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National Variation in Hospitalizations and Emergency Department/ Observation Visits for Medicare Beneficiaries Receiving Long-Term Care in Nursing Centers

A report by staff from Providigm, LLC, for the Medicare Payment Advisory Commission

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National Variation in Hospitalizations and Emergency Department /Observation Visits for Medicare Beneficiaries Receiving Long-Term Care in Nursing Centers

Final Report

Submitted to:
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1 INTRODUCTION

Concerns about hospitalization and emergency department (ED) use of long-term nursing center[1] residents have been raised in studies dating back more than 25 years (Saliba, et al. 2000; Ouslander et al. 2010; Gruneir et al. 2010; Spector et al. 2013; Burke et al. 2015). These studies have used various methods to identify acute events that may have been prevented including chart review, identifying services provided in the ED, transfer for ambulatory care sensitive conditions, and hospital diagnoses for which hospital transfer could potentially be avoided, termed potentially avoidable hospitalizations (PAHs).

As in most other studies, we focused on hospitalizations from long-term care (LTC) that may have been prevented rather than all-cause hospitalizations, even though we also include the latter in this report. The drawback of using all-cause hospitalizations to look at variation as well as interventions is that all-cause rates tend to vary less in response to care as they include elective hospitalizations and those that may be appropriate under most circumstances. In contrast, the two types of hospital transfers that have been considered PAHs, include: 1) conditions that should be managed in a typical nursing center; and 2) conditions that should be prevented from occurring if nursing centers provide high quality care. Depending on the definition, population, and methodology used, prior research has found that the proportion of hospitalizations that were potentially avoidable has been estimated to be in the range of 39% to 67% (Walsh et al. 2010; Saliba et al. 2000; Ouslander et al. 2010; and Spector et al. 2013). The proportion of ED visits estimated to be preventable ranged from 25% to 44% (Saliba et al. 2000; Gruneir et al. 2010).

If these events can be prevented based on the quality of care received in the nursing center, we would expect to find considerable variation in the rates of PAHs and ED visits across nursing centers, and somewhat less variation in all-cause rates. The first objective of this study was therefore to determine the variability across nursing centers in hospital use of Medicare beneficiaries identified as LTC residents. To assess variability in practice/quality requires risk adjustment for LTC resident characteristics (e.g. comorbidity, function, age) that would likely influence the rate at which nursing centers transfer residents to acute care due to varying risk of decline.

If there is variability across nursing centers in risk-adjusted rates, the second objective of the study was to identify the resident-level factors that are associated with this variability. For example, due to the frequency of hospital transfers occurring at the end of life (Levy et al. 2004), we would expect higher rates of hospital use in nursing centers that provide more end-of-life care. In addition, race has been found in past studies to be associated with the rates of hospitalization at the end of life, so we would expect to find a higher rate of hospital use in nursing centers that treat more minorities (Cai, et al. 2016). Geographic variation is a well-known phenomenon in health care decisions where there is room for discretion that is influenced by geographic differences in practice patterns, so we would expect geographic variation in hospital use.

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[1] Nursing center is used to refer to nursing facilities (NFs) or skilled nursing facilities (SNFs) that provide long-term care (LTC) to Medicare beneficiaries.

A third objective of this study was to determine whether services that might constitute higher quality care, and for which information is available in secondary data, are associated with rates of hospital use. In particular, studies suggest that the reason for ED visits and some hospital admissions is for diagnostic testing particularly X-ray (Burke et al. 2015), so we would hypothesize lower rates of acute transfers from nursing centers where radiology is available on site. In addition, based on studies involving advanced practice nurses rounding as physician extenders as in the Evercare model, or in the more successful states in the current CMS demonstration of Enhanced Care and Coordination Providers (ECCP) implemented across seven states (Ingber et al. 2016), we hypothesize that greater physician visits either from a physician or other health professional working with a physician would be associated with lower hospital use.

We also hypothesize that higher rates of RN staffing would be associated with improved skilled care in the nursing center and reduced hospital use. Finally, to the extent that nursing centers utilize hospice services, we would hypothesize that higher rates of hospice care would reduce hospital use at the end of life.

A final objective of this study was to examine the extent to which "cycling" also referred to as the "revolving door" occurs for long-stay nursing center residents (Mor et al. 2010). Medicare requires beneficiaries to have an inpatient hospital stay lasting three days or longer within 30 days of SNF admission to qualify for the SNF benefit. Due to higher payment for Medicare SNF stays than Medicaid LTC days, there is an incentive for a NF to transfer a dual-eligible beneficiary to an acute care hospital in a potentially avoidable circumstance, so that Medicare pays for SNF care (instead of Medicaid paying for NF care) upon discharge from the acute care hospital. While cycling has been discussed in the context of SNF care, where residents are less stable after leaving the hospital, Mor et al. (2010) highlight the incentives for long-stay residents to be repeatedly admitted in potentially avoidable situations, and ultimately have a larger portion of their days covered by Medicare. Thus, in addition to examining hospitalizations, which would be elevated if cycling occurred, the current study also includes an analysis of variation in the outcome of SNF days as a proxy for cycling of long-stay residents.

This study provides national rates of hospital use, the extent of variation in these rates, and facility characteristics associated with such rates. To the extent that the reasons for variation are within the control of the nursing center, the study could provide insights into how to reduce potentially-avoidable hospital use for long-stay nursing center residents.

2 METHODS

2.1 Definitions and Sample

2.1.1 Definitions for Inclusion in Study

Long-Term Care (LTC) Stay: A beneficiary stay in a nursing center composed of at least 100 contiguous days, interrupted only by inpatient transfers. Any discharge to the community with greater than one day in length ended a LTC stay and disqualified that stay as a LTC stay if it occurred within the first 100 days. Death ended a LTC stay. Any days during the stay that were in an inpatient location (acute care, rehab, psychiatric hospital, etc.) were not included toward the 100 contiguous day calculation.

Long-Term Care (LTC) Beneficiaries: Medicare beneficiaries who had at least one LTC stay (as defined above) exceeding 100 days were included in the study. A qualified beneficiary could have more than one LTC stay in a single nursing center or stays in multiple nursing centers.

Long-Term Care (LTC) Days: Once a resident was qualified as being in a LTC stay, then all SNF and NF days beginning with the 101st day were counted toward the total LTC days for the nursing center. We define these days as LTC days based on the duration of the stay in the facility, not based on payer. LTC days occurring in a nursing center were pooled across stays and across residents. Thus, consistent with other studies, the unit of analysis was the LTC day, not beneficiaries or stays.

End-of-Life Days/Share: Any LTC days that occurred within six months prior to the death of the beneficiary were designated as end-of-life days. These days were included in the pool of LTC days, but due to the higher risk of hospitalization at the end of life, the share of LTC days that were in the last six months of beneficiaries' lives was determined for each nursing center.

Medicare Share: The portion of LTC days covered by Medicare. This includes days for a LTC beneficiary covered by Medicare following a three-day hospitalization that occurred after the 100th day in the nursing center. We count these days in this study as SNF days. Medicare days occurring within the first 100 days were not counted toward the Medicare share (or as SNF days) since the LTC stay begin on the 101st day of contiguous nursing center care.

2.1.2 Exclusions and Final Sample

Exclusions were applied at the beneficiary-, stay-, and center-level. All beneficiaries with Managed Care Organization (MCO) participation anytime during the study period were removed from the data due to data limitations on claims associated with these beneficiaries. This resulted in slightly less than 22% of Medicare beneficiaries being removed from the Medicare Enrollment file, most of who were not LTC beneficiaries. From the Medicare FFS beneficiaries, we excluded those that did not have a qualifying LTC stay of 100 days and those missing a provider number resulting in 1,342,945 beneficiaries receiving LTC in FYs 2013/2014.

Aggregating stays to the nursing center level resulted in a facility-level file with 15,996 nursing centers. Data from Medicare's Provider of Services and Nursing Home Compare files were merged by provider number and only those nursing centers that were in all three files were retained resulting in 15,583 nursing centers.

In order to ensure stability for the facility-level outcome measures two further exclusions were applied. Only nursing centers with at least 500 pooled LTC days and at least 10 contributing beneficiaries were retained. This resulted in 15,146 nursing centers. Any nursing centers with missing urban/rural indicator or located outside the continental US, Alaska or Hawaii were also removed. The resulting final analysis file included 15,140 nursing centers.

2.2 Outcome Measures

2.2.1 Outcome Measure Development

We relied on hospital claims data to determine the rate of all-cause hospitalization of long-term care beneficiaries residing in nursing facility. The PAH measure was defined using the diagnoses from hospital discharge claims. While the gold standard for determining a PAH or ED visit is record review by an expert panel (Saliba et al. 2000; Ouslander et al. 2010), consensus based on chart review is impractical on large-scale studies. Thus, it has become customary in large-scale studies to define PAH from the primary diagnosis associated with the hospitalization (Walsh et al. 2010; Spector et al. 2013). For prior MedPAC studies, we previously developed a list of ICD-9 codes for readmission from SNFs, which most recently found that about 47% of all-cause readmissions from SNF met criteria for potentially avoidable readmissions (Kramer et al. 2014).

To determine PAH for long-term care, we reviewed available literature and reports both on the development of and studies of PAH and ED visits from nursing centers. . For long-stay nursing center residents, authors have used the set of Ambulatory Care-Sensitive Conditions (Carter 2003), convened Technical Expert Panels to review lists from previous studies (Walsh et al. 2010), and based on additional review identified additional nursing center-sensitive avoidable conditions (Spector et al. 2013). Walsh et al. identified about 39% of all-cause hospitalizations to be PAHs. Spector et al., found that 60% were PAHs.

As in the case of other recent studies, we did not assume that the Ambulatory Care-Sensitive Conditions that were developed to measure the quality of care for individuals residing in the community were the appropriate set of conditions for long-stay nursing center residents. Similarly, we did not base our definition on lists of conditions of PAHs and ED visits for all Medicare beneficiaries or all dual-eligible Medicare beneficiaries many of whom reside in the community.

We also did not assume that the same conditions would necessarily be appropriate for defining PAH as ED visits. In fact, upon review of literature related specifically to ED visit use among LTC residents, it was clear that even though LTC residents often were admitted to the acute hospital from the ED, there are substantial differences between these Medicare beneficiaries and those that use the ED and return to the nursing center (Caffrey et al. 2004; Burke et al. 2016). Due to a lack of reliable diagnosis data for ED visits from claims, and the recent study (Burke et

al. 2016) that identified service criteria rather than diagnosis to identify potentially preventable ED visits from nursing centers, we chose to use an all-cause measure of ED visits. We also included observation visits, consisting of stays in the hospital of more than 24 hours that never resulted in an admission to acute care (and hence an acute care claim), often occurring in an observation unit or the ED. These were very modest in number relative to ED visits.

We began defining PAHs for LTC by reviewing our prior list of conditions of potentially avoidable readmissions to SNFs to determine if some of these no longer applied. We then reviewed the other sets of conditions from the literature to determine if additional conditions should be added for long-stay residents (e.g. chronic problems like anemia that can be attributable to the care of the long-stay resident). Sepsis was removed from the SNF list, and eight additional more chronic conditions were added (Diarrhea / Gastroenteritis, Constipation / Fecal Impaction, Anemia, Weigh Loss / Failure to Thrive, Nutritional Deficiencies, Seizures, Chest Pain, and Fever). Based on this process, we developed a set of conditions using ICD-9 code ranges for PAHs from long-term care, which are detailed in Table 1. PAH from LTC represented 45.5% of all-cause hospitalizations in this study, which is within a similar range with other studies and our rate for SNFs (Kramer et al. 2014).

2.2.2 Outcome Measure Definitions

Four outcome measures were used in the final analysis. These included: 1) all-cause hospitalizations per 1,000 LTC days; 2) PAH per 1,000 LTC days; 3) all-cause ED/Observation (ED/O) visits per 1,000 LTC days; and 4) the number of SNF days per 1,000 LTC days.

All-Cause Hospitalizations per 1,000 LTC Days: All-cause hospitalizations occurring in short-term acute care inpatient hospitals after day 100 of the LTC stay were summed. Contiguous hospital stays (e.g. if there was a transfer to a different inpatient facility) were counted as one hospital stay. Other inpatient stays (i.e. inpatient rehabilitation facility (IRF) or inpatient stays at a psychiatric facility) were not included in this measure.

Potentially Avoidable Hospitalizations per 1,000 LTC days: PAH were based on ICD-9 codes for the primary diagnosis assigned at the hospital discharge. The potentially avoidable conditions included the following 21 broad conditions: congestive heart failure, electrolyte imbalance, respiratory illnesses, urinary tract / kidney infections, hypoglycemia / hyperglycemia / diabetic complications, anticoagulant complications, fracture injuries (likely due to falls), other injuries, adverse drug reactions, acute delirium, cellulitis/wound infection, pressure ulcers, blood pressure management, diarrhea / gastroenteritis, constipation / fecal impaction, anemia, weight loss / failure to thrive, nutritional deficiencies, seizures, chest pain, and fever. Specific ICD-9 codes for each condition are listed in Table 1.

All-Cause Emergency Department / Observations Visits per 1,000 LTC Days: Only those ED/O visits that occurred during the LTC days were summed in the same manner as the hospitalization measures.

Medicare Skilled Nursing Facility Days per 1,000 LTC Days: Medicare SNF days were summed across the LTC stays. SNF days could occur anytime after a hospitalization during the LTC stay. SNF days that occurred in the first 100 days of the LTC stay were not included.

2.3 Covariates

2.3.1 Risk-Adjustment Covariates

To adjust for differences between nursing centers in resident characteristics that could influence the outcomes, we risk-adjusted for age and gender, functional status, and comorbidity. Age (at the end of the LTC stay) was divided into five binary age categories: less than 65, 65 to less than 75, 75 to less than 85, 85 to less than 95, and 95 or greater.

Functional status items from available MDS assessments were used to construct an average modified Barthel Index (Mahoney et al. 1965) ranging from 0 (poor function) to 90 (good function). Contributing items included the following activities of daily living (ADLs): eating, transferring, grooming, toileting, bathing, walking/ambulation, and dressing, as well as bowel and bladder incontinence. The index was then collapsed into three binary categories reflecting low (0 to 30), medium (35 to 55), and high (60 to 90) functional status.

Comorbidity items were selected from Hierarchical Condition Categories (HCCs) and for three additional comorbid diseases from the MDS conditions in Section I, Active Diagnoses. Binary covariates for 87 HCCs were constructed from the HCC file using the combined calendar year files from 2013 and 2014. Based on Spearman correlations both with the outcome measures and among the covariates, 20 HCCs were selected for inclusion and 3 MDS conditions (not well represented in the HCCs) were selected to conduct risk adjustment based on comorbidity. Two of the MDS conditions (Arthritis and Osteoporosis) were combined into a binary arthritis condition indicator.

Demographic, functional status, and comorbid conditions were all weighted at the stay level using the number of valid LTC days for each contributing stay before summing to the facility level. The pooled values at the facility level were then divided by the total LTC days. For example, if a nursing center had three beneficiary stays and two stays were male and one female with LTC days of 100, 200 and 500 days respectively, the calculated weighted gender average for the facility was 62.5% female calculated as (100*0+200*0+500*1)/800.

2.3.2 Effect Variables

Following the calculation of risk-adjusted rates using only the variables enumerated above, effects of facility-level variables were tested in saturated models including the risk-adjustment variables. Effect variables included: Race/ethnicity (White, African American, Hispanic, and Other), and marital status (Never Married, Married, Widowed, Separated, Divorced) hospital-based, hospice share, physician and other health professional visits, end-of-life share, staffing hours per resident day (CNA, LPN, and RN), clinical laboratory on-site, X-ray on-site services, and state binary indicators. Percent hospice share, end-of-life share, physician and other health professional visits, and staffing hours were all collapsed into three binary categories for low, medium, and high utilization based on cut points that yielded about 10% in the high and low categories. The middle approximately 80% was set as the referent and the bottom 10% was denoted as low and the upper 10% was denoted as high. Thus all of these variables had three similar levels rendering the interpretation of the coefficients more comparable.

2.4 Data

2.4.1 Data sources and file build

LTC stays were constructed using MDS assessments from 6/1/2012 to 1/31/2015. FY 2013 and 2014 LTC stays were determined using the period beginning four months prior to and following the study period as well as during the study period (6/1/2012 to 1/31/2015). Constructed stays were augmented with information from enrollment files, Part A inpatient, SNF, and hospice claims, Part B outpatient and carrier claims, HCC beneficiary files, and Provider of Service (POS) and Nursing Home Compare data files. Hospitalizations, and combined ED and observation visits (ED/O visits), and the proportion of Medicare SNF days relative to LTC length of stay were studied.

All data was provided by MedPAC under a data use agreement with the CMS. A beneficiary finder file was constructed using all MDS assessments for the study period of FYs 2013 and 2014 which had 5,277,994 beneficiaries. The list of beneficiaries from the MDS assessments finder file was matched to the enrollment files resulting in an enrollment file with 5,256,298 beneficiaries. The enrollment file was used to screen all assessments and claims records for this beneficiary population.

All MDS assessments were matched to the enrollment finder file resulting in 10,530,978 assessments. MDS assessment entry (A1600), discharge (A2000), and reference (A2300) dates were used to aggregate the assessment-level data to a stay level. Assessment-level items were aggregated to the stay level using different approaches depending on the nature of the item. For example, dichotomous items were generally either counted across assessments within a date range, or transformed into indicators based on the presence of a condition on any of the MDS assessments during the stay.

The MDS stay-level file was then merged with SNF, inpatient, and hospice claims. A hierarchical status was assigned to each type of record with acute inpatient as the highest, followed by rehab inpatient, other inpatient, and finally SNF claims. Stay dates were modified to remove overlapping stays based on this hierarchy so that a beneficiary could only be in one of those locations on a given date. If there was no indication of a beneficiary being in an inpatient facility or a nursing center, then it was assumed that the beneficiary was located in the community. Hospice coverage was allowed to overlap into any of the three locations (inpatient, long-term care, or community). Both hospice and dual eligibility status were assigned as an attribute of the LTC stay.

