Measure Worksheet (MEW-PA-New)

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Brief Measure Information

CBE #: 3728

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

Measure Steward: Centers for Medicare & Medicaid Services

sp.02. Brief Description of Measure: SNF HAI is a one-year outcome measure that estimates the risk-standardized rate of healthcare-associated infections (HAIs) that are acquired during SNF care and result in hospitalization. HAIs that are acquired during SNF care and result in hospitalization are identified using the principal diagnosis on residents' Medicare inpatient claims. The hospitalization must occur during the period beginning on day four after SNF admission and within three days after SNF discharge. The measure is risk-adjusted to allow for comparison based on residents 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. The risk-adjusted HAI rate for each SNF is the product of the standardized risk ratio (SRR) for a given SNF and the national average observed rate of HAIs for all SNFs. The SRR is a provider-level ratio that measures excess HAIs by comparing the predicted HAIs of the provider being measured to the expected number of HAIs for an average provider with the same patient case-mix. Overall, lower SNF HAI scores indicate better infection control and prevention among SNF providers.

1b.01. Developer Rationale: A healthcare-associated infection (HAI) is defined as an infection acquired while receiving care at a health care facility that was not present or incubating at the time of admission [1][2]. A 2014 report from the Office of Inspector General (OIG) estimated that 1 in 4 adverse events among SNF residents are due to HAIs [3]. If the prevention and treatment of HAIs are poorly managed, they can cause poor health care outcomes for residents and lead to wasteful resource use. Although HAIs are not considered never-events, most are considered to be potentially preventable because they are outcomes of processes and structures of care, as described in sections 1a.01 and 1a.03. In other words, HAIs are typically the result of inadequate patient management following a medical intervention, such as surgery or device implantation, or poor adherence to hygiene protocol and antibiotic stewardship guidelines. Therefore, measuring HAIs among SNF residents can provide valuable information about a SNF's quality of care. Improvements in quality envisioned by this measure are summarized by the pre-TEP feedback described in section 1a.02.

Content
References: [1] World Health Organization. (n.d.). The burden of health care-associated infection worldwide. Retrieved from https://www.who.int/gpsc/country_work/burden_hcai/en/ [2] For more information about the measure numerator, please see sections **sp.13** and **sp.14**. [3] 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
sp.13. Numerator Statement: The measure numerator is the number of stays with an HAI acquired during SNF care and resulting in an inpatient hospitalization. The hospitalization must occur during the period beginning on day four after SNF admission and within three days of SNF discharge. **sp.15. Denominator Statement:** The study population includes Medicare Part A fee-for-service (FFS) SNF stays that were admitted during the measure time period (one year) and that meet the inclusion criteria during the measurement period. **sp.17. Denominator Exclusions:** SNF stays are excluded from the denominator if they meet one or more of the following criteria: (i) residents who are less than 18 years of age at the time of admission; (ii) the SNF length of stay was shorter than four days; (iii) residents who were not continuously enrolled in Part A FFS Medicare during the SNF stay, 12 months prior to the measure period, and three days after the end of the SNF stay; (iv) residents who did not have a Part A short-term acute care hospital stay within 30 days prior to the SNF admission date (the short-term stay must have positive payment and positive length of stay); (v) residents who were transferred to a federal hospital from the SNF as determined by the discharge status code on the SNF claim, (vi) residents who received care from a provider located outside of the United States, Puerto Rico, or a United States territory as determined from the first two characters of the SNF CCN; (vii) SNF stays in which data were missing on any variable used in the measure construction or risk adjustment, (viii) stays where Medicare did not pay for the stay resulting in a non-positive payment on the SNF claim, and (xi) swing bed stays in critical access hospitals. Refer to Table 1 to reference the rationale behind each exclusion criterion.
Measure Type: Outcome **sp.30. Data Source:** Claims **sp.07. Level of Analysis:** Facility
IF Endorsement Maintenance—Original Endorsement Date: New measure **Most Recent Endorsement Date:** N/A

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IF this measure is included in a composite, Composite#/title: N/A **IF this measure is paired/grouped, CBE#/title:** N/A **sp.03. IF PAIRED/GROUPED, what is the reason this measure must be reported with other measures to appropriately interpret results?**
Staff Assessment: New Measure
Criterion 1: Importance to Measure and Report
1a. Evidence
1a. Evidence. The evidence requirements for a ***health outcome*** measure include providing empirical data that demonstrate a relationship between the outcome and at least one healthcare structure, process, intervention, or service; if these data not available, data demonstrating wide variation in performance can be used, assuming the data are from a robust number of providers and the results are not subject to systematic bias. For measures derived from a patient report, the evidence also should demonstrate that the target population values the measured outcome, process, or structure and finds it meaningful. **The developer provides the following description for this measure:** • This is a new outcome measure at the facility-level that estimates the risk-standardized rate of healthcare-associated infections (HAIs) that are acquired during Skilled Nursing Facility (SNF) care and result in hospitalization. • This one-year outcome measure identifies HAIs acquired during care that result in hospitalization and are identified on residents' Medicare inpatient claims (using principal diagnosis). The developer provides criteria, including but not limited to the requirement that a patient's hospitalization must occur during the time frame beginning on the fourth day after SNF admission and within three days post SNF discharge. The measure is risk-adjusted. • The developer noted the measure's objective to detect SNFs with higher HAI rates than comparable peers. Generally, lower SNF HAI scores denote improved infection control among SNF providers. • The developer provides a logic model that depicts relationships between structures (staff turnover, staff education), processes (e.g., antibiotic stewardship, staff vaccination), and rate of HAIs acquired in SNFs requiring hospitalization. Generally, negative structures and processes showed increased hospitalization rates and scores. • Exclusion criteria (e.g., resident is <18 years old when admitted to SNF) and construction for the SNF HAI measure (e.g., Medicare enrollment birthdate data) are clearly defined.

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Summary:

- This claims-based measure estimates the risk-standardized rate of HAIs that are acquired during SNF care and have a hospitalization outcome. Data sources include Medicare Enrollment Database (EDB) and SNF and inpatient claims. Performance scores from FY2019, 2020, and 2021 among publicly reportable SNF providers (all *n*s > 11,000) indicated a variability in SNF HAI rates, suggesting improvement was possible for SNFs with high scores (better quality = lower score).
- Two systematic reviews are cited, which provide consistent findings asserting that improvement of HAI rates are possible by providers modifying processes and intervention; however, there is limited information provided regarding samples and analyses conducted.
  - A 2022 review identified administrative engagement as a core component of long-term care facility interventions.
  - A 2019 review noted successful interventions for reducing HAIs (e.g., infection prevention and control programs focused on education, monitoring, and feedback).

Question for the Standing Committee:

- Is there at least one thing that the provider can do to achieve a change in the measure results?

Guidance From the Evidence Algorithm

- Box 1: Yes → Box 2: Pass

Preliminary rating for evidence: ☒ **Pass** ☐ **No Pass**

1b. Gap in Care/Opportunity for Improvement and Disparities

1b. Performance Gap. The performance gap requirements include demonstrating quality problems and opportunity for improvement.

- The developer posits that measuring HAIs among SNF residents can provide valuable information about a particular SNF's care quality. By measuring infection and hospitalization rates, the measure provides an opportunity to identify health care structures and processes that could improve care.
- Significant variability in these data suggest there are improvement opportunities for SNF facilities.
- FY2021 data: Among publicly reportable SNF providers (*n* = 11,961), the average SNF HAI rate was 7.63% with a minimum of 3.19%, maximum of 20.27%, median of 7.37%, interquartile range of 2.31 percentage points, and a standard deviation of 1.80 percentage points.
- FY2020 data: Among publicly reportable SNF providers (*n* = 13,278), the average SNF HAI rate was 7.11% with a minimum of 2.40%, maximum of 21.09%, median of 6.67%, interquartile range of 2.76 percentage points, and a standard deviation of 2.21 percentage points.
- FY2019 data: Among publicly reportable SNF providers (*n* = 14,102), the average SNF HAI rate was 5.85% with a minimum of 2.36%, maximum of 17.62%, median of 5.59%, interquartile range of 1.94 percentage points, and a standard deviation of 1.53

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percentage points. • Additionally, 100% of TEP panelists considered the prevention and reduction of HAIs as top priorities, as the HAI measure would establish baseline rates, evaluate effectiveness of treatment, promote attention to HAIs, and fight antibiotic resistance.
Disparities • The developer cited several studies that suggested increased age, cognitive and functional decline, use of indwelling devices, frequent care transitions, select cardiovascular and respiratory conditions, impaired functional status, and close contact with other residents and healthcare workers were risk factors. • The developer conducted dual stratification (based on proportion of non-White and Medicare/Medicaid dual-enrolled residents), which showed SNFs in the fifth quintile had a higher mean risk-adjusted HAI rate compared to SNFs in the first quintile (8.38% and 6.71%, respectively). Further, race/ethnicity stratification showed SNFs in the fifth quintile had a higher risk-adjusted HAI rate compared to SNFs in the first quintile (8.31% and 7.20%, respectively). • The developer caveated these findings by highlighting that the overlap in distributions across quintiles showed that SNFs with a higher proportion of vulnerable residents could still perform well.
Questions for the Standing Committee: • Is there a gap in care that warrants a national performance measure?
Preliminary rating for opportunity for improvement: ☐ **High** ☒ **Moderate** ☐ **Low** ☐ **Insufficient**
Criteria 2: Scientific Acceptability of Measure Properties
Complex measure evaluated by the Scientific Methods Panel (SMP)? ☐ **Yes** ☒ **No**
Evaluators: Battelle Staff
2a. Reliability: Specifications and Testing
2a2. Reliability testing demonstrates whether the measure data elements are repeatable and producing the same results a high proportion of the time when assessed in the same population in the same time period, and/or whether the measure score is precise enough to distinguish differences in performance across providers.
Specifications: • Measure specifications are clear and precise. o Measure scores are calculated using Medicare Part A fee-for-service claims data and Medicare enrollment data.

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○ Medicare enrollment data are also used for some of risk adjustment covariates, such as sex, age, and original reason for Medicare entitlement.
Reliability Testing: • Reliability testing conducted at the Accountable Entity Level: ○ Dates of data were FY2021 i.e., 10/1/2020 to 9/30/2021 ○ In total, 11,961 Medicare-certified Skilled Nursing Facilities (SNFs) were eligible for public reporting and had 25 stays or more. ○ The counts and percentages of SNFs that met certain characteristics (facility size, ownership type, region, and urban/rural status) were provided. ○ Split-half reliability testing was used to analyze the data. ○ Stays within a facility were randomly assigned to one of two groups and the correlation of HAI rates between groups is assessed with the Intraclass correlation coefficient and Pearson's correlation. ○ Process was repeated 40 times and the mean correlation score over these iterations was reported. ○ All correlation coefficients were adjusted using the Spearman-Brown prediction formula. ○ For SNFs included in the analysis, the ICC and Pearson correlation were both 0.49 [0.48-0.51], on average.
Questions for the Standing Committee regarding reliability: • *Do you have any concerns that the measure cannot be consistently implemented (i.e., are the measure specifications adequate)?*
Guidance From the Reliability Algorithm Box 1: Yes → Box 2: Yes → Box 4: Yes → Box 5: Yes → Box 6: Moderate The highest possible rating is HIGH
Preliminary rating for reliability: ☐ High ☒ Moderate ☐ Low ☐ Insufficient
2b. Validity: Validity Testing; Exclusions; Risk Adjustment; Meaningful Differences; Comparability; Missing Data
2b2. Validity testing should demonstrate that the measure data elements are correct and/or the measure score correctly reflects the quality of care provided, adequately identifying differences in quality.
2b2-2b6. Potential threats to validity should be assessed/addressed. **Validity Testing** • Validity testing conducted at the Accountable Entity Level:

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- Rank correlation between measure to similar care processes or outcomes (SNF QRP claims-based measures)
  - Moderate negative correlation with discharge to community (-0.30), RN staffing (-0.28)
  - Weak negative correlation with percentage of short-stay residents assessed and appropriately given influenza vaccine (-0.07) and pneumococcal vaccine (-0.06)
  - Positive correlation with potentially preventable 30-day post-discharge readmission measure (0.15)
- Correlation between measure and COVID-19 cases and deaths between 1/1/20-11/29/20
  - SNFs stratified into quintiles of HAI rates
  - Facilities in higher quintiles had a higher average number of cases per 1,000 residents (161.6, 5th quintile vs 90.5, 1st quintile) and an average number of deaths per 1,000 residents (30.4, 5th quintile vs. 18.0, 1st quintile).
- Deaths increased with HAI rate

Exclusions

- The measure has the following exclusions:
  - Residents who:
    - Are < 18 years of age
    - SNF length of stay < 4 days
    - Are not continuously enrolled in Part A FFS Medicare during stay 12 months prior to measure period, 3 days after end of stay
    - Did not have Part A short-term acute care hospital stay within 30 days prior to SNF readmission date
    - Were transferred to a federal hospital
    - Received care from a provider outside USA
  - SNF stays missing any variables used in measure
  - Stays not paid for by Medicare
  - Swing bed stays in critical access hospitals

- Using FY2021 data, the developer examined the stay-level frequency of each exclusion criterion by calculating the number and percentage of stays eligible for inclusion in the measure denominator (Table 8). The developer also assessed the facility-level distribution of exclusion criteria (Table 9).

- The two criteria that excluded the greatest number of stays include (i) the requirement for stays to be matched to a prior eligible inpatient stay, and (ii) the requirement that a stay has completed information for measure construction and risk adjustment.

Risk Adjustment

- The developer used a hierarchical model to show provider-specific effects by accounting for clustering of patients within the same facility.

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- In accordance with recommendations from a 2019 technical expert panel (TEP), the developer aligned SNF HAI risk adjustment categories with those used for other claims-based quality measures (i.e., SNF 30-Day All Cause Readmission Measure (SNFRM), Potentially Preventable 30-Day Post Discharge Readmission Measure (PPR), and Discharge to Community (DTC)).
- These categories include, age; sex; original reason for Medicare entitlement (age, disability, or ESRD); surgical categories based on the prior hospital claim; principal diagnosis on the prior hospital claim; comorbidities on the prior hospital claim or a 365-day lookback (HCCs); length of stay in the prior hospital stay; any prior ICU or CCU utilization; and a count of the prior hospital discharges in the prior year. The developer notes that the TEP particularly favored accounting for the number of previous hospital stays in risk adjustment.
- The developer designed the SNF HAI measure before the conclusion of the 2017-2021 NQF social risk factor trial. Therefore, when designing the measure, it followed previous NQF guidance, including consideration of forgoing adjustment by social risk factors to ensure that disparities in care are not masked. After the conclusion of the NQF social risk factor trial, the developer conducted two analyses to determine the appropriateness of adjusting for social risk factors (SRFs). The developer states that both analyses show that risk adjusting the SNF HAI measure for SRFs is inappropriate.
- Using FY2021 data, the developer conducted model fit statistics to determine model predictability while controlling for difference in resident case mix; c-statistic = 0.70

Meaningful Differences

- To determine meaningful differences in provider performance, the developer determined the number of risk-adjusted HAIs that could be avoided if all publicly reportable providers (with at least 25 stays) performed at least as well as the national average.
- In total, 9,022 HAI could be avoided if all providers performed at least as well as the national average SNF HAI rate (n = 5,736).
- The developer states that results of this analysis are clinically and meaningfully significant as approximately 10% of total HAIs can be avoided if all providers performed at least as well as the national average. Treating HAIs that result in hospitalization is estimated to cost approximately $15,000 per HAI event. The developer notes the estimated cost savings of avoiding 9,022 HAIs can result in over $134 million of savings.

Missing Data

- The developer states missing data are rare because submission and completion of claims is tied to provider reimbursement.

Comparability

- The measure only uses one set of specifications.

Questions for the Standing Committee regarding validity:

- *Do you have any concerns regarding the validity of the measure (e.g., exclusions, risk adjustment approach, etc.)?*

Guidance From the Validity Algorithm

Content
Box 1: Yes → Box 2: Yes → Box 5: Yes → Box 6: Yes → Box 7: Moderate Highest possible rating is a HIGH
Preliminary rating for validity: ☐ **High** ☒ **Moderate** ☐ **Low** ☐ **Insufficient**
Criterion 3. Feasibility
3. Feasibility is the extent to which the specifications, including measure logic, require data that are readily available or could be captured without undue burden and can be implemented for performance measurement. • ALL data elements are in defined fields in electronic claims. • The developer attests that the data needed to calculate this measure are readily available and require no additional data submission beyond what is already collected on Medicare fee-for-service (FFS) claims in the normal course of business. This measure poses no additional data collection burden to SNF providers.
Questions for the Standing Committee: • *Are the required data elements routinely generated and used during care delivery?* • *Are the required data elements available in electronic form (e.g., EHR or other electronic sources)?*
Preliminary rating for feasibility: ☒ **High** ☐ **Moderate** ☐ **Low** ☐ **Insufficient**
Criterion 4: Use and Usability
4a. Use (4a1. Accountability and Transparency; 4a2. Feedback on measure)
4a. Use evaluates the extent to which audiences (e.g., consumers, purchasers, providers, and policymakers) use or could use performance results for both accountability and performance improvement activities.
4a1. Accountability and Transparency. Performance results are used in at least one accountability application within three years after initial endorsement and are publicly reported within six years after initial endorsement (or the data on performance results are available). If they are not in use at the time of initial endorsement, then a credible plan for implementation within the specified time frames is provided.
Current uses of the measure

Content			
Publicly reported?	☒ Yes	☐ No	
Current use in an accountability program?	☒ Yes	☐ No	☐ UNCLEAR
Planned use in an accountability program?	☒ Yes	☐ No	☐ N/A

Accountability program details

- The measures is currently being publicly reported in the Center for Medicare & Medicaid Services Skilled Nursing Facility Quality Reporting Program (SNF QRP - pay-for-reporting) and will be implemented in the Skilled Nursing Facility Value-Based Purchasing Program (SNF VBP - pay-for-performance), beginning in 2026.
- The developer also states that the measure is currently being used for quality improvement and benchmarking.

4a.2. Feedback on the measure by those being measured or others. Three criteria demonstrate feedback: (1) Those being measured have been given performance results or data, as well as assistance with interpreting the measure results and data; (2) Those being measured, and other users have been given an opportunity to provide feedback on the measure performance or implementation; and (3) This feedback has been considered when changes are incorporated into the measure.

