.309	0.005	<0.001
Post period * Congestive Heart Failure (HCC 85)	0.290	0.007	<0.001
Pre period * Acute Myocardial Infarction (HCC 86)	0.013	0.011	0.267
Post period * Acute Myocardial Infarction (HCC 86)	0.041	0.012	0.001
Pre period * Unstable Angina and Other Acute Ischemic Heart Disease (HCC 87)	0.105	0.012	<0.001
Post period * Unstable Angina and Other Acute Ischemic Heart Disease (HCC 87)	0.095	0.017	<0.001
Pre period * Angina Pectoris (HCC 88)	0.100	0.014	<0.001
Post period * Angina Pectoris (HCC 88)	0.092	0.015	<0.001
Pre period * Specified Heart Arrhythmias (HCC 96)	0.150	0.005	<0.001
Post period * Specified Heart Arrhythmias (HCC 96)	0.146	0.006	<0.001
Pre period * Cerebral Hemorrhage (HCC 99)	−0.090	0.015	<0.001
Post period * Cerebral Hemorrhage (HCC 99)	−0.084	0.019	<0.001
Pre period * Ischemic or Unspecified Stroke (HCC 100)	0.009	0.007	0.177
Post period * Ischemic or Unspecified Stroke (HCC 100)	−0.008	0.009	0.395
Pre period * Hemiplegia/Hemiparesis (HCC 103)	0.058	0.008	<0.001
Post period * Hemiplegia/Hemiparesis (HCC 103)	0.048	0.010	<0.001
Pre period * Monoplegia, Other Paralytic Syndromes (HCC 104)	0.103	0.029	<0.001
Post period * Monoplegia, Other Paralytic Syndromes (HCC 104)	0.102	0.040	0.010
Pre period * Atherosclerosis of the Extremities with Ulceration or Gangrene (HCC 106)	0.190	0.013	<0.001
Post period * Atherosclerosis of the Extremities with Ulceration or Gangrene (HCC 106)	0.122	0.016	<0.001
Pre period * Vascular Disease with Complications (HCC 107)	0.069	0.011	<0.001
Post period * Vascular Disease with Complications (HCC 107)	0.063	0.014	<0.001
Pre period * Vascular Disease (HCC 108)	0.060	0.006	<0.001
Post period * Vascular Disease (HCC 108)	0.056	0.007	<0.001
Pre period * Cystic Fibrosis or Chronic Obstructive Pulmonary Disease (HCC 110 or HCC 111)	0.377	0.005	<0.001
Post period * Cystic Fibrosis or Chronic Obstructive Pulmonary Disease (HCC 110 or HCC 111)	0.338	0.007	<0.001
Pre period * Fibrosis of Lung and Other Chronic Lung Disorders (HCC 112)	0.241	0.022	<0.001
Post period * Fibrosis of Lung and Other Chronic Lung Disorders (HCC 112)	0.178	0.032	<0.001
Pre period * Aspiration and Specified Bacterial Pneumonias (HCC 114)	0.382	0.009	<0.001
Post period * Aspiration and Specified Bacterial Pneumonias (HCC 114)	0.360	0.011	<0.001

(continued)

Table R-1. Complete multivariate regression results of probability of potentially avoidable hospitalization per resident, all ECCPs (6 states), Payment-Only: Estimated coefficients with standard errors and p-values (continued)