Stays were cleaned to remove duplicates and other unwanted stays and exclusions were applied which resulted in a stay file with 3,146,851 Medicare and non-Medicare stays. Using stay dates, outpatient claims files were merged into the LTC stays to provide emergency department and observation visits as stay attributes. Carrier claims files were also merged by stay date to provide physician and other health professional visits during the LTC stay.

The stay-level file with associated attributes and various data items from the MDS and claims files were then aggregated to the facility level using the provider ID (CMS certification number).

Various types of days and counts as well as demographic and comorbid conditions were rolled appropriately as pooled counts or days weighted appropriately. The resulting facility-level file was then merged with items from the POS and Nursing Home Compare files.

Facility characteristics from the POS and Nursing Home Compare files included ownership (for-profit, non-profit, and government), hospital-based vs. free standing, urban/rural, the number of certified beds, on-site laboratory and X-ray services, staffing hours per resident day for certified nursing assistants (CNAs), licensed practicing nurses (LPNs), and registered nurses (RNs), and finally binary state indicators for the nursing center location.

2.5 Analysis

Linear regression was used to risk adjust the four outcome measures as well as to quantify the selected effects covariates in the saturated models. Poisson regression models were examined to determine if it was more appropriate to use them given the distribution of the outcome measures but they gave essentially the same results so Poisson models were not used.

The risk-adjustment models each used a similar set of covariates; however, the coefficients of the variables varied for each outcome based on the regression analysis conducted separately for each outcome variable. Non-significant risk-adjustment variables for a given outcome measure were then removed from the model for that outcome variable only. The risk-adjustment variables were: binary age categories, binary Barthel Index categories, binary comorbid diagnosis categories. Adjusted R-squared values for risk-adjustment models pertaining to all-cause hospital admissions, PAHs, ED/O visits, and SNF days were 0.51, 0.28, 0.16, and 0.10, respectively. Once determined to be significant for an outcome, the risk-adjustment variables were included in all future models for that outcome.

For binary effect variables (e.g. urban/rural) one of the two categories was chosen to be denoted as "0" and the other "1", and the variable was labeled accordingly. Continuous effect variables were collapsed into three categories. To be included in the final model, at least one of the categories for the covariate had to have a p-value less than 0.05 and improve the R-squared by at least .002. Once determined to be significant for an outcome, the risk-adjustment variables were included in all future models for that outcome.

Two separate outcome measure models were estimated for each outcome due to multicollinearity of nursing center ownership and staffing variables. The ownership model included nursing center ownership and hospital-based covariates but not staffing covariates (CNA, LPN, and RN). The staffing model included staffing covariates but not ownership or hospital-based covariates. Both the ownership and staffing models included an identical set of additional effects covariates. Additional effects covariates included percent hospice share, end-of-life share, physician visits, on-site laboratory, on-site X-ray services, and binary state indicators.

3   RESULTS

3.1 Characteristics of Nursing Centers Providing Long-Term Care

A total of 1,342,945 Medicare beneficiaries met LTC resident criteria in FY 2013 and 2014 from the 15,140 nursing centers meeting the inclusion criteria. These nursing centers averaged 95 beneficiaries staying at least 100 consecutive days (excluding hospital transfers) during the two-year period (Table 2). The 10th percentile nursing center had 36 residents, the 90th percentile had 159 residents, and the interquartile range was 57-121, with a median of 86 long-stay beneficiaries, demonstrating a long tail among higher volumes nursing centers (Table 3). That is, a small number of nursing centers with much higher volumes of long stay residents than the average nursing center.

The typical nursing center providing LTC was freestanding, for-profit, and urban (Table 2). These nursing centers typically had both on-site laboratory (78.5%) and on-site radiology (79.4%). Nursing centers varied substantially with respect to staffing, averaging 2.45 CNA hours per resident day, 0.82 LPN hours per resident day, and 0.76 RN hours per resident day (Table 3). Physician provider and health professional visits, which may have been advanced practice nurses or physician assistants working under physician supervision, varied greatly averaging 0.04 per LTC day ranging from .0001 in the 1st percentile to 0.12 at the 99th percentile.

While they averaged 7.6% of LTC days covered by Medicare, Medicare SNF share varied substantially from 1.2% in the 10th percentile to 17.2% of LTC days in the 90th percentile (Table 3). Days for long-stay beneficiaries who were dually eligible for Medicare and Medicaid averaged 78.5% of total LTC days in the nursing center, but varied between 49.3% in the 10th percentile to 96.4% in the 90th percentile. Variability was also large in the share of end-of-life days across nursing centers (10th to 90th percentile: 8.0% to 17.6%) around a mean of 12.7%. Use of hospice was more skewed with hospice share of LTC days 10th percentile to 90th percentile of 0.1% to 11.1% with a mean of 4.8%.

3.2 LTC Resident Characteristics

Demographic characteristics also varied substantially among LTC residents. On a facility level, the weighted average age of LTC residents ranged from 74.5 to 88.7 between the 10th and the 90th percentile with weighted facility average of 82.0 years of age (Table 4). This average age difference reflects the large variation found at the extremes. For example, the average percentage of LTC days for less-than-65-year-old Medicare beneficiaries (qualified as a result of a disability or ESRD) equaled 10.4% and almost one quarter of LTC days for facilities at the 90th percentile. The same variation was true for the oldest (over 95) age category that was represented at just 2.1% of the days at the 10th percentile nursing centers and 21.5% at facilities at the 90th percentile.

Race/ethnicity varied substantially across facilities with an average of 80.7% of LTC days comprised by white beneficiaries, but ranging from 45.0% of LTC days at the 10th percentile and 100% white at the 90th percentile (Table 4). Functional status also varied substantially with 48.5% of LTC days for almost totally dependent individuals at the 10th percentile, whereas the

90th percentile had 87.0% LTC days of residents who were totally dependent (Table 4). Selected comorbidity rates also varied, particularly chronic diseases with relatively high incident rates, such as diabetes with and without complications, protein calorie malnutrition, and COPD (Table 5).

3.3 Variation in Outcomes

Even after risk adjusting for resident characteristics, substantial variability was found in rates of hospital admissions, PAH, ED/O Visits, and SNF Days per 1,000 LTC days (Table 6). Rates of PAH averaged 0.76 PAH per 1,000 days and all-cause rates averaged 1.64 per 1,000 days. Thus, PAHs were about 46% of all-cause hospitalizations. There were outliers at both ends of the distributions, particularly in the bottom and top decile.

The rates of all-cause hospitalizations and PAHs were highly correlated across facilities (r=0.81). However, there was greater variability in the PAH rates (e.g. about two-fold difference in all-cause rates between centers in the 10th and 90th percentile compared to about a three-fold difference in PAHs). Much of our discussion will provide detail on the PAH where we found greater variability, but given the high correlation between the two measures the results were generally consistent with the all-cause hospitalization rates.

ED/O visits were found to vary more substantially than hospitalization rates or PAH rates, with considerable outliers. With an average of 1.86 per 1,000 days, there was more than three-fold variation between the 10th and 90th percentile (Table 6)

With the variation in hospitalization rates, not surprisingly the number of SNF days per 1,000 LTC days also varied substantially. The 1st percentile had no risk-adjusted SNF days and even the 10th percentile had just 15.9 per 1,000 LTC days, whereas the 90th to 99th percentile ranged from about 169.0 days per 1,000 LTC days to 340.5 days per 1,000 LTC days. Thus, the top 10th percentile had high rates for each outcome and there were providers with no acute or post-acute (SNF) events.

3.4 Regression analysis

Facility-level regression analyses were conducted for all four outcomes (hospital admissions, PAHs, ED/O visits, and SNF days) and included the risk adjustment variables as well as geographic variables and other effect variables (Tables 7,8,9, and 10, respectively). For each outcome, regression results are presented for the risk-adjustment models, and the two types of effect variable models: one including the ownership variables and the other including the staffing variables. The Adjusted R-squared for the final models including the ownership variables were 0.56, 0.38, 0.28, and 0.16, respectively. We highlight key findings from these regression models below.

Nursing centers with a high share of end-of-life days were associated with higher rates of both all-cause hospitalizations and PAHs (Tables 7 and 8). However, a high share of hospice days was associated with fewer all-cause and PAHs. In addition, although end-of-life share was not significantly associated with ED/O visits, hospice share was associated with lower rates of ED/O visits (Table 9).

Nursing centers with higher rates of minority populations had higher rates of both all-cause hospitalizations and PAHs (Tables 7 and 8). Similarly, geographic variation was pronounced with some of the largest effect sizes due to a wide range of state-level variables. The state where the facility was located reflects a range of state policies, as well as both geographic factors and practice pattern differences making it difficult to identify the exact factors driving these associations. Urban/rural location was also tested in the models and associated most strongly with PAHs and secondarily ED/O visits, even controlling for states in the models.

Facilities with low rates of visits from physicians or other health professionals were associated with higher rates of all-cause hospital admissions and PAHs, whereas facilities with high rates of visits from physicians or other health professionals were associated with lower rates of PAHs (Tables 7 and 8). We also found this pattern to be true for ED/O visits, with an even bigger effect size for nursing centers with high rates of physician and other health professionals (Table 9).

On-site radiology was associated with lower rates of all-cause hospitalizations and PAHs (Tables 7 and 8), and even lower relative rates in ED/O visits (Table 9). However, on-site laboratory, did not generally have statistically significant associations with these outcomes. For-profit ownership was modestly associated with an increase in hospitalizations (Tables 7 and 8), ED/O visits (Table 9), and a 15-day increase in SNF days per 1,000 days (Table 10).

The nurse staffing associations were mixed: lower LPNs per resident day were associated with lower PAHs (Table 8); higher RN hours per resident day were associated with higher ED visits (Table 9); and higher CNA hours per resident day were associated with fewer SNF days (Table 10). Given the limitations of our staffing data from Nursing Home Compare reported through the OSCAR system, which aggregate staffing levels over only a two-week period across the entire nursing center including both short-term and long-term care units, these associations cannot validly be applied to the long-term care stays included in our study. The limitations of these staffing data are well known, which prompted CMS to collect payroll-based staffing data for public reporting purposes beginning on July 1, 2016.

SNF days per 1,000 LTC days were associated with marital status and race, such that residents who were widowed, separated, or divorced, and Hispanic and "other" (non-African American) minorities had significantly fewer SNF days (Table 10). Also, rural providers had six more SNF days per 1,000 LTC days and hospital-based providers had 14 fewer SNF days per 1,000 LTC days (Table 10).

4 DISCUSSION

This study of long-stay residents from 15,140 nursing centers included LTC days beginning on the 101st day of the resident's stay. Nursing center case mix for these LTC residents was found to vary substantially among centers. For example, in the nursing center at the 10th percentile there were no LTC beneficiaries younger than age 65, but the nursing center at the 90th percentile had 23.5% of LTC days for residents age less than 65. And at the other age extreme, the nursing center at the 10th percentile had only 2.1% of LTC days for beneficiaries over 95 years of age, but the 90th percentile was ten-fold higher at 21.5% of LTC days. Between the first and last decile of nursing centers, an almost two-fold difference was found in nursing center rates of total dependence in ADLs. Between the first and last decile of nursing centers, at least five- to ten-fold variation was found in selected comorbidities (e.g. diabetes with chronic complications, protein-calorie malnutrition, morbid obesity). These resident-level characteristics were all associated with variation in acute care hospital use highlighting the importance of risk adjustment when comparing these outcomes across nursing centers.

Nursing centers also varied substantially in other selected socio-demographic characteristics of their LTC residents. Between the first and last decile, we found a substantial difference in nursing center proportions of minorities (55% at the 10th percentile compared with 0 at the 90th percentile). African Americans had significantly more PAHs per 1,000 days relative to White Caucasians, and Hispanics had significantly more PAHs per 1,000 days relative to White Caucasians. This finding is consistent with a previous study of nursing centers that found higher hospitalization rates in minorities receiving end-of-life care (Cai, et. al. 2016).

Between the first and last decile, we found about a two-fold difference in nursing center rates of beneficiaries dually eligible for Medicare and Medicaid. In longer stays in nursing centers, it is not unusual for private pay residents to spend down their assets and be covered by state Medicaid programs, which increases the rate of dually eligible individuals. Alternatively, the elderly sometime remain in assisted living facilities while they have sufficient resources to cover the cost of such care and then transfer to nursing centers when they are dependent on Medicaid.

Long-stay nursing center residents generally remained in LTC until time of death unless they were transferred to a hospital or to an inpatient hospice. Due to the challenges of providing end-of-life care in the nursing center and the high rate of transfer to hospital at the time of death (Levy et al. 2004), we divided days into end-of-life days, those days occurring in the last six months of life, and LTC days not during the last six months of life. Between the first and last decile, we found more than a two-fold difference in nursing center share of end-of-life days, demonstrating that some nursing centers provide substantially more care in the last six months of life. When comparing rates of hospital transfer, the latter proved to be a statistically significant covariate in that nursing centers in the highest decile of end-of-life days had more hospital admissions and PAHs per 1,000 days relative to the nursing centers in the middle 80%. Those centers with a lowest decile of end-of-life share had fewer all-cause hospitalizations and PAHs per 1,000 days relative to those nursing centers in the middle. These highly significant differences due to a nursing centers proportion of end-of-life days suggests that there is a strong relationship between care provided in the last six months of life for LTC residents and the likelihood that they will be admitted to the hospital for any cause. This suggests the potential importance of palliative care services at the end of life for LTC beneficiaries.

This finding suggesting higher relative hospitalization rates for beneficiaries at the end of life is countered by the hospice share findings of significantly fewer all-cause hospitalizations, PAHs, and ED/O visits for nursing centers in the highest decile of hospice care share. The highest decile included nursing centers with about 11% of total LTC days involving hospice services. With nursing centers having substantially higher shares of end-of-life days than hospice days on average, nursing centers providing a higher percent of end-of-life care with less hospice may be driving the higher rates of hospital use. The decisions and nursing center practices regarding hospitalizations at the end-of-life are apparent from this study.

While average risk-adjusted nursing center all-cause hospitalization and PAH rates were modest, substantial outliers existed at both the low and high end, suggesting opportunities for improvement in some nursing centers. The risk-adjusted nursing center average was 0.76 PAHs per 1,000 LTC days. The value of using the PAH measure was apparent from the greater variability of PAH rates relative to all-cause hospitalization rates at the extremes and between the tenth and 90th decile. The 10th percentile PAH rate, at one-third of the top decile, suggests that there may be opportunities to substantially lower avoidable hospital events in some centers. Much can probably be learned from practices of these nursing centers with low PAH rates. The stratified analyses (provided in the appendix), offer some insight into the characteristics of these nursing centers at the extremes; however, without concurrently controlling for other factors, such as state, these analyses have some limitations relative to the multivariate analysis.

SNF days, which we would expect to see elevated in nursing centers where cycling might be occurring between LTC and the acute hospital, had ten-fold variation between the lowest and highest decile. This is suggestive of the possibility that financial incentives may be driving admission in some cases, which would require a deeper look at practices in the highest decile facilities.

Selected Medicare-covered services provided on-site in nursing centers were found to be significantly associated with lower rates of all-cause hospitalizations and PAHs. For example, the availability of on-site radiology service, and centers with the highest decile of on-site hospice care were associated with fewer hospitalizations. The lowest decile of on-site physician or supervised advanced practice nurse visits relative to moderate physician service levels were associated with more hospitalizations. The associations with staffing and ownership on PAHs were weaker than associations with these selected Medicare-covered services. Both for-profit and government ownership were associated with moderately higher rates of hospitalizations.

The same selected Medicare-covered services provided in the nursing center were found to be associated with lower rates of ED/O visits. The risk-adjusted nursing center average rate of ED/O visits was 1.86 per 1,000 LTC days. The 1st percentile was almost zero and with much lower rates for the bottom decile as well, there seem to be lessons that can be learned from these lower rate centers. Availability of on-site radiology service, centers within the top decile for on-site physician service visits, and centers within the top decile for on-site hospice care were associated with fewer ED/O visits.

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Tables and Figures

Table 1: Potentially Avoidable Condition ICD-9 Codes for Hospitalizations from LTC

Condition	ICD-9 Codes	Percent[1]
CHF (Congestive Heart Failure)	428.xx; 518.4	9.70%
Electrolyte Imbalance / Dehydration	276.xx; 584.5 - 584.9, 588.8, 588.9	12.93%
Respiratory Infection, Bronchitis (Pneumonia, Influenza, and Pneumonitis due to inhalation of food or vomitus), and COPD and Asthma	466.xx; 480.xx – 487.x; 491.xx; 492.xx; 493.xx; 494.xx; 496.xx; 507.0	33.40%
Urinary Tract and Kidney Infections (Cystitis, Urethritis, Urethral Stricture)	590.xx; 595.0; 595.1; 595.2; 595.4; 595.89; 595.9; 597.0; 598.0x; 599.0	13.93%
Hypoglycemia, Hyperglycemia, and Diabetic Complications	250.1-250.3; 250.8; 250.9; 250.0; 251.0; 251.1; 251.2; 790.29	2.24%
Anticoagulant Complications (Cerebral Hemorrhage and Thromboembolic Stroke while Anticoagulated)	451.xx; 453.xx; or MDS indicator for anticoagulant therapy and one of the following ICD9 codes in the readmission primary diagnosis: (415.1; 430.xx-432.xx; 434.xx-435.xx; 850.xx-854.xx)	1.15%
Fracture Injuries (likely due to falls)	800.xx-869.xx	10.04%
Other Injuries	870.xx-897.xx or 910.xx-929.xx	0.55%
Adverse Drug Reaction	960.xx-979.xx	0.31%
Delirium	290.3; 290.41; 290.42, 290.43, 290.8, 290.9 293.0; 293.1, 293.8, 293.9; 297.xx; 298.xx or (294.xx, 296.xx, 331.xx and secondary DX from first list above)	0.38%
Cellulitis / Wound Infection	681.xx; 682.xx; 683.xx; 686.xx	3.37%
Pressure Ulcers	707.xx	0.97%
Blood Pressure Management (Hypertension and Hypotension)	401.0; 401.9; 402.0; 402.1; 402.9; 403.0; 403.1; 403.9; 404.0; 404.1; 404.9; 458.0; 458.1; 458.21; 458.29; 458.8; 458.9	2.31%
Diarrhea / Gastroenteritis (Includes C diff)	003.0-009,558.9, 787.91	2.20%
Constipation/ Fecal Impaction	560.39,564,564.01,564.09	0.36%
Anemia	280,281,285.2, 285.9	2.28%
Weight Loss/ Failure to Thrive	783.2,783.3,783.7	0.21%
Nutritional Deficiencies	260-263,268.0,268.1	0.12%
Seizures	345,346,436,780.31,780.39	1.95%
Chest Pain	786.5	1.20%
Fever	780.6	0.42%

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[1] Percent of all Potentially Avoidable Hospitalizations (409,546) from 15,583 facilities.

