Measure Worksheet (MEW-PA-Maint)

Partnership for Quality Measurement

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Brief Measure Information

CBE #: 3636

Measure Title: Quarterly Reporting of COVID-19 Vaccination Coverage among Healthcare Personnel

Measure Steward: Surveillance Branch, Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention (CDC)

sp.02. Brief Description of Measure: This quarterly measure identifies the average percentage of healthcare personnel (HCP) who are considered up to date with recommended COVID-19 vaccines among the total number of HCP who regularly work in the facility.

The measure is reported for a quarter (3-month period). The quarterly COVID-19 vaccination coverage is determined by selecting one week per month and calculating the percentage of HCP who are considered up to date with recommended COVID-19 vaccines, then averaging 3 weekly percentages (one week from each of the 3 months in the quarter).

1b.01. Developer Rationale: High COVID-19 vaccine uptake is needed to protect the healthcare workforce, but also protect patients and the community. For these reasons, the Advisory Committee on Immunization Practices (ACIP) recommended prioritizing healthcare personnel (along with long-term care facility residents) with the first phase of vaccine supplies.

- The healthcare setting can be high-risk for SARS-CoV-2 exposure and transmission and protecting healthcare personnel from infection is critical to preserving the capacity to care for patients with COVID-19 or other illnesses. For example, as of the week ending January 29, 2023, there have been 1,539,765 nursing home staff COVID-19 cases and 2,958 nursing home COVID-19 staff deaths (in addition to 1,517,948 nursing home resident COVID-19 cases and 163,909 nursing home COVID-19 deaths). https://data.cms.gov/covid-19/covid-19-nursing-home-data
- Tracking vaccination coverage among healthcare personnel can help improve uptake of highly efficacious COVID-19 vaccines which reduce the burden of illness and death.
- Regular monitoring of vaccination coverage rates can help facilities maintain current efforts to vaccinate new staff and continue to engage and build confidence among staff who may be hesitant.

sp.12. Numerator Statement: The numerator for this measure consists of the cumulative number of HCP in the denominator

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population, who: 1. Are considered up to date with recommended COVID-19 vaccines administered at the healthcare facility; or 2. Are considered up to date with recommended COVID-19 vaccines administered elsewhere, based upon having reported in writing (paper or electronic) or provided documentation of being up to date with recommended COVID-19 vaccines. **sp.14. Denominator Statement:** The target population is the number of healthcare personnel (HCP) eligible to work in the healthcare facility for at least one day during the one-week data collection reporting period, excluding persons with contraindications/exclusions to COVID-19 vaccination. The quarterly reported measure includes at least one week of data collection a month for each of the 3 months in a quarter. The denominators are reported to NHSN by the HCP categories below: 1. Employees: all persons who receive a direct paycheck from the reporting facility (i.e., on the facility's payroll). 2. Licensed independent practitioners: include physicians (MD, DO), advanced practice nurses, and physician assistants only who are affiliated with the reporting facility who do not receive a direct paycheck from the reporting facility. 3. Adult students/trainees and volunteers include all students/trainees and volunteers aged 18 or over who do not receive a direct paycheck from the reporting facility. 4. Other contract personnel: Facilities may also report on individuals who are contract personnel. However, reporting for this category is optional. Contract personnel are defined as persons providing care, treatment, or services at the facility through contract who do not fall into any of the above-mentioned denominator categories. **sp.16. Denominator Exclusions:** Exclusions include individuals with medical contraindications to COVID-19 vaccination.
Measure Type: Process **sp.28. Data Source:** Other; The source is not specified as it may vary by facility. Data may be collected from electronic sources or paper-based sources. It may be obtained from existing records or a system specifically designed for COVID-19 vaccination tracking. This approach is consistent with the implementation of NQF 0431 - “Data sources for the required data elements include management/personnel data, medical or occupational health records, and vaccination records.” (The National Healthcare Safety Network (NHSN) Manual, Healthcare Personnel Safety Component Protocol, Healthcare Personnel Vaccination Module: Influenza Vaccination Summary. https://www.cdc.gov/nhsn/pdfs/hps-manual/vaccination/hps-flu-vaccine-protocol-508.pdf). **sp.07. Level of Analysis:** Facility
IF Endorsement Maintenance—Original Endorsement Date: Fall 2021 **Most Recent Endorsement Date:** Fall 2021

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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: Maintenance of Endorsement To maintain endorsement, endorsed measures are evaluated periodically to ensure that the measure still meets the endorsement criteria ("maintenance"). The emphasis for maintaining endorsement is focused on how effective the measure is for promoting improvements in quality. Endorsed measures should have some experience from the field to inform the evaluation. The emphasis for maintaining endorsement is noted for each criterion.
Criterion 1: Importance to Measure and Report
1a. Evidence. The evidence requirements for a ***structure, process, or intermediate outcome*** measure are that it is based on a systematic review (SR) and grading of the body of empirical evidence in which the specific focus of the evidence matches what is being measured. For measures derived from a patient report, the evidence also should demonstrate that the target population values the measured process or structure and finds it meaningful.
The developer provides the following description for this measure: • This is a maintenance process measure at the facility-level identifies the average percentage of health care personnel (HCP) who are considered up to date with recommended COVID-19 vaccines among the total number of HCP who regularly work in the facility, reported by quarter (3-month period). • The developer provides a logic model that depicts three categories: activities, outputs, and outcomes. Activities include conducting outreach, providing vaccination opportunities, and identifying up-to-date status of personnel. Activities lead to outputs, which include professionals being up to date with vaccines, up to date information collection, and reporting of coverage. Finally, outputs lead to outcomes, including increased protection against COVID-19 infection and morbidity/mortality, and decreased infection transmission and workplace disruption.
The developer provides the following evidence for this measure: • Systematic Review of the evidence specific to this measure? ☐ Yes ☒ No

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• Quality, Quantity, and Consistency of evidence provided? ☐ Yes ☒ No • Evidence graded? ☐ Yes ☒ No

Summary of prior review in 2021
• The developer stated that evidence for this measure derives from the Advisory Committee on Immunization Practices (ACIP) recommendations for allocation of COVID-19 vaccines as presented to the Director of the Centers of Disease Control and Prevention (CDC). The ACIP COVID-19 Vaccines Work Group considered evidence related to SARS-CoV-2 epidemiology, vaccination program implementation, and ethical principles in developing the interim recommendation on allocation of the initial supply of COVID-19 vaccine (Phase 1a).
  • The developer mentioned seven public ACIP meetings during which evidence-based information addressing COVID-19 vaccine topics and early allocation has been explicitly and transparently reviewed.
  • The developer also stated that a COVID-19 Vaccines Work Group, comprising experts in vaccines and ethics, held more than 25 meetings to review data regarding vaccine candidates, COVID-19 surveillance, and modeling, as well as the vaccine allocation literature from published and external expert committee reports in order to inform policy options for ACIP.
• The Standing Committee cited one concern on the potential for the public to interpret low vaccination rates among professionals in the hospital as lower quality of care, but that this information can impact patients and should be publicly available regardless. The measure was passed on evidence.

Changes to evidence from last review • The developer notes that there are no published data on the impact of reporting up to date COVID-19 coverage reporting among health care workers. However, the developer cites evidence from real-world observational data supporting the positive impact of COVID-19 vaccination, HCP vaccination, and booster COVID-19 vaccine dose(s). • Evidence shows increased infections and decreased immunity for those with only primary vaccination status compared to those with boosters.
Exception to evidence • The developer notes that there are no published data on the impact of reporting up to date COVID-19 coverage reporting among health care workers. However, the developer cites evidence from real-world observational data supporting the positive impact of COVID-19 vaccination, HCP vaccination, and booster COVID-19 vaccine dose(s).
Questions for the Standing Committee: • *Does the Standing Committee agree that it is acceptable (or beneficial) to hold providers accountable without empirical evidence?* • *What is the relationship between this measure and patient outcomes?* • *How strong is the evidence for this relationship?* • *Is the evidence directly applicable to the process of care being measured?*

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Guidance From the Evidence Algorithm Box 1: No → Box 3: No → Box 7: No → Box 10: No → Box 11: Yes → Box 12: Yes → Insufficient Evidence With Exception **Preliminary rating for evidence: ☐ High ☐ Moderate ☐ Low ☒ Insufficient with Exception** **RATIONALE**: The developer notes that there are no published data on the impact of reporting up to date COVID-19 coverage reporting among health care workers. However, the developer cites evidence from real-world observational data supporting the positive impact of COVID-19 vaccination, HCP vaccination, and booster COVID-19 vaccine dose(s).
1b. Gap in Care/Opportunity for Improvement and Disparities
Maintenance measures—increased emphasis on gap and variation **1b. Performance Gap.** The performance gap requirements include demonstrating quality problems and opportunity for improvement. • The measure previously passed on performance gap with no concerns. In the new submission, the devleoper states that it was not possible to provide evaluation of the performance over time due to limited data based on the timing of updated NHSN reporting. • However, performance scores were calculated among facilities reporting at least one week of data during Q3 2022 and among facilities reporting one week per month for Q3 2022, as of 01/02/2023. • The developer reports that skilled nursing facilities had the largest portion of active facilities reporting complete data for Q3 2022 at the time of analysis. Among the other facility types, dialysis facilities had the largest portion of active facilities reporting complete data for Q3 2022 at the time of analysis.
Disparities • The developer cites recent data, which show disparities in COVID-19 booster uptake. • Literature shows disparities in vaccine booster uptake with lower rates for non-white race, lower socioeconomic status, lower education, and those without health insurance.
Questions for the Standing Committee: • *Is there a gap in care that warrants a national performance measure?* • *If limited disparities information is provided, are you aware of evidence that disparities exist in this area of healthcare?*
Preliminary rating for opportunity for improvement: **☐ High ☒ Moderate ☐ Low ☐ Insufficient**
Criteria 2: Scientific Acceptability of Measure Properties

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Complex measure evaluated by the Scientific Methods Panel (SMP)? ☐ **Yes** ☒ **No**
Evaluators: Battelle Staff
2a. Reliability: Specifications and Testing
For maintenance measures—no change in emphasis—specifications should be evaluated the same as with new measures.
For maintenance measures—less emphasis if no new testing data are provided.
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 during the same time period, and/or whether the measure score is precise enough to distinguish differences in performance across providers.

Specifications:
• Have the measure specifications changed since the last review? ☒ Yes ☐ No
  • CDC updated its recommendations for COVID-19 vaccination to include booster doses(s) when eligible in addition to primary COVID vaccination. The numerator was updated to reflect this updated recommendation.
  • The numerator has been updated from the average percentage of healthcare personnel (HCP) "who have ever received a primary COVID-19 vaccination course" among the total number of HCP who regularly work in the facility, to the average percentage of HCP "who are considered up to date with recommended COVID-19 vaccines" among the total number of HCP who regularly work in the facility.
• Measure specifications are clear and precise.

Reliability Testing:
• Did the developer conduct new reliability testing? ☒ Yes ☐ No
• Reliability testing conducted at the Accountable Entity Level:
  ○ Data were collected by various means including electronic or paper-based sources, existing records or systems design for COVID-19 vaccination tracking.
  ○ Data used for reliability testing were collected from the week ending 7/3/2022 to the week ending 9/25/2022. i.e., Q3 of 2022
  ○ Data came from among 15100 Skilled Nurse Facilities (SNFs) and 13518 Healthcare Personnel Safety (HPS) facilities in all 50 US states and US territories.
  ○ Summary statistics were provided by type of facility, number of core healthcare personnel (HCP) and region.
  ○ Facility-level reliability was estimated using a signal-to-noise ratio analysis.

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○ The proportion of health care personnel with up to date vaccination was treated as a binomial distributed and the beta-binomial approach was used. ○ Reliability scores were calculated separately for SNFs and HPS facilities and included the mean, min, max and quantiles (5, 25, 50, 75, 95). The percentage of facilities with reliability greater than 0.7 was also calculated. ○ Average reliability (mean/median) for SNFs and all types of HPS facilities was around or greater than 0.9 which is considered high.
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 • Submitted specifications are precise, unambiguous and complete. (Box 1) • Empirical reliability testing conducted using statistical tests with the measure as specified. (Box 2) • Reliability testing conducted with computed performance measure scores for each measured entity. (Box 4) • Method described was appropriate for assessing the proportion of variability due to real difference among measured entities. Signal-to-noise analysis performed. (Box 5) • There is a high confidence that the measures are reliable. Mean reliability of 0.97 for SNFs and 0.95 for all HPS facilities. (Box 6a) • 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
For maintenance measures—less emphasis if no new testing data are provided **2b2. Validity testing** should demonstrate 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 • Did the developer conduct new validity testing? ☒ Yes ☐ No • Validity testing conducted at the Accountable-Entity Level: ○ Examined validity through correlation of measure score with performance on originally validated quality measure (quarterly primary series COVID-19 vaccination of HCP) ○ Hypothesized a positive correlation under assumption that facilities that ensure high rates of primary series vaccination

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are likely to ensure high rates of up to date vaccination coverage among HCP in their facilities ○ SNFs: r = 0.45, moderate positive correlation ○ HPS facilities: r = 0.43, moderate positive correlation ○ Higher correlation for facilities with < HCP
Exclusions • The measure excludes individuals with medical contraindications to COVID-19 vaccine. • Among 15100 SNFs reporting COVID-19 vaccination coverage among health care personnel (HCP) for at least one week per month during Q3 (July, August, September), 2022, the mean percentage of HCP with contraindications was 0.99%, with a standard deviation of 2.92%. • Among 13518 HPS facilities reporting COVID-19 vaccination coverage among HCP for at least one week per month during Q3 (July, August, September), 2022, the mean percentage of HCP with contraindications was 0.77%, with a standard deviation of 2.4%.
Risk Adjustment • The measure is not risk-adjusted or stratified.
Meaningful Differences • Calculated measure quartiles for facility types and compared vaccination coverage rate by quartile • Measure median 38.53 for SNFs and 22.13 for HPS facilities • Compared 10th and 90th percentiles for measure by facility type • SNF: 71.81% difference , HPS: 75.65% difference
Missing Data • Modified coverage measure was used for facilities with missing data: used data only from months where data was present. • 99% of SNFs and 90% of HPS facilities reported data for all months in reporting period.
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., testing, exclusions, etc.)?*
Guidance From the Validity Algorithm • Box 1 -> Yes • Box 2 -> Yes • Box 5 -> Yes • Box 6 -> Yes, correlation and differences between groups

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• Box 7 -> Moderate
Preliminary rating for validity: ☐ High ☒ Moderate ☐ Low ☐ Insufficient
Criterion 3. Feasibility
Maintenance measures—no change in emphasis—implementation issues may be more prominent **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.
• Data are abstracted from records and only some data elements are defined fields in electronic sources. There are no fees, licensing, or other requirements. There is no intent to develop and eCQM. The developer pointed to some tangential concerns by those being measured, cited in section 4a.08.
Questions for the Standing Committee: • *Are the required data elements routinely generated and used during care delivery?* • *Is the data collection strategy ready to be put into operational use?*
Preliminary rating for feasibility: ☐ High ☒ Moderate ☐ Low ☐ Insufficient
Criterion 4: Use and Usability
Maintenance measures—increased emphasis—much greater focus on measure use and usefulness, including both impact/improvement and unintended consequences
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. **4a.1. 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

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 developer indicates that this measure is currently in use in public reporting, public health/disease surveillance, and regulatory and accreditation programs:
  - This measure is used by the National Healthcare Safety Network (NHSN) to support the nation's COVID-19 response by providing a Long-term Care Facilities (LTCFs) COVID-19 Module, which enables an assessment of the impact of COVID-19 through facility reported information. This is assessed at the state level for CMS-certified nursing homes and outpatient dialysis centers.

4a.2. Feedback on the measure provided 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

- All facilities have full access to the data which they reported.
- Feedback was obtained through a public comment period on proposed rulemaking by CMS to include this updated measure in quality reporting programs.
- Both those being measured and other interested parties cited concerns for unintended consequences. Those being measured had a variety of commentary, including: difficulty with frequently changing definitions and highly detailed measure specifications, wanting vaccination rates to be measured and reported by demographics, stating that vaccination rates should not be publicly posted, suggesting reporting changes to an annual cycle, and ensuring that measures specifications are not overly burdensome for collection and reporting.
- Developer responses were given in relation to each concern. No modifications were made.

Questions for the Standing Committee:

- *How have (or can) 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)

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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.

4b.1 Improvement. Progress toward achieving the goal of high quality, efficient healthcare for individuals or populations is demonstrated.

Improvement results

- Aggregated Q3 data showed low up to date vaccination coverage compared to primary coverage, and Q4 was not able to be analyzed due to unavailability of data at the time of submission.
- Q3 showed wide variability in coverage at the facility level which may be used to inform targeted outreach.

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 developer reports that there were no unexpected findings.

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?*

Preliminary rating for Usability and Use: ☐ High ☒ Moderate ☐ Low ☐ Insufficient

Criterion 5: Related and Competing Measures

Related Measures

- CBE #0431 Influenza Vaccination Coverage Among Healthcare Personnel

Harmonization

- The developer attests that the measures are harmonized to the extent possible. However the data collection and reporting period is a seasonal 6-month period for #0431 and 3 months for #3636. Rationale for requiring only 1 week of data collection in each of the 3 months of the CBE #3636 reporting period is to reduce burden, and the rationale for requiring quarterly reporting (every 3 months) rather than the 6-month period for the annual influenza CBE #0431 is the non-seasonality of COVID-19 compared with influenza.

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.
3636

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

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

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

Accumulating evidence for waning immunity with primary series COVID-19 vaccination has prompted CDC to update its recommendations for COVID-19 vaccination to include booster dose(s) when eligible. As a result, we are updating the measure numerator.

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.

NQF 3636 was developed early in the COVID-19 pandemic before booster vaccines were approved and available. At the recommendation of CMS and considering CDC's evolved recommendations for COVID-19 vaccination coverage, it was decided to update the measure specifications as part of the Early Measure Review process. In this respecified measure, the numerator has been updated from the average percentage of healthcare personnel (HCP) "who have ever received a primary COVID-19 vaccination course" among the total number of HCP who regularly work in the facility, to the average percentage of healthcare personnel (HCP) "who are considered up to date with recommended COVID-19 vaccines" among the total number of HCP who regularly work in the facility.

The rationale underlying this change from primary to up to date COVID-19 is the accumulating evidence for waning immunity and increased HCP breakthrough infections among those with primary vaccination compared with those who also received 1 or 2 booster shots (Cohen et al. 2022; Ferdinands et al. 2022; Oster et al. 2022; Prasad et al. 2022; Tenforde et al. 2022).

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.

Quarterly Reporting of COVID-19 Vaccination Coverage among Healthcare Personnel

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).

This quarterly measure identifies the average percentage of healthcare personnel (HCP) who are considered up to date with recommended COVID-19 vaccines among the total number of HCP who regularly work in the facility.

The measure is reported for a quarter (3-month period). The quarterly COVID-19 vaccination coverage is determined by selecting one week per month and calculating the percentage of HCP who are considered up to date with recommended COVID-19 vaccines, then averaging 3 weekly percentages (one week from each of the 3 months in the quarter).

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): 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 Acute Care Hospitals (incl. Hospital Outpatient and PPS-Exempt Cancer Hospitals)
☒ Other (please specify here: Outpatient Dialysis Facilities, Ambulatory Surgical Centers, Long-Term Care Hospitals, Inpatient Psychiatric Facilities)
☐ 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".

Data collection forms and instructions:

- Healthcare Personnel COVID-19 Vaccination Cumulative Summary (CDC 57.219, Rev 7) https://www.cdc.gov/nhsn/forms/COVIDVax.HCP_.FORM_May2022-508.pdf
- Instructions for Completion of the Weekly Healthcare Personnel COVID-19 Vaccination Cumulative Summary (57.219, REV 8) https://www.cdc.gov/nhsn/forms/instr/COVIDVax.Staff_.Revised.TOI_.MAY2022-508.pdf

Additional training and supporting materials:

- For long-term care (post-acute care) facilities (LTCFs): https://www.cdc.gov/nhsn/ltc/weekly-covid-vac/index.html
- For non-LTCFs: https://www.cdc.gov/nhsn/hps/weekly-covid-vac/index.html

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) Not an eCQM.

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 (and attached .pdf)

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 numerator for this measure consists of the cumulative number of HCP in the denominator population, who:

1. Are considered up to date with recommended COVID-19 vaccines administered at the healthcare facility; or
2. Are considered up to date with recommended COVID-19 vaccines administered elsewhere, based upon having reported in writing (paper or electronic) or provided documentation of being up to date with recommended COVID-19 vaccines.

Up to date vaccination is defined by CDC Stay Up to Date with Your COVID-19 Vaccines | CDC and facilities are instructed to use the Up to Date definition as of the first day of the reporting quarter: https://www.cdc.gov/nhsn/pdfs/hps/covidvax/UpToDateGuidance-508.pdf

As of June 27, 2022 (the beginning of the three-month period tested), up to date included:

Persons aged <50 years who:

- Received at least one booster dose, OR
- Recently received all recommended doses in the primary vaccine series but are not yet eligible for a booster dose. This includes individuals who:
    - Completed their 2-dose primary vaccination series (Pfizer-BioNTech or Moderna vaccines) less than 5 months ago
    - Received a single dose of Janssen less than 2 months ago

Persons aged ≥50 years who:

- Received second booster dose (or received first booster dose less than 4 months ago and not yet eligible for a second booster dose), OR
- Recently received all recommended doses in the primary vaccine series but is not yet eligible for a booster dose. This includes individuals who:
    - Completed their 2-dose primary series of an mRNA COVID-19 vaccine (Pfizer-BioNTech or Moderna) less than 5 months ago
    - Received a single dose of Janssen less than two months ago

Notes:

1. A completed primary vaccine series was defined as receiving a 2-dose series of an mRNA COVID-19 vaccine (Pfizer-BioNTech and Moderna), OR a single dose of Janssen COVID-19 vaccine. (The Novavax COVID-19 Vaccine was approved by the FDA on July 13, 2022. The Novavax COVID-19 Vaccine, Adjuvanted is administered as a two-dose primary series. Individuals who completed the Novavax primary series were considered up to date two weeks after the final dose in their primary series, since a booster dose was not yet recommended for anyone who has completed the Novavax primary series.)

2. A booster dose is another dose of vaccine administered after receiving a primary vaccine series to enhance or restore protection which might have subsided over time.
3. Individuals are considered up to date with their COVID-19 vaccines when they have received all doses in the primary series and all booster doses recommended for them, when eligible.

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.

The time period for data collection is one week. A week always begins at 12:01 AM on a Monday and ends on the following Sunday at midnight.

Collect the number of healthcare personnel (HCP) who are considered up to date with recommended COVID-19 vaccines at this facility or elsewhere. Data sources may include HCP health records and paper and/or electronic documentation of vaccinations given at the healthcare facility or elsewhere. Vaccinations elsewhere should provide documentation of the vaccination, which includes the vaccine type.

Use of COVID-19 vaccines in a primary vaccine series or as a booster is defined by the FDA authorization for use COVID-19 Vaccines | FDA and recommendations made by the Advisory Committee on Immunization Practices ACIP COVID-19 Vaccine Recommendations | CDC which are reviewed and, if adopted by CDC and the Department of Health and Human Services, published in the Morbidity and Mortality Weekly Report (MMWR).

These recommendations are further described Interim Clinical Considerations for Use of COVID-19 Vaccines Currently Approved or Authorized in the United States.

- As of December 1, 2022, completion of a primary vaccination series is receipt of two doses of Moderna vaccine (age 6 months and older), Pfizer-BioNTech vaccine (ages 5 years and older), or Novavax vaccine (age 12 years and older), or one dose of Johnson & Johnson's Janssen vaccine (age 18 years and older).
- Receipt of a booster dose with monovalent mRNA vaccines (Moderna, Pfizer-BioNTech) was no longer recommended after updated (bivalent) boosters were authorized on September 2, 2022.

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 target population is the number of healthcare personnel (HCP) eligible to work in the healthcare facility for at least one day during the one-week data collection reporting period, excluding persons with contraindications/exclusions to COVID-19 vaccination. The quarterly reported measure includes at least one week of data collection a month for each of the 3 months in a quarter.

The denominators are reported to NHSN by the HCP categories below:

1. Employees: all persons who receive a direct paycheck from the reporting facility (i.e., on the facility's payroll).
2. Licensed independent practitioners: include physicians (MD, DO), advanced practice nurses, and physician assistants only who are affiliated with the reporting facility who do not receive a direct paycheck from the reporting facility.
3. Adult students/trainees and volunteers include all students/trainees and volunteers aged 18 or over who do not receive a direct paycheck from the reporting facility.
4. Other contract personnel: Facilities may also report on individuals who are contract personnel. However, reporting for this category is optional. Contract personnel are defined as persons providing care, treatment, or services at the facility through contract who do not fall into any of the above-mentioned denominator categories.

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 identify all healthcare personnel (HCP) eligible to work during the reporting week:

1. Include all HCP who were eligible to have worked at this healthcare facility for at least 1 day during the reporting week, regardless of clinical responsibility or patient contact.
2. HCP who are eligible to have worked include those who are scheduled to work in the facility at least 1 day of the week. Working any part of 1 day is considered as working 1 day.
3. Include HCP even if they are on temporary leave during the reporting week. Temporary leave is defined as less than or equal to 2 weeks in duration. Examples of temporary leave may include sick leave or vacation. In instances where temporary leave extends past two weeks, the healthcare worker should not be included for the current week of data collection.
4. Include persons who worked full-time and part-time.
5. Each person should be counted only once in the denominator.
6. HCP categories should be mutually exclusive. Do not count a person in more than one category.

7. If HCP were eligible to have worked in two or more facilities, each facility should include such personnel in their denominator.
8. Count HCP as individuals rather than full-time equivalents.
9. Data sources for determining eligibility may include payroll, attendance, or other records.

sp.17) Describe the denominator exclusions.

Brief narrative description of exclusions from the target population.

Exclusions include individuals with medical contraindications to COVID-19 vaccination.

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.

Contraindications are listed in a vaccine's FDA authorization or labeling and include severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a component of the COVID-19 vaccine, or history of known diagnosed allergy to a component of the COVID-19 vaccine.

The most up-to-date list of contraindications as well as precautions may be found at https://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html#contraindications. Of note, although precautions to COVID-19 vaccination may be a reason for HCP not to be recommended for COVID-19 vaccination, for the purposes of surveillance and to ensure consistency in classification across all facilities, only contraindications will count for denominator exclusions.

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

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.

Data Collection:

1. Identify all healthcare personnel (HCP) eligible to work during the selected week. The week always begins on a Monday at 12:00 midnight and ends on Sunday at 11:59 pm.
2. Categorize all eligible HCP into one of four HCP categories (employees, licensed independent practitioners, adult students/trainees and volunteers, and other contract personnel [optional]).
3. Among eligible HCP, identify those who are considered up to date with recommended COVID-19 vaccines.
4. Among eligible HCP who are not considered up to date with recommended COVID-19 vaccines, identify those who have a contraindication to COVID-19 vaccination.
5. Among eligible HCP who are not considered up to date with recommended COVID-19 vaccines and who do not have a contraindication to COVID-19 vaccination, identify those who have refused or declined vaccination.
6. Among eligible HCP who are not considered up to date with recommended COVID-19 vaccines, identify those whose COVID-19 vaccination status can not be determined.

Measure Calculation:

1. For each one-week period, tabulate the denominator by summing the number of HCP in each of the categories of core HCP (employees, licensed independent practitioners, and adult students/trainees and volunteers) minus the number with contraindications to COVID-19 vaccination.
2. Calculate the weekly COVID-19 up to date vaccination coverage percentage by dividing the number of core HCP in the denominator who are considered up to date with recommended COVID-19 vaccines by the number of core HCP in the denominator and multiplying by 100.

Report quarterly COVID-19 up to date vaccination coverage by averaging 3 weekly coverage percentages (one week from each of the 3 months in the quarter).

If facilities report COVID-19 vaccination coverage more than one week per month, data from the latest week of data for the reporting month should be used.

A week is designated as belonging to the month of the week-end date. For example, submitting data for the week of December 26, 2022 through January 1, 2023 is considered submitting data for a week in January 2023.

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).

sp.26) Indicate the responder for your instrument.

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

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.
N/A

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

N/A (the level of data collection is on the facility level)

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:

The source is not specified as it may vary by facility. Data may be collected from electronic sources or paper-based sources. It may be obtained from existing records or a system specifically designed for COVID-19 vaccination tracking. This approach is consistent with the implementation of NQF 0431 - "Data sources for the required data elements include management/personnel data, medical or occupational health records, and vaccination records." (The National Healthcare Safety Network (NHSN) Manual, Healthcare Personnel Safety Component Protocol, Healthcare Personnel Vaccination Module: Influenza Vaccination Summary. https://www.cdc.gov/nhsn/pdfs/hps-manual/vaccination/hps-flu-vaccine-protocol-508.pdf)

☐ 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.

Data are collected using the National Healthcare Safety Network of the U.S. Centers for Disease Control and Prevention - https://www.cdc.gov/nhsn/index.html

Data collection forms and instructions:

- Healthcare Personnel COVID-19 Vaccination Cumulative Summary (CDC 57.219, Rev 7) https://www.cdc.gov/nhsn/forms/COVIDVax.HCP_.FORM_May2022-508.pdf
- Instructions for Completion of the Weekly Healthcare Personnel COVID-19 Vaccination Cumulative Summary (57.219, REV 8) https://www.cdc.gov/nhsn/forms/instr/COVIDVax.Staff_.Revised.TOI_.MAY2022-508.pdf

Additional training and supporting materials:

- For long-term care (post-acute care) facilities (LTCFs): https://www.cdc.gov/nhsn/ltc/weekly-covid-vac/index.html
- For non-LTCFs: https://www.cdc.gov/nhsn/hps/weekly-covid-vac/index.html

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

The rationale underlying this change from primary to up to date COVID-19 is the accumulating evidence for waning immunity and increased HCP breakthrough infections among those with primary vaccination compared with those who also received 1 or 2 booster shots (Cohen et al. 2022; Ferdinands et al. 2022; Oster et al. 2022; Prasad et al. 2022; Tenforde et al. 2022).

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.

1a.03) Provide empirical data demonstrating the relationship between the outcome (or PRO) and at least one healthcare structure, process, intervention, or service.

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.

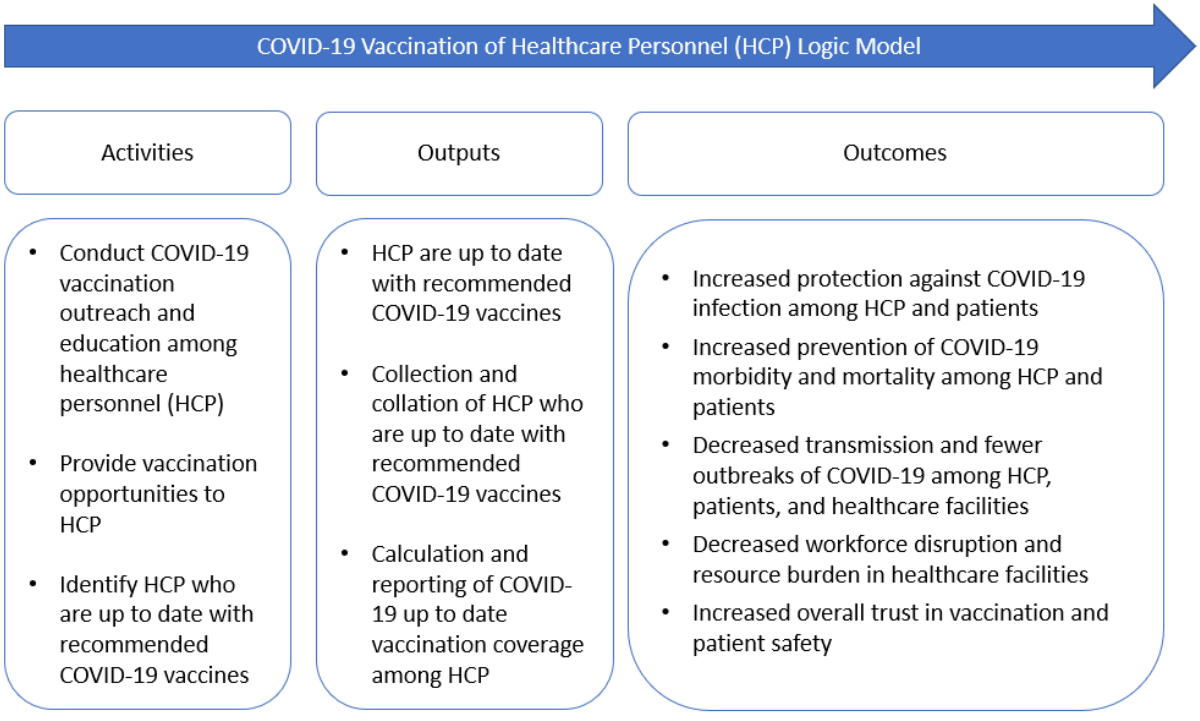
Previous (Year) Submission:

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.

Current Submission:



Based on Table 4 of Weber, D., Al-Tawfiq, J., Babcock, H., et al (2021). Multisociety statement on

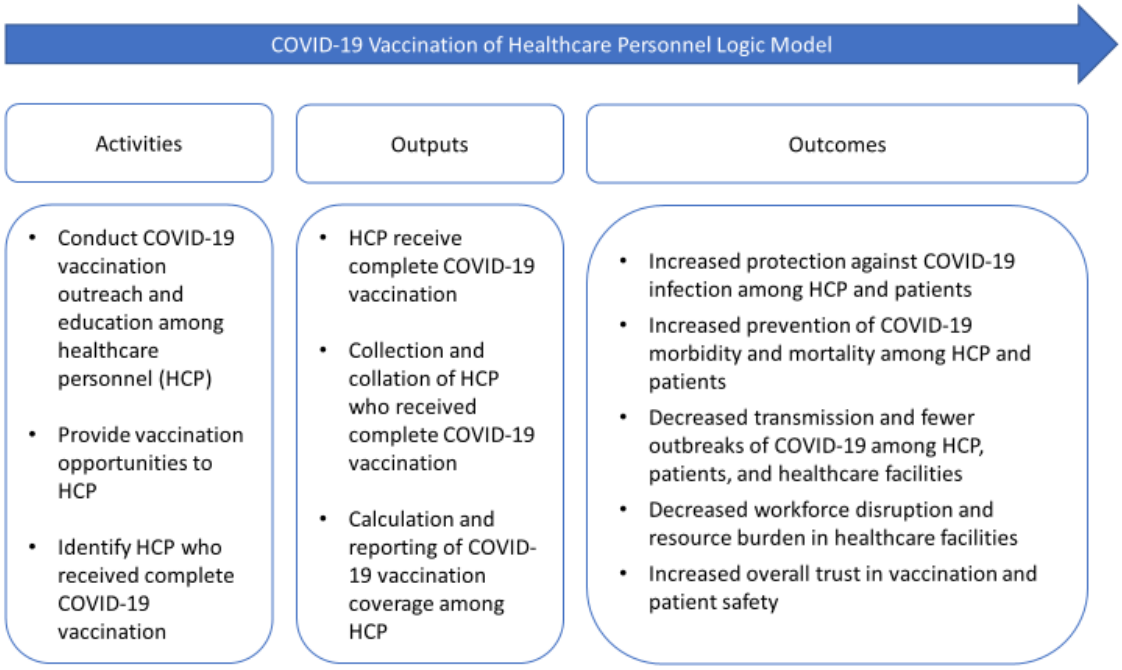
coronavirus disease 2019 (COVID-19) vaccination as a condition of employment for healthcare personnel. Infection Control & Hospital Epidemiology, 1-9. doi:10.1017/ice.2021.322

- *Activities* include conducting COVID-19 vaccination outreach and education among healthcare personnel (HCP); providing vaccination opportunities to HCP; and identifying HCP who are considered up to date COVID-19 vaccines.

