

Skilled Nursing Facility (SNF) Healthcare-Associated Infections (HAI) Requiring Hospitalization Measure

Technical Specification Report

Prepared for

**Center for Clinical Standards and Quality
Centers for Medicare & Medicaid Services**
7500 Security Boulevard
Baltimore, MD 21244-1850

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September 2026



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Introduction

This report presents the technical measure specifications for the refined Skilled Nursing Facility (SNF) Healthcare-Associated Infections (HAI) Requiring Hospitalization measure.

Section 1 provides an overview of the measure including a measure description, a history of the original version of this measure and the rationale for and summary of the refinements in the current measure, and the purpose and rationale for the original and current versions of the measure.

Section 2 describes the measure specifications, including the construction of the denominator and numerator, data sources, measure observation window, the risk adjustment model, and steps for calculating the final measure result.

Section 3 discusses measure testing, including the measure's reportability, variability, reliability, and validity results.

1. Overview

This chapter provides an overview of the updated SNF HAI measure, including a general description of the measure, the history of the measure's development, refinements to the original measure (Section 1.1), and the purpose and rationale for the measure and refinements (Section 1.2). A more detailed explanation of the measure specifications is available in Chapter 2.

1.1 Measure Description

The SNF HAI measure is a facility-level, one-year outcome measure that estimates the risk-standardized rate of HAIs that are acquired during SNF care and result in hospitalization. The measure is designed to report a variety of healthcare-associated infections as a singular rate, and it incorporates an indicator of infection severity as it only assesses infections that require hospitalization. HAIs that are acquired during SNF care and result in hospitalization are identified using the principal diagnosis on beneficiaries' Medicare inpatient (IP) claims. Hospitalizations do not include emergency department visits or observation stays. The measure accounts for misattribution through use of an incubation window. As such, hospitalization resulting from an HAI must occur during the period beginning on day four after SNF admission and within three days after SNF discharge. The measure also applies a 14-day repeat infection timeframe to exclude infections that are preexisting to the SNF stay. The measure is risk-adjusted to allow for comparison based on beneficiaries with similar characteristics across SNFs. Since HAIs are not considered never-events, the measure's objective is to identify SNFs that have higher HAI rates than their peers.

This measure calculates a risk-adjusted HAI rate for each SNF. This is derived by first calculating a standardized risk ratio – the predicted number of SNF stays with an HAI divided by the expected number of SNF stays with an HAI for the same patients if treated at the average

SNF. The standardized risk ratio is then multiplied by the mean rate of SNF stays with an HAI in the population (i.e., all SNF stays for Medicare fee-for-service (FFS) and Medicare Advantage patients eligible for the measure) to generate the SNF-level standardized rate of HAI.

1.1.1 Updates to the SNF HAI Measure to Include Medicare Advantage Beneficiaries

This Technical Specifications Report describes updates to the SNF HAI measure to add Medicare Advantage (MA) records as a data source in addition to Medicare Fee-for-Service (FFS) claims. Updates related to the inclusion of MA records include:

1. Additional data sources Section 2.1
2. Updates to stay creation, Section 2.2.1
3. Modifications of the exclusion criteria to not exclude beneficiaries with MA (Part C) coverage, and to exclude stays with problematic data coming from MA records, Section 2.2.3
4. Addition of a risk adjustment covariate for Medicare Advantage (Part C) coverage at the start of the SNF stay, Section 2.5.2.

1.2 Purpose/Rationale for the Measure

Monitoring the occurrence of HAIs among SNF residents can provide valuable information about a SNF's quality of care. Most HAIs are preventable as they are often the result of poor processes and structures of care. A report from OIG (2014) estimated that one in four adverse events among SNF residents are due to HAIs, and more than half of all HAIs are potentially preventable.¹ Typically, HAIs result from inadequate patient management following a medical intervention, such as surgery or device implementation, or poor adherence to protocol and antibiotic stewardship guidelines.^{2,3,4}

Several facility characteristics may influence rates of HAIs requiring hospitalization. Empirical evidence demonstrates that high staff and leadership turnover, low staff-to-resident ratios, and a

¹ Office of Inspector General. (2014). Adverse events in skilled nursing facilities: National incidence among Medicare beneficiaries. Retrieved from <https://oig.hhs.gov/oei/reports/oei-06-11-00370.pdf>

² Beganovic, M., & Laplante, K. (2018). Communicating with Facility Leadership; Metrics for Successful Antimicrobial Stewardship Programs (Asp) in Acute Care and Long-Term Care Facilities. Rhode Island medical journal (2013), 101(5) (2018), 45–49.

³ Cooper, D., McFarland, M., Petrilli, F., & Shells, C. (2019). Reducing inappropriate antibiotics for urinary tract infections in long-term care: A replication study. Journal of Nursing Care Quality, 34(1), 16–21. <http://dx.doi.org/10.1097/NCQ.0000000000000343>

⁴ Feldstein, D., Sloane, P. D., & Feltner, C. (2018). Antibiotic stewardship programs in nursing homes: A systematic review. Journal of the American Medical Directors Association, 19(2), 110–116. <http://dx.doi.org/10.1016/j.jamda.2017.06.019>

lack of full-time nurses are all factors related to higher rates of HAIs.^{5,6,7} Additional facility characteristics influencing HAI rates include occupancy rates, and adoption of, or lack thereof, infection surveillance and prevention policies.⁸ One study found associations between facility profit margins and infections, noting that facilities in lower profit margin quintiles had higher odds of persistent infection prevention and control citations.¹⁴ Furthermore, additional studies conclude that facility utilization of electronic medical records, and uptake of information technology infrastructure were associated with reduced HAI rates.^{9,10} Inadequate prevention and treatment of HAIs is likely to result in poor health care outcomes for residents and wasteful resource use. For example, HAIs are associated with longer lengths of stay, use of higher-intensity care, increased mortality, and high health care costs.^{11,12,13,14} Given the higher resource use and economic burden that HAIs present, the SNF HAI measure provides actionable data on infection rates that can identify quality improvement opportunities for SNFs.

Preventing and reducing HAIs is crucial for delivering safe and high-quality care across health care systems and has been a priority objective across federal, state, and local levels. The SNF HAI measure fulfills the Making Care Safer by Reducing Harm Caused in the Delivery of Care within CMS's Meaningful Measure framework. Additionally, the SNF HAI measure aligns with the Office of Disease Prevention and Health Promotion's National Action Plan to Prevent Health Care-Associated Infections, with specific attention to HAIs in long-term care facilities.¹⁵ The purpose of the SNF HAI measure is to estimate the risk-standardized rate of HAIs that are acquired during SNF care and result in hospitalization in one summary measure result. Unlike other HAI measures that target specific infections, this measure targets all HAIs that are serious

⁵ Castle, N., Engberg, J. B., Wagner, L. M., & Handler, S. (2017). Resident and facility factors associated with the incidence of urinary tract infections identified in the Nursing Home Minimum Data Set. *Journal of Applied Gerontology*, 36(2), 173–194. <http://dx.doi.org/10.1177/0733464815584666>.

⁶ Crnich, C. J., Jump, R., Trautner, B., Sloane, P. D., & Mody, L. (2015). Optimizing antibiotic stewardship in nursing homes: A narrative review and recommendations for improvement. *Drugs & Aging*, 32(9), 699–716. <http://dx.doi.org/10.1007/s40266-015-0292-7>.

⁷ Furuno, J. P., & Mody, L. (2020). Several Roads Lead to Rome: Operationalizing Antibiotic Stewardship Programs in Nursing Homes. *Journal of the American Geriatrics Society*, 68(1), 11–14. <https://doi.org/10.1111/jgs.16279>

⁸ Sharma, H., & Xu, L. (2021). Nursing Home Profit Margins and Citations for Infection Prevention and Control. *Journal of the American Medical Directors Association*, 22(11), 2378–2383.e2. <https://doi.org/10.1016/j.jamda.2021.03.024>

⁹ Cohen, C. C., Powell, K., Dick, A. W., Stone, P. W., & Alexander, G. L. (2022). The Association Between Nursing Home Information Technology Maturity and Urinary Tract Infection Among Long-Term Residents. *Journal of Applied Gerontology*, 41(7), 1695–1701. <https://doi.org/10.1177/07334648221082024>

¹⁰ Cooper, D. L., Buterakos, R., Wagner, L. M., Tith, J., & Lee, S.-Y. D. (2021). A retrospective comparison of guidelines to assess hospital-diagnosed urinary tract infection in nursing home residents. *American Journal of Infection Control*, 49(11), 1354–1358. <https://doi.org/10.1016/j.ajic.2021.04.001>

¹¹ Refer to footnote 1

¹² Centers for Disease Control and Prevention (2009). The Direct Medical Costs of Healthcare-Associated Infections in U.S. Hospitals and the Benefits of Prevention. Retrieved from <https://stacks.cdc.gov/view/cdc/11550>

¹³ Ouslander, J. G., Diaz, S., Hain, D., & Tappen, R. (2011). Frequency and diagnoses associated with 7- and 30-day readmission of skilled nursing facility patients to a nonteaching community hospital. *Journal of the American Medical Directors Association*, 12(3), 195–203. <http://dx.doi.org/10.1016/j.jamda.2010.02.015>

¹⁴ Zimlichman, E., Henderson, D., Tamir, O., Franz, C., Song, P., Yamin, C. K., . . . Bates, D. W. (2013). Health care-associated infections: A meta-analysis of costs and financial impact on the US health care system. *JAMA Internal Medicine*, 173(22), 2039–2046. Retrieved from <https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/1733452>

¹⁵ Office of Inspector General. (2014). Adverse events in skilled nursing facilities: National incidence among Medicare beneficiaries. Retrieved from <https://oig.hhs.gov/oei/reports/oei-06-11-00370.pdf>

enough to require transfer to an acute care hospital. It is important to recognize that HAIs in SNFs are not considered “never-events.” The goal of this risk-adjusted measure is to identify SNFs that have notably higher rates of HAIs acquired during SNF care, when compared to their peers and to the national average HAI rate. The SNF HAI measure provides information about a facility’s adeptness in infection prevention and management. The measure is actionable as it holds providers accountable as well as encourages them to improve the quality of care they deliver. Further, this measure promotes patient safety and increases the transparency of quality of care in the SNF setting.

2. Measure Specifications

This section describes the methodology used to construct the updated SNF HAI measure. Section 2.1 describes the data sources used. Section 2.2 describes SNF stay construction and measure inclusion/exclusion criteria. Sections 2.3 and 2.4 describe the denominator and numerator, respectively. Section 2.5 describes the risk adjustment model and variables used for risk adjustment. Section 2.6 presents the steps involved in calculating the final measure result. Section 2.7 describes the measure results.