Table 2: Nursing Center Characteristics Means (N=15,140)

Characteristic	Mean	Characteristic	Mean
Number of LTC Beneficiaries	94.7	Total LTC Days	35,387
Number of Beds	108.8	Medicare Stays	52.9
50 or Less	12.4%	Medicare Days	2,643
51 to 100	38.6%	Medicare Share of LTC Days	7.6%
101 to 200	43.4%		
201 or More	5.5%	Dual Eligible Days	29,254
		Dual Eligible Share of LTC Days	78.5%
Ownership			
For-Profit	70.8%	Hospice Days	1,581
Non-Profit	23.1%	Hospice Share of LTC Days	4.8%
Government	6.1%	Less than 0.1%	10.8%
		0.1% to Less than 11.1%	79.2%
Hospital-Based	4.0%	11.1% or Greater	10.0%
Urban	69.1%	End-of-life care Days	4,327
		End-of-life share of LTC Days	12.7%
Laboratory On Site	78.5%	Less than 8.0%	10.1%
		8.0% to Less than 17.6%	79.9%
X-Ray On Site	79.4%	17.6% or Greater	10.0%
Staffing ((Hours/Resident Day)		Physician Visits	1,496
Certified Nursing Assistant (CNA)	2.45	Physician Visits per LTC Days	0.0397
Less than 1.8	8.2%	Less than 0.01	10.1%
1.8 to Less than 3.2	80.5%	0.01 to Less than 0.07	79.6%
3.2 or Greater	9.3%	0.07 or Greater	10.3%
Licensed Practicing Nurse (LPN)	0.82		
Less than 0.4	9.2%		
0.4 to Less than 1.2	78.6%		
1.2 or Greater	10.3%		
Registered Nurse (RN)	0.76		
Less than 0.4	11.3%		
0.4 to Less than 1.2	76.7%		
1.2 or Greater	10.1%		

Table 3: Nursing Center Characteristics Distributions (N=15,140)

Characteristic	Mean	1st	10th	25th	50th	75th	90th	99th
Number of LTC Beneficiaries	94.7	15	36	57	86	121	159	283
Number of Beds	108.8	24	48	67	100	130	179	314
Staffing (Hours/Resident Day)								
Certified Nursing Assistant (CNA)	2.45	0.98	1.84	2.08	2.39	2.75	3.18	4.27
Licensed Practicing Nurse (LPN)	0.82	0.04	0.41	0.61	0.81	1.00	1.21	1.93
Registered Nurse (RN)	0.76	0.22	0.39	0.51	0.69	0.92	1.21	2.07
Total LTC Days	35,387	3,215	12,204	20,172	31,493	45,420	61,438	115,258
Medicare Stays	52.9	0	9	21	42	69	104	228
Medicare Days	2,643	0	226	700	1,627	3,239	6,097	15,939
Medicare Share of LTC Days	7.6%	0.0%	1.2%	2.7%	5.1%	9.7%	17.2%	36.6%
Dual Eligible Days	29,254	0	6,705	14,645	25,700	39,205	54,013	103,508
Dual Eligible Share of LTC Days	78.5%	0.0%	49.3%	73.2%	86.5%	93.2%	96.4%	99.5%
Hospice Days	1,581	0	13	310	1,037	2,239	3,850	7,982
Hospice Share of LTC Days	4.8%	0.0%	0.1%	1.2%	3.5%	7.0%	11.1%	22.3%
End-of-life care Days	4,327	240	1,331	2,413	3,851	5,682	7,646	13,704
End-of-life share of LTC Days	12.7%	2.2%	8.0%	10.3%	12.6%	15.0%	17.6%	24.3%
Physician Visits	1,496	2	161	474	1,068	1,998	3,236	7,557
Physician Visits per LTC Day	0.0397	0.0001	0.0099	0.0223	0.0367	0.0528	0.0708	0.1198

Table 4: Mean and Percentile Nursing Center Weighted Demographic and Functional Characteristics (N=15,140)

Characteristic	Mean	1st	10th	25th	50th	75th	90th	99th
Female	69.3%	23.5%	52.4%	62.9%	71.4%	78.5%	83.8%	92.9%
Age in Years:	82.0	61.8	74.5	79.1	83.0	86.3	88.7	91.9
Age Categories								
Less Than 65	10.4%	0.0%	0.0%	2.6%	7.1%	13.9%	23.5%	61.2%
65 to Less Than 75	14.7%	0.0%	3.1%	7.5%	13.4%	20.6%	28.0%	41.7%
75 to Less Than 85	25.2%	3.5%	14.7%	20.0%	25.4%	30.5%	35.2%	45.2%
85 to Less Than 95	38.6%	1.2%	19.1%	29.2%	39.6%	48.9%	56.4%	71.4%
95 or More	11.1%	0.0%	2.1%	5.3%	9.8%	15.3%	21.5%	35.1%
Marital Status:								
Never Married	17.2%	0.0%	4.2%	7.9%	13.4%	21.9%	34.7%	72.8%
Married	17.3%	0.9%	8.1%	12.1%	16.5%	21.4%	27.0%	42.4%
Widowed	50.5%	3.6%	26.9%	40.9%	53.0%	62.6%	69.9%	82.1%
Separated	1.4%	0.0%	0.0%	0.0%	0.0%	1.8%	3.9%	13.4%
Divorced	12.7%	0.0%	3.4%	7.2%	11.8%	17.0%	22.7%	35.7%
Race/Ethnicity:								
White	80.7%	6.3%	45.0%	71.1%	90.5%	98.1%	100.0%	100.0%
African American	11.4%	0.0%	0.0%	0.0%	3.3%	14.2%	35.8%	84.0%
Hispanic	4.4%	0.0%	0.0%	0.0%	0.0%	3.3%	12.5%	59.9%
Other	2.3%	0.0%	0.0%	0.0%	0.0%	1.4%	4.9%	44.1%
Died during study period	23.8%	1.9%	14.3%	19.0%	23.5%	28.3%	33.4%	45.9%
Barthel Index (0, Bad to 90, Good)	26.1	9.0	15.6	19.6	24.8	30.9	37.7	57.4
Barthel Categories:								
Low (0 to 30)	68.4%	22.2%	48.5%	59.4%	70.1%	79.5%	87.0%	97.6%
Medium (35 to 55)	14.4%	0.2%	6.2%	9.8%	13.8%	18.4%	23.2%	35.0%
High (60 to 90)	13.8%	0.0%	1.3%	5.2%	11.3%	19.0%	28.4%	58.5%

Table 5: Mean and Percentile Nursing Center Weighted HCCs / MDS Section I Conditions (N=15,140)

Variable	Medical Comorbidity Conditions:	Mean	1st	10th	25th	50th	75th	90th	99th
HCC001	HIV / Aids	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	3.8%
HCC018	Diabetes with Chronic Complications	20.7%	0.5%	7.2%	12.3%	19.4%	28.0%	35.9%	50.6%
HCC019	Diabetes without Complications	20.7%	1.5%	8.6%	13.4%	19.9%	26.9%	33.9%	47.4%
HCC021	Protein-Calorie Malnutrition	10.6%	0.0%	2.0%	4.6%	8.6%	14.3%	21.3%	39.9%
HCC022	Morbid Obesity	5.0%	0.0%	0.1%	1.8%	4.2%	7.1%	10.5%	19.0%
HCC027	End-stage Liver Disease	0.7%	0.0%	0.0%	0.0%	0.0%	1.0%	2.3%	5.9%
HCC039	Bone, Joint, Muscle Infections	3.0%	0.0%	0.0%	0.8%	2.4%	4.3%	6.6%	13.8%
HCC040	Rheumatoid Arthritis	4.8%	0.0%	0.6%	2.2%	4.1%	6.6%	9.4%	17.4%
HCC047	Disorders of Immunity	1.6%	0.0%	0.0%	0.0%	1.0%	2.4%	3.9%	8.7%
HCC055	Drug / Alcohol Dependence	1.6%	0.0%	0.0%	0.0%	0.8%	2.3%	4.3%	11.3%
HCC080	Coma / Brain Compression	1.5%	0.0%	0.0%	0.0%	0.7%	2.1%	3.8%	11.0%
HCC086	Acute Myocardial Infarction	3.3%	0.0%	0.0%	1.2%	2.7%	4.6%	6.9%	13.2%
HCC087	Unstable Angina / Hear Disease	2.9%	0.0%	0.0%	0.5%	2.1%	4.1%	6.6%	14.0%
HCC088	Angina Pectoris	2.0%	0.0%	0.0%	0.0%	1.2%	2.9%	5.0%	11.8%
HCC096	Specified Heart Arrhythmias	26.0%	4.2%	14.0%	19.5%	25.7%	32.0%	38.3%	53.3%
HCC107	Vascular Disease with Complications	4.4%	0.0%	0.3%	1.8%	3.7%	6.1%	8.7%	16.6%
HCC111	Chronic Obstructive Pulmonary Disease	25.4%	3.7%	12.3%	17.8%	24.6%	31.9%	39.3%	56.4%
HCC134	Dialysis Status	1.8%	0.0%	0.0%	0.0%	0.8%	2.6%	4.9%	12.1%
HCC188	Artificial Feeding/Elimination Openings	6.2%	0.0%	0.2%	2.0%	4.7%	8.3%	13.2%	29.5%
HCC189	Amputation Complications	1.5%	0.0%	0.0%	0.0%	0.8%	2.3%	4.1%	8.6%
MDS2300	Urinary Tract Infection	20.2%	0.3%	6.4%	12.1%	19.2%	27.1%	34.7%	50.1%
Arthritis Condition Indicator		38.5%	2.3%	14.5%	24.7%	37.8%	51.4%	63.4%	82.1%
	MDS3700 Arthritis	30.1%	0.4%	8.7%	16.8%	28.3%	41.3%	53.9%	75.0%
	MDS3800 Osteoporosis	17.5%	0.0%	4.0%	8.6%	15.5%	23.8%	33.1%	55.5%

Table 6: Mean and Percentile Nursing Center Outcomes per 1,000 LTC Days (N=15,140)

Outcome	Mean	1st	10th	25th	50th	75th	90th	99th
All-cause Hospitalizations								
Observed	1.64	0.27	0.74	1.08	1.52	2.05	2.64	4.40
Risk Adjusted	1.64	0.36	1.02	1.29	1.59	1.94	2.31	3.43
Potentially Avoidable Hospitalizations								
Observed	0.76	0.06	0.30	0.47	0.70	0.97	1.29	2.24
Risk Adjusted	0.76	0.06	0.38	0.53	0.72	0.94	1.19	1.95
All-cause ED/Observation Visits								
Observed	1.85	0.26	0.72	1.09	1.62	2.34	3.24	5.64
Risk Adjusted	1.86	0.14	0.84	1.20	1.66	2.29	3.09	5.32
SNF Days								
Observed	75.80	0.00	12.39	27.04	50.63	97.09	171.96	366.08
Risk Adjusted	76.25	0.00	15.89	32.27	53.14	94.85	168.95	340.52

Table 7:   All-Cause Hospitalization Linear Regression Models (FYs 2013/14, Facility N=15,140)

	Risk-Adjustment Model		Ownership Model		Staffing Model	
Adjusted R-Squared	**0.51**		**0.56**		**0.56**	
Covariate	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**
Intercept	0.4871	<.0001	-0.1658	0.2292	-0.1528	0.2660
Age Category Low to Less Than 65	-0.2885	<.0001	-0.1312	0.0961	-0.1568	0.0473
Age Category 65 to Less Than 75	-0.1147	0.2127	0.0451	0.6224	0.0692	0.4502
Age Category 75 to Less Than 85	Referent		Referent		Referent	
Age Category 85 to Less Than 95	-0.1350	0.0590	-0.0526	0.4549	-0.0732	0.2978
Age Category 95 to High	-0.0864	0.3234	-0.0659	0.4582	-0.1177	0.1830
Barthel Index, low, 0-30 (lowest function)	-0.3005	<.0001	-0.1767	0.0046	-0.1618	0.0095
Barthel Index, medium 35-55	Referent		Referent		Referent	
Barthel Index, high 60-90 (highest function)	0.0280	0.7363	-0.2413	0.0026	-0.2224	0.0057
HIV/Aids	1.2054	<.0001	0.7671	0.0009	0.7388	0.0014
Diabetes with Chronic Complications	0.4314	<.0001	0.4304	<.0001	0.4530	<.0001
Diabetes without Complications	0.7064	<.0001	0.4440	<.0001	0.4597	<.0001
Protein-Calorie Malnutrition	1.2660	<.0001	1.1083	<.0001	1.1226	<.0001
Morbid Obesity	1.4714	<.0001	1.5343	<.0001	1.5361	<.0001
End-Stage Liver Disease	3.1799	<.0001	3.5192	<.0001	3.5163	<.0001
Bone, Joint, Muscle Infections / Necrosis	1.5340	<.0001	1.5517	<.0001	1.5595	<.0001
Rheumatoid Arthritis / Inflamed Connective Tissue	*	*	*	*	*	*
Disorders of Immunity	1.2994	<.0001	1.3924	<.0001	1.4084	<.0001
Drug or Alcohol Dependence	0.5118	0.0160	1.2115	<.0001	1.2642	<.0001
Coma or Brain Compression / Anoxic Damage	*	*	*	*	*	*
Acute Myocardial Infarction	3.2672	<.0001	3.0581	<.0001	3.0742	<.0001
Unstable Angina and Other Acute Heart Disease	1.9869	<.0001	2.1144	<.0001	2.1160	<.0001
Angina Pectoris	1.9395	<.0001	1.5810	<.0001	1.6042	<.0001
Specified Heart Arrhythmias	0.7426	<.0001	0.8621	<.0001	0.8570	<.0001
Vascular Disease with Complications	1.0896	<.0001	1.2147	<.0001	1.2172	<.0001
Chronic Obstructive Pulmonary Disease (COPD)	1.1100	<.0001	1.1456	<.0001	1.1535	<.0001

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* Not a covariate in the model

Table 7(Continued):   All-Cause Hospitalization Linear Regression Models (FYs 2013/14, Facility N=15,140)

	Risk-Adjustment Model		Ownership Model		Staffing Model	
Adjusted R-Squared	**0.51**		**0.56**		**0.56**	
Covariate	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**
Dialysis Status	2.5697	<.0001	2.2561	<.0001	2.2667	<.0001
Artificial Feeding / Elimination Openings	2.8218	<.0001	2.4247	<.0001	2.3423	<.0001
Amputation Status, Lower Limb / Complications	1.7317	<.0001	1.3224	<.0001	1.3542	<.0001
Arthritis Condition	-0.3508	<.0001	-0.3538	<.0001	-0.3532	<.0001
Urinary Tract Infection (UTI)	0.4053	<.0001	0.4059	<.0001	0.3861	<.0001
Race/Ethnicity: White	*	*	Referent		Referent	
Race/Ethnicity: African American	*	*	0.2954	<.0001	0.2902	<.0001
Race/Ethnicity: Hispanic	*	*	0.1273	0.0163	0.1315	0.0133
Race/Ethnicity: Other	*	*	0.1628	0.0156	0.1804	0.0075
Married	*	*	Referent		Referent	
Never Married	*	*	0.2859	<.0001	0.2945	<.0001
Widowed	*	*	-0.0603	0.3291	-0.0457	0.4606
Separated	*	*	0.1435	0.4110	0.1918	0.2727
Divorced	*	*	-0.3785	<.0001	-0.3460	<.0001
Low to less than 0.1%, Hospice share	*	*	0.0144	0.3724	0.0046	0.7749
0.1% to less than 11.1%, Hospice share	*	*	Referent		Referent	
11.1% to High, Hospice share	*	*	-0.1139	<.0001	-0.1134	<.0001
Low to less than 8.0%, End-of-life share	*	*	-0.2134	<.0001	-0.2172	<.0001
8.0% to less than 17.6%, End-of-life share	*	*	Referent		Referent	
17.6% to High, End-of-life share	*	*	0.1966	<.0001	0.1947	<.0001
Low to less than 0.01, Physician Visits	*	*	0.1671	<.0001	0.1588	<.0001
0.01 to less than 0.07, Physician Visits	*	*	Referent		Referent	
0.07 to High, Physician Visits	*	*	0.0219	0.1793	0.0226	0.1669
Rural Indicator	*	*	0.0367	0.0022	0.0340	0.0044
For Profit Ownership	*	*	0.0483	0.0001	*	*
Not for Profit Ownership	*	*	Referent		*	*
Government or Other Ownership	*	*	0.0431	0.0481	*	*

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* Not a covariate in the model

Table 7(Continued):   All-Cause Hospitalization Linear Regression Models (FYs 2013/14, Facility N=15,140)