- *Outputs* include HCP staying up to date with recommended COVID-19 vaccines; collection and collation of HCP who are considered up to date COVID-19 vaccines; and calculation and reporting of up to date COVID-19 vaccination coverage among HCP by healthcare facilities.

- *Outcomes* include increased protection against SARS-CoV-2 infection among HCP and patients; increased prevention of COVID-19 morbidity and mortality among HCP and patients; decreased transmission and fewer outbreaks of COVID-19 among HCP and patients within healthcare facilities; decreased workforce disruption and resource burden in healthcare facilities; and increased overall trust in vaccination.

Previous (2021) Submission:



Based on Table 4 of Weber, D., Al-Tawfiq, J., Babcock, H., Bryant, K., Drees, M., Elshaboury, R., . . . Young, H. (2021). Multisociety statement on coronavirus disease 2019 (COVID-19) vaccination as a condition of employment for healthcare personnel. Infection Control & Hospital Epidemiology, 1-9. doi:10.1017/ice.2021.322

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:)

Current Submission:

Rosenblum HG, Wallace M, Godfrey M, et al. Interim Recommendations from the Advisory Committee on Immunization Practices for the Use of Bivalent Booster Doses of COVID-19 Vaccines — United States, October 2022. MMWR Morb Mortal Wkly Rep 2022 Nov 11;71(45):1436-1441. doi: 10.15585/mmwr.mm7145a2.

Mbaeyi S, Oliver SE, Collins JP, et al. The Advisory Committee on Immunization Practices' Interim Recommendations for Additional Primary and Booster Doses of COVID-19 Vaccines — United States, 2021. MMWR Morb Mortal Wkly Rep 2021 Nov 5;70(44):1545-1552. doi: 10.15585/mmwr.mm7044e2.

Previous (2021) Submission:

Dooling K, Marin M, Wallace M, et al. The Advisory Committee on Immunization Practices' Updated Interim Recommendation for Allocation of COVID-19 Vaccine — United States, December 2020. MMWR Morb Mortal Wkly Rep 2021;69:1657-1660. DOI: http://dx.doi.org/10.15585/mmwr.mm695152e2.

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.

Evidence - Systematic Reviews Table (Repeatable)

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

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.

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

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

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

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

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

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

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

1a.12) Identify any new studies conducted since the systematic review, and indicate whether the new studies change the conclusions from the systematic review.

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.

Current Submission:

The Advisory Committee on Immunization Practices (ACIP) provides advice and guidance to the Director of the CDC regarding use of vaccines and related agents for control of vaccine-preventable diseases in the civilian population of the United States. Recommendations made by the ACIP are reviewed by the CDC Director and, if adopted, are published as official CDC/HHS recommendations in the Morbidity and Mortality Weekly Report (MMWR).

Previous (2021) Submission:

The Advisory Committee on Immunization Practices (ACIP) provides advice and guidance to the Director of the CDC regarding use of vaccines and related agents for control of vaccine-preventable diseases in the civilian population of the United States. Recommendations made by the ACIP are reviewed by the CDC Director and, if adopted, are published as official CDC/HHS recommendations in the Morbidity and Mortality Weekly Report (MMWR).

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

Current Submission:

There are no published data on the impact of reporting up to date COVID-19 coverage reporting among healthcare workers; however, the following real-world observational data support the positive impact of COVID-19 vaccination, healthcare personnel vaccination, and booster COVID-19 vaccine dose(s).

1. COVID-19 vaccine uptake in the U.S. is associated with reduced COVID-19 incidence and mortality:

- Suthar AB, Wang J, Seffren V, et al. Public health impact of covid-19 vaccines in the US: observational study. *BMJ* 2022 Apr 27;377:e069317. doi: 10.1136/bmj-2021-069317.
    - December 2020-December 2021 cross-sectional analysis of US county level surveillance and vaccine administration data from 48 states.
    - It was observed that 10% improvement in vaccination coverage was associated with an 8% reduction in mortality rates and a 7% reduction in incidence.

2. Among U.S. healthcare workers, COVID-19 vaccine effectiveness has been found to be high:

- Pilishvili T, Gierke R, Fleming-Dutra KE, et al. Effectiveness of mRNA Covid-19 Vaccine among U.S. Health Care Personnel. *N Engl J Med* 2021 Dec 16;385(25):e90. doi: 10.1056/NEJMoa2106599.
    - This was a test-negative case-control study of US healthcare personnel from 25 states conducted from December 2020-May 2021.
    - Vaccine effectiveness against infection was 88.8% (95% CI, 84.6 to 91.8) for BNT162b2 vaccine and 96.3% (95% CI, 91.3 to 98.4) for the mRNA-1273 vaccine.

3. U.S. Healthcare worker COVID-19 vaccination was associated with reduced patient COVID-19 infections and deaths:

- McGarry BE, Barnett ML, Grabowski DC, et al. Nursing Home Staff Vaccination and Covid-19 Outcomes. *N Engl J Med* 2022 Jan 27;386(4):397-398. doi: 10.1056/NEJMc2115674.
    - This study was a cross-sectional analysis of US nursing home staff vaccination and resident infection data reported to the US Centers for Medicare and Medicaid Services from June 2021-August 2021.
    - In the presence of high community prevalence of COVID-19, nursing homes with low staff vaccination coverage had COVID-19 infection and death rates 132% and 195% higher, respectively, than those with high staff vaccination coverage.
- Sinha S, Konetzka RT. Association of COVID-19 Vaccination Rates of Staff and COVID-19 Illness and Death Among Residents and Staff in US Nursing Homes. *JAMA Netw Open* 2022 Dec 1;5(12):e2249002. doi: 10.1001/jamanetworkopen.2022.49002.
    - This longitudinal cohort study evaluated US nursing home staff vaccination and resident infection data from 15,000 facilities reporting to the National Healthcare Safety Network from May 2021-January 2022.
    - Prior to the Omicron variant wave, increasing staff vaccination rates was associated with lower incidence of COVID-19 cases and deaths among residents and staff in nursing homes. A secondary analysis of Omicron wave (December 2021-January 2022) data suggested primary (2-dose) vaccination was no longer associated with reduced rates of adverse outcomes in nursing homes.

4. With the COVID-19 Omicron variant, despite continued protection against invasive mechanical ventilation and death, a decrement in COVID-19 vaccine effectiveness has been observed for Emergency Department visits and hospitalizations:

- Tenforde MW, Self WH, Gaglani M, et al. Effectiveness of mRNA Vaccination in Preventing COVID-19-Associated Invasive Mechanical Ventilation and Death - United States, March 2021-January 2022. *MMWR Morb Mortal Wkly Rep* 2022 Mar 25;71(12):459-465. doi: 10.15585/mmwr.mm7112e1.
    - This study was a case-control study of mRNA vaccine effectiveness (VE) against COVID-19 associated invasive mechanical ventilation (IMV) and in-hospital death among adults hospitalized at 21 US hospitals from March 2021-January 2022.
    - VE against IMV or in-hospital death was 90% overall; 88% for 2 doses and 94% for 3 doses, and 94% for 3 doses during the Omicron-predominant period.
- Ferdinands JM, Rao S, Dixon BE, et al. Waning 2-Dose and 3-Dose Effectiveness of mRNA Vaccines Against COVID-19–Associated Emergency Department and Urgent Care Encounters and Hospitalizations Among Adults During Periods of Delta and Omicron Variant Predominance — VISION Network, 10 States, August 2021–January 2022. *MMWR Morb Mortal Wkly Rep* 2022 Feb 18;71(7):255-263. doi: 10.15585/mmwr.mm7107e2.
    - This test-negative case-control study evaluated vaccine effectiveness (VE) against COVID-19 emergency department/urgent care (ED/UC) visits and hospitalizations among adults at sites across 10 states from August 2021-January 2022.
    - During the Omicron period, VE against ED/UC visits was 87% in the first two months after a 3rd dose and decreased to 66% among those vaccinated 4-5 months prior; VE against hospitalizations was 91% during the first two months following a 3rd dose and decreased to 78% ≥4 months after a 3rd dose.

5. Additional or booster dosing has been associated with reduced COVID-19 infections in both patients and healthcare workers during the period of Omicron-variant predominance:

- Prasad N, Derado G, Nanduri SA, et al. Effectiveness of a COVID-19 Additional Primary or Booster Vaccine Dose in Preventing SARS-CoV-2 Infection Among Nursing Home Residents During Widespread Circulation of the Omicron Variant — United States, February 14–March 27, 2022. *MMWR Morb Mortal Wkly Rep* 2022 May 6;71(18):633-637. doi: 10.15585/mmwr.mm7118a4.
    - This report is a cross-sectional analysis of nursing home resident data reported to CMS from 15,000 nursing homes from January-March 2022.
    - Compared with primary series vaccination only, an additional or booster dose provided greater protection (relative VE = 46.9%) against SARS-CoV-2 infection during Omicron variant predominance.
- Dubendris H, Reses HE, Wong E, et al. Laboratory-Confirmed COVID-19 Case Incidence Rates Among Residents in Nursing Homes by Up-to-Date Vaccination Status - United States, October 10, 2022-January 8, 2023. *MMWR Morb Mortal Wkly Rep* 2023 Jan 27;72(4):95-99. doi: 10.15585/mmwr.mm7204a3.
    - This study analyzed nursing home resident data reported to CDC's National Healthcare Safety Network from 15,000 nursing homes from October 2022–January 2023.
    - Weekly incidence rate ratios (IRRs) indicated that residents who were not up to date with COVID-19 vaccines had a higher risk for acquiring SARS-CoV-2 than their up-to-date counterparts (IRR range = 1.3-1.5).

- Oster Y, Benenson S, Nir-Paz R, et al. The effect of a third BNT162b2 vaccine on breakthrough infections in health care workers: a cohort analysis. *Clin Microbiol Infect* 2022 May;28(5):735.e1-735.e3. doi: 10.1016/j.cmi.2022.01.019. Epub 2022 Feb 7.
    - This two-hospital cohort study evaluating COVID-19 infection rate among healthcare workers (HCWs) receiving a 3rd vaccine dose (booster) compared with those who had received only a two-dose regimen in August 2021.
    - HCWs who received only the two-dose regimen had an infection rate of 21.4% (85 of 398), compared with 0.7% (35/4973; relative risk 30) among the boosted group.
- Cohen MJ, Oster Y, Moses AE et al. Association of Receiving a Fourth Dose of the BNT162b Vaccine With SARS-CoV-2 Infection Among Health Care Workers in Israel. *JAMA Netw Open* 2022 Aug 1;5(8):e2224657.
    - This 11-hospital cohort of 29,611 healthcare workers (HCWs) examined SARS-CoV-2 breakthrough infections among HCWs who had received a 4th vaccine dose in January 2022 compared with those who had received only 3 doses.
    - The SARS-CoV-2 breakthrough infection rate in the week following HCW receipt of a 4th dose in January 2022 was 6.9%, compared with a breakthrough infection rate of 19.8% of HCWs who had received only 3 doses.
- Stirrup O, Shrotri M, Adams NL et al. Clinical Effectiveness of SARS-CoV-2 Booster Vaccine Against Omicron Infection in Residents and Staff of Long-term Care Facilities: A Prospective Cohort Study (VIVALDI). *Open Forum Infect Dis* 2022 Dec 29;10(1):ofac694. doi: 10.1093/ofid/ofac694.
    - This prospective cohort study of 14,175 long-term care facility (LTCF) residents and 19,793 LTCF staff in England examined SARS-CoV-2 Omicron variant infections and severe outcomes from December 2021–March 2022.
    - Booster vaccination was found to provide sustained protection against hospitalization and death among residents, although protection against infection waned with time (with no protection after 112 days post-booster). Staff infections were reduced in those who had received booster vaccination, but the rates of hospitalization and death were too low for analysis.

Evidence reviewed by the ACIP is linked to in 1a) 16 Below.

Previous (2021) Submission:

Healthcare settings are high risk locations for SARS-CoV-2 exposure.[1]

As of December 1, 2020, approximately 245,000 COVID-19 cases and 860 COVID-19-associated deaths have been reported among HCP.[2]

HCP are at risk of transmitting the virus to medically vulnerable patients as seen with long-term care facility (LTCF) outbreaks.[3,4]

From a subset of jurisdictions reporting occupation type and job setting for HCP with COVID-19, health care support workers accounted for the largest overall group of occupation types (32%) and residential care facilities were the most common job setting (67%).[1]

Analysis of COVID-19 hospitalization data from 13 sites through May 31 indicated that 6% of adults hospitalized with COVID-19 were HCP. Of those hospitalized with HCP, 52% were non-Hispanic blacks. Approximately 28% of hospitalized HCP were admitted to an intensive care unit, 16% required invasive mechanical ventilation, and 4% died. [5]

LTCF modeling predicted more cases and deaths averted at the facility by vaccinating staff compared with vaccinating residents.[6]

Early protection of HCP is critical to preserve healthcare capacity to care for COVID-19 patients and ensure hospitals maintain a workforce to care for non-COVID-19 patients.

1. Hughes MM, Groenewold MR, Lessem SE, et al. Update: Characteristics of health care personnel with COVID-19 — United States, February 12–July 16, 2020. MMWR Morb Mortal Wkly Rep 2020;69:1364–1368. DOI: https://dx.doi.org/10.15585/mmwr.mm6938a3external icon
2. CDC COVID Data Tracker. Accessed November 29, 2020.
3. McMichael TM, Clark S, Pogosjans S, et al. COVID-19 in a Long-Term Care Facility — King County, Washington, February 27–March 9, 2020. MMWR Morb Mortal Wkly Rep 2020;69:339-342. DOI: http://dx.doi.org/10.15585/mmwr.mm6912e1external icon.
4. Dora AV, Winnett A, Jatt LP, et al. Universal and serial laboratory testing for SARS-CoV-2 at a long-term care skilled nursing facility for veterans—Los Angeles, California, 2020. MMWR Morb Mortal Wkly Rep 2020;69:651–5. DOI: https://dx.doi.org/10.15585/mmwr.mm6921e1external icon.
5. Kambhampati AK, O'Halloran AC, Whitaker M, et al. COVID-19–Associated hospitalizations among health care personnel — COVID-NET, 13 States, March 1–May 31, 2020. MMWR Morb Mortal Wkly Rep 2020;69:1576–1583. DOI: http://dx.doi.org/10.15585/mmwr.mm6943e3external icon.
6. Slayton R. Modeling allocation strategies for the initial SARS-CoV-2 vaccine supply. Presentation to ACIP. August 21, 2020.

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

From June 2020 through November 2022, ACIP convened 33 public meetings to review data relevant to the potential use of COVID-19 vaccines. The ACIP COVID-19 Vaccine Work Group, comprising experts in adult and pediatric medicine, infectious diseases, vaccinology, vaccine safety, public health, and ethics, has met weekly to review COVID-19 surveillance data, evidence for vaccine efficacy, post-authorization effectiveness, safety, and implementation considerations for COVID-19 vaccines. To assess the certainty of evidence for benefits and harms of a bivalent booster dose and guide deliberations, ACIP used the Evidence to Recommendations (EtR) Framework. Within this framework, ACIP considered the importance of COVID-19 as a public health problem, including during the Omicron-predominant period, and issues of resource use, benefits and harms, patients' values and preferences, acceptability, feasibility, and equity for use of the vaccines.

Previous (2021) Submission:

The ACIP COVID-19 Vaccines Work Group considered evidence related to SARS-CoV-2 epidemiology, vaccination program implementation, and ethical principles in developing the interim recommendation on allocation of the initial supply of COVID-19 vaccine (Phase 1a).

Evidence-based information addressing COVID-19 vaccine topics including early allocation has been explicitly and transparently reviewed during seven public ACIP meetings (Advisory Committee on Immunization Practices. ACIP meeting information. Atlanta, GA: US Department of Health and Human Services, CDC; 2020. https://www.cdc.gov/vaccines/acip/meetings/index.html).

To inform policy options for ACIP, the COVID-19 Vaccines Work Group, comprising experts in vaccines and ethics, held more than 25 meetings to review data regarding vaccine candidates, COVID-19 surveillance, and modeling, as well as the vaccine allocation literature from published and external expert committee reports.

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

Current Submission:

Rosenblum HG, Wallace M, Godfrey M, et al. Interim Recommendations from the Advisory Committee on Immunization Practices for the Use of Bivalent Booster Doses of COVID-19 Vaccines — United States, October 2022. MMWR Morb Mortal Wkly Rep 2022 Nov 11;71(45):1436-1441. doi: 10.15585/mmwr.mm7145a2.

- Evidence Table: https://www.cdc.gov/vaccines/acip/recs/grade/covid-19-bivalent-booster-etr.html

Mbaeyi S, Oliver SE, Collins JP, et al. The Advisory Committee on Immunization Practices' Interim Recommendations for Additional Primary and Booster Doses of COVID-19 Vaccines — United States, 2021. MMWR Morb Mortal Wkly Rep 2021 Nov 5;70(44):1545-1552. doi: 10.15585/mmwr.mm7044e2.

- Evidence Table: https://www.cdc.gov/vaccines/acip/recs/grade/covid-19-booster-doses.html

Previous (2021) Submission:

Dooling K, McClung N, Chamberland M, et al. The Advisory Committee on Immunization Practices' Interim Recommendation for Allocating Initial Supplies of COVID-19 Vaccine — United States, 2020. MMWR Morb Mortal Wkly Rep 2020;69:1857-1859. DOI: http://dx.doi.org/10.15585/mmwr.mm6949e1

ACIP Evidence Table for COVID-19 Vaccines Allocation in Phase 1a of the Vaccination Program is available at: https://www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/covid-19/evidence-table.html

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.

High COVID-19 vaccine uptake is needed to protect the healthcare workforce, but also protect patients and the community. For these reasons, the Advisory Committee on Immunization Practices (ACIP) recommended prioritizing healthcare personnel (along with long-term care facility residents) with the first phase of vaccine supplies.

- The healthcare setting can be high-risk for SARS-CoV-2 exposure and transmission and protecting healthcare personnel from infection is critical to preserving the capacity to care for patients with COVID-19 or other illnesses. For example, as of the week ending January 29, 2023, there have been 1,539,765 nursing home staff COVID-19 cases and 2,958 nursing home COVID-19 staff deaths (in addition to 1,517,948 nursing home resident COVID-19 cases and 163,909 nursing home COVID-19 deaths). https://data.cms.gov/covid-19/covid-19-nursing-home-data
- Tracking vaccination coverage among healthcare personnel can help improve uptake of highly efficacious COVID-19 vaccines which reduce the burden of illness and death,
- Regular monitoring of vaccination coverage rates can help facilities maintain current efforts to vaccinate new staff and continue to engage and build confidence among staff who may be hesitant.

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.

Current Submission:

The deadline for reporting data from the third quarter of 2022 (Q3 2022) is February 15, 2023. Because Q3 2022 is the first quarter in which up to date vaccination coverage reporting was incorporated into NHSN, it was not yet possible (at the time of measure submission) to evaluate the measure's performance over time.

Performance scores were calculated among facilities reporting at least one week of data during Q3 2022 and among facilities reporting one week per month for Q3 2022, as of 01/02/2023.

Skilled nursing facilities had the largest portion of active facilities reporting complete data for Q3 2022 at the time of analysis. Among the other facility types, dialysis facilities had the largest portion of active facilities reporting complete data for Q3 2022 at the time of analysis.

Cumulative number (%) facilities reporting COVID-19 Vaccination Module data during the Quarter 3 2022 surveillance period, as of 01/02/2023

Facility Type	Number of Facilities Reporting at least one week of data during one month of the quarter	Number of Facilities Reporting at least one week of data during each month of the quarter	Number of Active Facilities in NHSN
Skilled Nursing Facilities (SNFs)	15232 (92.01)	15100 (91.30)	16539
Acute Care Hospitals[¥]	3121 (57.53)	2557 (47.13)	5425
Long-Term Acute Care Hospitals	364 (82.35)	325 (73.53)	442
Inpatient Rehabilitation Facilities[‡]	374 (86.57)	341 (78.94)	432
Inpatient Psychiatric Facilities[‡]	575 (72.97)	475 (60.28)	788
Ambulatory Surgery Centers	3413 (63.16)	2692 (49.81)	5404
Dialysis Facilities	7261 (93.01)	7128 (91.30)	7807

[¥]Data from inpatient rehabilitation facility (IRF) units and inpatient psychiatric facility (IPF) units with unique CMS Certification Numbers (CCNs) located within acute care hospitals are not included in the acute care hospital category. Critical Access Hospitals are included in this category.
[‡]Includes freestanding IPF and IRF locations and IPF and IRF units with unique CCNs located within acute care hospitals.

Quarterly up to date COVID vaccination coverage among healthcare personnel at facilities reporting at least one week of data during Q3 2022, National Healthcare Safety Network (NHSN), as of 01/02/2023

Facility type	No. facilities reporting	HCP Median (IQR)	Percent Up to Date				
			Mean	Median	Min	Max	SD
Skilled Nursing Facilities (SNFs)	15232	100 (70-142)	42.53	38.53	0.00	100.00	26.31
Acute Care Hospitals	3121	521 (158-1440)	31.60	22.78	0.00	100.00	27.66
Long-Term Acute Care Hospitals	364	236 (126-368)	34.14	27.03	0.00	100.00	27.42
Inpatient Rehabilitation Facilities	374	244 (159-351)	27.79	21.31	0.00	100.00	20.00
Inpatient Psychiatric Facilities	575	214 (137.5-321)	38.01	27.83	0.00	100.00	31.58
Ambulatory Surgery Centers	3413	36 (20-69)	43.83	34.67	0.00	100.00	34.88
Dialysis Facilities	7261	26 (18-39)	28.41	19.37	0.00	100.00	25.10

Quarterly up to date COVID vaccination coverage among healthcare personnel at facilities reporting one week per month during Q3 2022, National Healthcare Safety Network (NHSN), as of 01/02/2023

Facility type	No. facilities reporting	HCP Median (IQR)	Percent Up to Date				
			Mean	Median	Min	Max	SD
Skilled Nursing Facilities (SNFs)	15100	100 (70-142)	42.51	38.53	0.00	100.00	26.27
Acute Care Hospitals	2557	531 (159-1452)	31.52	23.25	0.00	100.00	27.22

Facility type	No. facilities reporting	HCP Median (IQR)	Percent Up to Date				
			Mean	Median	Min	Max	SD
Long-Term Acute Care Hospitals	325	215 (145-314)	35.57	29.93	0.00	100.00	26.37
Inpatient Rehabilitation Facilities	341	246 (163-345)	27.24	21.37	0.00	100.00	19.42
Inpatient Psychiatric Facilities	475	236 (129-371)	35.93	25.68	0.00	100.00	30.49
Ambulatory Surgery Centers	2692	37 (20-70)	42.18	33.27	0.00	100.00	34.14
Dialysis Facilities	7128	26 (18-39)	28.20	19.33	0.00	100.00	24.80

Given that the majority of facilities reporting data during this period submitted data for at least one week per month, in line with the requirements for the quality measure, all additional analyses are presented among facilities reporting complete data for the quarter (defined as reporting at least one week of data during each month of the quarter).

Previous Submission (2021):

In December 2020, the National Healthcare Safety Network (NHSN) released the COVID-19 vaccination coverage reporting module for voluntary reporting of COVID-19 vaccination coverage among healthcare personnel (HCP) in long-term care (post-acute care) and inpatient.

In June 2021, CMS began to require CMS-certified long-term care facilities to collect and report weekly COVID-19 vaccination coverage through the National Healthcare Safety Network (NHSN). (Interim Final Rule - COVID-19 Vaccine Immunization Requirements for Residents and Staff: QSO-21-19-NH. May 11, 2021. Center for Clinical Standards and Quality/Quality, Safety & Oversight Group, CMS. https://www.cms.gov/files/document/qso-21-19-nh.pdf)

Quarterly COVID-19 vaccination coverage among healthcare personnel (HCP) among CMS-certified nursing homes, National Healthcare Safety Network (NHSN), 2021

Facility Characteristic	**Quarter 1 (Jan, Feb, Mar)**	**Quarter 2 (Apr, May, Jun)**	**Quarter 3 (Jul, Aug, Sep)**
No. Facilities	4,197	15,156	15,267
Mean No. HCP (SD)	112.3 (72.4)	117.0 (77.5)	117.0 (77.0)
COVID-19 vaccination coverage percentage (SD)	35.0 (23.8)	56.2 (20.9)	64.1 (18.8)
95% Confidence Interval	34.3, 35.7	55.8, 56.5	63.8, 64.4
COVID-19 vaccination coverage percentage by quantile	**Quarter 1 (Jan, Feb, Mar)**	**Quarter 2 (Apr, May, Jun)**	**Quarter 3 (Jul, Aug, Sep)**
0%	0.0	0.0	0
1%	0.0	1.4	19.8
5%	0.0	21.6	31.9
10%	0.0	29.0	38.8
25% (Q1)	17.3	41.9	50.8
50% (median)	33.4	56.2	64.9
75% (Q3)	51.2	71.2	78.6

90%	67.2	84.1	89.0
95%	77.2	90.7	93.3
99%	95.6	99.2	98.7
100%	100.0	100.0	100.0
Region, No. of facilities (%)	**Quarter 1 (Jan, Feb, Mar)**	**Quarter 2 (Apr, May, Jun)**	**Quarter 3 (Jul, Aug, Sep)**
Northeast	902 (21.5)	2,503 (16.5)	2,514 (16.4)
South	1,463 (34.9)	5,364 (35.4)	5,405 (35.3)
Midwest	1,276 (30.4)	4,936 (32.6)	4,972 (32.5)
West	552 (13.2)	2,346 (15.5)	2,369 (15.5)
Puerto Rico or territory	4 (0.1)	7 (0.1)	36 (0.2)

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.

Current Submission:

Data for the measure are aggregated (not collected at an individual level) and not collected by race/ethnicity, gender, age, insurance status, socioeconomic status, and/or disability.

Previous Submission (2021):

Data for the measure are aggregated (not collected at an individual level) and not collected by race/ethnicity, gender, age, insurance status, socioeconomic status, and/or disability.

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.

Current Submission:

In addition to disparities in COVID-19 primary vaccination uptake previously identified (detailed below), recent data have highlighted COVID-19 booster dose uptake disparities.

Booster dose uptake disparities by race/ethnicity were identified in the National Immunization Survey–Adult COVID Module, which collected data during February 27–March 26, 2022 from adult participants contacted via random-digit dialing of United States cellular phones. In March 2022, booster dose coverage was found to be 63.4% overall, but lower among non-Hispanic Black (52.7%), Hispanic (55.5%), Non-Hispanic American Indian/Alaska Native (56.6%), and Native Hawaiian/Pacific Islander (45.4%) than non-Hispanic White adults (67.7%). Socioeconomic disparities in booster dose uptake were identified with 51.6% booster dose coverage among those below the poverty line, compared with 59.8% among those within $75,000 of the poverty line and 70.4% among those $75,000 or more above the poverty line. Additionally, lower booster dose vaccination rates were found among those with lower educational attainment and without healthcare insurance.

> Lu PJ, Srivastav A, Vashist K, et al. COVID-19 Booster Dose Vaccination Coverage and Factors Associated with Booster Vaccination among Adults, United States, March 2022. *Emerg Infect Dis* 2023 Jan;29(1):133-140.

Previous (2021) Submission:

An analysis of disparities in COVID-19 vaccination coverage among healthcare personnel (HCP) types has identified lower COVID-19 vaccination coverage rates among certain HCP categories (nurses and aides) and among facilities located in zip codes with indicators of social vulnerability (*MMWR* 2021;70:1036–1039. DOI: http://dx.doi.org/10.15585/mmwr.mm7030a2).

During March 1–April 4, a total of 1,898 LTCFs voluntarily reported HCP COVID-19 vaccination data through the National Healthcare Safety Network (NHSN), including 300 (16%) facilities from 47 states that reported numbers for HCP and vaccination status for every job category.

In this convenience sample, the HCP type with the highest vaccination percentage was physicians and other advanced practice providers (75.1%), followed by therapists (69.2%), ancillary services employees (58.5%), nurses (56.7%), and aides (45.6%). Coverage was 68.5% among other HCP not reported in these categories (e.g., students, contractors). The proportion of persons who declined COVID-19 vaccination ranged from 11.1% among physicians to 33.2% among aides.

The percentage of aides who were completely vaccinated was lower among those working in facilities located in ZIP-code areas with higher proportions of ethnic and racial minorities (43.5% versus 50.5%), lower household median income (40.5% versus 48.1%), higher poverty (42.4% versus 49.2%), and lower high school completion (42.2% vs 49.3%).

Other research has identified lower vaccination coverage among nurses and support staff, among Black and Hispanic healthcare personnel, and higher vaccination acceptance among doctoral-degree personnel.[1] Various studies have found decreased likelihood of vaccine acceptance among healthcare personnel identified as Black[2,3,4,5,6,7,8], Latinx[2], female [2,3,5,7,8], or having lower educational attainment[3,6,7,8].

1. A Cross-Sectional Study of SARS-CoV-2 Vaccination Among Employees of an Urban Safety-Net Health Care System. *Ann Intern Med* 2021 Sep;174(9):1340-1343.
2. COVID-19 vaccine acceptance among health care workers in the United States. *Vaccines* 2021;9(2):119.

3. Perspectives on the receipt of a COVID-19 vaccine: A survey of employees in two large hospitals in Philadelphia. *Vaccine* 2021 Mar 19;39(12):1693-1700.
4. Assessment of US health care personnel (HCP) attitudes towards COVID-19 vaccination in a large university health care system. *Clin Infect Dis* 2021 Jan 25;ciab054.
5. COVID-19 vaccination hesitancy among healthcare personnel in the emergency department deserves continued attention. *Am J Emerg Med* 2021 Feb 2;S0735-6757(21)00100-5.
6. Vaccination rates and acceptance of SARS-CoV-2 vaccination among US emergency department health care personnel. *Acad Emerg Med* 2021 Apr;28(4):455-458.
7. Acceptance of COVID-19 Vaccination Among Health System Personnel. *J Am Board Fam Med* May-Jun 2021;34(3):498-508.
8. Coronavirus disease 2019 (COVID-19) vaccine hesitancy among physicians, physician assistants, nurse practitioners, and nurses in two academic hospitals in Philadelphia. *Infect Control Hosp Epidemiol* 2021 Sep 20;1-9.

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

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

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

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

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:

Current Submission:

The source is not specified as it may vary by facility. Data may be collected from electronic sources or paper-based sources. It may be obtained from existing records or a system specifically designed for COVID-19 vaccination tracking. This approach is consistent with the implementation of NQF 0431 - "Data sources for the required data elements include management/personnel data, medical or occupational health records, and vaccination records." (The National Healthcare Safety Network (NHSN) Manual, Healthcare Personnel Safety Component Protocol, Healthcare Personnel Vaccination Module: Influenza Vaccination Summary. https://www.cdc.gov/nhsn/pdfs/hps-manual/vaccination/hps-flu-vaccine-protocol-508.pdf)

Previous (2021) Submission:

The source is not specified as it may vary by facility. Data may be collected from electronic sources or paper-based sources. It may be obtained from existing records or a system specifically designed for COVID-19 vaccination tracking. This approach is consistent with the implementation of NQF 0431 - "Data sources for the required data elements include management/personnel data, medical or occupational health records, and vaccination records." (The National Healthcare Safety Network (NHSN) Manual, Healthcare Personnel Safety Component Protocol, Healthcare Personnel Vaccination Module: Influenza Vaccination Summary. https://www.cdc.gov/nhsn/pdfs/hps-manual/vaccination/hps-flu-vaccine-protocol.pdf)

☐ Paper Medical Records
☐ Registry Data

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

N/A

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).

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

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

Current Submission:

Data used for reliability testing: week ending 07-03-2022 – 09-25-2022 (downloaded 01/02/2023)
Data used for validity testing: week ending 07-03-2022 – 09-25-2022 (downloaded 01/02/2023)
Data used for assessing missing data and exclusions: week ending 07-03-2022 – 09-25-2022 (downloaded 01/02/2023)

Previous (2021) Submission:

Data used for reliability testing: 12-28-2020 – 01-17-2021

Data used for validity testing: 07-04-2021 – 09-26-2021

Data used for assessing missing data and exclusions: 07-4-2021 – 09-26-2021

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.

☒ Facility

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.

Current Submission:

Usability, validity, and reliability testing were conducted using data reported to NHSN for the third quarter of 2022 (06-27-2022 - 09-25-2022). All data submitted to NHSN as of 1/2/2023 were included.

- The last reported value of the proportion of healthcare personnel with up to date vaccination for each month in the quarter was averaged to create a quarterly total for each facility.
- Healthcare personnel with medical contraindication(s) were excluded from the denominator.
- Months with missing data or zero denominator were excluded, as were facilities that had no CMS Certification Number (CCN).
- Computed performance measure scores for the proposed updated quarterly COVID-19 vaccination measure (up to date vaccination coverage) for Q3 of 2022 (July – September) were

compared to the NQF-endorsed (primary vaccination) measure scores for quarterly COVID-19 vaccination measure for the same period

This was conducted among 15100 SNFs and 13518 HPS facilities (to include Acute Care Hospitals, Critical Access Hospitals, Long-term Acute Care Hospitals, Inpatient rehabilitation facilities, Inpatient Psychiatric facilities, Ambulatory Surgery Centers, and Dialysis facilities) with reporting at least one week per month during Q3 2022.

- These facilities are from all 50 US states and US territories.

Skilled Nursing Facilities (SNFs):

- The table below displays the number of facilities and mean number of core healthcare workers among SNFs by mean number of core healthcare workers and Health and Human Services Region among 15100 SNF facilities with reporting at least one week per month during Q3 2022.
- The median number of healthcare workers among SNFs was 100 (IQR 70-142). Some regional differences exist, with region 7 reporting the lowest median number of healthcare workers (72) and region 2 reporting the highest median number of healthcare workers (120).