Feedback on the measure provided by those being measured or others

- The devleoper notes that there were several opportunities for public comment on the SNF HAI measure including (i) the 30-day public comment period held during draft SNF HAI measure specification, (ii) the 60-day public comment period held during FY2022 SNF HAI rulemaking for the SNF QRP, (iii) the 60-day public comment period held during FY2023 SNF HAI rulemaking for the SNF VBP, and (vi) any public comment opportunities held during the pre-rulemaking Measures under Consideration (MUC) List or Measure Application Partnership (MAP) process.
- The developer states that it reviewed the public comments received during the various public comment periods and responded to them in the SNF HAI Public Comment Summary Report and in the FY2022 and FY2023 SNF PPS Final Rules and determined that we would not change the measure's specifications outlined in the SNF HAI Technical Report: https://www.cms.gov/files/document/snf-hai-technical-report.pdf.
- However, the developer continues to monitor any unintended consequences of the measure including patient selection patterns, which could lead to future re-specification of the measure as needed

Questions for the Standing Committee:

- *How have the performance results be used to further the goal of high quality, efficient healthcare?*
- *How has the measure been vetted in real-world settings by those being measured or others?*

Preliminary rating for Use: ☒ **Pass** ☐ **No Pass**

4b. Usability (4b1. Improvement; 4b2. Benefits of measure)

Content
4b. Usability evaluates the extent to which audiences (e.g., consumers, purchasers, providers, and policymakers) use or could use performance results for both accountability and performance improvement activities.
4b1 Improvement. Progress toward achieving the goal of high quality, efficient healthcare for individuals or populations is demonstrated. **Improvement results** • The developer focused on comparing trends between FY2019 and FY2021 SNF HAI performance data. • In FY2019, 84.9% of SNFs were eligible for public reporting, whereas 80.2% of SNFs were eligible for public reporting in FY2021. The developer posits that this decrease in reportability may be the result of both facility closures and a decrease in elective procedures during the COVID-19 public health emergency (PHE). • FY2019 and FY2021 reportability results indicate the high usability of the SNF HAI measure. Additionally, the average provider-level risk-adjusted SNF HAI rate increased between FY2019 (5.85%) and FY2021 (7.63%) by approximately 1.78 percentage points. The developer interprets this difference to be related to the PHE and COVID-19 surges that occurred in FY2021.
4b2. Benefits versus harms. The benefits of the performance measure in facilitating progress toward achieving high quality, efficient healthcare for individuals or populations outweigh evidence of unintended negative consequences to individuals or populations (if such evidence exists). **Unexpected findings (positive or negative) during implementation** • The devleoper does not note any specific unexpected findings due to the use of the measure, but notes that in the development of the SNF HAI measure, the developer recognized the concern that the measure may provide an incentive for providers to selectively enroll residents, either by encouraging or avoiding admission of certain types of residents. • To account for this unintended consequence, the developer specified the measure to evaluate provider performance against their peers after adjusting for difference in resident case-mix across SNFs. The developer states that the measure's risk adjustment methodology is designed to capture resident characteristics that are associated with higher rates of HAIs, helping to mitigate providers' incentive to selectively enroll residents or transfer residents to hospitals early. **Potential harms** • None were reported by the developer.
Questions for the Standing Committee: • *How can the performance results be used to further the goal of high quality, efficient healthcare?* • *Do the benefits of the measure outweigh any potential unintended consequences?*

Content
Preliminary rating for Usability and Use: ☐ **High** ☒ **Moderate** ☐ **Low** ☐ **Insufficient**]
Criterion 5: Related and Competing Measures

Related Measures
• The developer identified the following related measures:
  • Percent of Residents with a Urinary Tract Infection (Long-Stay) (CBE ID #0684)
  • National Healthcare Safety Network (NHSN) Catheter-Associated Urinary Tract Infections (CBE ID #0138)
  • NHSN Central Line-Associated Bloodstream Infections (CBE ID #0139)
  • NHSN Facility-Wide Inpatient Hospital-onset Clostridium Difficile Infection (CBE ID #1717)
  • Skilled Nursing Facility 30-Day All-Cause Readmission measure (CBE ID #2510)

Harmonization • The developer states that after review of the consensus-endorsed measures, it was unable to identify any CBE-endorsed measures for SNFs focused on capturing several types of severe infections attributable to the SNF setting in one composite score.

QUALITY MEASURE SUBMISSION FORM

Version: 1.0; Generated: 13 April 2023

Introduction

Thank you for your interest in submitting a measure to Battelle for possible endorsement.

What criteria are used to evaluate measures? Measures are evaluated on standardized criteria: importance to measure and report, scientific acceptability of measure properties, feasibility, usability and use, and related and competing measures. For your measure to be evaluated against these measure evaluation criteria, you must complete the measure submission form.

Why do I have to complete a form? Due to the volume and/or complexity of proposed measures, Battelle provides measure information to committee reviewers in a standardized format to facilitate their evaluation of whether the measure meets the measure evaluation criteria. This form allows the measure steward to present information demonstrating that the proposed measure meets endorsement criteria.

What is on the form? The information requested in this form is directly related to the measure evaluation criteria.

Can't I just submit our files for consideration? No. Measures must be submitted through the online form to be considered for the Spring 2023 cycle. Requested information should be entered directly into this form and as well as any necessary or required attachments.

Can I submit additional details and materials? Additional materials will be considered only as supplemental. Do NOT rely on material provided in an appendix to provide measure specifications or to demonstrate meeting the criteria. The core information needed to evaluate the measure should be provided in the appropriate submission form fields and required attachments. Please contact PQMsupport@battelle.org regarding questions about submitting supplemental materials.

What do I do first? If you have started a new submission by answering five qualifying questions, you may proceed to the “Previous Submission Information" tab to continue with your submission. The “Conditions” tab will list the conditions that must be met before your proposed measures may be considered and evaluated for suitability as endorsed voluntary consensus standards. You are asked to acknowledge reading and accepting the conditions.

Can I make changes to a form once I have submitted it? No. Once you submit your

measure, you will NOT be able to return to this submission form to make further revisions. You will need to contact project staff.

What if I need additional help? Please contact the project staff at PQMsupport@battelle.org if you have questions regarding the information requested or submitting supplemental materials.

NOTE: All measure submissions should be 508-compliant. Refer to the Checklist for Developer 508 Guidelines (PDF) to ensure all guidelines apply to all parts of your submission, including all fields and attachments used within the measure submission form.

Please email us at PQMsupport@battelle.org if you experience technical difficulties using the online submission form.

Thank you for your interest in submitting measures to Battelle.

Previous Submission Information (1 – 4)

1) Select whether this measure was previously submitted to the prior consensus-based entity (the National Quality Forum [NQF]) and given an identifying number.

☐ Previously submitted to NQF
☒ New measure, never submitted.

2) Provide the measure number of the previously submitted measure.

N/A

3) If the measure has an electronic clinical quality measure (eCQM) version, provide the measure number of the previously submitted measure.

N/A

4) If this eCQM has a registry version, provide the measure numbers of the previously submitted measure.

N/A

Conditions (1 - 2)

Several conditions must be met before proposed measures may be considered and evaluated for suitability as voluntary consensus standards. If any of the conditions are not met, the measure will not be accepted for consideration.

A. A Measure Steward Agreement is signed or the steward is a government organization. (All non-government organizations must sign a Measure Steward Agreement.) For more information about completing a Measure Steward Agreement, please go to: Endorsement | Partnership for Quality Measurement (p4qm.org) and follow the instructions.

B. The measure owner/steward verifies there is an identified responsible entity and a process to maintain and update the measure on a schedule that is commensurate with the rate of clinical innovation, but at least every three years.

C. The intended use of the measure includes both accountability applications (including public reporting) and performance improvement to achieve high-quality, efficient healthcare.

D. The measure is fully specified and tested for reliability and validity.

E. The measure developer/steward attests that harmonization with related measures and issues with competing measures have been considered and addressed, as appropriate.

F. The requested measure submission information is complete and responsive to the questions so that all the information needed to evaluate all criteria is provided.

1) Check if either of the following apply.

☐ Proprietary measure or components (e.g., risk model, codes)
☐ Proprietary measure or components with fees
☒ None of the above

2) Check the box below to agree to the conditions listed above.

☒ I have read and accept the conditions as specified above

Specifications: Maintenance Update (spma.01 - spma.02)

spma.01) Indicate whether there are changes to the specifications since the last updates/submission. If yes, update the specifications in the Measure Specifications section of the Measure Submission Form, and explain your reasoning for the changes below.

☒ No
☐ Yes

spma.02) Briefly describe any important changes to the measure specifications since the last measure update and provide a rationale.

For annual updates, please explain how the change in specifications affects the measure results. If a material change in specification is identified, data from re-testing of the measure with the new specifications is required for early maintenance review.

For example, specifications may have been updated based on suggestions from a previous measure endorsement review.

N/A

Measure Specifications (sp.01 - sp.32)

sp.01) Provide the measure title.

Measure titles should be concise yet convey who and what is being measured.

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

sp.02) Provide a brief description of the measure.

Including type of score, measure focus, target population, timeframe, (e.g., Percentage of adult patients aged 18-75 years receiving one or more HbA1c tests per year).

SNF HAI is a one-year outcome measure that estimates the risk-standardized rate of healthcare-associated infections (HAIs) that are acquired during SNF care and result in hospitalization. HAIs that are acquired during SNF care and result in hospitalization are identified using the principal diagnosis on residents' Medicare inpatient claims. The hospitalization must occur during the period beginning on day four after SNF admission and within three days after SNF discharge. The measure is risk-adjusted to allow for comparison based on residents 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. The risk-adjusted HAI rate for each SNF is the product of the standardized risk ratio (SRR) for a given SNF and the national average observed rate of HAIs for all SNFs. The SRR is a provider-level ratio that measures excess HAIs by comparing the predicted HAIs of the provider being measured to the expected number of HAIs for an average provider with the same patient case-mix. Overall, lower SNF HAI scores indicate better infection control and prevention among SNF providers.

sp.03) Provide a rationale for why this measure must be reported with other measures to appropriately interpret results.

N/A

sp.04) Check all the clinical condition/topic areas that apply to your measure, below.

☐ Behavioral Health
☐ Behavioral Health: Alcohol, Substance Use/Abuse
☐ Behavioral Health: Anxiety
☐ Behavioral Health: Attention Deficit Hyperactivity Disorder (ADHD)
☐ Behavioral Health: Bipolar Disorder
☐ Behavioral Health: Depression
☐ Behavioral Health: Domestic Violence

- ☐ Behavioral Health: Other Serious Mental Illness
- ☐ Behavioral Health: Post-Traumatic Stress Disorder (PTSD)
- ☐ Behavioral Health: Schizophrenia
- ☐ Behavioral Health: Suicide
- ☐ Cancer
- ☐ Cancer: Bladder
- ☐ Cancer: Breast
- ☐ Cancer: Colorectal
- ☐ Cancer: Gynecologic
- ☐ Cancer: Hematologic
- ☐ Cancer: Liver
- ☐ Cancer: Lung, Esophageal
- ☐ Cancer: Prostate
- ☐ Cancer: Renal
- ☐ Cancer: Skin
- ☐ Cancer: Thyroid
- ☐ Cardiovascular
- ☐ Cardiovascular: Arrythmia
- ☐ Cardiovascular: Congestive Heart Failure
- ☐ Cardiovascular: Coronary Artery Disease
- ☐ Cardiovascular: Coronary Artery Disease (AMI)
- ☐ Cardiovascular: Coronary Artery Disease (PCI)
- ☐ Cardiovascular: Hyperlipidemia
- ☐ Cardiovascular: Hypertension
- ☐ Cardiovascular: Secondary Prevention
- ☐ Critical Care
- ☐ Critical Care: Assisted Ventilation
- ☐ Critical Care: Intensive Monitoring
- ☐ Dental
- ☐ Dental: Caries
- ☐ Dental: Tooth Loss
- ☐ Ears, Nose, Throat (ENT)
- ☐ Ears, Nose, Throat (ENT): Ear Infection
- ☐ Ears, Nose, Throat (ENT): Hearing
- ☐ Ears, Nose, Throat (ENT): Pharyngitis
- ☐ Ears, Nose, Throat (ENT): Tonsilitis
- ☐ Endocrine
- ☐ Endocrine: Calcium and Metabolic Bone Disorders
- ☐ Endocrine: Diabetes
- ☐ Endocrine: Female and Male Endocrine Disorders

☐ Endocrine: Hypothalamic-Pituitary Disorders
☐ Endocrine: Thyroid Disorders
☐ Eye Care
☐ Eye Care: Age-related macular degeneration (AMD)
☐ Eye Care: Cataracts
☐ Eye Care: Diabetic retinopathy
☐ Eye Care: Glaucoma
☐ Gastrointestinal (GI)
☐ Gastrointestinal (GI): Constipation
☐ Gastrointestinal (GI): Gall Bladder Disease
☐ Gastrointestinal (GI): Gastroenteritis
☐ Gastrointestinal (GI): Gastro-Esophageal Reflux Disease (GERD)
☐ Gastrointestinal (GI): Hemorrhoids
☐ Gastrointestinal (GI): Hernia
☐ Gastrointestinal (GI): Inflammatory Bowel Disease
☐ Gastrointestinal (GI): Irritable Bowel Syndrome
☐ Gastrointestinal (GI): Peptic Ulcer
☐ Genitourinary (GU)
☐ Genitourinary (GU): Benign Prostatic Hyperplasia
☐ Genitourinary (GU): Erectile Dysfunction/Premature Ejaculation
☐ Genitourinary (GU): Incontinence/pelvic floor disorders
☐ Genitourinary (GU): Prostatitis
☐ Genitourinary (GU): Urinary Tract Injection (UTI)
☐ Gynecology (GYN)
☐ Gynecology (GYN): Abnormal bleeding
☐ Gynecology (GYN): Endometriosis
☐ Gynecology (GYN): Infections
☐ Gynecology (GYN): Menopause
☐ Gynecology (GYN): Pelvic Pain
☐ Gynecology (GYN): Uterine fibroids
☒ Infectious Diseases (ID)
☐ Infectious Diseases (ID): HIV/AIDS
☐ Infectious Diseases (ID): Influenza
☐ Infectious Diseases (ID): Lyme Disease
☐ Infectious Diseases (ID): Meningococcal Disease
☐ Infectious Diseases (ID): Pneumonia and respiratory infections
☐ Infectious Diseases (ID): Sepsis
☐ Infectious Diseases (ID): Sexually Transmitted
☐ Infectious Diseases (ID): Tuberculosis
☐ Liver

- ☐ Liver: Viral Hepatitis
- ☐ Musculoskeletal
- ☐ Musculoskeletal: Falls and Traumatic Injury
- ☐ Musculoskeletal: Gout
- ☐ Musculoskeletal: Joint Surgery
- ☐ Musculoskeletal: Low Back Pain
- ☐ Musculoskeletal: Osteoarthritis
- ☐ Musculoskeletal: Osteoporosis
- ☐ Musculoskeletal: Rheumatoid Arthritis
- ☐ Neurology
- ☐ Neurology: Alzheimer's Disease
- ☐ Neurology: Autism
- ☐ Neurology: Brain Injury
- ☐ Neurology: Epilepsy
- ☐ Neurology: Migraine
- ☐ Neurology: Parkinson's Disease
- ☐ Neurology: Spinal Cord Injury
- ☐ Neurology: Stroke/Transient Ischemic Attack (TIA)
- ☐ Other (please specify here:)
- ☐ Palliative Care and End-of-Life Care
- ☐ Palliative Care and End-of-Life Care: Advanced Directives
- ☐ Palliative Care and End-of-Life Care: Amyotrophic Lateral Sclerosis (ALS)
- ☐ Palliative Care and End-of-Life Care: Hospice Management
- ☐ Palliative Care and End-of-Life Care: Inappropriate use of acute care services
- ☐ Palliative Care and End-of-Life Care: Pain Management
- ☐ Perinatal Health
- ☐ Perinatal Health: Labor and Delivery
- ☐ Perinatal Health: Newborn Care
- ☐ Perinatal Health: Post-Partum Care
- ☐ Perinatal Health: Preconception Care
- ☐ Perinatal Health: Prenatal Care
- ☐ Renal
- ☐ Renal: Acute Kidney Injury
- ☐ Renal: Chronic Kidney Disease (CKD)
- ☐ Renal: End Stage Renal Disease (ESRD)
- ☐ Renal: Infections
- ☐ Reproductive Health
- ☐ Reproductive Health: Family planning and contraception
- ☐ Reproductive Health: Infertility
- ☐ Reproductive Health: Male reproductive health

☐ Respiratory
☐ Respiratory: Acute Bronchitis
☐ Respiratory: Allergy
☐ Respiratory: Asthma
☐ Respiratory: Chronic Obstructive Pulmonary Disease (COPD)
☐ Respiratory: Dyspnea
☐ Respiratory: Pneumonia
☐ Respiratory: Sleep Apnea
☐ Surgery
☐ Surgery: Cardiac Surgery
☐ Surgery: Colorectal
☐ Surgery: Neurosurgery / Spinal
☐ Surgery: Orthopedic
☐ Surgery: Orthopedic Hip/Pelvic Fractures
☐ Surgery: Pediatric
☐ Surgery: Perioperative and Anesthesia
☐ Surgery: Plastic
☐ Surgery: Thoracic Surgery
☐ Surgery: Trauma
☐ Surgery: Vascular Surgery

sp.05) Check all the non-condition specific measure domain areas that apply to your measure, below.

☐ Access to Care
☐ Care Coordination
☐ Care Coordination: Readmissions
☐ Care Coordination: Transitions of Care
☐ Disparities Sensitive
☐ Health and Functional Status
☐ Health and Functional Status: Change
☐ Health and Functional Status: Nutrition
☐ Health and Functional Status: Obesity
☐ Health and Functional Status: Physical Activity
☐ Health and Functional Status: Quality of Life
☐ Health and Functional Status: Total Health
☐ Immunization
☐ Other (please specify here:)
☐ Person-and Family-Centered Care: Person-and Family-Centered Care
☐ Person-and Family-Centered Care: Workforce
☐ Primary Prevention

☐ Primary Prevention: Nutrition
☐ Primary Prevention: Tobacco Use
☐ Safety
☐ Safety: Complications
☒ Safety: Healthcare Associated Infections
☐ Safety: Medication
☐ Safety: Overuse
☐ Screening

sp.06) Select one or more target population categories.

Select only those target populations which can be stratified in the reporting of the measure's result.

☒ Adults (Age >= 18)
☐ Children (Age < 18)
☐ Elderly (Age >= 65)
☐ Populations at Risk: Dual eligible beneficiaries of Medicare and Medicaid
☐ Populations at Risk: Individuals with multiple chronic conditions
☐ Populations at Risk: Veterans
☐ Women

sp.07) Select the levels of analysis that apply to your measure.

Check ONLY the levels of analysis for which the measure is SPECIFIED and TESTED.

☐ Accountable Care Organization
☐ Clinician: Group/Practice
☐ Clinician: Individual
☒ Facility
☐ Health Plan
☐ Integrated Delivery System
☐ Other (please specify here:)
☐ Population: Community, County or City
☐ Population: Regional and State

sp.08) Indicate the care settings that apply to your measure.

Check ONLY the settings for which the measure is SPECIFIED and TESTED.
☐ Ambulatory Care
☐ Behavioral Health
☐ Home Care

☐ Inpatient/Hospital
☐ Other (please specify here:)
☐ Outpatient Services
☒ Post-Acute Care

sp.09) Provide a Uniform Resource Locator (URL) link to a web page specific for this measure that contains current detailed specifications including code lists, risk model details, and supplemental materials.

Do not enter a URL linking to a home page or to general information. If no URL is available, indicate "none available".

https://www.cms.gov/files/document/snf-hai-technical-report.pdf-0

sp.10) Indicate whether Health Quality Measure Format (HQMF) specifications are attached.

Attach the zipped output from the measure authoring tool (MAT) for eCQMs - if the MAT was not used, contact staff. (Use the specification fields in this online form for the plain-language description of the specifications). HQMF specifications are attached.

☐ HQMF specifications are NOT attached (Please explain).

N/A

sp.11) Attach the simulated testing attachment.

All eCQMs require a simulated testing attachment to confirm that the HTML output from Bonnie testing (or testing of some other simulated data set) includes 100% coverage of measured patient population testing, with pass/fail test cases for each sub-population. This can be submitted in the form of a screenshot.

