Analyzing Device-Associated HAI Data

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Learning Objectives

- Understand the standardized infection ratio (SIR) and its use in the interpretation of Device-associated data
- Discuss the risk-adjustment methods for SIR Data
- Explain the use of the SIR data and interpretation of the analysis reports
- Review some frequently asked questions (FAQs)
Why Analyze?

- Analysis tools within NHSN help facilitate internal validation activities and help ensure accuracy
- Reports generated from NHSN can help inform prioritization and success of prevention activities
- Data entered into NHSN may be used by: CDC, CMS, your state health department, your corporation, special study groups, etc...
- Know YOUR data!!!!!
A Review: The Standardized Infection Ratio (SIR)

- **SIR** – A summary statistic that compares the number of healthcare-associated infections (HAIs) that were reported to the number of HAIs that were predicted to occur, based on a calculation using data for HAI events that occurred in a given referent time period

\[ SIR = \frac{\text{# observed HAIs}}{\text{# predicted HAIs}} \]
A Review: The Standardized Infection Ratio (SIR)

- **SIR interpretation:**
  - 1 = number of infections reported as would be predicted given the US baseline data
  - Greater than 1 = more infections reported than what would be predicted given the US baseline data
    - SIR of 1.25 = 25% more infections than predicted
  - Less than 1 = fewer infections reported than what would be predicted given the US baseline data
    - SIR of 0.50 = 50% fewer infections than predicted
Basis for Using SIRs and not Rates

- The SIR allows users to summarize data by more than a single stratum (e.g. location or procedure category), adjusting for differences in the incidence of infection among the strata.

- The SIR permits comparisons between the number of infections experienced by a facility, group, or state to the number of infections that were predicted to have occurred based on national data.
Calculating the Number of Predicted Infections

- The number of predicted infections in NHSN is calculated based on the 2015 national HAI aggregate data and adjusted for each facility using variables found to be significant predictors of HAI incidence.

- Negative binomial regression models are used to calculate the number of predicted events for CLABSI, MBI-LCBI, CAUTI, VAE.

<table>
<thead>
<tr>
<th>orgID</th>
<th>ccn</th>
<th>summaryYM</th>
<th>infCount</th>
<th>numPred</th>
<th>numclldays</th>
<th>SIR</th>
<th>SIR_pval</th>
<th>sir95ci</th>
</tr>
</thead>
<tbody>
<tr>
<td>10000</td>
<td>31C0001043</td>
<td>2019M01</td>
<td>0</td>
<td>0.615</td>
<td>769</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
</tbody>
</table>

Remember that NHSN performs this calculation for you.

Using Models for Device-associated Infections

- General Negative Binomial Regression Model:

  \[
  \log(\lambda) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_i X_i , \text{ where:}
  \]

  \[
  \alpha = \text{Intercept} \\
  \beta_i = \text{Parameter Estimate} \\
  X_i = \text{Value of Risk Factor (Categorical variables= 1 if present, 0 if not.)} \\
  i = \text{Number of Predictors}
  \]

Factors Included in the Model: Acute Care Hospitals (ACHs)

<table>
<thead>
<tr>
<th>Factor</th>
<th>CLABSI</th>
<th>CLABSI (NICU)</th>
<th>CAUTI</th>
<th>Total VAE</th>
<th>IVAC Plus</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDC Location</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Facility Type</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Medical School Affiliation*</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Birthweight</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facility Bed size*</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

* Variables taken from the Annual Survey
Device-associated SIR Risk Adjustment
Methods for Calculating the Predicted Number of CLABSI Infections in Acute Care Hospital (non-NICU)