Skilled Nursing Facility characteristics by mean number of core healthcare workers and Health and Human Services Region—National Healthcare Safety Network (NHSN) Long-term Care Facility Component, Q3 2022[*]

Parameter	Skilled Nursing Facilities (SNFs)	
	No. of SNFs	**Median no. of healthcare workers (IQR)**
Total	15100	100 (70-142)
Core Healthcare Workers[†]		
1-50 Healthcare Personnel	1528	41 (35-46)
51-100 Healthcare Personnel	6083	77 (65-88)
101-200 Healthcare Personnel	6044	132 (115-157)
201-500 Healthcare Personnel	1371	248 (219-298)
501-1000 Healthcare Personnel	70	582 (541-720)
1001 or more Healthcare Personnel	4	1378 (1074-1699.5)
Health and Human Services Region		
Region 1 (CT,ME,MA,NH,RI,VT)	846	114 (77-164)
Region 2 (NJ, NY, PR, VI)	965	172 (122-245)
Region 3 (DC,DE, MD, PA, VA, WV)	1394	120 (87-163)
Region 4 (AL,FL,GA,KY,MS,NC,SC, TN)	2685	105 (76-145)
Region 5 (IL, IN, MI, MN, OH, WI)	3287	97 (71-136)
Region 6 (AR, LA, NM, OK, TX)	2047	84 (61-110)
Region 7 (IA, KS, MO, NE)	1424	72 (53-103)
Region 8 (CO, MT, ND, SD, UT, WY)	594	83 (57-123)
Region 9 (AZ, CA, HI, NV, AS, GU)	1430	110.5 (79-150)
Region 10 (AK, ID, OR, WA)	428	88 (62-118)

[*]Data are among 15100 skilled nursing facilities with reporting at least one week per month to NHSN during Q3 2022.

[†]Core healthcare workers are defined as employees (staff on facility payroll), licensed independent practitioners (physicians, advanced practice nurses, and physician assistants) and adult students/trainees and volunteers.

Healthcare Personnel Safety (HPS) facilities:

- HPS facilities report data through NHSN's Healthcare Personnel Safety component and include Acute Care Hospitals, Critical Access Hospitals, Long-term Acute Care Hospitals, Inpatient Rehabilitation Facilities, Inpatient Psychiatric facilities, Ambulatory Surgery Centers, and Dialysis facilities.
- The first table below displays the number of facilities and mean number of core healthcare workers among each HPS facility type by mean number of core healthcare workers and Health and Human Services Region among 13518 HPS facilities reporting at least one week per month during Q3 2022.
- The majority are Dialysis facilities, with a median of 26 healthcare personnel (HCP) (IQR 18-39). The next largest group of facilities is Ambulatory Surgery Centers (ASCs) with a median 36 HCP (IQR 20-69), followed by acute care hospitals (ACHs) with a median of 521 HCP (IQR 158-1440). Inpatient Psychiatric facilities (IPFs), Long-term acute care hospitals (LTACHs), and inpatient rehabilitation facilities (IRFs) had a similar distribution of HCP with median values of 236, 214 and 244 HCP respectively.
- ACHs have some differences in median number of healthcare workers by region. Region 7 (IA, KS, MO, NE) and Region 6 (AR, LA, NM, OK, TX) have smaller median HCP numbers (365 and 371, respectively) compared to region 9 (AZ, CA, HI, NV, AS, GU) which has a median HCP value of 937.5.
- Further usability, validity and reliability analyses were conducted with data aggregated by facility type.

Mean number of core healthcare workers and Health and Human Services Region by facility type—National Healthcare Safety Network (NHSN) Healthcare Personnel Safety (HPS) Component, Q3 2022*

Parameter	Acute Care Hospitals†		Inpatient Psychiatric Facilities‡		Inpatient Rehabilitation Facilities‡		Long-Term Acute Care Hospitals		Ambulatory Surgery Centers		Dialysis Facilities	
	No. of facilities	Median No. of healthcare workers (IQR)	No. of facilities	Median No. of healthcare workers (IQR)	No. of facilities	Median No. of healthcare workers (IQR)	No. of facilities	Median No. of healthcare workers (IQR)	No. of facilities	Median No. of healthcare workers (IQR)	No. of facilities	Median No. of healthcare workers (IQR)
Total	2557	531 (159-1452)	475	236 (129-371)	341	246 (163-345)	325	215 (145-314)	2692	37 (20-70)	7128	26 (18-39)
Core Healthcare Workers§												
1-50 Healthcare Personnel	318	28 (20-39)	28	42 (32-43)	17	35 (28-40)	14	25 (12-44)	1666	23 (15-34)	6134	24 (17-33)
51-100 Healthcare Personnel	167	71 (59-88)	57	76 (66-88)	18	76.5 (67-85)	34	85.5 (70-93)	616	66.5 (58-82)	944	62 (56-72)
101-200 Healthcare Personnel	263	153 (130-174)	107	147 (122-181)	88	159 (141-179)	99	162 (136-180)	310	131 (115-156)	50	124 (110-137)
201-500 Healthcare Personnel	494	325.5 (260-402)	213	294 (247-364)	196	300 (248-366.5)	157	290 (237-351)	87	267 (229-342)	0	-
501-1000 Healthcare Personnel	462	707 (600-843)	48	675 (547-794)	18	626.5 (556-799)	17	608 (525-637)	9	951 (926-952)	0	-
1001 or more Healthcare Personnel	853	2066 (1452-3347)	22	1266.50 (1167-1568)	4	1988.5 (1300-2619.5)	4	1275 (1209-1393.5)	4	1514 (1131-3306)	0	-
Health and Human Services Region												
Region 1 (CT, ME, MA, NH, RI, VT)	74	762.5 (118-2122)	19	261 (1190-433)	12	277 (127.5-395.5)	8	454.5 (187-1062)	90	52(30-70)	173	27 (20-35)

Parameter	Acute Care Hospitals†		Inpatient Psychiatric Facilities‡		Inpatient Rehabilitation Facilities‡		Long-Term Acute Care Hospitals		Ambulatory Surgery Centers		Dialysis Facilities	
	No. of facilities	Median No. of healthcare workers (IQR)	No. of facilities	Median No. of healthcare workers (IQR)	No. of facilities	Median No. of healthcare workers (IQR)	No. of facilities	Median No. of healthcare workers (IQR)	No. of facilities	Median No. of healthcare workers (IQR)	No. of facilities	Median No. of healthcare workers (IQR)
Region 2 (NJ, NY, PR, VI)	131	622 (140-1706)	44	369 (247.5-676)	17	386 (159-433)	14	217 (126-421)	206	48.5 (28-84)	507	31 (22-43)
Region 3 (DC, DE, MD, PA, VA, WV)	219	507 (139-1822)	39	344 (241-527)	36	285 (217-357.5)	30	180.5 (126-283)	320	29 (16-55.5)	779	25(17-36)
Region 4 (AL, FL, GA, KY, MS, NC, SC, TN)	556	544.5 (159-1444)	95	229 (126-342)	74	257 (187-330)	74	223 (137-335)	619	35 (20-71)	1774	24 (17-34)
Region 5 (IL, IN, MI, MN, OH, WI)	401	531 (176-1035)	79	182 (95-317)	37	222 (153-368)	55	230 (169-302)	369	43 (24-88)	1239	24 (16-37)
Region 6 (AR, LA, NM, OK, TX)	467	382 (135-1026)	102	188.5 (99-281)	97	235 (150-311)	85	201 (122-271)	338	36 (20-73)	1068	26 (18-39)
Region 7 (IA, KS, MO, NE)	222	365 (112-960)	20	281 (201-365)	19	246 (172-358)	17	188 (136-234)	142	38 (20-74.5)	301	23 (15-33)
Region 8 (CO, MT, ND, SD, UT, WY)	110	610.5 (174-1755)	14	268.5(182-351)	13	154 (140-207)	11	225 (160-322)	108	39.5 (21.5-89)	171	22 (13-33)
Region 9 (AZ, CA, HI, NV, AS, GU)	278	1104.5 (305-2102)	48	224.5 (89-348)	30	325 (203-422)	28	313 (196-448)	366	34 (17-63)	907	39 (26-58)
Region 10 (AK, ID, OR, WA)	99	792 (206-1840)	15	270 (120-301)	6	95 (37-234)	3	216 (122-255)	134	30 (16-56)	209	29 (19-43)

*Data are among 13518 HPS facilities with reporting at least one week per month to NHSN during Q3 2022

†Data from inpatient rehabilitation facility (IPF) units and inpatient psychiatric facility (IRF) units with unique CMS Certification Numbers (CCNs) located within acute care hospitals are not included in the acute care hospital category. Critical Access Hospitals are included in this category.

‡Includes freestanding IPF and IRF locations and IPF and IRF units with unique CCNs located within acute care hospitals.

§Core healthcare workers are defined as employees (staff on facility payroll), licensed independent practitioners (physicians, advanced practice nurses, and physician assistants) and adult students/trainees and volunteers.

Previous (2021) Submission:

For reliability testing:

- Individual-level data element testing for the numerator data element of healthcare personnel (HCP) COVID-19 vaccination was conducted in 869 CMS-certified nursing homes (NHs) based on data collected from December 2020 – January 2021.

  Immediately following the authorization of the first COVID-19 vaccines in December 2020, NHSN released COVID-19 reporting modules for tracking vaccination coverage among residents and staff of long-term care facilities. These modules allow for voluntary weekly reporting by facilities and are designed to collect data on the number of current residents and staff eligible for vaccination and who have been vaccinated.

  Also beginning in December 2020, the Pharmacy Partnership for Long-Term Care Program was designed as a time-limited initiative to facilitate a limited number of vaccination clinics at each participating facility.

  The collection of HCP vaccination data by facilities which participated in both of these independent systems allowed for reliability testing of the key new data element of the COVID-19 vaccination coverage measure.

  The measured entities included in reliability testing were 869 CMS-certified NHs which participated in both the Pharmacy Partnership for Long-Term Care Program and reported COVID-19 vaccination coverage to NHSN during one of the three weeks from December 28, 2020 through January 17, 2021.

  These NHs represent 48 states, ranging from 1 participating facility in WY and MT to 91 participating facilities in TX.

- Individual-level data element testing for the denominator data element of number of HCP was assessed in prior reliability testing for NQF measure 0431, which included long term care settings (Libby TE, Lindley MC, Lorick SA, MacCannell T, Lee SJ, Smith C, Geevarughese A, Makvandi M, Nace DA, Ahmed F. Reliability and validity of a standardized measure of influenza vaccination coverage among healthcare personnel. Infect Control Hosp Epidemiol. 2013 Apr;34(4):335-45. doi: 10.1086/669859. Epub 2013 Feb 19. PMID: 23466904. Appendix

For validity testing:

- Computed performance measure scores for the proposed quarterly COVID-19 vaccination measure for Q3 of 2021 (July – September) were compared to the NQF endorsed measure scores for influenza vaccination of HCP for the 2020-2021 influenza season for 1,807 CMS-certified NHs.

  These NHs represent 50 states.

1. Weekly HCP & Resident COVID-19 Vaccination. National Healthcare Safety Network (NHSN) Long-term Care Facility Component.

Gharpure R, Guo A, Bishnoi CK, et al. Early COVID-19 First-Dose Vaccination Coverage Among Residents and Staff Members of Skilled Nursing Facilities Participating in the Pharmacy Partnership for Long-Term Care Program — United States, December 2020–January 2021. *MMWR Morb Mortal Wkly Rep* 2021;70:178–182. DOI:

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.

Current Submission:

Core healthcare personnel (HCP) in all the participating facilities were included in the analysis. Core healthcare personnel are defined as employees (staff on facility payroll), licensed independent practitioners (physicians, advanced practice nurses, & physician assistants) and adult students/trainees & volunteers.

Skilled Nursing Facilities (SNFs):

The number of HCP at SNFs ranged from 1 to 1748 HCP, with a median of 100 HCP and an inter-quartile range of 70-142 HCP. The median percent up to date was 38.53 (IQR 22.26-60.13) while the median percent with complete primary series was 91.89 (IQR 81.17-98.69).

Individual HCP characteristics (e.g., age, sex, race) were not collected in the COVID-19 vaccination measures.

COVID-19 vaccination coverage (primary and up to date) among Skilled Nursing Facility Healthcare Personnel—National Healthcare Safety Network (NHSN) Long-term Care Facility Component, Q3 2022*

Skilled Nursing Facility (SNF) Parameter	Minimum	Maximum	Median (IQR)
Number of SNF Healthcare Personnel	1	1748	100 (70-142)
Percent Up to Date	0	100	38.53 (22.26-60.13)
Percent with Complete Primary series vaccine	0	100	91.89 (81.17-98.69)
*Data are among 15100 skilled nursing facilities with reporting at least one week per month to NHSN during Q3 2022.			

Healthcare Personnel Safety (HPS) facilities:
The number of HCP among the 13518 HPS facilities ranged from 1 to 33318 HCP with a median of 37. Individual HCP characteristics (e.g., age, sex, race) were not collected in the COVID-19 vaccination measures. For more information on characteristics by facility type please see 2a.05) "List the measured entities included in the testing and analysis (by level of analysis and data source)."

Among the 2557 ACHs reporting for Q3 2022 as of 1/4/23, the median number of HCP per facility was 531. The median percent of HCP with complete primary series was 90.1% while the median percent of HCP up to date with COVID-19 vaccines was 23.3%.

The median percent up to date across facility types ranged from 19.33 (IQR 10.39-38.17) among dialysis facilities to 33.27 (IQR 12.00-73.33) among Ambulatory Surgery Centers. Dialysis facilities had the lowest median percent of HCP with complete primary series (84.60 (73.95-92.99) while Ambulatory Surgery Centers had the highest (92.58 [IQR 82.33-100.00]).

Distribution of facility type by COVID-19 vaccination coverage (primary and up to date)—National Healthcare Safety Network (NHSN) Healthcare Personnel Safety (HPS) Component, Q3 2022*

HPS Facility Type	Frequency reporting	No. of healthcare personnel Median (IQR)	Percent with complete primary series Median (IQR)	Percent up to date Median (IQR)
Acute Care Hospitals†	2557	531 (159-1452)	90.08 (82.17-95.93)	23.25 (10.65-46.41)
Long-Term Acute Care Hospitals	325	215 (145-314)	90.10 (83.80-95.14)	29.93 (16.25-49.94)
Inpatient Rehabilitation Facilities‡	341	246 (163- 345)	88.33 (82.78-93.99)	21.37 (14.61-33.29)
Inpatient Psychiatric Facilities‡	475	236 (129-371)	89.32 (82.21-96.62)	25.68 (11.29-55.10)
Ambulatory Surgery Centers	2692	37 (20-70)	92.58 (82.33-100.00)	33.27 (12.00-73.33)
Dialysis Facilities	7128	26 (18-39)	84.60 (73.95-92.99)	19.33 (10.39-38.17)

*Data are among 13518 HPS facilities with reporting at least one week per month to NHSN during Q3 2022.
†Data from inpatient rehabilitation facility (IPF) units and inpatient psychiatric facility (IRF) units with unique CMS Certification Numbers (CCNs) located within acute care hospitals are not included in the acute care hospital category. Critical Access Hospitals are included in this category.
‡Includes freestanding IPF and IRF locations and IPF and IRF units with unique CCNs located within acute care hospitals.

Previous (2021) Submission:

Healthcare personnel (HCP) in all the participating facilities were included in the analysis.
The number of HCP at the facilities ranged from 15 to 591 HCP, with a median of 96 HCP and an inter-quartile range of 70-135 HCP. Individual HCP characteristics (e.g., age, sex, race) were not collected in the COVID-19 vaccination measure and were not collected for testing.

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.

Current Submission:

For validity testing: We included 15100 CMS-certified skilled nursing facilities (SNFs) from the long-term care facility NHSN component and 13518 facilities from the NHSN healthcare personnel safety (HPS) component in analysis. Facilities in the HPS module included 3121 acute care hospitals (ACHs), 364 long-term acute care hospitals (LTACHs), 374 inpatient rehabilitation facilities (IRFs), 575 inpatient psychiatric facilities (IPFs), 3413 ambulatory surgery centers, and 7228 dialysis facilities.

There was a 100% match in the number of facilities reporting both up to date and primary vaccination measures, and both measures use the same denominator and exclusion criteria. These facilities represent the number of CMS-Certified SNFs and HPS facilities that participated in NHSN COVID-19

vaccination surveillance for at least one week during quarter 3 (July, August, September) 2022. 99% (n=15100) of SNFs reported data for at least one week in each month of the quarter. The number of HPS facilities reporting at least one week in each month of the quarter was lower, 89.48% (n=13518). This was expected because while SNFs have a weekly CMS reporting requirement, with the exception of dialysis facilities, HPS facilities did not have such a requirement and the deadline for quarterly report of these data for quarter 3 2022 had not yet passed at the time of analysis.

For additional assessment of missing data and exclusions (contraindications)

Since all fields associated with numerator, denominator and exclusions are required to report NHSN COVID-19 vaccination surveillance data for any given week, there were no missing values for these key variables among the 15100 CMS-certified SNFs and 13518 HPS facilities included in analysis.

The denominator for both measures is the number of healthcare personnel eligible to have worked at the facility at least one day during the reporting week. Excluded from this value are any reported medical contraindications to receiving COVID-19 vaccine. Contraindications are not frequently reported. Among SNFs the median quarterly percent of healthcare personnel reported as having a documented medical contract indication 0 with an IQR of 0-0.82. Among HPS facilities we see similar values (median quarterly present of HPS reported as having a documented medical contraindication 0 with an IQR of 0-0.33). There are no major differences in the median percent of HPS reported as having a medical contraindication by facility type; with most facilities reporting less than 1% of healthcare personnel as having a medical contraindication. All facility types do contain outliers, as demonstrated by the maximum values.

Percent of skilled nursing facility healthcare personnel with medical contraindications to COVID-19 vaccine—National Healthcare Safety Network (NHSN), Q3 2022[*]

Facility Type	No. Reporting	Percent of HCP with medical contraindication		
		Median (IQR)	Minimum	Maximum
Skilled Nursing Facilities	15100	0.31 (0.00-0.82)	0	62015

[*]Data are among 15100 skilled nursing facilities with reporting at least one week per month to NHSN during Q3 2022.

Percent of healthcare personnel with medical contraindications to COVID-19 vaccine by facility type—National Healthcare Safety Network (NHSN) Healthcare Personnel Safety (HPS) Component, Q3 2022[*]

Facility Type	No. Reporting	Percent of HCP with medical contraindication		
		Median (IQR)	Minimum	Maximum
Acute Care Hospitals[†]	2557	0.31 (0.00-0.96)	0.00	32.91
Long-Term Acute Care Hospitals	325	0.00 (0.00-0.71)	0.00	15.13
Inpatient Rehabilitation Facilities[‡]	341	0.36 (0.00-0.81)	0.00	11.42
Inpatient Psychiatric Facilities[‡]	475	0.26 (0.00-1.23)	0.00	42.55
Ambulatory Surgery Centers	2692	0.00 (0.00-0.17)	0.00	88.89
Dialysis Facilities	7128	0.00 (0.00-0.00)	0.00	27.27
Total HPS Facilities	13518	0.00 (0.00-0.27)	0.00	88.89

[*]Data are among 13518 HPS facilities with reporting at least one week per month to NHSN during Q3 2022.
[†]Data from inpatient rehabilitation facility (IPF) units and inpatient psychiatric facility (IRF) units with unique CMS

Certification Numbers (CCNs) located within acute care hospitals are not included in the acute care hospital category. Critical Access Hospitals are included in this category.
‡Includes freestanding IPF and IRF locations and IPF and IRF units with unique CCNs located within acute care hospitals.

Previous (2021) Submission:

For reliability testing,

The 869 CMS-certified nursing homes which participated in both National Healthcare Safety Network (NHSN) COVID-19 vaccination coverage reporting and the Pharmacy Partnership for Long-Term Care Program for the 3 weeks between December 18, 2020 and January 17, 2021 were used.

For validity testing,

The 1,807 CMS-certified nursing homes which participated in both NHSN COVID-19 vaccination coverage reporting for Quarter 3 (July, August, September) 2021 and NHSN annual influenza vaccination coverage reporting for the 2020-2021 influenza season were used.

For additional assessment of missing data and exclusions (contraindications)

All 15,267 CMS-certified nursing homes which participated in NHSN COVID-19 vaccination coverage reporting and NHSN for at least one month of Quarter 3 (July, August, September) 2021 were used.

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.

Current Submission:

N/A

Previous (2021) Submission:

N/A

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.

Current Submission:

Facility-level reliability was estimated using a signal-to-noise ratio analysis which captures the ability of the measure to distinguish between facilities (Adams J.L. 2009). Signal to noise reliability is calculated as $R = \frac{\sigma_b^2}{\sigma_b^2+\sigma_w^2}$, where σ_b^2 is the between-facility variance and σ_w^2 is the within-facility variance.

The proportion of healthcare personnel with up-to-date vaccination was treated as a binomial distribution and the beta-binomial approach suggested by Adams (2009) was used. The beta binomial distribution is an extension of the binomial distribution (binomial(n, p)) where p is itself a beta variate (beta(α, β)). The between-facility variance is then extracted as the variance of beta(α, β). The beta binomial distribution was fitted to the data using the BetaBin SAS macro (used by Adams, 2009, but authored by Ian Wakeling) that utilizes SAS Proc NLmixed to compute the maximum likelihood estimates of the parameters of the beta binomial distribution. Estimates for α and β were used to calculate the variance of the beta-variate p, which is the estimate of the between-facility variance, as $\frac{\alpha\beta}{(\alpha+\beta)^2(\alpha+\beta+1)}$. The within-facility variance was then estimated from the binomial error distribution at the facility level as $\sigma_w^2 = \frac{p(1-p)}{n}$.

Reference:
Adams J.L. “The Reliability of Provider Profiling: A Tutorial”; RAND Corporation, TR-653-NCQA, 2009.

Previous (2021) Submission:

Reliability Testing

Numerator testing: Data element reliability testing was conducted for the critical data element of the number of HCP who have received COVID-19 vaccination for each measured entity using multiple statistical methods to assess the amount of variability compared to an independent comparator.

Reliability testing was conducted by comparing the number of HCP who had received COVID-19 vaccinations as reported to the National Healthcare Safety Network (NHSN) (measure numerator) to the number of COVID-19 vaccinations administered by Pharmacy Partnership for Long-Term Care Program (independent comparator) at each facility during the same week.

The steps and statistical analyses conducted to assess repeatability and bias were the following (1,2):

1. Assess the strength *of the association* between the NHSN (measure numerator) reporting and PPP (independent comparator) reporting of the number of HCP receiving COVID-19 vaccinations.
(a) linear association with Pearson Correlation Coefficient
(b) nonparametric association (based on number of concordances and discordances in paired observations) with Kendall’s Tau-b Correlation Coefficient

2. Assess *comparability (bias) in measurement* of the number of HCP receiving COVID-19 vaccinations by NHSN (measure numerator) reporting and PPP (independent comparator) reporting

(a) Qualitative visualization – plot a line of unity (slope=1) on the scatterplot of NHSN and PPP reporting
(b) Assess mean difference:

i. Quantitative assessment - paired t-test of the mean difference between NHSN and PPP reporting

ii. Qualitative assessment - Bland-Altman plot of difference between NHSN and PPP reporting against the mean of the two measurements

3. Assess the strength of association and comparability *stratified* by:
(a) *Facility size* (stratified by number of HCP [tertiles])
(b) *Weekly vaccination coverage rate* (stratified by NHSN coverage rate [tertiles])
(c) *Reporting week* (stratified by week ending January 3, January 10, or January 17, 2021)

Repeated measures over time in the same facility were not assessed, as the number of HCP vaccinated will change over time due to vaccination uptake efforts and staffing changes (e.g., new hired HCP, retirement of HCP).

Denominator Testing: Data element reliability testing was not conducted for the data element of the number of HCP eligible to receive COVID-19 vaccination for each measured entity. The proposed measure uses the same denominator HCP definitions and categories as the previously NQF-endorsed measure, NQF 0431 Influenza Vaccination Coverage Among Healthcare Personnel. (3)

1. Johnson M and Waller J. Simple Methods for Repeatability and Comparability: Bland-Altman Plots, Bias, and Measurement Error, Paper 1815-2018. https://www.sas.com/content/dam/SAS/support/en/sas-global-forum-proceedings/2018/1815-2018.pdf
2. Giavarina D. Understanding Bland Altman analysis. Biochem Med (Zagreb). 2015;25(2):141-51. doi: 10.11613/BM.2015.015. PMID: 26110027; PMCID: PMC4470095.
3. Libby TE, Lindley MC, Lorick SA, MacCannell T, Lee SJ, Smith C, Geevarughese A, Makvandi M, Nace DA, Ahmed F. Reliability and validity of a standardized measure of influenza vaccination coverage among healthcare personnel. Infect Control Hosp Epidemiol. 2013 Apr;34(4):335-45. doi: 10.1086/669859. Epub 2013 Feb 19. PMID: 23466904. Appendix

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).

Current Submission:

Signal-to-noise reliability scores were calculated separately for healthcare personnel in **facilities participating in the NHSN** long-term care **component (skilled nursing facilities)** and Healthcare Personnel Safety (HPS) **component** and are shown in the tables below. The median reliability score for healthcare personnel in **skilled nursing** facilities was 0.98, ranging from 0.58 to 1.00. The 25th and 75th percentiles were 0.97 and 0.99, respectively. 99.9% of facilities had reliability score exceeding 0.7.

The median reliability scores for all HPS facility types were all > 0.90. Their 25th and 75th percentiles were 0.85 and 1.0, respectively. For all HPS facilities, at least 97% had reliability score exceeding 0.7.

Signal-to-noise reliability for up to date vaccination coverage among skilled nursing facility healthcare personnel—National Healthcare Safety Network (NHSN) Long-term Care Facility Component, Q3 2022*

Facility type	N	Signal-to-Noise Reliability								
		Mean	Min	p5	p25	p50	p75	p95	Max	>=0.7
Skilled Nursing Facility	15100	0.97	0.58	0.94	0.97	0.98	0.99	1.0	1.0	15097/15100 (99.9%)

*Data are among 15100 skilled nursing facilities with reporting at least one week per month to NHSN during Q3 2022.

Signal-to-noise reliability for up to date vaccination coverage among healthcare personnel, by facility type—National Healthcare Safety Network (NHSN) Healthcare Personnel Safety (HPS) Component, Q3 2022*

Facility type	N	Signal-to-Noise Reliability								
		Mean	Min	p5	p25	p50	p75	p95	Max	>=0.7
Acute Care Hospitals†	2557	0.99	0.40	0.95	0.99	1	1	1	1	2551/2557 (99.8%)
Long-Term Acute Care Hospitals	325	0.99	0.77	0.97	0.98	0.99	0.99	1	1	325/325 (100%)
Inpatient Rehabilitation Facilities‡	341	0.97	0.30	0.94	0.97	0.98	0.99	0.99	1	340/341 (99.7%)
Inpatient Psychiatric Facilities‡	475	0.99	0.57	0.97	0.99	0.99	1	1	1	474/475 (99.8%)
Ambulatory Surgery Centers	2692	0.96	0.5	0.87	0.95	0.98	0.99	1	1	2685/2692 (99.7%)
Dialysis Facilities	7128	0.89	0.29	0.74	0.85	0.91	0.95	1.00	1.00	6924/7128 (97.1%)
All HPS Facilities	13518	0.95	0.38	0.83	0.92	0.97	0.99	1.00	1.00	13412/13518 (99.2%)

*Data are among 13518 HPS facilities with reporting at least one week per month to NHSN during Q3 2022.
†Data from inpatient rehabilitation facility (IPF) units and inpatient psychiatric facility (IRF) units with unique CMS Certification Numbers (CCNs) located within acute care hospitals are not included in the acute care hospital category. Critical Access Hospitals are included in this category.
‡Includes freestanding IPF and IRF locations and IPF and IRF units with unique CCNs located within acute care hospitals.

Previous (2021) Submission:

1a. Linear association assessed by Pearson Correlation Coefficients

Overall Pearson Correlation Coefficient for the number of HCP who received COVID-19 vaccinations as reported to the National Healthcare Safety Network (NHSN) (measure numerator) to the number of COVID-19 vaccinations administered by Pharmacy Partnership for Long-Term Care Program (independent comparator): 0.846, p<0.0001 (869 Facilities)

Pearson Correlation Coefficient Stratified by Facility Size (Number of healthcare personnel [HCP])

Statistic	Tertile 1 (<=76 HCP, n=290 facilities)	Tertile 2 (77-116 HCP, n=292 facilities)	Tertile 3 (>=117 HCP, n=287 facilities)
Pearson Correlation Coefficient	0.839	0.692	0.769
P-value	**<0.0001**	**<0.0001**	**<0.0001**

Pearson Correlation Coefficient Stratified by Vaccination Coverage

Statistic	Tertile 1 (<=30.7% vaccination, n=290 facilities)	Tertile 2 (30.7-48.9% vaccination, n=290 facilities)	Tertile 3 (>=49.0% HCP vaccination, n=289 facilities)
Pearson Correlation Coefficient	0.754	0.886	0.810
P-value	**<0.0001**	**<0.0001**	**<0.0001**

Pearson Correlation Coefficient Stratified by Reporting Week

Statistic	Week 1 (n=305 facilities)	Week 2 (n=361 facilities)	Week 3 (n=203 facilities)
Pearson Correlation Coefficient	0.746	0.902	0.901
P-value	**<0.0001**	**<0.0001**	**<0.0001**

1b. Nonparametric association assessed by Kendall's Tau-b Correlation Coefficient

Overall Kendall's Tau-b Correlation Coefficient: 0.751, p<0.0001 (869 Facilities)

Kendall's Tau-b Correlation Coefficient Stratified by Tertiles of Facilities by Facility Size, Vaccination %, and Reporting Week

Kendall's Tau-b Correlation Coefficient Stratified by Facility Size (Number of healthcare personnel [HCP])

Statistic	Tertile 1 (<=76 HCP, n=290 facilities)	Tertile 2 (77-116 HCP, n=292 facilities)	Tertile 3 (>=117 HCP, n=287 facilities)
Kendall's Tau-b Correlation	0.707	0.644	0.704

Coefficient			
P-value	**<0.0001**	**<0.0001**	**<0.0001**

Kendall's Tau-b Coefficient Stratified by Vaccination Coverage

Statistic	**Tertile 1 (<=30.7% vaccination, n=290 facilities)**	**Tertile 2 (30.7-48.9% vaccination, n=290 facilities)**	**Tertile 3 (>=49.0% HCP vaccination, n=289 facilities)**
Kendall's Tau-b Correlation Coefficient	0.681	0.738	0.704
P-value	**<0.0001**	**<0.0001**	**<0.0001**

Kendall's Tau-b Correlation Coefficient Stratified by Reporting Week

Statistic	**Week 1 (n=305 facilities)**	**Week 2 (n=361 facilities)**	**Week 3 (n=203 facilities)**
Kendall's Tau-b Correlation Coefficient	0.676	0.804	0.774
P-value	**<0.0001**	**<0.0001**	**<0.0001**

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?)

Current Submission:

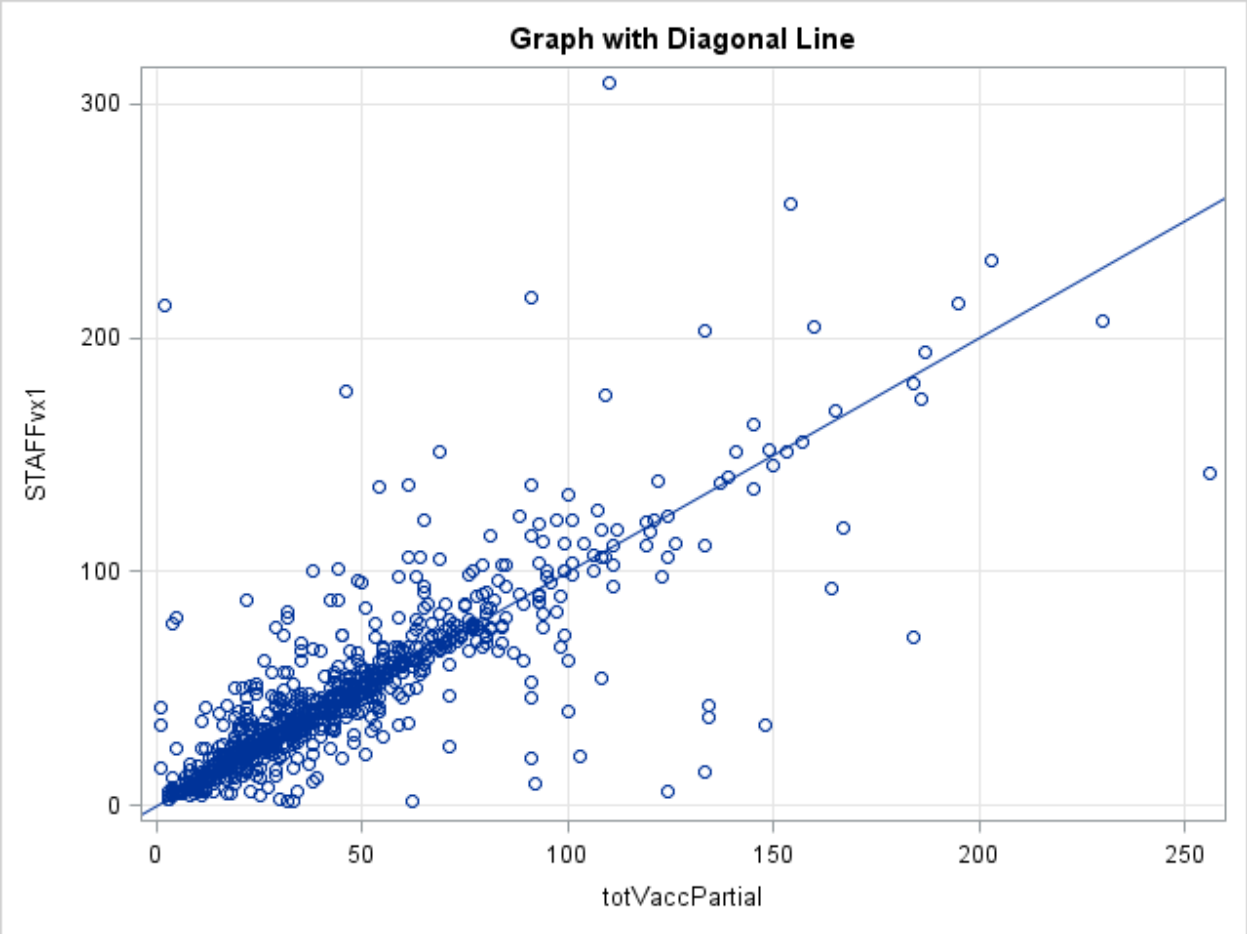
Signal-to-Noise reliability scores vary across facilities from zero to one, with a score of zero indicating that all variation is attributable to noise (variation across patients within facilities) and a score of one indicating that all variation is caused by real differences in performance across facilities. For the up-to-date vaccination measure, the median signal-to-noise reliability score was 0.98 for healthcare personnel in facilities participating in the NHSN long-term care component (skilled nursing facilities) and greater than 0.9 for personnel in facilities participating in the NHSN healthcare personnel safety (HPS) component, demonstrating substantial agreement.

