CHAPTER 9

Hospital and SNF use by Medicare beneficiaries who reside in nursing facilities

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Chapter summary

Transferring Medicare beneficiaries who are long-stay nursing facility (NF) residents to a hospital for conditions that could have been prevented or treated by the NF exposes beneficiaries to several health risks (such as falls, delirium, infections, and medication interactions) and unnecessarily raises Medicare program spending. Although Medicare does not pay for the long-term portion of care, it does pay for hospital use by long-stay NF residents. High rates of hospital use may indicate poor care coordination between the NF staff and physicians or poor quality of care provided within the NF for long-stay NF residents. In addition, transferring long-stay residents to the hospital may result in a higher paid Medicare skilled nursing facility (SNF) stay following hospital discharge. In response to Medicare's Hospital Readmission Reduction Program, some hospitals have begun to pressure NFs to adopt strategies to reduce hospital use. Through interviews with NF staff, the Commission found that these strategies include increased staff communication, staff training, medication review, and advance care planning.

As a gauge of the quality of care furnished by NFs, the Commission developed facility-level measures to track use of hospitals by long-stay NF residents, including all-cause hospital admissions, potentially avoidable hospital admissions, and a combined measure of emergency department visits and observation stays. To capture the extent to which NF residents become requalified for higher paying Medicare SNF stays, we also developed

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a measure of long-stay beneficiaries' use of Medicare-paid SNF care following discharge from the hospital. The Commission's analyses were performed at the facility level and the measures were risk adjusted to make findings comparable across facilities.

Consistent with other studies, our analysis found that, on a risk-adjusted basis, the rates of all-cause hospital admissions were slightly less than 2 all-cause hospital admissions per 1,000 days. We also found wide variation in rates of hospital use across facilities. Differences in state Medicaid policies may explain some of the variation observed across states, but we also observed high within-state variation. Several facility-level characteristics helped to explain the variation in the measures of hospital use, including the frequency of physician visits and access to on-site X-ray capabilities. This variation indicates potential disparities in quality across facilities and suggests opportunities for reductions in hospital use, which would reduce potential harm to beneficiaries and unnecessary Medicare spending. We found more pronounced variation in the use of SNF care after a long-stay resident was discharged from the hospital.

CMS and the Congress could evaluate policies regarding hospital and SNF use by long-stay NF beneficiaries. CMS could consider developing measures of hospital and SNF use to incorporate into the NFs' public reporting requirements; if successful, the Congress could consider expanding the SNF value-based purchasing program to include additional measures such as a long-stay NF resident–hospital admission measure. CMS could also consider focusing on aberrant patterns of hospital and SNF use as part of the agency's program integrity efforts. ■

Introduction

Much of the Commission's work focuses on Medicare policies that promote care coordination and increase quality as a way to enhance the program's value to beneficiaries and taxpayers. Although beneficiaries residing in nursing facilities (NFs) are frail and at high risk for hospitalization, frequent hospital use by this population may indicate poor care coordination between the NF staff and physicians or poor quality of care in the NF. Transferring these residents to a hospital for conditions that may have been prevented or managed by the NF unnecessarily exposes beneficiaries to several health risks (including falls, delirium, nosocomial infections, pressure ulcer development, and medication interactions) and raises program spending since Medicare pays for most long-stay NF residents' hospital use (Cassel 2004, Gillick et al. 1982). Researchers contend that a lack of on-site primary care clinicians, the inability to obtain timely laboratory test results and intravenous fluids, and the inability to assess acute changes in patients' conditions have contributed to high rates of hospital admissions among NF residents (Ouslander et al. 2014). Much of the hospital use among these residents could be prevented if the NF provided high-quality care with adequate physician and ancillary resources.

NFs have a financial incentive to transfer a beneficiary to a hospital for treatment because doing so shifts the costs of more intensive nursing care and ancillary services from the NF to the hospital. In addition, some state-level policies provide incentives for NFs to hospitalize dually eligible beneficiaries (beneficiaries who are eligible for both Medicare and Medicaid). Thirty-four states require the Medicaid program to reserve a bed for the resident of the NF during an intervening hospital stay, a policy known as a "bed-hold" (Medicaid and CHIP Payment and Access Commission 2014). Further, since most facilities with long-stay NF residents also admit post-acute care patients under Medicare's skilled nursing facility (SNF) benefit, transferring residents to a hospital may requalify these residents for the higher paying Medicare SNF stay following hospital discharge.

The implementation of Medicare's Hospital Readmissions Reduction Program (HRRP) has led acute care hospitals to develop partnerships with select NFs for strategic referral purposes. Facilities with low readmission rates are able to market themselves to referring hospitals as a high-quality facility, thereby ensuring a steady referral source. The same practices that lower readmissions of post-acute care beneficiaries could also reduce hospital admissions of long-stay NF residents. Recent evaluations of an initiative funded through the Center for Medicare & Medicaid Innovation (CMMI) and administered through the Medicare–Medicaid Coordination Office found that hospital admissions of long-stay NF residents were generally declining across facilities (Ingber et al. 2016). However, the large degree of variation in the rates of hospital admissions of long-stay NF residents suggests that facilities could further reduce unnecessary hospital use.

Initiatives and strategies to reduce hospital use by long-stay NF residents

NFs may have an opportunity to participate in initiatives currently being implemented to reduce hospital use by long-stay NF residents enrolled in either fee-for-service (FFS) Medicare or certain Medicare Advantage (MA) plans. In addition, some NFs have attempted to reduce hospital use by long-stay residents without any financial arrangements with MA plans or participation in a formal initiative. In many cases, NFs report that they engage in medication review and advance care planning, expand or introduce palliative care programs, implement communication tools, work with nurse practitioners (NPs) to provide direct patient care, and increase skill training for staff both with and without additional financial or staff resources.

Reducing admissions for beneficiaries enrolled in Medicare FFS

CMMI and the CMS Medicare–Medicaid Coordination Office launched the Initiative to Reduce Avoidable Hospitalizations among Nursing Facility Residents (RAH–NFR) for FFS beneficiaries. CMS's RAH–NFR initiative contracts with coordinating organizations that partner with between 15 and 30 NFs (about 140 in total) to implement evidence-based clinical and educational strategies to reduce avoidable hospitalizations.[1] These strategies can include on-site training for staff, data support, and direct patient care. Five of the seven coordinating organizations use funding from the initiative to provide advanced practice nurses, NPs, or registered nurses (RNs) to augment existing nursing staff in direct patient care. The remaining two coordinating organizations use the additional nurses to provide education and advise facilities on best practices, data trends, and staff training, but not

to engage in direct patient care (Ingber et al. 2017a). The second phase of the RAH–NFR initiative, which began in the fall of 2016, includes a three-part payment model for facilities and practitioners to assess and treat long-stay residents within the NF (see text box on Phase II of the RAH–NFR initiative) (Center for Medicare & Medicaid Innovation 2015).