2.1 Data Sources

This measure relies on data from Medicare FFS Part A claims, MA Encounter Data Records, and Medicare’s Enrollment Database, accessed via the CMS Centralized Data Repository (CDR) and the Integrated Data Repository (IDR) environments. The enrollment files provide beneficiary-level information such as date of birth, date of death, sex, reasons for Medicare eligibility, and enrollment histories in Medicare Parts A and C. The FFS claims and Medicare Advantage encounter files provide information about each SNF and hospital stay, including dates of admission and discharge, diagnoses and procedures, and indicators for care received. Claims and encounter data are used to construct for each person a history of care before the SNF stay, which is used for constructing risk adjustment variables. This measure also uses publicly available data, such as the Clinical Classification Software (CCS) and Hierarchical Condition Categories (HCC).

Documentation for the Medicare FFS claims data, Medicare Advantage encounter data, and Medicare enrollment data is provided online by the Chronic Conditions Data Warehouse (CCW). Data dictionaries for all standard analytical files are available at: <https://www2.ccwdata.org/web/quest/data-dictionaries>.

2.2 SNF Stay Construction and Measure Inclusion/Exclusion Criteria

2.2.1 Construct SNF and Hospital Stays

Construct SNF and hospital stays for the measure period. SNF and hospital stays are constructed using final action Medicare FFS Part A claims and MA Encounter Data Records. Stays are constructed by linking claims that share the same beneficiary identifier, facility CCN, and admission date. Records with missing or invalid admission dates are first assigned an admission date by linkage to other claims with valid admission dates within the same stay,

linked using beneficiary identifier, facility CCN, from date, through date, and patient status code. If no such linkage is identified, the admission date is imputed using the claim from date.

SNF stays considered for the denominator prior to exclusion criteria are those that end within the measure period, based on the discharge date. To implement exclusion criteria and apply risk adjustment, index SNF stays are linked to other stays and demographic and enrollment data using the beneficiary identifier. SNF stays considered for the denominator prior to exclusion criteria are those that end within the measure period, based on the discharge date.

2.2.2 Measure Time Window

The measure is calculated using one year of data. All SNF stays ending during the measure window, except those that meet the exclusion criteria, are included in the measure. For SNF patients/residents with multiple SNF stays during the one-year period, each stay is eligible for inclusion in the measure.

2.2.3 SNF Stay Exclusion Criteria

Index SNF stays are excluded from the measure calculation if any of the following exclusion criteria are met. All remaining index stays are eligible for measure calculation.

1. The beneficiary was under 18 years of age at the start of the stay.

Rationale: Residents under 18 years old are not included in the target population for this measure because there are few pediatric SNF residents and they may have different patterns of care than adults.

2. SNF length of stay was shorter than four days.

Rationale: HAIs that require hospitalization beginning day four after SNF admission will be identified as SNF HAIs. This helps exclude pre-existing infections from being included in the measure. SNF stays shorter than four days are not long enough for identifying SNF HAIs.

3. The beneficiary was not continuously enrolled in Medicare (Part A, Original Medicare, and/or Part C, Medicare Advantage) during the SNF stay, 365 days prior to the SNF stay, and 3 days after the end of the SNF stay.

Rationale: Certain risk adjustment elements for this measure require information on acute inpatient claims for one year prior to the SNF admission, and acute care utilization must be observable in the observation window following the end of SNF care. Residents without Medicare coverage will have incomplete inpatient claims or records.

4. The beneficiary was not discharged from a short-term acute care hospital within 30 days prior to SNF admission. The short-term stay must have a positive length of stay.

Rationale: This measure requires information from the prior short-term acute care hospital stay in the elements used for risk adjustment.

5. The beneficiary was discharged from the SNF to a federal hospital.

Rationale: Residents who are transferred to federal hospitals will have incomplete inpatient claims.

6. The SNF stay was outside the 50 states, District of Columbia, Puerto Rico, and U.S. Territories (determined via the CCN of the provider rendering care, using the SOM CCN-to-U.S. state mappings).

Rationale: Residents who received care from foreign providers may have incomplete inpatient claims, and these providers may not be subject to the same policy decisions related to the measure outcome

7. The SNF stay is associated with problematic or incomplete data. Data were missing on any variable used in measure construction or risk adjustment.

Rationale: The measure calculation requires accurate and complete information from the SNF stay, prior short-term acute-care hospital stays, and resident characteristics used for risk adjustment.

8. The index SNF stay occurred in a Critical Access Hospital (CAH) swing bed.

Rationale: Critical access hospitals are not required to submit quality data under the SNF QRP. Therefore, claims-based quality measures exclude swing bed stays in critical access hospitals.

2.3 Denominator

The measure denominator is the risk-adjusted expected number of SNF stays with the measure outcome. The calculation of the “expected” number of stays starts with the total eligible SNF stays which is then risk-adjusted for resident characteristics excluding the SNF effect. The “expected” number of stays with the measure outcome represents the predicted number of stays with the measure outcome if the same SNF residents were treated in the “average” SNF. Refer to section 2.5.1 for details on risk adjustment and to section 2.5.2.2 for the calculation of expected number of SNF stays with HAI.

2.4 Numerator

The measure numerator is the risk-adjusted predicted number of SNF stays with the measure outcome. This estimate starts with the observed HAIs, and it is risk-adjusted for patient/resident characteristics and a statistical estimate of the facility effect beyond case mix.

2.4.1. Identifying Numerator Events

Identify SNF stays with an HAI acquired during SNF care that results in an IP hospitalization within the measure incubation window. Steps 2.4.1.1 through 2.4.1.3 are used to identify numerator events:

2.4.1.1. Identify IP readmissions within the incubation window

Identify IP readmissions that fall within the measure’s incubation window, beginning on or after the fourth day of the SNF stay and within three days of SNF discharge.

2.4.1.2. Identify HAI diagnoses for numerator inclusion.

Search for HAI diagnoses in the principal diagnosis field of the readmitting IP claim. Only HAI diagnoses marked as present on admission (POA) within the IP claim are included in the measure numerator. See Table 1 in the Skilled Nursing Facility Healthcare Associated Infections Requiring Hospitalization Supplemental Codes workbook for a full list of ICD-10 codes included in the measure numerator for fiscal year (FY) 2025.

- If an HAI diagnosis is found, and is marked as POA, proceed to Step 2.4.1.3.
- If no HAI diagnosis is found, or if the HAI diagnosis is not marked as POA, then the infection is not counted toward the measure numerator.

2.4.1.3. Apply the 14-day repeat infection timeframe (RIT) to exclude preexisting infections.

Calculate the number of days between IP stays, which is defined as the difference between the discharge date of the most proximal IP stay prior to SNF admission and the admission date of the readmitting IP stay.

- If the number of days between IP stays is less than 14 days, then search for HAI-related conditions in all ICD-10 diagnosis codes of the prior IP stay. The preexisting infection recorded in the prior proximal hospitalization must be a diagnosis that is related to the HAI recorded in the rehospitalization. Related diagnoses include principal and comorbid ICD-10 diagnoses on the prior hospital claim. See Table 1 in the Skilled Nursing Facility Healthcare Associated Infections Requiring Hospitalization Supplemental Codes workbook for a full list of principal and comorbid ICD-10 codes.
 - If a preexisting condition is found, then the HAI case should be excluded from the measure numerator. The HAI case is considered a repeated infection.
 - If a preexisting condition is not found, then the HAI case should be included in the HAI numerator.
- If the number of days between IP stays is 14 days or greater, the diagnosis information recorded in the prior IP stay does not need to be accounted for. The case should be counted as an HAI for numerator inclusion.

Exhibit 1. Prevalence of Events Included in the SNF HAI Numerator Definition

HAI Category	FFS, n (%) N= 1,407,036	MA, n (%) N= 1,273,097	Total, n (%) N= 2,680,133
Total HAIs	101,612 (7.22%)	64,676 (5.08%)	166,288 (6.20%)
Sepsis	62,446 (4.44%)	39,526 (3.10%)	101,972 (3.80%)
Respiratory infections	15,209 (1.08%)	10,146 (0.80%)	25,355 (0.95%)
Infections related to devices or stumps	12,274 (0.87%)	8,156 (0.64%)	20,430 (0.76%)
Genito-urinary infections	8,135 (0.58%)	4,599 (0.36%)	12,734 (0.48%)
Skin infections	1,737 (0.12%)	1,033 (0.08%)	2,770 (0.10%)
Gastrointestinal infections	1,666 (0.12%)	1,131 (0.09%)	2,797 (0.10%)
Neurological infections	37 (0.00%)	28 (0.00%)	65 (0.00%)
Unknown site and unknown bugs	92 (0.01%)	49 (0.00%)	141 (0.01%)
Ear/eye infections	-	-	24 (<0.01%)

Note: Includes SNF stays eligible for the SNF HAI measure from fiscal year (FY) 2025. The FFS column represents statistics for stays that include only FFS claims. The MA column represents statistics for stays that include any Medicare Advantage encounter record. When the number of cases is less than 11, or could be calculated as less than 11, data are suppressed.

2.5 Statistical Risk Model and Risk Adjustment Covariates

2.5.1. Risk Adjustment Covariates

To account for beneficiary characteristics that may affect the risk of potentially preventable HAIs requiring hospitalization, the risk adjustment model uses potential risk factors associated with each SNF stay:

- Beneficiary age and sex category.
- Original Reason for Medicare Entitlement.
- Prior proximal IP stay surgery category.
- Prior proximal IP stay dialysis treatment (not including ESRD).
- Prior proximal IP stay principal diagnosis category, using CCS categories.
- Comorbidities based on the prior proximal acute care stay or a 365-day lookback.¹⁶
- Length of the prior proximal IP stay.
- Utilization of the ICU or CCU during the prior proximal IP stay.

¹⁶ Depending on the specific comorbidity, diagnoses are mapped to HCCs using principal or secondary ICD-10 diagnosis codes from IP claims; HCCs are constructed using either the secondary diagnoses from the prior proximal acute care stay or all diagnoses from IP stays, other than the prior proximal stay, in the 365-day lookback period.

- Number of prior IP stays within a 365-day lookback from the SNF admission date, excluding the most proximal hospitalization prior to the SNF admission.
- Medicare Advantage (Part C) coverage at the start of the SNF stay.