Signal-to-noise reliability above 0.70 is generally considered acceptably reliable. For the healthcare personnel up-to-date vaccination measure, 99.9% of skilled nursing facilities and at least 97.1% of HPS facilities have reliability above 0.70, indicating excellent signal to noise reliability.

Previous (2021) Submission:

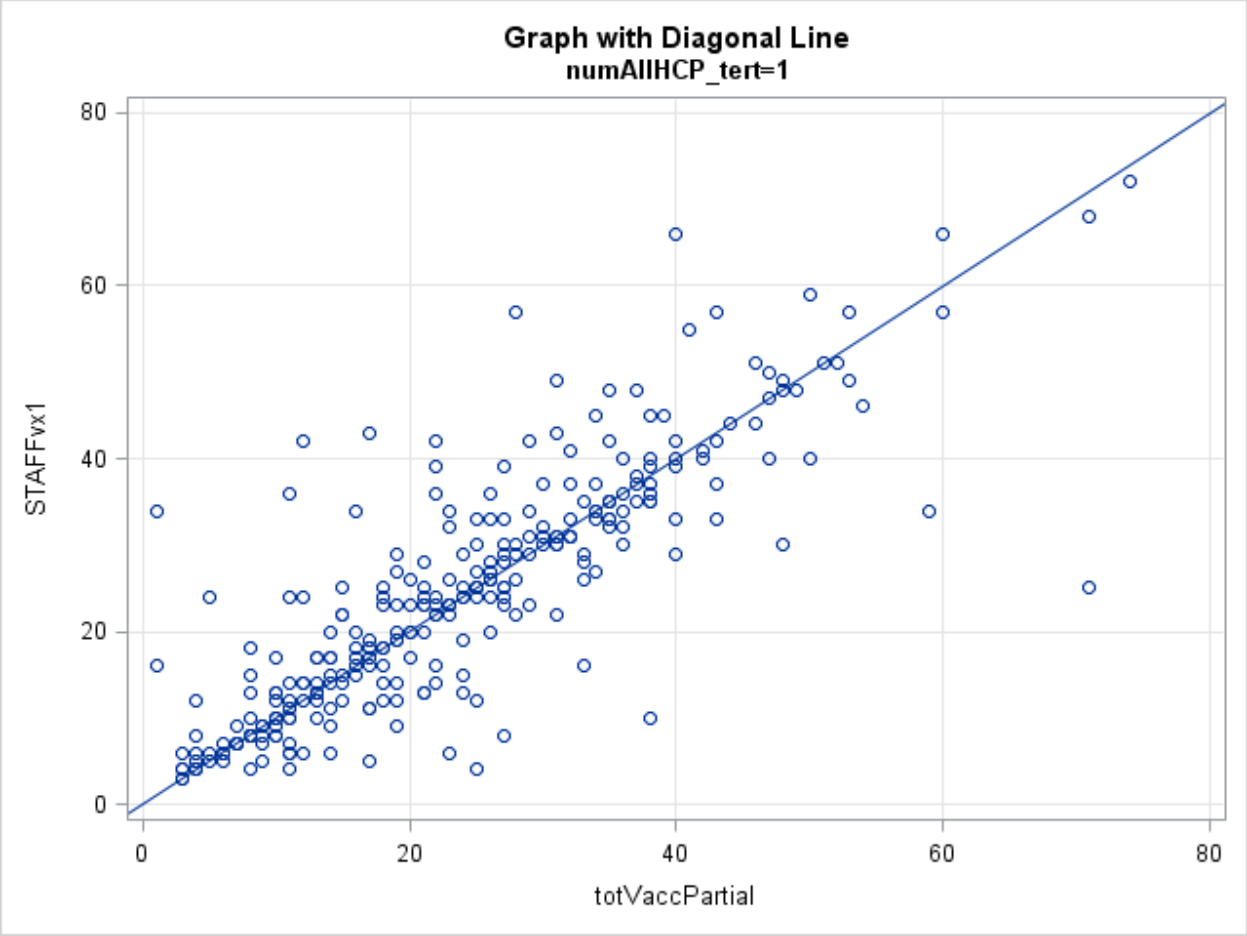
Qualitative visualization of the correlation between **the number of HCP who received COVID-19 vaccinations as reported to the National Healthcare Safety Network (NHSN) (measure numerator) to the number of COVID-19 vaccinations administered by Pharmacy Partnership for Long-Term Care Program (independent comparator)**

***Overall* (869 facilities)** scatterplot of **the number of HCP who had received COVID-19 vaccination as reported to the National Healthcare Safety Network (NHSN) (measure numerator, Y-axis) to the number of COVID-19 vaccinations administered by Pharmacy Partnership for Long-Term Care Program (independent comparator, X-axis)**

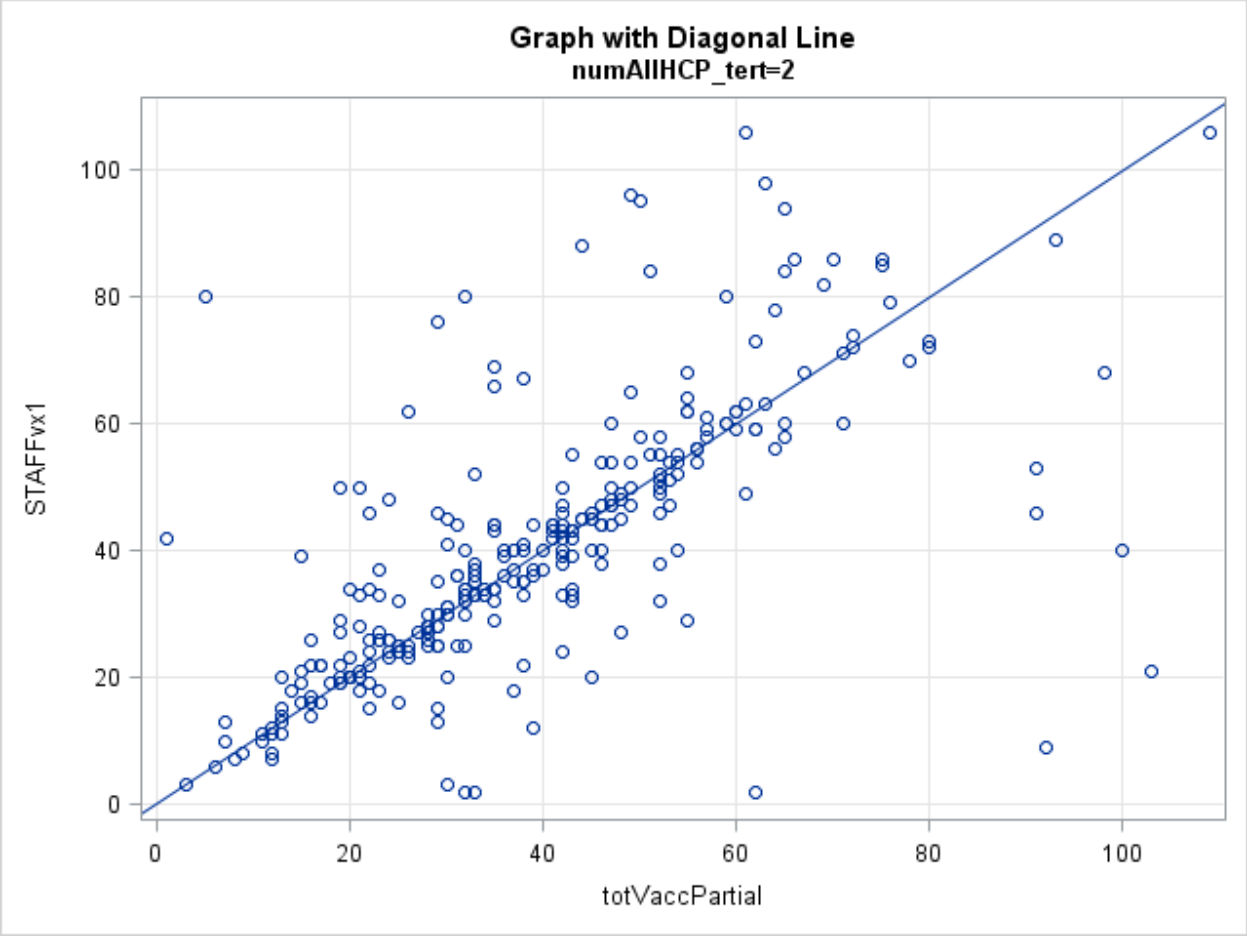


Scatterplots by tertiles of facility size (number of HCP)

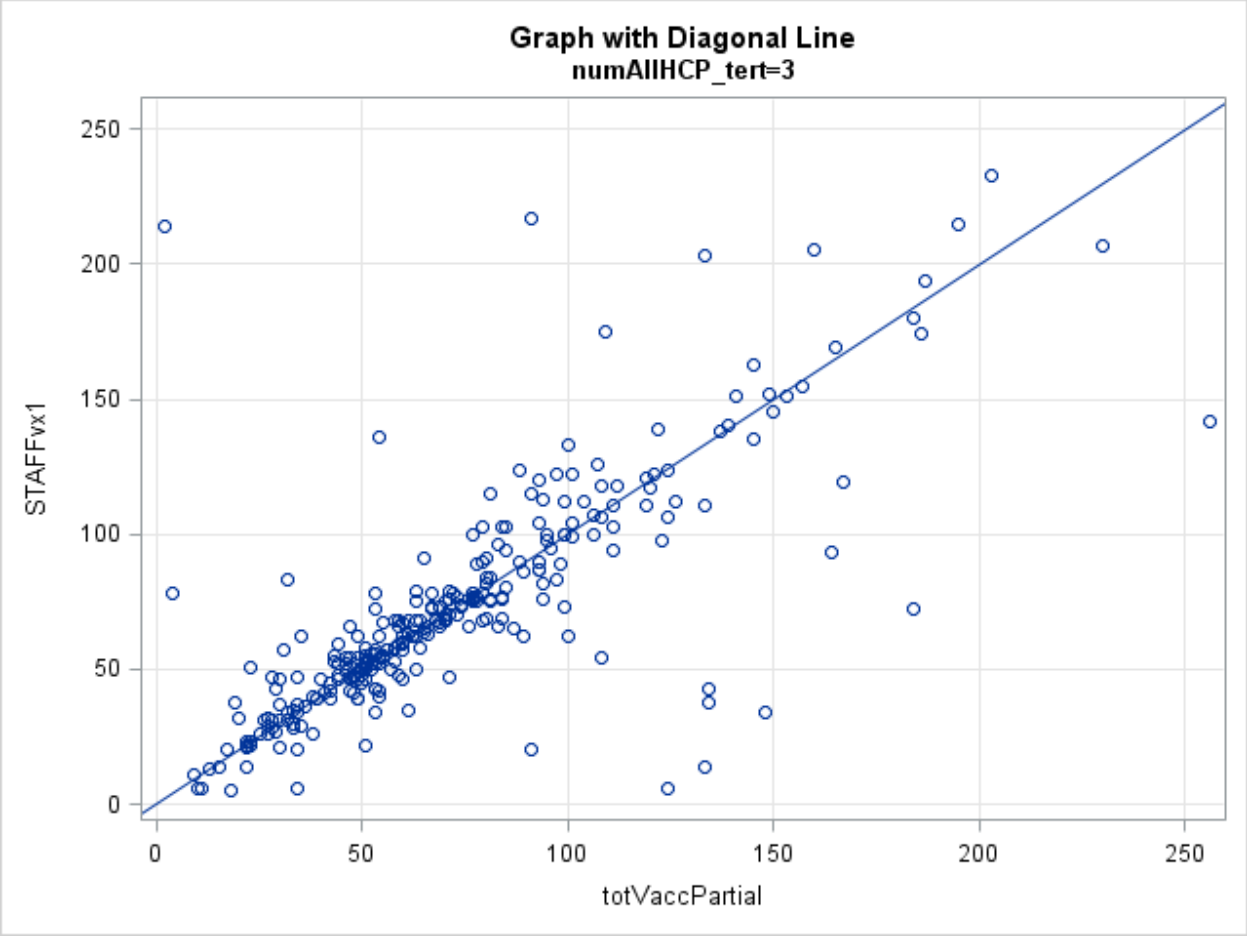
***Facility Size Tertile 1* (<=76 HCP, n=290 facilities)** scatterplot of **the number of HCP who had received COVID-19 vaccination as reported to the National Healthcare Safety Network (NHSN) (measure numerator, Y-axis) to the number of COVID-19 vaccinations administered by Pharmacy Partnership for Long-Term Care Program (independent comparator, X-axis**



***Facility Size Tertile 2* (77-116 HCP, n=292 facilities)** scatterplot of **the number of HCP who had received COVID-19 vaccination as reported to the National Healthcare Safety Network (NHSN) (measure numerator, Y-axis) to the number of COVID-19 vaccinations administered by Pharmacy Partnership for Long-Term Care Program (independent comparator, X-axis)**

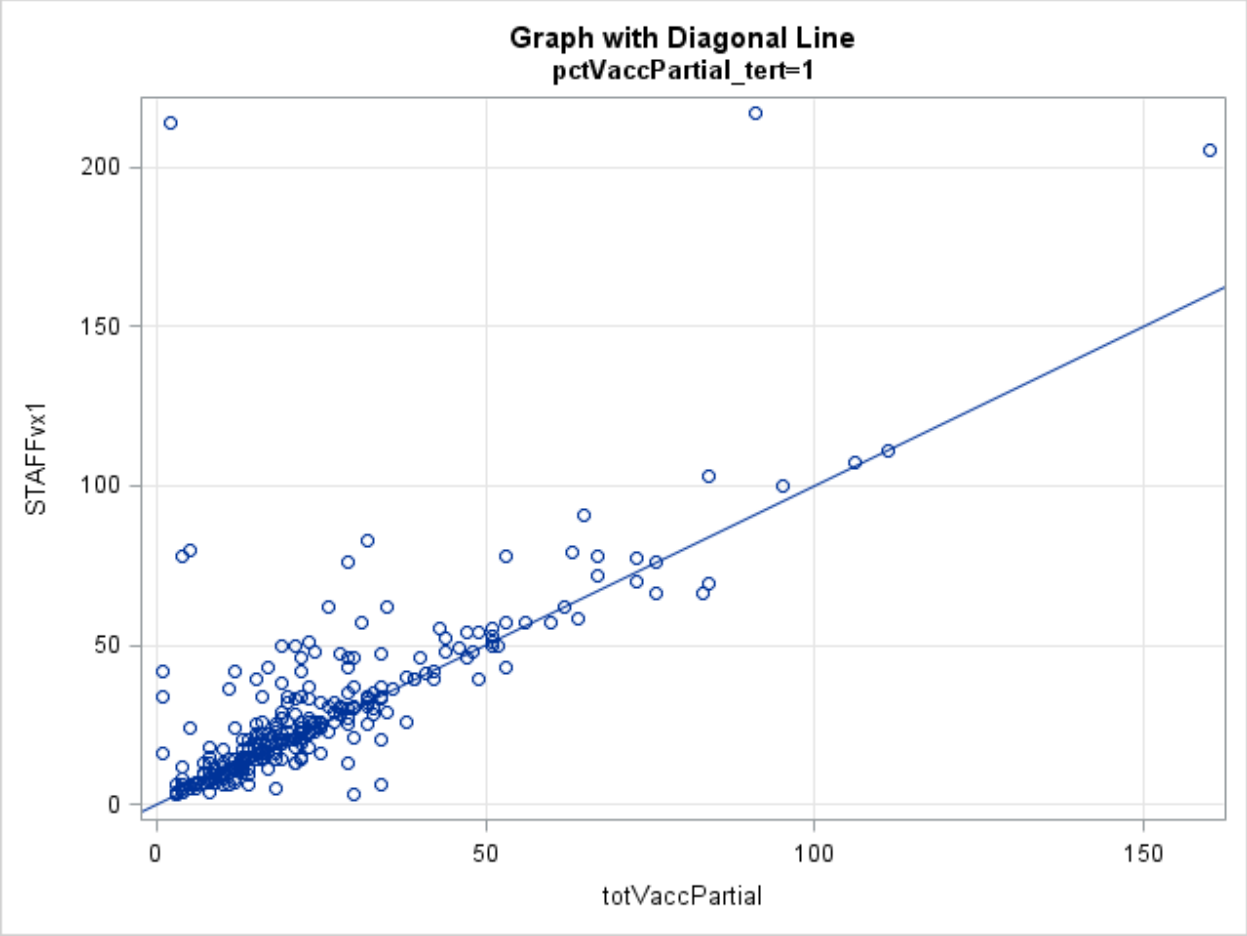


Facility Size Tertile 3 **(>=117 HCP, n=287 facilities)** scatterplot of **the number of HCP who had received COVID-19 vaccination as reported to the National Healthcare Safety Network (NHSN) (measure numerator, Y-axis) to the number of COVID-19 vaccinations administered by Pharmacy Partnership for Long-Term Care Program (independent comparator, X-axis)**

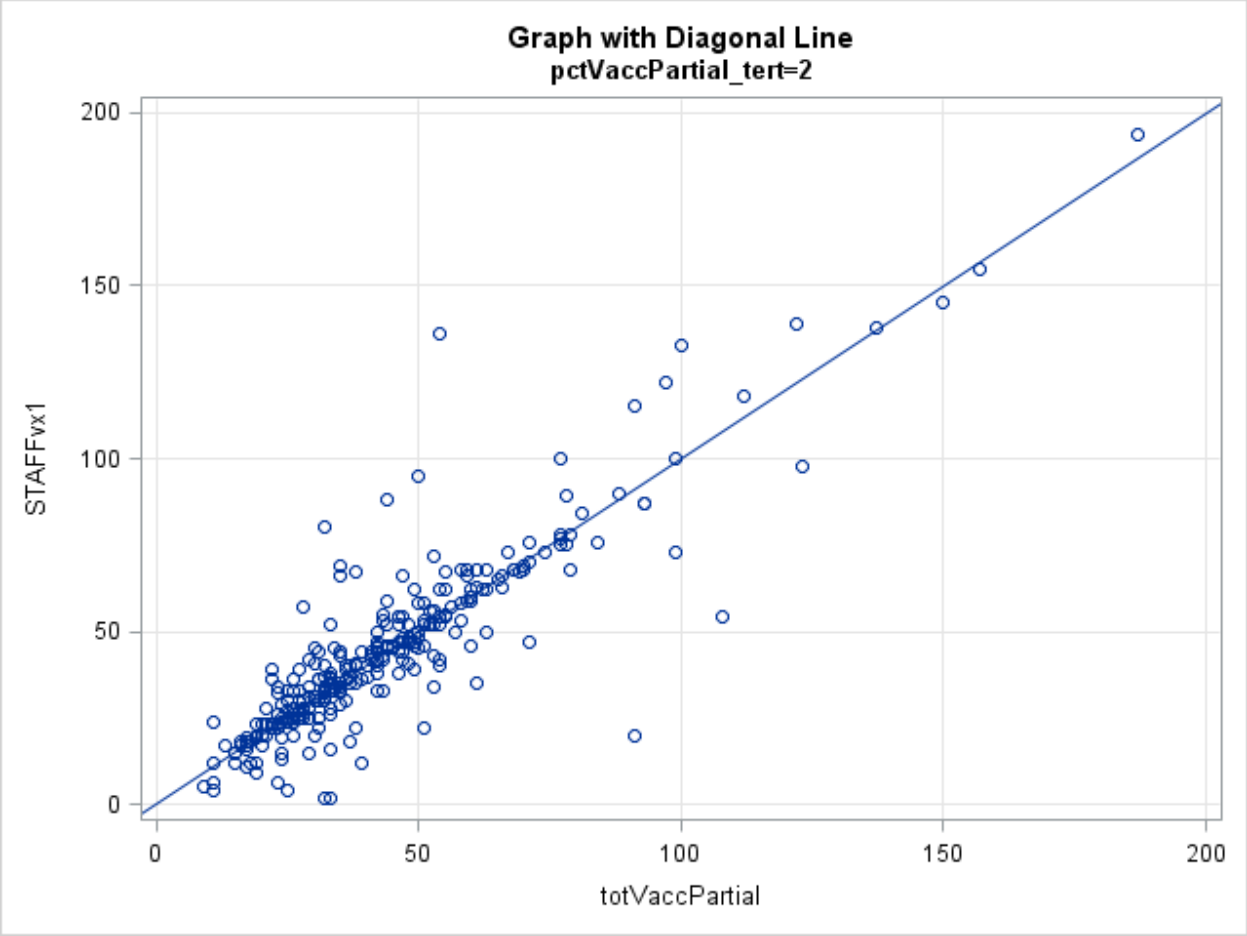


Scatterplots by tertiles of vaccine coverage

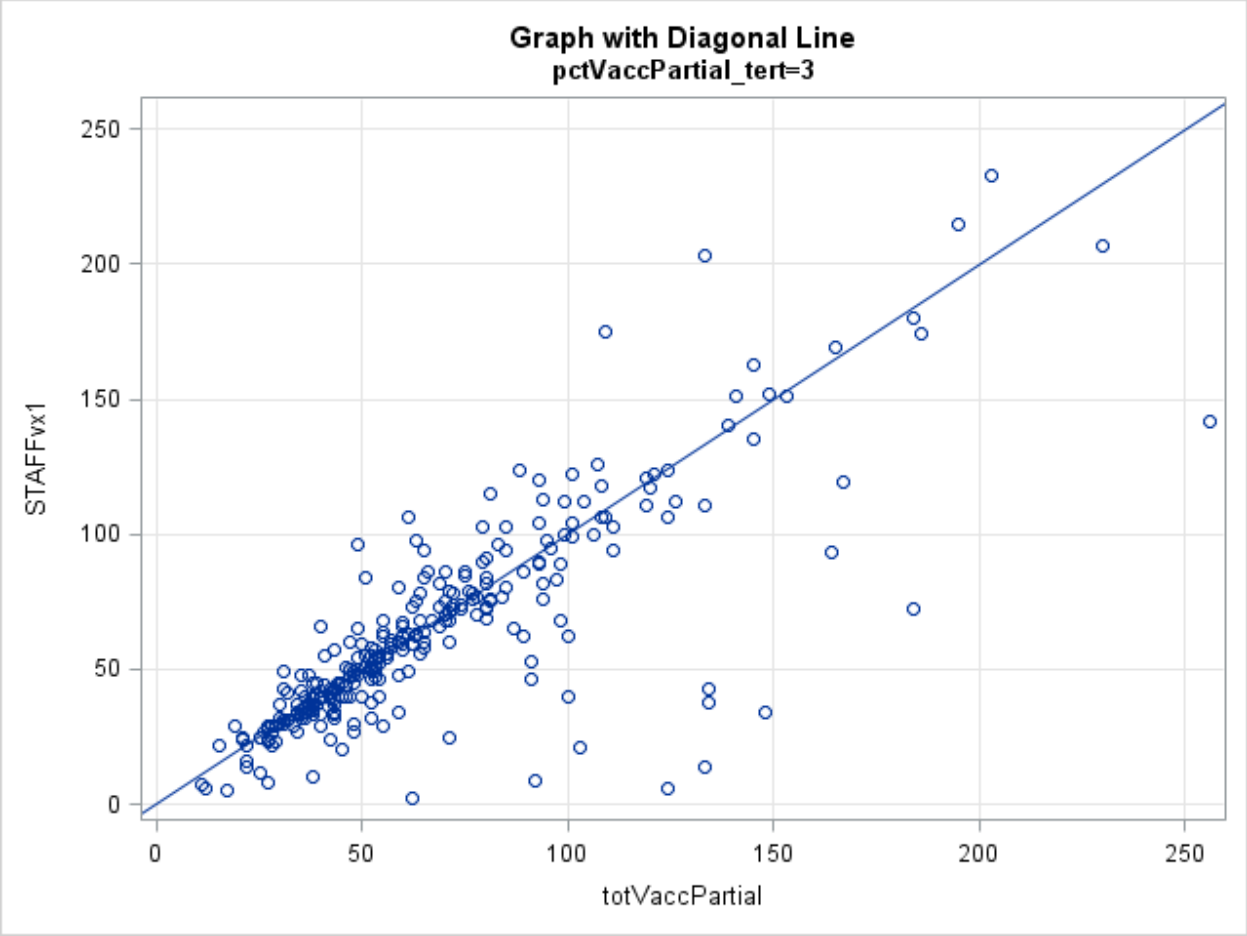
Facility Size Tertile 1 **(<=30.7% vaccination, n=290 facilities)** scatterplot of **the number of HCP who had received COVID-19 vaccination as reported to the National Healthcare Safety Network (NHSN) (measure numerator, Y-axis) to the number of COVID-19 vaccinations administered by Pharmacy Partnership for Long-Term Care Program (independent comparator, X-axis)**



Facility Size Tertile 2 **(30.7-48.9% vaccination, n=290 facilities)** scatterplot of **the number of HCP who had received COVID-19 vaccination as reported to the National Healthcare Safety Network (NHSN) (measure numerator, Y-axis) to the number of COVID-19 vaccinations administered by Pharmacy Partnership for Long-Term Care Program (independent comparator, X-axis)**

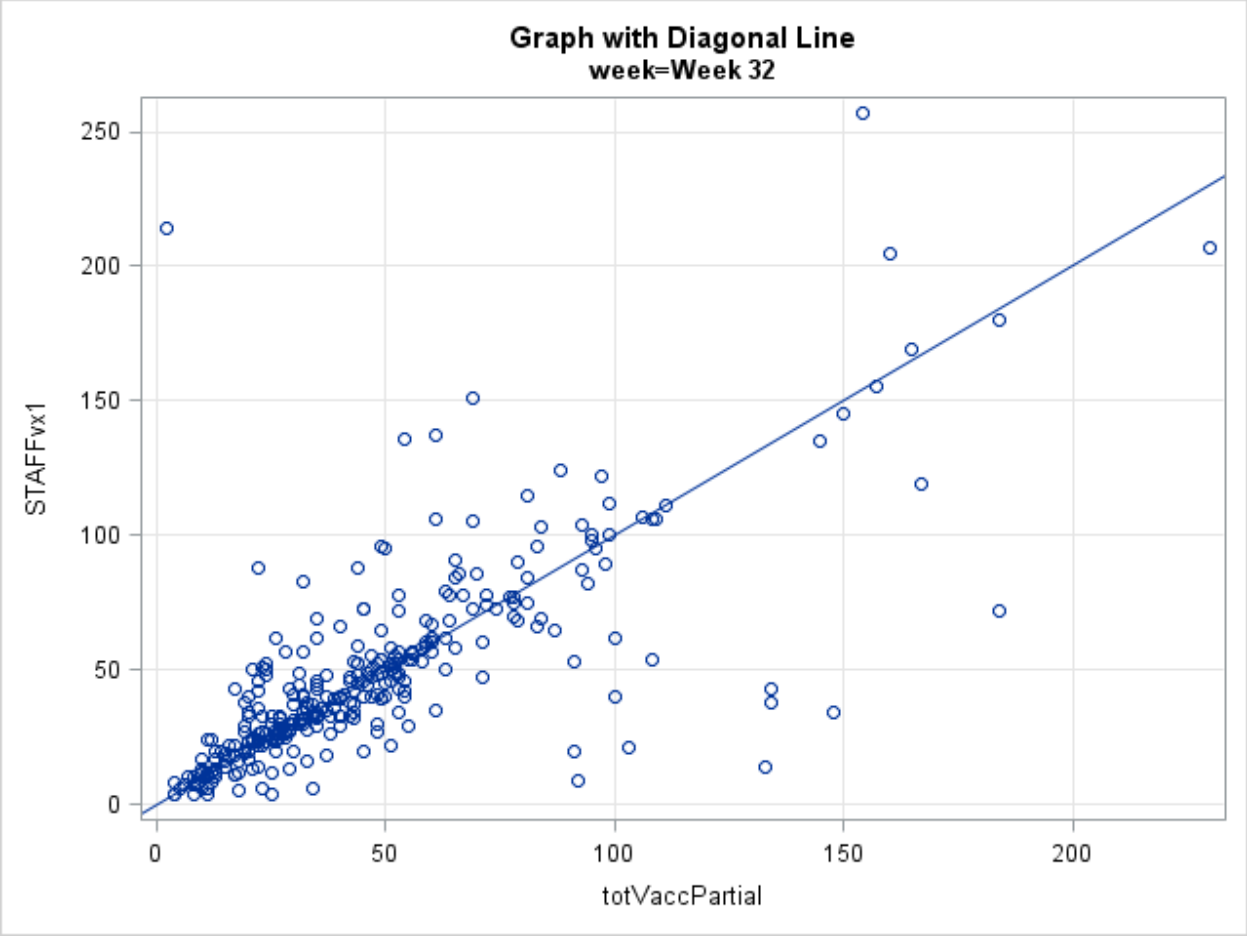


Facility Size Tertile 3 **(>=49.0% HCP vaccination, n=289 facilities)** scatterplot of **the number of HCP who had received COVID-19 vaccination as reported to the National Healthcare Safety Network (NHSN) (measure numerator, Y-axis) to the number of COVID-19 vaccinations administered by Pharmacy Partnership for Long-Term Care Program (independent comparator, X-axis)**

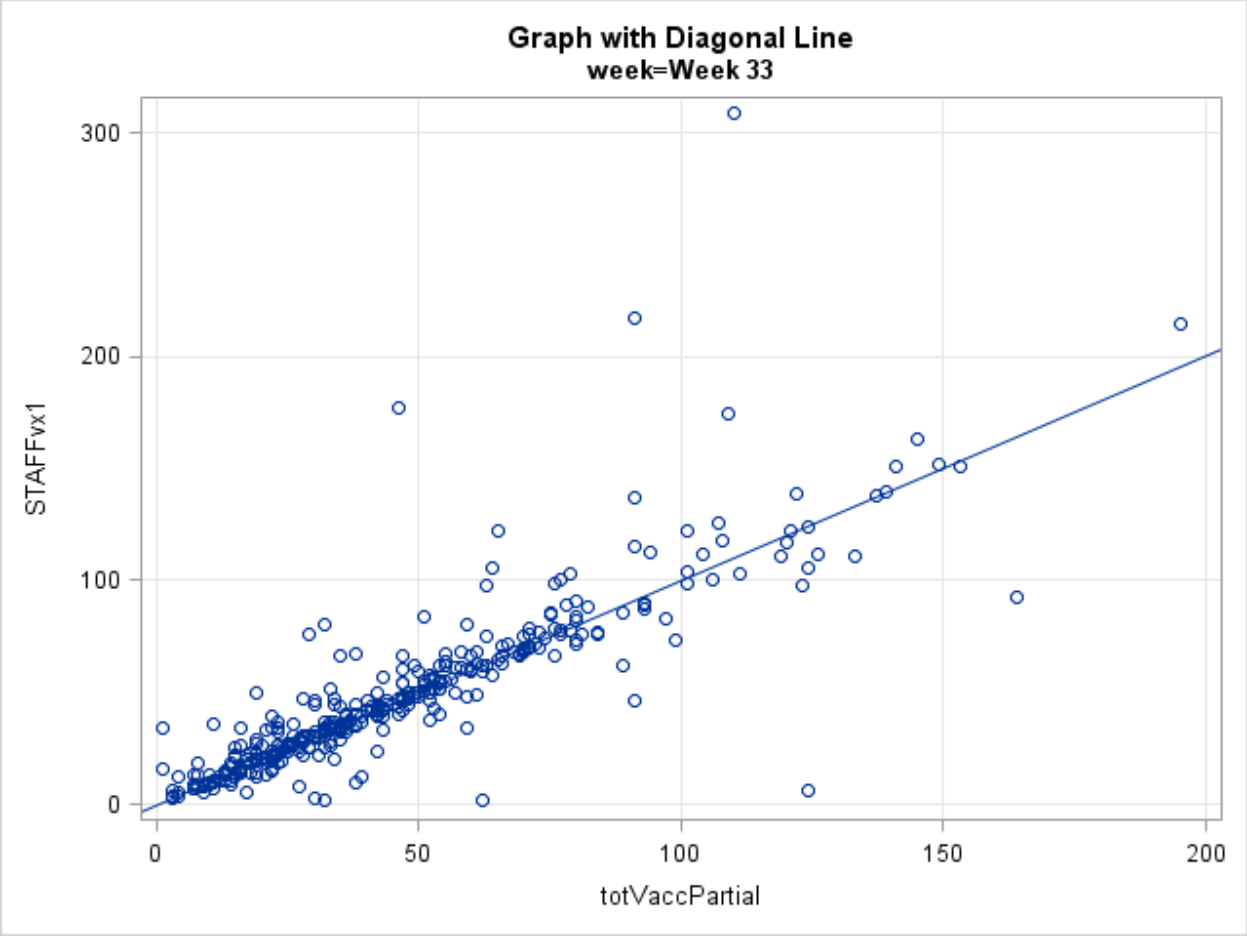


Scatterplots by reporting week

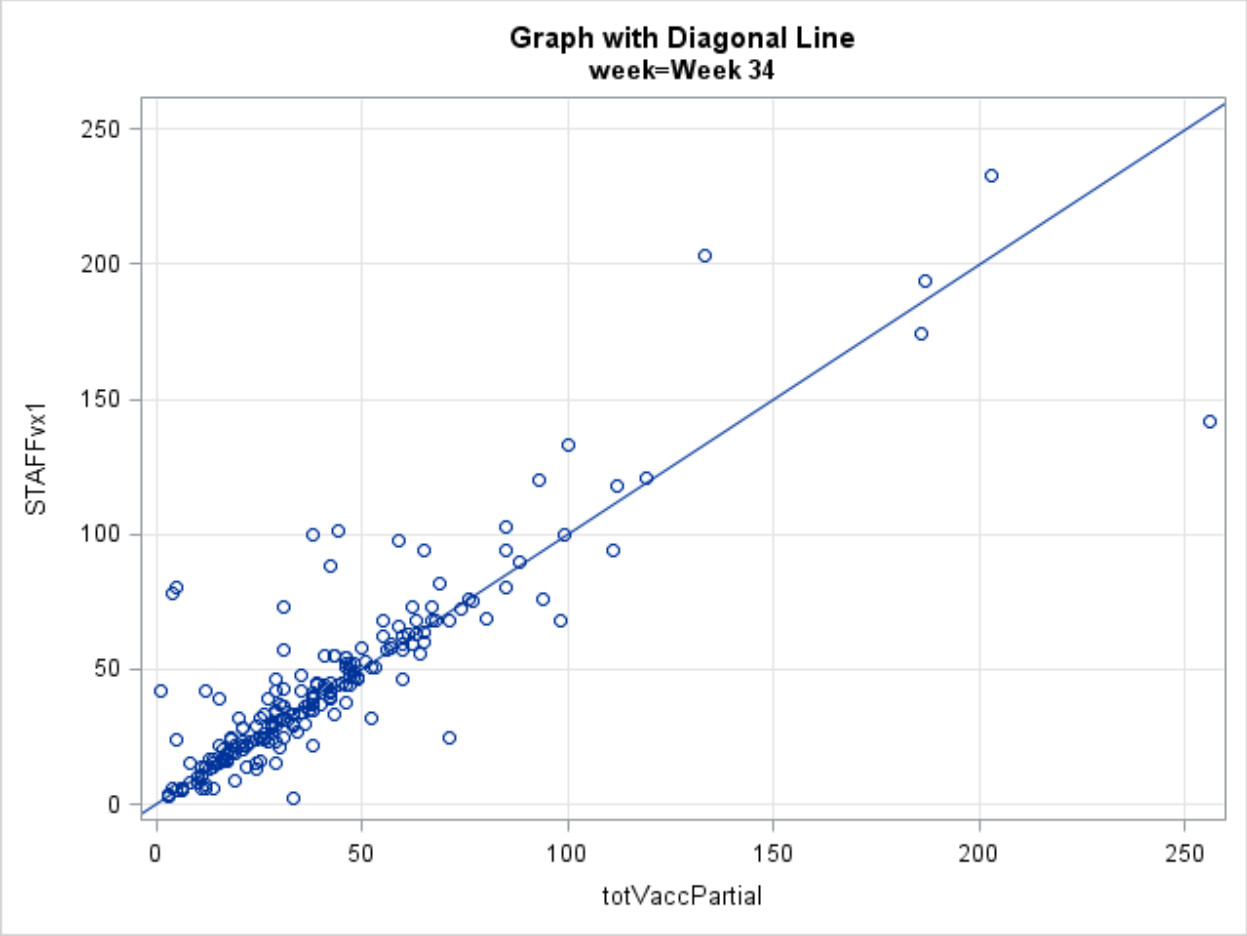
Reporting Week 1 **(n=305 facilities)** scatterplot of **the number of HCP who received COVID-19 vaccinations as reported to the National Healthcare Safety Network (NHSN) (measure numerator, Y-axis) to the number of COVID-19 vaccinations administered by Pharmacy Partnership for Long-Term Care Program (independent comparator, X-axis)**



