HOSPITAL HEALTHCARE-ASSOCIATED INFECTIONS (HAI) INTERNAL VALIDATION GUIDANCE

Contents

Oregon Health Authority

INTRODUCTION

Each facility has received a hidden link to the HAI Summary Data Table containing reportable HAI data for 2022 that was reported to the Oregon Health Authority (OHA) via the National Healthcare Safety Network (NHSN). After internal validation is complete, this data will be published and available as a supplemental dataset to the Hospital HAI Tableau Dashboard. This guidance will explain what data are included in the HAI Summary Data Table, how to review the data to ensure data quality, and how to interpret what the summary data table includes.

Each facility should review their facility's data and make corrections in NHSN by the date provided by the HAI Program. Corrected data will be included in the final HAI Summary Data Table that will be made publicly available. Thank you for participating in this review, as it helps OHA provide high-quality publicly reported data.

With questions or for help reviewing data, please contact Lisa Iguchi at lisa.c.iguchi@oha.oregon.gov.

DATA INCLUDED IN THE REPORT

The HAI Program exported data from NHSN last on December 28, 2023. Any changes made in NHSN after this date may not be reflected in the report.

Annual data are presented as standardized infection ratios (SIR) for each calendar year, based on the updated 2015 NHSN baseline. 2022 data is included for validation; prior years have already been validated.

Please note that this guidance document is organized according to the format of the HAI Summary Data Table. This process follows the same guidance as the previous year and is intended to simplify the review process for facilities.

DATA IN THE SUMMARY TABLE INCLUDE:

- Hospital Characteristics including:
  - Name
  - Facility Type
  - Facility Location/Unit
  - Hospital Preparedness Program (HPP) Region
- Data reported by HAI measure
  - Central line-associated bloodstream infections (CLABSI)
  - Catheter-associated urinary tract infections (CAUTI)
  - Laboratory-identified *Clostridium difficile* infections (CDI LabID Event)
  - Laboratory-Identified Methicillin-Resistant *Staphylococcus aureus* bloodstream infections (MRSA BSI LabID Event)
  - Surgical site infections (SSI) following
    - Coronary artery bypass graft with chest and donor site incisions (CBGB)
    - Colon surgery (COLO)
    - Hip prosthesis (HPRO)
    - Abdominal hysterectomy (HYST)
    - Knee prosthesis (KPRO)

WHAT TO DO WITH THESE DATA

The data can be viewed directly on the online table, or can be downloaded as a csv or excel file.

We are asking for review of your facility's data for the **2022** calendar year.

You can filter the table to only view data for your facility.
Review each row of data for accuracy. Each row represents annual denominator and numerator data, including the SIR for the calendar year. Facilities can compare these data to both what they reported into NHSN and to the resources they use to collect and report data for these measures (such as operative reports for SSI).

Checkboxes are provided to facilitate the data validation process

- ☐ Regenerate your datasets in NHSN before reviewing the report.
- ☐ Open the hidden link to the summary data table.
- ☐ On the table, use the filters above to search by Hospital Name for the facility you want to view. You can select multiple facilities if needed.
- ☐ If preferred, you can download the datasets from the data table. Click the button on the dashboard to view instructions on how to download the dataset.
- ☐ Review denominator data (depending on infection type this would be the total procedures, device days, patient days, or summary data).
- ☐ Review numerator data (observed infections).
- ☐ Review the predicted number of infections and the SIR. If the denominator and numerator data look as expected, this can be an optional step.
- ☐ Identify any discrepancies between the summary data table and what the facility expects to see based on the data in NHSN. Feel free to contact the HAI Program if you need help identifying, understanding, or resolving issues.
- ☐ Make any needed edits in NHSN to resolve identified discrepancies before the due date provided. After this date, the HAI Program may not be able to accommodate data revisions.

ADDITIONAL STEPS IN NHSN

The following steps will also help to increase the accuracy of the facility's data.