2.5.2 Calculate risk adjustment coefficients.

The measure utilizes a hierarchical logistic regression model to predict the probability of an HAI that is acquired during SNF care and results in hospitalization. The covariates listed in Section 2.5.1 are predictor variables in the model. The model estimates both the predictive effect of beneficiary characteristics across all SNFs, and the degree to which each SNF has an effect on the HAI outcome that differs from that of the average SNF. The measure utilizes the following model:

Let Y_{ij} denote the outcome (equal to 1 if the beneficiary i has an HAI that is acquired during SNF care and results in hospitalization) for a beneficiary i at SNF j ; Z_{ij} denotes a set of risk factors. It is assumed that the outcome is related linearly to the covariates via a logit function with dispersion:

$$\text{logit}(P(Y_{ij} = 1 | Z_{ij}, \alpha_j)) = \log \frac{P(Y_{ij} = 1 | Z_{ij}, \alpha_j)}{1 - P(Y_{ij} = 1 | Z_{ij}, \alpha_j)} = \alpha_j + \beta \cdot Z_{ij}$$

$$\alpha_j = \mu + \omega_j; \omega_j \sim N(0, \tau^2)$$

where $Z_{ij} = (Z_{ij1}, Z_{ij2}, \dots, Z_{ijk})$ is a set of k beneficiary-level covariates. α_j represents the SNF-specific intercepts of the j -th SNF which is assumed to follow a normal distribution with mean μ and variance τ^2 , independent of Z_{ij} . The estimated equation is used twice in the measure (to calculate the predicted value and the expected value below). The sum of the probabilities of HAIs, including both the effects of beneficiary characteristics and SNFs, is the "predicted number" of HAIs that are acquired during SNF care and result in hospitalization after adjusting for case mix. The same equation is used without the SNF effect to compute the "expected number" for the same beneficiaries at a SNF whose quality is at the national average level.

2.5.2.1 Calculate the predicted value.

To calculate the predicted number of HAIs for provider j , sum the predicted probabilities of HAI for all stays at provider j :

$$\text{Predicted Value}_j = \sum \frac{\exp(\hat{\alpha}_j + \hat{\beta} \cdot Z_{ij})}{\exp(\hat{\alpha}_j + \hat{\beta} \cdot Z_{ij}) + 1}$$

2.5.2.2 Calculate the expected value.

To calculate the expected number of HAIs for provider j , sum the predicted probabilities of HAI for all stays at provider j using the national average effect:

$$\text{Expected Value}_j = \sum \frac{\exp(\hat{\mu} + \hat{\beta} \cdot Z_{ij})}{\exp(\hat{\mu} + \hat{\beta} \cdot Z_{ij}) + 1}$$

2.6 Measure Calculation Algorithm

2.6.1 Determine the national observed HAI rate.

The national observed rate is the average observed HAI rate across all included SNF stays. To calculate the national observed rate, divide the total number of stays resulting in an HAI over the total number of SNF stays.

2.6.2 Calculate the standardized risk ratio (SRR).

Calculate the ratio of predicted to expected number of HAIs that are acquired during SNF care and result in hospitalization using the following formula:

$$\text{SRR}_j = \frac{\text{Predicted Value}_j}{\text{Expected Value}_j}$$

2.6.3 Multiply the SRR by the national average to produce the final risk-adjusted measure score.

Calculate the risk-standardized rate of HAIs that are acquired during SNF care and result in hospitalization for each SNF by multiplying the SRR_j (calculated in Section 2.6.2) by the overall national observed rate of HAIs, $\bar{Y}$ (calculated in Section 2.6.1).

$$\text{Risk Adjusted HAI Rate} = \text{SRR}_j \times \bar{Y}$$

2.7 Measure Results

Exhibit 2 shows the stay-level observed SNF HAI rate for all eligible SNF residents. The proportion of SNF residents with an HAI was 7.22 for stays covered by FFS (Part A), 5.08 for stays covered by MA (Part C), and 6.20 across all stays.

Exhibit 2. Stay-level observed SNF HAI Rate

Measure	FFS, n (%) N = 1,407,036	MA, n (%) N = 1,273,097	Total, n (%) N = 2,680,133
Stay-level Observed SNF HAI rate	101,612 (7.22)	64,676 (5.08)	166,288 (6.20)

Note: Includes SNF stays eligible for the HAI measure from FY 2025. The FFS column represents statistics for stays that include only FFS claims. The MA column represents statistics for stays that include any Medicare Advantage encounter record.

Exhibit 3 shows the SNF-level observed and risk standardized HAI rate for all SNFs, and the rate for SNFs with at least 25 eligible stays in the measure period. The risk standardized HAI rate was 6.31 across all SNFs and 6.32 for SNFs with at least 25 stays.

Exhibit 3. SNF-level observed and risk standardized HAI Rate

Measure	All SNFs N = 14,584	SNFs with 25+ Stays N = 13,273
Observed HAI rate	6.28	6.34
Risk standardized HAI rate	6.31	6.32

Note: Calculated using SNF stays eligible for the HAI measure from FY 2025.

3. Measure Testing

Below we provide testing results for the HAI measure including reportability, variability, reliability and validity.

3.1 Reportability

Reportability testing examines the total number and proportion of SNF providers that have at least 25 eligible SNF stays for the HAI measure in the reporting period. 13,273 SNFs out of 14,584 (91.01%) had at least 25 stays.

Exhibit 4. Publicly Reportable SNFs, FY 2025

Total Number of SNFs	Total Number of SNFs with ≥ 25 Stays	Percentage of SNFs with ≥ 25 Stays
14,584	13,273	91.01%

Note: HAI measure results calculated using FY 2025 data.

3.2 Variability

Variability testing summarizes the distribution of the provider-level final HAI results.

Exhibit 5. SNF-Level Distribution of HAI

N	Mean Score	Standard Deviation	Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum
13,273	6.32	1.04	3.08	5.60	6.19	6.91	12.35

Note: HAI results calculated using FY 2025 data from providers with at least 25 stays.

3.3 Reliability

The split-half reliability test examined agreement between two SNF HAI measure results for each SNF based on randomly split, independent subsets of observations for each SNF in the same measurement period. Good agreement between pairs of performance measure results

calculated in this manner provides evidence that the measure is capturing an attribute of the SNF rather than the effect of random chance.

For SNFs with at least 25 eligible stays in FY 2025, each SNF's residents were randomly divided into halves. We calculated a provider-level HAI result for each split-half sample. We used the Shrout-Fleiss intraclass correlation coefficient (ICC [2, 1]) with the Spearman-Brown correction to calculate agreement between the split-half results. The overall intraclass correlation coefficient for SNFs with more than 25 eligible residents was 0.44, which is low but statistically significant.

3.4 Validity

To evaluate convergent validity, we examined the relationships between provider HAI results and related SNF measures. Using Spearman's rank correlation, we compared providers' HAI results to quality measures that reflect similar care processes or outcomes. Since the SNF HAI measure fills a measurement gap in the program, correlations with other measures are not expected to be high by design.

We hypothesized that the SNFs that have a lower (better) result on SNF HAI are likely to have a higher (better) result on the DTC-PAC, Pneumococcal Vaccine, Influenza Vaccine, and RN Hours measures. As expected, those measures were negatively correlated with SNF HAI. Spearman's rank correlations were statistically significant using the alpha level of 0.05 for DTC-PAC and RN Hours, but not for the Pneumococcal Vaccine and Influenza Vaccine measures.

We hypothesized that the SNFs that have a lower (better) result on SNF HAI are likely to have a lower (better) result on PPR-PD. As expected, PPR-PD was negatively correlated with SNF HAI. The Spearman's rank correlation was statistically significant using the alpha level of 0.05.

The analysis used SNF HAI results calculated using FY 2025 data from providers with at least 25 stays.

Exhibit 6. Correlations Between SNF HAI and Other Publicly Reported Measures

Measure	N SNFs	Spearman's Correlation	p-value
Discharge to Community – Post Acute Care (DTC-PAC)	10,473	-0.246	< 0.001
Potentially Preventable 30-Day Post-Discharge Readmission (PPR-PD)	11,440	0.149	< 0.001
Percentage of short-stay residents assessed and appropriately given the pneumococcal vaccine	12,044	-0.015	0.089
Percentage of short-stay residents who were assessed and appropriately given the seasonal influenza vaccine	11,462	-0.018	0.056
Case-mix adjusted RN hours per resident day	11,709	-0.241	< 0.001

Note: RTI analysis of Medicare FFS claims data and Medicare Advantage encounter data (SNF HAI results calculated using FY 2025 data from providers with at least 25 stays), and publicly reported SNF quality measures (available for download at <https://data.cms.gov/provider-data>). Data collection periods for publicly reported SNF claims-based measures used in this analysis are the most recent available.

Appendix A. SNF HAI Risk-Adjustment Covariates

Exhibit 7 shows the prevalence of each risk factor for SNF stays eligible for the HAI measure from FY 2025, as well as risk adjustment coefficients and standard errors for the pooled (FFS and MA) population. The FFS column represents statistics for stays that include only FFS claims. The MA column represents statistics for stays that include any Medicare Advantage encounter record.

Exhibit 7. SNF HAI Risk-Adjustment Covariates Prevalence and Model Coefficients

Risk Factor	Prevalence			Risk Adjustment Model Coefficients	
	FFS (N=1,407,036)	MA (N=1,273,097)	Total (N=2,680,133)	Coefficient	P-value
MA coverage at start of stay	0 (0.0%)	1,267,674 (99.6%)	1,267,674 (47.3%)	-0.3892	<0.001
Male age 18 to 34	903 (0.1%)	358 (< 0.1%)	1,261 (< 0.1%)	-0.0366	0.7327
Male age 35 to 44	3,522 (0.3%)	1,913 (0.2%)	5,435 (0.2%)	-0.0441	0.4168
Male age 45 to 54	9,982 (0.7%)	8,468 (0.7%)	18,450 (0.7%)	-0.0262	0.4204
Male age 55 to 59	12,474 (0.9%)	12,217 (1.0%)	24,691 (0.9%)	0.0086	0.7666
Age 60-64 years, male [REFERENCE GROUP]	23,319 (1.7%)	25,429 (2.0%)	48,748 (1.8%)	-	-
Male age 65 to 69	64,857 (4.6%)	72,290 (5.7%)	137,147 (5.1%)	0.0937	<0.001
Male age 70 to 74	90,698 (6.4%)	92,445 (7.3%)	183,143 (6.8%)	0.1489	<0.001
Male age 75 to 79	105,518 (7.5%)	94,928 (7.5%)	200,446 (7.5%)	0.2438	<0.001
Male age 80 to 84	108,223 (7.7%)	92,531 (7.3%)	200,754 (7.5%)	0.3130	<0.001
Male age 85 to 89	90,287 (6.4%)	68,624 (5.4%)	158,911 (5.9%)	0.3576	<0.001
Male age 90 to 94	49,351 (3.5%)	34,246 (2.7%)	83,597 (3.1%)	0.3831	<0.001
Male age ≥ 95	16,031 (1.1%)	9,713 (0.8%)	25,744 (1.0%)	0.3841	<0.001
Female age 18 to 34	659 (< 0.1%)	345 (< 0.1%)	1,004 (< 0.1%)	-0.0417	0.7389
Female age 35 to 44	2,616 (0.2%)	1,972 (0.2%)	4,588 (0.2%)	-0.0069	0.9087
Female age 45 to 54	8,095 (0.6%)	9,157 (0.7%)	17,252 (0.6%)	-0.0572	0.1011
Female age 55 to 59	10,060 (0.7%)	13,003 (1.0%)	23,063 (0.9%)	0.0033	0.9162
Female age 60 to 64	19,694 (1.4%)	29,029 (2.3%)	48,723 (1.8%)	0.0448	0.0600
Female age 65 to 69	60,887 (4.3%)	81,761 (6.4%)	142,648 (5.3%)	0.0546	0.0029