Reporting Week 2 **(n=361 facilities)** scatterplot of **the number of HCP who received COVID-19 vaccinations as reported to the National Healthcare Safety Network (NHSN) (measure numerator, Y-axis) to the number of COVID-19 vaccinations administered by Pharmacy Partnership for Long-Term Care Program (independent comparator, X-axis)**



Reporting Week 3 **(n=203 facilities)** scatterplot of **the number of HCP who vaccinations received COVID-19 vaccination as reported to the National Healthcare Safety Network (NHSN) (measure numerator, Y-axis) to the number of COVID-19 vaccinations administered by Pharmacy Partnership for Long-Term Care Program (independent comparator, X-axis)**



2b. Quantitative assessment of mean difference

i. The overall vaccinations **of the mean difference** in **the number of HCP who received COVID-19 vaccinations as reported to the National Healthcare Safety Network (NHSN) (measure numerator) to the number of COVID-19 vaccinations administered by Pharmacy Partnership for Long-Term Care Program (independent comparator) was *Not* Significantly Different: -0.70 vaccinations, p=0.278, 95% CI -1.96 - 0.56**

Mean Difference Stratified by *Facility Size* (Number of healthcare personnel [HCP])

	Tertile 1 (<=76 HCP, n=290 facilities)	Tertile 2 (77-116 HCP, n=292 facilities)	Tertile 3 (>=117 HCP, n=287 facilities)
Mean Difference in number of vaccinations	-0.731	-1.30	0.056
95% Confidence Interval	(-1.65-0.19)	(-3.10-0.51)	(-3.28-3.17)

Mean Difference Stratified by *Vaccination Coverage*

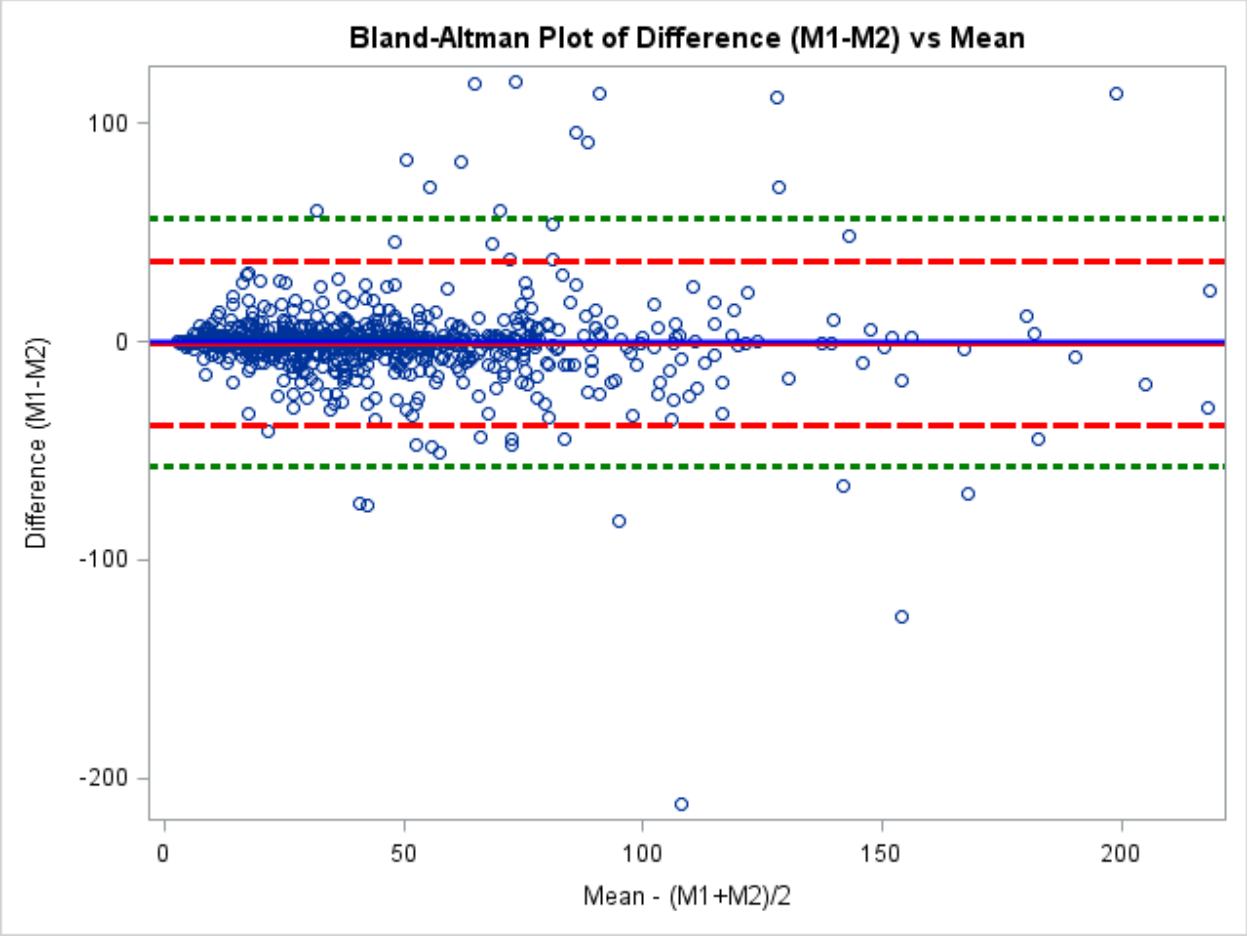
	Tertile 1 (<=30.7% vaccination, n=290 facilities)	Tertile 2 (30.7-48.9% vaccination, n=290 facilities)	Tertile 3 (>=49.0% HCP vaccination, n=289 facilities)
Mean Difference in number of vaccinations	-4.81	-0.848	3.57
95% Confidence Interval	(-6.91--2.70)	(-2.28-0.59)	(0.85-6.29)

Mean Difference Stratified by Reporting Week

	Week 1 (n=305 facilities)	Week 2 (n=361 facilities)	Week 3 (n=203 facilities)
Mean Difference in number of vaccinations	0.564	-1.17	-1.76
95% Confidence Interval	(-2.21-3.34)	(-2.69-0.36)	(-3.88-0.35)

2b. Qualitative visualization of mean difference

ii. Bland-Altman scatter plot of the difference in **the number of HCP who had received COVID-19 vaccination as reported to the National Healthcare Safety Network (NHSN) (measure numerator, M1) and the number of COVID-19 vaccinations administered by Pharmacy Partnership for Long-Term Care Program (independent comparator, M2)** (y-axis) vs the mean of vaccinations reported ([M1+M2]/2) (x-axis) for each facility



** a reference line for 0 difference is indicated on the x-axis and with a solid blue **

** a reference line for the mean of the difference is indicated by solid red **

** a reference line for +/- 2 SD of the mean of the difference is indicated by long red dashes **

** a reference line for +/- 3 SD of the mean of the difference is indicated by short green dashes **

Numerator Testing

1. The number of HCP receiving COVID-19 vaccinations reported by the methodology of the proposed measure using NHSN is ***strongly associated*** **with an independent comparator** - the number of vaccinations reported to be administered by independently reported data from the federal PPP.

- The **Pearson Correlation Coefficient** is the most reasonable assessment of the strength of association as the number of HCP vaccinated is close to a continuous variable and the expected relationship between the number of vaccinations measured using NHSN and PPP is a linear one. The overall **correlation coefficient (r=0.846) is high.**

- Although not the best measure of association, as the number of vaccinations is a nearly continuous value rather than a categorical value, a non-parametric measure of association, Kendall's Tau-b Correlation Coefficient, was also calculated and was also high (r=0.751).

- **After stratifying by hospital size/number of HCP, stratifying by vaccination coverage, and stratifying by reporting week, strength of association remained high** for both the Pearson Correlation Coefficient (r=0.692 to r=0.912) and for Kendall's Tau-b Correlation Coefficient (r=0.644 to r=0.804)

2. ***Comparability*** **to an independent comparator was a 1:1 relationship**. While high correlation alone does not necessarily indicate comparability of two assessment methods, plotting a line of unity (slope=1) on a scatterplot of number of vaccinations reported by NHSN and by federal PPP reporting provides an initial qualitative assessment, there is not only a linear relationship but a **1:1 relationship** between the number of HCP receiving COVID-19 vaccination reported by the methodology of the proposed measure using NHSN and the number of vaccinations reported to be administered by the PPP, an independent comparator.

Quantitative assessment of comparability with an independent comparator was high. Comparability was quantitatively assessed by calculating the mean difference between NHSN and PPP reporting of the number of HCP who have received COVID-19 vaccine shows the overall **mean difference was minimal** (**mean difference of -0.699 vaccinations)** for a **narrow confidence interval (95% CI, -1.96 - 0.56 vaccinations)** between the number reported to NHSN and PPP reporting; p=0.28 indicating no statistically significant difference.

- **When stratifying by facility size/number of HCP and reporting week, the mean difference remained low, indicating high comparability** (mean difference -1.76 to 0.56 vaccinations) and all 95% CIs included the null value,rate, indicating no statistically significant difference.

- When stratified by vaccination coverage rate, the range of mean differences were larger by tertile, ranging from (-4.81 vaccinations in the lower tertile of vaccination coverage to 3.57 vaccinations in the higher vaccination tertile). These small but statistically significant differences in the number of vaccinations delivered identified when stratified by vaccination coverage are likely because NHSN reports vaccinations HCP may have received elsewhere, while PPP only reports vaccinations delivered at the facility. In the high vaccination tertile, it may be more likely that HCP received vaccinations elsewhere and these vaccinations were reported to NHSN. Second, when there were additional vaccine doses, PPP delivered vaccinations to others who may not have met the definition of HCP used by NHSN so as not to have vaccine doses go unused. In the low vaccination coverage tertile this situation may be more likely to occur.

Qualitative assessment of comparability to an independent comparator with a Bland-Altman plot demonstrated **random variability** (no pattern of variability based on number of vaccines delivered) **with**

minimal bias (mean difference very close to zero). Of note, there are 869 COVID-19 vaccination measurements assessed in this plot.

Denominator Testing

The proposed measure uses the same denominator HCP definitions and categories as the previously endorsed NQF-endorsed measure, NQF 0431 Influenza Vaccination Coverage Among Healthcare Personnel. The reliability testing of this denominator has been previously reported. Agreement was high (more than 90%) for all denominator categories. While some facilities excluded nonemployee contractors for whom the numerator and denominator were difficult to determine in this study conducted in 2010 – 2011, nonemployee contractors have become more commonplace and have been reported to NHSN throughout the pandemic response.

1. Libby TE, Lindley MC, Lorick SA, MacCannell T, Lee SJ, Smith C, Geevarughese A, Makvandi M, Nace DA, Ahmed F. Reliability and validity of a standardized measure of influenza vaccination coverage among healthcare personnel. Infect Control Hosp Epidemiol. 2013 Apr;34(4):335-45. doi: 10.1086/669859. Epub 2013 Feb 19. PMID: 23466904. Appendix

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.

Current Submission:

We assessed validity by computing the measure score for each measured entity (quarterly up to date COVID-19 vaccination coverage of healthcare personnel [HCP] at each facility) and then correlating those measure scores with performance on the original validated quality measure, which tracked quarterly primary series COVID-19 vaccination coverage of HCP. This was done among facilities reporting data for all three months of the reporting quarter.

We hypothesized that facilities committed to ensuring high rates of primary series COVID-19 vaccination in their HCP are likely to be committed to ensuring high rates of up to date COVID-19 vaccination coverage among HCP in their facilities. However, it is worth noting that current CMS mandates require primary vaccine coverage among HCP working in these care settings but there is no such mandate for remaining up to date with COVID-19 vaccination.

We calculated Pearson correlation coefficients to assess correlation between these two rates (primary and up to date COVID-19 vaccination coverage among HCP).

Previous (2021) Submission:

The method of validity testing was to compute the measure score for each measured entity (quarterly COVID-19 vaccination coverage of healthcare personnel [HCP] at each facility) and then correlate these measure scores with performance on another very similar quality measure, influenza vaccination coverage of HCP.

We hypothesize that facilities committed to ensuring high rates of influenza vaccination in their HCP are likely to be committed to ensuring high rates of COVID-19 vaccination in their HCP. Facilities with lower rates of influenza vaccination in their HCP are likely to have lower rates of COVID-19 vaccination in their HCP.

Based on an internet panel survey of 2,401 U.S. HCP, vaccination coverage was highest among HCP in ambulatory care and hospital settings with vaccination requirements (96.1% and 95.7%, respectively), and lowest in ambulatory and long-term care settings without vaccination requirements, promotion, or on-site offer (47.7% and 49.9%, respectively).

https://www.cdc.gov/flu/fluvaxview/hcp-coverage_1920estimates.htm

We expect that facilities with high rates of influenza vaccination and requirements and promotion will also institute COVID-19 vaccination requirements and promotion, which will lead to high coverage rates.

Pearson Correlation Coefficients between the Quarterly COVID-19 coverage measure for Q3 (July, August, September) 2021 and the annual Influenza Vaccination coverage measure NQF 0431.

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

Examples may include correlations or t-test results.

Current Submission:

Skilled Nursing Facilities (SNFs):

We considered a correlation coefficient between .10 and .29 to be slightly or mildly correlated, a coefficient between .3 and .5 to represent moderate correlation, and a correlation coefficient greater than .5 as strong correlation.

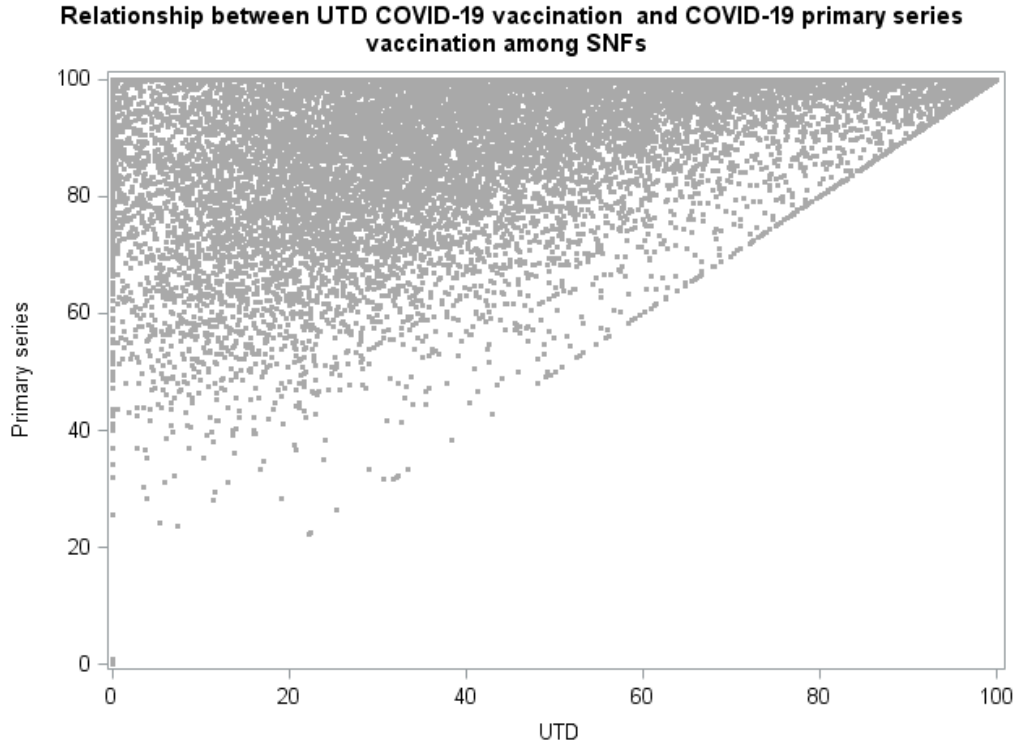
The Overall Pearson Correlation Coefficient between the quarterly primary series COVID-19 coverage measure for Q3 (July, August, September) 2022 and quarterly rates of up to date COVID-19 vaccination coverage across SNFs is 0.4504 with a p-value of <.0001. This moderate correlation remained statistically significant among all facility sizes (estimated by number of healthcare personnel).

Correlation between percent up to date with COVID-19 vaccine and complete primary COVID-19 series by number of skilled nursing facility (SNF) healthcare personnel – National Healthcare Safety Network, Q3 2022*

Number of SNF Healthcare Personnel (Quartile)	No. Reporting	Mean percent up to date	Mean percent with complete COVID-19 primary series vaccine	Pearson Correlation Coefficient	P-value
1-69 (1st)	3631	41.16	85.08	0.43485	<.0001
70-99 (2nd)	3846	40.23	86.85	0.45167	<.0001
100-141 (3rd)	3827	42.83	88.69	0.45657	<.0001
≥142 (4th)	3796	45.78	91.23	0.45408	<.0001
Total	15100	42.51	87.99	0.45040	<.0001

*Data are among 15100 skilled nursing facilities with reporting at least one week per month to NHSN during Q3 2022.

Scatterplot of COVID-19 vaccination coverage measures for primary series (y-axis) and up to date (x-axis) for Q3 (July, August, September) 2022 among skilled nursing facilities (n=15100)



***Healthcare Personnel Safety (HPS) Component facilities**:*

We considered a correlation coefficient between .10 and .29 to be slightly or mildly correlated, a coefficient between .3 and .5 to represent moderate correlation, and a correlation coefficient greater than .5 as strong correlation. The Overall Pearson Correlation Coefficient between the quarterly primary series COVID-19 coverage measure for Q3 (July, August, September) 2022 and quarterly rates of up to date COVID-19 vaccination coverage across all facility types is 0.4278 with a p-value of <.0001. All facility types had positive correlation between quarterly primary series COVID-19 coverage measure for Q3 (July, August, September) 2022 and quarterly rates of up to date COVID-19 vaccination. Correlation was slight among Inpatient Rehabilitation Facilities (Pearson correlation 0.28312), Long-term Acute Care Hospitals (Pearson correlation 0.20837) and Acute Care hospitals (Pearson correlation 0.28312) and moderate among all other facility types with the strongest correlation observed among dialysis facilities (Pearson correlation 0.48477). All were statistically significant (p-value <.05). This level of moderate correlation is consistent when stratifying by facility size (estimated by number of healthcare personnel). Correlation was stronger among smaller facility sizes. We do not show this breakdown by facility size for all facility types due to small cell counts.

Of note, dialysis facilities are required to report vaccination data weekly while all other facility types are required to report only quarterly and thus non-dialysis facilities may delay reporting due to this difference in requirement.

Correlation between percent up to date and complete primary series COVID-19 vaccination coverage by facility type—National Healthcare Safety Network (NHSN) Healthcare Personnel Safety (HPS) Component, Q3 2022*

HPS Facility Type	Number Reporting	Mean percent up to date	Mean percent with complete COVID-19 primary series vaccine	Pearson Correlation Coefficient	P-value
Acute Care Hospitals†	2557	31.52	87.56	0.28312	<.0001
Long-Term Acute Care Hospitals	325	35.57	88.29	0.20837	0.0002
Inpatient Rehabilitation Facilities‡	341	27.24	87.71	0.29385	<.0001
Inpatient Psychiatric Facilities‡	475	35.93	87.52	0.36026	<.0001
Ambulatory Surgery Centers	2692	42.19	88.38	0.39240	<.0001
Dialysis Facilities	7128	28.20	82.15	0. 48477	<.0001
Total	13518	32.04	84.89	0.42708	<.0001

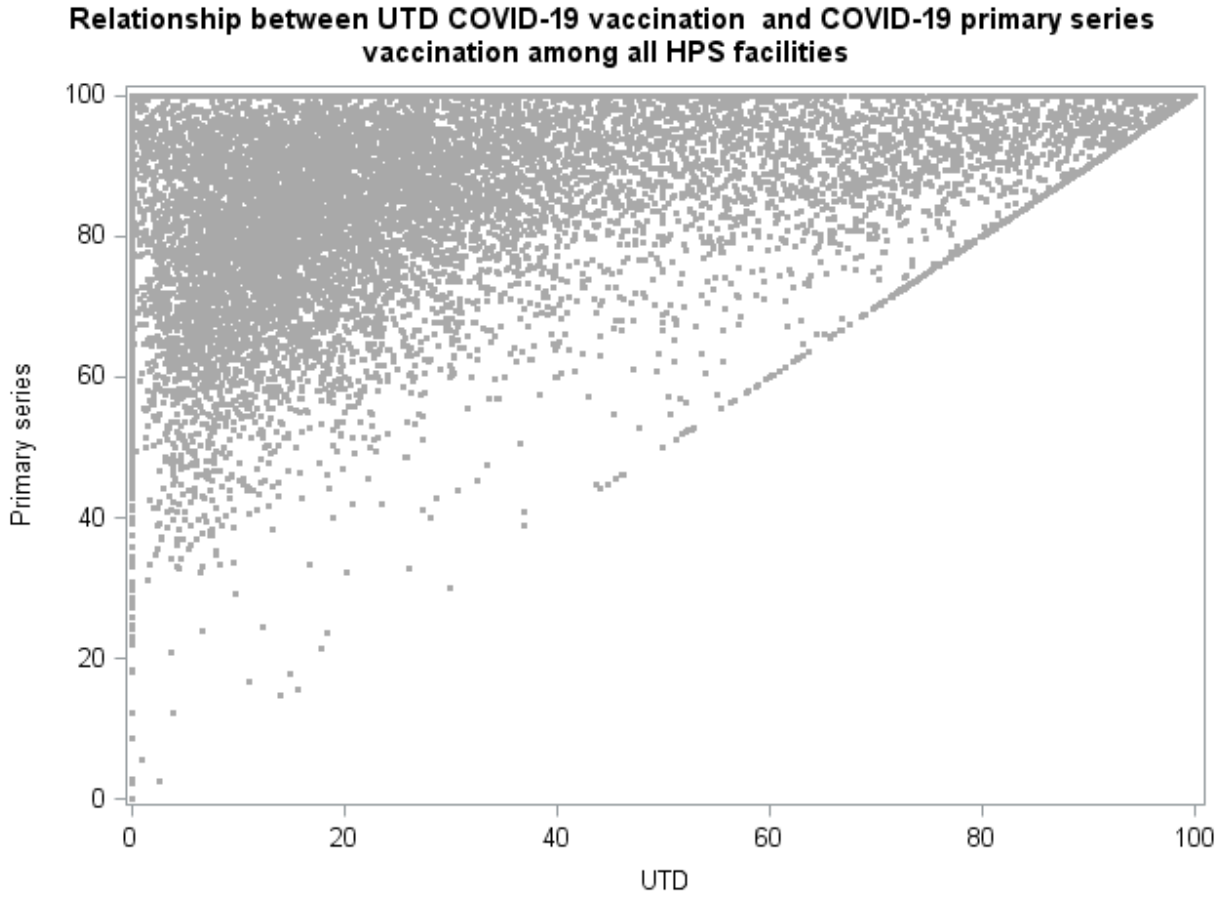
*Data are among 13518 HPS facilities with reporting at least one week per month to NHSN during Q3 2022.
†Data from inpatient rehabilitation facility (IPF) units and inpatient psychiatric facility (IRF) units with unique CMS Certification Numbers (CCNs) located within acute care hospitals are not included in the acute care hospital category. Critical Access Hospitals are included in this category.
‡Includes freestanding IPF and IRF locations and IPF and IRF units with unique CCNs located within acute care hospitals.

Correlation between percent up to date and complete primary series COVID-19 vaccination coverage by number of healthcare personnel—National Healthcare Safety Network (NHSN) Healthcare Personnel Safety (HPS) Component, Q3 2022*

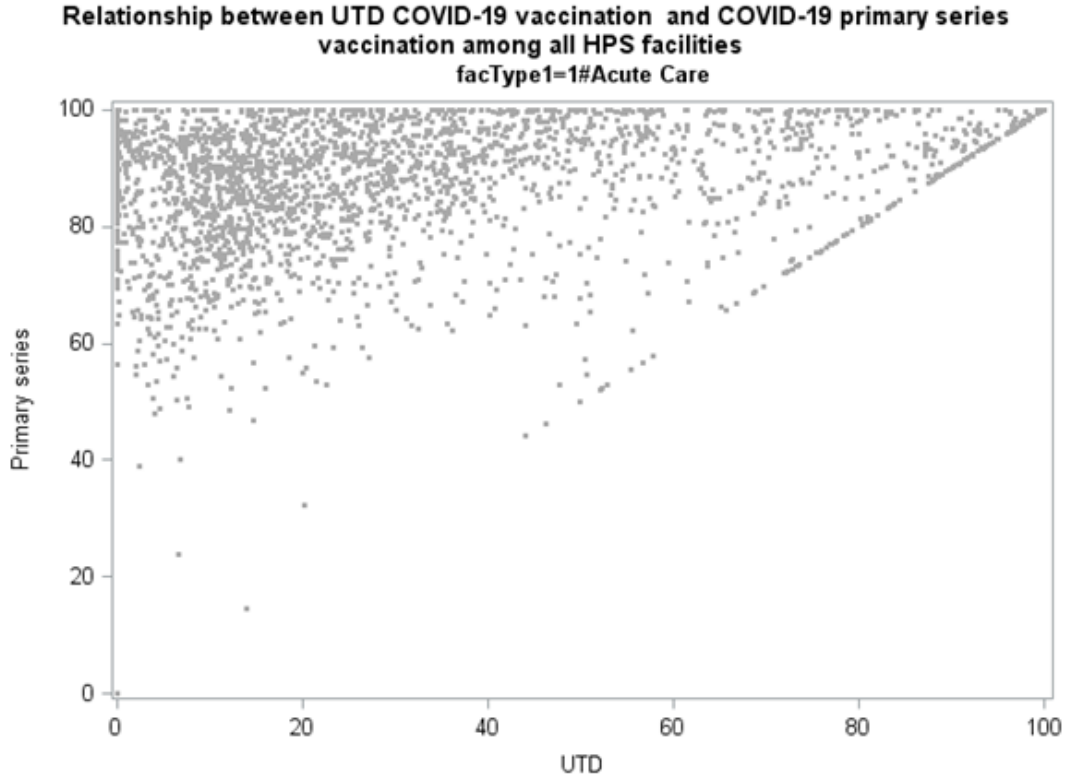
Number of Healthcare Personnel	No. Reporting	Mean percent up to date	Mean percent with complete COVID-19 primary series	Pearson Correlation Coefficient	P-value
1-50	8177	31.39	84.10	0.45064	<.0001
51-100	1836	35.01	83.21	0.52144	<.0001
101-200	917	32.70	86.07	0.36396	<.0001
201-500	1147	30.92	87.39	0.27701	<.0001
501-1000	554	29.69	87.68	0.26297	<.0001
≥1001	887	34.09	89.41	0.33383	<.0001

*Data are among 13518 HPS facilities with reporting at least one week per month to NHSN during Q3 2022.

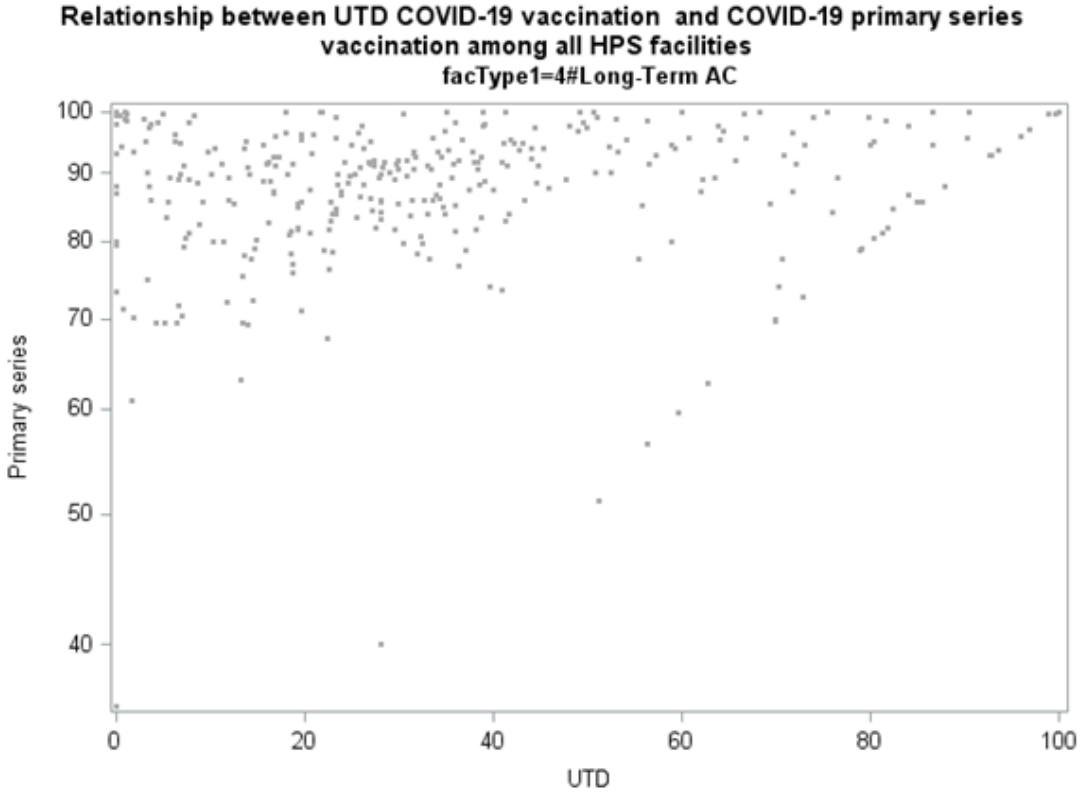
Scatterplot of COVID-19 vaccination coverage measures for primary series (y-axis) and up to date (x-axis) for Q3 (July, August, September) 2022 among Healthcare Personnel Safety (HPS) component facilities (n=13518)



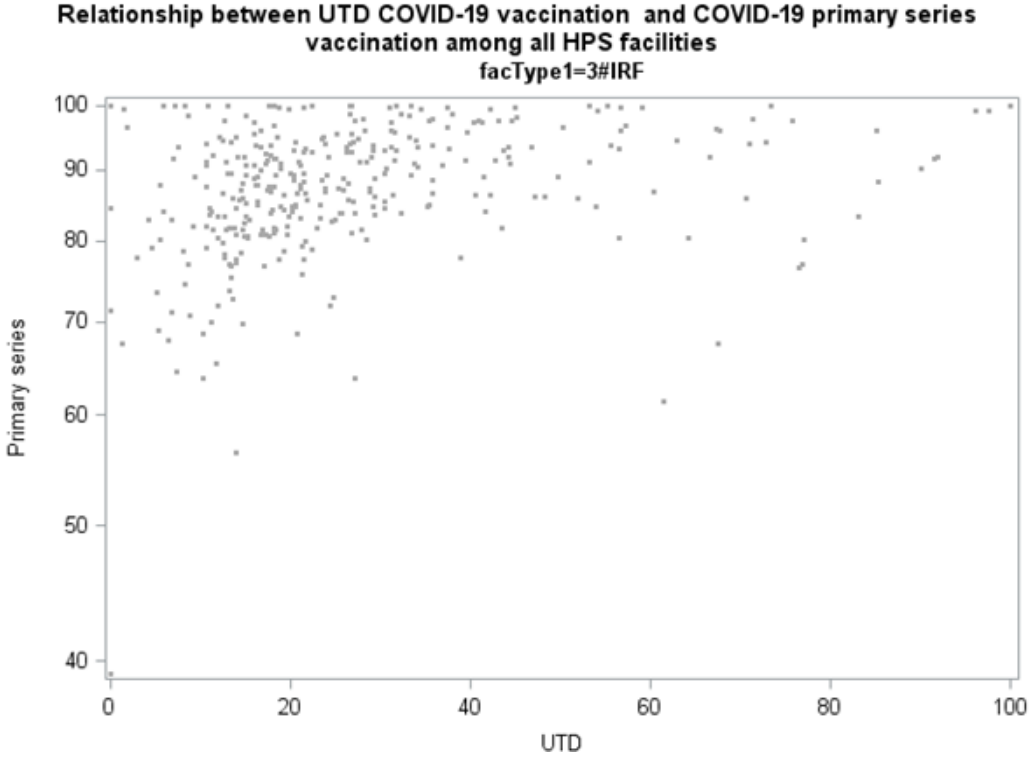
Scatterplot of COVID-19 vaccination coverage measures for primary series (y-axis) and up to date (x-axis) for Q3 (July, August, September) 2022 among Acute Care Hospitals (n=2557)