Reducing admissions for beneficiaries enrolled in Medicare Advantage

Certain MA plans also attempt to avoid unnecessary hospitalizations of NF beneficiaries. MA plans have the flexibility to contract with a NF to provide payments for services beyond the traditional FFS benefits and to make payments based on the level of clinical services provided. For example, Optum's CarePlus model, formerly known as Evercare, provides care coordination to beneficiaries enrolled in the UnitedHealthcare Nursing Home Plan.[2] The CarePlus model uses "intensive service days," paying NFs to provide treatment for acute illness in the NF. In addition, Optum provides on-site nurse practitioners to participating NFs to manage the beneficiary's care and provide services including physical examinations, assessments for acute conditions, lab tests, and prescriptions. Enrollment in MA plans focused on the institutionalized population (special needs plans for the institutionalized, or I–SNPs) has been limited, however, with less than 60,000 individuals enrolled as of 2016 (representing less than 1 percent of MA enrollees) (Medicare Payment Advisory Commission 2016a). In 2015, the UnitedHealthcare Nursing Home Plan accounts for about three-quarters of this enrollment (Kaiser Family Foundation 2015, Medicare Payment Advisory Commission 2015b). One issue for insurers providing services within an institution has been enrolling a critical volume of long-stay NF residents within a given facility in the same MA plan. Without a critical volume of beneficiaries, it is financially difficult for a plan to provide on-site services and implement protocols that could reduce hospital admissions.

Strategies to reduce hospital use

To better understand the interventions and initiatives NFs use to reduce hospitalizations of long-stay residents, the Commission conducted 10 interviews with a geographically diverse set of individuals who participated in the RAH–NFR initiative; had experience with the Optum CarePlus model; or adopted tools to reduce the transfer of beneficiaries to the hospital, independent of any outside funding source for beneficiaries enrolled in FFS.[3] Interviewees cited use of additional nursing staff including NPs, increased staff communication, staff training, medication review, and advance care planning as strategies to increase the quality of care in NFs and thus reduce the likelihood of a potentially avoidable hospital admission. One interviewee also cited using telemedicine technology to extend the hours of NP availability.

Use of additional nursing staff

Additional nursing staff is a foundation of both the RAH–NFR initiative and Optum's CarePlus model, so it is not surprising that the interviewees frequently cited the value of the additional nursing staff (including RNs, advanced practice registered nurses (APRNs), and NPs). For example, interviewees reported that additional nursing staff resulted in consistent implementation of the initiative and higher quality of care provided to beneficiaries. An interviewee from a NF with the Optum CarePlus model noted the high level of expertise exhibited by the on-site NPs. It was further noted that having NPs on-site supported facility staff managing some of the residents but also assisted with education and coaching. Interviewees cited nursing staff contributions to improving staff communication, staff training, medication review, palliative care and advance care planning, and telehealth as critical to the implementation of the initiative at their facility.

Increased staff communication

Strategies to reduce hospital use by beneficiaries often include new processes designed to improve the skills of staff providing direct care to residents and to facilitate better communication between facility staff and managing clinicians.[4] Many of those interviewed used the suite of INTERACT tools to monitor changes in condition, facilitate staff communication, promote advance care planning, and support quality improvement (Ouslander et al. 2014).[5] Certain communication tools are intended to encourage providing the on-call clinician(s) with the information necessary to make informed decisions and better manage the care of NF residents with complex medical needs. A majority of interviewees cited using standardized forms to communicate with clinicians and other caregivers. One form serves as a checklist to uniformly collect information regarding the health issues, medical history, and treatment recommendations from the primary clinician. These documents are intended to better inform physicians and other health professionals before they make decisions regarding treatment and to document the decision to be carried out by NF staff.

Phase II of the Initiative to Reduce Avoidable Hospitalizations among Nursing Facility Residents

The second phase of the Initiative to Reduce Avoidable Hospitalizations among Nursing Facility Residents (RAH–NFR) began in the fall of 2016 and includes six of the seven coordinating organizations involved in the first phase of the initiative. Phase II provides payments directly to participating facilities and practitioners. To allow for evaluation and comparison, the payment model is being tested across two groups of nursing facilities (NFs)—facilities that participated in Phase I of the RAH–NFR initiative and facilities that did not (currently about 260 facilities in total). The payment model includes three types of payments, as described below.

One aspect of the payment model includes a new Part B code to allow NFs to bill CMS for the treatment of a qualifying condition. The qualifying conditions include pneumonia, dehydration, congestive heart failure, urinary tract infection, skin ulcers, cellulitis, chronic obstructive pulmonary disease, and asthma. The NF receives $218 per day to treat beneficiaries for a qualifying condition within the facility, which includes long-stay NF residents who are not currently receiving Medicare post-acute care skilled nursing facility (SNF) services (Center for Medicare & Medicaid Innovation 2015).

The next aspect of the payment model increases payments to physicians, nurse practitioners, and physician assistants under Medicare Part B for the treatment of a qualifying condition at the NF. This increase in payment from $137.81 to $205.64 (for physicians) for an initial visit to treat a qualifying condition equalizes the Medicare payment between services provided to a beneficiary in a hospital and services provided in a nursing facility.[6] This payment could be provided for all long-stay NF residents regardless of whether they are currently receiving Medicare post-acute care SNF services with a qualifying condition mentioned above.

The third aspect of the payment model provides a payment to physicians, nurse practitioners, and physician assistants under Medicare Part B for care coordination and caregiver engagement. Physicians receive $79.67 per visit (geographically adjusted) that involves at least 25 minutes of face-to-face time with the beneficiary or caregiver.[7] Physicians, NPs, or physician assistants can bill this code only once per year per beneficiary without a significant change in condition or once within 14 days for a significant change in condition. This payment could be provided for all long-stay NF residents regardless of whether they are currently receiving Medicare post-acute care SNF services (Center for Medicare & Medicaid Innovation 2015).

The second phase of the RAH–NFR initiative is expected to continue through 2020. The first evaluation of the second phase of this initiative is not expected for several years. ■

Staff training

Many interviewees reported that facility staff are trained to recognize changes in a patient's condition and report the changes to nursing staff or on-call clinicians in a more complete, concise, and consistent manner. For example, some facilities train nonlicensed staff to use forms to recognize and report the signs and symptoms of deteriorating health status to licensed nursing staff before a larger problem develops that could result in transfer to a hospital. Other staff training efforts include educating staff about fall prevention; improving a specific clinical skill, such as IV insertion; and teaching nurses, nurse leaders, and social workers how to effectively conduct advance care planning discussions with residents and their families.