Note that these steps are optional but are helpful to validate the data.

- ☐ Review the Patient Safety Component Annual Hospital Survey and all Monthly Reporting Plans for 2022 to ensure data reported are accurate[i]
- ☐ Review the HAI checklists to help classify reportable events and correctly evaluate NHSN HAI criteria[ii]
- ☐ Review the mapped locations to ensure that all locations are mapped accurately and are appropriately categorized as active or inactive[iii]
- ☐ Review facility users to ensure that each user's rights do not exceed their role regarding NHSN reporting and that those no longer needing access have been inactivated[iv]
- ☐ Run and review eight Data Quality reports[v]
- ☐ Run and review the Unusual Susceptibility Profiles Alert[vi]

- ☐ Review the Issue List, which details known issues with the application[vii]
- ☐ Review the NHSN Toolkit and Guidance for Data Quality Checks for Reporting Facilities: Internal Validation Guidance[viii]
- ☐ Review the Troubleshooting Guides for additional information[ix]

SUPPLEMENTAL REPORT INFORMATION

Details regarding the data included in the HAI Summary Data Table are provided below. Please note that the information provided in this guide are not exhaustive and are not meant to replace a thorough reading of, and precise adherence to, NHSN protocols.[x] Please see the References section on the last page of this document for more information.

HAI MEASURE-SPECIFIC DATA

THE HAI SUMMARY DATA TABLE INCLUDES THE FOLLOWING FIELDS FOR ALL INFECTION TYPES:

- Year: The calendar year of data. The supplemental table will include annual data from 2016 through 2022, sorted in ascending order. For validation purposes, only 2022 is shown by default.
- Hospital Name: The hospital name, as it is licensed by Health Care Regulation and Quality Improvement. Statewide data is presented in aggregate under the 'All Oregon' hospital name. Names by default are sorted alphabetically.
- Hospital Location: The location within the hospital that the data represent. For CLABSI and CAUTI, data are stratified by medical, surgical, and medical/surgical ICUs and wards, including NICUs, as well as in aggregate (All Adult/Ped ICUs & M/S/MS Wards Combined). For MRSA BSI and CDI, data is reported in aggregate as 'facilitywide'. For SSIs, data is reported in aggregate as 'inpatient' as only inpatient procedures are included. For data reported from an inpatient rehab facility, the location is classified as 'Rehabilitation Wards'.
- Infection Type: The HAI measure reportable to OHA via NHSN reporting. There are five main infection types – CLABSI, CAUTI, MRSA BSI, CDI, and SSI. SSIs are stratified further by procedure type and whether the patient fell into the adult or pediatric category.
- Denominator: Differs depending on the infection type; for CLABSI and CAUTI it is the number of device days, for MRSA BSI and CDI it is the number of patient days, and for SSI it is the number of procedures by type.
- Observed Infections: The number of actual infections reported by the facility to NHSN.
- Predicted infections: The number of infections predicted by NHSN, based on 2015 national data
- SIR: The standardized infection ratio, or ratio of observed to predicted infections. If a row of data had fewer than one predicted infections, no SIR will be calculated.
- 95% confidence interval: The 95% confidence interval for the SIR, measuring statistical significance. If a row of data had fewer than one predicted infections, no 95% confidence interval will be calculated.
- Performance compared to HHS target: Whether the HHS goal SIR was met ("HHS_Target_Met").
- SIR Interpretation (2015 US Baseline): Whether there were fewer or more infections than predicted, and if it was statistically significant based on the SIR and 95% confidence interval.
- HPP Region: The hospital preparedness program (HPP) region the hospital resides in. HPP regions are used as part of a regional approach to guide public health preparedness and response activities.

CLABSI AND CAUTI DATA

The summary data table includes CLABSI and CAUTI annual SIR data. If the facility has inpatient rehabilitation facility (IRF) locations, it will have additional rows of data for CAUTI IRF locations.