☐ Testing is attached
☐ Testing is NOT attached (please explain)

N/A

sp.12) Attach the data dictionary, code table, or value sets (and risk model codes and coefficients when applicable). Excel formats (.xlsx or .csv) are preferred.

Attach an excel or csv file; if this poses an issue, contact staff at PQMsupport@battelle.org. Provide descriptors for any codes. Use one file with multiple worksheets, if needed.

☒ Available in attached Excel or csv file

☐ No data dictionary/code table – all information provided in the submission form

For the question below: state the outcome/process being measured. Calculations of the risk-adjusted outcome measures should be described in sp.22.

sp.13) State the numerator.

Brief, narrative description of the measure focus or what is being measured about the target population, i.e., cases from the target population with the target process, condition, event, or outcome).

DO NOT include the rationale for the measure.

The measure numerator is the number of stays with an HAI acquired during SNF care and resulting in an inpatient hospitalization. The hospitalization must occur during the period beginning on day four after SNF admission and within three days of SNF discharge.

For the question below: describe how the observed outcome is identified/counted. Calculation of the risk-adjusted outcome should be described in sp.22.

sp.14) Provide details needed to calculate the numerator.

All information required to identify and calculate the cases from the target population with the target process, condition, event, or outcome such as definitions, time period for data collection, specific data collection items/responses, code/value sets.

Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at sp.11.

Step 1: To calculate the measure numerator, inpatient readmissions within the specified incubation window are identified; these include readmissions beginning on day four of the SNF stay and within three days of SNF discharge.

Step 2: Next, HAI diagnosis ICD-10 codes on the principal diagnosis field of the readmitting inpatient claim are identified. Only HAI diagnoses marked as present on admission (POA) within the inpatient claim are included in the measure numerator. Only infections that are likely to be acquired during SNF care and severe enough to require hospitalization are included in the measure numerator. Infections related to invasive (not implanted) medical devices may also be included in the measure numerator. Several infections are excluded, such as chronic infections, infections that typically require a long period of time to present, infections that are likely related to the resident's prior hospital stay, and more. See the SNF-HAI-CBE-Submission-Attachment-sp12-20230503.xlsx attachment in section **sp.12** for a full list of ICD-10 codes included in the measure numerator.

Step 3: Following HAI identification, application of the 14-day repeat infection timeframe is determined to exclude infections that are preexisting to the SNF stay from the measure numerator. The repeat infection timeframe is defined as the number of days between inpatient stays, which is calculated by taking the difference between the discharge date of the most proximal inpatient stay prior to SNF admission and the admission date of the readmitting inpatient stay. Preexisting infections are determined using all of the diagnosis codes on the prior inpatient claim immediately preceding the SNF admission. 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. If the number of days between the rehospitalization and the prior proximal hospitalization is less than 14 and a preexisting infection is recorded in any of the diagnosis codes for the prior inpatient stay, then the HAI is excluded from the numerator. If the number of days between the rehospitalization and the prior proximal hospitalization is 14 or greater, then the HAI is included in the measure numerator.

For the question below: state the target population for the outcome. Calculation of the risk-adjusted outcome should be described in sp.22.

sp.15) State the denominator.

Brief, narrative description of the target population being measured.

The study population includes Medicare Part A fee-for-service (FFS) SNF stays that were admitted during the measure time period (one year) and that meet the inclusion criteria during the measurement period.

For the question below: describe how the target population is identified. Calculation of the risk-adjusted outcome should be described in sp.22.

sp.16) Provide details needed to calculate the denominator.

All information required to identify and calculate the target population/denominator such as definitions, time period for data collection, specific data collection items/responses, code/value sets.

Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at sp.11.

To calculate the measure denominator, the number of eligible SNF stays are counted. Stays are constructed using final action Medicare Part A claims. Stay construction begins by linking claims that share the same beneficiary identifier, facility CMS Certification Number (CCN), and admission date. To implement study restrictions and apply risk adjustment, stays created from SNF claims are linked to other Medicare claims and enrollment data using the beneficiary identifier. Once stays are constructed, eligible stays are identified for inclusion in the measure denominator. The eligible stays

for this measure are all Medicare FFS SNF stays that do not meet the exclusion criteria. Denominator exclusion criteria are listed below in section **sp.17** and **sp.18**.

sp.17) Describe the denominator exclusions.

Brief narrative description of exclusions from the target population.

SNF stays are excluded from the denominator if they meet one or more of the following criteria: (i) residents who are less than 18 years of age at the time of admission; (ii) the SNF length of stay was shorter than four days; (iii) residents who were not continuously enrolled in Part A FFS Medicare during the SNF stay, 12 months prior to the measure period, and three days after the end of the SNF stay; (iv) residents who did not have a Part A short-term acute care hospital stay within 30 days prior to the SNF admission date (the short-term stay must have positive payment and positive length of stay); (v) residents who were transferred to a federal hospital from the SNF as determined by the discharge status code on the SNF claim, (vi) residents who received care from a provider located outside of the United States, Puerto Rico, or a United States territory as determined from the first two characters of the SNF CCN; (vii) SNF stays in which data were missing on any variable used in the measure construction or risk adjustment, (viii) stays where Medicare did not pay for the stay resulting in a non-positive payment on the SNF claim, and (xi) swing bed stays in critical access hospitals. Refer to **Table 1** to reference the rationale behind each exclusion criterion.

Table 1. Exclusion Criteria and Rationale for SNF HAI Measure

Exclusion	Rationale
Resident is less than 18 years old at time of SNF admission.	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.
The SNF length of stay was shorter than four days.	HAIs that require hospitalization beginning day four after SNF admission will be identified as SNF HAIs. This helps exclude pre-existing infections from the measure numerator. By construction, SNF stays shorter than four days are not long enough to identify SNF HAIs.
Residents who were not continuously enrolled in Part A FFS Medicare during the SNF stay, 12 months prior to the measure period, and three days after the end of SNF stay.	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 discharge. Residents without Part A coverage or who are enrolled in Medicare Advantage plans will have incomplete inpatient claims.
Residents who did not have Part A short-term acute care hospital stay within 30 days prior to the SNF admission date. The short-term stay must have positive payment and positive length of stay.	This measure requires information from the prior short-term acute care hospital stay in the elements used for risk adjustment.
Residents who were transferred to a federal hospital from the SNF as determined by the discharge status code on the SNF claim.	Residents who are transferred to federal hospitals will have incomplete inpatient claims.
Residents who received care from a provider located outside of the United States, Puerto Rico, or a U.S. territory as determined from the first two characters of the SNF CMS Certification Number.	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.
SNF stays in which data were missing on any variable used in the measure construction or risk adjustment. This also includes stays where Medicare did not pay for the stay, which is identified by non-positive payment on the SNF claim.	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.
SNF stays where Medicare did not pay for the stay resulting in a non-positive payment on the SNF claim.	The stay was not covered under Medicare Part A.
SNF stays from swing beds in critical access hospitals.	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.

sp.18) Provide details needed to calculate the denominator exclusions.

All information required to identify and calculate exclusions from the denominator such as definitions, time period for data collection, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at sp.11.

Table 2 provides additional details related to the construction of exclusion criteria:

Table 2. Exclusion Criteria and Construction for the SNF HAI Measure

Exclusion	Exclusion Construction
Resident is less than 18 years old at time of SNF admission.	Age is determined by the resident's birth date on Medicare enrollment data
The SNF length of stay was shorter than four days.	Length of stay is the number of days of care from admission to discharge.
Residents who were not continuously enrolled in Part A FFS Medicare during the SNF stay, 12 months prior to the measure period, and three days after the end of SNF stay.	Resident monthly enrollment status is determined through the enrollment database.
Residents who did not have Part A short-term acute care hospital stay within 30 days prior to the SNF admission date. The short-term stay must have positive payment and positive length of stay.	A Part A short-term acute care hospital stay is considered within 30 days prior to the SNF admission date if the discharge date of the hospital stay is within 30 days of SNF admission.
Residents who were transferred to a federal hospital from the SNF as determined by the discharge status code on the SNF claim.	Transfer to a federal hospital is determined by the discharge status code on the SNF claim.
Residents who received care from a provider located outside of the United States, Puerto Rico, or a U.S. territory as determined from the first two characters of the SNF CMS Certification Number.	Provider state is determined from the first two characters of the SNF's CMS Certification Number.
SNF stays in which data were missing on any variable used in the measure construction or risk adjustment. This also includes stays where Medicare did not pay for the stay, which is identified by non-positive payment on the SNF claim.	Variables needed in measure construction are depicted in section sp.24, while variables required for risk adjustment are depicted in the *SNF-HAI-CBE-Submission-Attachment-sp12-20230503.xlsx* document referred to in section sp.12.
SNF stays where Medicare did not pay for the stay resulting in a non-positive payment on the SNF claim.	Stays that were not covered by Medicare are indicated by a non-positive payment on the SNF claim.
SNF stays from swing beds in critical access hospitals.	The third character of the SNF's CMS Certification Number indicates whether a provider is a swing bed.

sp.19) Provide all information required to stratify the measure results, if necessary.

Include the stratification variables, definitions, specific data collection items/responses, code/value sets, and the risk-model covariates and coefficients for the clinically-adjusted version of the measure when appropriate. Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format in the Data Dictionary field.

N/A: This measure does not publicly report stratified HAI rates.

sp.20) Is this measure adjusted for socioeconomic status (SES)?

☐ Yes
☒ No

sp.21) Select the risk adjustment type.

Select type. Provide specifications for risk stratification and/or risk models in the Scientific Acceptability section.

☐ No risk adjustment or risk stratification
☒ Statistical risk model
☐ Stratification by risk category/subgroup (specify number of risk factors)
☐ Other approach to address risk factors (please specify here:)

sp.22) Select the most relevant type of score.

Attachment: If available, please provide a sample report.

☐ Categorical, e.g., yes/no
☐ Continuous variable, e.g. average
☐ Count
☐ Frequency Distribution
☐ Non-weighted score/composite/scale
☐ Other (please specify here:)
☒ Rate/proportion
☐ Ratio
☐ Weighted score/composite scale

sp.23) Select the appropriate interpretation of the measure score.

Classifies interpretation of score according to whether better quality or resource use is associated with a higher score, a lower score, a score falling within a

defined interval, or a passing score.

☐ Better quality = Higher score
☒ Better quality = Lower score
☐ Better quality = Score within a defined interval
☐ Passing score defines better quality

sp.24) Diagram or describe the calculation of the measure score as an ordered sequence of steps.

Identify the target population; exclusions; cases meeting the target process, condition, event, or outcome; time period of data, aggregating data; risk adjustment; etc.

Step 1 – Stay Construction: Construct stays as described in **sp.16** and **sp.31**.

Step 2– Denominator Eligibility: Identify eligible stays for inclusion in the measure denominator as described in **sp.17** and **sp.18**.

Step 3 – Specifying the Incubation Window: To calculate the measure numerator, identify inpatient readmissions within the specified incubation window as described in Step 1 of **sp.14**.

Step 4 – HAI Identification: Identify HAIs as described in Step 2 of **sp.14**.

Step 5 – Applying the Repeat Infection Timeframe: Apply the 14-day repeat infection timeframe as described in Step 3 of **sp.14**.

Step 6 – Identifying Risk Adjustment Variables: Once the observed measure numerator and denominator are calculated, determine the presence or absence of risk adjustment variables for each resident. The SNF HAI measure is risk-adjusted by several variables including (i) age and sex categories, (ii) original reason for Medicare entitlement, (iii) prior proximal inpatient stay surgery category, (iv) prior dialysis treatment (not including end-stage renal disease) in the prior proximal inpatient stay, (v) principal diagnosis category in the prior proximal inpatient stay, (vi) Hierarchical Condition Category (HCC) comorbidities, (vii) length of the prior proximal inpatient stay, (viii) utilization of the intensive care unit (ICU) or critical care unit (CCU) in the prior proximal inpatient stay, and (ix) number of prior inpatient stays. Refer to **2b.20** for more information regarding risk adjustment.

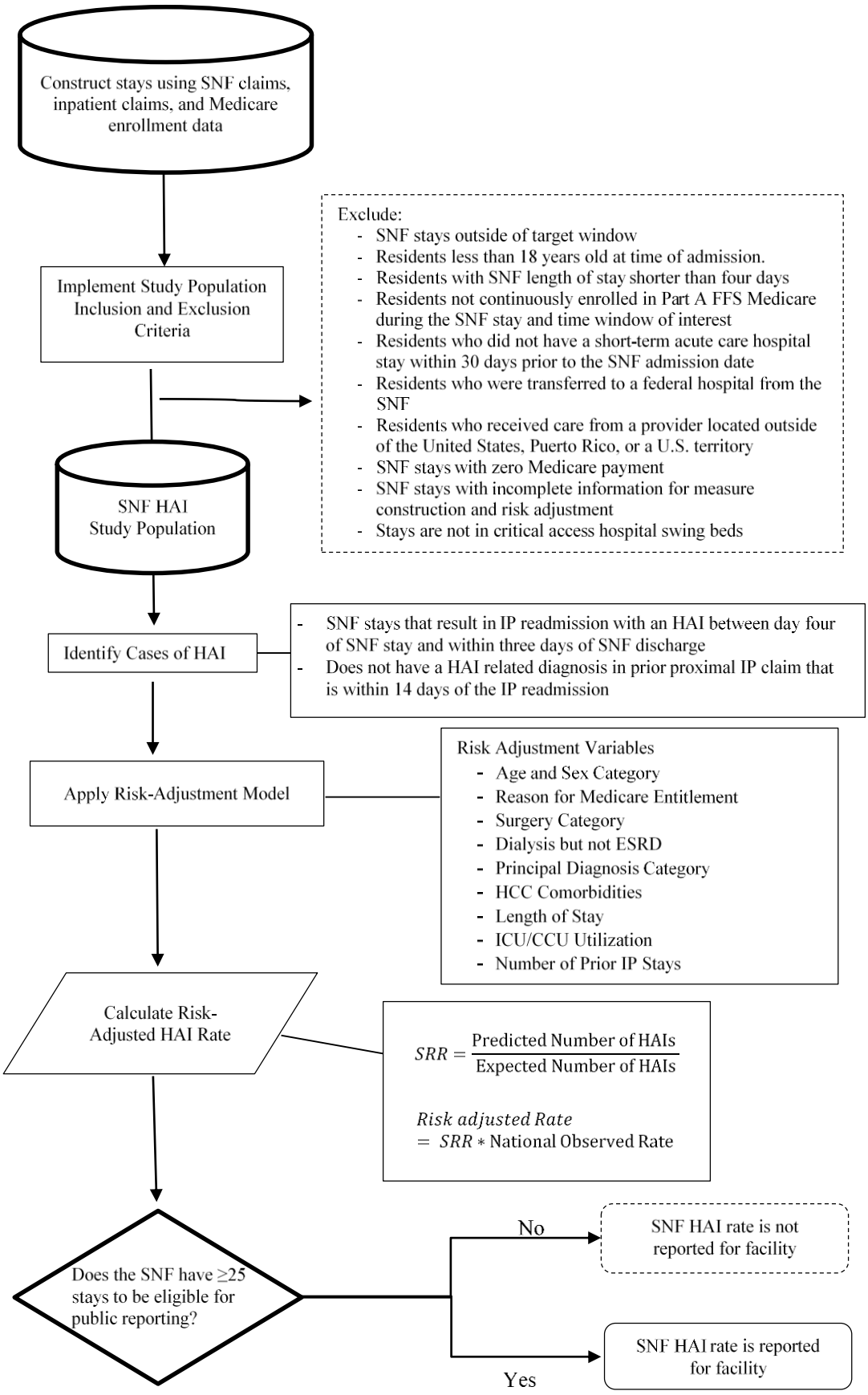
Step 7 – Calculating Predicted and Expected HAIs: Use the hierarchical logistic regression model to calculate the predicted and expected number of HAIs that are acquired during SNF care and result in hospitalization. The predicted number is the sum of the predicted probability of HAIs for each SNF based on the specific provider's performance given its observed case-mix, including a provider-specific effect. This provider-specific effect accounts for clustering of patients within the same facility and captures variation in the measure outcome across SNFs. The expected number is the sum of the predicted probability of HAIs for each SNF based on the average provider's

performance and its given case-mix, excluding the provider-specific effect. The standardized risk ratio (SRR) is calculated per SNF by dividing the predicted value by the expected value.

Step 8 – Final Risk-Adjusted HAI Rate: Calculate the risk-adjusted rate of HAIs that are acquired during SNF care and result in hospitalization by multiplying the SRR per provider by the overall national observed rate of HAIs.

Step 9 – Public Reporting Threshold: Only SNFs with 25 or more stays are eligible for public reporting.

Refer to image below a diagram of these steps.


Construct stays using SNF claims, inpatient claims, and Medicare enrollment data
Implement Study Population Inclusion and Exclusion Criteria
Exclude:
- SNF stays outside of target window
- Residents less than 18 years old at time of admission.
- Residents with SNF length of stay shorter than four days
- Residents not continuously enrolled in Part A FFS Medicare during the SNF stay and time window of interest
- Residents who did not have a short-term acute care hospital stay within 30 days prior to the SNF admission date
- Residents who were transferred to a federal hospital from the SNF
- Residents who received care from a provider located outside of the United States, Puerto Rico, or a U.S. territory
- SNF stays with zero Medicare payment
- SNF stays with incomplete information for measure construction and risk adjustment
- Stays are not in critical access hospital swing beds
SNF HAI Study Population
Identify Cases of HAI
- SNF stays that result in IP readmission with an HAI between day four of SNF stay and within three days of SNF discharge
- Does not have a HAI related diagnosis in prior proximal IP claim that is within 14 days of the IP readmission
Apply Risk-Adjustment Model
Risk Adjustment Variables
- Age and Sex Category
- Reason for Medicare Entitlement
- Surgery Category
- Dialysis but not ESRD
- Principal Diagnosis Category
- HCC Comorbidities
- Length of Stay
- ICU/CCU Utilization
- Number of Prior IP Stays
Calculate Risk-Adjusted HAI Rate
$SRR = \frac{\text{Predicted Number of HAIs}}{\text{Expected Number of HAIs}}$
$Risk\ adjusted\ Rate = SRR * \text{National Observed Rate}$
Does the SNF have ≥25 stays to be eligible for public reporting?
No
SNF HAI rate is not reported for facility
Yes
SNF HAI rate is reported for facility

sp.25) Attach a copy of the instrument (e.g. survey, tool, questionnaire, scale) used as a data source for your measure, if available.

☐ Copy of instrument is attached.
☒ Copy of instrument is NOT attached (please explain).

This measure is calculated using administrative Medicare Part A fee-for-service claims data.

sp.26) Indicate the responder for your instrument.

☐ Patient
☐ Family or other caregiver
☐ Clinician
☒ Other (specify)

This is a claims-based measure and therefore does not rely on responders to use an instrument.

sp.27) If measure testing is based on a sample, provide instructions for obtaining the sample and guidance on minimum sample size.

Examples of samples used for testing:

• Testing may be conducted on a sample of the accountable entities (e.g., hospital, physician). The analytic unit specified for the particular measure (e.g., physician, hospital, home health agency) determines the sampling strategy for scientific acceptability testing.

• The sample should represent the variety of entities whose performance will be measured. The samples used for reliability and validity testing often have limited generalizability because measured entities volunteer to participate. Ideally, however, all types of entities whose performance will be measured should be included in reliability and validity testing.

• The sample should include adequate numbers of units of measurement and adequate numbers of patients to answer the specific reliability or validity question with the chosen statistical method.