Adjusted R-Squared	Risk-Adjustment Model 0.51		Ownership Model 0.56		Staffing Model 0.56	
Covariate	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
Hospital Based Indicator	*	*	-0.1393	<.0001	*	*
Low to less than 1.8, CNA Hours/Resident Day	*	*	*	*	-0.0049	0.7743
1.8 to less than 3.2, CNA Hours/Resident Day	*	*	*	*	Referent	
3.2 to High, CNA Hours/Resident Day	*	*	*	*	-0.0169	0.3029
Low to less than 0.4, LPN Hours/Resident Day	*	*	*	*	-0.0448	0.0094
0.4 to less than 1.2, LPN Hours/Resident Day	*	*	*	*	Referent	
1.2 to High, LPN Hours/Resident Day	*	*	*	*	0.0555	0.0004
Low to less than 0.4, RN Hours/Resident Day	*	*	*	*	0.0060	0.7064
0.4 to less than1.2, RN Hours/Resident Day	*	*	*	*	Referent	
1.2 to High, RN Hours/Resident Day	*	*	*	*	-0.0019	0.9075
Clinical Laboratory On-Site	*	*	0.0055	0.6964	0.0049	0.7241
X-ray On-Site	*	*	-0.0268	0.0799	-0.0283	0.0645
AK(02)-ALASKA	*	*	0.0864	0.5935	0.0079	0.9611
AL(01)-ALABAMA	*	*	0.5120	<.0001	0.5054	<.0001
AR(04)-ARKANSAS	*	*	0.8627	<.0001	0.8725	<.0001
AZ(03)-ARIZONA	*	*	0.1254	0.2615	0.1270	0.2564
CA(05)-CALIFORNIA	*	*	0.4456	<.0001	0.4470	<.0001
CO(06)-COLORADO	*	*	0.1964	0.0732	0.2106	0.0551
CT(07)-CONNECTICUT	*	*	0.4419	<.0001	0.4591	<.0001
DC(09)-DISTRICT OF COLUMBIA	*	*	0.2173	0.1923	0.1879	0.2604
DE(08)-DELAWARE	*	*	0.5524	<.0001	0.5687	<.0001
FL(10)-FLORIDA	*	*	0.5735	<.0001	0.5758	<.0001
GA(11)-GEORGIA	*	*	0.5610	<.0001	0.5398	<.0001
HI(12)-HAWAII	*	*	Referent		Referent	
IA(16)-IOWA	*	*	0.6423	<.0001	0.6542	<.0001

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* Not a covariate in the model

Table 7(Continued):   All-Cause Hospitalization Linear Regression Models (FYs 2013/14, Facility N=15,140)

	Risk-Adjustment Model		Ownership Model		Staffing Model	
Adjusted R-Squared	**0.51**		**0.56**		**0.56**	
Covariate	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**
ID(13)-IDAHO	*	*	0.1944	0.1099	0.1904	0.1187
IL(14)-ILLINOIS	*	*	0.9164	<.0001	0.9390	<.0001
IN(15)-INDIANA	*	*	0.5352	<.0001	0.5295	<.0001
KS(17)-KANSAS	*	*	0.7096	<.0001	0.7166	<.0001
KY(18)-KENTUCKY	*	*	0.6577	<.0001	0.6582	<.0001
LA(19)-LOUISIANA	*	*	0.8278	<.0001	0.8247	<.0001
MA(22)-MASSACHUSETTS	*	*	0.3599	0.0007	0.3704	0.0005
MD(21)-MARYLAND	*	*	0.5062	<.0001	0.5136	<.0001
ME(20)-MAINE	*	*	0.2710	0.0195	0.3027	0.0091
MI(23)-MICHIGAN	*	*	0.4195	<.0001	0.4260	<.0001
MN(24)-MINNESOTA	*	*	0.4910	<.0001	0.4778	<.0001
MO(26)-MISSOURI	*	*	0.6678	<.0001	0.6812	<.0001
MS(25)-MISSISSIPPI	*	*	0.9903	<.0001	0.9882	<.0001
MT(27)-MONTANA	*	*	0.4139	0.0005	0.4113	0.0005
NC(34)-NORTH CAROLINA	*	*	0.4718	<.0001	0.4765	<.0001
ND(35)-NORTH DAKOTA	*	*	0.5210	<.0001	0.5003	<.0001
NE(28)-NEBRASKA	*	*	0.5021	<.0001	0.5116	<.0001
NH(30)-NEW HAMPSHIRE	*	*	0.3458	0.0044	0.3611	0.0030
NJ(31)-NEW JERSEY	*	*	0.5685	<.0001	0.5791	<.0001
NM(32)-NEW MEXICO	*	*	0.3580	0.0032	0.3752	0.0020
NV(29)-NEVADA	*	*	0.1048	0.4196	0.0945	0.4680
NY(33)-NEW YORK	*	*	0.4998	<.0001	0.4935	<.0001
OH(36)-OHIO	*	*	0.4232	<.0001	0.4275	<.0001
OK(37)-OKLAHOMA	*	*	0.8547	<.0001	0.8592	<.0001
OR(38)-OREGON	*	*	0.3044	0.0074	0.3269	0.0041
PA(39)-PENNSYLVANIA	*	*	0.5195	<.0001	0.5213	<.0001

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* Not a covariate in the model

Table 7(Continued):   All-Cause Hospitalization Linear Regression Models (FYs 2013/14, Facility N=15,140)

	Risk-Adjustment Model		Ownership Model		Staffing Model	
Adjusted R-Squared	**0.51**		**0.56**		**0.56**	
Covariate	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**
RI(41)-RHODE ISLAND	*	*	0.3180	0.0079	0.3661	0.0022
SC(42)-SOUTH CAROLINA	*	*	0.4718	<.0001	0.4783	<.0001
SD(43)-SOUTH DAKOTA	*	*	0.6714	<.0001	0.6883	<.0001
TN(44)-TENNESSEE	*	*	0.6537	<.0001	0.6514	<.0001
TX(45)-TEXAS	*	*	0.5115	<.0001	0.5170	<.0001
UT(46)-UTAH	*	*	0.3104	0.0089	0.3371	0.0045
VA(49)-VIRGINIA	*	*	0.6290	<.0001	0.6248	<.0001
VT(47)-VERMONT	*	*	0.3073	0.0245	0.3086	0.0242
WA(50)-WASHINGTON	*	*	0.3472	0.0014	0.3643	0.0008
WI(52)-WISCONSIN	*	*	0.4652	<.0001	0.4836	<.0001
WV(51)-WEST VIRGINIA	*	*	0.4344	0.0002	0.4260	0.0002
WY(53)-WYOMING	*	*	0.4708	0.0007	0.4749	0.0006

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[*] Not a covariate in the model

Table 8: Potentially Avoidable Hospitalization Linear Regression Models (FYs 2013/14, Facility N=15,140)

	Risk-Adjustment Model		Ownership Model		Staffing Model	
Adjusted R-Squared	**0.28**		**0.38**		**0.38**	
Covariate	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**
Intercept	0.5227	<.0001	-0.0863	0.3092	-0.0651	0.4415
Age Category Low to Less Than 65	-0.4001	<.0001	-0.1385	0.0043	-0.1443	0.0030
Age Category 65 to Less Than 75	-0.2633	<.0001	-0.0180	0.7493	-0.0077	0.8909
Age Category 75 to Less Than 85	Referent		Referent		Referent	
Age Category 85 to Less Than 95	-0.1154	0.0098	-0.0133	0.7594	-0.0220	0.6114
Age Category 95 to High	-0.1544	0.0048	-0.0244	0.6552	-0.0438	0.4208
Barthel Index, low, 0-30	-0.3595	<.0001	-0.1961	<.0001	-0.1908	<.0001
Barthel Index, medium 35-55	Referent		Referent		Referent	
Barthel Index, high 60-90	-0.0075	0.8860	-0.1930	<.0001	-0.1896	0.0001
HIV/Aids	*	*	*	*	*	*
Diabetes with Chronic Complications	0.1993	<.0001	0.2443	<.0001	0.2511	<.0001
Diabetes without Complications	0.4588	<.0001	0.2823	<.0001	0.2869	<.0001
Protein-Calorie Malnutrition	0.5968	<.0001	0.4638	<.0001	0.4689	<.0001
Morbid Obesity	0.6790	<.0001	0.7108	<.0001	0.7123	<.0001
End-Stage Liver Disease	*	*	*	*	*	*
Bone, Joint, Muscle Infections / Necrosis	0.4094	<.0001	0.6488	<.0001	0.6542	<.0001
Rheumatoid Arthritis / Inflamed Connective Tissue	*	*	*	*	*	*
Disorders of Immunity	*	*	*	*	*	*
Drug or Alcohol Dependence	*	*	*	*	*	*
Coma or Brain Compression / Anoxic Damage	-0.9915	<.0001	-0.7703	<.0001	-0.8213	<.0001
Acute Myocardial Infarction	1.2426	<.0001	1.2155	<.0001	1.2226	<.0001
Unstable Angina and Other Acute Heart Disease	0.7116	<.0001	1.0942	<.0001	1.0969	<.0001
Angina Pectoris	1.2878	<.0001	0.8676	<.0001	0.8734	<.0001
Specified Heart Arrhythmias	0.3063	<.0001	0.4628	<.0001	0.4659	<.0001
Vascular Disease with Complications	*	*	*	*	*	*
Chronic Obstructive Pulmonary Disease (COPD)	0.6822	<.0001	0.7375	<.0001	0.7394	<.0001

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* Not a covariate in the model

Table 8(Continued): Potentially Avoidable Hospitalization Linear Regression Models (FYs 2013/14, Facility N=15,140)

	Risk-Adjustment Model		Ownership Model		Staffing Model	
Adjusted R-Squared	0.28		0.38		0.38	
Covariate	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**
Dialysis Status	*	*	*	*	*	*
Artificial Feeding / Elimination Openings	0.9034	<.0001	0.7017	<.0001	0.6908	<.0001
Amputation Status, Lower Limb / Complications	0.9402	<.0001	0.6465	<.0001	0.6608	<.0001
Arthritis Condition	-0.1986	<.0001	-0.1891	<.0001	-0.1892	<.0001
Urinary Tract Infection (UTI)	0.3190	<.0001	0.2240	<.0001	0.2169	<.0001
Race/Ethnicity: White	*	*	Referent		Referent	
Race/Ethnicity: African American	*	*	0.1215	<.0001	0.1178	<.0001
Race/Ethnicity: Hispanic	*	*	0.1044	0.0013	0.1047	0.0012
Race/Ethnicity: Other	*	*	0.0880	0.0335	0.0952	0.0215
Married	*	*	Referent		Referent	
Never Married	*	*	0.1217	0.0031	0.1199	0.0036
Widowed	*	*	0.0489	0.1993	0.0509	0.1820
Separated	*	*	0.0230	0.8302	0.0326	0.7616
Divorced	*	*	-0.1474	0.0052	-0.1372	0.0093
Low to less than 0.1%, Hospice share	*	*	-0.0018	0.8540	-0.0040	0.6889
0.1% to less than 11.1%, Hospice share	*	*	Referent		Referent	
11.1% to High, Hospice share	*	*	-0.0454	<.0001	-0.0453	<.0001
Low to less than 8.0%, End-of-life share	*	*	-0.0875	<.0001	-0.0889	<.0001
8.0% to less than 17.6%, End-of-life share	*	*	Referent		Referent	
17.6% to High, End-of-life share	*	*	0.0872	<.0001	0.0867	<.0001
Low to less than 0.01, Physician Visits	*	*	0.1376	<.0001	0.1358	<.0001
0.01 to less than 0.07, Physician Visits	*	*	Referent		Referent	
0.07 to High, Physician Visits	*	*	-0.0203	0.0433	-0.0193	0.0559
Rural Indicator	*	*	0.0767	<.0001	0.0761	<.0001
For Profit Ownership	*	*	0.0214	0.0057	*	*
Not for Profit Ownership	*	*	Referent		*	*
Government or Other Ownership	*	*	0.0264	0.0497	*	*

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* Not a covariate in the model

Table 8(Continued): Potentially Avoidable Hospitalization Linear Regression Models (FYs 2013/14, Facility N=15,140)

	Risk-Adjustment Model 0.28		Ownership Model 0.38		Staffing Model 0.38	
Adjusted R-Squared						
Covariate	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**
Hospital Based Indicator	*	*	-0.0423	0.0069	*	*
Low to less than 1.8, CNA Hours/Resident Day	*	*	*	*	0.0017	0.8759
1.8 to less than 3.2, CNA Hours/Resident Day	*	*	*	*	Referent	
3.2 to High, CNA Hours/Resident Day	*	*	*	*	0.0013	0.9007
Low to less than 0.4, LPN Hours/Resident Day	*	*	*	*	-0.0263	0.0132
0.4 to less than 1.2, LPN Hours/Resident Day	*	*	*	*	Referent	
1.2 to High, LPN Hours/Resident Day	*	*	*	*	0.0169	0.0784
Low to less than 0.4, RN Hours/Resident Day	*	*	*	*	0.0102	0.2969
0.4 to less than1.2, RN Hours/Resident Day	*	*	*	*	Referent	
1.2 to High, RN Hours/Resident Day	*	*	*	*	-0.0087	0.3883
Clinical Laboratory On-Site	*	*	-0.0019	0.8293	-0.0018	0.8384
X-ray On-Site	*	*	-0.0345	0.0003	-0.0350	0.0002
AK(02)-ALASKA	*	*	0.1183	0.2351	0.0883	0.3757
AL(01)-ALABAMA	*	*	0.3592	<.0001	0.3461	<.0001
AR(04)-ARKANSAS	*	*	0.5697	<.0001	0.5589	<.0001
AZ(03)-ARIZONA	*	*	0.1340	0.0513	0.1249	0.0694
CA(05)-CALIFORNIA	*	*	0.2404	0.0001	0.2313	0.0002
CO(06)-COLORADO	*	*	0.1484	0.0280	0.1464	0.0302
CT(07)-CONNECTICUT	*	*	0.2566	0.0001	0.2535	0.0002
DC(09)-DISTRICT OF COLUMBIA	*	*	0.2577	0.0121	0.2391	0.0200
DE(08)-DELAWARE	*	*	0.4069	<.0001	0.4052	<.0001
FL(10)-FLORIDA	*	*	0.3763	<.0001	0.3647	<.0001
GA(11)-GEORGIA	*	*	0.4157	<.0001	0.3956	<.0001
HI(12)-HAWAII	*	*	Referent		Referent	
IA(16)-IOWA	*	*	0.4033	<.0001	0.3977	<.0001

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* Not a covariate in the model

Table 8(Continued):   Potentially Avoidable Hospitalization Linear Regression Models (FYs 2013/14, Facility N=15,140)

	Risk-Adjustment Model		Ownership Model		Staffing Model	
Adjusted R-Squared	**0.28**		**0.38**		**0.38**	
Covariate	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**
ID(13)-IDAHO	*	*	0.1191	0.1117	0.1094	0.1449
IL(14)-ILLINOIS	*	*	0.5320	<.0001	0.5311	<.0001
IN(15)-INDIANA	*	*	0.3351	<.0001	0.3247	<.0001
KS(17)-KANSAS	*	*	0.4505	<.0001	0.4439	<.0001
KY(18)-KENTUCKY	*	*	0.4705	<.0001	0.4591	<.0001
LA(19)-LOUISIANA	*	*	0.6974	<.0001	0.6828	<.0001
MA(22)-MASSACHUSETTS	*	*	0.2716	<.0001	0.2654	<.0001
MD(21)-MARYLAND	*	*	0.2989	<.0001	0.2915	<.0001
ME(20)-MAINE	*	*	0.1890	0.0082	0.1931	0.0069
MI(23)-MICHIGAN	*	*	0.1786	0.0067	0.1716	0.0093
MN(24)-MINNESOTA	*	*	0.2938	<.0001	0.2783	<.0001
MO(26)-MISSOURI	*	*	0.4223	<.0001	0.4151	<.0001
MS(25)-MISSISSIPPI	*	*	0.7048	<.0001	0.6945	<.0001
MT(27)-MONTANA	*	*	0.2639	0.0003	0.2598	0.0004
NC(34)-NORTH CAROLINA	*	*	0.2672	<.0001	0.2581	<.0001
ND(35)-NORTH DAKOTA	*	*	0.3388	<.0001	0.3179	<.0001
NE(28)-NEBRASKA	*	*	0.3364	<.0001	0.3302	<.0001
NH(30)-NEW HAMPSHIRE	*	*	0.1895	0.0112	0.1869	0.0125
NJ(31)-NEW JERSEY	*	*	0.3334	<.0001	0.3282	<.0001
NM(32)-NEW MEXICO	*	*	0.2936	<.0001	0.2924	<.0001
NV(29)-NEVADA	*	*	0.1399	0.0803	0.1282	0.1097
NY(33)-NEW YORK	*	*	0.2383	0.0002	0.2245	0.0006
OH(36)-OHIO	*	*	0.3107	<.0001	0.3018	<.0001
OK(37)-OKLAHOMA	*	*	0.5665	<.0001	0.5533	<.0001
OR(38)-OREGON	*	*	0.1297	0.0636	0.1273	0.0690
PA(39)-PENNSYLVANIA	*	*	0.3247	<.0001	0.3149	<.0001

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* Not a covariate in the model

Table 8(Continued):   Potentially Avoidable Hospitalization Linear Regression Models (FYs 2013/14, Facility N=15,140)

	Risk-Adjustment Model		Ownership Model		Staffing Model	
Adjusted R-Squared	0.28		0.38		0.38	
Covariate	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
RI(41)-RHODE ISLAND	*	*	0.2068	0.0051	0.2215	0.0027
SC(42)-SOUTH CAROLINA	*	*	0.3411	<.0001	0.3325	<.0001
SD(43)-SOUTH DAKOTA	*	*	0.4067	<.0001	0.4074	<.0001
TN(44)-TENNESSEE	*	*	0.4706	<.0001	0.4585	<.0001
TX(45)-TEXAS	*	*	0.4056	<.0001	0.3945	<.0001
UT(46)-UTAH	*	*	0.2388	0.0011	0.2454	0.0008
VA(49)-VIRGINIA	*	*	0.3168	<.0001	0.3044	<.0001
VT(47)-VERMONT	*	*	0.1871	0.0262	0.1765	0.0363
WA(50)-WASHINGTON	*	*	0.1678	0.0121	0.1673	0.0123
WI(52)-WISCONSIN	*	*	0.2744	<.0001	0.2738	<.0001
WV(51)-WEST VIRGINIA	*	*	0.3081	<.0001	0.2945	<.0001
WY(53)-WYOMING	*	*	0.3078	0.0003	0.3064	0.0003