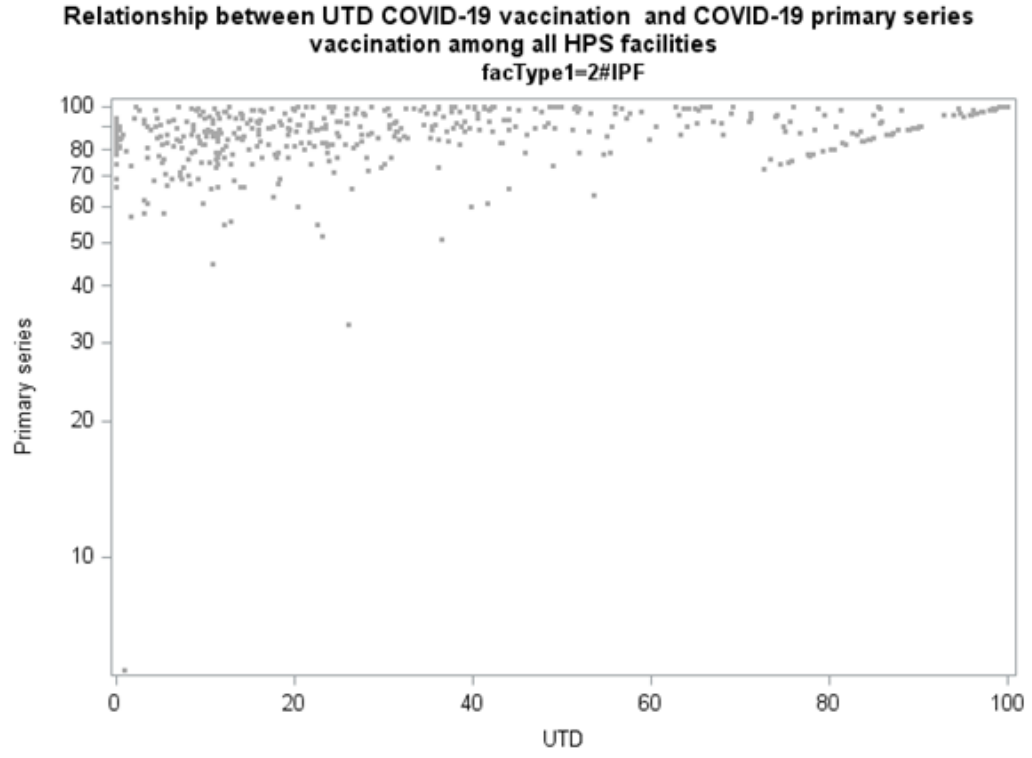
Scatterplot of COVID-19 vaccination coverage measures for primary series (y-axis) and up to date (x-axis) for Q3 (July, August, September) 2022 among Long-Term Acute Care Hospitals (n=325)



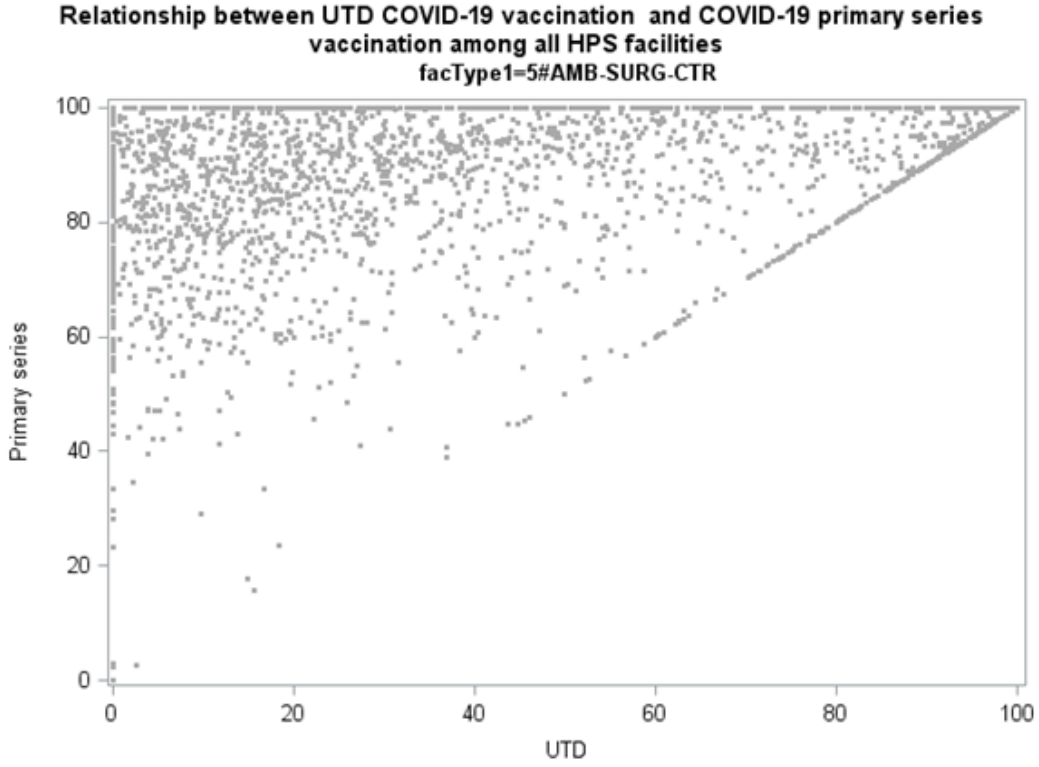
Scatterplot of COVID-19 vaccination coverage measures for primary series (y-axis) and up to date (x-axis) for Q3 (July, August, September) 2022 among Inpatient Rehabilitation Facilities (n=341)



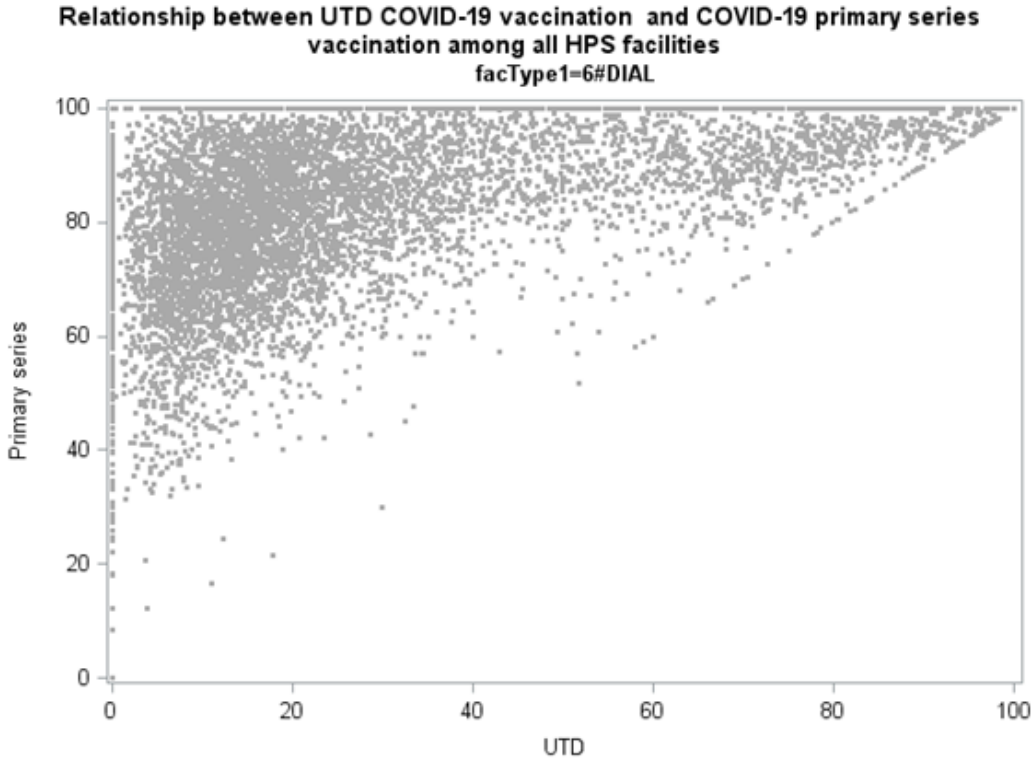
Scatterplot of COVID-19 vaccination coverage measures for primary series (y-axis) and up to date (x-axis) for Q3 (July, August, September) 2022 among Inpatient Psychiatric Facilities (n=475)



Scatterplot of COVID-19 vaccination coverage measures for primary series (y-axis) and up to date (x-axis) for Q3 (July, August, September) 2022 among Ambulatory Surgery Centers (n=2692)



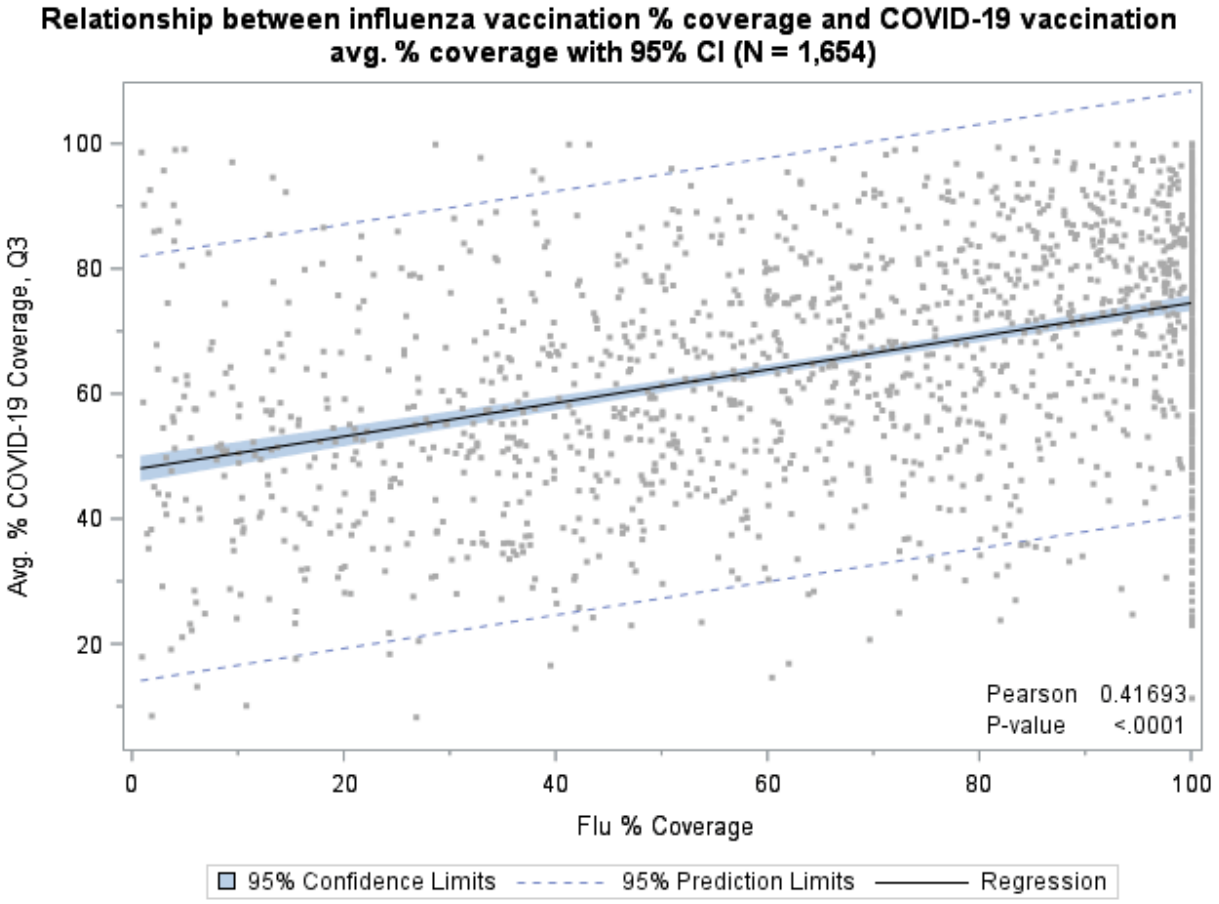
Scatterplot of COVID-19 vaccination coverage measures for primary series (y-axis) and up to date (x-axis) for Q3 (July, August, September) 2022 among Dialysis Facilities (n=7128)



Previous (2021) Submission:

The **Overall Pearson Correlation Coefficient between the quarterly** COVID-19 coverage measure for Q3 (July, August, September) 2021 and annual Influenza Vaccination coverage measure NQF 0431**: 0.4169, p<0.0001 (1,654 Facilities)**

Scatterplot of quarterly COVID-19 coverage measure for Q3 (July, August, September) 2021 (y-axis) and annual Influenza Vaccination coverage measures by NQF 0431 (x-axis)

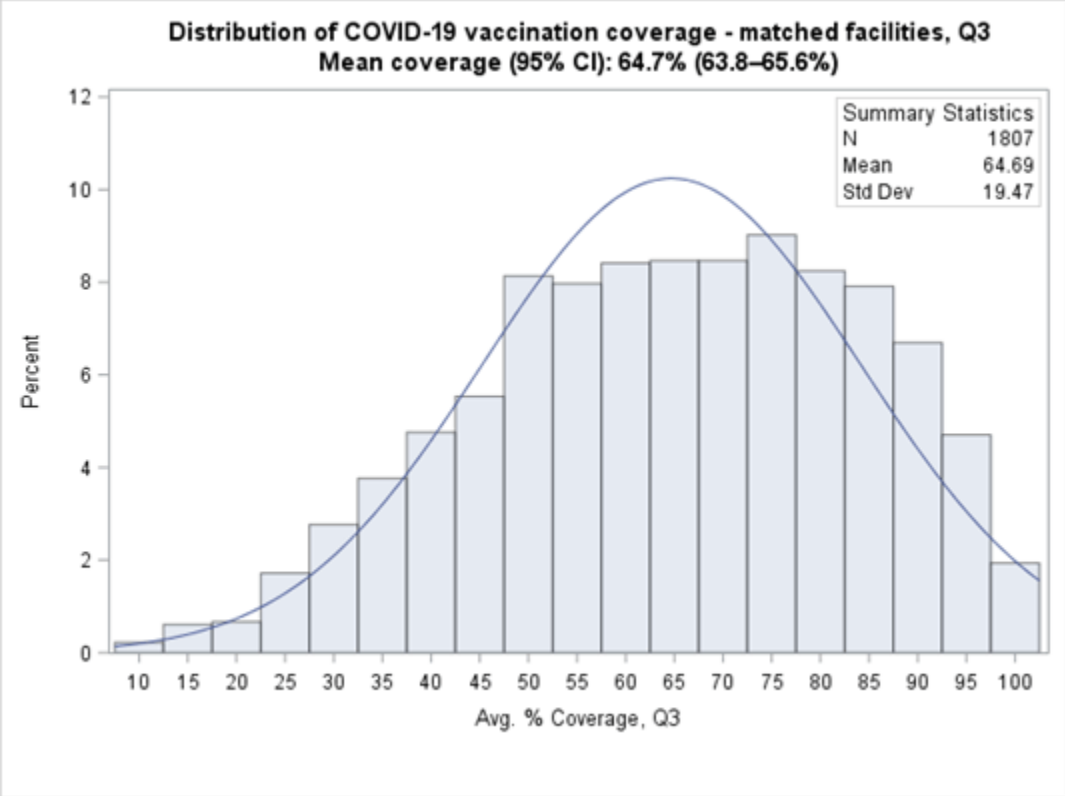


Pearson Correlation Coefficient between quarterly COVID-19 coverage measure for Q3 (July, August, September) 2021 and annual influenza vaccination coverage measures by NQF 0431 **stratified by Quartiles of Facilities by Facility Size**

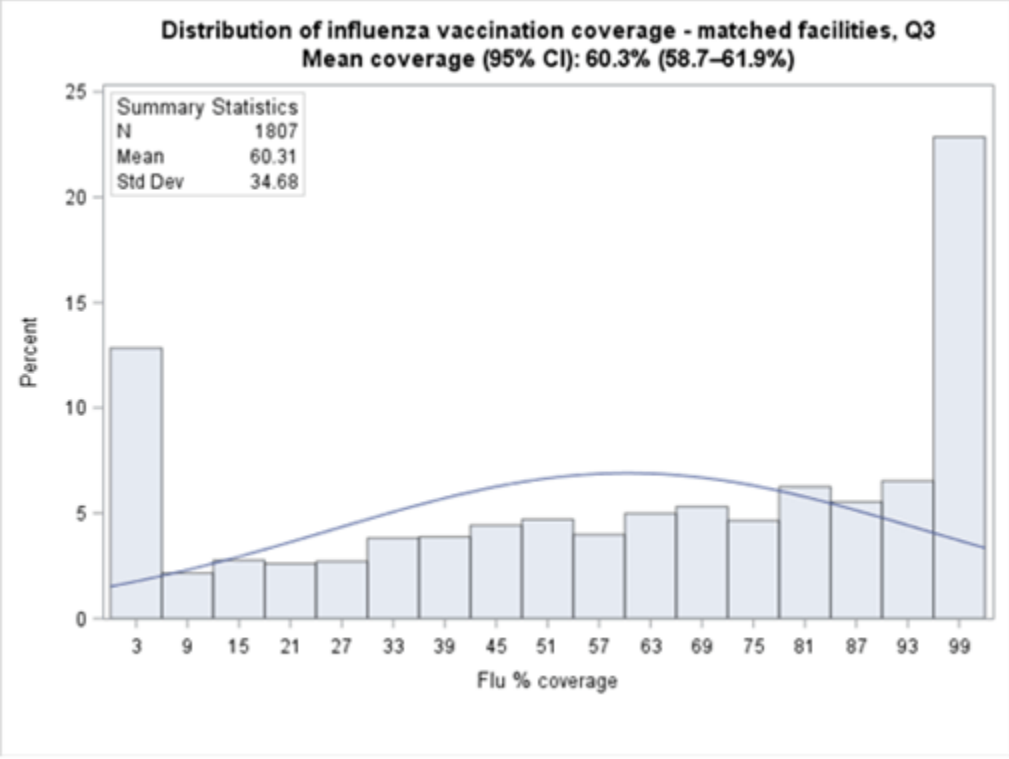
Pearson Correlation Coefficient Stratified by Facility Size (Number of healthcare personnel [HCP])

Statistic	1 (<=67 HCP)	Quartile 2 (64-93 HCP)	Quartile 3 (94-131 HCP)	Quartile 4 (>=132 HCP)
Pearson Correlation Coefficient	0.388	0.378	0.457	0.450
P-value	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**

Distribution of quarterly COVID-19 coverage measure for matched National Healthcare Safety Network facilities, Q3 (July, August, September) 2021



Distribution of the annual influenza coverage measure for matched National Healthcare Safety Network facilities, 2020-2021 season



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?)

Current Submission:

Skilled Nursing Facilities (SNFs):
A correlation was found among SNFs (0.4504 with a p-value of < .0001) indicating moderate correlation between the proposed (up to date) and previously endorsed (primary series) COVID-19 vaccination coverage measure. This level of moderate correlation was consistent when stratifying by facility size (estimated by number of healthcare personnel). Correlation was stronger among smaller facility sizes. As with HPS facilities (detailed below), it is notable that over time an increasing number of facilities have reported a high rate of primary COVID-19 vaccination coverage. The time to receive the bivalent booster dose and remain up to date according to current recommendations has been limited compared to the time to receive primary vaccine series. Additionally, while certain Federal mandates were instituted for primary vaccine series, no mandate exists for the bivalent booster. Through ongoing public health efforts to encourage booster doses of COVID-19 vaccine and address vaccine hesitancy, up-to-date coverage rates might be expected to increase and correlate more strongly with coverage rates for primary vaccine series.

Healthcare Personnel Safety (HPS) Component Facilities:
The Overall Pearson correlation coefficient between the two measures across all HPS facility types was moderate (0.4278 with a p-value of <.0001). All HPS facility types had positive correlation between quarterly primary series COVID-19 coverage measure for Q3 (July, August, September) 2022 and quarterly rates of up to date COVID-19 vaccination coverage. Correlation was slight among Inpatient Rehabilitation Facilities (Pearson correlation 0.28312), Long-term Acute Care Hospitals (Pearson correlation 0.20837) and Acute Care hospitals (Pearson correlation 0.28312) and moderate among all other facility types with the strongest correlation observed among dialysis facilities (Pearson correlation 0.48477). All were statistically significant (p-value <.05). This level of moderate correlation was consistent when stratifying by facility size (estimated by number of healthcare personnel). Correlation was stronger among smaller facility sizes.

One reason that the correlation may not have been stronger is that during the period tested, primary vaccination among HCP working in these care settings was required but there was no such mandate for remaining up to date with COVID-19 vaccination.

It is notable that over time an increasing number of facilities have reported a high rate of primary COVID-19 vaccination coverage. Through ongoing public health efforts to encourage booster doses of COVID-19 vaccine and address vaccine hesitancy, up-to-date coverage rates might be expected to increase and correlate more strongly with coverage rates for primary vaccine series.

Previous Submission (2021):

The overall Pearson Correlation Coefficient between the between Quarterly COVID-19 coverage measure for Q3 (July, August, September) 2021 and annual influenza vaccination coverage measure NQF 0431 for facilities that reported both measures indicate “medium” correlation (generally accepted range for medium correlation, 0.30 – 0.49) between the proposed and previously endorsed coverage measure.

This medium correlation was consistent when stratified by facility size (number of healthcare personnel [HCP]).

There are factors outside of the facilities' control which impact HCP COVID-19 vaccination coverage which are independent of influenza vaccination. A key reason that the correlation may not have been stronger, is that HCP may have reasons for which they decline COVID-19 vaccine which they do not apply similarly to the influenza vaccine. In addition, community rates of COVID-19 may vary from community rates of influenza and impact HCP vaccination decisions. Finally, it is notable that high numbers of facilities reported 99% or higher influenza vaccination coverage. With additional time for the new COVID-19 vaccines to gain acceptance and for implementation of vaccination programs to address COVID-19 vaccination hesitancy, coverage rates of COVID-19 and influenza vaccination are likely to correlate more strongly.

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.

Current Submission:

Performance differences were identified by a) above average performance: vaccination rate in the top quartile, b) average performance: vaccination rate in the 2nd and 3rd quartile, and c) below average performance: vaccination rate in the bottom quartile. Vaccination coverage rates were calculated using reported data elements and then classified into quartiles for analysis.

Previous Submission (2021):

To determine if statistically significant differences in performance measure scores among measured entities, the mean scores and 95% confidence intervals for each quarter were compared to each other and to the performance measure scores for the 25th- and 75th-percentile facilities.

To determine if practically meaningful differences in performance measure scores among measured entities, quarterly COVID-19 coverage for the top and bottom 10% of facilities were compared for clinically meaningful differences in coverage rates within a quarter and across quarters for the first 3 quarters of 2021.

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.

Current Submission:

Differences were seen across quartiles among all facility types. The median percent up to date among SNFs was 38.53 with an IQR of 22.26-60.13. The median percent up to date among Healthcare Personnel Safety (HPS) Component facilities was 22.13 with an IQR of 10.94-46.97.

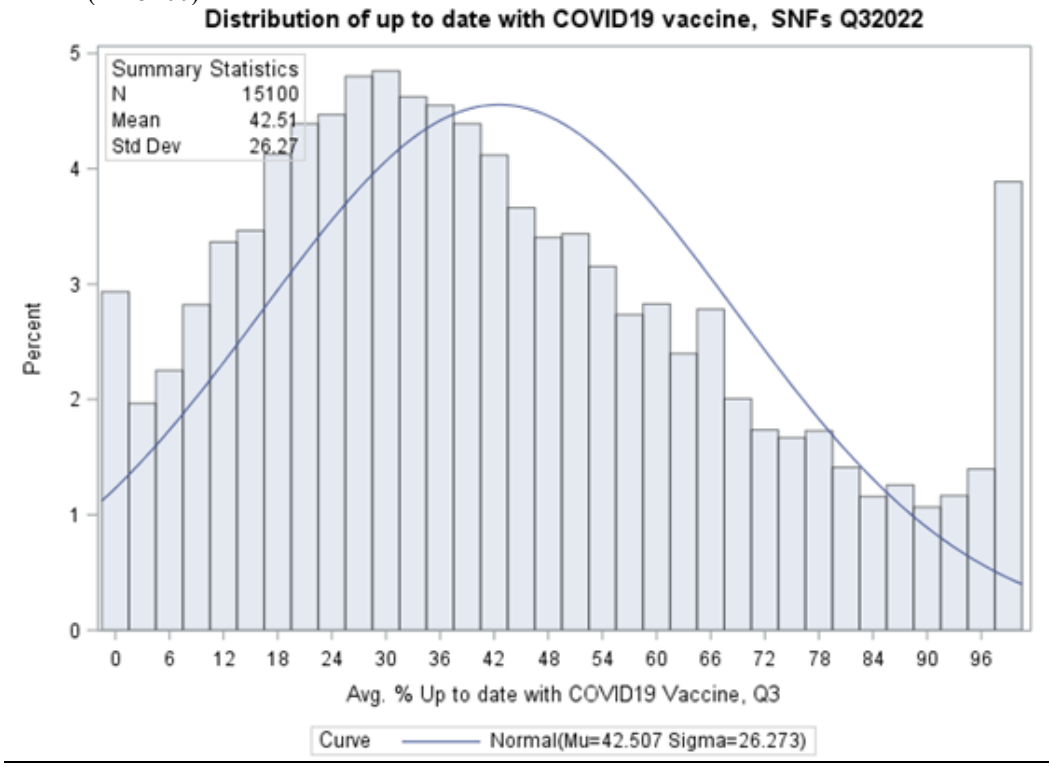
Up to date COVID-19 vaccination healthcare personnel coverage by facility type among Skilled Nursing and Healthcare Personnel Safety (HPS) facilities—National Healthcare Safety Network (NHSN), Q3 2022[*]

Facility Type	Frequency reporting	Percent up to date median (IQR)
Skilled Nursing Facilities	15100	38.53 (22.26- 60.13)
HPS Facilities	13518	22.13 (10.94- 46.97)
Acute Care Hospitals[¥]	2557	23.25 (10.65-46.41)
Long-Term Acute Care Hospitals	325	29.93 (16.25-49.94)
Inpatient Rehabilitation Facilities[‡]	341	21.37 (14.61-33.29)
Inpatient Psychiatric Facilities[‡]	475	25.68 (11.29-55.10)
Ambulatory Surgery Centers	2692	33.27 (12.00-73.33)
Dialysis Facilities	7128	19.33 (10.39-38.17)

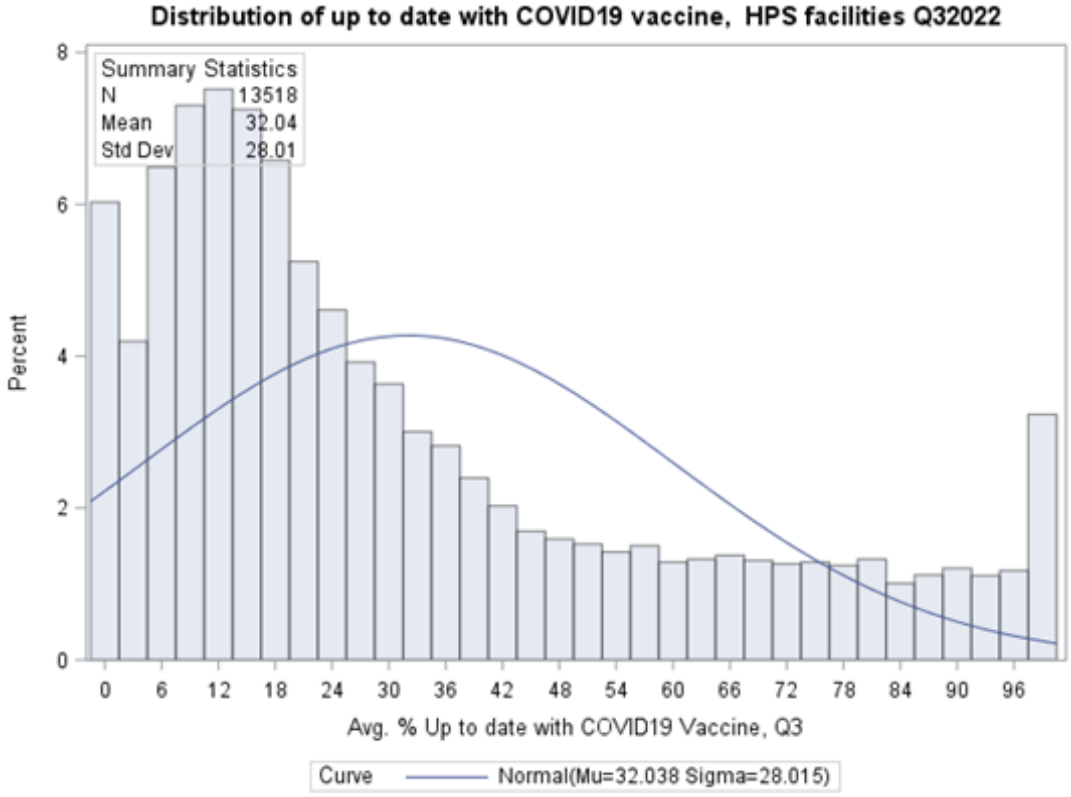
[*]Data are among 15100 SNFs and 13518 HPS facilities (to include Acute Care Hospitals, Critical Access Hospitals, Long-term Acute Care Hospitals, Inpatient rehabilitation facilities, Inpatient Psychiatric facilities, Ambulatory Surgery Centers, and Dialysis facilities) with reporting at least one week per month to NHSN during Q3 2022.
[¥]Data from inpatient rehabilitation facility (IRF) units and inpatient psychiatric facility (IPF) units with unique CMS Certification Numbers (CCNs) located within acute care hospitals are not included in the acute care hospital category. Critical Access Hospitals are included in this category.
[‡]Includes freestanding IPF and IRF locations and IPF and IRF units with unique CCNs located within acute care hospitals.

The quarterly COVID-19 up to date vaccination coverage metric identified non-uniformity in the coverage rates reported across quartiles in all facility types, with distributions displayed below:

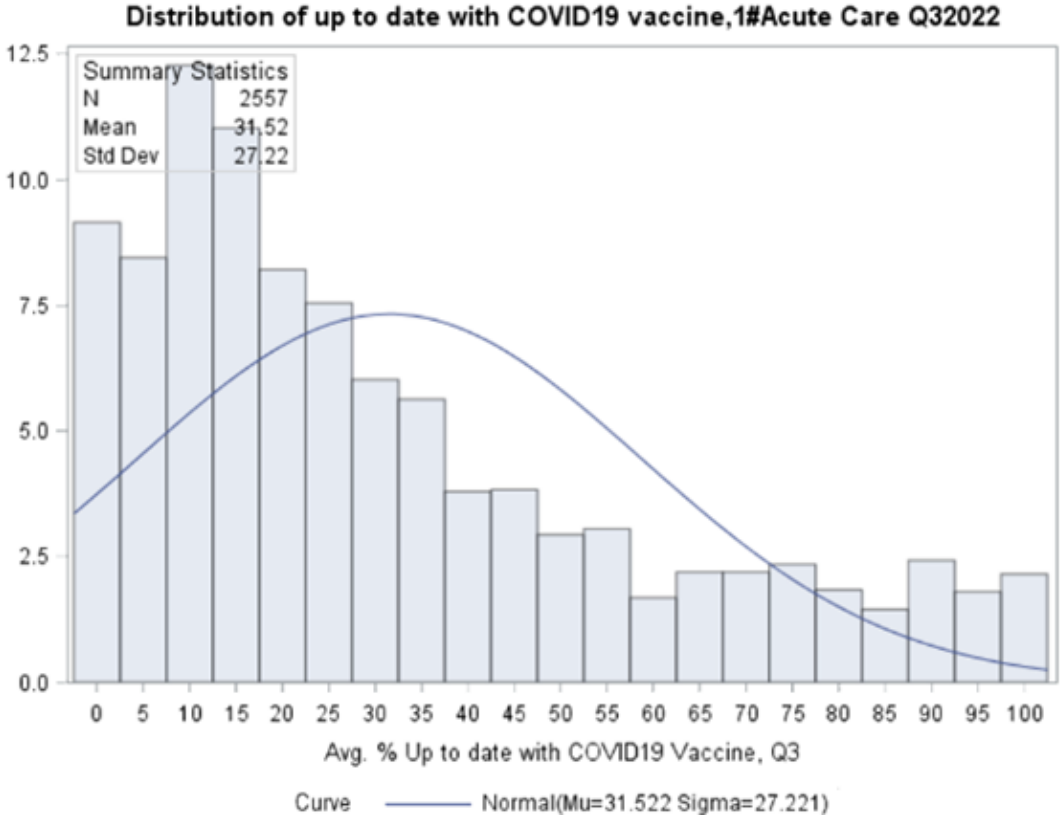
Distribution of up to date COVID-19 vaccination coverage for Q3 (July, August, September) 2022 among skilled nursing facilities (n=15100)



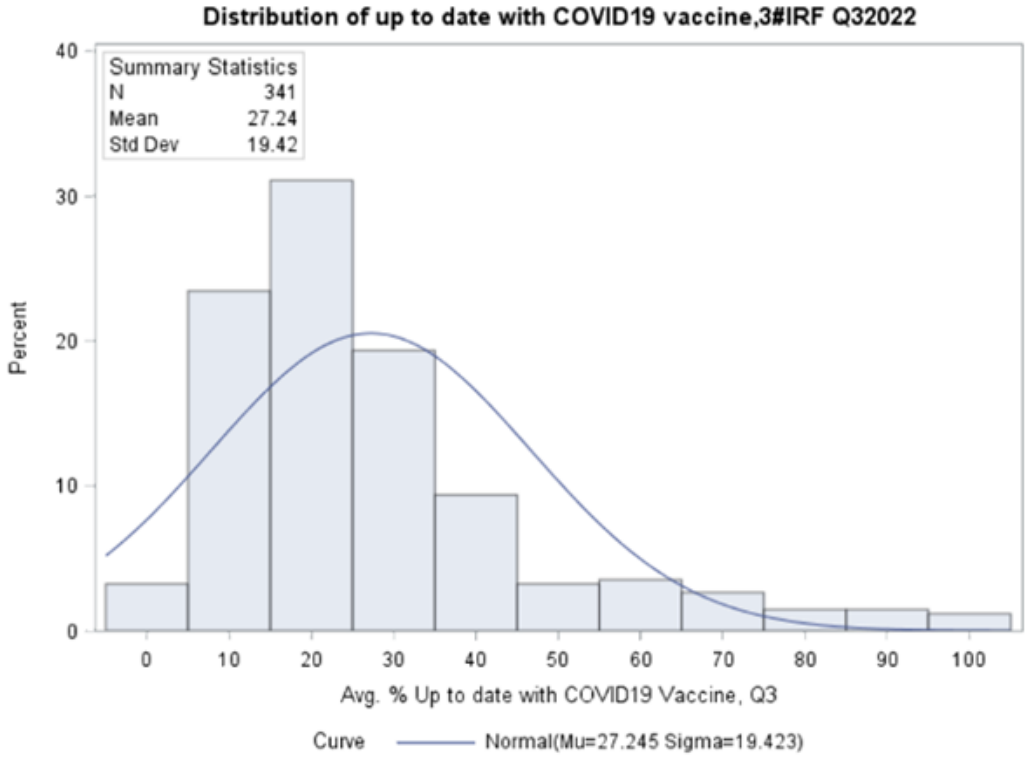
Distribution of up to date COVID-19 vaccination coverage for Q3 (July, August, September) 2022 among Healthcare Personnel Safety (HPS) facilities (n=13518)