• When possible, units of measurement and patients within units should be randomly selected.

Sampling is not used for this measure.

sp.28) Identify whether and how proxy responses are allowed.

N/A

sp.29) Survey/Patient-reported data.

Provide instructions for data collection and guidance on minimum response rate. Specify calculation of response rates to be reported with performance measure results.

N/A

sp.30) Select only the data sources for which the measure is specified.

☐ Assessment Data
☒ Claims
☐ Electronic Health Data
☐ Electronic Health Records
☐ Instrument-Based Data
☐ Management Data
☐ Other (please specify here:)
☐ Paper Medical Records
☐ Registry Data

sp.31) Identify the specific data source or data collection instrument.

For example, provide the name of the database, clinical registry, collection instrument, etc., and describe how data are collected.

This measure is calculated entirely using administrative data. This measure uses data from the Medicare Enrollment Database (EDB) and SNF and inpatient claims. The EDB file provides information on residents' date of birth, demographics, original reason for Medicare enrollment, and periods of Medicare enrollment information. Information used for measure construction from SNF claims includes residents' date of admission, hospitalization information and diagnoses, as well as variables used for risk adjustment including residents' prior acute care utilization.

sp.32) Provide the data collection instrument.

☐ Available at measure-specific web page URL identified in sp.09
☐ Available in attached appendix in Question 1 of the Additional Section
☒ No data collection instrument provided

Importance to Measure and Report: Maintenance of Endorsement (1ma.01)

1ma.01) Indicate whether there is new evidence about the measure since the most recent maintenance evaluation. If yes, please briefly summarize the new evidence, and ensure you have updated entries in the Evidence section as needed.

☐ Yes
☐ No

N/A: This measure has never been through CBE endorsement, prior to this submission.

Importance to Measure and Report: Evidence (Complete for Outcome Measures) (1a.01 - 1a.03)

Please separate added or updated information from the most recent measure evaluation within each question response in the Importance to Measure and Report: Evidence section. For example:

Current Submission:

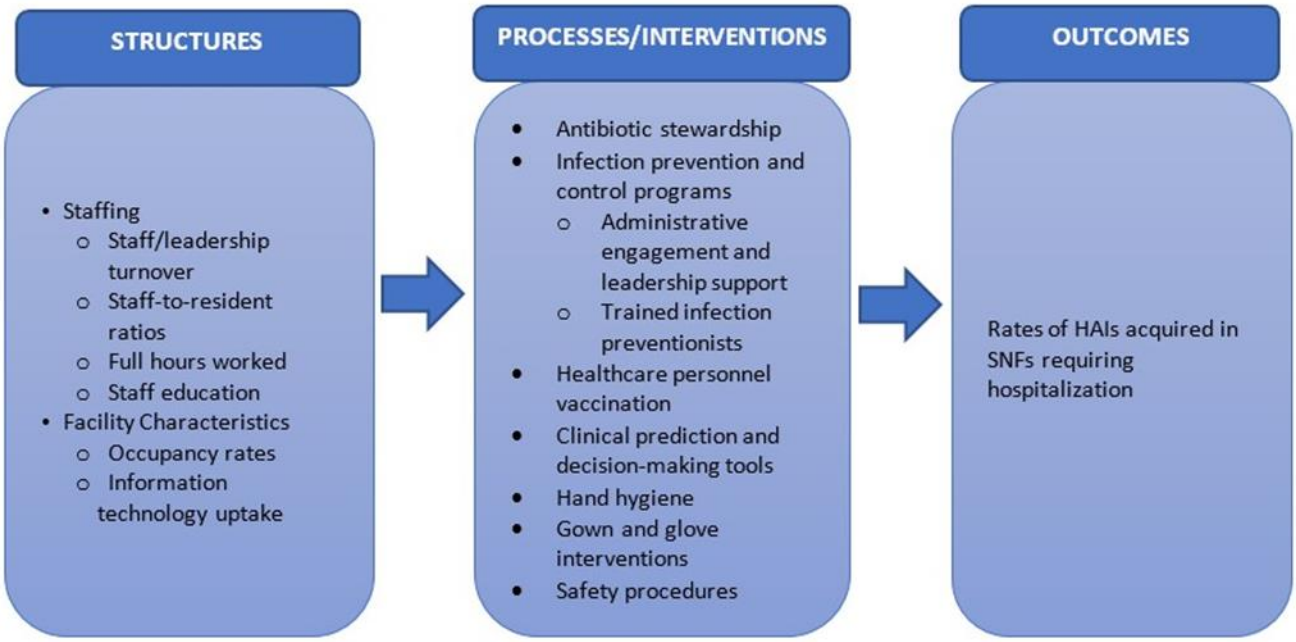
Updated evidence information here.

Previous (Year) Submission:

Evidence from the previous submission here.

1a.01) Provide a logic model.

Briefly describe the steps between the healthcare structures and processes (e.g., interventions, or services) and the patient's health outcome(s). The relationships in the diagram should be easily understood by general, non-technical audiences. Indicate the structure, process or outcome being measured.



1a.02) Provide evidence that the target population values the measured outcome, process, or structure and finds it meaningful.

Describe how and from whom input was obtained.

As part of the measure development process, a TEP was convened to seek measure concept and specification input on the SNF HAI measure. The TEP consisted of 12 stakeholders with a diverse range of expertise, including SNF and post-acute care subject matter knowledge, clinical and infectious disease expertise, patient and family perspectives, and measure development experience [1]. Results of a pre-TEP survey revealed that (i) 100% of TEP panelists considered the prevention and reduction of HAIs as top priorities as implementation of an HAI measure would help establish baseline rates, evaluate effectiveness of interventions, promote attention to HAIs, and combat the rise of antibiotic-resistant infections [2]; (ii) 91% of panelists agreed that large or moderate performance gaps exist in HAI prevention [3], (iii) 100% of panelists considered an HAI measure to be highly or moderately actionable as reducing HAIs is feasible through the use of well-designed interventions [4], and (iv) 91% of TEP panelists agreed that there is potential for an HAI measure to reduce rates of HAIs [5]. Overall, TEP panelists supported the SNF HAI measure concept and provided useful input on the measure's specifications [6]. A summary of TEP proceedings and discussions is included in the TEP Summary Report available at the following webpage: https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/Downloads/SNF-HAI-Final-TEP-Report-7-15-19_508C.pdf.

Additionally, residents may find the SNF HAI measure meaningful as several factors place residents at a greater risk for contracting HAIs requiring hospitalizations, including increased age, cognitive and functional decline, use of indwelling devices, frequent care transitions, and close contact with other residents and healthcare workers [7,8,9,10]. Additional risk factors include admission from an acute care hospital, select cardiovascular and respiratory conditions, impaired functional status, and receipt of antibiotics or American Geriatric Society Beers criteria medications [11]. The COVID-19 public health emergency (PHE) also highlighted the need for better infection control practices in the SNF and nursing home settings. COVID-19 studies revealed higher patient spread due to poor infection control, staff rotations between multiple SNFs, and poor patient COVID-19 screenings [12,13]. Overall, 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 [14,15,16,17].

References:

[1] RTI International. (2019). Technical Expert Composition (Membership) List. Retrieved from https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/Downloads/SNF-HAI-Technical-Expert-Panel-Composition-List_081619_508C.pdf.

[2] On a five-point scale (5 meaning high and 0 meaning low), 45.5% of TEP panelists voted 5 and 54.5% of panelists voted 4 for determining the priority and importance of an HAI measure.
[3] On a five-point scale (5 meaning high and 0 meaning low), 45.5% of TEP panelists voted 5, 27.3% voted 4, and 18.2% voted 3 for assessing an HAI performance gap.
[4] On a five-point scale, (5 meaning high and 0 meaning low), 18.2% of TEP panelists voted 5, 18.2% of panelists voted 4, and 63.6% of TEP panelists voted 3 in relation to the actionability of an HAI measure.
[5] On a five-point scale, (5 meaning high and 0 meaning low), 27.3% of TEP panelists voted 5, 27.3% of panelists voted 4, and 36.4% panelists voted 3 in terms of HAI measure usability.
[6] RTI International. (2019). Final Technical Expert Panel Summary Report: Development of a Healthcare-Associated Infections Quality Measure for the Skilled Nursing Facility Quality Reporting Program. Retrieved from https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/Downloads/SNF-HAI-Final-TEP-Report-7-15-19_508C.pdf.
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Montgomery, P., Rao, A. K., Currie, D. W., Chow, E. J., Tobolowsky, F., Bardossy, A. C., Oakley, L. P., … Public Health – Seattle & King County, EvergreenHealth, and CDC COVID-19 Investigation Team (2020). COVID-19 in a Long-Term Care Facility - King County, Washington, February 27-March 9, 2020. MMWR. Morbidity and mortality weekly report, 69(12), 339–342. https://doi.org/10.15585/mmwr.mm6912e1.
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1a.03) Provide empirical data demonstrating the relationship between the outcome (or PRO) and at least one healthcare structure, process, intervention, or service.

HAIs requiring hospitalization are related to several health care structures and processes; various interventions may help reduce HAI rates.

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 lack of full-time nurses are all factors related to higher rates of HAIs [1,2,3]. For example, both urinary tract infections (UTIs) and multidrug resistant organisms (MDROs) rates were negatively related to the Registered Nurse (RN) staffing component of the Nursing Home Five-Star Quality Rating System [4]. Evidence also shows inadequacy of staff educational programs leading to greater HAI risk among residents. Notably, one 2018 study noted that less than 40 percent of infection preventionists had specific training in infection control, and less than three percent were certified in infection control [5]. Additional facility characteristics influencing HAI rates include occupancy rates, and adoption of, or lack thereof, infection surveillance and prevention policies [6]. 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 [6]. Furthermore, additional studies conclude that facility utilization of electronic medical records, and uptake of information technology infrastructure were associated with reduced HAI rates [7,8].

In addition to facility characteristics, several facility processes also influence rates of HAIs requiring hospitalization. Empirical evidence demonstrates that antibiotic stewardship efforts, such as auditing culture and prescribing practices, providing feedback to prescribers, and engaging clinical staff with educational in-services, are likely to reduce HAI rates [9]. Among studies that have implemented antibiotic stewardship practices, results show decreases in systemic antibiotic prescription rates, less antibiotic use to treat cystitis, lower C. difficile infection rates with no urosepsis events, and 17% lower antibiotic use for urinary tract infections [10,11,12]. Medical director involvement in antibiotic stewardship programs was found to be an important element of program success [13]. Furthermore, SNFs with trained infection preventionists were three times as likely to have a policy to restrict the use of antibiotics when controlling for facility characteristics [14,15]. In addition to antibiotic stewardship, vaccination of healthcare personnel (HCP) is another process that can reduce HAI rates. Among vaccination programs, HCP working in long-term care facilities had lower influenza vaccination rates when compared to providers in other settings [16,17]. Lastly, clinical prediction and decision-making tools are useful strategies for preventing HAIs. One study emphasized the use of clinical prediction tools to identify transfer of methicillin-resistant Staphylococcus aureus (MRSA) onto healthcare personnel gowns [18]. Another study highlighted the use of clinical decision tools such as SBAR (situation-background-assessment-recommendation) for assessing early signs of sepsis prior to and after implementation of sepsis screening [19].

Building off of processes that can influence HAI rates, various interventions may reduce HAI rates in SNFs. Several studies focus on multicomponent interventions to mitigate HAIs, including the adoption of infection surveillance and prevention policies, safety procedures, hand hygiene, gown and glove interventions, and staff education and training programs [20,21,22]. Additionally, infection prevention and control programs with core components in education, monitoring, and feedback on infection rates from surveillance programs have been found to be successful interventions for reducing HAIs [23]. Studies identify administrative engagement to be a core component of long-term care facility interventions [22]. The effectiveness of these interventions suggests improvement of HAI rates among SNF residents is possible through modifying provider-led processes and interventions.

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Importance to Measure and Report: Evidence (Complete for Process Measures) (1a.03 - 1a.16)

Please separate added or updated information from the most recent measure evaluation within each question response in the Importance to Measure and Report: Evidence section. For example:

Current Submission:

Updated evidence information here.

Previous (Year) Submission:

Evidence from the previous submission here.

1a.01) Provide a logic model.

Briefly describe the steps between the healthcare structures and processes (e.g., interventions, or services) and the patient's health outcome(s). The relationships in the diagram should be easily understood by general, non-technical audiences. Indicate the structure, process or outcome being measured.

N/A

1a.02) Select the type of source for the systematic review of the body of evidence that supports the performance measure.

A systematic review is a scientific investigation that focuses on a specific question and uses explicit, prespecified scientific methods to identify, select, assess, and summarize the findings of similar but separate studies. It may include a quantitative synthesis (meta-analysis), depending on the available data.

☐ Clinical Practice Guideline recommendation (with evidence review)
☐ US Preventive Services Task Force Recommendation
☐ Other systematic review and grading of the body of evidence (e.g., Cochrane Collaboration, AHRQ Evidence Practice Center)
☐ Other (please specify here:)

If the evidence is not based on a systematic review, skip to the end of the section and do not complete the repeatable question group below. If you wish to include more than one systematic review, you may add additional tables to the relevant sections. Please follow the 508 Checklist for tables.

N/A

Evidence - Systematic Reviews Table (Repeatable)

1a.03) Provide the title, author, date, citation (including page number) and URL for the systematic review.

N/A

1a.04) Quote the guideline or recommendation verbatim about the process, structure or intermediate outcome being measured. If not a guideline, summarize the conclusions from the systematic review.

N/A

1a.05) Provide the grade assigned to the evidence associated with the recommendation and include the definition of the grade.

N/A

1a.06) Provide all other grades and definitions from the evidence grading system.

N/A

1a.07) Provide the grade assigned to the recommendation, with definition of the grade.

N/A

1a.08) Provide all other grades and definitions from the recommendation grading system.

N/A

1a.09) Detail the quantity (how many studies) and quality (the type of studies) of the evidence.

N/A

1a.10) Provide the estimates of benefit, and consistency across studies.

N/A

1a.11) Indicate what, if any, harms were identified in the study.

N/A

1a.12) Identify any new studies conducted since the systematic review, and

indicate whether the new studies change the conclusions from the systematic review.

N/A

Evidence

1a.13) If source of evidence is NOT from a clinical practice guideline, USPSTF, or systematic review, describe the evidence on which you are basing the performance measure.

N/A

1a.14) Briefly synthesize the evidence that supports the measure.

N/A

1a.15) Detail the process used to identify the evidence.

N/A

1a.16) Provide the citation(s) for the evidence.

N/A

Importance to Measure and Report: Gap in Care/Disparities (1b.01 - 1b.05)

1b.01) Briefly explain the rationale for this measure.

Explain how the measure will improve the quality of care and list the benefits or improvements in quality envisioned by use of this measure.

A healthcare-associated infection (HAI) is defined as an infection acquired while receiving care at a health care facility that was not present or incubating at the time of admission [1][2]. A 2014 report from the Office of Inspector General (OIG) estimated that 1 in 4 adverse events among SNF residents are due to HAIs [3]. If the prevention and treatment of HAIs are poorly managed, they can cause poor health care outcomes for residents and lead to wasteful resource use. Although HAIs are not considered never-events, most are considered to be potentially preventable because they are outcomes of processes and structures of care, as described in sections **1a.01** and **1a.03**. In other words, HAIs are typically the result of inadequate patient management following a medical intervention, such as surgery or device implantation, or poor adherence to hygiene protocol and antibiotic stewardship guidelines. Therefore, measuring HAIs among SNF residents can provide valuable information about a SNF's quality of care. Improvements in quality envisioned by this measure are summarized by the pre-TEP feedback described in section **1a.02**.

References:

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1b.02) Provide performance scores on the measure as specified (current and over time) at the specified level of analysis.

Include mean, std dev, min, max, interquartile range, and scores by decile. Describe the data source including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities include. This information also will be used to address the sub-criterion on improvement (4b) under Usability and Use.

FY2021 data: Among publicly reportable SNF providers (n = 11,961), the average SNF HAI rate was 7.63% with a minimum of 3.19%, maximum of 20.27%, median of 7.37%, interquartile range of 2.31 percentage points, and a standard deviation of 1.80 percentage points.

FY2020 data: Among publicly reportable SNF providers (n = 13,278), the average SNF

HAI rate was 7.11% with a minimum of 2.40%, maximum of 21.09%, median of 6.67%, interquartile range of 2.76 percentage points, and a standard deviation of 2.21 percentage points.

FY2019 data: Among publicly reportable SNF providers (n = 14,102), the average SNF HAI rate was 5.85% with a minimum of 2.36%, maximum of 17.62%, median of 5.59%, interquartile range of 1.94 percentage points, and a standard deviation of 1.53 percentage points.

1b.03) If no or limited performance data on the measure as specified is reported above, then provide a summary of data from the literature that indicates opportunity for improvement or overall less than optimal performance on the specific focus of measurement. Include citations.

N/A

1b.04) Provide disparities data from the measure as specified (current and over time) by population group, e.g., by race/ethnicity, gender, age, insurance status, socioeconomic status, and/or disability.

Describe the data source including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included. Include mean, std dev, min, max, interquartile range, and scores by decile. For measures that show high levels of performance, i.e., "topped out", disparities data may demonstrate an opportunity for improvement/gap in care for certain sub-populations. This information also will be used to address the sub-criterion on improvement (4b) under Usability and Use.

To assess the relationship between social risk factors and SNF HAI provider performance, we used FY2021 data to stratify SNFs meeting the public reporting threshold (25 stays or more) into quintiles based on their proportion of non-White and Medicare/Medicaid dually-enrolled residents. Providers in higher quintiles (i.e., the fifth quintile) had a higher proportion of vulnerable residents than those in lower quintiles (i.e., the first quintile). Descriptive characteristics of FY2021 data are described in section **1b.02**.

Results of the dual stratification show that facilities in the fifth quintile have a higher mean risk-adjusted HAI rate in comparison to facilities in the first quintile (8.38% and 6.71%, respectively) (**Table 3**). Similarly, results of the race/ethnicity stratification show that facilities in the fifth quintile have a higher risk-adjusted HAI rate in comparison to facilities in the first quintile (8.31% and 7.20%, respectively) (**Table 4**). Although we observe performance differences across quintiles, we highlight that the overlap in distributions across quintiles shows that facilities with a higher proportion of vulnerable residents may still perform well. See the tables below for distribution information.

We do not observe a clear difference in performance between facilities caring for high- and low-SRF residents within the same quintile. To further understand performance

differences within-provider and across provider quintiles, we compared standardized risk ratios (SRRs) within each quintile among the dual and non-dual populations and among race/ethnicity groups. Results of this analysis reveal minimal differences in SRR when comparing dual to non-dual populations and non-White to White populations within the same quintile group. Therefore, this trend is likely due to differences at the provider-level rather than SRFs at the resident-level. For instance, it is possible that high-SRF populations often experience difficulties in accessing higher quality facilities. See results of this analysis in the tables below, and refer to section **2b.25** for more information about social risk factors and the SNF HAI risk adjustment model.