Risk Factor	Prevalence			Risk Adjustment Model Coefficients	
	FFS (N=1,407,036)	MA (N=1,273,097)	Total (N=2,680,133)	Coefficient	P-value
Female age 70 to 74	104,682 (7.4%)	119,199 (9.4%)	223,881 (8.4%)	0.0902	<0.001
Female age 75 to 79	151,752 (10.8%)	149,053 (11.7%)	300,805 (11.2%)	0.1120	<0.001
Female age 80 to 84	166,424 (11.8%)	146,479 (11.5%)	312,903 (11.7%)	0.1141	<0.001
Female age 85 to 89	155,039 (11.0%)	116,534 (9.2%)	271,573 (10.1%)	0.0854	<0.001
Female age 90 to 94	104,116 (7.4%)	68,129 (5.4%)	172,245 (6.4%)	0.0783	<0.001
Female age ≥ 95	47,847 (3.4%)	25,274 (2.0%)	73,121 (2.7%)	0.0516	0.0328
Disability/ESRD	333,891 (23.7%)	378,749 (29.8%)	712,640 (26.6%)	0.0415	<0.001
Neurosurgery	16,559 (1.2%)	21,172 (1.7%)	37,731 (1.4%)	0.1149	<0.001
Ophthalmology	190 (< 0.1%)	192 (< 0.1%)	382 (< 0.1%)	0.3248	0.1070
Otolaryngology	2,177 (0.2%)	2,371 (0.2%)	4,548 (0.2%)	-0.1562	0.0155
Cardio Thoracic	14,055 (1.0%)	18,196 (1.4%)	32,251 (1.2%)	-0.2400	<0.001
Vascular Surgery	15,776 (1.1%)	20,741 (1.6%)	36,517 (1.4%)	-0.0720	0.0016
Urology	10,886 (0.8%)	9,512 (0.7%)	20,398 (0.8%)	0.0869	0.0011
Obstetrics/Gynecology	1,868 (0.1%)	1,927 (0.2%)	3,795 (0.1%)	-0.1991	0.0101
Orthopedics	206,782 (14.7%)	236,145 (18.5%)	442,927 (16.5%)	-0.2161	<0.001
Plastic Surgery	39,610 (2.8%)	45,309 (3.6%)	84,919 (3.2%)	0.0221	0.1281
General Surgery	63,515 (4.5%)	75,272 (5.9%)	138,787 (5.2%)	-0.0636	<0.001
Dialysis but not ESRD	14,035 (1.0%)	17,258 (1.4%)	31,293 (1.2%)	0.1566	<0.001
Reference: Collapsed CCS 10; 22; 36; 37; 53; 56; 86; 87; 88; 124; 167; 181; 183; 184; 191; 195; 203; 247; 254; 255; 256; 652; 654; 655; 663	22,785 (1.6%)	20,321 (1.6%)	43,106 (1.6%)	-	-
CCS 1- Tuberculosis	62 (< 0.1%)	56 (< 0.1%)	118 (< 0.1%)	0.1959	0.5791
CCS 2- Septicemia (except in labor)	199,068 (14.1%)	168,313 (13.2%)	367,381 (13.7%)	0.3864	<0.001
CCS 3- Bacterial infection; unspecified site	1,301 (0.1%)	1,276 (0.1%)	2,577 (0.1%)	0.6100	<0.001
CCS 4- Mycoses	1,047 (0.1%)	858 (0.1%)	1,905 (0.1%)	0.8485	<0.001
CCS 5- HIV infection	145 (< 0.1%)	126 (< 0.1%)	271 (< 0.1%)	0.2756	0.2329
CCS 6- Hepatitis	232 (< 0.1%)	247 (< 0.1%)	479 (< 0.1%)	0.2169	0.2747

Risk Factor	Prevalence			Risk Adjustment Model Coefficients	
	FFS (N=1,407,036)	MA (N=1,273,097)	Total (N=2,680,133)	Coefficient	P-value
CCS 7- Viral infection	1,197 (0.1%)	873 (0.1%)	2,070 (0.1%)	0.5287	<0.001
CCS 11- Cancer of head and neck	777 (0.1%)	904 (0.1%)	1,681 (0.1%)	0.4671	<0.001
CCS 12- Cancer of esophagus	395 (< 0.1%)	397 (< 0.1%)	792 (< 0.1%)	0.4352	<0.001
CCS 13- Cancer of stomach	467 (< 0.1%)	525 (< 0.1%)	992 (< 0.1%)	-0.0319	0.8251
CCS 14- Cancer of colon	2,956 (0.2%)	2,814 (0.2%)	5,770 (0.2%)	0.1202	0.0636
CCS 15- Cancer of rectum and anus	1,025 (0.1%)	1,022 (0.1%)	2,047 (0.1%)	0.3702	<0.001
CCS 16- Cancer of liver and intrahepatic bile duct	558 (< 0.1%)	582 (< 0.1%)	1,140 (< 0.1%)	0.6472	<0.001
CCS 17- Cancer of pancreas	967 (0.1%)	902 (0.1%)	1,869 (0.1%)	0.3658	<0.001
CCS 18- Cancer of other GI organs; peritoneum	436 (< 0.1%)	446 (< 0.1%)	882 (< 0.1%)	0.5750	<0.001
CCS 19- Cancer of bronchus; lung	2,310 (0.2%)	2,371 (0.2%)	4,681 (0.2%)	0.6287	<0.001
CCS 20- Cancer; other respiratory and intrathoracic	44 (< 0.1%)	47 (< 0.1%)	91 (< 0.1%)	0.7564	0.0263
CCS 21- Cancer of bone and connective tissue	386 (< 0.1%)	409 (< 0.1%)	795 (< 0.1%)	0.1283	0.4410
CCS 23- Other non-epithelial cancer of skin	310 (< 0.1%)	230 (< 0.1%)	540 (< 0.1%)	0.6775	<0.001
CCS 24- Cancer of breast	581 (< 0.1%)	439 (< 0.1%)	1,020 (< 0.1%)	0.3323	0.0167
CCS 27- Cancer of ovary	332 (< 0.1%)	271 (< 0.1%)	603 (< 0.1%)	0.2121	0.2556
CCS 28- Cancer of other female genital organs	160 (< 0.1%)	161 (< 0.1%)	321 (< 0.1%)	0.9245	<0.001
CCS 32- Cancer of bladder	1,039 (0.1%)	990 (0.1%)	2,029 (0.1%)	0.7858	<0.001
CCS 33- Cancer of kidney and renal pelvis	574 (< 0.1%)	609 (< 0.1%)	1,183 (< 0.1%)	0.4642	<0.001
CCS 34- Cancer of other urinary organs	111 (< 0.1%)	92 (< 0.1%)	203 (< 0.1%)	0.7156	0.0031
CCS 35- Cancer of brain and nervous system	1,051 (0.1%)	908 (0.1%)	1,959 (0.1%)	0.1680	0.1042
CCS 38- Non-Hodgkin's lymphoma	1,207 (0.1%)	1,137 (0.1%)	2,344 (0.1%)	0.8166	<0.001
CCS 39- Leukemias	804 (0.1%)	704 (0.1%)	1,508 (0.1%)	0.5187	<0.001
CCS 40- Multiple myeloma	750 (0.1%)	769 (0.1%)	1,519 (0.1%)	0.6333	<0.001
CCS 41- Cancer; other and unspecified primary	110 (< 0.1%)	115 (< 0.1%)	225 (< 0.1%)	0.7432	0.0015
CCS 42- Secondary malignancies	4,953 (0.4%)	4,880 (0.4%)	9,833 (0.4%)	0.6125	<0.001
CCS 43- Malignant neoplasm without specification of site	343 (< 0.1%)	356 (< 0.1%)	699 (< 0.1%)	0.7131	<0.001