Parameter	Any potentially avoidable hospitalizations		
	β	SE	p
Pre period * Pneumococcal Pneumonia, Empyema, Lung Abscess (HCC 115)	0.283	0.022	<0.001
Post period * Pneumococcal Pneumonia, Empyema, Lung Abscess (HCC 115)	0.369	0.018	<0.001
Pre period * Proliferative Diabetic Retinopathy and Vitreous Hemorrhage (HCC 122)	0.064	0.017	<0.001
Post period * Proliferative Diabetic Retinopathy and Vitreous Hemorrhage (HCC 122)	0.151	0.022	<0.001
Pre period * Exudative Macular Degeneration (HCC 124)	0.044	0.014	0.002
Post period * Exudative Macular Degeneration (HCC 124)	0.051	0.018	0.004
Pre period * Acute Renal Failure (HCC 135)	0.384	0.006	<0.001
Post period * Acute Renal Failure (HCC 135)	0.395	0.007	<0.001
Pre period * Chronic Kidney Disease, Stage 5 (HCC 136)	0.111	0.022	<0.001
Post period * Chronic Kidney Disease, Stage 5 (HCC 136)	0.142	0.030	<0.001
Pre period * Chronic Kidney Disease, Severe (Stage 4) (HCC 137)	0.265	0.018	<0.001
Post period * Chronic Kidney Disease, Severe (Stage 4) (HCC 137)	0.257	0.021	<0.001
Pre period * Pressure Ulcer of Skin with Necrosis Through to Muscle, Tendon, or Bone (HCC 157)	0.198	0.015	<0.001
Post period * Pressure Ulcer of Skin with Necrosis Through to Muscle, Tendon, or Bone (HCC 157)	0.186	0.018	<0.001
Pre period * Pressure Ulcer of Skin with Full Thickness Skin Loss (HCC 158)	0.113	0.011	<0.001
Post period * Pressure Ulcer of Skin with Full Thickness Skin Loss (HCC 158)	0.102	0.012	<0.001
Pre period * Chronic Ulcer of Skin, Except Pressure (HCC 161)	0.125	0.008	<0.001
Post period * Chronic Ulcer of Skin, Except Pressure (HCC 161)	0.129	0.011	<0.001
Pre period * Severe Head Injury or Major Head Injury (HCC 166 or HCC 167)	0.157	0.014	<0.001
Post period * Severe Head Injury or Major Head Injury (HCC 166 or HCC 167)	0.150	0.018	<0.001
Pre period * Vertebral Fractures without Spinal Cord Injury (HCC 169)	0.143	0.012	<0.001
Post period * Vertebral Fractures without Spinal Cord Injury (HCC 169)	0.151	0.015	<0.001
Pre period * Hip Fracture/Dislocation (HCC 170)	0.317	0.008	<0.001
Post period * Hip Fracture/Dislocation (HCC 170)	0.376	0.011	<0.001
Pre period * Complications of Specified Implanted Device or Graft (HCC 176)	−0.059	0.010	<0.001
Post period * Complications of Specified Implanted Device or Graft (HCC 176)	−0.053	0.012	<0.001

(continued)

Table R-1. Complete multivariate regression results of probability of potentially avoidable hospitalization per resident, all ECCPs (6 states), Payment-Only: Estimated coefficients with standard errors and p-values (continued)

Parameter	Any potentially avoidable hospitalizations		
	β	SE	p
Pre period * Artificial Openings for Feeding or Elimination (HCC 188)	0.223	0.009	<0.001
Post period * Artificial Openings for Feeding or Elimination (HCC 188)	0.124	0.012	<0.001
Pre period * Amputation Status, Lower Limb/Amputation Complications (HCC 189)	0.198	0.015	<0.001
Post period * Amputation Status, Lower Limb/Amputation Complications (HCC 189)	0.178	0.018	<0.001
ESRD patient with dialysis status	0.426	0.011	<0.001
ESRD patients after transplant who are not on dialysis after transplant	0.411	0.048	<0.001
Full-dual eligibility	0.147	0.006	<0.001
Original eligibility due to disability	0.057	0.005	<0.001
Nursing facility in the hospital	−0.070	0.031	0.026
For-profit nursing facility	0.078	0.009	<0.001
Arkansas	0.380	0.035	<0.001
Arizona	−0.307	0.054	<0.001
Connecticut	−0.332	0.038	<0.001
Delaware	0.007	0.073	0.921
Florida	0.026	0.029	0.387
Georgia	0.098	0.031	0.002
Iowa	−0.037	0.031	0.237
Idaho	−0.510	0.060	<0.001
Illinois	0.111	0.029	<0.001
Kansas	0.117	0.036	0.001
Kentucky	0.132	0.036	<0.001
Louisiana	0.495	0.033	<0.001
Massachusetts	−0.215	0.029	<0.001
Maryland	−0.287	0.032	<0.001
Maine	−0.439	0.051	<0.001
Michigan	−0.325	0.032	<0.001
Minnesota	−0.255	0.036	<0.001
Missouri	0.416	0.040	<0.001
Montana	−0.313	0.058	<0.001
North Carolina	−0.197	0.031	<0.001
North Dakota	−0.203	0.052	<0.001
New Hampshire	−0.367	0.054	<0.001
New Jersey	−0.061	0.031	0.049
New Mexico	−0.093	0.059	0.112
Ohio	−0.196	0.028	<0.001
Oklahoma	0.302	0.035	<0.001
Oregon	−0.363	0.056	<0.001

(continued)

Table R-1. Complete multivariate regression results of probability of potentially avoidable hospitalization per resident, all ECCPs (6 states), Payment-Only: Estimated coefficients with standard errors and p-values (continued)

Parameter	Any potentially avoidable hospitalizations		
	β	SE	p
Rhode Island	−0.380	0.043	<0.001
South Carolina	0.038	0.043	0.377
South Dakota	−0.099	0.051	0.053
Tennessee	0.057	0.037	0.125
Texas	0.082	0.027	0.002
Utah	−0.509	0.078	<0.001
Virginia	−0.232	0.033	<0.001
Vermont	−0.345	0.084	<0.001
Washington	−0.577	0.042	<0.001
Wisconsin	−0.316	0.035	<0.001
West Virginia	−0.134	0.046	0.003
Wyoming	−0.194	0.072	0.007
Constant	−2.879	0.029	<0.001