Table 3. Distribution of Risk-Adjusted HAI Rate and Mean SRR by Percent Dual Quintiles

Percent Dual Quintiles	Number of SNFs	Mean	SD	Min	P10	P25	P50	P75	P90	Max	Average SRR Dual	Average SRR Non-Dual
First [0 – 0.19]	2,392	6.71%	1.48%	3.19%	5.07%	5.70%	6.51%	7.51%	8.65%	13.75%	0.82	0.80
Second [0.19 – 0.32]	2,379	7.33%	1.68%	3.19%	5.44%	6.16%	7.08%	8.30%	9.54%	15.46%	1.02	0.98
Third [0.32 – 0.45]	2,406	7.71%	1.68%	3.86%	5.82%	6.50%	7.49%	8.63%	9.96%	15.54%	1.10	1.10
Fourth [0.45 – 0.61]	2,386	8.03%	1.80%	3.83%	6.02%	6.70%	7.74%	9.02%	10.50%	16.59%	1.20	1.21
Fifth [0.61 – 1]	2,398	8.38%	1.87%	4.17%	6.26%	6.99%	8.12%	9.42%	10.77%	20.27%	1.33	1.36

*Average SRR = sum of observed/sum of expected

Table 4. Distribution of Risk-Adjusted HAI Rates and Mean SRR by Percent Non-White Quintiles

Percent Non-White Quintiles	Number of SNFs	Mean	SD	Min	P10	P25	P50	P75	P90	Max	Mean SRR White	Mean SRR Black	Mean SRR Hispanic	Mean SRR Asian	Mean SRR Native American
First [0 – 0.03]	2,398	7.20%	1.62%	3.45%	5.48%	6.07%	6.91%	8.01%	9.28%	20.27%	0.89	1.03	0.93	0.22	0.44
Second [0.03 – 0.07]	2,380	7.20%	1.68%	3.45%	5.36%	6.01%	6.92%	8.09%	9.39%	15.70%	0.92	0.93	0.66	0.83	0.81
Third [0.07 – 0.14]	2,410	7.53%	1.70%	3.70%	5.56%	6.32%	7.31%	8.52%	9.76%	14.50%	1.01	1.01	1.04	0.82	0.93
Fourth [0.14 – 0.28]	2,381	7.93%	1.86%	3.19%	5.81%	6.60%	7.72%	8.98%	10.38%	17.56%	1.13	1.10	1.04	1.21	1.07
Fifth [0.28 – 1]	2,392	8.31%	1.86%	3.19%	6.11%	6.94%	8.07%	9.44%	10.75%	16.54%	1.28	1.23	1.21	1.36	1.16

*Average SRR = sum of observed/sum of expected

1b.05) If no or limited data on disparities from the measure as specified is reported above, then provide a summary of data from the literature that addresses disparities in care on the specific focus of measurement. Include citations. Not necessary if performance data provided in above.

N/A

Scientific Acceptability: Maintenance (2ma.01 - 2ma.04)

2ma.01) Indicate whether additional empirical reliability testing at the accountable entity level has been conducted. If yes, please provide results in the following section, Scientific Acceptability: Reliability - Testing. Include information on all testing conducted (prior testing as well as any new testing).

Please separate added or updated information from the most recent measure evaluation within each question response in the Scientific Acceptability sections. For example:

Current Submission:

Updated testing information here.

Previous Submission:

Testing from the previous submission here.

☐ Yes
☐ No

N/A

2ma.02) Indicate whether additional empirical validity testing at the accountable entity level has been conducted. If yes, please provide results in the following section, Scientific Acceptability: Validity - Testing. Include information on all testing conducted (prior testing as well as any new testing).

Please separate added or updated information from the most recent measure evaluation within each question response in the Scientific Acceptability sections. For example:

Current Submission:

Updated testing information here.

Previous Submission:

Testing from the previous submission here.

☐ Yes
☐ No

N/A

2ma.03) For outcome, patient-reported outcome, resource use, cost, and some process measures, risk adjustment/stratification may be conducted. Did you perform a risk adjustment or stratification analysis?

☐ Yes
☐ No

N/A

2ma.04) For maintenance measures in which risk adjustment/stratification has been performed, indicate whether additional risk adjustment testing has been conducted since the most recent maintenance evaluation. This may include updates to the risk adjustment analysis with additional clinical, demographic, and social risk factors.

Please update the Scientific Acceptability: Validity - Other Threats to Validity section.

Note: This section must be updated even if social risk factors are not included in the risk adjustment strategy.

☐ Yes - Additional risk adjustment analysis is included
☐ No additional risk adjustment analysis included

N/A

Scientific Acceptability: Reliability - Testing (2a.01 - 2a.12)

Measure testing must demonstrate adequate reliability and validity in order to be recommended for endorsement. Testing may be conducted for data elements and/or the computed measure score. Testing information and results should be entered in the appropriate fields in the Scientific Acceptability sections of the Measure Submission Form.

- Measures must be tested for all the data sources and levels of analyses that are specified. If there is more than one set of data specifications or more than one level of analysis, contact Battelle staff at PQMsupport@battelle.org about how to present all the testing information in one form.
- All required sections must be completed.
- For composites with outcome and resource use measures, Questions 2b.23-2b.37 (Risk Adjustment) also must be completed.
- If specified for multiple data sources/sets of specifications (e.g., claims and EHRs), Questions 2b.11-2b.13 also must be completed.
- An appendix for supplemental materials may be submitted (see Question 1 in the Additional section), but there is no guarantee it will be reviewed.
- Contact Battelle staff at PQMsupport@battelle.org with any questions.
- For information on the most updated guidance on how to address social risk factors variables and testing in this form refer to the release notes for the 2021 Measure Evaluation Criteria and Guidance.

Note: The information provided in this form is intended to aid the Standing Committee and other stakeholders in understanding to what degree the testing results for this measure meet the evaluation criteria for testing.

2a. Reliability testing demonstrates the measure data elements are repeatable, producing the same results a high proportion of the time when assessed in the same population in the same time period and/or that the measure score is precise. For instrument-based measures (including PRO-PMs) and composite performance measures, reliability should be demonstrated for the computed performance score.

2b1. Validity testing demonstrates that the measure data elements are correct and/or the measure score correctly reflects the quality of care provided, adequately identifying differences in quality. For instrument-based measures (including PRO-PMs) and composite performance measures, validity should be demonstrated for the computed performance score.

2b2. Exclusions are supported by the clinical evidence and are of sufficient frequency to warrant inclusion in the specifications of the measure;

AND

If patient preference (e.g., informed decision-making) is a basis for exclusion, there must be evidence that the exclusion impacts performance on the measure; in such cases, the measure must be specified so that the information about patient preference and the effect on the measure is transparent (e.g., numerator category computed separately, denominator exclusion category computed separately).

2b3. For outcome measures and other measures when indicated (e.g., resource use):

• an evidence-based risk-adjustment strategy (e.g., risk models, risk stratification) is specified; is based on patient factors (including clinical and social risk factors) that influence the measured outcome and are present at start of care; 14,15 and has demonstrated adequate discrimination and calibration

OR

• rationale/data support no risk adjustment/ stratification.

2b4. Data analysis of computed measure scores demonstrates that methods for scoring and analysis of the specified measure allow for identification of statistically significant and practically/clinically meaningful 16 differences in performance;

OR

there is evidence of overall less-than-optimal performance.

2b5. If multiple data sources/methods are specified, there is demonstration they produce comparable results.

2b6. Analyses identify the extent and distribution of missing data (or nonresponse) and demonstrate that performance results are not biased due to systematic missing data (or differences between responders and non-responders) and how the specified handling of missing data minimizes bias.

2c. For composite performance measures, empirical analyses support the composite construction approach and demonstrate that:

2c1. the component measures fit the quality construct and add value to the overall composite while achieving the related objective of parsimony to the extent possible; and

2c2. the aggregation and weighting rules are consistent with the quality construct and rationale while achieving the related objective of simplicity to the extent possible.

(if not conducted or results not adequate, justification must be submitted and accepted)

Definitions

Reliability testing applies to both the data elements and computed measure score. Examples of reliability testing for data elements include, but are not limited to: inter-rater/abstractor or intra-rater/abstractor studies; internal consistency for multi-item scales; test-retest for survey items. Reliability testing of the measure score addresses precision of measurement (e.g., signal-to-noise).

Validity testing applies to both the data elements and computed measure score. Validity testing of data elements typically analyzes agreement with another authoritative source of the same information. Examples of validity testing of the measure score include, but are not limited to: testing hypotheses that the measures scores indicate quality of care, e.g., measure scores are different for groups known to have differences in quality assessed by another valid quality measure or method; correlation of measure scores with another valid indicator of quality for the specific topic; or relationship to conceptually related measures (e.g., scores on process measures to scores on outcome measures). Face validity of the measure score as a quality indicator may be adequate if accomplished through a systematic and transparent process, by identified experts, and explicitly addresses whether performance scores resulting from the measure as specified can be used to distinguish good from poor quality. The degree of consensus and any areas of disagreement must be provided/discussed.

Examples of evidence that an exclusion distorts measure results include, but are not limited to: frequency of occurrence, variability of exclusions across providers, and sensitivity analyses with and without the exclusion.

Patient preference is not a clinical exception to eligibility and can be influenced by provider interventions.

Risk factors that influence outcomes should not be specified as exclusions.

With large enough sample sizes, small differences that are statistically significant may or may not be practically or clinically meaningful. The substantive question may be, for example, whether a statistically significant difference of one percentage point in the percentage of patients who received smoking cessation counseling (e.g., 74 percent v. 75 percent) is clinically meaningful; or whether a statistically significant difference of $25 in cost for an episode of care (e.g., $5,000 v.$5,025) is practically meaningful. Measures with overall less-than-optimal performance may not demonstrate much variability across providers.

Please separate added or updated information from the most recent measure evaluation within each question response in the Scientific Acceptability sections. For example:

Current Submission:

Updated testing information here.

Previous (Year) Submission:

Testing from the previous submission here.

2a.01) Select only the data sources for which the measure is tested.

☐ Assessment Data
☒ Claims
☐ Electronic Health Data
☐ Electronic Health Records
☐ Instrument-Based Data
☐ Management Data
☐ Other (please specify here:)
☐ Paper Medical Records
☐ Registry Data

2a.02) If an existing dataset was used, identify the specific dataset.

The dataset used for testing must be consistent with the measure specifications for target population and healthcare entities being measured; e.g., Medicare Part A claims, Medicaid claims, other commercial insurance, nursing home MDS, home health OASIS, clinical registry).

Measure scores are calculated using Medicare Part A fee-for-service claims data and Medicare enrollment data. Medicare enrollment data is also used for some of our risk adjustment covariates, such as sex, age, and original reason for Medicare entitlement. All Medicare Part A SNF PPS claims are used except those with exclusions mentioned in sections **sp.17** and **sp.18**.

2a.03) Provide the dates of the data used in testing.

Use the following format: "MM-DD-YYYY - MM-DD-YYYY"

FY2021 (10-1-2020 – 09-30-2021); Note that the measure utilizes a 365-day lookback period.

2a.04) Select the levels of analysis for which the measure is tested.

Testing must be provided for all the levels specified and intended for measure implementation, e.g., individual clinician, hospital, health plan.

☐ Accountable Care Organization
☐ Clinician: Group/Practice
☐ Clinician: Individual
☒ Facility
☐ Health Plan
☐ Integrated Delivery System
☐ Other (specify)
☐ Population: Community, County or City
☐ Population: Regional and State

2a.05) List the measured entities included in the testing and analysis (by level of analysis and data source).

Identify the number and descriptive characteristics of measured entities included in the analysis (e.g., size, location, type); if a sample was used, describe how entities were selected for inclusion in the sample.

11,961 of all Medicare-certified SNFs are eligible for public reporting and have 25 stays or more. Among this population, the average SNF HAI rate was 7.63% with a minimum of 3.19%, maximum of 20.27%, median of 7.37%, interquartile range of 2.31%, and a standard deviation of 1.80%. See ***Table 5*** for information regarding the percentage of SNFs per SNF characteristics, (i.e., facility size, ownership type, region, and urban/rural status) among publicly reportable facilities.

Table 5. Percentage of SNFs per SNF Characteristic, FY2021

SNF Characteristics	Number of SNFs	Percent of SNFs
National Rate		
All SNFs	11,961	100.00%
Number of Eligible Stays		
25-49	3,747	31.33%
50-79	3,024	25.28%
80-199	4,116	34.41%
200-499	1,012	8.46%
500+	62	0.52%
Ownership		
For-Profit	8,723	72.93%
Nonprofit	2,688	22.47%
Government	540	4.51%
Unknown	10	0.08%
Institution Type		
Freestanding	11,557	96.62%
Hospital-based	299	2.50%
Swing Bed	103	0.86%
Unknown	2	0.02%
Census Region		
New England	724	6.05%
Middle Atlantic	1,501	12.55%
East North Central	2,328	19.46%
West North Central	1,136	9.50%
South Atlantic	2,106	17.61%
East South Central	903	7.55%
West South Central	1,498	12.52%
Mountain	517	4.32%
Pacific	1,245	10.41%
Outlying	3	0.03%
Urban/Rural Status		
Urban	9,165	76.62%
Rural	2,791	23.33%
Unknown	5	0.04%

2a.06) Identify the number and descriptive characteristics of patients included in the analysis (e.g., age, sex, race, diagnosis), separated by level of analysis and data source; if a sample was used, describe how patients were selected for inclusion in the sample.

If there is a minimum case count used for testing, that minimum must be reflected in the specifications.

See the table below (***Table 6***) for information regarding SNF stays and resident characteristics.

Table 6. Percentage of Stays per Resident Characteristic, FY2021

Resident Characteristics	Number of Stays	Percent of Stays
National Rate		
All Stays	1,196,443	100.00%
Sex		
Male	487,689	40.76%
Female	708,754	59.24%
Age		
18-34 years	1,773	0.15%
35-44 years	6,260	0.52%
45-54 years	20,843	1.74%
55-59 years	28,290	2.36%
60-64 years	47,947	4.01%
65-69 years	118,203	9.88%
70-74 years	175,847	14.70%
75-79 years	198,042	16.55%
80-84 years	211,717	17.70%
85-89 years	198,718	16.61%
90-94 years	135,912	11.36%
95+ years	52,891	4.42%
Race/Ethnicity		
White	1,008,679	84.31%
Black	125,030	10.45%
Hispanic	17,734	1.48%
Asian	15,026	1.26%
Native American	6,960	0.58%
Other/Unknown	23,014	1.92%
Original Reason for Enrollment		
Aged (with or without ESRD)	892,080	74.56%
Disabled (with or without ESRD)	297,015	24.82%
ESRD only	7,348	0.61%
Medicare/Medicaid Enrollment		
Not Dually Enrolled	782,218	65.38%
Dually Enrolled	414,204	34.62%

2a.07) If there are differences in the data or sample used for different aspects of

testing (e.g., reliability, validity, exclusions, risk adjustment), identify how the data or sample are different for each aspect of testing.

N/A

2a.08) List the social risk factors that were available and analyzed.

For example, patient-reported data (e.g., income, education, language), proxy variables when social risk data are not collected from each patient (e.g. census tract), or patient community characteristics (e.g. percent vacant housing, crime rate) which do not have to be a proxy for patient-level data.

Note: If accuracy/correctness (validity) of data elements was empirically tested, separate reliability testing of data elements is not required – in 2a.09 check patient or encounter-level data; in 2a.010 enter "see validity testing section of data elements"; and enter "N/A" for 2a.11 and 2a.12.

We assessed Medicare/Medicaid dual enrollment and race/ethnicity in relation to the SNF HAI measure. See section **1b.04** and **2b.25** for more details.

2a.09) Select the level of reliability testing conducted.

Choose one or both levels.
☐ Patient or Encounter-Level (e.g., inter-abstractor reliability; data element reliability must address ALL critical data elements)

☒ Accountable Entity Level (e.g., signal-to-noise analysis)

2a.10) For each level of reliability testing checked above, describe the method of reliability testing and what it tests.

Describe the steps—do not just name a method; what type of error does it test; what statistical analysis was used.

Split-half reliability testing was used to assess the internal consistency of FY2021 (Q42020-Q32021) SNF HAI data. In split-half testing, stays within a facility are randomly assigned into two groups and the observed and risk-adjusted HAI rate per facility is calculated for both groups. The correlation between the HAI rates of the two groups is measured using the Intraclass correlation coefficient (2,1) and Pearson's correlation. This process was repeated 40 times to even and rule out extreme values. The results below report the mean correlation score over 40 iterations. All correlation coefficients were adjusted using the Spearman-Brown prediction formula.

2a.11) For each level of reliability testing checked above, what were the statistical results from reliability testing?

For example, provide the percent agreement and kappa for the critical data elements, or distribution of reliability statistics from a signal-to-noise analysis. For score-level reliability testing, when using a signal-to-noise analysis, more than just one overall statistic should be reported (i.e., to demonstrate variation in reliability across providers). If a particular method yields only one statistic, this should be explained. In addition, reporting of results stratified by sample size is preferred (pg. 18, Measure Evaluation Criteria).

Among publicly reportable SNFs with 25 or more stays (n = 11,961), Intraclass and Pearson correlations were both 0.49 [0.48-0.51].

2a.12) Interpret the results, in terms of how they demonstrate reliability.

(In other words, what do the results mean and what are the norms for the test conducted?)

Results of the split-half reliability analysis indicate moderate reliability.

Scientific Acceptability: Validity - Testing (2b.01 - 2b.04)

2b.01) Select the level of validity testing that was conducted.

☐ Patient or Encounter-Level (data element validity must address ALL critical data elements)

☐ Accountable Entity Level (e.g., hospitals, clinicians)

☒ Empirical validity testing of the measure score

☐ Systematic assessment of face validity of performance measure score as an indicator of quality or resource use (i.e., is an accurate reflection of performance on quality or resource use and can distinguish good from poor performance)

2b.02) For each level of testing checked above, describe the method of validity testing and what it tests.

Describe the steps—do not just name a method; what was tested, e.g., accuracy of data elements compared to authoritative source, relationship to another measure as expected; what statistical analysis was used.

1. **Convergent Validity**: To assess convergent validity, the relationships between the SNF HAI measure and other publicly reported quality measures were assessed. Groups of quality measures that reflect similar care processes or outcomes were examined with the hypothesis that a facility's percentile ranking (compared to all facilities reporting the measure) may be somewhat consistent among related quality measures. Since the SNF HAI measure fills a measurement gap in the program, correlations with other measures are not expected to be high by design. This analysis was restricted to FY2021 data and only included providers with at least 25 stays and are eligible for public reporting (n = 11,961).

2. **Model Fit**: Model fit statistics were used to determine if the SNF HAI model can predict HAI cases while controlling for differences in resident case mix. The C-statistic is a measure of risk adjustment model discrimination that judges the model's ability to correctly classify outcomes as negative or positive. The validity testing sample included all Medicare-certified SNFs (n = 15,132) and stays. Please note that all stays in this sample meet denominator eligibility criteria. We do not apply the public reporting threshold of excluding SNFs with less than 25 stays until after risk adjustment is performed.

3. **COVID-19 Correlation Analysis**: In a test of predictive validity, a correlation analysis was performed to assess the relationship between FY2019 SNF HAI rates and COVID-19 cases and deaths occurring from January 1, 2020 - November 29, 2020. In this analysis, SNFs were stratified into quintiles of HAI rates and the average HAI rate, the

percentage of facilities without COVID-19 cases, and average COVID-19 case and death rates for each quintile were calculated. This study population included Medicare-certified facilities providing SNF care that have submitted COVID-19 data to the Centers for Disease Control and Prevention's (CDC) National Healthcare Safety Network (NHSN) for the week of November 29, 2020 and have at least 25 SNF stays (n = 11,192).

2b.03) Provide the statistical results from validity testing.

Examples may include correlations or t-test results.