Risk Factor	Prevalence			Risk Adjustment Model Coefficients	
	FFS (N=1,407,036)	MA (N=1,273,097)	Total (N=2,680,133)	Coefficient	P-value
CCS 44- Neoplasms of unspecified nature or uncertain behavior	963 (0.1%)	841 (0.1%)	1,804 (0.1%)	0.4950	<0.001
CCS 45- Maintenance chemotherapy; radiotherapy	732 (0.1%)	551 (< 0.1%)	1,283 (< 0.1%)	0.0699	0.5375
CCS 48- Thyroid disorders	1,219 (0.1%)	1,229 (0.1%)	2,448 (0.1%)	0.4782	<0.001
CCS 51- Other endocrine disorders	6,585 (0.5%)	5,409 (0.4%)	11,994 (0.4%)	0.3938	<0.001
CCS 52- Nutritional deficiencies	1,941 (0.1%)	1,589 (0.1%)	3,530 (0.1%)	0.5578	<0.001
CCS 54- Gout and other crystal arthropathies	1,253 (0.1%)	1,302 (0.1%)	2,555 (0.1%)	0.3290	<0.001
CCS 55- Fluid and electrolyte disorders	26,263 (1.9%)	20,449 (1.6%)	46,712 (1.7%)	0.4701	<0.001
CCS 57- Immunity disorders	112 (< 0.1%)	100 (< 0.1%)	212 (< 0.1%)	0.5472	0.0302
CCS 58- Other nutritional; endocrine; and metabolic disorders	7,597 (0.5%)	6,111 (0.5%)	13,708 (0.5%)	0.5237	<0.001
CCS 59- Deficiency and other anemia	6,573 (0.5%)	4,922 (0.4%)	11,495 (0.4%)	0.5509	<0.001
CCS 60- Acute posthemorrhagic anemia	4,131 (0.3%)	3,422 (0.3%)	7,553 (0.3%)	0.4016	<0.001
CCS 61- Sickle cell anemia	120 (< 0.1%)	116 (< 0.1%)	236 (< 0.1%)	-0.0027	0.9927
CCS 62- Coagulation and hemorrhagic disorders	3,127 (0.2%)	2,190 (0.2%)	5,317 (0.2%)	0.4566	<0.001
CCS 63- Diseases of white blood cells	558 (< 0.1%)	424 (< 0.1%)	982 (< 0.1%)	0.7395	<0.001
CCS 64- Other hematologic conditions	191 (< 0.1%)	176 (< 0.1%)	367 (< 0.1%)	0.5981	0.0019
CCS 76- Meningitis (except that caused by tuberculosis or sexually transmitted disease)	294 (< 0.1%)	354 (< 0.1%)	648 (< 0.1%)	0.6492	<0.001
CCS 77- Encephalitis (except that caused by tuberculosis or sexually transmitted disease)	612 (< 0.1%)	636 (< 0.1%)	1,248 (< 0.1%)	0.5102	<0.001
CCS 78- Other CNS infection and poliomyelitis	743 (0.1%)	928 (0.1%)	1,671 (0.1%)	0.3974	<0.001
CCS 79- Parkinson`s disease	5,161 (0.4%)	3,675 (0.3%)	8,836 (0.3%)	0.3441	<0.001
CCS 80- Multiple sclerosis	677 (< 0.1%)	729 (0.1%)	1,406 (0.1%)	0.5104	<0.001
CCS 81- Other hereditary and degenerative nervous system conditions	2,072 (0.1%)	1,579 (0.1%)	3,651 (0.1%)	0.2910	<0.001
CCS 82- Paralysis	502 (< 0.1%)	594 (< 0.1%)	1,096 (< 0.1%)	0.4650	<0.001
CCS 83- Epilepsy; convulsions	9,874 (0.7%)	8,345 (0.7%)	18,219 (0.7%)	0.2089	<0.001

Risk Factor	Prevalence			Risk Adjustment Model Coefficients	
	FFS (N=1,407,036)	MA (N=1,273,097)	Total (N=2,680,133)	Coefficient	P-value
CCS 84- Headache; including migraine	483 (< 0.1%)	536 (< 0.1%)	1,019 (< 0.1%)	0.1444	0.3910
CCS 85- Coma; stupor; and brain damage	98 (< 0.1%)	80 (< 0.1%)	178 (< 0.1%)	0.8506	<0.001
CCS 89- Blindness and vision defects	205 (< 0.1%)	157 (< 0.1%)	362 (< 0.1%)	0.0472	0.8689
CCS 90- Inflammation; infection of eye (except that caused by tuberculosis or sexually transmitted disease)	283 (< 0.1%)	238 (< 0.1%)	521 (< 0.1%)	0.5718	0.0011
CCS 91- Other eye disorders	202 (< 0.1%)	171 (< 0.1%)	373 (< 0.1%)	-0.2462	0.4109
CCS 92- Otitis media and related conditions	167 (< 0.1%)	137 (< 0.1%)	304 (< 0.1%)	1.0084	<0.001
CCS 93- Conditions associated with dizziness or vertigo	1,948 (0.1%)	1,632 (0.1%)	3,580 (0.1%)	-0.2243	0.0523
CCS 94- Other ear and sense organ disorders	146 (< 0.1%)	120 (< 0.1%)	266 (< 0.1%)	0.3639	0.1781
CCS 95- Other nervous system disorders	30,879 (2.2%)	24,797 (1.9%)	55,676 (2.1%)	0.4065	<0.001
CCS 96- Heart valve disorders	4,528 (0.3%)	4,738 (0.4%)	9,266 (0.3%)	0.2487	<0.001
CCS 97- Peri-; endo-; and myocarditis; cardiomyopathy (except that caused by tuberculosis or sexually transmitted disease)	1,895 (0.1%)	1,872 (0.1%)	3,767 (0.1%)	0.3576	<0.001
CCS 98- Essential hypertension	150 (< 0.1%)	383 (< 0.1%)	533 (< 0.1%)	-0.6102	0.0879
CCS 99- Hypertension with complications and secondary hypertension	74,627 (5.3%)	70,429 (5.5%)	145,056 (5.4%)	0.2946	<0.001
CCS 100- Acute myocardial infarction	11,509 (0.8%)	12,562 (1.0%)	24,071 (0.9%)	0.2340	<0.001
CCS 101- Coronary atherosclerosis and other heart disease	4,758 (0.3%)	6,235 (0.5%)	10,993 (0.4%)	0.0023	0.9687
CCS 102- Nonspecific chest pain	1,853 (0.1%)	1,533 (0.1%)	3,386 (0.1%)	0.2448	0.0031
CCS 103- Pulmonary heart disease	9,707 (0.7%)	9,645 (0.8%)	19,352 (0.7%)	0.4300	<0.001
CCS 104- Other and ill-defined heart disease	503 (< 0.1%)	511 (< 0.1%)	1,014 (< 0.1%)	0.2294	0.1292
CCS 105- Conduction disorders	3,929 (0.3%)	3,919 (0.3%)	7,848 (0.3%)	0.0429	0.4780
CCS 106- Cardiac dysrhythmias	21,157 (1.5%)	18,924 (1.5%)	40,081 (1.5%)	0.3826	<0.001
CCS 107- Cardiac arrest and ventricular fibrillation	457 (< 0.1%)	544 (< 0.1%)	1,001 (< 0.1%)	0.1358	0.2884

Risk Factor	Prevalence			Risk Adjustment Model Coefficients	
	FFS (N=1,407,036)	MA (N=1,273,097)	Total (N=2,680,133)	Coefficient	P-value
CCS 108- Congestive heart failure; nonhypertensive	4,399 (0.3%)	3,569 (0.3%)	7,968 (0.3%)	0.3104	<0.001
CCS 109- Acute cerebrovascular disease	45,309 (3.2%)	49,397 (3.9%)	94,706 (3.5%)	0.4617	<0.001
CCS 110- Occlusion or stenosis of precerebral arteries	1,376 (0.1%)	1,490 (0.1%)	2,866 (0.1%)	0.2253	0.0164
CCS 111- Other and ill-defined cerebrovascular disease	596 (< 0.1%)	732 (0.1%)	1,328 (< 0.1%)	0.0726	0.5976
CCS 112- Transient cerebral ischemia	3,321 (0.2%)	2,751 (0.2%)	6,072 (0.2%)	0.2040	0.0032
CCS 113- Late effects of cerebrovascular disease	3,292 (0.2%)	3,387 (0.3%)	6,679 (0.2%)	0.2425	<0.001
CCS 114- Peripheral and visceral atherosclerosis	3,750 (0.3%)	4,354 (0.3%)	8,104 (0.3%)	0.5066	<0.001
CCS 115- Aortic; peripheral; and visceral artery aneurysms	2,138 (0.2%)	2,728 (0.2%)	4,866 (0.2%)	0.0670	0.3581
CCS 116- Aortic and peripheral arterial embolism or thrombosis	610 (< 0.1%)	689 (0.1%)	1,299 (< 0.1%)	0.4569	<0.001
CCS 117- Other circulatory disease	10,069 (0.7%)	9,136 (0.7%)	19,205 (0.7%)	0.2616	<0.001
CCS 118- Phlebitis; thrombophlebitis and thromboembolism	4,944 (0.4%)	4,858 (0.4%)	9,802 (0.4%)	0.4233	<0.001
CCS 119- Varicose veins of lower extremity	364 (< 0.1%)	360 (< 0.1%)	724 (< 0.1%)	0.4118	0.0112
CCS 120- Hemorrhoids	948 (0.1%)	747 (0.1%)	1,695 (0.1%)	0.4189	<0.001
CCS 121- Other diseases of veins and lymphatics	1,533 (0.1%)	1,327 (0.1%)	2,860 (0.1%)	0.2311	0.0115
CCS 122- Pneumonia (except that caused by tuberculosis or sexually transmitted disease)	56,964 (4.0%)	43,652 (3.4%)	100,616 (3.8%)	0.5438	<0.001
CCS 123- Influenza	10,017 (0.7%)	8,290 (0.7%)	18,307 (0.7%)	0.3811	<0.001
CCS 125- Acute bronchitis	1,332 (0.1%)	877 (0.1%)	2,209 (0.1%)	0.3708	<0.001
CCS 126- Other upper respiratory infections	578 (< 0.1%)	398 (< 0.1%)	976 (< 0.1%)	0.3425	0.0211
CCS 127- Chronic obstructive pulmonary disease and bronchiectasis	10,351 (0.7%)	9,778 (0.8%)	20,129 (0.8%)	0.6111	<0.001
CCS 128- Asthma	649 (< 0.1%)	515 (< 0.1%)	1,164 (< 0.1%)	0.4869	<0.001
CCS 129- Aspiration pneumonitis; food/vomitus	14,771 (1.0%)	9,486 (0.7%)	24,257 (0.9%)	0.5310	<0.001