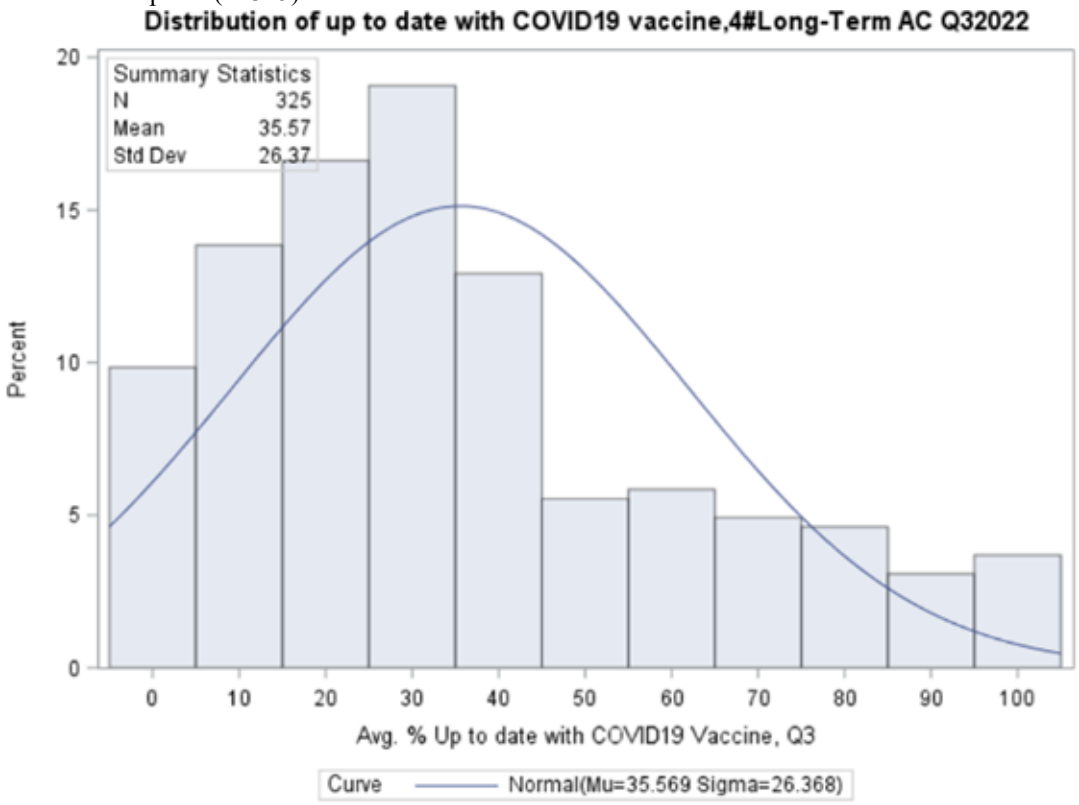
Distribution of up to date COVID-19 vaccination coverage for Q3 (July, August, September) 2022 among Acute Care Hospitals (n=2557)



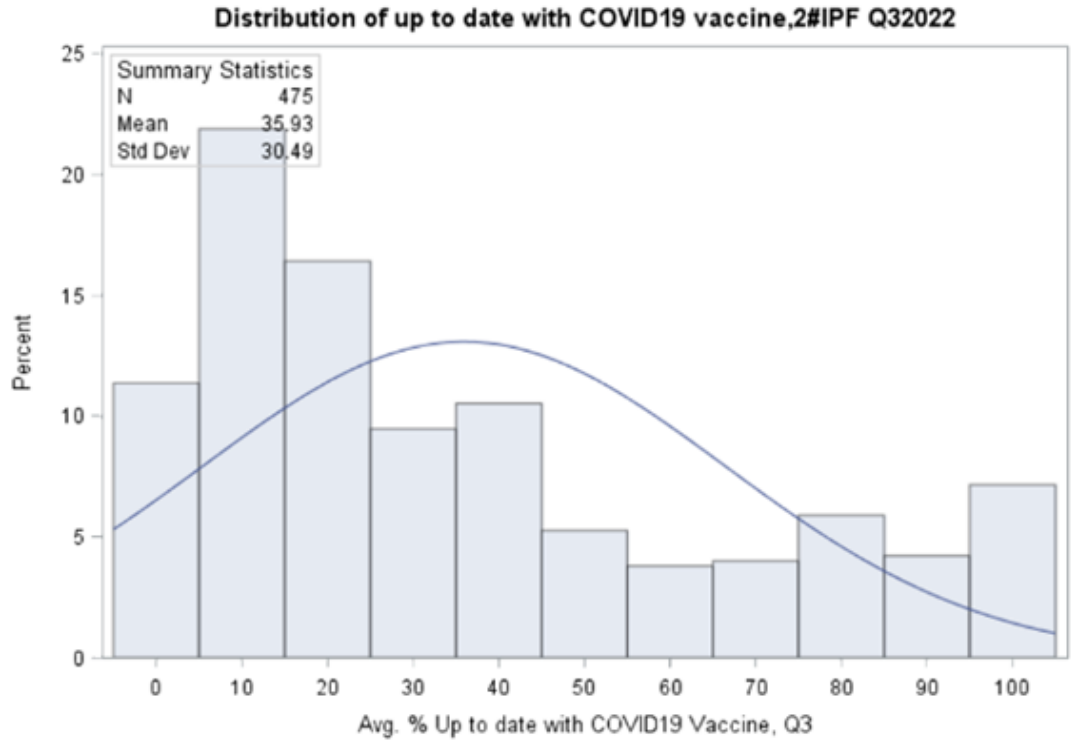
Distribution of up to date COVID-19 vaccination coverage for Q3 (July, August, September) 2022 among Inpatient Rehabilitation Facilities (n=341)



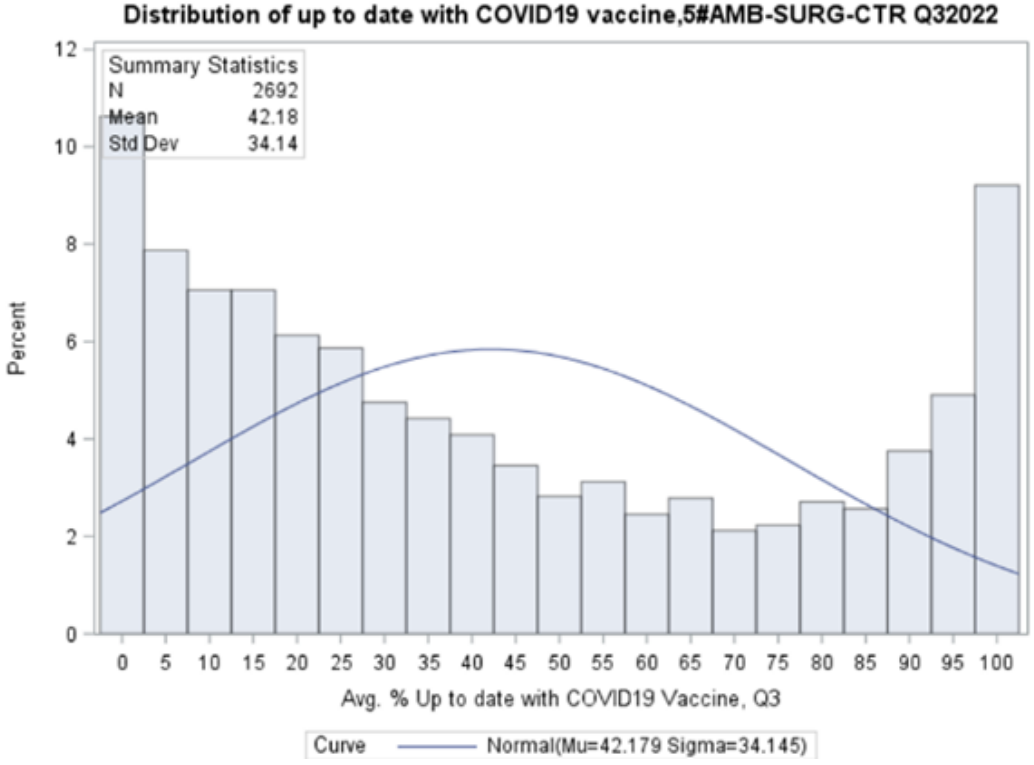
Distribution of up to date COVID-19 vaccination coverage for Q3 (July, August, September) 2022 among Long-Term Acute Care Hospitals (n=325)



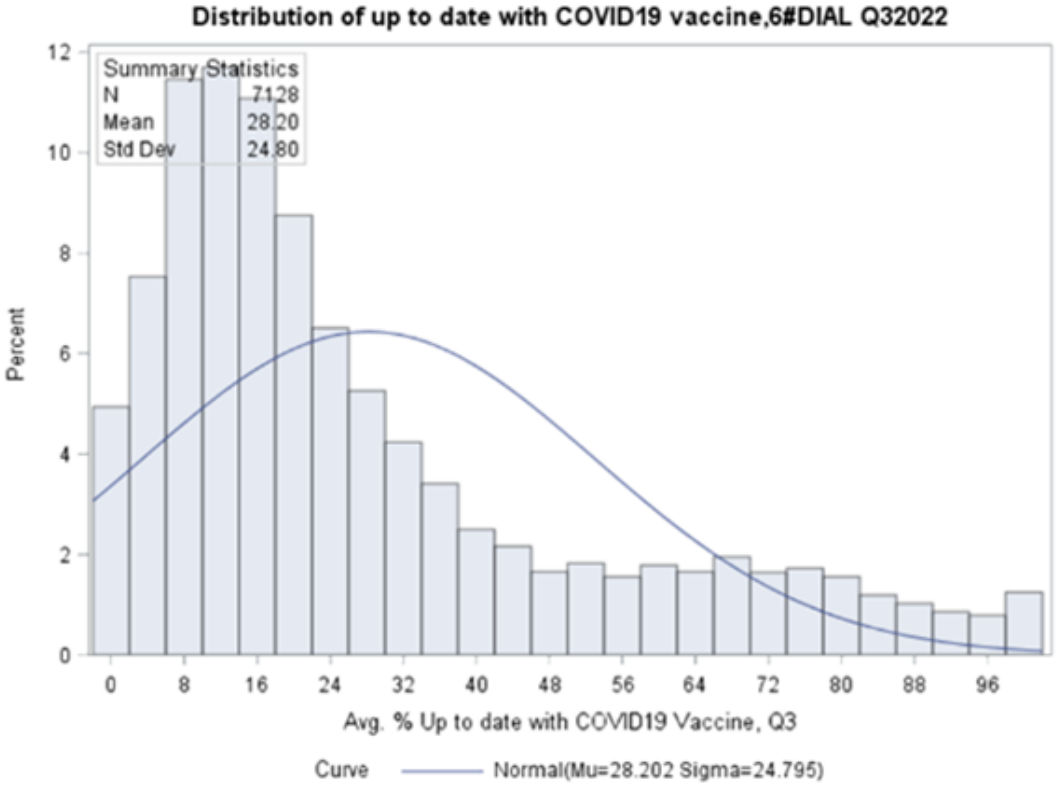
Distribution of up to date COVID-19 vaccination coverage for Q3 (July, August, September) 2022 among Inpatient Psychiatric Facilities (n=475)



Distribution of up to date COVID-19 vaccination coverage for Q3 (July, August, September) 2022 among Ambulatory Surgery Centers (n=2692)



Distribution of up to date COVID-19 vaccination coverage for Q3 (July, August, September) 2022 among Dialysis Facilities (n=7128)



Comparison between 10th and 90th percentiles of up to date COVID-19 vaccination coverage by facility type—National Healthcare Safety Network (NHSN), Q3 2022*

Facility Type	No. of facilities	Percent Up to Date with COVID-19 vaccine		
		10th percentile	90th percentile	Difference between top and bottom deciles
Skilled Nursing Facilities (SNFs)	15100	10.53	82.34	71.81
HPS Facilities	13518	4.35	80.00	75.65
Acute Care Hospitals¥	2557	2.95	76.71	73.76
Long-Term Acute Care Hospitals	325	5.09	79.12	74.04
Inpatient Rehabilitation Facilities‡	341	10.34	55.27	44.93
Inpatient Psychiatric Facilities‡	475	4.45	86.91	82.46
Ambulatory Surgery Centers	2692	2.08	96.65	94.57
Dialysis Facilities	7128	5.13	70.02	64.89

*Data are among 15100 SNFs and 13518 HPS facilities (to include Acute Care Hospitals, Critical Access Hospitals, Long-term Acute Care Hospitals, Inpatient rehabilitation facilities, Inpatient Psychiatric facilities, Ambulatory Surgery Centers, and Dialysis facilities) with reporting at least one week per month to NHSN during Q3 2022.
¥Data from inpatient rehabilitation facility (IRF) units and inpatient psychiatric facility (IPF) units with unique CMS Certification Numbers (CCNs) located within acute care hospitals are not included in the acute care hospital category. Critical Access Hospitals are included in this category.
‡Includes freestanding IPF and IRF locations and IPF and IRF units with unique CCNs located within acute care hospitals.
HPS, Healthcare Personnel Safety component

Previous Submission (2021):

Please see the table in question 1b.02) Quarterly COVID-19 vaccination coverage among healthcare personnel (HCP) among CMS-certified nursing homes, National Healthcare Safety Network (NHSN), 2021, for the primary data table.

Statistical differences.

The mean quarterly COVID-19 vaccination coverage rate (95% confidence intervals) and inter quartile ranges for the first 3 quarters of 2021 were:

Q1: mean coverage 35.0% (34.3% – 35.7%); interquartile range 17.3% – 51.2%

Q2: mean coverage 56.2% (55.8% – 56.5%); interquartile range 41.9% – 71.2%

Q3 mean coverage is 64.1% (63.8% - 64.4%); interquartile range is 50.8% – 78.6%.

Clinical differences.

The quarterly COVID-19 vaccination coverage metric identified that the lowest 10th-percentile of nursing homes reporting had 0% coverage in Q1 of 2021, while the 90th-percentile of nursing homes reported coverage of 67.2%.

By Q3 of 2021, the lowest 10th-percentile of nursing homes improved vaccination coverage rates to 38.8% and the 90th-percentile of nursing homes improved to 89.0%.

A clinically meaningful difference in COVID-19 healthcare personnel vaccination rates is a difference that would be expected to lead to fewer symptomatic infections. Based on mathematical modeling, assuming 90% baseline resident coverage and symptom-based testing only, increasing vaccination coverage among staff from 0% to 90% reduces total symptomatic cases in the nursing home by 33%-63% depending upon vaccine effectiveness against infection and vaccine effectiveness in prevention of infectiousness. (1)

Kahn R, Holmdahl I, Reddy S, Jernigan J, Mina MJ, Slayton RB. Mathematical modeling to inform vaccination strategies and testing approaches for COVID-19 in nursing homes. medRxiv [Preprint]. 2021 Mar 1:2021.02.26.21252483. doi: 10.1101/2021.02.26.21252483. Update on: Clin Infect Dis. 2021 Jun 04; PMID: 33688668; PMCID: PMC7941643.)

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?

Current Submission:

The range between the first and third quartiles in both SNF and HPS facilities indicate meaningful differences in performance that are easily detected by examining the data visually. See **2b.06).**

Furthermore, as shown in the table in 2b.06), comparing the top and bottom deciles for rates of up to date COVID-19 vaccination coverage by facility type during Q3 2023, SNFs demonstrate a greater than 70% difference in the 90th and 10th percentile. Likewise, HPS facilities overall demonstrate a greater than 70% difference. These findings are indicative of the ability to identify meaningful differences in up to date COVID-19 vaccination coverage among healthcare personnel.

Previous Submission (2021):

The quarterly measure can identify statistically significant differences in performance across measured entities. The mean quarterly COVID-19 vaccination coverage metric had 95% confidence intervals, that were narrower than the interquartile range.

The quarterly measure can identify statistically significant differences in performance across quarters of measurement. The mean quarterly COVID-19 vaccination coverage metric was significantly higher each of the first 3 quarters of 2021, based on non-overlapping 95% confidence intervals.

Most importantly, the measure can identify clinically significant differences in performance across measured entities. Applying the modeled estimated decrease in symptomatic cases, there would be 33%-63% more symptomatic cases in the lowest 10th-percentile of nursing homes in Q1 of 2021 than the 90th-percentile nursing homes in Q3 of 2021 (assuming similar community disease rates, resident vaccination rates, and testing and infection control practices).

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.

Current Submission:

The quarterly up to date COVID-19 vaccination coverage rate was determined by selecting one week per month and calculating the percentage of HCP who were considered up to date with COVID-19 vaccination, then averaging 3 weekly percentages (one week from each of the 3 months in the quarter).

For Quarter 3 (July – September) 2022, the numbers of facilities which did not report (had missing data) for one or more of the three months in the quarter were identified.

For facilities with only 1 or 2 months of data, a modified coverage measure using only those months was calculated and standard deviations and 95% confidence intervals were calculated for the average measure for facilities missing 1 or 2 months of data. The average vaccination coverage rates for facilities with and without a month of data reported were compared.

Previous Submission (2021):

The quarterly COVID-19 vaccination coverage is determined by selecting one week per month and calculating the percentage of HCP who have ever received a primary COVID-19 vaccination course, then averaging 3 weekly percentages (one week from each of the 3 months in the quarter).

For the quarter 3 (July – September) 2021, the number of facilities which did not report (had missing data) for one or more of the three months in the quarter were identified.

For facilities with only 1 or 2 months of data, a modified coverage measure using only those months was calculated and standard deviations and 95% confidence intervals were calculated for the average measure for facilities missing 1 or 2 months of data. The average vaccination coverage rates for facilities with and without a month of data reported were compared.

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).

Current Submission:

Skilled Nursing Facilities (SNFs):

15232 CMS-certified nursing homes reported up to date COVID-19 vaccination coverage for healthcare personnel through the National Healthcare Safety Network (NHSN) at least once a month during Q3 (July – September), 2022. Among SNFs, 99% of facilities reported data for all months in the reporting period.

Up to date COVID-19 vaccination mean coverage rate among skilled nursing facilities by number of months of reporting—National Healthcare Safety Network (NHSN), Q3 2022[*]

No. months reporting vaccination coverage	No. of facilities	Percentage of facilities	Up to date COVID-19 vaccination coverage, mean percent (SD)	95% CI of up to date COVID-19 vaccination coverage
1 month	61	0.40%	49.29 (31.30)	25.83, 74.07
2 months	71	0.47%	40.62 (28.69)	16.09, 62.79
3 months	15100	99.13%	42.51 (26.27)	22.26, 60.13

[*]Data are among 15232 CMS-certified skilled nursing facilities reporting up to date COVID-19 vaccination coverage for healthcare personnel at least once a month during Q3 2022.

Healthcare Personnel Safety (HPS) facilities:

Nearly 90% of all HPS facilities reported data for all months in the reporting period. The proportion of facilities reporting ranged from 79% among ambulatory surgery centers to 98% among dialysis facilities.

15108 HPS facilities reported up to date COVID-19 vaccination coverage for healthcare personnel (HCP) through the National Healthcare Safety Network (NHSN) at least once a month during Q3 (July-September) 2022.

Number and percent of facilities reporting up to date COVID-19 vaccination coverage for healthcare personnel, by number of months of reporting and facility type—National Healthcare Safety Network (NHSN) Healthcare Personnel Safety (HPS) Component, Q3 2022*

No. months reporting vaccination coverage	Acute Care Hospitals[¥]	Long-Term Acute Care Hospitals	Inpatient Rehabilitation Facilities[‡]	Inpatient Psychiatric Facilities[‡]	Ambulatory Surgery Centers	Dialysis Facilities	Total
1 month	252 (8.07)	17 (4.67)	12 (3.21)	64 (11.13)	348 (10.20)	56 (0.77)	
2 months	312 (10.00)	22 (6.04)	21 (5.61)	36 (6.26)	373 (10.93)	77 (1.06)	841
3 months	2557 (81.93)	325 (89.29)	341 (91.18)	475 (82.61)	2692 (78.87)	7128 (98.17)	13518

No. months reporting vaccination coverage	Acute Care Hospitals[¥]	Long-Term Acute Care Hospitals	Inpatient Rehabilitation Facilities[‡]	Inpatient Psychiatric Facilities[‡]	Ambulatory Surgery Centers	Dialysis Facilities	Total
Total	3121	364	374	575	3413	7261	15108

*Data are among 15108 HPS facilities (to include Acute Care Hospitals, Critical Access Hospitals, Long-term Acute Care Hospitals, Inpatient rehabilitation facilities, Inpatient Psychiatric facilities, Ambulatory Surgery Centers, and Dialysis facilities) reporting to NHSN at least once per month during Q3 2022.
[¥]Data from inpatient rehabilitation facility (IRF) units and inpatient psychiatric facility (IPF) units with unique CMS Certification Numbers (CCNs) located within acute care hospitals are not included in the acute care hospital category. Critical Access Hospitals are included in this category.
[‡]Includes freestanding IPF and IRF locations and IPF and IRF units with unique CCNs located within acute care hospitals.

Up to date COVID-19 vaccination mean coverage rate by number of months of reporting—National Healthcare Safety Network (NHSN) Healthcare Personnel Safety (HPS) Component, Q3 2022[*]

No. months reporting vaccination coverage	No. of facilities	Percentage of facilities	Up to date COVID-19 vaccination coverage, mean percent (SD)	95% CI of up to date COVID-19 vaccination coverage
1 month	749	4.96%	45.75 (36.50)	43.13, 48.37
2 months	841	5.57%	42.50 (33.68)	40.23, 44.79
3 months	13518	89.48%	32.04 (28.01)	31.57, 32.51

[*]Data are among HPS facilities with reporting at least one week of up to date COVID-19 vaccination coverage for healthcare personnel during Q3 2022.

Previous Submission (2021):

CMS-certified nursing home reporting of COVID-19 vaccination coverage for healthcare personnel (HCP) through the National Healthcare Safety Network (NHSN) at least once a month during Q3 (July – August), 2021*

No. months reporting vaccination coverage	No. of facilities	Percentage of facilities	COVID-19 vaccination coverage, mean percent (SD)	95% CI of COVID-19 vaccination coverage
1 month	62	0.41	65.17 (22.59)	59.43, 70.91
2 months	99	0.65	59.06 (23.69)	54.33, 63.78
3 months	15,106	98.95	64.17 (18.76)	63.88, 64.47
At least 1 month	15,267	100	64.15 (18.81)	63.84, 64.44

*29 facilities do not have any COVID-19 vaccination coverage data during Q3

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.

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.

Current Submission:

Skilled Nursing Facilities (SNFs):

For Q3 (July - September) 2022, the number of facilities which did not report (had missing data) for one or more of the three months in the quarter was low (less than 1% among SNFs). The low level of missingness suggests that these results are not being biased due to systematic missing data. If a facility is missing vaccination coverage data for a month in the quarter, the facility is not considered to have completed the requirements of the measure. Even though the mean calculated vaccination coverage for a facility which is missing 1 or 2 months of vaccination coverage data using the months that are reported is similar to the mean for facilities with complete quarterly data, to be in accordance with the vaccination coverage measure, vaccination coverage must be reported for at least one week of each month in the quarter.

Healthcare Personnel Safety (HPS) facilities:

Among all HPS facility types, nearly 90% of all facilities reported data for all months in the reporting period. This ranged from 79% among ambulatory surgery centers to 98% among dialysis facilities.

Up to date vaccination rates were similar among the groups of facilities reporting 1, 2 or 3 months of data, suggesting these results are not overly biased due to systematic missing data. If a facility is missing vaccination coverage data for a month in the quarter, the facility is not considered to have completed the requirements of the measure. Even though the mean calculated vaccination coverage for a facility which is missing 1 or 2 months of vaccination coverage data using the months that are reported is similar to the mean for facilities with complete quarterly data, to be in accordance with the COVID-19 vaccination coverage measure, vaccination coverage must be reported for at least one week of each month in the quarter.

Previous Submission (2021):

If a facility is missing vaccination coverage data for a month in the quarter, the facility is not considered to have completed the requirements of the measure. It is possible to calculate vaccination coverage

using the months for which data is reported, but it must be noted that all 3 months were not reported as specified by the measure.

Missing a month of coverage data can affect the quarterly measure. For the quarter 3 (July - September) 2021, the number of facilities which did not report (had missing data) for one or more of the three months in the quarter was quite low; however, the 95% confidence intervals for the mean quarterly vaccination coverage for facilities which were missing 1 month of coverage data are just statistically significant difference from the mean quarterly vaccination coverage for those facilities which reported vaccination coverage for all 3 months. On the other hand, the mean quarterly vaccination coverage for facilities which were missing 2 months of coverage data was not statistically significantly different from the mean quarterly vaccination coverage for those facilities which reported vaccination coverage for all 3 months.

In addition, if a facility could still be considered reporting in accordance with the specifications, but only report coverage for 2 months or just a single month, to maximize the reported coverage, it would be logical for facilities to simply not report their lowest coverage months, which would not accurately reflect the level of vaccine protection for residents or other healthcare personnel.

Thus, even though the calculated vaccination coverage for a facility which is missing 1 or 2 months of vaccination coverage data using the months that are reported is better than no vaccination coverage data at all, to be in accordance with the vaccination coverage measure, vaccination coverage must be reported for at least one week of each month in the quarter.

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.

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.

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.

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?

Current Submission:

The average proportion of healthcare personnel (HCP) reported to have contraindications/restrictions was calculated as well as the range, interquartile range, standard deviation for the SNFs participating in COVID-19 vaccination coverage reporting in Q3 (July, August, September), 2022. The average proportion of healthcare personnel (HCP) reported to have contraindications/restrictions was stratified by facility type, size (number of HCP) and region.

Previous Submission (2021):

The average proportion of healthcare personnel (HCP) reported to have contraindications/restrictions was calculated as well as the range, interquartile range, standard deviation for the 15,267 CMS-certified nursing homes (NHs) participating in COVID-19 vaccination coverage reporting in Q3 (July, August, September), 2021.

The average proportion of healthcare personnel (HCP) reported to have contraindications/restrictions was stratified by facility size (number of HCP) and region.

The impact on performance measure score was calculated for sample week.

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.

Current Submission:

Skilled Nursing Facilities (SNFs):

Among 15100 SNFs reporting COVID-19 vaccination coverage among healthcare personnel (HCP) for at least one week per month during Q3 (July, August, September), 2022, the mean percentage of HCP with contraindications was 0.99%, with a standard deviation of 2.92%.

Frequency of contraindications to COVID-19 vaccination among SNF healthcare personnel, by Quantile—National Healthcare Safety Network (NHSN), Q3 2022*

Facility Quantile of HCP with contraindications	Percentage of HCP with contraindications
Level	**Quantile**
100% Max	63.15
99%	14.65
95%	4.96
90%	2.49
75% Q3	0.82
50% Median	0.00
25% Q1	0.00
10%	0.00
5%	0.00
1%	0.00

*Data are among 15100 SNFs with reporting at least one week per month during Q3 2022.

Frequency of contraindications to COVID-19 vaccination among SNF healthcare personnel (HCP) by facility size (No. of HCP), COVID-19 vaccination coverage, and region—National Healthcare Safety Network, Q3 2022*

Quantile of SNF size based upon number of HCP per facility (No. of facilities)	Mean percentage of HCP with contraindications (Standard Deviation)
Q1 (N = 3631)	1.20 (3.59)
Q2 (N = 3846)	1.04 (3.13)
Q3 (N = 3827)	0.97 (2.67)
Q4 (N = 3796)	0.78 (2.13)
Health and Human Services (HHS) Region	**Mean percentage of HCP with contraindications (Standard Deviation)**
Region 1 (n=846)	0.58 (1.55)
Region 2 (n=965)	0.46 (1.01)
Region 3 (n=1394)	0.87 (2.45)
Region 4 (n=2685)	1.02 (2.73)
Region 5 (n=3287)	0.85 (0.73)
Region 6 (n=2047)	1.30 (3.86)
Region 7 (n=1424)	1.74 (3.64)
Region 8 (n=594)	1.03 (2.40)
Region 9 (n=1430)	1.34 (3.33)
Region 10 (n=428)	1.10 (2.99)

*Data are among 15100 SNFs with reporting at least one week per month during Q3 2022. HHS regions: Region 1 (CT, MA, ME, NH, RI, VT); Region 2 (NJ, NY, PR, VI); Region 3 (DC, DE, MD, PA, VA, WV); Region 4 (AL, FL, GA, KY, MS, NC, SC, TN); Region 5 (IL, IN, MI, MN, OH, WI); Region 6 (AR, LA, NM, OK, TX); Region 7 (IA, KS, MO, NE); Region 8 (CO, MT, ND, SD, UT, WY); Region 9 (AZ, CA, HI, NV) Region 10 (AK, ID, OR, WA)

Healthcare Personnel Safety (HPS) facilities:

Among 13518 HPS facilities reporting COVID-19 vaccination coverage among healthcare personnel (HCP) for at least one week per month during Q3 (July, August, September), 2022, the mean percentage of HCP with contraindications was 0.77%, with a standard deviation of 2.4%.

Frequency of contraindications to COVID-19 vaccination among healthcare personnel—National Healthcare Safety Network (NHSN) Healthcare Personnel Safety (HPS) Component, Q3 2022*

Facility Quantile of HCP with contraindications	Percentage of HCP with Contraindications						
	Acute Care Hospitals¥	Long-Term Acute Care Hospitals	Inpatient Rehabilitation Facilities‡	Inpatient Psychiatric Facilities‡	Ambulatory Surgery Centers	Dialysis Facilities	Total
75% Q3	0.87	0.71	0.81	1.24	0.17	0	0.27
50% Median	0.30	0	0.36	0.26	0	0	0
25% Q1	0	0	0	0	0	0	0

*Data are among 13518 HPS facilities with reporting at least one week per month to NHSN during Q3 2022.
¥Data from inpatient rehabilitation facility (IRF) units and inpatient psychiatric facility (IPF) units with unique CMS Certification Numbers (CCNs) located within acute care hospitals are not included in the acute care hospital category. Critical Access Hospitals are included in this category.
‡Includes freestanding IPF and IRF locations and IPF and IRF units with unique CCNs located within acute care hospitals.

Frequency of contraindications to COVID-19 vaccination among healthcare personnel (HCP) during Q3 (July, August, September), 2021 (N=13518 healthcare personnel safety facilities)

Facility Quantile of healthcare personnel (HCP) with contraindications	Percentage of HCP with contraindications
100% Max	88.89
99%	11.15
95%	4.62
90%	2.25
75% Q3	0.27
50% Median	0.00
25% Q1	0.00
10%	0.00
5%	0.00
1%	0.00
0% Min	0.00
HCP per facility (No. of facilities)	Mean Percentage of HCP with contraindications (Standard Deviation)
1-50 HCP (N = 8177)	0.73 (2.59)
51-100 HCP (N=1836)	0.58 (1.73)
101-200 HCP (N=917)	1.11 (2.79)
201-500 HCP (N=1147)	1.06 (2.45)
501-1000 HCP (N=554)	0.91 (1.93)
1001 or more HCP (N=887)	0.73 (1.29)
Health and Human Services (HHS) Region	Mean Percentage of HCP with contraindications (Standard Deviation)
Region 1 (N=376)	0.57 (1.57)
Region 2 (n=919)	0.41 (1.59)
Region 3 (N=1423)	0.74 (2.09)

Region 4 (N=3192)	0.93 (2.53)
Region 5 (N=2180)	0.77 (2.66)
Region 6 (N=2157)	0.85 (2.96)
Region 7 (N=721)	0.95 (2.48)
Region 8 (N=427)	0.73 (1.96)
Region 9 (N=1657)	0.52 (1.89)
Region 10 (N=466)	0.84 (2.16)

* Data are among 13518 HPS facilities with reporting at least one week per month during Q3 2022. HHS regions: Region 1 (CT, MA, ME, NH, RI, VT); Region 2 (NJ, NY, PR, VI); Region 3 (DC, DE, MD, PA, VA, WV); Region 4 (AL, FL, GA, KY, MS, NC, SC, TN); Region 5 (IL, IN, MI, MN, OH, WI); Region 6 (AR, LA, NM, OK, TX); Region 7 (IA, KS, MO, NE); Region 8 (CO, MT, ND, SD, UT, WY); Region 9 (AZ, CA, HI, NV) Region 10 (AK, ID, OR, WA).

Frequency of contraindications to COVID-19 vaccination among healthcare personnel, by Quantile—National Healthcare Safety Network (NHSN) Healthcare Personnel Safety (HPS) Component, Q3 2022*

Facility Quantile of HCP with contraindications	Percentage of HCP with contraindications
Level	**Quantile**
100% Max	88.89
99%	11.15
95%	4.62
90%	2.25
75% Q3	0.27
50% Median	0
25% Q1	0
10%	0
5%	0
1%	0

* Data are among 13518 HPS facilities with reporting at least one week per month during Q3 2022.

Frequency of contraindications to COVID-19 vaccination among healthcare personnel (HCP) by facility size (No. of HCP), COVID-19 vaccination coverage, and region—National Healthcare Safety Network Healthcare Personnel Safety (HPS) Component, Q3 2022*

HCP per facility (No. of facilities)	Mean percentage of HCP with contraindications (Standard Deviation)
1-50 HCP (8177)	0.73 (2.59)
51-100 HCP (1836)	0.58 (1.73)
101-200 HCP (917)	1.11 (2.79)
201-500 HCP (1147)	1.06 (2.45)
501-1000 HCP (554)	0.91 (1.93)
≥1001 HCP (887)	0.73 (1.29)
Health and Human Services (HHS) Region (No. of facilities)	**Mean percentage of HCP with contraindications (Standard Deviation)**
Region 1 (376)	0.57 (1.57)
Region 2 (919)	0.41 (1.59)
Region 3 (1423)	0.74 (2.09)
Region 4 (3192)	0.93 (2.53)
Region 5 (2180)	0.77 (2.66)
Region 6 (2157)	0.85 (2.96)

Region 7 (721)	0.95 (2.48)
Region 8 (427)	0.73 (1.96)
Region 9 (1657)	0.52 (1.89)
Region 10 (466)	0.84 (2.16)

* Data are among 13518 HPS facilities with reporting at least one week per month during Q3 2022. HHS regions: Region 1 (CT, MA, ME, NH, RI, VT); Region 2 (NJ, NY, PR, VI); Region 3 (DC, DE, MD, PA, VA, WV); Region 4 (AL, FL, GA, KY, MS, NC, SC, TN); Region 5 (IL, IN, MI, MN, OH, WI); Region 6 (AR, LA, NM, OK, TX); Region 7 (IA, KS, MO, NE); Region 8 (CO, MT, ND, SD, UT, WY); Region 9 (AZ, CA, HI, NV) Region 10 (AK, ID, OR, WA)

Previous Submission (2021):

Among 15,267 facilities reporting COVID-19 vaccination coverage among healthcare personnel (HCP) during Q3 (July, August, September), 2021, the mean number of HCP per facility was 117.0 , with a standard deviation of 77.0.

Among these 15,267 facilities, the mean percentage of HCP with contraindications was 0.6%, with a standard deviation of 2.0%.