1. **Convergent Validity**: Using Spearman's rank correlation, we compared the HAI measure to SNF QRP claims-based measures [Discharge to Community (DTC) and Potentially Preventable 30-Day Post-Discharge Readmission Measure (PPR)], NHQI short-stay assessment-based measures [Percentage of short-stay residents who were assessed and appropriately given the seasonal influenza vaccine and Percentage of short-stay residents assessed and appropriately given the pneumococcal vaccine], and Five-Star Quality Rating measures [RN Staffing]. As expected, the following measures were negatively correlated with HAI: DTC (-0.30 [-0.32,-0.28]), RN Staffing (-0.28 [-0.30,-0.26]), Percentage of short-stay residents who were assessed and appropriately given the seasonal influenza vaccine (-0.07 [-0.09,-0.05]), Percentage of short-stay residents assessed and appropriately given the pneumococcal vaccine (-0.06 [-0.08,-0.05]). As expected, PPR was positively correlated with HAI (0.15 [0.13,0.16]). All Spearman's rank correlations were statistically significant using the alpha level of 0.05.

2. **Model Fit**: The C-statistic was 0.70.

3. **COVID-19 Correlation Analysis**: Facilities in higher quintiles, with higher SNF HAI measure rates, had a higher average number of COVID-19 cases and deaths per 1,000 residents and had lower percentages of providers with no COVID-19 cases. Specifically, there was an average of 161.6 COVID-19 cases per 1,000 residents in the fifth quintile, compared to 90.5 in the first. There was an average of 30.4 COVID-19 deaths per 1,000 residents in the fifth quintile compared to 18.0 in the first. In the fifth quintile, 8.1% of providers had zero cases of COVID-19 compared to 14.6% in the first quintile. See the table below ***Table 7*** for a summary of these results. Spearman rank-order correlations between the SNF HAI measure and COVID-19 metrics were also assessed. SNF HAI quintile bins were positively correlated with COVID-19 case bins (r_s = 0.14 [0.12-0.16], $p < 0.0001$) and death median bins (r_s = 0.11 [0.09-0.13], $p < 0.0001$) (zero cases or deaths below the median case or death rate, and above the median case or death rate).

Table 7. Summary of COVID-19 Rates and Risk-Adjusted SNF HAI Rates by Quantiles

HAI Quintile	Number of Providers	Average Risk-Adjusted HAI Rate (95% Confidence Interval)	Average Number of COVID-19 Cases per 1,000 Residents (95% Confidence Interval)	Average Number of COVID-19 Deaths per 1,000 Residents (95% Confidence Interval)	Percentage of Providers without COVID-19 (95% Confidence Interval)
First	2,239	4.2 (4.1% to 4.2%)	90.5 (85.8 to 95.1)	18.0 (16.8 to 19.2)	14.6% (13.2% to 16.1%)
Second	2,238	5.0 (5.0% to 5.0%)	126.0 (120.0 to 132.0)	24.6 (23.1 to 26.2)	13.0% (11.6% to 14.4%)
Third	2,238	5.7 (5.7% to 5.7%)	127.0 (121.2 to 132.8)	24.3 (22.8 to 25.9)	12.3% (11.0% to 13.7%)
Fourth	2,239	6.5 (6.5% to 6.6%)	138.4 (132.2 to 144.5)	27.1 (25.3 to 28.9)	10.8% (9.5% to 12.1%)
Fifth	2,238	8.3 (8.3% to 8.4%	161.6 (155.3 to 167.8)	30.4 (28.7 to 32.1)	8.1% (7.0% to 9.2%)
Total	11,192	6.0 (5.9% to 6.0%)	128.7 (126.1 to 131.3)	24.9 (24.2 to 25.6)	11.8% (11.2% to 12.4%)

2b.04) Provide your interpretation of the results in terms of demonstrating validity. (i.e., what do the results mean and what are the norms for the test conducted?)

1. **Convergent Validity**: The direction of the correlations aligned with clinical expectations and all Spearman's rank correlations were statistically significant using the alpha level of 0.05. This indicates good convergent/predictive validity and that the SNF HAI measure is related to other specific measures as expected.

2. **Model Fit**: A C-statistic of 0.70 suggests good model discrimination.

3. **COVID-19 Correlation Analysis**: Facilities with higher HAI rates in FY2019 have higher numbers of COVID-19 case and deaths. Therefore, the measure can identify SNFs in need of improved infection control and prevention efforts.

Scientific Acceptability: Validity - Threats to Validity (Statistically Significant Differences, Multiple Data Sources, Missing Data) (2b.05 - 2b.14)

2b.05) Describe the method for determining if statistically significant and clinically/practically meaningful differences in performance measure scores among the measured entities can be identified.

Describe the steps—do not just name a method; what statistical analysis was used? Do not just repeat the information provided in Importance to Measure and Report: Gap in Care/Disparities.

1. **HAI distribution**: To determine the variation in provider performance among the SNF HAI measure and assess meaningful differences in performance measure scores, we examined the distribution of scores, including mean, minimum, and maximum performance scores among publicly reportable SNFs (n = 11,961).

2. **Number of avoidable HAIs among publicly reportable SNFs**: To determine meaningful differences in provider performance, we determined the number of risk-adjusted HAIs that could be avoided if all publicly reportable providers (with at least 25 stays) performed at least as well as the national average. To perform this calculation, we identified providers whose risk-adjusted HAI rates were greater than the national average HAI rate. We calculated the number of HAIs we expected based on the risk-adjusted HAI rate and national average rate by multiplying the rates with the number of stays in the provider. We took the difference in the number of HAIs per provider's risk-adjusted HAI rate and national average rate, and summed the value across all providers with risk-adjusted HAI rates greater than national average HAI rate.

For providers with risk-adjusted HAI rates greater than the national average HAI rate:

1. National Average HAI Rate * Number of Stays in Provider = N HAI Per National Average Rate
2. Risk Adjusted HAI Rate * Number of Stays in Provider = N HAI Per Risk-Adjusted Rate
3. Excess HAI in provider = N HAI Per Risk-Adjusted Rate - N HAI Per National Average Rate
4. Sum excess HAIs across providers with risk-adjusted HAI rates greater than the national average HAI rate

2b.06) Describe the statistical results from testing the ability to identify statistically significant and/or clinically/practically meaningful differences in performance measure scores across measured entities.

Examples may include number and percentage of entities with scores that were statistically significantly different from mean or some benchmark, different from expected; how was meaningful difference defined.

1. **HAI Distribution**: 11,961 of all Medicare-certified SNFs are eligible for public reporting and have 25 stays or more. Among this population, the average SNF HAI rate was 7.63% with a minimum of 3.19%, maximum of 20.27%, median of 7.37%, interquartile range of 2.31%, and a standard deviation of 1.80%.

2. **Number of avoidable HAIs among publicly reportable SNFs**: In total, 9,022 HAI could be avoided if all providers performed at least as well as the national average SNF HAI rate (n = 5,736).

2b.07) Provide your interpretation of the results in terms of demonstrating the ability to identify statistically significant and/or clinically/practically meaningful differences in performance across measured entities.

In other words, what do the results mean in terms of statistical and meaningful differences?

1. **HAI distribution**: There is a wide variation in SNF HAI measure scores indicating meaningful differences in performance measure scores.

2. **Number of avoidable HAIs among publicly reportable SNFs**: Results of this analysis are clinically and meaningfully significant as approximately 10% of total HAIs can be avoided if all providers performed at least as well as the national average. Treating HAIs that result in hospitalization is estimated to cost approximately $15,000 per HAI event. Therefore, the estimated cost savings of avoiding 9,022 HAIs can result in over $134 million of savings.

2b.08) Describe the method of testing conducted to identify the extent and distribution of missing data (or non-response) and demonstrate that performance results are not biased due to systematic missing data (or differences between responders and non-responders). Include how the specified handling of missing data minimizes bias.

Describe the steps—do not just name a method; what statistical analysis was used.

This measure is calculated using Medicare FFS data; because submission and completion of claims is tied to provider reimbursement, missing data are rare.

2b.09) Provide the overall frequency of missing data, the distribution of missing data across providers, and the results from testing related to missing data.

For example, provide results of sensitivity analysis of the effect of various rules for missing data/non-response. If no empirical sensitivity analysis was conducted, identify the approaches for handling missing data that were considered and benefits and drawbacks of each).
N/A
2b.10) Provide your interpretation of the results, in terms of demonstrating that

performance results are not biased due to systematic missing data (or differences between responders and non-responders), and how the specified handling of missing data minimizes bias.

In other words, what do the results mean in terms of supporting the selected approach for missing data and what are the norms for the test conducted; if no empirical analysis was conducted, justify the selected approach for missing data.

N/A

Note: This item is directed to measures that are risk-adjusted (with or without social risk factors) OR to measures with more than one set of specifications/instructions (e.g., one set of specifications for how to identify and compute the measure from medical record abstraction and a different set of specifications for claims or eCQMs). It does not apply to measures that use more than one source of data in one set of specifications/instructions (e.g., claims data to identify the denominator and medical record abstraction for the numerator). Comparability is not required when comparing performance scores with and without social risk factors in the risk adjustment model. However, if comparability is not demonstrated for measures with more than one set of specifications/instructions, the different specifications (e.g., for medical records vs. claims) should be submitted as separate measures.

2b.11) Indicate whether there is more than one set of specifications for this measure.

☐ Yes, there is more than one set of specifications for this measure
☒ No, there is only one set of specifications for this measure

2b.12) Describe the method of testing conducted to compare performance scores for the same entities across the different data sources/specifications.

Describe the steps—do not just name a method. Indicate what statistical analysis was used.

N/A

2b.13) Provide the statistical results from testing comparability of performance scores for the same entities when using different data sources/specifications.

Examples may include correlation, and/or rank order.

N/A

2b.14) Provide your interpretation of the results in terms of the differences in performance measure scores for the same entities across the different data sources/specifications.

In other words, what do the results mean and what are the norms for the test conducted.

N/A

Scientific Acceptability: Validity - Other Threats to Validity (Exclusions, Risk Adjustment) (2b.15 - 2b.32)

2b.15) Indicate whether the measure uses exclusions.

☐ N/A or no exclusions
☒ Yes, the measure uses exclusions.

2b.16) Describe the method of testing exclusions and what was tested.

Describe the steps—do not just name a method; what was tested, e.g., whether exclusions affect overall performance scores; what statistical analysis was used?

Measure exclusion criteria are presented in section **sp.17** and **sp18**. Using FY2021 data, we examined the stay-level frequency of each exclusion criterion, meaning we calculated the number and percentage of stays eligible for inclusion in the measure denominator (***Table 8***). We also assessed the facility-level distribution of exclusion criteria (***Table 9***).

2b.17) Provide the statistical results from testing exclusions.

Include overall number and percentage of individuals excluded, frequency distribution of exclusions across measured entities, and impact on performance measure scores.

The percentage of stays eligible for inclusion in the measure denominator are listed as follows and also encompassed in ***Table 8*** per eligibility criterion. 100% of stays were eligible for inclusion in the measure denominator due to the beneficiary age requirement of 18 years or older. 100% of stays were also eligible due to provider location within the United States. 100% of stays were eligible due to lack of resident transfer to a federal hospital. 96.5% of stays were eligible as they were not in critical access hospital swing beds. 93.9% of stays were eligible due to a length of stay of four or more days. 81.9% of stays were eligible as they had a non-zero Medicare payment. 76.7% of stays were eligible due to continuous beneficiary enrollment in Medicare Part A. 72.2% of stays were eligible as they could be matched to a prior eligible inpatient stay within 30 days of SNF admission. Lastly, 72.2% of stays had complete information for measure construction and risk adjustment and were eligible for denominator inclusion. Overall, 52.3% of stays met all seven inclusion criteria. Lastly, the facility-level distribution of eligibility criteria is presented in ***Table 9***.

Table 8. Stay-level Frequencies of SNF HAI Denominator Eligibility Criteria

Eligibility Criteria	Number of Stays	Percentage of Stays
Continuous enrollment in Medicare Part A (one year before SNF admission and three days after discharge)	1,755,629	76.7%
Stay can be matched to prior eligible inpatient stay	1,652,587	72.2%
Beneficiary age is 18 years or older	2,287,886	100.0%
Length of stay is greater or equal to four days	2,147,504	93.9%
Stay was not transferred to a federal hospital	2,287,742	100.0%
Stay has a non-zero Medicare payment	1,873,721	81.9%
Provider of stay is located within the 50 U.S. states, Puerto Rico, or U.S. territory	2,287,886	100.0%
Stays have completed information for measure construction and risk adjustment	1,652,587	72.2%
Stays are not in critical access hospital swing beds	2,207,047	96.5%
Total Eligible SNF stays	1,196,443	52.3%

Table 9. Facility-level Distribution of SNF HAI Denominator Eligibility Criteria

Eligibility Criteria	Mean	SD	Min	25th	50th	75th	Max
Continuous enrollment in Medicare Part A (one year before SNF admission and three days after discharge)	81.4%	18.2%	0.0%	71.4%	88.5%	95.4%	100.0%
Stay can be matched to prior eligible inpatient stay	73.0%	17.3%	0.0%	61.7%	75.5%	86.4%	100.0%
Beneficiary age is 18 years or older	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Length of stay is greater or equal to four days	93.7%	5.4%	0.0%	92.2%	94.4%	96.6%	100.0%
Stay was not transferred to a federal hospital	100.0%	0.3%	75.7%	100.0%	100.0%	100.0%	100.0%
Stay has a non-zero Medicare payment	87.0%	17.7%	0.0%	79.6%	95.9%	99.6%	100.0%
Provider of stay is located within the 50 U.S. states, Puerto Rico, or U.S. territory	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Stays have completed information for measure construction and risk adjustment	73.0%	17.3%	0.0%	61.7%	75.5%	86.4%	100.0%
Stays are not in critical access hospital swing beds	92.2%	26.8%	0.0%	100.0%	100.0%	100.0%	100.0%
Total Eligible SNF stays	52.3%	24.0%	0.0%	37.7%	54.9%	70.5%	100.0%

2b.18) Provide your interpretation of the results, in terms of demonstrating that exclusions are needed to prevent unfair distortion of performance results.

In other words, the value outweighs the burden of increased data collection and

analysis. Note: If patient preference is an exclusion, the measure must be specified so that the effect on the performance score is transparent, e.g., scores with and without exclusion.

The two criteria that excluded the greatest number of stays include (i) the requirement for stays to be matched to a prior eligible inpatient stay, and (ii) the requirement that a stay has completed information for measure construction and risk adjustment. Exclusions are required to ensure availability of complete and valid data for measure specification. For example, since information from the prior inpatient claim is needed for risk adjustment, beneficiaries are only eligible for denominator inclusion if their stays can be matched to a prior eligible inpatient stay. The same is true for any stays missing information needed for measure construction. In practice, the number of stays excluded due to the requirement that a stay has completed information for measure construction and risk adjustment is driven by the requirement for stays to be matched to a prior eligible inpatient stay.

2b.19) Check all methods used to address risk factors.

☒ Statistical risk model with risk factors (specify number of risk factors)

As referenced in ***Table 10*** in section **2b.20**, the risk adjustment model includes nine variable categories: (i) age and sex categories, (ii) original reason for Medicare entitlement, (iii) prior proximal inpatient stay surgery category, (iv) prior dialysis treatment (not including end-stage renal disease) in the prior proximal inpatient stay, (v) principal diagnosis category in the prior proximal inpatient stay, (vi) Hierarchical Condition Category (HCC) comorbidities, (vii) length of the prior proximal inpatient stay, (viii) utilization of the intensive care unit (ICU) or critical care unit (CCU) in the prior proximal inpatient stay, and (ix) number of prior inpatient stays. Approximately 200 clinical categories are captured through risk adjustment for the principal diagnosis on the prior proximal inpatient stay, and approximately 80 comorbidities are captured by adjustment of HCCs.

☐ Stratification by risk category (specify number of categories)
☐ Other (please specify here:)
☐ No risk adjustment or stratification

2b.20) If using statistical risk models, provide detailed risk model specifications, including the risk model method, risk factors, risk factor data sources, coefficients, equations, codes with descriptors, and definitions.

Risk adjustment model specifications: Refer to ***Table 10*** for a full list of SNF HAI risk adjustment variables. The SNF HAI measure is risk-adjusted using a hierarchical logistic risk model to account for differences in patient case-mix across SNF providers. The model predicts the probability of an HAI that is acquired during SNF care and results in hospitalization. The risk-adjustors are predictor variables in the model. The

hierarchical modeling allows for a provider-specific effect which accounts for clustering of patients within the same facility. The model estimates both the average predictive effect on resident characteristics across all SNFs, and the degree to which each SNF has an effect on the outcome that differs from that of the average SNF. The SNF provider effect is assumed to be randomly distributed around the average (according to a normal distribution). When computing the estimate of the SNF provider effect, hierarchical modeling accounts for the known predictors of the outcome, on average, such as resident characteristics, the observed SNF rate for this outcome, and the number of SNF stays eligible for the measure. The estimated SNF effect is primarily determined by the SNF's own data if the number of stays is relatively large, as the estimate would be relatively precise. The estimated SNF effect is adjusted toward the average if the number of stays is small, as small samples yield less precise estimates.

Risk adjustment equations: Refer to the attached equations used in the risk adjustment model. Let Y_{ij}, denote the outcome (equal to 1 if the resident *i* has an HAI that is acquired during SNF care and results in hospitalization) for a resident *i* at SNF *j*; Z_{ij} denotes a set of risk factors. We assume the outcome is related linearly to the covariates via a logit function with dispersion: where $Z_{ij} = (Z_{ij1}, Z_{ij2}, \ldots Z_{ijk})$ is a set of *k* resident-level covariates. α_j represents the SNF specific intercept 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. The sum of the probabilities of HAIs, including both the effects of resident characteristics and the specific SNF of interest, 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 residents at a SNF whose quality is at the national average level. The ratio of the predicted-to-expected number of HAIs measures the degree to which the number of HAIs that are acquired during the SNF's care and result in hospitalization are higher or lower than what would otherwise be expected at the average SNF. This ratio is called the standardized risk ratio, which is then multiplied by the overall observed rate of the measure outcome in the target population (all SNF stays included in the measure) to obtain the risk-adjusted rate of HAIs that are acquired during SNF care and result in hospitalization, for each SNF.

$$\text{logit}(P(Y_{ij} = 1 \mid Z_{ij}, \alpha_j)) = \log\left(\frac{P(Y_{ij} = 1 \mid Z_{ij}, \alpha_j)}{1 - P(Y_{ij} = 1 \mid Z_{ij}, \alpha_j)}\right) = \alpha_j + \beta * Z_{ij}$$

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

A comprehensive list of our risk adjustment covariates as well as coefficient estimates are included in the *SNF-HAI-CBE-Submission-Attachment-sp12-20230503.xlsx* attachment in questions **sp.12**. Refer to ***Table 10*** for descriptions of each risk adjustment category.