Medication review

Medication therapy review and medication therapy management (MTM) are services pharmacists provide that focus on the patient's complete medication therapy regimen, rather than considering each medication in isolation (American Pharmacists Association and the National Association of Chain Drug Stores Foundation 2008). The goal of these pharmacy services is to ensure that the patient receives appropriate medications.

Conducting medication review is one strategy NFs reported using to reduce avoidable hospitalizations due to dosing errors, underprescribing, overprescribing, and medication interactions. In some facilities, the advanced practice nurse works with the beneficiary's clinician, pharmacist, and nursing staff to review and, as necessary, adjust each resident's drug regimen, in addition to reviews conducted independently by long-term care pharmacists and the beneficiary's drug plan.[8]

Palliative care and advance care planning

Ongoing conversations with residents about their end-of-life preferences regarding treatments, interventions, and hospital use may prevent unwanted medical care, including hospitalizations. The plan may include palliative care efforts that focus on quality of life, symptom management, and the tailoring of a patient's treatment to his or her goals and preferences. Several interviewees discussed the importance of including the resident's family in conversations about patient's preferences for care through advance care planning as well as the need for updates to advance directives following a hospital admission or change in health status.[9] State-level departments of public health maintain a variety of tools for providers to document beneficiary care goals and treatment preferences.[10] These tools include forms that capture patients' treatment preferences and are transferable across care settings (Physician Orders for Life-Sustaining Treatment Paradigm 2016).

Interviewees noted that families were generally more satisfied with the patient care provided when they were involved with medical decision making from the beginning of the resident's stay. Most of the facilities that participate in the CMS RAH–NFR initiative and the nurse practitioners in the Optum CarePlus model engage in palliative care and advance care planning with long-stay NF residents.

Telehealth

Employing telehealth is another, albeit less frequently implemented, strategy for reducing readmissions by extending the availability of health professionals and allowing examination of a resident remotely. One recent study concluded that after-hours physician-based telehealth can reduce hospitalizations by almost 10 percent; however, this particular study reflects only one NF chain's results and acknowledges that implementing this technology in NFs is complex and potentially costly (Grabowski and O'Malley 2014).

In addition to the financial barrier, workflow issues were commonly cited as reasons NFs have either not adopted a telehealth model or have had difficulty implementing telehealth broadly. For example, some facilities reported that using telehealth to care for patients requires additional in-facility staff time. Others reported that potential efficiencies gained through the use of telehealth technology are not achieved because of the low volume of beneficiaries eligible for using telehealth in a given facility. This low volume could also be attributed to a NF's inability to integrate telehealth into its regular workflow. NF staff members may need to receive approval to initiate a telehealth protocol, retrieve the telehealth cart, and complete the applicable assessments before the physician or other health professional determines the best course of action for the beneficiary. Instead, some staff prefer requesting physician orders to transfer residents to a hospital for assessment and treatment.

NFs may also be reluctant to adopt telehealth because the availability of a separate payment that covers telehealth services varies. Medicare permits rural NFs as an originating site for telehealth services, allowing physicians and other health professionals at the facility to bill for Part B payments.

One CMS RAH–NFR initiative includes a telehealth component that begins with a telephone call to an advanced practice nurse. If indicated, the NF staff then accesses the telehealth technology and the advanced practice nurse conducts the exam remotely. Based on the findings from the consultation session, the clinical staff determines whether to further assess, treat, or transfer the beneficiary to a hospital.

Evaluations of programs to reduce hospital admissions from NFs

Researchers from RTI International (RTI) released an interim evaluation of the results of the CMS RAH–NFR initiative in February 2017. Researchers found statistically significant reductions in all-cause and potentially avoidable hospital admissions across about half (three out of seven and four out of seven, respectively) of the coordinating organizations implementing evidence-based clinical and educational strategies to reduce avoidable hospitalizations. RTI found statistically significant reductions in all-cause and potentially avoidable emergency department (ED) visits between 2012 and 2015 across two coordinating organizations. RTI also found statistically significant reductions in total Medicare expenditures for all-cause hospital admissions; however, the reduction in total Medicare spending for participants

in the initiative on net was not statistically significant. Researchers found that the effects from the intervention were larger in 2015 compared with earlier years, and they concluded that models that provide direct patient care have resulted in stronger positive outcomes to date (Ingber et al. 2017a, Ingber et al. 2017b, Ingber et al. 2016).

A 2002 evaluation of the Evercare demonstration program (now known as the Optum CarePlus model) found that hospitalizations occurred less frequently for the population enrolled in the CarePlus model compared with study controls. In addition, patients enrolled in the CarePlus model used the ED approximately half as often as their peers. The CarePlus population was also seen more frequently by physicians or other health professionals (Kane et al. 2002). While the evaluation found promising reductions in hospital use across participating beneficiaries, it did not reduce spending for the Medicare program because Medicare pays for services provided to beneficiaries under the Optum CarePlus model on a capitated basis. Therefore, any savings attributed to reductions in hospital use would be retained by the health plan. (Likewise, the health plan would be at risk for any spending beyond the capitated payment.) Under current payment policy, there may be areas where plan payments are below 100 percent of what Medicare's program costs in FFS would otherwise be.

Developing measures of hospital and SNF use for beneficiaries residing in NFs

Concerns about unnecessarily exposing Medicare beneficiaries to the health risks in a hospital setting and unnecessarily raising Medicare program spending necessitate a measure of hospital use for long-stay NF residents. A 2013 Office of Inspector General (OIG) report recommended that CMS develop a quality measure of nursing home resident hospitalization rates (Office of Inspector General 2013). To address this shortcoming, the Commission contracted with Providigm to develop three hospital-use measures specific to Medicare beneficiaries who reside in NFs, including an all-cause hospital admission measure, a potentially avoidable hospital admission measure, and a combined ED use and observation visit measure. The Commission also developed a measure of SNF use by long-stay NF residents. These measures align with the Commission's long-held interests in moving to population-based outcomes measures, care coordination, and decreases in unnecessary Medicare expenditures.[11]

Defining rates of hospital use

Across the measures of all-cause hospital admission, potentially avoidable hospital admission, and combined ED visits and observation stays, we developed a rate of hospital use by calculating the applicable hospital events per 1,000 long-stay resident days for Medicare beneficiaries. We defined long-stay resident days as the total days Medicare beneficiaries resided in the NF beyond the first 100 days (see text box describing our approach to developing measures, pp. 274–275). The risk-adjusted rate of hospital admissions is calculated by dividing the number of hospital admissions by the total facility days across Medicare beneficiaries who are long-stay residents. Because these rates are calculated on a facility-level basis, using these rates for purposes of public reporting or within pay-for-performance programs should encourage quality improvement across facilities.