Risk Factor	Prevalence			Risk Adjustment Model Coefficients	
	FFS (N=1,407,036)	MA (N=1,273,097)	Total (N=2,680,133)	Coefficient	P-value
CCS 130- Pleurisy; pneumothorax; pulmonary collapse	3,275 (0.2%)	2,817 (0.2%)	6,092 (0.2%)	0.3969	<0.001
CCS 131- Respiratory failure; insufficiency; arrest (adult)	19,907 (1.4%)	18,240 (1.4%)	38,147 (1.4%)	0.5178	<0.001
CCS 132- Lung disease due to external agents	390 (< 0.1%)	286 (< 0.1%)	676 (< 0.1%)	0.5061	<0.001
CCS 133- Other lower respiratory disease	2,413 (0.2%)	1,996 (0.2%)	4,409 (0.2%)	0.5990	<0.001
CCS 134- Other upper respiratory disease	642 (< 0.1%)	486 (< 0.1%)	1,128 (< 0.1%)	0.3191	0.0078
CCS 135- Intestinal infection	7,175 (0.5%)	5,831 (0.5%)	13,006 (0.5%)	0.6096	<0.001
CCS 136- Disorders of teeth and jaw	265 (< 0.1%)	216 (< 0.1%)	481 (< 0.1%)	0.0751	0.7577
CCS 137- Diseases of mouth; excluding dental	505 (< 0.1%)	308 (< 0.1%)	813 (< 0.1%)	0.6350	<0.001
CCS 138- Esophageal disorders	2,014 (0.1%)	1,628 (0.1%)	3,642 (0.1%)	0.2955	<0.001
CCS 139- Gastroduodenal ulcer (except hemorrhage)	841 (0.1%)	955 (0.1%)	1,796 (0.1%)	0.2127	0.0625
CCS 140- Gastritis and duodenitis	2,792 (0.2%)	2,084 (0.2%)	4,876 (0.2%)	0.4044	<0.001
CCS 141- Other disorders of stomach and duodenum	982 (0.1%)	847 (0.1%)	1,829 (0.1%)	0.3119	0.0015
CCS 142- Appendicitis and other appendiceal conditions	627 (< 0.1%)	605 (< 0.1%)	1,232 (< 0.1%)	0.0370	0.8107
CCS 143- Abdominal hernia	4,612 (0.3%)	4,043 (0.3%)	8,655 (0.3%)	0.0373	0.5372
CCS 144- Regional enteritis and ulcerative colitis	570 (< 0.1%)	495 (< 0.1%)	1,065 (< 0.1%)	0.7173	<0.001
CCS 145- Intestinal obstruction without hernia	10,661 (0.8%)	8,431 (0.7%)	19,092 (0.7%)	0.2965	<0.001
CCS 146- Diverticulosis and diverticulitis	7,240 (0.5%)	6,073 (0.5%)	13,313 (0.5%)	0.2902	<0.001
CCS 147- Anal and rectal conditions	1,728 (0.1%)	1,379 (0.1%)	3,107 (0.1%)	0.3907	<0.001
CCS 148- Peritonitis and intestinal abscess	598 (< 0.1%)	640 (0.1%)	1,238 (< 0.1%)	0.5347	<0.001
CCS 149- Biliary tract disease	7,304 (0.5%)	6,257 (0.5%)	13,561 (0.5%)	0.4041	<0.001
CCS 151- Other liver diseases	5,879 (0.4%)	5,656 (0.4%)	11,535 (0.4%)	0.4389	<0.001
CCS 152- Pancreatic disorders (not diabetes)	2,038 (0.1%)	1,929 (0.2%)	3,967 (0.1%)	0.3811	<0.001
CCS 153- Gastrointestinal hemorrhage	18,179 (1.3%)	14,835 (1.2%)	33,014 (1.2%)	0.3381	<0.001

Risk Factor	Prevalence			Risk Adjustment Model Coefficients	
	FFS (N=1,407,036)	MA (N=1,273,097)	Total (N=2,680,133)	Coefficient	P-value
CCS 154- Noninfectious gastroenteritis	3,862 (0.3%)	2,889 (0.2%)	6,751 (0.3%)	0.4917	<0.001
CCS 155- Other gastrointestinal disorders	7,573 (0.5%)	5,569 (0.4%)	13,142 (0.5%)	0.4088	<0.001
CCS 156- Nephritis; nephrosis; renal sclerosis	150 (< 0.1%)	128 (< 0.1%)	278 (< 0.1%)	0.5601	0.0090
CCS 157- Acute and unspecified renal failure	41,742 (3.0%)	38,810 (3.0%)	80,552 (3.0%)	0.5415	<0.001
CCS 158- Chronic kidney disease	153 (< 0.1%)	217 (< 0.1%)	370 (< 0.1%)	0.4320	0.0319
CCS 159- Urinary tract infections	62,439 (4.4%)	44,679 (3.5%)	107,118 (4.0%)	0.6090	<0.001
CCS 160- Calculus of urinary tract	661 (< 0.1%)	534 (< 0.1%)	1,195 (< 0.1%)	0.6520	<0.001
CCS 161- Other diseases of kidney and ureters	1,458 (0.1%)	1,188 (0.1%)	2,646 (0.1%)	0.7607	<0.001
CCS 162- Other diseases of bladder and urethra	936 (0.1%)	789 (0.1%)	1,725 (0.1%)	0.7267	<0.001
CCS 163- Genitourinary symptoms and ill-defined conditions	1,267 (0.1%)	907 (0.1%)	2,174 (0.1%)	0.9560	<0.001
CCS 164- Hyperplasia of prostate	956 (0.1%)	727 (0.1%)	1,683 (0.1%)	0.8793	<0.001
CCS 165- Inflammatory conditions of male genital organs	754 (0.1%)	707 (0.1%)	1,461 (0.1%)	0.4354	<0.001
CCS 166- Other male genital disorders	184 (< 0.1%)	148 (< 0.1%)	332 (< 0.1%)	0.2458	0.2952
CCS 168- Inflammatory diseases of female pelvic organs	188 (< 0.1%)	204 (< 0.1%)	392 (< 0.1%)	0.1481	0.5468
CCS 173- Menopausal disorders	153 (< 0.1%)	109 (< 0.1%)	262 (< 0.1%)	0.6316	0.0084
CCS 175- Other female genital disorders	355 (< 0.1%)	294 (< 0.1%)	649 (< 0.1%)	0.5485	<0.001
CCS 197- Skin and subcutaneous tissue infections	18,520 (1.3%)	16,205 (1.3%)	34,725 (1.3%)	0.4298	<0.001
CCS 198- Other inflammatory condition of skin	500 (< 0.1%)	421 (< 0.1%)	921 (< 0.1%)	0.9251	<0.001
CCS 199- Chronic ulcer of skin	4,957 (0.4%)	4,116 (0.3%)	9,073 (0.3%)	0.5595	<0.001
CCS 200- Other skin disorders	217 (< 0.1%)	194 (< 0.1%)	411 (< 0.1%)	0.4728	0.0179
CCS 201- Infective arthritis and osteomyelitis (except that caused by tuberculosis or sexually transmitted disease)	6,259 (0.4%)	6,459 (0.5%)	12,718 (0.5%)	0.4389	<0.001
CCS 202- Rheumatoid arthritis and related disease	444 (< 0.1%)	503 (< 0.1%)	947 (< 0.1%)	0.4476	0.0023
CCS 204- Other non-traumatic joint disorders	3,483 (0.2%)	2,804 (0.2%)	6,287 (0.2%)	0.1576	0.0305

Risk Factor	Prevalence			Risk Adjustment Model Coefficients	
	FFS (N=1,407,036)	MA (N=1,273,097)	Total (N=2,680,133)	Coefficient	P-value
CCS 207- Pathological fracture	26,430 (1.9%)	25,949 (2.0%)	52,379 (2.0%)	0.3635	<0.001
CCS 208- Acquired foot deformities	274 (< 0.1%)	201 (< 0.1%)	475 (< 0.1%)	-0.9561	0.0611
CCS 209- Other acquired deformities	1,506 (0.1%)	1,792 (0.1%)	3,298 (0.1%)	-0.0033	0.9770
CCS 210- Systemic lupus erythematosus and connective tissue disorders	402 (< 0.1%)	342 (< 0.1%)	744 (< 0.1%)	0.3504	0.0207
CCS 211- Other connective tissue disease	11,460 (0.8%)	10,825 (0.9%)	22,285 (0.8%)	0.3580	<0.001
CCS 212- Other bone disease and musculoskeletal deformities	1,000 (0.1%)	1,117 (0.1%)	2,117 (0.1%)	0.3071	0.0076
CCS 225- Joint disorders and dislocations; trauma-related	1,287 (0.1%)	1,180 (0.1%)	2,467 (0.1%)	0.4473	<0.001
CCS 226- Fracture of neck of femur (hip)	87,013 (6.2%)	97,988 (7.7%)	185,001 (6.9%)	0.4889	<0.001
CCS 227- Spinal cord injury	814 (0.1%)	1,026 (0.1%)	1,840 (0.1%)	0.7877	<0.001
CCS 228- Skull and face fractures	1,503 (0.1%)	1,355 (0.1%)	2,858 (0.1%)	0.1827	0.0771
CCS 229- Fracture of upper limb	16,981 (1.2%)	15,178 (1.2%)	32,159 (1.2%)	0.2461	<0.001
CCS 230- Fracture of lower limb	33,367 (2.4%)	37,142 (2.9%)	70,509 (2.6%)	0.3691	<0.001
CCS 231- Other fractures	47,082 (3.3%)	44,071 (3.5%)	91,153 (3.4%)	0.2717	<0.001
CCS 232- Sprains and strains	2,186 (0.2%)	1,772 (0.1%)	3,958 (0.1%)	0.0203	0.8374
CCS 233- Intracranial injury	17,836 (1.3%)	17,408 (1.4%)	35,244 (1.3%)	0.2950	<0.001
CCS 234- Crushing injury or internal injury	3,131 (0.2%)	3,427 (0.3%)	6,558 (0.2%)	0.3378	<0.001
CCS 235- Open wounds of head; neck; and trunk	1,298 (0.1%)	1,002 (0.1%)	2,300 (0.1%)	0.4285	<0.001
CCS 236- Open wounds of extremities	1,204 (0.1%)	1,006 (0.1%)	2,210 (0.1%)	0.5466	<0.001
CCS 237- Complication of device; implant or graft	58,088 (4.1%)	48,724 (3.8%)	106,812 (4.0%)	0.4191	<0.001
CCS 238- Complications of surgical procedures or medical care	24,741 (1.8%)	25,799 (2.0%)	50,540 (1.9%)	0.3720	<0.001
CCS 239- Superficial injury; contusion	4,965 (0.4%)	4,257 (0.3%)	9,222 (0.3%)	0.3030	<0.001
CCS 240- Burns	608 (< 0.1%)	828 (0.1%)	1,436 (0.1%)	0.3677	0.0011
CCS 241- Poisoning by psychotropic agents	418 (< 0.1%)	415 (< 0.1%)	833 (< 0.1%)	0.3203	0.0484