CLABSI and CAUTI are device-associated infections, and are reportable to OHA only in certain locations, which align with the CMS reporting requirements. Refer to the CMS Location Mapping Checklist (Step 3) for a list of the CDC location codes ("loccdc") of reportable units.[xi] Annual SIR data are presented in aggregate for the facility (All Adult/Ped ICUs & M/S/MS Wards Combined), and by specific location.

Numerator, or 'observed infections', data for CLABSI and CAUTI are presented as the number of infections that occurred during the year in applicable locations and were reported into NHSN by the facility.

Denominator data for CLABSI and CAUTI are presented as device days. These are the number of days during which patients in applicable locations had the device during the year and were reported into NHSN by the facility.

Depending upon the facility, the CLABSI model used to generate the report is the:
-"SIR – Acute Care Hospital CLAB Data,"
-"SIR – Critical Access Hospital CLAB Data," or
-"SIR – Long Term Acute Care CLAB Data."

The data table will not include:

- BSI events where central line = "No"
- Mucosal barrier injury laboratory-confirmed BSI (MBI-LCBI) events
- Data from any location that is not categorized as an adult, pediatric, or neonatal intensive care unit (ICU) or an adult or pediatric medical, surgical, or medical/surgical ward

Depending on the facility, the CAUTI model(s) used to generate the report is the:
-"SIR – Acute Care Hospital CAU Data,"
-"SIR – Critical Access Hospital CAU Data,"
-"SIR – Long Term Acute Care CAU Data," or
-"SIR – Inpatient Rehab Facilities CAU Data."

The data table will not include:

- UTI events where urinary catheter = "Neither"
- Data from any location that is not categorized as an adult or pediatric ICU or an adult or pediatric medical, surgical, medical/surgical, or inpatient rehabilitation ward

MRSA BSI AND CDI LABID DATA

The report includes MRSA BSI and CDI annual SIR data[xii]. MRSA BSI and CDI are LabID Events and are reportable to OHA only in certain locations categorized as "FACWIDEIN" as well as emergency departments, 24-hour observation units, and inpatient rehabilitation facility locations. Annual SIR data for these HAIs are presented on one line for the entire facility; however, if the facility has inpatient rehabilitation facility (IRF) locations, it will have additional rows for MRSA BSI and CDI IRF data.

Numerator, or 'observed infections', data for MRSA BSI and CDI are presented as the number of positive laboratory results that were collected for clinical purposes during the year in applicable locations and were reported into NHSN by the facility.

Denominator data for MRSA BSI and CDI are presented as patient days. These are the number of days spent by patients in applicable locations during the year and reported into NHSN by the facility.

Depending on the facility, the CDI model used to generate the report is the:
-"SIR – Acute Care Hospital CDI Facwide IN LabID Data,"
-"SIR – Critical Access Hospital CDI Facwide IN LabID Data," or
-"SIR – Long Term Acute Care CDI Facwide IN LabID Data."

The report will only include:

- Specimens collected in an inpatient location (in acute-care or critical-access hospitals, these include CMS-certified inpatient rehabilitation [IRF] or psychiatric [IPF] locations with a separate CMS certification number [CCN]), as determined by the standard NHSN category selected by the facility when mapping each location ("loccdc"), in an ED, or in a 24-hour observation location
  - Specimens classified as "healthcare facility-onset" (HO), meaning the specimen collection date was >3 days after the patient's facility admission date (day of admission=Day 1).
  - Incident events, meaning the event occurred >56 days after the most recent CDI LabID Event for that patient that occurred in any applicable location as defined above.

Depending on the facility, the MRSA BSI model used to generate the report is the:
-"SIR – Acute Care Hospital MRSA Blood Facwide IN LabID Data,"
-"SIR – Critical Access Hospital MRSA Blood Facwide IN LabID Data," or
-"SIR – Long Term Acute Care MRSA Blood Facwide IN LabID Data."