All-cause and potentially avoidable hospital admissions

Working with Providigm, the Commission developed definitions of all-cause and potentially avoidable hospital use by long-stay NF residents. The all-cause measure includes all hospital admissions regardless of primary diagnosis or unplanned/preplanned status (e.g., an admission for a planned surgical procedure). Researchers generally agree that certain clinical conditions in NFs can be managed in a long-term care NF and be prevented from occurring if the NF provides a sufficient level of care quality. In constructing the definition of potentially avoidable hospital admission of long-stay NF residents, we reviewed existing literature, evaluated the relevance of potentially avoidable readmissions from post-acute care providers, and relied on Providigm's clinical judgment to determine the conditions appropriate to include in our definition of potentially avoidable hospital use. We included in the definition conditions that the NF could reasonably be expected to manage or for which the NF could be held accountable for poor care management (for instance, admissions for a disease management error such as anticoagulation or diabetic complications) (Kramer et al. 2017). Unlike the all-cause measure, our potentially avoidable hospital use measure excludes admissions that are likely to be planned or not potentially avoidable (e.g., palliative surgery). In developing the measure of potentially avoidable hospital admission, we recognize that conditions considered "potentially avoidable" are not necessarily always avoidable. Thus, we do not expect the rate of potentially avoidable hospital admissions to equal zero, even at NFs that provide the highest quality of care.

Developing measures of hospital and skilled nursing facility use for NF residents

We estimated hospital use by Medicare beneficiaries residing in nursing facilities (NFs) with all-cause and potentially avoidable hospital use measures. The all-cause hospital admission measure includes all long-stay NF residents who were admitted to a hospital regardless of diagnosis. The potentially avoidable hospital admission measure counts hospitalized long-stay NF residents whose primary diagnosis for hospital admission is considered potentially avoidable—that is, the condition should have been managed or prevented in the NF setting. Because high rates of emergency department (ED) visits and observation stays may unnecessarily expose beneficiaries to health risks, we calculated a combined all-cause ED visit and observation stay rate. We also developed a rate for days the long-stay beneficiaries used the skilled nursing facility (SNF) benefit.

Measure population

To identify long-stay residents, we considered only Medicare beneficiaries who had a minimum of 100 consecutive days in the facility without a discharge to the community between June 2012 and October 2014.[12] Focusing on the population with more than 100 days of NF care excludes beneficiaries who had only a Medicare-paid post-acute SNF stay before returning to a community setting.

For the long-stay residents identified, our measures accounted for hospital and SNF use that occurred after the first 100 days of the stay. Our analysis began with about 16,000 nursing facilities; about 400 of these facilities were excluded because of missing provider data. We excluded another 435 low-volume facilities (defined as facilities with fewer than 500 days for

(continued next page)

TABLE 9–1

Variables in the risk adjustment model

Age categories
Age less than 65
Age 65 to less than 75
Age 75 to less than 85
Age 85 to less than 95
Age 95 and above
Function categories
Barthel Index, low, 0–30 (lowest function)
Barthel Index, medium, 35–55
Barthel Index, high, 60–90 (highest function)
Comorbidities
HIV/AIDS
Diabetes with chronic complications
Diabetes without complications
Protein-calorie malnutrition
Morbid obesity
End-stage liver disease
Bone, joint, muscle infections/necrosis
Rheumatoid arthritis/inflamed connective tissue
Disorders of immunity
Drug or alcohol dependence
Coma or brain compression/anoxic damage
Acute myocardial infarction
Unstable angina and other acute heart disease
Angina pectoris
Specified heart arrhythmias
Vascular disease with complications
Chronic obstructive pulmonary disease
Dialysis status
Artificial feeding/elimination openings
Amputation status, lower limb/complications
Arthritis condition
Urinary tract infection

Source: Providigm analysis of 1.4 million long-stay nursing facility residents using data from fiscal years 2013 and 2014.

The conditions included in our potentially avoidable hospital admission measure are similar to others developed for the dual-eligible populations, with some exceptions (Spector et al. 2013, Walsh et al. 2010). Our potentially avoidable hospital admission measure includes two conditions related to proper medication management—anticoagulant complications and adverse drug reactions—that can often be avoided in frail elders with careful review for drug interactions and past medication history.

Developing measures of hospital and skilled nursing facility use for NF residents (cont.)

long-stay beneficiaries or fewer than 10 qualifying beneficiaries). Excluded facilities tended to be smaller and were more likely to be hospital based than the facilities included in the analysis.

Risk adjustment

We risk adjusted each facility's rate based on its mix of resident characteristics, including demographics, function, and comorbid diseases (Table 9-1). A consistent set of variables for each of the four measures was tested, and the final risk adjustment models included only the factors that were significant (Kramer et al. 2017). We evaluated the robustness of the risk adjustment model for each measure by its ability to explain variation across facilities (using an R^2 test). The risk adjustment model helped explain about 50 percent of the variation in the all-cause hospital admission rate and about 30 percent of the variation in the potentially avoidable hospital admission rate. We were able to explain some variation across the combined measure of ED visits and observation use and the measure of SNF days, albeit at lower rates (16 percent and 10 percent, respectively). We did not include socioeconomic status in risk adjusting the rates of hospital or SNF use for the long-stay NF population. ■

We calculated risk-adjusted rates at a facility level. Risk-adjusted rates compare a facility's observed rates with its expected rates based on the mix of patients across functional outcome groups, age category, and comorbidity. The measures are intended to identify NFs with generally good or poor performance, not to identify how an individual case was handled or to determine whether hospital use by a particular beneficiary was potentially avoidable. Instead, the methodology combines two years of facility-level data and provides a single facility-level risk-adjusted rate.

ED visits and observation stays by long-stay NF residents

Another dimension of hospital use is the frequency of ED visits and observation stays. We include this outpatient visit measure because of concerns about the exposure to unnecessary health risks and the stress beneficiaries face while in an ED or observation setting.