Risk Factor	Prevalence			Risk Adjustment Model Coefficients	
	FFS (N=1,407,036)	MA (N=1,273,097)	Total (N=2,680,133)	Coefficient	P-value
CCS 244- Other injuries and conditions due to external causes	8,253 (0.6%)	7,849 (0.6%)	16,102 (0.6%)	0.3453	<0.001
CCS 245- Syncope	4,078 (0.3%)	3,326 (0.3%)	7,404 (0.3%)	0.1534	0.0175
CCS 246- Fever of unknown origin	338 (< 0.1%)	228 (< 0.1%)	566 (< 0.1%)	0.2244	0.2547
CCS 248- Gangrene	2,455 (0.2%)	2,759 (0.2%)	5,214 (0.2%)	0.6132	<0.001
CCS 249- Shock	564 (< 0.1%)	607 (< 0.1%)	1,171 (< 0.1%)	0.3997	<0.001
CCS 250- Nausea and vomiting	444 (< 0.1%)	341 (< 0.1%)	785 (< 0.1%)	0.4732	0.0019
CCS 251- Abdominal pain	468 (< 0.1%)	321 (< 0.1%)	789 (< 0.1%)	0.5692	<0.001
CCS 252- Malaise and fatigue	5,616 (0.4%)	4,603 (0.4%)	10,219 (0.4%)	0.3735	<0.001
CCS 253- Allergic reactions	382 (< 0.1%)	284 (< 0.1%)	666 (< 0.1%)	0.4412	0.0057
CCS 257- Other aftercare	970 (0.1%)	628 (< 0.1%)	1,598 (0.1%)	-0.1870	0.1954
CCS 258- Other screening for suspected conditions (not mental disorders or infectious disease)	263 (< 0.1%)	175 (< 0.1%)	438 (< 0.1%)	0.4514	0.0282
CCS 259- Residual codes; unclassified	1,991 (0.1%)	1,285 (0.1%)	3,276 (0.1%)	0.3976	<0.001
CCS 650- Adjustment disorders	215 (< 0.1%)	111 (< 0.1%)	326 (< 0.1%)	-0.3590	0.2918
CCS 651- Anxiety disorders	337 (< 0.1%)	248 (< 0.1%)	585 (< 0.1%)	-0.0311	0.8953
CCS 653- Delirium dementia and amnestic and other cognitive disorders	21,152 (1.5%)	11,890 (0.9%)	33,042 (1.2%)	0.2369	<0.001
CCS 656- Impulse control disorders NEC	44 (< 0.1%)	30 (< 0.1%)	74 (< 0.1%)	-0.3678	0.6100
CCS 657- Mood disorders	5,330 (0.4%)	2,077 (0.2%)	7,407 (0.3%)	-0.0397	0.5865
CCS 660- Alcohol-related disorders	5,862 (0.4%)	6,367 (0.5%)	12,229 (0.5%)	0.2181	<0.001
CCS 661- Substance-related disorders	641 (< 0.1%)	689 (0.1%)	1,330 (< 0.1%)	0.1157	0.4346
CCS 662- Suicide and intentional self-inflicted injury	397 (< 0.1%)	317 (< 0.1%)	714 (< 0.1%)	-0.4263	0.0577
CCS 670- Miscellaneous mental health disorders	396 (< 0.1%)	435 (< 0.1%)	831 (< 0.1%)	-0.2767	0.2125
CCS 8_9- Other infections; including parasitic and Sexually transmitted infections (not HIV or hepatitis)	351 (< 0.1%)	339 (< 0.1%)	690 (< 0.1%)	-0.2743	0.2319
CCS 25_26- Cancer of uterus and cervix	479 (< 0.1%)	502 (< 0.1%)	981 (< 0.1%)	0.6865	<0.001

Risk Factor	Prevalence			Risk Adjustment Model Coefficients	
	FFS (N=1,407,036)	MA (N=1,273,097)	Total (N=2,680,133)	Coefficient	P-value
CCS 29_31- Male cancer group	574 (< 0.1%)	510 (< 0.1%)	1,084 (< 0.1%)	0.5147	<0.001
CCS 46_47- Benign neoplasm of uterus and Other and unspecified benign neoplasm	1,901 (0.1%)	1,964 (0.2%)	3,865 (0.1%)	0.4121	<0.001
CCS 49_50- Diabetes mellitus with and without complication	31,721 (2.3%)	39,518 (3.1%)	71,239 (2.7%)	0.3990	<0.001
CCS 658_659- Personality disorders and Schizophrenia and other psychotic disorders	8,379 (0.6%)	1,247 (0.1%)	9,626 (0.4%)	-0.0661	0.3188
CCS 169_172-Endometriosis, Prolapse of female genital organs, Menstrual disorders, and Ovarian cyst	106 (< 0.1%)	90 (< 0.1%)	196 (< 0.1%)	0.2965	0.4432
CCS 205_206-Spondylosis; intervertebral disc disorders; other back problems and Osteoporosis	22,491 (1.6%)	26,540 (2.1%)	49,031 (1.8%)	0.2953	<0.001
CCS 213_217- Cardiac and circulatory, Digestive, Genitourinary, Nervous system, and other congenital anomalies	405 (< 0.1%)	406 (< 0.1%)	811 (< 0.1%)	0.1196	0.4970
CCS 242_2617- Poisoning by other medications and drugs and nonmedicinal substances, and Adverse effects of medical drugs	2,413 (0.2%)	2,444 (0.2%)	4,857 (0.2%)	0.2602	<0.001
HCC1: HIV/AIDS	5,558 (0.4%)	6,052 (0.5%)	11,610 (0.4%)	0.0786	0.0256
HCC2: Septicemia, Sepsis, Systemic Inflammatory Response Syndrome/Shock	430,939 (30.6%)	379,680 (29.8%)	810,619 (30.2%)	0.1812	<0.001
HCC6: Opportunistic Infections	13,978 (1.0%)	12,858 (1.0%)	26,836 (1.0%)	0.1841	<0.001
HCC8: Metastatic Cancer and Acute Leukemia	53,210 (3.8%)	49,110 (3.9%)	102,320 (3.8%)	0.3565	<0.001
HCC9: Lung and Other Severe Cancers	32,074 (2.3%)	29,939 (2.4%)	62,013 (2.3%)	0.1987	<0.001
HCC10: Lymphoma and Other Cancers	26,604 (1.9%)	21,946 (1.7%)	48,550 (1.8%)	0.1942	<0.001
HCC11: Colorectal, Bladder, and Other Cancers	24,313 (1.7%)	22,168 (1.7%)	46,481 (1.7%)	0.1162	<0.001
HCC12: Breast, Prostate, and Other Cancers and Tumors	41,058 (2.9%)	37,418 (2.9%)	78,476 (2.9%)	0.0114	0.4513
HCC17: Diabetes with Acute Complications	23,296 (1.7%)	28,235 (2.2%)	51,531 (1.9%)	0.0837	<0.001

Risk Factor	Prevalence			Risk Adjustment Model Coefficients	
	FFS (N=1,407,036)	MA (N=1,273,097)	Total (N=2,680,133)	Coefficient	P-value
HCC18: Diabetes with Chronic Complications	463,400 (32.9%)	479,187 (37.6%)	942,587 (35.2%)	0.1033	<0.001
HCC19: Diabetes without Complication	107,471 (7.6%)	96,190 (7.6%)	203,661 (7.6%)	0.0789	<0.001
HCC21: Protein-Calorie Malnutrition	325,833 (23.2%)	282,159 (22.2%)	607,992 (22.7%)	0.1548	<0.001
HCC22: Morbid Obesity	174,745 (12.4%)	193,183 (15.2%)	367,928 (13.7%)	0.0791	<0.001
HCC23: Other Significant Endocrine and Metabolic Disorders	144,208 (10.2%)	134,640 (10.6%)	278,848 (10.4%)	0.0455	<0.001
HCC27: End-Stage Liver Disease	29,733 (2.1%)	30,455 (2.4%)	60,188 (2.2%)	0.1415	<0.001
HCC28: Cirrhosis of Liver	32,105 (2.3%)	34,360 (2.7%)	66,465 (2.5%)	0.0599	<0.001
HCC29: Chronic Hepatitis	7,563 (0.5%)	8,334 (0.7%)	15,897 (0.6%)	0.0053	0.8623
HCC33: Intestinal Obstruction/Perforation	106,293 (7.6%)	93,010 (7.3%)	199,303 (7.4%)	0.0089	0.3486
HCC34: Chronic Pancreatitis	8,931 (0.6%)	9,796 (0.8%)	18,727 (0.7%)	0.0102	0.7152
HCC35: Inflammatory Bowel Disease	18,118 (1.3%)	15,130 (1.2%)	33,248 (1.2%)	0.0238	0.2775
HCC39: Bone/Joint/Muscle Infections/Necrosis	85,080 (6.0%)	91,899 (7.2%)	176,979 (6.6%)	-0.0481	<0.001
HCC40: Rheumatoid Arthritis and Inflammatory Connective Tissue Disease	93,329 (6.6%)	84,111 (6.6%)	177,440 (6.6%)	0.0957	<0.001
HCC46: Severe Hematological Disorders	13,180 (0.9%)	10,518 (0.8%)	23,698 (0.9%)	0.1263	<0.001
HCC47: Disorders of Immunity	92,236 (6.6%)	83,521 (6.6%)	175,757 (6.6%)	0.0555	<0.001
HCC48: Coagulation Defects and Other Specified Hematological Disorders	258,420 (18.4%)	236,666 (18.6%)	495,086 (18.5%)	0.0207	0.0016
HCC51: Dementia With Complications	215,809 (15.3%)	143,612 (11.3%)	359,421 (13.4%)	0.0311	<0.001
HCC52: Dementia Without Complication	226,019 (16.1%)	161,976 (12.7%)	387,995 (14.5%)	0.0583	<0.001
HCC54: Substance Use with Psychotic Complications	7,887 (0.6%)	8,158 (0.6%)	16,045 (0.6%)	-0.4468	<0.001
HCC55: Substance Use Disorder, Moderate/ Severe, or Substance Use with Complications	71,284 (5.1%)	79,402 (6.2%)	150,686 (5.6%)	-0.1201	<0.001
HCC56: Substance Use Disorder, Mild, Except Alcohol or Cannabis	8,593 (0.6%)	10,736 (0.8%)	19,329 (0.7%)	-0.1807	<0.001
HCC57: Schizophrenia	56,626 (4.0%)	26,262 (2.1%)	82,888 (3.1%)	-0.0047	0.7543