<table>
<thead>
<tr>
<th>Effect</th>
<th>Parameter Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-7.6325</td>
</tr>
<tr>
<td>CDC Location: Adult Critical Care Units, Oncology CC units</td>
<td>0.3257</td>
</tr>
<tr>
<td>CDC Location: Pediatric Critical Care</td>
<td>0.5695</td>
</tr>
<tr>
<td>CDC Location: Burn Critical Care</td>
<td>1.4269</td>
</tr>
<tr>
<td>CDC Location: Trauma Critical Care</td>
<td>0.6287</td>
</tr>
<tr>
<td>CDC Location: Specialty Care Areas</td>
<td>0.3766</td>
</tr>
<tr>
<td>CDC Location: Step-down Units</td>
<td>0.2155</td>
</tr>
<tr>
<td>CDC Location: Select Adult Wards</td>
<td>0.1797</td>
</tr>
<tr>
<td>CDC Location: Oncology Wards</td>
<td>0.3698</td>
</tr>
<tr>
<td>CDC Location Oncology Stem Cell Transplant Wards</td>
<td>0.6876</td>
</tr>
<tr>
<td>CDC Location: Pediatric Wards &amp; Nurseries</td>
<td>0.1912</td>
</tr>
<tr>
<td>CDC Location: All Other Wards</td>
<td>REFERENT</td>
</tr>
<tr>
<td>Effect</td>
<td>Parameter Estimate</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Intercept</td>
<td>-7.6325</td>
</tr>
<tr>
<td>Medical School Affiliation*: Major</td>
<td>0.2627</td>
</tr>
<tr>
<td>Medical School Affiliation*: Graduate</td>
<td>0.1494</td>
</tr>
<tr>
<td>Medical School Affiliation*: Undergraduate/Non-teaching</td>
<td>REFERENT</td>
</tr>
<tr>
<td>Facility Type: Children’s, Military, Veteran’s Affairs, Women’s, Women’s and Children’s</td>
<td>0.1429</td>
</tr>
<tr>
<td>Facility Type: General Acute Care, Oncology, Orthopedic, Psychiatric, Surgical</td>
<td>REFERENT</td>
</tr>
<tr>
<td>Facility Bed Size*: ≥224 Beds</td>
<td>0.2571</td>
</tr>
<tr>
<td>Facility Bed Size*: 94 – 223 Beds</td>
<td>0.1160</td>
</tr>
<tr>
<td>Facility Bed Size*: ≤93 Beds</td>
<td>REFERENT</td>
</tr>
</tbody>
</table>
Example: Applying Risk Model for CLABSI, NHSN 2015

\[ \text{Risk} = \exp(-7.6325 + 0.3257 \times \text{Adult Critical Care and Oncology CC} + 0.5695 \times \text{Pediatric Critical Care} + 1.4269 \times \text{Burn Critical Care} + 0.6287 \times \text{Trauma Critical Care} + 0.3766 \times \text{Specialty Care Areas} + 0.2155 \times \text{Step-down Units} + 0.1797 \times \text{Select Adult Wards} + 0.3798 \times \text{Oncology Wards} + 0.6876 \times \text{Oncology Stem Cell Transplant} + 0.1912 \times \text{Pediatric Wards & Nurseries} + 0.2627 \times \text{Med School Aff: Major} + 0.1494 \times \text{Med School Aff: Graduate} + 0.1429 \times \text{Facility Type: Children’s, Military, VA, Women’s and Children’s} + 0.2571 \times \text{Facility Bed Size ≥224 Beds} + 0.1160 \times \text{Facility Bed Size 94-223 Beds}) \times \text{numCLDays} \]

* For these risk factors, if present = 1; if not = 0
Example: Applying Risk Model for CLABSI, NHSN 2015

- Facility Profile:
  - 215-beds
  - General Acute Care Hospital
  - Graduate Teaching Facility
  - Reporting for:
    - Medical Cardiac Critical Care
    - With 565 central line days for January 2019
Example: Applying Risk Model for CLABSI, NHSN 2015

\[ \text{exp}(-7.6325 + 0.3257 \times (1) + 0.5695 \times (0) + 1.4269 \times (0) + 0.6287 \times (0) + 0.3766 \times (0) + 0.2155 \times (0) + 0.1797 \times (0) + 0.3698 \times (0) + 0.6876 \times (0) + 0.1912 \times (0) + 0.2627 \times (0) + 0.1494 \times (1) + 0.1429 \times (0) + 0.2571 \times (0) + 0.1160 \times (1)) \times \text{565 Central line days} \]

\[ 0.494 = \text{predicted CLABSI events for the month of January} \]

* For these risk factors, if present = 1; if not = 0
Example: Applying Risk Model for CLABSI, NHSN 2015

\[ \text{0.494} = \text{predicted CLABSI events for the month of January} \]

* For these risk factors, if present = 1; if not = 0
Your hospital has been measuring CLABSI using SIRs and you have noticed a difference of your number predicted from month to month. Primarily, what factor would largely contribute to variations in the number predicted from month to month?