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[*] Not a covariate in the model

Table 9: All-Cause ED / Observation Visits Linear Regression Models (FYs 2013/14, Facility N=15,140)

	Risk-Adjustment Model 0.16		Ownership Model 0.28		Staffing Model 0.28	
Adjusted R-Squared						
Covariate	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**
Intercept	2.2747	<.0001	0.6562	0.0017	0.6592	0.0015
Age Category Low to Less Than 65	-0.3105	0.0187	0.1573	0.2619	0.1442	0.3041
Age Category 65 to Less Than 75	-0.5503	0.0008	0.0825	0.6093	0.1064	0.5098
Age Category 75 to Less Than 85	Referent		Referent		Referent	
Age Category 85 to Less Than 95	-0.6638	<.0001	-0.2624	0.0337	-0.3047	0.0133
Age Category 95 to High	-1.0193	<.0001	-0.4123	0.0082	-0.4870	0.0017
Barthel Index, low, 0-30	-1.3067	<.0001	-0.6552	<.0001	-0.6644	<.0001
Barthel Index, medium 35-55	Referent		Referent		Referent	
Barthel Index, high 60-90	0.1374	0.3575	0.1935	0.1716	0.2004	0.1580
HIV/Aids	2.9218	<.0001	4.0414	<.0001	3.9505	<.0001
Diabetes with Chronic Complications	0.2124	0.0286	0.7179	<.0001	0.7547	<.0001
Diabetes without Complications	0.9120	<.0001	0.8942	<.0001	0.9300	<.0001
Protein-Calorie Malnutrition	*	*	*	*	*	*
Morbid Obesity	2.6761	<.0001	1.9825	<.0001	1.9977	<.0001
End-Stage Liver Disease	*	*	*	*	*	*
Bone, Joint, Muscle Infections / Necrosis	1.1416	<.0001	1.9203	<.0001	1.9234	<.0001
Rheumatoid Arthritis / Inflamed Connective Tissue	1.9149	<.0001	1.8621	<.0001	1.8348	<.0001
Disorders of Immunity	1.9719	<.0001	2.9378	<.0001	2.9194	<.0001
Drug or Alcohol Dependence	3.1454	<.0001	3.4911	<.0001	3.5384	<.0001
Coma or Brain Compression / Anoxic Damage	-2.3188	<.0001	-2.0676	<.0001	-2.1686	<.0001
Acute Myocardial Infarction	1.9343	<.0001	2.0403	<.0001	2.0343	<.0001
Unstable Angina and Other Acute Heart Disease	*	*	*	*	*	*
Angina Pectoris	1.9956	<.0001	2.1642	<.0001	2.1651	<.0001
Specified Heart Arrhythmias	*	*			*	*
Vascular Disease with Complications	1.0690	<.0001	1.7626	<.0001	1.7506	<.0001
Chronic Obstructive Pulmonary Disease (COPD)	*	*	*	*	*	*

* Not a covariate in the model

Table 9(Continued):   All-Cause ED / Observation Visits Linear Regression Models (FYs 2013/14, Facility N=15,140)

	Risk-Adjustment Model		Ownership Model		Staffing Model	
Adjusted R-Squared	**0.16**		**0.28**		**0.28**	
Covariate	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**
Dialysis Status	*	*	*	*	*	*
Artificial Feeding / Elimination Openings	1.0518	<.0001	1.9759	<.0001	1.8861	<.0001
Amputation Status, Lower Limb / Complications	3.2523	<.0001	2.1901	<.0001	2.1747	<.0001
Arthritis Condition	-0.2830	<.0001	-0.3973	<.0001	-0.4026	<.0001
Urinary Tract Infection (UTI)	1.1586	<.0001	0.8366	<.0001	0.8279	<.0001
Race/Ethnicity: White	*	*	Referent		Referent	
Race/Ethnicity: African American	*	*	0.0023	0.9712	0.0068	0.9142
Race/Ethnicity: Hispanic	*	*	-0.4814	<.0001	-0.4619	<.0001
Race/Ethnicity: Other	*	*	-0.4099	0.0005	-0.3882	0.0010
Married	*	*	Referent		Referent	
Never Married	*	*	-0.3312	0.0050	-0.3139	0.0078
Widowed	*	*	-0.2137	0.0506	-0.1619	0.1388
Separated	*	*	-0.3510	0.2555	-0.2488	0.4207
Divorced	*	*	-0.1834	0.2253	-0.1725	0.2539
Low to less than 0.1%, Hospice share	*	*	-0.0947	0.0009	-0.1039	0.0003
0.1% to less than 11.1%, Hospice share	*	*	Referent		Referent	
11.1% to High, Hospice share	*	*	-0.0827	0.0033	-0.0857	0.0023
Low to less than 8.0%, End-of-life share	*	*	-0.0137	0.6680	-0.0211	0.5107
8.0% to less than 17.6%, End-of-life share	*	*	Referent		Referent	
17.6% to High, End-of-life share	*	*	0.0517	0.0656	0.0475	0.0913
Low to less than 0.01, Physician Visits	*	*	0.1088	0.0004	0.1030	0.0007
0.01 to less than 0.07, Physician Visits	*	*	Referent		Referent	
0.07 to High, Physician Visits	*	*	-0.1826	<.0001	-0.1839	<.0001
Rural Indicator	*	*	0.3846	<.0001	0.3851	<.0001
For Profit Ownership	*	*	0.0519	0.0194	*	*
Not for Profit Ownership	*	*	Referent		*	*
Government or Other Ownership	*	*	-0.0785	0.0420	*	*

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* Not a covariate in the model

Table 9(Continued):   All-Cause ED / Observation Visits Linear Regression Models (FYs 2013/14, Facility N=15,140)

	Risk-Adjustment Model 0.16		Ownership Model 0.28		Staffing Model 0.28	
Adjusted R-Squared						
Covariate	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**
Hospital Based Indicator	*	*	0.0449	0.3178	*	*
Low to less than 1.8, CNA Hours/Resident Day	*	*	*	*	0.0352	0.2440
1.8 to less than 3.2, CNA Hours/Resident Day	*	*	*	*	Referent	
3.2 to High, CNA Hours/Resident Day	*	*	*	*	-0.0420	0.1473
Low to less than 0.4, LPN Hours/Resident Day	*	*	*	*	-0.0326	0.2843
0.4 to less than 1.2, LPN Hours/Resident Day	*	*	*	*	Referent	
1.2 to High, LPN Hours/Resident Day	*	*	*	*	0.0971	0.0004
Low to less than 0.4, RN Hours/Resident Day	*	*	*	*	-0.0231	0.4102
0.4 to less than1.2, RN Hours/Resident Day	*	*	*	*	Referent	
1.2 to High, RN Hours/Resident Day	*	*	*	*	0.0833	0.0041
Clinical Laboratory On-Site	*	*	0.0171	0.4897	0.0177	0.4742
X-ray On-Site	*	*	-0.1069	<.0001	-0.1030	0.0001
AK(02)-ALASKA	*	*	0.4051	0.1410	0.3599	0.1911
AL(01)-ALABAMA	*	*	0.5114	0.0013	0.5111	0.0013
AR(04)-ARKANSAS	*	*	1.5836	<.0001	1.6153	<.0001
AZ(03)-ARIZONA	*	*	0.3410	0.0408	0.3344	0.0448
CA(05)-CALIFORNIA	*	*	0.4933	0.0008	0.5069	0.0005
CO(06)-COLORADO	*	*	0.6831	<.0001	0.6889	<.0001
CT(07)-CONNECTICUT	*	*	0.8180	<.0001	0.8417	<.0001
DC(09)-DISTRICT OF COLUMBIA	*	*	0.8334	0.0023	0.8145	0.0029
DE(08)-DELAWARE	*	*	0.7795	0.0001	0.7722	0.0002
FL(10)-FLORIDA	*	*	0.3849	0.0094	0.4007	0.0069
GA(11)-GEORGIA	*	*	1.0440	<.0001	1.0436	<.0001
HI(12)-HAWAII	*	*	0.5348	0.0198	0.5234	0.0228
IA(16)-IOWA	*	*	0.9300	<.0001	0.9511	<.0001

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* Not a covariate in the model

Table 9(Continued): All-Cause ED / Observation Visits Linear Regression Models (FYs 2013/14, Facility N=15,140)

	Risk-Adjustment Model		Ownership Model		Staffing Model	
Adjusted R-Squared	**0.16**		**0.28**		**0.28**	
Covariate	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**
ID(13)-IDAHO	*	*	1.5077	<.0001	1.5210	<.0001
IL(14)-ILLINOIS	*	*	1.0821	<.0001	1.0978	<.0001
IN(15)-INDIANA	*	*	0.8627	<.0001	0.8137	<.0001
KS(17)-KANSAS	*	*	0.7386	<.0001	0.7557	<.0001
KY(18)-KENTUCKY	*	*	1.1416	<.0001	1.1531	<.0001
LA(19)-LOUISIANA	*	*	1.7609	<.0001	1.7716	<.0001
MA(22)-MASSACHUSETTS	*	*	0.9814	<.0001	0.9970	<.0001
MD(21)-MARYLAND	*	*	0.5225	0.0009	0.5309	0.0008
ME(20)-MAINE	*	*	1.5953	<.0001	1.6269	<.0001
MI(23)-MICHIGAN	*	*	0.5830	0.0001	0.5939	<.0001
MN(24)-MINNESOTA	*	*	1.2722	<.0001	1.2768	<.0001
MO(26)-MISSOURI	*	*	0.9019	<.0001	0.9237	<.0001
MS(25)-MISSISSIPPI	*	*	1.3200	<.0001	1.3171	<.0001
MT(27)-MONTANA	*	*	0.9523	<.0001	0.9700	<.0001
NC(34)-NORTH CAROLINA	*	*	0.9360	<.0001	0.9485	<.0001
ND(35)-NORTH DAKOTA	*	*	1.3426	<.0001	1.3546	<.0001
NE(28)-NEBRASKA	*	*	0.4874	0.0022	0.4867	0.0022
NH(30)-NEW HAMPSHIRE	*	*	1.2066	<.0001	1.2069	<.0001
NJ(31)-NEW JERSEY	*	*	0.4922	0.0013	0.4961	0.0012
NM(32)-NEW MEXICO	*	*	1.0939	<.0001	1.1053	<.0001
NV(29)-NEVADA	*	*	Referent		Referent	
NY(33)-NEW YORK	*	*	0.7291	<.0001	0.7411	<.0001
OH(36)-OHIO	*	*	0.9832	<.0001	0.9904	<.0001
OK(37)-OKLAHOMA	*	*	1.2043	<.0001	1.2327	<.0001
OR(38)-OREGON	*	*	1.0251	<.0001	1.0610	<.0001
PA(39)-PENNSYLVANIA	*	*	0.7276	<.0001	0.7283	<.0001

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* Not a covariate in the model

Table 9(Continued):   All-Cause ED / Observation Visits Linear Regression Models (FYs 2013/14, Facility N=15,140)

	Risk-Adjustment Model		Ownership Model		Staffing Model	
Adjusted R-Squared	**0.16**		**0.28**		**0.28**	
Covariate	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**
RI(41)-RHODE ISLAND	*	*	1.1853	<.0001	1.2284	<.0001
SC(42)-SOUTH CAROLINA	*	*	0.9555	<.0001	0.9636	<.0001
SD(43)-SOUTH DAKOTA	*	*	1.2857	<.0001	1.3166	<.0001
TN(44)-TENNESSEE	*	*	0.8038	<.0001	0.8063	<.0001
TX(45)-TEXAS	*	*	0.9763	<.0001	0.9898	<.0001
UT(46)-UTAH	*	*	0.6927	0.0001	0.6954	0.0001
VA(49)-VIRGINIA	*	*	0.9756	<.0001	0.9726	<.0001
VT(47)-VERMONT	*	*	1.2254	<.0001	1.2426	<.0001
WA(50)-WASHINGTON	*	*	0.9775	<.0001	0.9827	<.0001
WI(52)-WISCONSIN	*	*	1.0439	<.0001	1.0531	<.0001
WV(51)-WEST VIRGINIA	*	*	1.2723	<.0001	1.2791	<.0001
WY(53)-WYOMING	*	*	0.8472	0.0001	0.8477	0.0001

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* Not a covariate in the model

Table 10: SNF Days Linear Regression Models (FYs 2013/14, Facility N=15,140)

Covariate	Risk-Adjustment Model		Ownership Model		Staffing Model	
Adjusted R-Squared	**0.10**		**0.16**		**0.15**	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
Intercept	10.3846	0.2674	-26.4900	0.2006	-27.6883	0.1826
Age Category Low to Less Than 65	-0.6302	0.9440	-6.1991	0.5350	-8.7350	0.3859
Age Category 65 to Less Than 75	-16.8276	0.1507	-5.4459	0.6499	-0.4021	0.9734
Age Category 75 to Less Than 85	Referent		Referent		Referent	
Age Category 85 to Less Than 95	9.4700	0.2948	3.5486	0.6998	-2.7924	0.7619
Age Category 95 to High	10.2902	0.3473	2.1339	0.8528	-11.0597	0.3353
Barthel Index, low, 0-30	-15.0157	0.0587	3.5674	0.6606	6.1117	0.4548
Barthel Index, medium 35-55	Referent		Referent		Referent	
Barthel Index, high 60-90	-25.6516	0.0159	-43.2402	<.0001	-41.6823	<.0001
HIV/Aids	*	*	*	*	*	*
Diabetes with Chronic Complications	*	*	*	*	*	*
Diabetes without Complications	50.8637	<.0001	31.6070	<.0001	33.4146	<.0001
Protein-Calorie Malnutrition	80.5338	<.0001	82.4174	<.0001	87.8946	<.0001
Morbid Obesity	191.3501	<.0001	151.8191	<.0001	157.7835	<.0001
End-Stage Liver Disease	207.2903	<.0001	241.3164	<.0001	237.3271	<.0001
Bone, Joint, Muscle Infections / Necrosis	68.3184	0.0009	71.2907	0.0004	76.4431	0.0002
Rheumatoid Arthritis / Inflamed Connective Tissue	*	*	*	*	*	*
Disorders of Immunity	126.3917	0.0001	132.9317	<.0001	139.7477	<.0001
Drug or Alcohol Dependence	78.5470	0.0037	87.6738	0.0011	102.6813	0.0001
Coma or Brain Compression / Anoxic Damage	*	*	*	*	*	*
Acute Myocardial Infarction	109.3931	<.0001	117.0228	<.0001	123.7360	<.0001
Unstable Angina and Other Acute Heart Disease	50.0599	0.0161	106.5313	<.0001	106.4133	<.0001
Angina Pectoris	*	*			*	*
Specified Heart Arrhythmias	61.8862	<.0001	54.6368	<.0001	53.3393	<.0001
Vascular Disease with Complications	81.0164	<.0001	74.7484	<.0001	76.6510	<.0001
Chronic Obstructive Pulmonary Disease (COPD)	59.6481	<.0001	65.5218	<.0001	70.2253	<.0001

* Not a covariate in the model

Table 10(Continued): SNF Days Linear Regression Models (FYs 2013/14, Facility N=15,140)

	Risk-Adjustment Model		Ownership Model		Staffing Model	
Adjusted R-Squared	**0.10**		**0.16**		**0.15**	
Covariate	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**
Dialysis Status	*	*	*	*	*	*
Artificial Feeding / Elimination Openings	*	*	*	*	*	*
Amputation Status, Lower Limb / Complications	105.9129	0.0011	74.5142	0.0203	76.3783	0.0180
Arthritis Condition	*	*	*	*	*	*
Urinary Tract Infection (UTI)	*	*	*	*	*	*
Race/Ethnicity: White	*	*	Referent		Referent	
Race/Ethnicity: African American	*	*	1.0761	0.8142	0.7175	0.8765
Race/Ethnicity: Hispanic	*	*	-16.1295	0.0158	-14.9675	0.0261
Race/Ethnicity: Other	*	*	-26.9179	0.0020	-22.8811	0.0089
Married	*	*	Referent		Referent	
Never Married	*	*	2.4447	0.7787	5.7968	0.5072
Widowed	*	*	-20.8443	0.0098	-13.7018	0.0916
Separated	*	*	-53.7054	0.0191	-43.2579	0.0609
Divorced	*	*	-43.2034	0.0001	-38.6074	0.0006
Low to less than 0.1%, Hospice share	*	*	3.3381	0.1134	0.9214	0.6627
0.1% to less than 11.1%, Hospice share	*	*	Referent		Referent	
11.1% to High, Hospice share	*	*	-3.0958	0.1390	-2.3178	0.2710
Low to less than 8.0%, End-of-life share	*	*	-3.2933	0.1647	-4.1905	0.0790
8.0% to less than 17.6%, End-of-life share	*	*	Referent		Referent	
17.6% to High, End-of-life share	*	*	16.1031	<.0001	15.9322	<.0001
Low to less than 0.01, Physician Visits	*	*	3.9164	0.0845	1.5441	0.4964
0.01 to less than 0.07, Physician Visits	*	*			Referent	
0.07 to High, Physician Visits	*	*	-4.4162	0.0387	-4.1935	0.0512
Rural Indicator	*	*	5.8537	0.0002	4.9366	0.0017
For Profit Ownership	*	*	15.3899	<.0001	*	*
Not for Profit Ownership	*	*	Referent		*	*
Government or Other Ownership	*	*	-10.7233	0.0002	*	*

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* Not a covariate in the model

Table 10(Continued): SNF Days Linear Regression Models (FYs 2013/14, Facility N=15,140)