Defining potentially avoidable ED visits is problematic for several reasons. A recent study of Medicare beneficiaries residing in NFs found substantial differences in the characteristics and health status of residents who use the ED but are not subsequently admitted to a hospital and those who use the ED and are admitted to a hospital for inpatient care. For example, a larger portion of beneficiaries not admitted to the hospital had normal vital signs and no diagnostic testing compared with the beneficiaries ultimately admitted to the hospital following ED use (Burke et al. 2015, Caffrey 2010). Further, the diagnosis assigned to an ED visit is based on more limited information than a hospital discharge diagnosis assigned at the end of a hospital stay, so it can be more difficult to identify a potentially avoidable event in an ED. Given these ambiguities, our measure of ED visits and observation stays includes all ED visits and observation stays not resulting in a hospital admission.

SNF use by long-stay NF residents

To capture the extent to which NF residents become requalified for Medicare SNF stays, we developed a measure of long-stay beneficiaries' use of Medicare-paid SNF care following discharge from the hospital. Transferring NF residents to a hospital may qualify that beneficiary for a Medicare-paid SNF stay following the hospital discharge. Since Medicare's payments for SNF care are generally higher than payment for NF care, the rate differential provides an incentive for NFs to maximize residents' time in a Medicare stay.[13] Since most facilities with long-stay NF residents also admit post-acute patients under Medicare's SNF benefit, facilities can experience increased revenues when residents are transferred back to the NF following a hospital stay. NFs can increase revenues for long-stay residents in two ways: by increasing the number of SNF days per stay (since Medicare pays on a per diem basis) and by increasing the frequency of SNF admissions. Facilities with high rates of SNF days per 1,000 long-stay resident days may be using SNF services

Illustrative rates by an average facility

Throughout this chapter, we present findings on a "per 1,000 long-stay resident day" basis. Because the average length of stay for long-stay residents varies and mortality rates are relatively high for this population, we chose to combine data across beneficiaries within a facility using the per 1,000 long-stay resident days as a denominator. To illustrate how this translates to the magnitude of hospital and SNF use, consider two 110-bed facilities with an average occupancy rate (85 percent) for which roughly half (52 percent) of days qualify as long-stay days based on the requirement that beneficiaries reside in the facility for longer than 100 days. Using these assumptions, each facility would have about 17,750 long-stay resident days per year.[14] Facility A has average hospital admission and skilled nursing facility (SNF) use rates, while Facility B has rates that place it at the 90th percentile for each rate.

Based on our analysis, Facility A would have about 29 all-cause hospital admissions per year, would have fewer than 14 potentially avoidable hospital admissions per year, and would use about 1,350 SNF days annually (Table 9-2). By comparison, Facility B would have 41 all-cause hospital admissions per year and just over 21 potentially avoidable hospital admissions per year. Long-stay residents in Facility B would use almost 3,000 SNF days annually, more than twice as many as long-stay residents in Facility A. ■

TABLE 9–2 **Illustrative annual hospitalizations and SNF use by similar facilities**

Measure	Facility A (average hospital admission and SNF use rates)	Facility B (90th percentile of hospital admission and SNF use rates)
All-cause hospital admissions	29.1	41.0
Potentially avoidable hospital admissions	13.5	21.1
All-cause ED visits and observation stays	33.0	54.8
Long-stay resident SNF days	1,353	2,998

Note: SNF (skilled nursing facility), ED (emergency department). We assumed that both Facility A and Facility B have 110 beds, an 85 percent occupancy rate, and 52 percent of days qualifying as long-stay resident days. We assumed Facility A had average rates of each measure while Facility B had rates at the 90th percentile for each measure.

Source: MedPAC analysis of facility-level rates calculated by Providigm across 1.4 million long-stay nursing facility residents using data from fiscal years 2013 and 2014.

to maximize Medicare payments rather than meet the care needs of beneficiaries.

Results

We found relatively low rates of both all-cause and potentially avoidable hospitalizations; however, we found wide variation in these rates across facilities. We noted a high degree of correlation between the two hospital admission measures (all cause and potentially avoidable). In our analysis of SNF days, we found that facilities with the highest rates of SNF use for their long-stay Medicare beneficiaries had rates 10 times higher than those with the lowest rates of SNF use. While some of this variation results from state-level policies and regional differences in medical culture, our analysis also found wide variation in rates within each state, indicating that, regardless of state-level policies, some facilities could better avoid unnecessary hospital admissions and SNF use.

Hospital admission rates

Our analysis found that, while the rate of hospital use by the long-stay population was relatively low, on average, the risk-adjusted rates of all-cause hospital admissions and potentially avoidable hospital admissions of long-stay NF

TABLE 9–3

Risk-adjusted rates of hospital use per 1,000 long-stay nursing facility resident days varied between two- and almost fourfold across facilities

Measure	Mean	Percentile					Ratio of 90th percentile to 10th percentile
		10th	25th	50th	75th	90th	
All-cause hospital admissions	1.6	1.0	1.3	1.6	1.9	2.3	2.3
Potentially avoidable hospital admissions	0.8	0.4	0.5	0.7	0.9	1.2	3.1
All-cause ED visits and observation stays	1.9	0.8	1.2	1.7	2.3	3.1	3.7

Note: ED (emergency department). The ratio of 90th percentile to 10th percentile in the last column may not necessarily equal the sixth column divided by the second column due to rounding.

Source: Providigm analysis of 1.4 million long-stay nursing facility residents using data from fiscal years 2013 and 2014.

residents equaled 1.6 and 0.8 per 1,000 long-stay resident days, respectively. However, there was wide variation in the rates across NFs (see text box on calculating illustrative rates for an average facility). For example, facilities with the highest rates of all-cause hospital admissions (those at or above the 90th percentile) had rates over two times higher than facilities with the lowest rates (those at or below the 10th percentile) (Table 9-3). This variation was greater for the potentially avoidable hospital admission measures. Facilities with the highest rates (those at or above the 90th percentile) had rates over three times higher than facilities with the lowest rates (those at or below the 10th percentile).[15]

Facilities with rates at or above the 90th percentile Given the high degree of variation across the measures, we more closely analyzed the facilities with rates at or above the 90th percentile. We found that NFs with the highest hospital admission rates (both all cause and potentially avoidable) for long-stay NF residents were more likely to be for-profit facilities (Table 9-4, p. 278). We also found a disproportionate share of rural facilities among those with the highest rates of hospital admissions. Although rural facilities made up 31 percent of facilities, they made up 37 percent of facilities with the highest rates of all-cause hospital admissions and 49 percent of facilities with the highest rates of potentially avoidable hospital admissions. Small facilities (those with 100 or fewer beds) also were more likely to have the highest rates of all-cause and potentially avoidable hospital admissions.