Table 10. SNF HAI Risk Adjustment Categories and Variable Information

Risk Adjustment Category	Variable Information
Age and sex category	Information on age and sex is obtained from the Medicare enrollment database. Age is calculated as of the admission date of the SNF stay using the beneficiary's date of birth as listed in the Medicare enrollment database.
Original reason for Medicare entitlement	Information on reason for Medicare entitlement is obtained from the Medicare enrollment database and re-categorized into two groups: i) Age and disabled or ii) End-stage renal disease (ESRD).
Prior proximal inpatient stay surgery category	Procedures from the prior proximal IP stay (if present on the prior proximal hospital claim) are grouped using the Clinical Classification Software (CCS) for ICD-10 procedures developed by the Agency for Healthcare Research and Quality (AHRQ) and then categorized into surgical categories as defined in the Hospital-Wide All-Cause Unplanned Readmission measure.
Prior dialysis treatment (not including ESRD)	Prior dialysis treatment is identified using revenue center codes on the prior proximal IP claim. This definition of dialysis utilization excludes ESRD patients, who are defined as beneficiaries with ESRD as their reason for Medicare eligibility in the month of admission of the prior proximal IP stay.
Principle diagnosis category from the prior proximal inpatient stay	The principal diagnosis on the prior proximal hospital claim was grouped into Clinical Classification Software (CCS) for ICD-10 diagnoses developed by the Agency for Healthcare Research and Quality (AHRQ).
HCC comorbidities	Comorbidities are obtained from the secondary diagnosis codes on the prior short-term claim and all diagnosis codes from earlier claims up to one year before SNF admission. Comorbidities are grouped using CMS Hierarchical Condition Categories (HCC) software version 22.
Length of prior proximal inpatient stay	The length of stay of the prior proximal inpatient stay is the total number of days of care from admission to discharge as obtained from the prior proximal hospital claim. In the case of a missing discharge date, the last day of the stay (latest thru date on the inpatient claim) is counted.
ICU/CCU utilization in the prior proximal inpatient stay	Prior intensive care and coronary care utilization is identified using revenue center codes on the prior proximal hospital claim.
Number of prior inpatient stays	The count of prior short-term discharges within a one-year lookback from the SNF admission date, excluding the most proximal hospitalization claim prior to the SNF admission.

2b.21) If an outcome or resource use measure is not risk-adjusted or stratified, provide rationale and analyses to demonstrate that controlling for differences in patient characteristics (i.e., case mix) is not needed to achieve fair comparisons across measured entities.

N/A, this measure is risk-adjusted.

2b.22) Select all applicable resources and methods used to develop the conceptual model of how social risk impacts this outcome.

☐ Published literature
☒ Internal data analysis
☐ Other (please specify here:)

2b.23) Describe the conceptual and statistical methods and criteria used to test and select patient-level risk factors (e.g., clinical factors, social risk factors) used in the statistical risk model or for stratification by risk.

Please be sure to address the following: potential factors identified in the literature and/or expert panel; regression analysis; statistical significance of p<0.10 or other statistical tests; correlation of x or higher. Patient factors should be present at the start of care, if applicable. Also discuss any "ordering" of risk factor inclusion; note whether social risk factors are added after all clinical factors. Discuss any considerations regarding data sources (e.g., availability, specificity).

In alignment with 2019 TEP recommendations, we aligned SNF HAI risk adjustment categories with those used for other claims-based quality measures (i.e., SNF 30-Day All Cause Readmission Measure (SNFRM), Potentially Preventable 30-Day Post Discharge Readmission Measure (PPR), and Discharge to Community (DTC))[1]. These categories include, age; sex; original reason for Medicare entitlement (age, disability, or ESRD); surgical categories based on the prior hospital claim; principal diagnosis on the prior hospital claim; comorbidities on the prior hospital claim or a 365-day lookback (HCCs); length of stay in the prior hospital stay; any prior ICU or CCU utilization; and a count of the prior hospital discharges in the prior year. The TEP particularly favored accounting for the number of previous hospital stays in risk adjustment.

When constructing the risk adjustment model, we considered the removal of non-statistically significant HCC and surgical categories. Using FY2018 data, we compared our current risk adjustment model to a revised model in which we removed three surgical categories and 26 HCC categories as they were not consistently statistically significant across three years of data. Results for this analysis are captured in section **2b.24**.

References:

[1] Levitt, A. T., Freeman, C., Schwartz, C. R., McMullen, T., Felder, S., Harper, R., Van, C. D., Li, Q., Chong, N., Hughes, K., Daras, L. C., Ingber, M., Smith, L., & Erim, D. (2019). Final Technical Expert Panel Summary Report: Development of a Healthcare-Associated Infections Quality Measure for the Skilled Nursing Facility Quality Reporting Program. Retrieved from https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/Downloads/SNF-HAI-Final-TEP-Report-7-15-19_508C.pdf.

2b.24) Detail the statistical results of the analyses used to test and select risk factors for inclusion in or exclusion from the risk model/stratification.

Referencing the analysis described in section **2b.23**., the C-statistics of our current risk adjustment model and the revised model (calculated using FY2018 data) were 0.7202 and 0.7194, respectively. Since these C-statistics are very similar, we ultimately decided not to remove any surgical or HCC categories from our model. All HCCs captured in software version 22 are included in our risk adjustment model. Refer to section **2b.27** for FY2021 C-statistic results for our current risk adjustment model.

2b.25) Describe the analyses and interpretation resulting in the decision to select or not select social risk factors.

Examples may include prevalence of the factor across measured entities, availability of the data source, empirical association with the outcome, contribution of unique variation in the outcome, or assessment of between-unit effects and within-unit effects. Also describe the impact of adjusting for risk (or making no adjustment) on providers at high or low extremes of risk.

We designed the SNF HAI measure before the conclusion of the 2017-2021 NQF social risk factor trial. Therefore, when designing the measure, we followed previous NQF guidance, including consideration of forgoing adjustment by social risk factors to ensure that disparities in care are not masked. After the conclusion of the NQF social risk factor trial, we conducted two analyses to determine the appropriateness of adjusting for social risk factors (SRFs) (see below). Both analyses show that risk adjusting the SNF HAI measure for SRFs is inappropriate.

Analysis 1 – SRF Model Fit:

We constructed a separate SNF HAI risk adjustment model to determine whether the measure should adjust for social risk factors (SRFs). This model mirrors that of the current measure; however, it risk adjusts for Medicare/Medicaid dual-enrollment status and race/ethnicity. Results indicate that both models have the same C-statistic suggesting similar model fit (0.70). Additionally, we observe similar distributions for risk-adjusted SNF HAI rates calculated using the SRF model and those calculated using the current model (means for the SRF model and the current model were 7.62% and 7.63%, respectively). Lastly, the Spearman-Rank and Pearson correlations between both models are very high (0.99). Overall, we interpret the results of this analysis to

indicate that risk adjusting for SRFs makes little difference in SNF HAI measure performance.

Similar model fit and performance distributions between the two aforementioned models is not surprising as we risk adjust for several demographic and clinical conditions that are conceptually important to include in the model and correlated with the SRFs we tested. For example, this measure risk adjusts for diabetes mellitus if it appears as a principal diagnosis on the resident's prior proximal hospital claim. Several social determinants of health cause certain populations (e.g., the Black population) to experience higher prevalence of diabetes in comparison to others (e.g., the White population)[1]. Since we risk adjust for diabetes (and several other clinical conditions), we are likely accounting for some of the social risk that causes some groups to experience higher prevalence over others.

Analysis 2 – Stratification by SRF:

To assess the relationship between social risk factors and SNF HAI provider performance, we used FY2021 data to stratify SNFs meeting the public reporting threshold (25 stays or more) into quintiles based on their proportion of non-White and Medicare/Medicaid dually-enrolled residents. Providers in higher quintiles (i.e., the fifth quintile) had a higher proportion of vulnerable residents than those in lower quintiles (i.e., the first quintile).

The results make clear that differences in performance between high-SRF and low-SRF facilities may reflect provider quality differences that should not be risk adjusted away. Results of the dual stratification show that facilities in the fifth quintile, have a higher mean risk-adjusted HAI rate in comparison to facilities in the first quintile (8.38% and 6.71%, respectively) (***Table 3***). Similarly, results of the race/ethnicity stratification show that facilities in the fifth quintile, have a higher risk-adjusted HAI rate in comparison to facilities in the first quintile (8.31% and 7.20%, respectively) (***Table 4***). However, we do not observe a clear difference in performance between facilities caring for high- and low-SRF residents within the same quintile. To further understand differences between within-provider quintiles and across provider quintiles, we compared SRRs within each quintile among the dual and non-dual populations and among race/ethnicity groups. Results of this analysis do not reveal differences in SRR when comparing dual to non-dual populations and non-White to White populations. Therefore, this trend is likely due to differences at the provider-level rather than SRFs at the resident-level. Additionally, it is possible that high-SRF populations often experience difficulties in accessing higher quality facilities. Due to this rationale, we find it premature to risk adjust for SRFs based on dual enrollment status or race/ethnicity at this time, and intend to reevaluate this decision periodically based on the latest empirical evidence.

References:

[1] Xavier Pi-Sunyer, F. (1990). Obesity and Diabetes in Blacks. Diabetes Care, 13(11), 1144–1149. https://doi.org/10.2337/diacare.13.11.1144

2b.26) Describe the method of testing/analysis used to develop and validate the adequacy of the statistical model or stratification approach (describe the steps—do not just name a method; what statistical analysis was used). Provide the statistical results from testing the approach to control for differences in patient characteristics (i.e., case mix) below. If stratified ONLY, enter "N/A" for questions about the statistical risk model discrimination and calibration statistics.

Validation testing should be conducted in a data set that is separate from the one used to develop the model.

To determine the adequacy of our statistical risk model, we analyzed several model fit statistics: C-statistic, Wald test, and risk decile plots. Use of the C-statistic assessed the model's discrimination and judged the model's ability to correctly classify outcomes as negative or positive. The Wald test assessed the null hypothesis that none of the covariates in the model were associated with the SNF HAI measure outcome. The risk decile plot compared expected and predicted HAI, per decile of predicted HAI probability (i.e. decile of predicted patient complexity). We grouped stays into decile bins based on their predicted HAI value, and calculated the ratio and difference in sum of predicted HAI versus sum of expected HAI for each decile bin.

2b.27) Provide risk model discrimination statistics.

For example, provide c-statistics or R-squared values.

Using FY2021 data, we observe a C-statistic of 0.70 suggesting good model fit. Wald test results (23,027.39; $p<0.0001$) soundly reject the null hypothesis that no covariates have a statistically significant effect.

2b.28) Provide the statistical risk model calibration statistics (e.g., Hosmer-Lemeshow statistic).

See section **2b.29** for risk decile results.

2b.29) Provide the risk decile plots or calibration curves used in calibrating the statistical risk model.

The preferred file format is .png, but most image formats are acceptable.

The risk-adjusted HAI rate for each SNF is the product of the standardized risk ratio (SRR) for a given SNF and the national average observed rate of HAIs for all SNFs. The SRR is a provider-level ratio that measures excess HAIs by comparing the predicted to expected number of HAIs. This ratio measures the degree to which the number of HAIs that are acquired during SNF care and result in hospitalization are higher or lower than what would otherwise be expected. The analysis captured in ***Table 11*** assesses whether the "predicted number" of HAIs systematically deviates from the

"expected number" for the same residents at a SNF whose quality is at the national average level. Since the ratio of the sum of predicted HAI over the sum of expected HAI is close to one, there is no evidence of excessive deviation of the predicted number of HAIs from the expected number of HAIs across patients at different risk levels for HAIs. Additionally, the distribution of the stay-level ratio of predicted over expected HAIs shows significant overlap in SRRs across all ten deciles, suggesting that within each patient risk group there are providers performing better or worse than what is expected or the national baseline.

Table 11. SNF HAI Model Diagnostics - Comparison of Expected and Predicted HAI by Expected HAI Decile & Distribution of Stay-level Predicted/Expected Ratios (FY2021)

Deciles of Expected Probability of HAI	Number of SNF stays	Sum of Predicted HAI	Sum of Expected HAI	Sum of Predicted/ Sum of Expected	Mean	P10	P25	P50	P75	P90
1	119,645	3,354.4	3,462.1	0.97	0.97	0.66	0.78	0.92	1.11	1.33
2	119,644	4,610.8	4,677.4	0.99	0.99	0.68	0.80	0.94	1.13	1.34
3	119,642	5,444.3	5,464.5	1.00	1.00	0.70	0.81	0.95	1.14	1.35
4	119,646	6,225.8	6,206.9	1.00	1.00	0.70	0.81	0.96	1.15	1.36
5	119,644	7,050.2	6,990.0	1.01	1.01	0.71	0.82	0.97	1.16	1.36
6	119,644	7,956.9	7,866.5	1.01	1.01	0.71	0.82	0.97	1.16	1.36
7	119,646	9,062.4	8,912.3	1.02	1.02	0.72	0.83	0.98	1.17	1.37
8	119,644	10,509.8	10,279.5	1.02	1.02	0.72	0.84	0.99	1.17	1.37
9	119,644	12,746.6	12,385.1	1.03	1.03	0.73	0.85	1.00	1.18	1.37
10	119,644	20,101.0	19,035.0	1.06	1.05	0.76	0.88	1.03	1.20	1.38

2b.30) Provide the results of the risk stratification analysis.

Not applicable, as this measure does not stratify in public reporting and confidential feedback reports.

2b.31) Provide your interpretation of the results, in terms of demonstrating adequacy of controlling for differences in patient characteristics (i.e., case mix).

In other words, what do the results mean and what are the norms for the test conducted?

As mentioned in section **2b.20**, we control for differences in resident case-mix through our hierarchical logistic risk adjustment model. The model captures provider-specific effects which accounts for the clustering of patients within the same facility and captures variation in measure outcome across SNFs. Results of our model fit analysis, presented in section **2b.27** show that the HAI model can accurately predict HAI cases while controlling for differences in resident case-mix.

2b.32) Describe any additional testing conducted to justify the risk adjustment approach used in specifying the measure.

Not required but would provide additional support of adequacy of the risk model, e.g., testing of risk model in another data set; sensitivity analysis for missing data; other methods that were assessed.
N/A

Feasibility (3.01 - 3.07)

3.01) Check all methods below that are used to generate the data elements needed to compute the measure score.

☐ Generated or collected by and used by healthcare personnel during the provision of care (e.g., blood pressure, lab value, diagnosis, depression score)
☒ Coded by someone other than person obtaining original information (e.g., DRG, ICD-10 codes on claims)
☐ Abstracted from a record by someone other than person obtaining original information (e.g., chart abstraction for quality measure or registry)
☐ Other (Please describe)

3.02) Detail to what extent the specified data elements are available electronically in defined fields.

In other words, indicate whether data elements that are needed to compute the performance measure score are in defined, computer-readable fields. ALL data elements are in defined fields in electronic health records (EHRs)

☒ ALL data elements are in defined fields in electronic claims
☐ ALL data elements are in defined fields in electronic clinical data (e.g., clinical registry, nursing home MDS, home health OASIS)
☐ ALL data elements are in defined fields in a combination of electronic sources
☐ Some data elements are in defined fields in electronic sources
☐ No data elements are in defined fields in electronic sources
☐ Patient/family reported information (may be electronic or paper)

3.03) If ALL the data elements needed to compute the performance measure score are not from electronic sources, specify a credible, near-term path to electronic capture, OR provide a rationale for using data elements not from electronic sources.

N/A

3.04) Describe any efforts to develop an eCQM.

N/A

3.05) Complete and attach the eCQM-Feasibility-Scorecard.xls file.

N/A

3.06) Describe difficulties (as a result of testing and/or operational use of the

measure) regarding data collection, availability of data, missing data, timing and frequency of data collection, sampling, patient confidentiality, time and cost of data collection, other feasibility/implementation issues.

The data needed to calculate this measure are readily available and require no additional data submission beyond what is already collected on Medicare fee-for-service (FFS) claims in the normal course of business. This measure poses no additional data collection burden to SNF providers.

Consider implications for both individuals providing data (patients, service recipients, respondents) and those whose performance is being measured.

3.07) Detail any fees, licensing, or other requirements to use any aspect of the measure as specified (e.g., value/code set, risk model, programming code, algorithm),

Attach the fee schedule here, if applicable.

This measure does not have any fees, licensing, or other requirements associated with it. Since the measure uses Medicare FFS claims data, there is no additional burden to providers or patients.

Use (4a.01 – 4a.10)

Extent to which intended audiences (e.g., consumers, purchasers, providers, policy makers) can understand the results of the measure and are likely to find them useful for decision making.

Endorsed measures are expected to be used in at least one accountability application within 3 years and publicly reported within 6 years of initial endorsement, in addition to demonstrating performance improvement.

4a.01) Check all current uses. For each current use checked, please provide:

- **Name of program and sponsor**
- **URL**
- **Purpose**
- **Geographic area and number and percentage of accountable entities and patients included**
- **Level of measurement and setting**

☒ Public Reporting

- Public Reporting explanation:
  - **Name of program and sponsor**: Center for Medicare & Medicaid Services Skilled Nursing Facility Quality Reporting Program (SNF QRP) and Skilled Nursing Facility Value-Based Purchasing Program (SNF VBP)
  - **URL**:
    - The SNF HAI measure is publicly reported on the Medicare.gov Care Compare webpage: https://www.medicare.gov/care-compare/
    - Facility level measure data is available on the data.cms.gov Provider Data Catalog webpage: https://data.cms.gov/provider-data/
  - **Purpose**: The SNF HAI measure estimates the risk-standardized rate of HAIs that are acquired during SNF care and result in hospitalization. SNF HAI rates are publicly reported on Care Compare and the Provider Data Catalog webpages to (i) inform consumer decision-making processes, and (ii) encourage quality improvement among providers. The SNF HAI measure has already begun public reporting for the SNF QRP, and the measure will be implemented in the SNF VBP in FY2026.
  - **Geographic area and number and percentage of accountable entities and patients included**: All Medicare-certified SNF stays meeting SNF HAI denominator eligibility criteria are included in the measure. 14,102 SNFs were eligible for public reporting of FY2019 data in the July 2022 Care Compare release. 11,961 SNFs were eligible for public reporting of FY2021 data in the October 2022 Care Compare release.
  - **Level of measurement and setting**: The SNF HAI measure is publicly reported at the facility/SNF level.

☒ Public Health/Disease Surveillance
- Public Health/Disease Surveillance explanation:
  - As mentioned in the aforementioned public reporting explanation, the SNF HAI measure is currently publicly reported under the SNF QRP. Publicly reporting this measure will encourage providers to improve their infection surveillance practices as they will receive HAI feedback through provider preview reports, confidential feedback reports, and publicly reported SNF HAI measure scores.

☒ Payment Program
- Payment Program explanation:
  - **SNF QRP**: The SNF QRP is a pay-for-reporting program. Therefore, SNFs are penalized financially if they fail to meet data submission requirements for the SNF QRP. Since the SNF HAI measure uses Medicare FFS claims, the SNF HAI measure does not require additional data collection burden.
  - **SNF VBP**: The SNF VBP is a pay-for-performance program. Therefore, SNFs will be either financially rewarded and penalized based on their SNF HAI measure performance.

☐ Regulatory and Accreditation Programs

☐ Professional Certification or Recognition Program

☒ Quality Improvement with Benchmarking (external benchmarking to multiple organizations)
- Quality improvement with benchmarking explanation:
  - The SNF HAI measure allows for peer comparison by categorizing SNFs into performance groups of “better than,” “no different than,” and “worse than” the SNF HAI national average.

☐ Quality Improvement (Internal to the specific organization)
- Internal quality improvement explanation:
  - SNFs can monitor their SNF HAI performance in comparison to their peers and the national average to gauge if any infection prevention and control programs should be instituted to improve HAI rates and quality of care.

☐ Not in use

☐ Use unknown

☐ Other (please specify here:)

4a.02) Check all planned uses.