	Risk-Adjustment Model 0.10		Ownership Model 0.16		Staffing Model 0.15	
Adjusted R-Squared						
Covariate	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**
Hospital Based Indicator	*	*	-14.2955	<.0001	*	*
Low to less than 1.8, CNA Hours/Resident Day	*	*	*	*	2.2732	0.3148
1.8 to less than 3.2, CNA Hours/Resident Day	*	*	*	*	Referent	
3.2 to High, CNA Hours/Resident Day	*	*	*	*	-11.8400	<.0001
Low to less than 0.4, LPN Hours/Resident Day	*	*	*	*	-4.3615	0.0556
0.4 to less than 1.2, LPN Hours/Resident Day	*	*	*	*	Referent	
1.2 to High, LPN Hours/Resident Day	*	*	*	*	-1.4949	0.4662
Low to less than 0.4, RN Hours/Resident Day	*	*	*	*	-1.0584	0.6131
0.4 to less than1.2, RN Hours/Resident Day	*	*	*	*	Referent	
1.2 to High, RN Hours/Resident Day	*	*	*	*	5.2729	0.0147
Clinical Laboratory On-Site	*	*	-1.5491	0.3994	-1.6370	0.3759
X-ray On-Site	*	*	3.4730	0.0844	4.2157	0.0370
AK(02)-ALASKA	*	*	51.0850	0.0386	39.4395	0.1122
AL(01)-ALABAMA	*	*	39.7884	0.0267	46.8886	0.0095
AR(04)-ARKANSAS	*	*	44.3165	0.0138	55.7585	0.0021
AZ(03)-ARIZONA	*	*	32.3627	0.0803	38.2353	0.0399
CA(05)-CALIFORNIA	*	*	23.2799	0.1826	29.9194	0.0886
CO(06)-COLORADO	*	*	20.1321	0.2655	25.9699	0.1531
CT(07)-CONNECTICUT	*	*	41.9891	0.0193	50.2598	0.0054
DC(09)-DISTRICT OF COLUMBIA	*	*	Referent		Referent	
DE(08)-DELAWARE	*	*	3.1109	0.8786	8.6243	0.6735
FL(10)-FLORIDA	*	*	24.6339	0.1593	30.8761	0.0796
GA(11)-GEORGIA	*	*	34.0626	0.0539	36.7458	0.0389
HI(12)-HAWAII	*	*	39.3094	0.0727	38.0516	0.0843
IA(16)-IOWA	*	*	60.6022	0.0006	67.2479	0.0002

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* Not a covariate in the model

Table 10(Continued): SNF Days Linear Regression Models (FYs 2013/14, Facility N=15,140)

Covariate	Risk-Adjustment Model 0.10		Ownership Model 0.16		Staffing Model 0.15	
Adjusted R-Squared	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
ID(13)-IDAHO	*	*	46.5624	0.0163	52.0409	0.0076
IL(14)-ILLINOIS	*	*	55.0372	0.0017	62.3391	0.0004
IN(15)-INDIANA	*	*	42.9036	0.0150	40.6691	0.0218
KS(17)-KANSAS	*	*	37.3937	0.0360	42.7788	0.0172
KY(18)-KENTUCKY	*	*	40.1547	0.0248	47.6604	0.0081
LA(19)-LOUISIANA	*	*	63.9631	0.0003	69.7456	0.0001
MA(22)-MASSACHUSETTS	*	*	33.5194	0.0580	40.2300	0.0237
MD(21)-MARYLAND	*	*	20.1804	0.2588	26.4301	0.1414
ME(20)-MAINE	*	*	2.0128	0.9145	13.1320	0.4864
MI(23)-MICHIGAN	*	*	36.0339	0.0411	41.2840	0.0200
MN(24)-MINNESOTA	*	*	49.6915	0.0052	50.0152	0.0052
MO(26)-MISSOURI	*	*	86.9471	<.0001	95.4649	<.0001
MS(25)-MISSISSIPPI	*	*	42.2146	0.0192	47.8946	0.0082
MT(27)-MONTANA	*	*	31.1939	0.1042	33.6993	0.0814
NC(34)-NORTH CAROLINA	*	*	36.7664	0.0372	43.3521	0.0146
ND(35)-NORTH DAKOTA	*	*	76.3262	<.0001	77.0628	<.0001
NE(28)-NEBRASKA	*	*	62.7955	0.0005	66.2798	0.0003
NH(30)-NEW HAMPSHIRE	*	*	41.3850	0.0317	46.8931	0.0155
NJ(31)-NEW JERSEY	*	*	4.1544	0.8145	9.4624	0.5951
NM(32)-NEW MEXICO	*	*	31.4711	0.1084	38.0323	0.0538
NV(29)-NEVADA	*	*	28.1341	0.1663	28.3515	0.1655
NY(33)-NEW YORK	*	*	20.9030	0.2324	24.5999	0.1627
OH(36)-OHIO	*	*	19.4558	0.2657	25.5068	0.1468
OK(37)-OKLAHOMA	*	*	20.1117	0.2614	28.9340	0.1088
OR(38)-OREGON	*	*	5.0635	0.7847	16.6702	0.3714
PA(39)-PENNSYLVANIA	*	*	47.8518	0.0063	51.0654	0.0038

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* Not a covariate in the model

Table 10(Continued): SNF Days Linear Regression Models (FYs 2013/14, Facility N=15,140)

Covariate	Risk-Adjustment Model Coefficient	Risk-Adjustment Model p-value	Ownership Model Coefficient	Ownership Model p-value	Staffing Model Coefficient	Staffing Model p-value
Adjusted R-Squared	**0.10**		**0.16**		**0.15**	
RI(41)-RHODE ISLAND	*	*	10.3132	0.5885	21.5133	0.2632
SC(42)-SOUTH CAROLINA	*	*	33.5847	0.0637	40.5489	0.0260
SD(43)-SOUTH DAKOTA	*	*	57.5600	0.0021	62.8282	0.0009
TN(44)-TENNESSEE	*	*	32.7498	0.0659	38.5332	0.0315
TX(45)-TEXAS	*	*	31.9737	0.0674	39.5179	0.0247
UT(46)-UTAH	*	*	18.1764	0.3433	24.1323	0.2113
VA(49)-VIRGINIA	*	*	24.0658	0.1765	29.9375	0.0947
VT(47)-VERMONT	*	*	12.7432	0.5436	19.8191	0.3475
WA(50)-WASHINGTON	*	*	52.3735	0.0037	58.1034	0.0014
WI(52)-WISCONSIN	*	*	49.1446	0.0055	54.0227	0.0024
WV(51)-WEST VIRGINIA	*	*	21.7434	0.2432	26.4496	0.1583
WY(53)-WYOMING	*	*	55.0138	0.0099	55.3986	0.0098

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* Not a covariate in the model

Appendix

Table 11: Nursing Center Characteristics Stratified by Outcome Percentiles

Population	Total	All-Cause Hospitalizations			Potentially Avoidable Hospitalizations		
Percentile Group		10th	11th to 89th	90th	10th	11th to 89th	90th
Number of Facilities	15,140	1,514	12,112	1,514	1,514	12,112	1,514
Ownership							
For Profit	70.8%	73.8%	69.6%	76.9%	73.9%	70.1%	73.4%
Not For Profit	23.1%	19.8%	24.2%	17.8%	19.6%	24.1%	19.0%
Government or Other	6.1%	6.4%	6.2%	5.4%	6.5%	5.9%	7.7%
Hospital-Based	4.0%	7.8%	3.6%	3.8%	6.7%	3.5%	5.1%
Free Standing	96.0%	92.2%	96.4%	96.2%	93.3%	96.5%	94.9%
Urban	69.1%	74.9%	69.1%	63.3%	75.4%	70.5%	51.1%
Rural	30.9%	25.1%	30.9%	36.7%	24.6%	29.5%	48.9%
Number of Certified Beds	109	100	111	102	100	112	96
50 or Less	12.4%	16.6%	11.6%	14.5%	16.5%	11.5%	15.8%
51 to 100	38.6%	39.6%	38.0%	43.0%	40.4%	37.6%	45.0%
101 to 200	43.4%	40.3%	44.5%	37.5%	39.6%	44.7%	36.4%
201 or More	5.5%	3.5%	5.9%	5.1%	3.5%	6.1%	2.8%
States							
AK(02)-ALASKA	0.1%	0.7%	0.1%	0.0%	0.5%	0.1%	0.1%
AL(01)-ALABAMA	1.5%	1.3%	1.6%	0.9%	1.1%	1.5%	1.3%
AR(04)-ARKANSAS	1.5%	0.5%	1.5%	2.8%	0.3%	1.4%	3.2%
AZ(03)-ARIZONA	0.9%	2.9%	0.7%	0.4%	2.1%	0.8%	0.3%
CA(05)-CALIFORNIA	7.6%	15.1%	6.5%	8.8%	15.5%	6.9%	5.1%
CO(06)-COLORADO	1.4%	3.7%	1.2%	0.5%	3.2%	1.2%	0.5%
CT(07)-CONNECTICUT	1.5%	1.5%	1.6%	0.7%	2.0%	1.6%	0.3%
DC(09)-DISTRICT OF COLUMBIA	0.1%	0.1%	0.1%	0.0%	0.1%	0.1%	0.1%
DE(08)-DELAWARE	0.3%	0.1%	0.3%	0.3%	0.1%	0.3%	0.3%

Table 11(Continued): Nursing Center Characteristics Stratified by Outcome Percentiles

Population	Total	All-Cause Hospitalizations			Potentially Avoidable Hospitalizations		
Percentile Group		10th	11th to 89th	90th	10th	11th to 89th	90th
Number of Facilities	15,140	1,514	12,112	1,514	1,514	12,112	1,514
States (Continued)							
FL(10)-FLORIDA	4.5%	3.3%	4.5%	5.3%	2.8%	4.7%	4.2%
GA(11)-GEORGIA	2.3%	1.7%	2.5%	1.8%	1.3%	2.4%	2.8%
HI(12)-HAWAII	0.2%	0.7%	0.2%	0.1%	0.7%	0.2%	0.0%
IA(16)-IOWA	2.9%	0.9%	3.2%	2.4%	1.4%	3.0%	3.0%
ID(13)-IDAHO	0.5%	0.9%	0.5%	0.0%	1.1%	0.4%	0.1%
IL(14)-ILLINOIS	4.8%	0.9%	4.5%	11.4%	1.2%	4.7%	9.3%
IN(15)-INDIANA	3.4%	3.0%	3.5%	2.9%	3.4%	3.5%	2.6%
KS(17)-KANSAS	2.2%	1.0%	2.2%	3.2%	2.0%	2.0%	4.1%
KY(18)-KENTUCKY	1.8%	1.1%	1.7%	3.0%	1.1%	1.7%	3.4%
LA(19)-LOUISIANA	1.8%	0.8%	1.7%	3.6%	0.4%	1.4%	5.8%
MA(22)-MASSACHUSETTS	2.7%	3.0%	2.9%	0.7%	2.2%	3.0%	0.8%
MD(21)-MARYLAND	1.5%	0.8%	1.5%	1.5%	0.5%	1.7%	0.7%
ME(20)-MAINE	0.7%	0.6%	0.8%	0.2%	0.4%	0.8%	0.2%
MI(23)-MICHIGAN	2.8%	4.4%	2.7%	2.1%	6.1%	2.6%	1.1%
MN(24)-MINNESOTA	2.4%	3.3%	2.2%	2.7%	3.0%	2.3%	2.5%
MO(26)-MISSOURI	3.3%	1.3%	3.6%	3.2%	2.0%	3.4%	4.0%
MS(25)-MISSISSIPPI	1.3%	0.1%	1.1%	3.8%	0.2%	1.0%	4.8%
MT(27)-MONTANA	0.5%	0.7%	0.5%	0.4%	0.3%	0.6%	0.5%
NC(34)-NORTH CAROLINA	2.7%	2.4%	2.7%	2.8%	3.4%	2.7%	2.0%
ND(35)-NORTH DAKOTA	0.5%	0.3%	0.6%	0.5%	0.1%	0.6%	0.6%
NE(28)-NEBRASKA	1.4%	0.9%	1.6%	0.9%	0.8%	1.5%	1.9%
NH(30)-NEW HAMPSHIRE	0.5%	0.5%	0.5%	0.1%	0.5%	0.6%	0.1%

Table 11(Continued): Nursing Center Characteristics Stratified by Outcome Percentiles

Population	Total	All-Cause Hospitalizations			Potentially Avoidable Hospitalizations		
Percentile Group		10th	11th to 89th	90th	10th	11th to 89th	90th
Number of Facilities	15,140	1,514	12,112	1,514	1,514	12,112	1,514
States (Continued)							
NJ(31)-NEW JERSEY	2.3%	1.3%	2.5%	2.0%	1.4%	2.5%	1.6%
NM(32)-NEW MEXICO	0.4%	0.8%	0.4%	0.3%	0.4%	0.4%	0.5%
NV(29)-NEVADA	0.3%	1.3%	0.2%	0.2%	1.0%	0.2%	0.1%
NY(33)-NEW YORK	4.1%	3.7%	4.1%	3.8%	5.5%	4.2%	1.8%
OH(36)-OHIO	6.2%	8.9%	6.2%	3.5%	7.5%	6.3%	3.8%
OK(37)-OKLAHOMA	2.0%	1.0%	2.0%	3.4%	0.9%	2.0%	3.4%
OR(38)-OREGON	0.9%	2.0%	0.7%	0.8%	2.0%	0.8%	0.5%
PA(39)-PENNSYLVANIA	4.4%	3.2%	4.7%	2.7%	2.9%	4.7%	3.2%
RI(41)-RHODE ISLAND	0.6%	0.5%	0.6%	0.2%	0.7%	0.6%	0.1%
SC(42)-SOUTH CAROLINA	1.2%	1.3%	1.1%	1.2%	0.9%	1.2%	1.4%
SD(43)-SOUTH DAKOTA	0.7%	0.1%	0.8%	0.9%	0.2%	0.7%	1.1%
TN(44)-TENNESSEE	2.0%	1.6%	2.0%	2.7%	1.5%	1.9%	3.4%
TX(45)-TEXAS	7.8%	9.2%	7.8%	6.6%	7.7%	7.6%	9.6%
UT(46)-UTAH	0.5%	0.9%	0.5%	0.3%	0.9%	0.5%	0.3%
VA(49)-VIRGINIA	1.8%	0.9%	1.9%	2.5%	1.3%	1.9%	1.5%
VT(47)-VERMONT	0.3%	0.1%	0.3%	0.0%	0.0%	0.3%	0.1%
WA(50)-WASHINGTON	1.4%	2.0%	1.5%	0.6%	2.2%	1.5%	0.5%
WI(52)-WISCONSIN	2.5%	1.9%	2.8%	0.7%	2.0%	2.8%	0.7%
WV(51)-WEST VIRGINIA	0.8%	0.9%	0.8%	0.3%	1.1%	0.8%	0.4%
WY(53)-WYOMING	0.2%	0.3%	0.2%	0.1%	0.1%	0.3%	0.1%

Table 11(Continued): Nursing Center Characteristics Stratified by Outcome Percentiles

Population	Total	All-Cause ED/Observation Visits			Skilled Nursing Facility Days		
Percentile Group		10th	11th to 89th	90th	10th	11th to 89th	90th
Number of Facilities	15,140	1,514	12,112	1,514	1,514	12,112	1,514
Ownership							
For Profit	70.8%	75.4%	69.8%	73.9%	68.8%	70.2%	77.3%
Not For Profit	23.1%	17.6%	24.1%	20.4%	22.5%	23.6%	19.8%
Government or Other	6.1%	7.0%	6.1%	5.7%	8.7%	6.2%	2.9%
Hospital-Based	4.0%	5.7%	3.6%	5.5%	7.5%	7.5%	3.8%
Free Standing	96.0%	94.3%	96.4%	94.5%	92.5%	92.5%	96.2%
Urban	69.1%	81.3%	70.3%	47.2%	75.6%	75.6%	68.7%
Rural	30.9%	18.7%	29.7%	52.8%	24.4%	24.4%	31.3%
Number of Certified Beds	109	110	110	95	106	106	110
50 or Less	12.4%	15.4%	11.5%	16.5%	14.9%	12.2%	11.8%
51 to 100	38.6%	38.0%	38.1%	44.1%	37.0%	38.5%	41.3%
101 to 200	43.4%	39.4%	44.7%	36.9%	43.0%	43.5%	43.3%
201 or More	5.5%	7.2%	5.7%	2.6%	5.2%	5.8%	3.6%
States							
AK(02)-ALASKA	0.1%	0.5%	0.1%	0.1%	0.3%	0.1%	0.1%
AL(01)-ALABAMA	1.5%	2.3%	1.5%	0.5%	1.6%	1.4%	1.7%
AR(04)-ARKANSAS	1.5%	0.3%	1.3%	4.1%	0.4%	1.6%	2.1%
AZ(03)-ARIZONA	0.9%	2.3%	0.7%	0.3%	2.0%	0.7%	0.9%
CA(05)-CALIFORNIA	7.6%	17.2%	7.1%	2.2%	12.3%	7.4%	4.9%
CO(06)-COLORADO	1.4%	1.5%	1.4%	0.8%	2.6%	1.2%	1.3%
CT(07)-CONNECTICUT	1.5%	1.0%	1.7%	0.7%	0.3%	1.7%	1.3%
DC(09)-DISTRICT OF COLUMBIA	0.1%	0.0%	0.1%	0.1%	0.2%	0.1%	0.1%
DE(08)-DELAWARE	0.3%	0.1%	0.3%	0.2%	0.6%	0.3%	0.1%

Table 11(Continued): Nursing Center Characteristics Stratified by Outcome Percentiles