Frequency of contraindications to COVID-19 vaccination among healthcare personnel (HCP) during Q3 (July, August, September), 2021 (N=15,267 facilities)

Facility Quantile of healthcare personnel (HCP) with contraindications	**Percentage of HCP with contraindications**
100% Max	88.89
99%	11.15
95%	4.62
90%	2.25
75% Q3	0.27
50% Median	0.00
25% Q1	0.00
10%	0.00
5%	0.00
1%	0.00
0% Min	0.00

Frequency of contraindications to COVID-19 vaccination among healthcare personnel (HCP) reported during Q3 (July, August, September), 2021, stratified by facility size (No. of HCP), COVID-19 vaccination coverage, and region (N=15,267 facilities)

Quantile of HCP per facility (No. of facilities)	**Percentage of HCP with contraindications (Standard Deviation)**
Q1 (N = 3,759)	0.8 (2.3)
Q2 (N = 3,769)	0.7 (2.3)
Q3 (N = 3,898)	0.6 (2.0)
Q4 (N = 3,841)	0.5 (1.3)
Quantile of COVID-19 vaccination coverage	**Percentage of HCP with contraindications**

	(Standard Deviation)
Q1 (N = 3,816)	0.5 (1.5)
Q2 (N = 3,818)	0.6 (1.9)
Q3 (N = 3,817)	0.7 (2.0)
Q4 (N = 3,816)	0.8 (2.5)
Region	**Percentage of HCP with contraindications (Standard Deviation)**
Northeast (N = 2,514)	0.5 (1.4)
Midwest (N = 4,972)	0.7 (2.6)
South (N = 5,405)	0.5 (1.7)
West (N = 2,369)	0.8 (1.8)
PR and territories (N = 7)	0.7 (1.2)

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.

Current Submission:

Contraindications/exclusions to COVID-19 vaccination were infrequent among SNF and HPS facility healthcare personnel. The proportion of HCP with contraindications/exclusions was similar when facilities were stratified by facility type, region, and size.

However, identification of healthcare personnel with contraindications/exclusions to vaccination is important for acceptability/fairness to facilities and healthcare personnel, as a facility should not be penalized for employing healthcare personnel with contraindications which preclude COVID-19 vaccination.

Of note, healthcare personnel personal preference or vaccine hesitancy is not considered a contraindication or exclusion.

Previous Submission (2021):

While contraindications/exclusions to COVID-19 vaccination are not frequent (reported for 1 in 167 healthcare personnel [HCP] on average), more than 10% of nursing homes reported at least 1 HCP with a contraindication to vaccination.

The proportion of HCP with contraindications/exclusions was similar when facilities were stratified by number of HCP and region.

The number of HCP with contraindications/exclusions would be expected to decline because receipt of monoclonal antibody treatment or convalescent plasma within 90 days and isolation for/recovering from COVID-19 are exclusions that should decline in frequency as more HCP are vaccinated.

However, identification of HCP with contraindications/exclusions to vaccination is important for acceptability/fairness to facilities and HCP, as a facility should not be penalized for employing a HCP with a contraindication which precludes COVID-19 vaccination, and HCP with contraindications or other exclusions identified in in Interim Clinical Considerations for Use of COVID-19 Vaccines Currently Approved or Authorized in the United States should not be vaccinated according to FDA authorization and ACIP/HHS recommendations.

It is important to note that HCP personal preference or vaccine hesitancy is not considered a contraindication or exclusion.

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

☐ Statistical risk model with risk factors (specify number of risk factors)
☐ 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.

Previous Submission:

N/A

Current Submission:

N/A

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.

Current Submission:

Risk adjustment is not appropriate for the proposed measure. By virtue of their work environment, all HCP are potentially at risk of contracting COVID-19 and transmitting the SARS-CoV-2 virus to patients. The ACIP and CDC/HHS recommend that all persons without contraindications remain up to date with COVID-19 vaccination.

Social risk factors are not directly available, as data is collected at the aggregate level rather than at the individual level.

Previous Submission (2021):

Risk adjustment is not appropriate for the proposed measure. By virtue of their work environment, all HCP are potentially at risk of contracting COVID-19 and transmitting the SARS-CoV-2 virus to patients.

The ACIP and CDC/HHS recommend that all HCP without contraindications receive a COVID-19 vaccination.

Social risk factors are not directly available, as data is collected at the aggregate level rather than at the individual level.

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).

Previous Submission:

N/A

Current Submission:

N/A

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.

Previous Submission:

N/A

Current Submission:

N/A

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.

Previous Submission:

N/A

Current Submission:

N/A

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.

Previous Submission:

N/A

Current Submission:

N/A

2b.27) Provide risk model discrimination statistics.

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

Previous Submission:

N/A

Current Submission:

N/A

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

Previous Submission:

N/A

Current Submission:

N/A

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.

Previous Submission:

N/A

Current Submission:

N/A

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

Previous Submission:

N/A

Current Submission:

N/A

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?

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.

Previous Submission:

N/A

Current Submission:

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.

Previous Submission:

N/A

Current Submission:

N/A

3.04) Describe any efforts to develop an eCQM.

Previous Submission:

N/A

Current Submission:

N/A

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

Previous Submission:

N/A

Current Submission:

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.

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

Current Submission:

Difficulties reported by facilities are included in the response to section **4a.08**

Previous Submission (2021):

Difficulties reported by facilities are included in the response to section **4a.08**

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.

Current Submission:

No fees, licensing, or other requirements.

Previous Submission (2021):

No fees, licensing, or other requirements.

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

Current Submission:

For emergency response during the pandemic phase of COVID-19, starting in May 2021, CMS-certified nursing homes were required to report HCP COVID-19 vaccination coverage weekly using the NHSN weekly COVID-19 Vaccination Coverage Module.

- Name of program: Interim Final Rule - COVID-19 Vaccine Immunization Requirements for Residents and Staff (QSO-21-19-NH) https://www.cms.gov/medicareprovider-enrollment-and-certificationsurveycertificationgeninfopolicy-and-memos-states-and/interim-final-rule-covid-19-vaccine-immunization-requirements-residents-and-staff
- URL: https://data.cms.gov/stories/s/COVID-19-Nursing-Home-Data/bkwz-xpvg
- Purpose: CMS is committed to continually taking critical steps to ensure America's healthcare facilities continue to respond effectively to the Coronavirus Disease 2019 (COVID-19) Public Health Emergency (PHE). Furthermore, LTC facilities must report COVID-19 vaccine and therapeutics treatment information to the Centers for Disease Control and Prevention's (CDC) National Healthcare Safety Network (NHSN). CMS will post the new information reported to the NHSN for viewing by facilities, stakeholders, or the general public on CMS's COVID-19 Nursing Home Data website.
- Geographic area: United States; >15,000 facilities; >1,600,000 individuals
- Level of Measurement and Setting: Facility level and state level for CMS-certified Nursing Homes

CMS also implemented quarterly reporting requirements for nursing home HCP COVID-19 vaccination coverage.

- Name of program: Medicare Program; Prospective Payment System and Consolidated Billing for Skilled Nursing Facilities; Updates to the Quality Reporting Program and Value-Based Purchasing

Program for Federal Fiscal Year 2022; and Technical Correction to Long-Term Care Facilities Physical Environment Requirements https://www.federalregister.gov/documents/2021/08/04/2021-16309/medicare-program-prospective-payment-system-and-consolidated-billing-for-skilled-nursing-facilities

- URL: https://www.medicare.gov/care-compare/?providerType=NursingHome
- Purpose: Quality reporting
- Geographic area: United States; >15,000 facilities; >1,600,000 individuals
- Level of Measurement and Setting: Facility level and state level for CMS-certified Nursing Homes

Similar reporting requirements to those for nursing homes have been implemented by CMS for Medicare-participating Acute care hospitals, Long-term care hospitals, Hospital Outpatient and Ambulatory surgery centers, Inpatient rehabilitation facilities, and Dialysis centers.

Acute Care and Long-Term care hospitals:

- Name of program: Medicare Program; Hospital Inpatient Prospective Payment Systems for Acute Care Hospitals and the Long-Term Care Hospital Prospective Payment System and Policy Changes and Fiscal Year 2022 Rates; Quality Programs and Medicare Promoting Interoperability Program Requirements for Eligible Hospitals and Critical Access Hospitals; Changes to Medicaid Provider Enrollment; and Changes to the Medicare Shared Savings https://www.federalregister.gov/documents/2021/08/13/2021-16519/medicare-program-hospital-inpatient-prospective-payment-systems-for-acute-care-hospitals-and-the?form=MY01SV&OCID=MY01SV
- URL: https://www.medicare.gov/care-compare/?providerType=Hospital or https://www.medicare.gov/care-compare/?providerType=LongTermCare
- Purpose: Quality reporting
- Geographic area: United States
- Level of Measurement and Setting: Facility level and state level

Outpatient/Ambulatory surgery centers:

- Name of program: Medicare Program: Hospital Outpatient Prospective Payment and Ambulatory Surgical Center Payment Systems and Quality Reporting Programs; Price Transparency of Hospital Standard Charges; Radiation Oncology Model https://www.federalregister.gov/documents/2021/11/16/2021-24011/medicare-program-hospital-outpatient-prospective-payment-and-ambulatory-surgical-center-payment
- URL: https://data.cms.gov/provider-data/topics/hospitals/ambulatory-surgical-centers#asc-quality-reporting-program
- Purpose: Quality reporting
- Geographic area: United States
- Level of Measurement and Setting: Facility level and state level

Inpatient psychiatric facilities:

- Name of program: Medicare Program; FY 2022 Inpatient Psychiatric Facilities Prospective Payment System and Quality Reporting Updates for Fiscal Year Beginning October 1, 2021 (FY 2022) https://www.federalregister.gov/documents/2021/08/04/2021-16336/medicare-program-fy-2022-inpatient-psychiatric-facilities-prospective-payment-system-and-quality
- URL: https://qualitynet.cms.gov/ipf/public-reporting
- Purpose: Quality reporting
- Geographic area: United States
- Level of Measurement and Setting: Facility level and state level

Inpatient rehabilitation facilities:

- Name of program: Medicare Program; Inpatient Rehabilitation Facility Prospective Payment System for Federal Fiscal Year 2022 and Updates to the IRF Quality Reporting Program; Payment for Complex Rehabilitative Wheelchairs and Related Accessories (Including Seating Systems) and Seat and Back Cushions Furnished in Connection With Such Wheelchairs https://www.federalregister.gov/documents/2021/08/04/2021-16310/medicare-program-inpatient-rehabilitation-facility-prospective-payment-system-for-federal-fiscal?form=MY01SV&OCID=MY01SV
- URL: https://www.medicare.gov/care-compare/?providerType=InpatientRehabilitation
- Purpose: Quality reporting
- Geographic area: United States
- Level of Measurement and Setting: Facility level and state level

Dialysis centers:

- Name of program: Medicare Program, End-Stage Renal Disease Quality Incentive Program (ESRD QIP) Calendar Year (CY) 2023 End-Stage Renal Disease (ESRD) Prospective Payment System (PPS) Final Rule: https://www.govinfo.gov/content/pkg/FR-2022-11-07/pdf/2022-23778.pdf
- URL: https://www.medicare.gov/care-compare/?providerType=DialysisFacility
- Purpose: Quality reporting
- Geographic area: United States
- Level of Measurement and Setting: Facility level and state level

Previous Submission (2021):

For emergency response during the pandemic phase of COVID-19, as of May 2021, CMS-certified nursing homes have been required to report HCP COVID-19 vaccination coverage weekly using the NHSN weekly COVID-19 Vaccination Coverage Module.

For emergency response during the pandemic phase of COVID-19, different HCP categories are being used to calculate vaccine coverage using NHSN and reporting frequency is every week.

- Name of program: Interim Final Rule - COVID-19 Vaccine Immunization Requirements for Residents and Staff (QSO-21-19-NH) https://www.cms.gov/medicareprovider-enrollment-and-certificationsurveycertificationgeninfopolicy-and-memos-states-and/interim-final-rule-covid-19-vaccine-immunization-requirements-residents-and-staff

- URL: https://data.cms.gov/stories/s/COVID-19-Nursing-Home-Data/bkwz-xpvg
- Purpose: CMS is committed to continually taking critical steps to ensure America's healthcare facilities continue to respond effectively to the Coronavirus Disease 2019 (COVID-19) Public Health Emergency (PHE). Furthermore, LTC facilities must report COVID-19 vaccine and therapeutics treatment information to the Centers for Disease Control and Prevention's (CDC) National Healthcare Safety Network (NHSN). CMS will post the new information reported to the NHSN for viewing by facilities, stakeholders, or the general public on CMS's COVID-19 Nursing Home Data website.
- Geographic area: United States; >15,000 facilities; >1,600,000 individuals
- Level of Measurement and Setting: Facility level and state level for CMS-certified Nursing Homes

☒ Public Health/Disease Surveillance

Current Submission:

CDC began collecting weekly vaccination data through the LTCF COVID-19 Module on December 14, 2020, as a voluntary reporting system. The Centers for Medicare & Medicaid Services (CMS) established COVID-19 vaccination reporting requirements for nursing homes effective May 13, 2021.
CDC began collecting weekly vaccination data on additional primary doses and booster doses in accordance with the Interim Clinical Considerations for Use of COVID-19 Vaccines Currently Approved or Authorized in the United States through the NHSN LTCF COVID-19 Vaccination Module on August 23, 2021. CDC began collecting weekly data on the number of residents and healthcare personnel who are up to date with COVID-19 vaccines through the NHSN LTCF COVID-19 Vaccination Module on May 30, 2022.

- Name of program: National Healthcare Safety Network (NHSN)
- URL: https://www.cdc.gov/nhsn/covid19/ltc-vaccination-dashboard.html
- Purpose: CDC's National Healthcare Safety Network (NHSN) supports the nation's COVID-19 response by providing a Long-term Care Facilities (LTCFs) COVID-19 Module, which enables an assessment of the impact of COVID-19 through facility reported information.
- Geographic area: United States; 50 states
- Level of Measurement and Setting:
    - Facility and State level for Long-term care facilities

Similar data collection occurs for non-long-term care facilities, reported through NHSN's Healthcare Personnel Safety component.

- Name of program: National Healthcare Safety Network (NHSN)
- URL: https://www.cdc.gov/nhsn/hps/weekly-covid-vac/index.html
- Purpose: CDC's National Healthcare Safety Network (NHSN) supports the nation's COVID-19 response by providing a Healthcare Personnel Safety COVID-19 Module, which enables an assessment of the impact of COVID-19 through facility reported information.
- Geographic area: United States; 50 states
- Level of Measurement and Setting:

- Facility and State level for non-Long term care facilities

Previous Submission (2021):

Since initiation of voluntary reporting of COVID-19 vaccination coverage reporting through NHSN was initiated in December 2020, data have been used by public health authorities for response to the public health emergency. Since CMS-certified nursing homes and outpatient dialysis facilities have been required to report HCP COVID-19 vaccination coverage weekly using the NHSN weekly COVID-19 Vaccination Coverage Module state-based data have been publicly available.

- Name of program: National Healthcare Safety Network (NHSN)
- URL: https://www.cdc.gov/nhsn/covid19/ltc-vaccination-dashboard.html
- Purpose: CDC's National Healthcare Safety Network (NHSN) supports the nation's COVID-19 response by providing a Long-term Care Facilities (LTCFs) COVID-19 Module, which enables an assessment of the impact of COVID-19 through facility reported information.
- Geographic area: United States; 50 states
- Level of Measurement and Setting:
  - State level for CMS-certified Nursing Homes
  - State level for Outpatient Dialysis Centers

☐ Payment Program
☐ Regulatory and Accreditation Programs
☐ Professional Certification or Recognition Program
☐ Quality Improvement with Benchmarking (external benchmarking to multiple organizations)
☐ Quality Improvement (Internal to the specific organization)
☐ 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?

Current Submission:

N/A

Previous Submission:

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.

Current Submission:

N/A

Previous Submission:

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.

Current Submission:

Quarterly targeted data quality outreach to all facility types is provided by NHSN, including quality checks on HCP up to date vaccination coverage. COVID-19 Vaccination Quick Reference Guides in Response to Monthly Combined Data Quality (cdc.gov)

Previous Submission (2021):

Prior to July 2021, facilities reporting results with low vaccination coverage rates (<10% coverage) were identified and contacted through email and telephone outreach to confirm the validity of reported results. Facilities with high week-to-week variation (>30% change in coverage week to week) were also identified and contacted by email and telephone outreach.

Since July 2021, facilities with required reporting by CMS have been receiving automatic alerts which identify outlying data entries. https://www.cdc.gov/nhsn/pdfs/hps/covidvax/dq-alerts-508.pdf

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.

Current Submission:

All facilities have full access to the data which they reported.

- Long-term care facility (LTCF):

https://www.cdc.gov/nhsn/pdfs/ltc/covidvax/how-to-run-LTC-reports-508.pdf

https://www.cdc.gov/nhsn/pdfs/ltc/covidvax/how-to-check-create-dates-508.pdf

- Non-LTCF:

https://www.cdc.gov/nhsn/pdfs/hps/covidvax/run-reports-hps-component-508.pdf

https://www.cdc.gov/nhsn/pdfs/hps/covidvax/hps-how-to-check-create-dates-508.pdf

Facilities can also utilize preformatted charting and other analysis capabilities of NHSN to assist in the interpretation of reported data.

- LTCF:

https://www.cdc.gov/nhsn/pdfs/hps/covidvax/create-vacc-data-barchart-nov22-508.pdf

- Non-LTCF:

https://www.cdc.gov/nhsn/pdfs/hps/covidvax/create-vacc-data-barchart-nov22-508.pdf

Facilities have been offered numerous training sessions and educational opportunities in both live and enduring content formats.

- LTCF:

https://www.cdc.gov/nhsn/ltc/weekly-covid-vac/index.html

- Non-LTCF:

https://www.cdc.gov/nhsn/hps/weekly-covid-vac/index.html

Finally, facilities may contact the NHSN Helpdesk by email at any time.

Previous Submission (2021):

All facilities have full access to the data which they reported.

https://www.cdc.gov/nhsn/pdfs/ltc/covidvax/covidvax-ltc-linelist-508.pdf

https://www.cdc.gov/nhsn/pdfs/ltc/covidvax/linelist-checkdates-508.pdf

Facilities can also utilize preformatted charting and other analysis capabilities of NHSN to assist in the interpretation of reported data.

https://www.cdc.gov/nhsn/pdfs/ltc/covidvax/covidvax-ltc-barchart-508.pdf

Facilities were offered numerous training sessions and educational opportunities both when the NHSN modules were initially released and when CMS policies began to require reporting by dialysis facilities and nursing homes.

https://www.cdc.gov/nhsn/ltc/weekly-covid-vac/index.html

Finally, facilities may contact the NHSN Helpdesk by email at any time.

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

Current Submission:

Feedback on measured performance was obtained through a public comment period on proposed rulemaking by CMS to include this updated measure in quality reporting programs.

Previous Submission (2021):

Feedback on measured performance was obtained through a public comment period on proposed rulemaking by CMS to include this measure in quality reporting programs.

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

Current Submission:

1. Denominator and numerator inclusion criteria should be less specific, to provide more flexibility over time and allow for more room to adapt to local circumstances.
2. “Up to date” definition changes over time, making facility rates difficult to interpret and meaningfully place into context of quality reporting.
3. COVID vaccination rates should not be publicly posted for reporting of comparative rates.
4. COVID vaccination rates should be measured and reported by demographic variables, including but not limited to race, ethnicity, disability status, sexual orientation, language proficiency, rural status, religious minority status, and poverty level status.
5. Specifications should not require overly burdensome data collection and reporting efforts.
6. Programs aimed at incentivizing COVID-19 vaccination uptake may have unintended consequences, such as worsening recruitment/retention of HCP.
7. Reporting should be changed to an annual cycle, similar to that used for influenza vaccination.

8. The measure should exclude unpaid volunteers from the measure denominator due to difficulty of collecting this information from those with whom the facility lacks an employment or financial relationship.

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

Multiple commenters expressed support for the updated measure.

Concerns expressed included:

9. The measure specifications and validity/reliability testing data should be submitted for consensus-based entity (CBE) endorsement.
10. Measure implementation should be monitored for unintended consequences.

Previous Submission (2021):

A number of commenters wrote in support of the measure's concept and the need to encourage widespread vaccination for HCP.

- The measure would help assess the degree to which facilities are taking steps to limit the spread of COVID-19 and reduce the risk of transmission within their facilities.
- Public reporting of COVID-19 vaccinations among HCP would provide consumers with important information with which to make informed decisions about the safety of a facility.
- The measure would provide greater transparency for federal officials and other stakeholders seeking to effectively target vaccine hesitancy, as well as provide resources related to the COVID-19 vaccines.

Concerns expressed included:

9. The measure specifications and testing data should be submitted for NQF endorsement.

10. It is unknown whether a booster vaccination will be necessary. How will vaccine recommendations and potential recommendations for booster doses be accounted for in reporting requirements?

11. Concern that the vaccinations have not received full FDA approval.

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.

Current Submission:

1. Measure specifications are important to provide a meaningful indicator of HCP vaccination. For the public to interpret a vaguely defined measure may be challenging. The current specifications clearly delineate who is included, in the same fashion as CBE #0431 (HCP Influenza Vaccination) does providing the public a well-defined cohort targeted by the measure. At the same time, the change from primary vaccination to up to date vaccination allows for flexibility over time, as CDC refines recommendations for COVID-19 vaccination. Thus the measure was not modified.

2. Quarterly reporting to NHSN is based upon the definition of up to date as of the first day of the quarter. This can pose a challenge in communication to facilities, but NHSN/CDC regularly communicates changes to facilities when definitions have been made to ensure they understand which definition to use. The original version of this measure tracked primary vaccination only, which was of higher relevance earlier in the pandemic before booster doses became available. CDC is constantly re-evaluating the data and has made alterations to COVID-19 vaccine recommendations to ensure "up to date" reflects the highest level of protection. This is expected to evolve with the pandemic. Thus, the measure was not modified.
3. Vaccination rates have already been publicly posted for most care settings, and while COVID-19 HCP vaccination is part of CMS pay for reporting programs, it is not included in pay for performance programs. Thus the measure was not modified.
4. While it is important to understand the role demographics variables play, data are submitted at the facility level rather than at the individual level. Thus the measure was not modified.
5. Burden is acknowledged, but facilities have already been reporting up to date vaccination data to NHSN. The number of facilities reporting COVID-19 vaccination data to NHSN has remained high – for example, during the 3rd quarter of 2022, when up to date COVID-19 vaccination among healthcare personnel was incorporated into NHSN, 84% of IRFs in NHSN and 92% of SNFs were reporting. Thus the measure was not modified.
6. While staff turnover is an important issue, the role of up to date vaccination status data collection is unclear. It is possible that facilities with high turnover are as interested in knowing up to date vaccination status of new staff as those with lower turnover. Moreover, reporting this vaccination coverage for measures does not require HCP to be vaccinated in order to successfully report the measure. Thus, the measure was not modified.
7. Annual reporting for seasonal influenza takes place after the end of each influenza season. While the COVID-19 pandemic continues to evolve, in the absence of an identified season, up to date vaccination is best reflected through quarterly reporting. In the future, a move from quarterly to annual reporting could be made once annual booster recommendations are implemented. Thus, the measure was not modified.
8. The denominator was created to mirror the denominator of the currently CBE-endorsed influenza vaccination of HCP measure (CBE #0431), which also requires reporting volunteer vaccination rates as part of non-employee HCP: "Medical, nursing, or other health professional students, interns, medical residents, or volunteers aged 18 or older who are affiliated with the healthcare facility, but are not directly employed by it (i.e., they do not receive a paycheck from the facility), regardless of clinical responsibility or patient contact." Thus, the measure was not modified.
9. The measure specifications and testing data are being submitted for CBE endorsement.
10. No unintended consequences have been identified in measure implementation.

Previous Submission (2021):

1. Efforts by facilities, states, federal agencies, and public-private partnerships have been engaged in ensuring adequate vaccination availability and vaccine availability rarely been identified as a limiting factor by nursing homes and other facilities, so the measure was not modified because

the reporting period is 3 months and there will be time during each quarter for persons receiving the two-dose vaccine to reach complete vaccination status.

2. It is unclear what unintended consequences and legal risks the commenters are referring to in terms of adverse events. Reporting this vaccination coverage for measures does not require HCP to be vaccinated in order to successfully report the measure, so the measure was not modified.
3. The Equal Employment Opportunity Commission (EEOC) has stated the federal equal employment opportunity (EEO) laws do not prevent an employer from requiring all employees physically entering the workplace to be vaccinated for COVID-19, so long as the employer complies with the reasonable accommodation provisions of the Americans with Disabilities Act (ADA) and Title VII of the Civil Rights Act of 1964 and other EEO considerations. (What You Should Know About COVID-19 and the ADA, the Rehabilitation Act, and Other EEO Laws. Available at https://www.eeoc.gov/wysk/what-you-should-know-about-covid-19-and-ada-rehabilitation-act-and-other-eeo-laws.) In addition, over 50 healthcare professional organizations have endorsed a requirement for healthcare personnel to be vaccinated. Thus, the measure has not been modified.
4. Assessing HCP contraindications and excluding from the measure denominator strikes a balance between obtaining accurate estimates of vaccine rates among HCP in a facility and not holding a facility accountable for HCP with a COVID-19 vaccination contraindication.
5. Because the measurement period covered by the Influenza Vaccination Coverage for HCP (NQF #0431) is quite long (the entire 6-month influenza season), HCP absences for illness, vacation, or other short-term leave do not impact the measure denominator. However, in order to provide more timely measurement of COVID-19 vaccination coverage while also reducing the burden of data collection for facilities, the data collection period of the COVID-19 vaccination for HCP measures is only one week, and a number of regularly working HCP who would be counted within a 6-month period may be absent during this shortened period. Therefore, HCPs who regularly work in the nursing facility, but may be temporarily absent for up to 2 weeks, are still to be included in the COVID-19 vaccination coverage measure.
6. Contraindications to COVID-19 vaccination have not changed since the vaccines have been authorized. There are additional considerations around the timing of the vaccine that are more clearly understood now. A summary of interim clinical considerations can be found https://www.cdc.gov/vaccines/covid-19/downloads/summary-interim-clinical-considerations.pdf which is referenced in the measure. Like any medical product, considerations for use may change with increased knowledge.
7. An earlier version of the measure considered combining 4 quarters of data into an annual coverage measure. Combination of quarters in this way is not the way the current measure is specified.
8. Healthcare facilities have experience of tracking information and collecting data to inform their care approaches and business practices. We are confident in facilities' abilities to track the COVID-19 vaccination information of their HCP. The specifications for collecting vaccine status, contraindications and declinations and reporting vaccinations 1 week per month are designed to balance timely information with the reporting burden.
9. The measure specifications and testing data are being submitted for NQF endorsement.
10. Currently, additional COVID-19 vaccines are not required as part of the primary vaccination series. If substantive revisions to the measure are needed in the future, revisions to the definition of the completed course of COVID-19 vaccination can be made.

11. Vaccines have been FDA approved.

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.

Current Submission:

Aggregate up to date vaccination coverage among HCP was low in Q3 2022 compared with primary vaccine series coverage, and at the time of measure submission it is too early to analyze Q4 2022 due to data submission lag. Notwithstanding, for Q3 2022 there was observed a wide variability in coverage at the facility-level which could be used to inform targeted outreach. For example, among 2557 acute care hospitals reporting at least one week of vaccination data per month to NHSN during Q3 2022, the median percent up to date was 23.25 with an interquartile range of 10.65-46.41.

Previous Submission (2021):

COVID-19 vaccination rates among HCPs working in CMS-certified skilled nursing facilities increased in each quarter of 2021. Of note, the number of facilities reporting vaccination coverage has increased significantly with CMS requirements to report vaccination coverage, which were published in May 2021.

At the beginning of Q4, 2021, for the 2-week period, ending October 24, 2021, 14,417 CMS-certified skilled nursing facilities (87.3%) CMS-certified skilled nursing facilities) reported COVID-19 vaccination coverage data for HCP from across the United States, with 1,317,841 (75.0%) of HCP reported to have completed COVID-19 vaccination.

The weekly data that are used for the quarterly measure are at: https://www.cdc.gov/nhsn/covid19/ltc-vaccination-dashboard.html

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

Current Submission:

There were no unexpected findings.

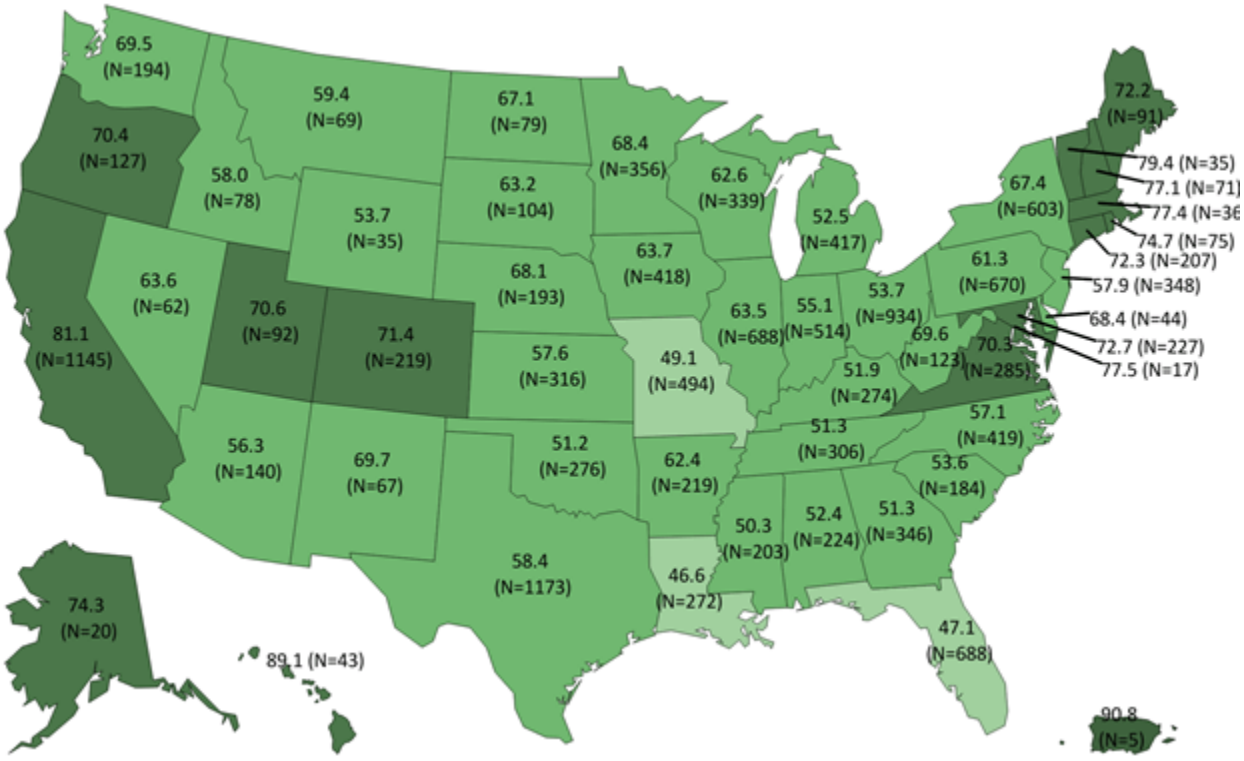
Previous Submission (2021):

While the measure is a quarterly measure, it is based on data collected for a reporting week. Examining

data from a reporting week finds that COVID-19 vaccination coverage among HCP working in CMS-certified skilled nursing facilities varies considerably by state, which may impact the incidence of COVID-19 infection in nursing homes.

For example, as COVID-19 case counts began to increase in the summer of 2021, COVID-19 vaccination coverage for CMS-certified nursing homes for the week ending July 18 varied by state, ranging from 46.6% [Louisiana, n=262 facilities] to 89.1% [Hawaii, n=43])

COVID-19 Vaccination Coverage Among CMS-certified Skilled Nursing Facility Staff (excluding those with medical contraindications) reporting within the last 2 weeks through the Week Ending July 18, 2021



Data reported to the National Healthcare Safety Network (NHSN)

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

Current Submission:

There were no unexpected benefits.

Previous Submission (2021):

Some public health entities (e.g., Massachusetts) identified the benefits of using NHSN to report this measure and required reporting for some facilities (e.g., nursing homes) within their jurisdiction prior to

national requirements.

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

0431: INFLUENZA VACCINATION COVERAGE AMONG HEALTHCARE PERSONNEL

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

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.

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

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

CBE 3636 is harmonized to use the same denominator categories as CBE 0431.

The target population of both CBE 0431 and CBE 3636 is healthcare personnel (HCP) who may be encountered by other HCP and patients during the reporting period.

However, the data collection and reporting period is annually for the 6 months from October to March for CBE 0431, whereas the data collection period for CBE 3636 is one week a month and the reporting period is quarterly (every 3 months).

The rationale for the shorter data collection period for CBE 3636 is to reduce the reporting burden; the rationale for the more frequent reporting period that is not seasonal is that COVID-19 vaccination coverage among HCP is a public health priority and COVID-19 has not yet demonstrated consistent seasonality like influenza.

Because of the different time periods for data collection and reporting, CBE 0431 includes HCP who worked for at least one day during the 6-month data collection, while CBE 3636 includes HCP who are

scheduled to work regularly (at least once a week). Many HCPs who regularly work in a facility may be temporarily absent from a facility for periods of up to two weeks due to illness, injury, or vacation/leave. Because the measurement period covered by the influenza vaccination measure is quite long (the entire 6-month influenza season), such absences will not impact the influenza measure denominator. However, the COVID-19 vaccination measure measurement period (CBE 3636) is only a week for each month of the quarter, so a number of regularly working HCP may be absent during this shortened period. Therefore, HCP who regularly work in the facility, but may be temporarily absent from the facility for up to 2 weeks, are still to be included.

For many facilities, collecting data for workers who regularly work in the facility reduces the data collection burden as a daily accounting of HCP work hours is not required. Reporting and calculating coverage rates for 3-month time periods rather than annually for a 6-month time period is a higher burden, but one that remains warranted for a disease which is responsible for a worldwide pandemic.

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.

N/A

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

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

Name	Organization	Role
Hannah Reses	CDC	Epidemiologist, assisted with measure development and testing
Heather Dubendris	Lantana Consulting Group, contractor for CDC	Subject matter expert, assisted with measure development and analytics
Jeneita Bell	CDC	Post-acute care subject matter expert, assisted with measure development, lead for surveillance data collection
Andrea Benin	CDC	Subject matter expert, assisted with measure development
Daniel Budnitz	CDC	Healthcare safety and public health surveillance subject matter expert
Andrew Geller	CDC	Healthcare safety and public health surveillance subject matter expert, assisted with measure development and CBE submission
Kristina Betz	CDC	Measure validation subject matter expert
Paula Farrell	Lantana Consulting Group, contractor for CDC	Measure Management
Matt Sapiano	Lantana Consulting Group, contractor for CDC	Statistical consultation on measure development and assessment of reliability and validity
Jonathan Edwards	CDC	Statistical consultation on measure development and assessment of reliability and validity
Elizabeth Kalayil	Lantana Consulting Group, Inc. (Contractor for CDC)	Influenza and COVID-19 vaccination subject matter expert
Lauren Wattenmaker	CDC	Health policy subject matter expert, coordinated measure input from key federal partners
Megan Lindley	CDC	Subject matter expert in immunization quality measurement
Alan Levitt	CMS	Post-acute care subject matter expert

3) Indicate the year the measure was first released.
2020

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.
N/A (early measure review)

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

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