☒ Public reporting

☒ Public Health/Disease Surveillance

☒ Payment Program

☐ Regulatory and Accreditation Program

☐ Professional Certification or Recognition Program

☒ Quality Improvement with Benchmarking (external benchmarking to multiple

organizations)
☒ Quality Improvement (internal to the specific organization)
☐ Measure Currently in Use
☐ Other (please specify here:)

4a.03) If not currently publicly reported OR used in at least one other accountability application (e.g., payment program, certification, licensing), explain why the measure is not in use.

For example, do policies or actions of the developer/steward or accountable entities restrict access to performance results or block implementation?

N/A

4a.04) If not currently publicly reported OR used in at least one other accountability application, provide a credible plan for implementation within the expected timeframes: used in any accountability application within 3 years, and publicly reported within 6 years of initial endorsement.

A credible plan includes the specific program, purpose, intended audience, and timeline for implementing the measure within the specified timeframes. A plan for accountability applications addresses mechanisms for data aggregation and reporting.

N/A

4a.05) Describe how performance results, data, and assistance with interpretation have been provided to those being measured or other users during development or implementation.

Detail how many and which types of measured entities and/or others were included. If only a sample of measured entities were included, describe the full population and how the sample was selected.

Provider preview reports are provided to all active SNF providers under the SNF QRP prior to public reporting on Care Compare. Providers have a 30-day preview period to check these provider preview reports and submit suppression requests if there was evidence of errors in their data. Additionally, providers can view their confidential feedback reports through the iQIES system (formerly the Quality Improvement and Evaluation System (QIES)/Certification and Survey Provider Enhanced Reports (CASPER) system). We maintain an active provider helpdesk to which providers can submit any questions about the measure, including questions about performance data and interpretation, as found on CMS' SNF QRP Help webpage: https://www.cms.gov/medicare/quality-initiatives-patient-assessment-instruments/nursinghomequalityinits/skilled-nursing-facility-quality-reporting-program/snf-quality-reporting-program-qrp-help. We provide individual responses to

each provider's questions. In addition, CMS holds open door forums during which stakeholders can ask general questions about a measure as referenced on CMS' SNF/LTC Open Door Forum webpage: https://www.cms.gov/outreach-and-education/outreach/opendoorforums/odf_snfltc. Finally, the SNF HAI measure specifications are publicly posted at the following CMS webpage: https://www.cms.gov/files/document/snf-hai-technical-report.pdf. The measure specifications are detailed and precise, allowing stakeholders to replicate measure calculations if they would like.

4a.06) Describe the process for providing measure results, including when/how often results were provided, what data were provided, what educational/explanatory efforts were made, etc.

The SNF HAI measure began public reporting on Care Compare and the Provider Data Catalog (PDC) in July 2022. Starting with the October 2022 release, SNF HAI is publicly reported on an annual basis. As explained in section **4a.05**, provider preview reports and confidential feedback reports are also distributed to providers. SNF resources available to providers are also described in section **4a.05**.

4a.07) Summarize the feedback on measure performance and implementation from the measured entities and others. Describe how feedback was obtained.

There were several opportunities for public comment on the SNF HAI measure including (i) the 30-day public comment period held during draft SNF HAI measure specification, (ii) the 60-day public comment period held during FY2022 SNF HAI rulemaking for the SNF QRP, (iii) the 60-day public comment period held during FY2023 SNF HAI rulemaking for the SNF VBP, and (vi) any public comment opportunities held during the pre-rulemaking Measures under Consideration (MUC) List or Measure Application Partnership (MAP) process. We note that these comment periods were open to the public and not solely limited to SNF providers. Some themes included in public comments – along with CMS clarifications in response to these comments – are summarized below.

- **Measure concept:** Several commenters supported the SNF HAI measure concept, recognizing the need for quality improvement in SNFs and the importance of HAI prevention. Several commenters believed that HAI surveillance can improve management and prevention of HAIs.
- **Data source**: In terms of using Medicare FFS claims as the measure's data source, some commenters were supportive as the use of claims data would not increase data collection burdens. However, other commenters expressed concern over (i) the appropriateness of using inpatient claims for a SNF measure as well as (ii) concerns with measure actionability due to data delays between claims submission and when data derived from those claims are used to calculate quality measure performance.
    - **Response**: Regarding the appropriateness of using inpatient claims data for a SNF measure, we note that it is ultimately the responsibility of the

SNF to guarantee efficient transfer of healthcare information. The information that SNFs already collect from hospitals include sufficient information related to the SNF HAI measure. SNFs should already be reviewing information from the prior facility as part of routine clinical practice. In terms of the accuracy of inpatient claims data, we note one study that did not find patterns of widespread underreporting of Hospital Acquired Conditions or overreporting of Present on Admission (POA) status in claims data, and another study that found high agreement between the principal diagnosis in Medicare claims and corresponding medical records [1,2]. Moreover, reliance on inpatient data for SNF measures is not a new concept as several other existing quality measures rely on data from other settings such as Skilled Nursing Facility 30-Day All-Cause Readmission (SNFRM) (CBE ID #2510) and the Potentially Preventable 30-Day Post-Discharge Readmission Measure for Skilled Nursing Facility Quality Reporting. Lastly, TEP members discussed alternative data sources to accurately capture infections acquired in a SNF, including MDS 3.0 and National Healthcare Safety Network (NHSN) surveillance data. Ultimately, the TEP agreed that claims data are of high quality and would strengthen the SNF measure portfolio without increasing provider burden.

  - **References**:
    - [1] Cafardi, S. G., Snow, C. L., Holtzman, L., Waters, H., McCall, N. T., Halpern, M., Newman, L., Langer, J., Eng, T., & Guzman, C. R. (2012). Accuracy of Coding in the Hospital-Acquired Conditions-Present on Admission Program Final Report. https://www.cms.gov/medicare/medicare-fee-for-service-payment/hospitalacqcond/downloads/accuracy-of-coding-final-report.pdf
    - [2] He, F., Daras, L. C., Renaud, J., Ingber, M., Evans, R., & Levitt, A. (2019, June 3). Reviewing Medical Records to Assess the Reliability of Using Diagnosis Codes in Medicare Claims to Identify Potentially Preventable Readmissions. https://academyhealth.confex.com/academyhealth/2019arm/meetingapp.cgi/Paper/31496

- **Actionability**: Some commenters were concerned with the actionability of including over 300 HAI diagnosis codes in the measure numerator as it may be difficult to isolate performance issues for quality improvement. Other commenters agreed that the measure is actionable in reducing HAI incidence.
  - **Response**: The SNF HAI measure fills a gap by providing a summary picture of overall performance in infection control and management. One of the benefits of a composite indicator is its simplicity. A single score is easier to interpret, easier to use a benchmark for tracking performance, and easier to use for comparisons among peers. The measure is not intended to be a standalone measure, rather it can be used in conjunction with other surveillance activities to plan for quality improvement. While an overall HAI rate may not provide information for targeting HAI prevention

efforts to specific infection types, we believe that aggregate HAI prevalence data still provides actionable feedback to SNFs. The prevention of HAIs is not specific to an individual type of infection. Rather, infection prevention and control efforts should address multiple infection types and SNFs should already be implementing infection control practices that includes various approaches such as vaccination, isolation, handwashing, antibiotic stewardship programs, surveillance, sanitation, and staff training.

- **Measure specifications**:
  - **General support:** Some commenters expressed general support for the HAI definition, agreeing with the restriction to HAIs that require inpatient hospitalization and the exclusion of emergency department visits and observation stays.
  - **HAI definition:** Other commenters recommended expansion of the HAI definition to prevent undercounting of preventable HAIs that may not lead to hospitalization. Some commenters disagreed with some of the infections included in the HAI diagnosis list and suggested modifications.
    - **Response**: The inclusion and exclusion criteria for infection types in the SNF HAI measure was developed in collaboration with subject matter experts during the 2019 TEP. The list was reviewed by TEP members and it was agreed upon that the list of HAI conditions reflect infections that are likely to be acquired during SNF care. Additionally, we maintain that the HAI conditions included in the measure are preventable or can be managed during SNF care and thereby prevent hospitalization. For example, while some conditions in the HAI diagnosis code list are a result of surgery in the inpatient setting, SNFs are responsible for surgical aftercare. Lastly, the SNF HAI measure enables many precautions to prevent misattribution and exclude conditions unrelated to SNF care, such as the Repeat Infection Timeframe (RIT) and the HAI incubation window.
  - **Incubation window**: In addition, some commenters supported the measure's incubation window while others did not. Of those that were unsupportive, commenters noted that different infections have varying incubation windows and that the measure should include mitigation approaches to prevent misattribution of HAI to a SNF.
    - **Response**: To help prevention misattribution, the measure implements an incubation window, and applies the Centers for Disease Control (CDC) and Prevention's National Healthcare Safety Network (NHSN) Repeat Infection Timeframe (RIT) to exclude preexisting infections that were acquired from the prior inpatient stay. We obtained clinical input from TEP panelists on the SNF HAI measure about the time window to identify HAIs attributable to the SNF. The TEP agreed that the same time window should be applied to all infections. Although the selected

incubation window may not hold true for all infections, TEP members noted it was a reasonable average.

- **Risk adjustment**: Furthermore, commenters offered recommendations for additional risk adjustment covariates, such as social risk factors and provider-level factors; while other commenters recommended to forgo risk adjustment altogether.
  - **Response**: See sections **2b.23 – 2b.25** for information regarding covariate selection. In terms of forgoing risk adjustment altogether due to the concern of masking adverse outcomes, we note that a lack of risk adjustment would disadvantage SNFs that specialize in treating high-risk populations in terms of HAI performance. In order to prevent provider manipulation, we focused on selecting factors that are not under the control of SNFs, such as patient characteristics rather than service provision. We would like to emphasize that 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 the national average HAI rate. The purpose of risk adjustment is to account for risk factor differences across SNFs, when comparing quality of care among them. In other words, risk adjustment "levels the playing field" and allows for fairer quality-of-care comparisons across SNFs by controlling for differences in resident case-mix.

- **Unintended consequences**: Commenters warned that the measure could potentially lead to unintended consequences such as selective enrollment of healthy patients and denial of admission for high-risk residents.
  - **Response**: See section **4b.02** for information addressing the concern of unintended consequences.
- **Implementation**: Some commenters recommended quarterly reporting of the SNF HAI measure, at least in provider reports. Other commenters recommended timely availability of patient-specific data reports.
  - **Response:** The SNF HAI measure is reported on an annual basis in alignment with the public reporting schedule of other SNF claims-based measures.

Additional details about public comments received on the SNF HAI measure and our responses can be found in the FY2023 SNF PPS final rule (87 FR 47568 through 47571), the FY2022 SNF PPS final rule (86 FR 42476 through 42481), and in the SNF HAI Public Comment Summary Report on the following webpage: https://www.cms.gov/files/document/snf-hai-public-comment-summary-report.pdf-0.

4a.08) Summarize the feedback obtained from those being measured.

Provider feedback was included above in section **4a.07** and in the TEP feedback described in section **1a.02**.

4a.09) Summarize the feedback obtained from other users.

User feedback was included above in section **4a.07** and in the TEP feedback described in section **1a.02.**

4a.10) Describe how the feedback described has been considered when developing or revising the measure specifications or implementation, including whether the measure was modified and why or why not.

We reviewed public comments received during the various public comment periods (as described in section **4a.07**) and responded to them in the SNF HAI Public Comment Summary Report and in the FY2022 and FY2023 SNF PPS Final Rules and determined that we would not change the measure's specifications outlined in the SNF HAI Technical Report: https://www.cms.gov/files/document/snf-hai-technical-report.pdf. However, we continue to monitor any unintended consequences of the measure including patient selection patterns, which could lead to future re-specification of the measure as needed.

Usability (4b.01 - 4b.03)

4b.01) You may refer to data provided in Importance to Measure and Report: Gap in Care/Disparities, but do not repeat here. Discuss any progress on improvement (trends in performance results, number and percentage of people receiving high-quality healthcare; Geographic area and number and percentage of accountable entities and patients included). If no improvement was demonstrated, provide an explanation. If not in use for performance improvement at the time of initial endorsement, provide a credible rationale that describes how the performance results could be used to further the goal of high-quality, efficient healthcare for individuals or populations.

The SNF HAI measure has publicly reported FY2019 and FY2021 data for the SNF QRP. Therefore, we will focus on comparing trends between FY2019 and FY2021 SNF HAI performance data, as depicted in section **1b.02**. In terms of measure reportability, there was a decrease in the number of providers and SNF stays captured in the measure between FY2019 and FY2021. In FY2019, 84.9% of SNFs were eligible for public reporting, whereas 80.2% of SNFs were eligible for public reporting in FY2021. This slight decrease in reportability may be the result of both facility closures and a decrease in elective procedures during the COVID-19 public health emergency (PHE). Nevertheless, FY2019 and FY2021 reportability results indicate the high usability of the SNF HAI measure. Additionally, the average provider-level risk-adjusted SNF HAI rate increased between FY2019 (5.85%) and FY2021 (7.63%) by approximately 1.78 percentage points. We interpret this difference to be related to the PHE and COVID-19 surges that occurred in FY2021.

4b.02) Explain any unexpected findings (positive or negative) during implementation of this measure, including unintended impacts on patients.

In the development of the SNF HAI measure, we were cognizant of the concern that the measure may provide an incentive for providers to selectively enroll residents, either by encouraging or avoiding admission of certain types of residents. For example, the measure's specification could incentivize very short SNF stays leading to inadequate care, since the measure excludes SNF stays shorter than four days. To account for this unintended consequence, we specified the measure to evaluate provider performance against their peers after adjusting for difference in resident case-mix across SNFs. As such, the measure's risk adjustment methodology is designed to capture resident characteristics that are associated with higher rates of HAIs, helping to mitigate providers' incentive to selectively enroll residents or transfer residents to hospitals early. Therefore, providers' performance on the SNF HAI measure are adjusted for the characteristics of their resident population to "level the playing field" across providers. For example, according to our risk adjustment model, the odds of contracting an HAI is 3.07 times higher for a resident with a hepatitis principal diagnosis from their prior proximal inpatient stay. Therefore, we risk adjust for hepatitis to prevent facilities from avoiding enrollment of hepatitis patients. The SNF HAI measure's detailed risk-adjustment strategy is publicly available in the *SNF HAI Technical Report*, allowing

providers to understand that those who provide care for more high-risk residents are not disadvantaged given their resident case mix [1].

References:

[1] Acumen LLC & CMS. (2021). Skilled Nursing Facility Healthcare-Associated Infections Requiring Hospitalization for the Skilled Nursing Facility Quality Reporting Program: Technical Report. Retrieved from https://www.cms.gov/files/document/snf-hai-technical-report.pdf.

4b.03) Explain any unexpected benefits realized from implementation of this measure.

N/A

Related and Competing (5.01 - 5.06)

If you are updating a maintenance measure submission for the first time in MIMS, please note that the previous related and competing data appearing in question 5.03 may need to be entered in to 5.01 and 5.02, if the measures are endorsed. Please review and update questions 5.01, 5.02, and 5.03 accordingly.

5.01) Search and select all endorsed related measures (conceptually, either same measure focus or target population) by going to the PQM website.

(Can search and select measures.)

- Percent of Residents with a Urinary Tract Infection (Long-Stay) (CBE ID #0684)
- National Healthcare Safety Network (NHSN) Catheter-Associated Urinary Tract Infections (CBE ID #0138)
- NHSN Central Line-Associated Bloodstream Infections (CBE ID #0139)
- NHSN Facility-Wide Inpatient Hospital-onset Clostridium Difficile Infection (CBE ID #1717)
- Skilled Nursing Facility 30-Day All-Cause Readmission measure (CBE ID #2510)

5.02) Search and select all endorsed competing measures (conceptually, the measures have both the same measure focus or target population) by going to the PQM website.

(Can search and select measures.)

N/A

5.03) If there are related or competing measures to this measure, but they are not endorsed, please indicate the measure title and steward.

There are two additional related measures that are not CBE endorsed: (i) Potentially Preventable 30-Day Post-Discharge Readmission measure for the SNF QRP and (ii) Skilled Nursing Facility Within-Stay Potentially Preventable Readmission (SNF WS PPR) measure for the SNF VBP. CMS is the measure steward for both measures, and Acumen LLC is the measure developer for both measures.

5.04) If this measure conceptually addresses EITHER the same measure focus OR the same target population as endorsed measure(s), indicate whether the measure specifications are harmonized to the extent possible.

☐ Yes
☐ No

N/A

5.05) If the measure specifications are not completely harmonized, identify the differences, rationale, and impact on interpretability and data collection burden.

N/A

5.06) Describe why this measure is superior to competing measures (e.g., a more valid or efficient way to measure quality). Alternatively, justify endorsing an additional measure.

Provide analyses when possible.

After review of the consensus-endorsed measures, we were unable to identify any CBE endorsed measures for SNFs focused on capturing several types of severe infections attributable to the SNF setting in one composite score. For example, although the measures Percent of Residents with a Urinary Tract Infection (Long-Stay) (CBE ID #0684), National Healthcare Safety Network (NHSN) Catheter-Associated Urinary Tract Infections (CBE ID #0138), NHSN Central Line-Associated Bloodstream Infections (CBE ID #0139), and NHSN Facility-Wide Inpatient Hospital-onset Clostridium Difficile Infection (CBE ID #1717) are CBE endorsed and all report on specific types of infections, they do not provide an overall HAI rate and are not specific to hospitalizations or the SNF setting. Additionally, although the Skilled Nursing Facility 30-Day All-Cause Readmission measure (SNFRM) (CBE ID #2510), the Potentially Preventable 30-Day Post-Discharge Readmission measure for SNF QRP, and the Skilled Nursing Facility Within-Stay Potentially Preventable Readmission (SNF WS PPR) measure for the SNF VBP are all specific to the SNF setting, they are not solely focused on infections.

Additional (1 - 9)

1) Provide any supplemental materials, if needed, as an appendix. All supplemental materials (such as data collection instrument or methodology reports) should be collated one file with a table of contents or bookmarks. If material pertains to a specific criterion, that should be indicated.

☐ Available in attached file
☐ No appendix
☒ Available at measure-specific web page URL identified in sp.09

See section **sp.12** for the attached file.

2) List the workgroup/panel members' names and organizations.

Describe the members' role in measure development.

A list of panelists who participated in the SNF HAI 2019 TEP as well as their expertise is described in the Technical Expert Composition (Membership) List on the following webpage: https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/Downloads/SNF-HAI-Technical-Expert-Panel-Composition-List_081619_508C.pdf.

3) Indicate the year the measure was first released.

The measure was finalized for SNF QRP adoption in the FY2022 SNF PPS Final Rule, published on 8/4/2021 (86 FR 42473 through 42481). The measure was finalized for SNF VBP adoption in the FY2023 SNF PPS Final Rule published on 8/3/2022 (87 FR 47565 through 47571). The measure was first publicly reported using FY2019 data in July 2022.

4) Indicate the month and year of the most recent revision.

N/A

5) Indicate the frequency of review, or an update schedule, for this measure.

Every three years, or when applicable for CBE maintenance processes.

6) Indicate the next scheduled update or review of this measure.

2026, or when applicable for CBE maintenance processes.

7) Provide a copyright statement, if applicable. Otherwise, indicate “N/A”.

N/A

8) State any disclaimers, if applicable. Otherwise, indicate "N/A".

N/A

9) Provide any additional information or comments, if applicable. Otherwise, indicate "N/A".

N/A