Facility-level characteristics Using a regression model, we found that several other facility-level characteristics aligned with the all-cause and potentially avoidable hospital admission rates.[16] For both rates, facilities with the lowest frequency of visits from physicians or other health professionals (facilities at or below the 10th percentile of provider visits) were associated with higher rates of hospital admissions. Facilities with access to on-site X-ray services had lower rates of potentially avoidable hospital admissions compared with facilities without access to these services; however, we did not find a similar association with the rate of all-cause hospital admissions (Kramer et al. 2017). We also stratified the data based on facility location (urban or rural) and found that a higher portion of urban facilities reported access to on-site X-ray services and more frequent visits from physicians and other health professionals compared with rural facilities, consistent with our regression model results.[17]

Correlation between all-cause and potentially avoidable hospital admission rates We found a positive, statistically significant correlation between the all-cause hospital admission rates and potentially avoidable hospital admission rates ($R^2 = 0.81$). However, fundamental differences between the two measures exist. A potentially avoidable measure does not hold providers or facilities accountable for every admission, so it is sometimes viewed as more fair. But it does require determinations about what types of admissions are avoidable, which can be controversial. In contrast, an all-cause measure does not attempt to litigate what providers should or should not be expected to manage. It does, however, hold them accountable for many hospitalizations that may not be avoidable.

Over the past decade, the Commission has developed potentially avoidable readmission measures for acute care hospitals, SNFs, and inpatient rehabilitation facilities.

TABLE 9–4

A disproportionate share of for-profit and rural facilities had the highest rates of hospital admissions

		Facilities at or above the 90th percentile in:	
	All facilities	All-cause hospital admissions	Potentially avoidable hospital admissions
Number of facilities	15,140	1,514	1,514
Ownership			
For profit	71%	77%	73%
Nonprofit	23	18	19
Government or other	6	5	8
Hospital based	4%	4%	5%
Freestanding	96	96	95
Urban	69%	63%	51%
Rural	31	37	49
Number of certified beds	109	102	96
50 or fewer	12%	15%	16%
51 to 100	39	43	45
101 to 200	43	38	36
201 or more	6	5	3

Note: Facilities with the highest hospital admission rates were those at or above the 90th percentile. Totals may not sum to 100 percent due to rounding.

Source: Providigm analysis of 1.4 million long-stay nursing facility residents using data from fiscal years 2013 and 2014.

The Congress enacted a readmission penalty as part of the Patient Protection and Affordable Care Act of 2010, which CMS implemented through the Hospital Readmissions Reduction Program in October 2012. In its research from 2009 through 2011, the Commission found decreases in both all-cause and potentially preventable hospital readmissions. The all-cause rate decreased by 0.3 percentage point while the potentially preventable rate decreased by 0.7 percentage point, suggesting that most of the decline in readmissions came from a reduction in potentially preventable readmissions (Medicare Payment Advisory Commission 2013).

All-cause ED and observation visit rates

On average, the risk-adjusted rate of all-cause ED visits and observation stay use was almost 2 visits per 1,000 long-stay resident days (Table 9-3, p. 277) (see text box on calculating illustrative rates by an average facility, p. 276). Analyzing facility-level characteristics using the regression models, we found that facilities with the highest level of visits from physicians or other health professionals were associated with lower rates of ED visits and observation stays. Similarly, the availability of on-site X-ray services was associated with lower rates of ED visits or observation stays for this population.

Rates of SNF days

We found that the mean risk-adjusted rate of long-stay NF residents' SNF days equaled 76 per 1,000 long-stay resident days, with a large degree of variation across facilities (see text box on calculating illustrative rates by an average facility, p. 276). Facilities at or above the 90th percentile had rates of SNF use over 10 times higher than facilities at or below the 10th percentile (Table 9-5). Two factors could contribute to the frequency and length of SNF use, including the amount of time a beneficiary spent

TABLE 9–5

Risk-adjusted rates of SNF use per 1,000 long-stay NF resident days vary more than tenfold across facilities

Measure	Mean	Percentile					Ratio of 90th percentile to 10th percentile
		10th	25th	50th	75th	90th	
Long-stay resident SNF days	76	16	32	53	95	169	10.6

Note: SNF (skilled nursing facility), NF (nursing facility).

Source: Providigm analysis of 1.4 million long-stay nursing facility residents using data from fiscal years 2013 and 2014.

in the hospital and whether the beneficiary initiated a new benefit period, enabling Medicare to cover the post-acute SNF stay with the hospitalization.

Considering facility-level characteristics, we found that long-stay NF resident in for-profit facilities used more SNF days than did their counterparts in nonprofit facilities. We also found that the residents in freestanding facilities used more days than those in hospital-based facilities. Consistent with other work showing that for-profit and freestanding facilities have longer SNF stays, our regression models confirmed that for-profit facilities are associated with a statistically significant higher rate of SNF days relative to nonprofit facilities.

State-level policy differences

Geographic variation was pronounced across the measures we explored. When we stratified our data by state, we found that the variation across states in average rates of hospital use for the all-cause hospital admission measure and the potentially avoidable hospital admission measure was almost twofold (Table 9-6). The average all-cause hospital admission rate for the 5 states with the lowest rates was 1.2 admissions per 1,000 NF resident days, while the average rate for the 5 states with the highest rates was 2.0 admissions per 1,000 NF resident days (Kramer et al. 2017). We found similar variation by state when we analyzed the measure of SNF days per 1,000 NF resident days. For this measure, states with the highest average rates of SNF days had rates that were more than twice those of states with the lowest average rates of SNF days (about 105 days per 1,000 NF resident days compared with about 47 days per 1,000 NF resident days, respectively). This degree of variation suggests that, in addition to facility characteristics, state-level policies and geographically specific practice patterns may help explain variation in hospital use rates. For example, state-level bed-hold policies and Medicaid policies could contribute

TABLE 9–6

State-level comparison of hospital and SNF use rates per 1,000 long-stay NF resident days finds about twofold variation across the measures

Measure	National average rate	Average of bottom 5 states (lowest rates)	Average of top 5 states (highest rates)	Ratio of states with highest to lowest rates
All-cause hospital admissions	1.6	1.2	2.0	1.7
Potentially avoidable hospital admissions	0.8	0.5	1.0	2.0
All-cause ED visits and observation stays	1.9	1.3	2.7	2.1
Long-stay resident SNF days	76	46.8	104.6	2.2

Note: SNF (skilled nursing facility), NF (nursing facility), ED (emergency department).

Source: MedPAC analysis of facility-level rates calculated by Providigm across 1.4 million long-stay nursing facility residents using data from fiscal years 2013 and 2014.