Population	Total	All-Cause ED/Observation Visits			Skilled Nursing Facility Days		
Percentile Group		10th	11th to 89th	90th	10th	11th to 89th	90th
Number of Facilities	15,140	1,514	12,112	1,514	1,514	12,112	1,514
States (Continued)							
FL(10)-FLORIDA	4.5%	10.6%	4.1%	0.9%	5.4%	4.5%	3.2%
GA(11)-GEORGIA	2.3%	1.1%	2.4%	2.8%	1.3%	2.5%	1.5%
HI(12)-HAWAII	0.2%	0.3%	0.3%	0.0%	0.0%	0.3%	0.0%
IA(16)-IOWA	2.9%	1.4%	3.1%	3.0%	1.2%	2.9%	4.1%
ID(13)-IDAHO	0.5%	0.3%	0.4%	1.2%	0.3%	0.5%	0.8%
IL(14)-ILLINOIS	4.8%	2.6%	5.1%	5.0%	1.7%	4.9%	7.7%
IN(15)-INDIANA	3.4%	2.6%	3.6%	2.3%	2.8%	3.5%	3.1%
KS(17)-KANSAS	2.2%	3.8%	2.0%	2.3%	2.6%	2.2%	1.6%
KY(18)-KENTUCKY	1.8%	1.1%	1.7%	3.5%	1.0%	1.9%	1.9%
LA(19)-LOUISIANA	1.8%	0.2%	1.4%	6.2%	1.0%	1.7%	3.5%
MA(22)-MASSACHUSETTS	2.7%	0.8%	3.0%	1.8%	1.4%	2.8%	3.0%
MD(21)-MARYLAND	1.5%	1.7%	1.6%	0.4%	1.3%	1.5%	1.3%
ME(20)-MAINE	0.7%	0.0%	0.6%	1.8%	1.1%	0.7%	0.2%
MI(23)-MICHIGAN	2.8%	4.3%	2.8%	1.3%	4.9%	2.4%	3.5%
MN(24)-MINNESOTA	2.4%	2.0%	2.0%	5.7%	2.4%	2.3%	3.1%
MO(26)-MISSOURI	3.3%	3.4%	3.3%	3.4%	2.1%	3.1%	6.9%
MS(25)-MISSISSIPPI	1.3%	0.7%	1.1%	3.3%	0.4%	1.4%	1.3%
MT(27)-MONTANA	0.5%	0.7%	0.5%	0.8%	0.3%	0.6%	0.3%
NC(34)-NORTH CAROLINA	2.7%	2.2%	2.7%	3.4%	4.2%	2.5%	3.2%
ND(35)-NORTH DAKOTA	0.5%	0.1%	0.5%	1.2%	0.2%	0.5%	1.0%
NE(28)-NEBRASKA	1.4%	2.0%	1.4%	0.7%	1.0%	1.4%	2.5%
NH(30)-NEW HAMPSHIRE	0.5%	0.3%	0.5%	0.7%	0.1%	0.6%	0.3%

Table 11(Continued): Nursing Center Characteristics Stratified by Outcome Percentiles

Population	Total	All-Cause ED/Observation Visits			Skilled Nursing Facility Days		
Percentile Group		10th	11th to 89th	90th	10th	11th to 89th	90th
Number of Facilities	15,140	1,514	12,112	1,514	1,514	12,112	1,514
States (Continued)							
NJ(31)-NEW JERSEY	2.3%	3.5%	2.4%	0.2%	2.8%	2.5%	0.3%
NM(32)-NEW MEXICO	0.4%	0.3%	0.5%	0.5%	0.5%	0.5%	0.3%
NV(29)-NEVADA	0.3%	1.5%	0.2%	0.1%	0.8%	0.2%	0.3%
NY(33)-NEW YORK	4.1%	4.6%	4.2%	2.4%	4.4%	4.2%	2.6%
OH(36)-OHIO	6.2%	4.4%	6.3%	6.7%	9.2%	6.2%	2.7%
OK(37)-OKLAHOMA	2.0%	1.1%	2.0%	2.8%	1.9%	2.2%	1.1%
OR(38)-OREGON	0.9%	1.5%	0.7%	1.8%	2.1%	0.8%	0.5%
PA(39)-PENNSYLVANIA	4.4%	3.4%	4.7%	2.8%	4.0%	4.1%	7.4%
RI(41)-RHODE ISLAND	0.6%	0.2%	0.6%	0.5%	0.1%	0.7%	0.2%
SC(42)-SOUTH CAROLINA	1.2%	0.4%	1.2%	1.4%	0.9%	1.1%	1.7%
SD(43)-SOUTH DAKOTA	0.7%	0.5%	0.7%	1.2%	0.3%	0.8%	0.8%
TN(44)-TENNESSEE	2.0%	1.1%	2.2%	1.5%	1.3%	2.1%	1.9%
TX(45)-TEXAS	7.8%	6.5%	7.8%	9.0%	6.2%	8.3%	5.5%
UT(46)-UTAH	0.5%	0.3%	0.6%	0.2%	0.7%	0.6%	0.1%
VA(49)-VIRGINIA	1.8%	0.6%	2.0%	1.7%	3.1%	1.7%	1.8%
VT(47)-VERMONT	0.3%	0.0%	0.3%	0.5%	0.0%	0.3%	0.1%
WA(50)-WASHINGTON	1.4%	0.8%	1.5%	1.6%	2.0%	1.3%	2.4%
WI(52)-WISCONSIN	2.5%	1.3%	2.6%	3.0%	1.3%	2.7%	2.6%
WV(51)-WEST VIRGINIA	0.8%	0.3%	0.8%	1.4%	1.4%	0.7%	0.8%
WY(53)-WYOMING	0.2%	0.1%	0.2%	0.3%	0.1%	0.2%	0.4%

Table 12: Stratified Risk-Adjusted Average Outcomes per 1,000 Nursing Center Days

	All-Cause Hospitalizations						Potentially Avoidable Hospitalizations					
	Total	N	Urban	N	Rural	N	Total	N	Urban	N	Rural	N
All Facilities	1.64	15,140	1.62	10,459	1.69	4,681	0.76	15,140	0.73	10,459	0.84	4,681
Ownership												
For Profit	1.65	10,717	1.63	7,723	1.71	2,994	0.77	10,717	0.73	7,723	0.86	2,994
Not For Profit	1.62	3,497	1.60	2,347	1.66	1,150	0.75	3,497	0.72	2,347	0.82	1,150
Government or Other	1.61	926	1.61	389	1.61	537	0.77	926	0.75	389	0.79	537
Hospital-Based	1.52	605	1.45	231	1.56	374	0.74	605	0.67	231	0.78	374
Free Standing	1.65	14,535	1.63	10,228	1.70	4,307	0.76	14,535	0.73	10,228	0.85	4,307
Number of Certified Beds												
50 or Less	1.63	1,880	1.63	980	1.63	900	0.78	1,880	0.75	980	0.81	900
51 to 100	1.66	5,851	1.63	3,571	1.72	2,280	0.78	5,851	0.73	3,571	0.86	2,280
101 to 200	1.63	6,570	1.61	5,116	1.68	1,454	0.75	6,570	0.72	5,116	0.83	1,454
201 or More	1.67	839	1.68	792	1.65	47	0.72	839	0.72	792	0.75	47
Clinical Laboratory On-Site	1.64	11,883	1.62	8,726	1.68	3,157	0.75	11,883	0.73	8,726	0.83	3,157
No Clinical Laboratory On-Site	1.66	3,257	1.62	1,733	1.71	1,524	0.79	3,257	0.73	1,733	0.86	1,524
X-ray On-Site	1.64	12,022	1.62	9,093	1.67	2,929	0.75	12,022	0.73	9,093	0.82	2,929
No X-ray On-Site	1.68	3,118	1.62	1,366	1.72	1,752	0.81	3,118	0.74	1,366	0.87	1,752

Table 12 (Continued): Stratified Risk-Adjusted Average Outcomes per 1,000 Nursing Center Days

	All-Cause Hospitalizations						Potentially Avoidable Hospitalizations					
	Total	N	Urban	N	Rural	N	Total	N	Urban	N	Rural	N
Staffing												
Certified Nursing Aid												
Staff Hours/Resident Day												
Low to Less than 1.8	1.67	1,249	1.64	801	1.71	448	0.79	1,249	0.74	801	0.86	448
1.8 to Less than 2.2	1.63	3,883	1.62	2,662	1.67	1,221	0.76	3,883	0.73	2,662	0.83	1,221
2.2 to Less than 2.4	1.63	2,425	1.61	1,715	1.67	710	0.75	2,425	0.72	1,715	0.82	710
2.4 to Less than 3.2	1.65	5,880	1.62	4,139	1.71	1,741	0.76	5,880	0.73	4,139	0.85	1,741
3.2 to High	1.63	1,413	1.60	927	1.67	486	0.76	1,413	0.73	927	0.83	486
Licensed Practicing Nurse												
Staff Hours/Resident Day												
Low to Less than .4	1.60	1,393	1.58	861	1.63	532	0.73	1,393	0.69	861	0.78	532
.4 to Less than .7	1.62	3,953	1.60	2,539	1.67	1,414	0.75	3,953	0.70	2,539	0.83	1,414
.7 to Less than .8	1.63	1,912	1.61	1,323	1.69	589	0.76	1,912	0.73	1,323	0.84	589
.8 to Less than 1.2	1.65	6,033	1.62	4,331	1.72	1,702	0.77	6,033	0.74	4,331	0.86	1,702
1.2 to High	1.70	1,559	1.70	1,190	1.72	369	0.79	1,559	0.77	1,190	0.87	369
Registered Nurse												
Staff Hours/Resident Day												
Low to Less than .4	1.70	1,714	1.66	1,093	1.76	621	0.82	1,714	0.77	1,093	0.90	621
.4 to Less than .6	1.68	3,798	1.64	2,471	1.75	1,327	0.80	3,798	0.75	2,471	0.89	1,327
.6 to Less than .7	1.66	2,045	1.64	1,340	1.71	705	0.77	2,045	0.73	1,340	0.85	705
.7 to Less than 1.2	1.60	5,762	1.59	4,108	1.63	1,654	0.73	5,762	0.70	4,108	0.80	1,654
1.2 to High	1.60	1,531	1.62	1,232	1.54	299	0.72	1,531	0.72	1,232	0.73	299

Table 12 (Continued): Stratified Risk-Adjusted Average Outcomes per 1,000 Nursing Center Days

	All-Cause Hospitalizations						Potentially Avoidable Hospitalizations					
	Total	N	Urban	N	Rural	N	Total	N	Urban	N	Rural	N
Number of NF Days												
Low to 12,000	1.67	1,471	1.69	1,085	1.59	386	0.78	1,471	0.78	1,085	0.78	386
12,001 to 24,000	1.63	3,557	1.59	2,315	1.70	1,242	0.76	3,557	0.71	2,315	0.86	1,242
24,001 to 34,000	1.65	3,375	1.61	2,114	1.71	1,261	0.78	3,375	0.73	2,114	0.86	1,261
34,001 to 61,000	1.64	5,179	1.62	3,679	1.69	1,500	0.76	5,179	0.73	3,679	0.84	1,500
61,001 to High	1.65	1,558	1.65	1,266	1.66	292	0.74	1,558	0.73	1,266	0.77	292
Medicare Share of NF Days												
Low to Less than 1.0%	1.47	1,238	1.41	703	1.54	535	0.68	1,238	0.63	703	0.75	535
1.0% to Less than 3.5%	1.50	3,961	1.48	2,772	1.55	1,189	0.67	3,961	0.64	2,772	0.74	1,189
3.5% to Less than 5.5%	1.63	2,921	1.61	2,077	1.69	844	0.75	2,921	0.72	2,077	0.84	844
5.5% to Less than 17.0%	1.75	5,464	1.73	3,820	1.80	1,644	0.83	5,464	0.79	3,820	0.91	1,644
17.0% to High	1.81	1,556	1.80	1,087	1.82	469	0.86	1,556	0.82	1,087	0.94	469
Hospice Share of NF Days												
Low to Less than 0.1%	1.64	1,632	1.66	902	1.61	730	0.74	1,632	0.71	902	0.79	730
0.1% to Less than 2.0%	1.69	3,576	1.66	2,260	1.75	1,316	0.78	3,576	0.73	2,260	0.87	1,316
2.0% to Less than 4.0%	1.68	2,974	1.66	2,076	1.74	898	0.78	2,974	0.74	2,076	0.88	898
4.0% to Less than 11.0%	1.61	5,417	1.60	4,014	1.66	1,403	0.75	5,417	0.73	4,014	0.83	1,403
11.0% to High	1.57	1,541	1.56	1,207	1.60	334	0.75	1,541	0.73	1,207	0.81	334

Table 12 (Continued):   Stratified Risk-Adjusted Average Outcomes per 1,000 Nursing Center Days

	All-Cause Hospitalizations						Potentially Avoidable Hospitalizations					
	Total	N	Urban	N	Rural	N	Total	N	Urban	N	Rural	N
Physician Visits												
per LTC/SNF Stay Days												
Low to Less than 0.01	1.79	1,529	1.76	346	1.80	1,183	0.91	1,529	0.83	346	0.93	1,183
0.01 to Less than 0.03	1.65	4,140	1.62	2,153	1.69	1,987	0.78	4,140	0.73	2,153	0.84	1,987
0.03 to Less than 0.04	1.61	2,793	1.60	2,020	1.63	773	0.74	2,793	0.72	2,020	0.79	773
0.041 to Less than 0.07	1.61	5,121	1.61	4,466	1.57	655	0.73	5,121	0.73	4,466	0.76	655
0.07 to High	1.65	1,557	1.66	1,474	1.50	83	0.72	1,557	0.73	1,474	0.67	83
Dual Eligible Coverage												
per LTC/SNF Days												
1st Decile	1.71	1,514	1.68	1,085	1.76	429	0.78	1,514	0.75	1,085	0.86	429
2nd Decile	1.67	1,514	1.59	820	1.76	694	0.79	1,514	0.71	820	0.89	694
3rd Decile	1.64	1,514	1.60	943	1.70	571	0.77	1,514	0.73	943	0.85	571
4th Decile	1.62	1,514	1.60	1,028	1.67	486	0.76	1,514	0.73	1,028	0.83	486
5th Decile	1.63	1,514	1.60	1,037	1.68	477	0.77	1,514	0.73	1,037	0.85	477
6th Decile	1.63	1,514	1.62	1,017	1.63	497	0.75	1,514	0.73	1,017	0.80	497
7th Decile	1.60	1,513	1.60	1,083	1.61	430	0.74	1,513	0.72	1,083	0.80	430
8th Decile	1.64	1,515	1.64	1,090	1.64	425	0.75	1,515	0.73	1,090	0.82	425
9th Decile	1.65	1,513	1.63	1,155	1.69	358	0.76	1,513	0.73	1,155	0.85	358
10th Decile	1.66	1,515	1.65	1,201	1.69	314	0.76	1,515	0.74	1,201	0.85	314

Table 12 (Continued):   Stratified Risk-Adjusted Average Outcomes per 1,000 Nursing Center Days

	All-Cause Hospitalizations						Potentially Avoidable Hospitalizations					
	Total	N	Urban	N	Rural	N	Total	N	Urban	N	Rural	N
States												
AK(02)-ALASKA	1.03	18	0.60	4	1.15	14	0.48	18	0.28	4	0.54	14
AL(01)-ALABAMA	1.58	222	1.58	137	1.60	85	0.75	222	0.72	137	0.80	85
AR(04)-ARKANSAS	1.94	226	1.87	113	2.00	113	0.97	226	0.88	113	1.05	113
AZ(03)-ARIZONA	1.25	129	1.21	109	1.44	20	0.56	129	0.53	109	0.71	20
CA(05)-CALIFORNIA	1.56	1,152	1.57	1,114	1.25	38	0.66	1,152	0.66	1,114	0.56	38
CO(06)-COLORADO	1.31	206	1.24	152	1.50	54	0.58	206	0.53	152	0.71	54
CT(07)-CONNECTICUT	1.55	230	1.56	220	1.27	10	0.65	230	0.66	220	0.46	10
DC(09)-DISTRICT OF CO	1.49	18	1.49	18		0	0.72	18	0.72	18		0
DE(08)-DELAWARE	1.66	45	1.73	34	1.44	11	0.82	45	0.88	34	0.62	11
FL(10)-FLORIDA	1.68	676	1.68	619	1.67	57	0.78	676	0.78	619	0.80	57
GA(11)-GEORGIA	1.68	351	1.66	218	1.70	133	0.84	351	0.81	218	0.88	133
HI(12)-HAWAII	1.17	37	1.09	21	1.29	16	0.48	37	0.44	21	0.54	16
IA(16)-IOWA	1.74	436	1.86	149	1.68	287	0.83	436	0.88	149	0.81	287
ID(13)-IDAHO	1.29	72	1.25	39	1.34	33	0.56	72	0.51	39	0.61	33
IL(14)-ILLINOIS	2.03	732	2.00	510	2.09	222	0.94	732	0.89	510	1.07	222
IN(15)-INDIANA	1.61	513	1.67	344	1.49	169	0.74	513	0.75	344	0.71	169
KS(17)-KANSAS	1.79	334	1.59	132	1.92	202	0.88	334	0.65	132	1.02	202
KY(18)-KENTUCKY	1.78	270	1.73	128	1.82	142	0.90	270	0.83	128	0.97	142
LA(19)-LOUISIANA	1.88	269	1.81	164	2.00	105	1.07	269	0.96	164	1.24	105
MA(22)-MASSACHUSETTS	1.48	408	1.48	406	1.47	2	0.68	408	0.68	406	0.73	2
MD(21)-MARYLAND	1.70	221	1.71	203	1.56	18	0.75	221	0.75	203	0.76	18
ME(20)-MAINE	1.47	106	1.45	50	1.49	56	0.69	106	0.66	50	0.72	56

Table 12 (Continued): Stratified Risk-Adjusted Average Outcomes per 1,000 Nursing Center Days