Risk Factor	Prevalence			Risk Adjustment Model Coefficients	
	FFS (N=1,407,036)	MA (N=1,273,097)	Total (N=2,680,133)	Coefficient	P-value
HCC58: Reactive and Unspecified Psychosis	10,083 (0.7%)	6,871 (0.5%)	16,954 (0.6%)	0.0673	0.0259
HCC59: Major Depressive, Bipolar, and Paranoid Disorders	128,334 (9.1%)	132,709 (10.4%)	261,043 (9.7%)	-0.0572	<0.001
HCC60: Personality Disorders	1,732 (0.1%)	1,384 (0.1%)	3,116 (0.1%)	-0.0709	0.3483
HCC70: Quadriplegia	26,748 (1.9%)	12,533 (1.0%)	39,281 (1.5%)	0.2878	<0.001
HCC71: Paraplegia	12,295 (0.9%)	9,026 (0.7%)	21,321 (0.8%)	0.2270	<0.001
HCC72: Spinal Cord Disorders/Injuries	22,842 (1.6%)	24,943 (2.0%)	47,785 (1.8%)	0.0993	<0.001
HCC73: Amyotrophic Lateral Sclerosis and Other Motor Neuron Disease	1,405 (0.1%)	928 (0.1%)	2,333 (0.1%)	0.0985	0.1919
HCC74: Cerebral Palsy	6,942 (0.5%)	3,204 (0.3%)	10,146 (0.4%)	0.1394	<0.001
HCC75: Myasthenia Gravis/Myoneural Disorders and Guillain-Barre Syndrome/Inflammatory and Toxic Neuropathy	16,173 (1.1%)	14,457 (1.1%)	30,630 (1.1%)	0.0135	0.5440
HCC76: Muscular Dystrophy	1,299 (0.1%)	980 (0.1%)	2,279 (0.1%)	0.1204	0.1348
HCC77: Multiple Sclerosis	14,486 (1.0%)	11,926 (0.9%)	26,412 (1.0%)	0.2099	<0.001
HCC78: Parkinson's and Huntington's Diseases	78,890 (5.6%)	55,700 (4.4%)	134,590 (5.0%)	0.0427	<0.001
HCC79: Seizure Disorders and Convulsions	125,304 (8.9%)	100,753 (7.9%)	226,057 (8.4%)	0.0011	0.9092
HCC80: Coma, Brain Compression/Anoxic Damage	32,776 (2.3%)	29,581 (2.3%)	62,357 (2.3%)	0.1171	<0.001
HCC82: Respirator Dependence/Tracheostomy Status	13,976 (1.0%)	11,258 (0.9%)	25,234 (0.9%)	0.4041	<0.001
HCC83: Respiratory Arrest	185 (< 0.1%)	294 (< 0.1%)	479 (< 0.1%)	-0.0920	0.6149
HCC84: Cardio-Respiratory Failure and Shock	472,722 (33.6%)	436,316 (34.3%)	909,038 (33.9%)	0.1238	<0.001
HCC85: Congestive Heart Failure	617,570 (43.9%)	566,552 (44.5%)	1,184,122 (44.2%)	0.0623	<0.001
HCC86: Acute Myocardial Infarction	155,268 (11.0%)	151,203 (11.9%)	306,471 (11.4%)	-0.0261	0.0014
HCC87: Unstable Angina and Other Acute Ischemic Heart Disease	82,816 (5.9%)	73,355 (5.8%)	156,171 (5.8%)	-0.0056	0.5879
HCC88: Angina Pectoris	12,991 (0.9%)	14,020 (1.1%)	27,011 (1.0%)	-0.0902	<0.001
HCC96: Specified Heart Arrhythmias	597,547 (42.5%)	520,715 (40.9%)	1,118,262 (41.7%)	0.0735	<0.001

Risk Factor	Prevalence			Risk Adjustment Model Coefficients	
	FFS (N=1,407,036)	MA (N=1,273,097)	Total (N=2,680,133)	Coefficient	P-value
HCC99: Intracranial Hemorrhage	30,056 (2.1%)	30,260 (2.4%)	60,316 (2.3%)	0.0058	0.7531
HCC100: Ischemic or Unspecified Stroke	84,399 (6.0%)	87,851 (6.9%)	172,250 (6.4%)	0.0331	0.0073
HCC103: Hemiplegia/Hemiparesis	122,284 (8.7%)	114,880 (9.0%)	237,164 (8.8%)	0.0366	<0.001
HCC104: Monoplegia, Other Paralytic Syndromes	8,505 (0.6%)	8,261 (0.6%)	16,766 (0.6%)	-0.0319	0.3319
HCC106: Atherosclerosis of the Extremities with Ulceration or Gangrene	51,981 (3.7%)	58,466 (4.6%)	110,447 (4.1%)	0.2361	<0.001
HCC107: Vascular Disease with Complications	77,037 (5.5%)	76,914 (6.0%)	153,951 (5.7%)	0.0190	0.0879
HCC108: Vascular Disease	258,711 (18.4%)	257,080 (20.2%)	515,791 (19.2%)	0.0269	<0.001
HCC110: Cystic Fibrosis	259 (< 0.1%)	208 (< 0.1%)	467 (< 0.1%)	0.2146	0.1795
HCC111: Chronic Obstructive Pulmonary Disease	373,630 (26.6%)	372,588 (29.3%)	746,218 (27.8%)	0.1149	<0.001
HCC112: Fibrosis of Lung and Other Chronic Lung Disorders	25,213 (1.8%)	20,268 (1.6%)	45,481 (1.7%)	0.1129	<0.001
HCC114: Aspiration and Specified Bacterial Pneumonias	159,185 (11.3%)	126,304 (9.9%)	285,489 (10.7%)	0.1649	<0.001
HCC115: Pneumococcal Pneumonia, Emphysema, Lung Abscess	12,535 (0.9%)	12,431 (1.0%)	24,966 (0.9%)	-0.0402	0.1034
HCC122: Proliferative Diabetic Retinopathy and Vitreous Hemorrhage	3,780 (0.3%)	5,040 (0.4%)	8,820 (0.3%)	-0.0343	0.4009
HCC124: Exudative Macular Degeneration	1,460 (0.1%)	1,590 (0.1%)	3,050 (0.1%)	-0.0138	0.8647
HCC134: Dialysis Status	60,598 (4.3%)	59,667 (4.7%)	120,265 (4.5%)	0.2409	<0.001
HCC135: Acute Renal Failure	589,086 (41.9%)	552,952 (43.4%)	1,142,038 (42.6%)	0.1910	<0.001
HCC136: Chronic Kidney Disease, Stage 5	2,851 (0.2%)	2,591 (0.2%)	5,442 (0.2%)	0.2605	<0.001
HCC137: Chronic Kidney Disease, Severe (Stage 4)	11,468 (0.8%)	10,094 (0.8%)	21,562 (0.8%)	0.1880	<0.001
HCC138: Chronic Kidney Disease, Moderate (Stage 3)	94,957 (6.7%)	88,788 (7.0%)	183,745 (6.9%)	0.0403	<0.001
HCC157: Pressure Ulcer of Skin with Necrosis Through to Muscle, Tendon, or Bone	24,726 (1.8%)	16,513 (1.3%)	41,239 (1.5%)	0.5416	<0.001

Risk Factor	Prevalence			Risk Adjustment Model Coefficients	
	FFS (N=1,407,036)	MA (N=1,273,097)	Total (N=2,680,133)	Coefficient	P-value
HCC158: Pressure Ulcer of Skin with Full Thickness Skin Loss	56,512 (4.0%)	46,486 (3.7%)	102,998 (3.8%)	0.3537	<0.001
HCC159: Pressure Ulcer of Skin with Partial Thickness Skin Loss	43,512 (3.1%)	35,596 (2.8%)	79,108 (3.0%)	0.2479	<0.001
HCC161: Chronic Ulcer of Skin, Except Pressure	53,854 (3.8%)	54,991 (4.3%)	108,845 (4.1%)	0.1006	<0.001
HCC162: Severe Skin Burn or Condition	658 (< 0.1%)	602 (< 0.1%)	1,260 (< 0.1%)	0.1429	0.1288
HCC166: Severe Head Injury	146 (< 0.1%)	175 (< 0.1%)	321 (< 0.1%)	0.4371	0.0139
HCC167: Major Head Injury	45,613 (3.2%)	41,609 (3.3%)	87,222 (3.3%)	-0.0319	0.0803
HCC169: Vertebral Fractures without Spinal Cord Injury	107,159 (7.6%)	94,816 (7.4%)	201,975 (7.5%)	0.0387	<0.001
HCC170: Hip Fracture/Dislocation	194,574 (13.8%)	197,933 (15.5%)	392,507 (14.6%)	-0.0277	0.0138
HCC173: Traumatic Amputations and Complications	22,851 (1.6%)	23,913 (1.9%)	46,764 (1.7%)	-0.0339	0.1124
HCC176: Complications of Specified Implanted Device or Graft	130,503 (9.3%)	111,567 (8.8%)	242,070 (9.0%)	0.1243	<0.001
HCC186: Major Organ Transplant or Replacement Status	6,834 (0.5%)	5,513 (0.4%)	12,347 (0.5%)	0.0824	0.0094
HCC188: Artificial Openings for Feeding or Elimination	64,100 (4.6%)	44,822 (3.5%)	108,922 (4.1%)	0.2337	<0.001
HCC189: Amputation Status, Lower Limb/Amputation Complications	26,851 (1.9%)	26,325 (2.1%)	53,176 (2.0%)	0.0741	<0.001
Psych Hospital Stay	12,906 (0.9%)	4,846 (0.4%)	17,752 (0.7%)	0.2495	<0.001
Prior stay: LOS 1-3 days [REFERENCE GROUP]	332,782 (23.7%)	200,090 (15.7%)	532,872 (19.9%)	-	-
4-7 days	634,143 (45.1%)	520,294 (40.9%)	1,154,437 (43.1%)	0.1333	<0.001
8-14 days	307,561 (21.9%)	379,177 (29.8%)	686,738 (25.6%)	0.2873	<0.001
>14 days	119,644 (8.5%)	168,690 (13.3%)	288,334 (10.8%)	0.4835	<0.001
ICU/CCU Utilization (Prior IP Stay)	550,432 (39.1%)	539,331 (42.4%)	1,089,763 (40.7%)	0.0611	<0.001
Prior ACH stays: 0 stays in past 365 days (excluding prior proximal) [REFERENCE GROUP]	574,139 (40.8%)	556,727 (43.7%)	1,130,866 (42.2%)	-	-

Risk Factor	Prevalence			Risk Adjustment Model Coefficients	
	FFS (N=1,407,036)	MA (N=1,273,097)	Total (N=2,680,133)	Coefficient	P-value
1-3 stays	684,585 (48.7%)	587,964 (46.2%)	1,272,549 (47.5%)	0.0655	<0.001
4-6 stays	118,310 (8.4%)	99,583 (7.8%)	217,893 (8.1%)	0.0679	<0.001
7-9 stays	22,454 (1.6%)	21,052 (1.7%)	43,506 (1.6%)	0.0652	<0.001
>9 stays	7,548 (0.5%)	7,771 (0.6%)	15,319 (0.6%)	0.0160	0.5817

Note: Includes SNF stays eligible for the HAI measure from FY 2025. The FFS column represents statistics for stays that include only FFS claims. The MA column represents statistics for stays that include any Medicare Advantage encounter record.