TABLE 9–7

Rates of SNF use per 1,000 long-stay NF resident days vary considerably

	Ratio of facility-level variation, 90th percentile to 10th percentile		
		State variation	
Measure	**National variation**	**Low-variation states**	**High-variation states**
All-cause hospital admissions	2.3	1.8	3.0
Potentially avoidable hospital admissions	3.1	2.2	4.3
All-cause ED visits and observation stays	3.7	2.5	5.4
Long-stay resident SNF days	10.6	4.4	27.5

Note: SNF (skilled nursing facility), NF (nursing facility), ED (emergency department). "Low-variation state" is defined as a state with variation at or below the 10th percentile. "High-variation state" is defined as a state with variation at or above the 90th percentile.

Source: MedPAC analysis of facility-level rates calculated by Providigm across 1.4 million long-stay nursing facility residents using data from fiscal years 2013 and 2014.

to facility incentives (or ability) to invest in the capital (human or technological) necessary to treat in place or better prevent hospital use. However, bed-hold policies are intended to provide a continual home for long-stay NF residents with the goal of encouraging proper hospital use. In their research, Intrator and colleagues found that facilities located in states with a bed-hold policy had higher rates of hospitalization of long-stay NF residents. States with a bed-hold policy have a greater financial incentive to transfer a beneficiary to an acute care hospital because Medicaid will continue to pay (in part or in whole) for that individual's NF bed while the beneficiary remains in the hospital (Intrator et al. 2007).[18]

We expect that different state-level policies may affect NFs' incentives to transfer a beneficiary to a hospital in conflicting ways; since we did not test each of these variables in the models, we do not know the degree to which each policy contributes to the state's average rates of unnecessary hospital use.

Intrastate variation

On a state-by-state basis, we found fairly consistent variation across facilities for the all-cause hospital admission, potentially avoidable hospital admission, and ED visit and observation stay measures compared with the degree of variation in national-level rates. For example, on a national level, the facilities with the highest rates of all-cause hospital admissions (those at or above the 90th percentile) had rates that were 2.3 times higher than that of facilities with the lowest rates (at or below the 10th percentile) (Table 9-7). We found a similar degree of variation across facilities within each state for the all-cause and potentially avoidable hospital admission measures. For these measures, states that had lower average hospital admission rates tended to have higher variation within the state. States with the highest average hospital admission rates tended to have lower variation across facilities within the state.

Based on the intrastate variation in hospital use across providers, we conclude that, while state-level policies contribute to a NF's incentive to transfer a long-stay NF resident, individual facility-specific practices also contribute to the large variation across the measures. The frequency of these visits could be influenced by the degree that the facility has a "closed" medical staff model (where the NF employs physicians to treat beneficiaries in the facility) compared with an "open" model (where beneficiaries' care is provided by physicians not employed by the NF) (Shield et al. 2014). Research suggests there are clinical benefits to having a closed medical staff on certain outcomes; however, facilities with closed systems may have more difficulty obtaining hospital referrals of post-acute care patients (Assistant Secretary for Planning and Evaluation 2006). In addition, to meet the requirements of Section 1919 of the Social Security Act, each NF resident has the right to choose a personal attending physician.

The intrastate variation in SNF use was considerable, exceeding a 25-fold difference in use between the 10th and 90th percentiles for states with the highest variation. For this measure, we did not find any correlation between the degree of variation across facilities within the state and the state average rate of SNF use for long-stay NF beneficiaries. Similar to the hospital use measures, we conclude that, while state-level policies contribute to a NF's incentive to maximize the SNF benefit for a long-stay NF resident, facility-specific practices also contribute to the large variation across the SNF use measure.

Considerations for future policy

This work suggests several options for future policy, including directing CMS to develop measures of hospital and SNF use for long-stay NF beneficiaries, public reporting of the developed measures, and consideration of incorporating the measures for long-stay NF residents into Medicare payment policy. There are also several areas the Commission could focus on in the future, including better understanding facility best practices to reduce unnecessary hospital admissions, conducting research that focuses on end-of-life and palliative care, and continuing to follow long-stay NF residents receiving care under alternative models of payment such as accountable care organizations (ACOs) and Medicare Advantage (MA).

Quality reporting

CMS could develop measures of hospital and SNF use for long-stay NF residents. The two inpatient admission measures we explored presented similar findings and were highly correlated, so the all-cause hospital admission and potentially avoidable hospital admission measures would likely have a similar effect on facilities. Once a measure or measures are developed, CMS could report the results to providers; ultimately, public reporting could be achieved through a website such as Nursing Home Compare. One option for including a long-stay NF resident hospital use measure in Medicare payment policy would involve congressional action to expand Medicare's SNF value-based purchasing program. Although Medicare does not pay for the long-term portion of care, it does pay for the hospital stays of NF residents. The threshold for a hospital or SNF use measure to affect payment should factor in the high levels of variation we found at the extreme of the rate distributions—not necessarily facilities at or slightly above the median rates.

Program integrity

Given the wide variation in rates of the measures we developed for long-stay NF residents, CMS and its auditors could consider further examining aberrant patterns of hospital and SNF use for long-stay NF beneficiaries. These patterns include high rates of hospital use, ED visits and observation stays, and SNF use. SNF use could be considered in the context of either medically unnecessary days or medically unnecessary admissions. Examining such SNF use could be an extension of OIG's 2016 work plan that focused on the documentation requirements to ensure that SNF care is reasonable and necessary, including a requirement for a physician's order at the time of admission for the resident's immediate care (Office of Inspector General 2015).

Considerations for future Commission work

The Commission could consider future work in three distinct areas: a better understanding of facilities' best practices and potential policies to allow those practices to be shared across facilities, research that focuses on end-of-life care and palliative care models, and future analysis of long-stay NF residents receiving care under alternative models of payment.

The Commission's exploration of best practices across facilities could include an analysis of the characteristics of facilities that provide high-quality care for long-stay NF beneficiaries. Once best practices are determined, the Commission could consider policies that help facilitate sharing best practices across facilities such as connecting lower quality NFs with higher quality NFs. The wide variation in rates of hospital use across NFs may suggest that some NFs currently cannot treat beneficiaries' medical conditions on-site.

The Commission could also focus research efforts on palliative and end-of-life care for the long-stay NF population and its effect on unnecessary hospital use. We could combine this effort with further exploration of palliative care models used by organizations such as ACOs. Because beneficiaries who reside in NFs typically have multiple chronic conditions, advanced diseases, and/or disabilities, palliative care may be of particular importance in this setting. Many initiatives we explored aimed at reducing hospital use by long-stay NF residents include end-of-life and palliative care efforts as one facet of a multifaceted approach; thus, evaluating the effects of these particular efforts is difficult.