States (Continued)	All-Cause Hospitalizations						Potentially Avoidable Hospitalizations					
	Total	N	Urban	N	Rural	N	Total	N	Urban	N	Rural	N
MI(23)-MICHIGAN	1.52	420	1.62	296	1.28	124	0.59	420	0.62	296	0.52	124
MN(24)-MINNESOTA	1.61	362	1.55	176	1.66	186	0.75	362	0.68	176	0.81	186
MO(26)-MISSOURI	1.72	507	1.72	289	1.71	218	0.81	507	0.79	289	0.83	218
MS(25)-MISSISSIPPI	2.10	197	2.22	62	2.05	135	1.14	197	1.17	62	1.12	135
MT(27)-MONTANA	1.52	80	1.48	16	1.53	64	0.71	80	0.64	16	0.73	64
NC(34)-NORTH CAROLINA	1.63	409	1.62	253	1.65	156	0.71	409	0.69	253	0.75	156
ND(35)-NORTH DAKOTA	1.62	80	1.55	22	1.64	58	0.79	80	0.68	22	0.83	58
NE(28)-NEBRASKA	1.65	217	1.52	58	1.70	159	0.82	217	0.65	58	0.89	159
NH(30)-NEW HAMPSHIRE	1.43	75	1.49	48	1.33	27	0.60	75	0.61	48	0.58	27
NJ(31)-NEW JERSEY	1.69	349	1.69	349		0	0.74	349	0.74	349		0
NM(32)-NEW MEXICO	1.48	67	1.34	29	1.59	38	0.74	67	0.68	29	0.79	38
NV(29)-NEVADA	1.21	47	1.14	36	1.45	11	0.54	47	0.51	36	0.67	11
NY(33)-NEW YORK	1.64	615	1.68	525	1.44	90	0.66	615	0.67	525	0.61	90
OH(36)-OHIO	1.50	932	1.55	688	1.39	244	0.71	932	0.73	688	0.66	244
OK(37)-OKLAHOMA	1.83	307	1.82	143	1.84	164	0.90	307	0.88	143	0.92	164
OR(38)-OREGON	1.49	131	1.51	94	1.44	37	0.61	131	0.61	94	0.61	37
PA(39)-PENNSYLVANIA	1.65	664	1.66	527	1.61	137	0.76	664	0.77	527	0.71	137
RI(41)-RHODE ISLAND	1.41	84	1.41	84		0	0.60	84	0.60	84		0
SC(42)-SOUTH CAROLINA	1.64	175	1.58	125	1.80	50	0.79	175	0.75	125	0.89	50
SD(43)-SOUTH DAKOTA	1.77	109	1.80	31	1.76	78	0.85	109	0.81	31	0.87	78
TN(44)-TENNESSEE	1.75	308	1.67	175	1.85	133	0.88	308	0.80	175	0.98	133
TX(45)-TEXAS	1.59	1,185	1.49	816	1.80	369	0.80	1,185	0.73	816	0.95	369

Table 12 (Continued): Stratified Risk-Adjusted Average Outcomes per 1,000 Nursing Center Days

	All-Cause Hospitalizations						Potentially Avoidable Hospitalizations					
	Total	N	Urban	N	Rural	N	Total	N	Urban	N	Rural	N
States (Continued)												
UT(46)-UTAH	1.41	83	1.37	66	1.60	17	0.66	83	0.62	66	0.79	17
VA(49)-VIRGINIA	1.80	276	1.80	202	1.81	74	0.76	276	0.74	202	0.82	74
VT(47)-VERMONT	1.51	38	1.51	8	1.50	30	0.70	38	0.66	8	0.71	30
WA(50)-WASHINGTON	1.52	218	1.51	179	1.55	39	0.62	218	0.60	179	0.73	39
WI(52)-WISCONSIN	1.57	382	1.61	221	1.51	161	0.70	382	0.71	221	0.69	161
WV(51)-WEST VIRGINIA	1.49	117	1.45	51	1.52	66	0.71	117	0.63	51	0.77	66
WY(53)-WYOMING	1.56	35	1.42	6	1.59	29	0.75	35	0.57	6	0.79	29

Table 12 (Continued): Stratified Risk-Adjusted Average Outcomes per 1,000 Nursing Center Days

	All-Cause ED/Observation Visits						Skilled Nursing Facility Days					
	Total	N	Urban	N	Rural	N	Total	N	Urban	N	Rural	N
All Facilities	1.86	15,140	1.71	10,459	2.18	4,681	76	15,140	74	10,459	82	4,681
Ownership												
For Profit	1.86	10,717	1.71	7,723	2.27	2,994	80	10,717	77	7,723	87	2,994
Not For Profit	1.85	3,497	1.72	2,347	2.12	1,150	70	3,497	65	2,347	80	1,150
Government or Other	1.80	926	1.72	389	1.86	537	57	926	60	389	55	537
Hospital-Based	1.94	605	1.70	231	2.08	374	54	605	59	231	51	374
Free Standing	1.85	14,535	1.71	10,228	2.19	4,307	77	14,535	74	10,228	84	4,307
Number of Certified Beds												
50 or Less	1.94	1,880	1.80	980	2.08	900	72	1,880	75	980	70	900
51 to 100	1.94	5,851	1.77	3,571	2.21	2,280	80	5,851	77	3,571	84	2,280
101 to 200	1.80	6,570	1.68	5,116	2.21	1,454	76	6,570	73	5,116	85	1,454
201 or More	1.54	839	1.51	792	2.11	47	65	839	64	792	71	47
Clinical Laboratory On-Site	1.82	11,883	1.69	8,726	2.19	3,157	76	11,883	74	8,726	82	3,157
No Clinical Laboratory On-Site	1.97	3,257	1.80	1,733	2.16	1,524	77	3,257	74	1,733	80	1,524
X-ray On-Site	1.81	12,022	1.69	9,093	2.17	2,929	76	12,022	74	9,093	83	2,929
No X-ray On-Site	2.04	3,118	1.83	1,366	2.20	1,752	77	3,118	73	1,366	79	1,752

Table 12 (Continued):   Stratified Risk-Adjusted Average Outcomes per 1,000 Nursing Center Days

	All-Cause ED/Observation Visits						Skilled Nursing Facility Days					
	Total	N	Urban	N	Rural	N	Total	N	Urban	N	Rural	N
Staffing												
Certified Nursing Aid												
Staff Hours/Resident Day												
Low to Less than 1.8	1.92	1,249	1.77	801	2.19	448	80	1,249	76	801	87	448
1.8 to Less than 2.2	1.88	3,883	1.75	2,662	2.18	1,221	81	3,883	79	2,662	86	1,221
2.2 to Less than 2.4	1.84	2,425	1.72	1,715	2.15	710	79	2,425	76	1,715	86	710
2.4 to Less than 3.2	1.81	5,880	1.65	4,139	2.20	1,741	73	5,880	70	4,139	81	1,741
3.2 to High	1.86	1,413	1.70	927	2.16	486	67	1,413	69	927	64	486
Licensed Practicing Nurse												
Staff Hours/Resident Day												
Low to Less than .4	1.87	1,393	1.77	861	2.04	532	74	1,393	71	861	79	532
.4 to Less than .7	1.80	3,953	1.66	2,539	2.07	1,414	80	3,953	76	2,539	88	1,414
.7 to Less than .8	1.85	1,912	1.68	1,323	2.24	589	78	1,912	74	1,323	87	589
.8 to Less than 1.2	1.85	6,033	1.70	4,331	2.24	1,702	74	6,033	72	4,331	79	1,702
1.2 to High	1.93	1,559	1.77	1,190	2.45	369	73	1,559	75	1,190	69	369
Registered Nurse												
Staff Hours/Resident Day												
Low to Less than .4	1.91	1,714	1.71	1,093	2.26	621	76	1,714	75	1,093	79	621
.4 to Less than .6	1.89	3,798	1.71	2,471	2.23	1,327	76	3,798	72	2,471	84	1,327
.6 to Less than .7	1.84	2,045	1.68	1,340	2.15	705	77	2,045	74	1,340	83	705
.7 to Less than 1.2	1.80	5,762	1.67	4,108	2.12	1,654	75	5,762	72	4,108	82	1,654
1.2 to High	1.88	1,531	1.80	1,232	2.20	299	80	1,531	82	1,232	71	299

Table 12 (Continued):   Stratified Risk-Adjusted Average Outcomes per 1,000 Nursing Center Days

	All-Cause ED/Observation Visits						Skilled Nursing Facility Days					
	Total	N	Urban	N	Rural	N	Total	N	Urban	N	Rural	N
Number of NF Days												
Low to 12,000	2.04	1,471	1.93	1,085	2.33	386	79	1,471	81	1,085	74	386
12,001 to 24,000	1.86	3,557	1.70	2,315	2.16	1,242	75	3,557	73	2,315	80	1,242
24,001 to 34,000	1.90	3,375	1.75	2,114	2.14	1,261	78	3,375	75	2,114	83	1,261
34,001 to 61,000	1.83	5,179	1.67	3,679	2.23	1,500	76	5,179	73	3,679	86	1,500
61,001 to High	1.65	1,558	1.57	1,266	2.00	292	71	1,558	71	1,266	73	292
Medicare Share of NF Days												
Low to Less than 1.0%	1.67	1,238	1.54	703	1.84	535	30	1,238	29	703	30	535
1.0% to Less than 3.5%	1.75	3,961	1.62	2,772	2.04	1,189	32	3,961	31	2,772	35	1,189
3.5% to Less than 5.5%	1.83	2,921	1.68	2,077	2.20	844	44	2,921	41	2,077	49	844
5.5% to Less than 17.0%	1.95	5,464	1.78	3,820	2.34	1,644	90	5,464	85	3,820	100	1,644
17.0% to High	2.00	1,556	1.85	1,087	2.34	469	241	1,556	235	1,087	255	469
Hospice Share of NF Days												
Low to Less than 0.1%	1.79	1,632	1.60	902	2.02	730	74	1,632	77	902	70	730
0.1% to Less than 2.0%	1.88	3,576	1.67	2,260	2.22	1,316	77	3,576	72	2,260	86	1,316
2.0% to Less than 4.0%	1.88	2,974	1.71	2,076	2.26	898	80	2,974	77	2,076	86	898
4.0% to Less than 11.0%	1.87	5,417	1.75	4,014	2.20	1,403	75	5,417	72	4,014	82	1,403
11.0% to High	1.79	1,541	1.70	1,207	2.10	334	76	1,541	75	1,207	79	334

Table 12 (Continued): Stratified Risk-Adjusted Average Outcomes per 1,000 Nursing Center Days

	All-Cause ED/Observation Visits						Skilled Nursing Facility Days					
	Total	N	Urban	N	Rural	N	Total	N	Urban	N	Rural	N
Physician Visits												
per LTC/SNF Stay Days												
Low to Less than 0.01	2.13	1,529	2.04	346	2.16	1,183	84	1,529	83	346	85	1,183
0.01 to Less than 0.03	2.07	4,140	1.90	2,153	2.26	1,987	81	4,140	77	2,153	85	1,987
0.03 to Less than 0.04	1.84	2,793	1.75	2,020	2.09	773	74	2,793	74	2,020	74	773
0.041 to Less than 0.07	1.69	5,121	1.63	4,466	2.11	655	73	5,121	72	4,466	77	655
0.07 to High	1.56	1,557	1.53	1,474	2.06	83	70	1,557	70	1,474	68	83
Dual Eligible Coverage												
per LTC/SNF Days												
1st Decile	1.92	1,514	1.84	1,085	2.14	429	84	1,514	82	1,085	90	429
2nd Decile	1.89	1,514	1.75	820	2.05	694	80	1,514	77	820	85	694
3rd Decile	1.86	1,514	1.74	943	2.05	571	80	1,514	77	943	84	571
4th Decile	1.88	1,514	1.73	1,028	2.20	486	75	1,514	73	1,028	80	486
5th Decile	1.89	1,514	1.72	1,037	2.26	477	77	1,514	73	1,037	84	477
6th Decile	1.88	1,514	1.73	1,017	2.17	497	74	1,514	74	1,017	76	497
7th Decile	1.82	1,513	1.67	1,083	2.21	430	76	1,513	73	1,083	83	430
8th Decile	1.87	1,515	1.71	1,090	2.28	425	73	1,515	71	1,090	78	425
9th Decile	1.82	1,513	1.66	1,155	2.34	358	72	1,513	69	1,155	81	358
10th Decile	1.73	1,515	1.58	1,201	2.31	314	70	1,515	70	1,201	71	314

Table 12 (Continued): Stratified Risk-Adjusted Average Outcomes per 1,000 Nursing Center Days

States	All-Cause ED/Observation Visits						Skilled Nursing Facility Days					
	Total	N	Urban	N	Rural	N	Total	N	Urban	N	Rural	N
AK(02)-ALASKA	1.30	18	0.86	4	1.42	14	60	18	93	4	51	14
AL(01)-ALABAMA	1.50	222	1.44	137	1.60	85	78	222	82	137	73	85
AR(04)-ARKANSAS	2.63	226	2.34	113	2.91	113	86	226	96	113	76	113
AZ(03)-ARIZONA	1.31	129	1.22	109	1.78	20	77	129	69	109	120	20
CA(05)-CALIFORNIA	1.39	1,152	1.38	1,114	1.75	38	63	1,152	63	1,114	74	38
CO(06)-COLORADO	1.65	206	1.58	152	1.87	54	61	206	61	152	59	54
CT(07)-CONNECTICUT	1.68	230	1.69	220	1.52	10	83	230	82	220	106	10
DC(09)-DISTRICT OF CO	1.79	18	1.79	18		0	40	18	40	18		0
DE(08)-DELAWARE	1.72	45	1.66	34	1.90	11	43	45	49	34	25	11
FL(10)-FLORIDA	1.32	676	1.29	619	1.66	57	66	676	66	619	67	57
GA(11)-GEORGIA	2.09	351	1.98	218	2.29	133	73	351	79	218	64	133
HI(12)-HAWAII	1.39	37	1.36	21	1.41	16	58	37	58	21	58	16
IA(16)-IOWA	1.98	436	2.08	149	1.93	287	96	436	87	149	100	287
ID(13)-IDAHO	2.59	72	2.45	39	2.75	33	84	72	90	39	77	33
IL(14)-ILLINOIS	1.99	732	1.82	510	2.39	222	96	732	94	510	102	222
IN(15)-INDIANA	1.82	513	1.79	344	1.89	169	77	513	80	344	71	169
KS(17)-KANSAS	1.76	334	1.39	132	2.01	202	70	334	76	132	66	202
KY(18)-KENTUCKY	2.22	270	1.76	128	2.63	142	85	270	82	128	89	142
LA(19)-LOUISIANA	2.78	269	2.67	164	2.95	105	103	269	103	164	102	105
MA(22)-MASSACHUSETTS	1.85	408	1.85	406	2.16	2	77	408	76	406	97	2
MD(21)-MARYLAND	1.54	221	1.52	203	1.72	18	65	221	67	203	45	18
ME(20)-MAINE	2.77	106	2.58	50	2.94	56	53	106	62	50	45	56

Table 12 (Continued): Stratified Risk-Adjusted Average Outcomes per 1,000 Nursing Center Days

	All-Cause ED/Observation Visits						Skilled Nursing Facility Days					
	Total	N	Urban	N	Rural	N	Total	N	Urban	N	Rural	N
States (Continued)												
MI(23)-MICHIGAN	1.54	420	1.50	296	1.62	124	76	420	77	296	76	124
MN(24)-MINNESOTA	2.38	362	2.13	176	2.61	186	85	362	79	176	91	186
MO(26)-MISSOURI	1.85	507	1.78	289	1.94	218	123	507	110	289	141	218
MS(25)-MISSISSIPPI	2.48	197	2.32	62	2.55	135	81	197	86	62	79	135
MT(27)-MONTANA	2.02	80	2.30	16	1.94	64	62	80	83	16	57	64
NC(34)-NORTH CAROLINA	2.01	409	1.87	253	2.25	156	82	409	80	253	86	156
ND(35)-NORTH DAKOTA	2.43	80	3.79	22	1.91	58	103	80	141	22	89	58
NE(28)-NEBRASKA	1.62	217	1.47	58	1.67	159	97	217	92	58	99	159
NH(30)-NEW HAMPSHIRE	2.15	75	1.90	48	2.60	27	78	75	88	48	61	27
NJ(31)-NEW JERSEY	1.39	349	1.39	349		0	45	349	45	349		0
NM(32)-NEW MEXICO	2.02	67	1.81	29	2.19	38	65	67	73	29	60	38
NV(29)-NEVADA	0.99	47	0.81	36	1.58	11	67	47	71	36	54	11
NY(33)-NEW YORK	1.61	615	1.52	525	2.15	90	61	615	57	525	83	90
OH(36)-OHIO	1.95	932	1.84	688	2.25	244	61	932	61	688	61	244
OK(37)-OKLAHOMA	2.13	307	1.95	143	2.28	164	57	307	56	143	57	164
OR(38)-OREGON	2.12	131	1.90	94	2.68	37	54	131	53	94	55	37
PA(39)-PENNSYLVANIA	1.72	664	1.60	527	2.18	137	90	664	85	527	110	137
RI(41)-RHODE ISLAND	2.03	84	2.03	84		0	53	84	53	84		0
SC(42)-SOUTH CAROLINA	1.99	175	1.78	125	2.52	50	79	175	84	125	65	50
SD(43)-SOUTH DAKOTA	2.32	109	3.22	31	1.96	78	88	109	95	31	86	78
TN(44)-TENNESSEE	1.81	308	1.71	175	1.95	133	76	308	72	175	81	133
TX(45)-TEXAS	1.90	1,185	1.72	816	2.31	369	71	1,185	71	816	71	369

Table 12 (Continued): Stratified Risk-Adjusted Average Outcomes per 1,000 Nursing Center Days

	All-Cause ED/Observation Visits						Skilled Nursing Facility Days					
	Total	N	Urban	N	Rural	N	Total	N	Urban	N	Rural	N
States (Continued)												
UT(46)-UTAH	1.65	83	1.64	66	1.71	17	60	83	58	66	66	17
VA(49)-VIRGINIA	1.99	276	1.86	202	2.32	74	70	276	70	202	69	74
VT(47)-VERMONT	2.40	38	2.93	8	2.26	30	62	38	94	8	54	30
WA(50)-WASHINGTON	1.95	218	1.91	179	2.13	39	97	218	100	179	82	39
WI(52)-WISCONSIN	2.06	382	2.04	221	2.08	161	87	382	87	221	88	161
WV(51)-WEST VIRGINIA	2.32	117	2.02	51	2.54	66	63	117	64	51	61	66
WY(53)-WYOMING	1.89	35	1.49	6	1.97	29	85	35	101	6	82	29