The report will only include:

  - MRSA-positive blood specimens
  - Specimens collected in an inpatient location (in acute-care or critical-access hospitals, these do not include CMS-certified IRF or IPF locations with a separate CCN), as determined by the standard NHSN category selected by your facility when mapping each location ("loccdc"), in an ED, or in a 24-hour observation location
  - Specimens classified as "healthcare facility-onset" (HO), meaning the specimen collection date was >3 days after the patient's facility admission date (day of admission=Day 1).
  - Incident events, meaning the patient did not have any prior positive MRSA blood specimen LabID events in the previous 14 days in any applicable location as defined above (specimen collection date=Day 1).

SSI DATA

The data includes SSI annual SIR data for procedures in adult (≥ 18 years of age at the time of the procedure) and pediatric patients. Adult and pediatric data are presented separately as noted under the infection type.

SSI data are procedure-associated infections, and are reportable to OHA following five types of procedures in all facility locations. Annual SIR data for these HAIs are presented as one SIR for each procedure type for all 'inpatient' locations. If there are both adult and pediatric procedures done in the facility, there will be a row for each adult and pediatric SIR.

Numerator, or 'observed infections', data for SSI are presented as the number of infections associated with procedures of a given type (CBGB, COLO, HPRO, HYST, KPRO) carried out during the year and reported into NHSN by the facility.

Denominator data for SSI are presented as the number of procedures of a given type carried out during the year and reported into NHSN by the facility.

The SIR model used to generate the report is the "Complex Admission/Readmission [A/R] SSI Model."

The data will only include:

- Procedure and event data for CBGB, COLO, HPRO, HYST, KPRO
- Inpatient procedures and associated SSIs
- In-plan data
- Deep Incisional Primary SSIs and Organ/Space SSIs
- SSIs identified on admission or readmission to the facility where the procedure was performed

Following NHSN protocol for excluded procedures, the data will not include:

- Superficial incisional secondary (SIS) or deep incisional secondary (DIS) SSIs
- SSIs associated with
  - Outpatient procedures and associated SSIs
- Procedures performed on patients with
  - Gender = "Other"
  - Age at the time of procedure greater than 109 years
  - Body Mass Index (BMI) of less than 12 or greater than 60 in adult patients
  - BMI of less than 10.49 or greater than 65.79 in pediatric patients
- Procedures with
  - Present at time of surgery ("PATOS")=Yes
  - Duration of less than 5 minutes
  - Duration of greater than interquartile range=5
- Procedures with missing data
  - Closure technique
  - ASA score
  - Gender
- Procedures or SSIs reported by facilities with data missing from the Annual Facility Survey
  - Medical affiliation
  - Medical affiliation="Y" and "Medical Type" missing
  - Number of beds

REFERENCES

[i] https://www.cdc.gov/nhsn/pdfs/pscmanual/3psc_monthlyreportingplancurrent.pdf

[ii] https://www.cdc.gov/nhsn/hai-checklists/index.html

[iii] https://www.cdc.gov/nhsn/pdfs/pscmanual/15locationsdescriptions_current.pdf

[iv] https://www.cdc.gov/nhsn/PDFs/slides/NHSN_Getting_Started.pdf

[v] https://www.cdc.gov/nhsn/pdfs/pscmanual/instructions_dq.pdf

[vi] https://www.cdc.gov/nhsn/pdfs/gen-support/usp-alert-current.pdf

[vii] https://www.cdc.gov/nhsn/releasemgt/index.html

[viii] https://www.cdc.gov/nhsn/pdfs/validation/2022/2022-nhsn-iv-for-facilities-508.pdf

[ix] https://www.cdc.gov/nhsn/ps-analysis-resources/reference-guides.html

[x] https://www.cdc.gov/nhsn/acute-care-hospital/index.html

[xi] https://www.cdc.gov/nhsn/pdfs/cms/Location-Mapping-Checklist.pdf

[xii] https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/mrsacdi_tips.pdf