As data become increasingly available, the Commission could look at trends in hospital and SNF use for long-stay NF residents receiving care under certain alternative models of payment. This analysis might include additional research on the use of ACOs with the long-stay NF population. To date, research has primarily focused on post-acute care, not necessarily the beneficiaries who are long-stay NF residents. However, CMS recently began accepting letters of intent for a new ACO model, the Medicare–Medicaid Accountable Care Organizational Model, scheduled to begin in 2018. These ACOs may be more focused on the long-stay NF population and might provide additional insights on reducing unnecessary hospital use for Medicare beneficiaries. With respect to another alternative model, the Commission issued a status report in its June 2016 report to the Congress regarding CMS's Financial Alignment Initiative between Medicare and Medicaid. We will continue to monitor its progress; in particular, we plan to focus on the development of the demonstration's care coordination models and their impact on the quality of care received by dual-eligible beneficiaries (Medicare Payment Advisory Commission 2016b). Last, as data become available and appropriately validated for analysis, the Commission could compare hospital and SNF use between the long-stay NF residents enrolled in Medicare fee-for-service compared with those in MA. ■

Endnotes

1 The coordinating organizations include the Alabama Quality Assurance Foundation, CHI/Alegent Creighton Health, HealthInsight of Nevada, Indiana University, the Curators of the University of Missouri, the Greater New York Hospital Foundation Inc., and UPMC Community Provider Services.

2 Optum CarePlus will be used to describe UnitedHealthcare's NF care coordination model even if the reference predates the change in name.

3 The Commission contracted with NORC at the University of Chicago to conduct the interviews with individuals involved in implementing these initiatives. To supplement the responses gathered through the interviews, the Commission also attended two meetings held by CMMI and further researched initiatives through a variety of phone calls, webinars, and a literature review.

4 *Clinician* refers to the resident's physician or other health professional managing the treatment of the beneficiary, including advanced practice registered nurses.

5 INTERACT is an acronym for **Inter**ventions to **R**educe **A**cute **C**are **T**ransfers. This suite includes quality improvement, communication, decision support, and advanced planning tools. The full suite can be accessed at https://interact2.net/tools_v4.html.

6 The payment is geographically adjusted. Nurse practitioners and physician assistants are paid at 85 percent of the geographically adjusted physician fee schedule amount. The original NF Current Procedural Terminology (CPT) code 99310 pays $137.81 in 2017, whereas the equivalent hospital visit CPT code 99223 pays $205.64 in 2017.

7 Nurse practitioners and physician assistants are paid at 85 percent of the geographically adjusted physician fee schedule amount.

8 Medicare Part D includes an MTM program that is intended to improve the quality of the pharmaceutical care high-risk beneficiaries receive. In the past, the Commission has questioned whether MTM programs offered through stand-alone prescription drug plans, without the cooperation and coordination of a beneficiary's care team, have the capacity to significantly improve beneficiaries' drug regimens. The Commission concluded that better medication management might be achieved through programs offered by accountable care organizations, medical homes, and other team-based delivery models. Patients might be more likely to follow the advice they receive if it comes from their physicians and pharmacists. Further, because medication errors are most likely to occur when a drug regimen is modified (e.g., when a patient transitions from one site of care to another), medication management programs that are part of a clinical setting may be more effective in identifying when patients' medications should be reviewed and reconciled (Medicare Payment Advisory Commission 2015a).

9 *Advance care planning* refers to a broad group of conversations regarding an individual's preferences for end-of-life care, formalized through written documentation. Advance care planning encompasses several types of documents. An advance directive, for example, includes a living will and a durable power of attorney for health care and goes into effect when the beneficiary is too ill to make his or her own health care decisions (National Institute on Aging 2016). The federal Patient Self-Determination Act of 1990 requires certain providers, including NFs, to maintain written policies and procedures to inform beneficiaries about advance directives. According to the Government Accountability Office, 55 percent of beneficiaries in NFs nationwide had an advance directive in 2014, with broad variation within and across states (Government Accountability Office 2015).

10 These tools include forms such as the Physician Order for Life-Sustaining Treatment, Medical Order for Life-Sustaining Treatment, Medical Order for Scope of Treatment, and Physician Order for Scope of Treatment.

11 For example, in 2013, the Commission published trends in potentially preventable hospital readmission rates and concluded that hospitals could more readily prevent certain readmissions (Medicare Payment Advisory Commission 2013). In 2014, we discussed rates of potentially preventable hospital and ED visits by all Medicare FFS beneficiaries in certain regions (Medicare Payment Advisory Commission 2014).

12 We calculated the rates using data in fiscal years 2013 and 2014. We used data from the last four months of fiscal year 2012 to determine eligibility status for beneficiaries whose NF stays began before our study period.

13 Medicare pays for up to 100 days in a SNF following an inpatient hospital stay lasting 3 days or longer per benefit period. Medicare pays in full for the first 20 days of the SNF stay, after which the beneficiary is responsible for coinsurance for days 21 through 100. In 2016, the coinsurance equaled $161 per day. A new benefit period begins with a hospital admission once the beneficiary has not used the inpatient hospital or SNF benefit for 60 days.

14 110 beds × 85 percent occupancy × 52 percent qualifying long-stay resident days × 365 days = 17,746 qualifying long-stay resident days per year

15 In prior work, the Commission found that variation in spending for post-acute care services varied twofold between the lowest 10th percentile of spending and the highest 90th percentile. The variation was less for acute inpatient services where the ratio of spending between the lowest 10th percentile and highest 90th percentile equaled 1.22 (Medicare Payment Advisory Commission 2011).

16 Given the collinearity between facility ownership and staffing levels, we conducted two separate regression analyses. One regression included ownership, the second included several staffing variables such as certified nursing assistant, licensed practical nursing, and registered nurse hours per resident day and excluded ownership. Both models produced similar explanatory power and similar results.

17 Almost 87 percent of urban facilities reported access to on-site X-ray services compared with about 63 percent of rural facilities in our analysis. We also found that 57 percent of urban facilities had rates of physician or other health professional visits exceeding 40 per 1,000 long-stay NF resident days, compared with 16 percent of rural facilities (Kramer et al. 2017).

18 Intrator and colleagues found that the states with a bed-hold policy had higher rates of hospitalization, equaling approximately 75 additional inpatient hospital stays every 5 months for every 1,000 long-stay NF residents (Intrator et al. 2007). This figure translates into 75 additional hospitalizations per 150,000 long-stay NF resident days, or 0.5 hospitalization per 1,000 days.

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