<table>
<thead>
<tr>
<th>CDC Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Beds</td>
</tr>
<tr>
<td>Number of Central lines</td>
</tr>
<tr>
<td>Medical School Affiliation</td>
</tr>
</tbody>
</table>
Knowledge Check: Your hospital has been measuring CLABSI using SIRs and you have noticed a difference of your number predicted from month to month. Primarily, what factor would largely contribute to variations in the number predicted from month to month?

- Central line days
- The parameter estimates for CLABSI model:
  - CDC Location – rarely changes
  - Facility bed size – changes, if any, per year
  - Facility Type – rarely changes
  - Medical school affiliation – changes, if any, per year
  - Central line days – multiplier that changes every month
SIR Tables in NHSN
Generate Data sets

- Always generate your datasets before analyzing your data

**Generate Patient Safety Analysis Data Sets**

Datasets generated will include data for the 3 most recent full calendar years up until today’s date for the Patient Safety Component. To include all years check the box below.

For all other components, datasets generated will include all years. Note that any analysis options you run will be limited to the time period shown on the date range bar.

- Include all data reported to NHSN for this component within the parameters of rights conferred.

[Generate New]  
Last Generated: Feb 26 2019 12:28PM
Device Associated Reports in NHSN

- Device-Associated (DA) Module
  - Central Line-Associated BSI
  - Mucosal Barrier Injury (CLABSI)
  - Ventilator-Associated PNEU
  - Ventilator-Associated Events
  - Pediatric Ventilator-Associated Events
  - Urinary Catheter-Associated UTI
  - Central Line Insertion Practices
- Procedure-Associated (PA) Module
- HAI Antimicrobial Resistance (DA+PA Modules)
- Antimicrobial Use and Resistance Module
- MDRO/CDI Module - LABID Event Reporting
- MDRO/CDI Module - Infection Surveillance
- MDRO/CDI Module - Process Measures
- MDRO/CDI Module - Outcome Measures
- CMS Reports
  - Acute Care Hospitals (Hospital IQR)
  - Critical Access Hospitals (Hospital IQR)
  - Inpatient Rehabilitation Facilities (IRFQR)
  - Long Term Acute Care Hospitals (LTCHQR)
  - PPS-Exempt Cancer Hospitals (PCHQR)

Baseline Set 1
- DA - Central Line Associated BSI
- DA - Ventilator-Associated VAE
- DA - Urinary Catheter-Associated UTI
- PA - SSI
- MDRO/CDI - LabID Events
- CMS - Acute Care Hospitals (Hospital IQR)
- CMS - Inpatient Rehabilitation Facilities (IRFQR)
- CMS - Long Term Acute Care Hospitals (LTCHQR)
- CMS - PPS-Exempt Cancer Hospitals (PCHQR)
- TAP - Acute Care Hospitals (ACHs)
- TAP - Inpatient Rehabilitation Facilities (IRFs)
- TAP - Long Term Acute Care Hospitals (LTACHs)
- Advanced - Procedure-Level Data
Standardized Infection Ratio (SIR) Table
Standardized Infection Ratio (SIR) Table

- **Report Modification**: For the purpose of this example, the modifications that have been made are: *summaryYr was set to 2018*, filtered by Critical Care (CC) locationType, and the report grouped by summaryYH.
Standardized Infection Ratio (SIR) Table

- **Report Modification**: For the purpose of this example, the modifications that have been made are: summaryYr was set to 2018, filtered by **Critical Care (CC) locationType**, and the report grouped by summaryYH.
Standardized Infection Ratio (SIR) Table

- **Report Modification**: For the purpose of this example, the modifications that have been made are: `summaryYr` was set to 2018, filtered by Critical Care (CC) `locationType`, and the report grouped by `summaryYH`.
Standardized Infection Ratio (SIR) Table

### Output/Results

**National Healthcare Safety Network**

**SIR for Central Line-Associated BSI Data for Acute Care Hospitals (2015 baseline) - By OrgID**

As of: February 26, 2019 at 2:20 PM

Date Range: BS2 CLAB RATESALL summaryYr 2018 to 2018

<table>
<thead>
<tr>
<th>orgID</th>
<th>ccn</th>
<th>summaryYH</th>
<th>infCount</th>
<th>numPred</th>
<th>numcldays</th>
<th>SIR</th>
<th>SIR_pval</th>
<th>sir95ci</th>
</tr>
</thead>
<tbody>
<tr>
<td>10000</td>
<td>31C0001043</td>
<td>2018H1</td>
<td>6</td>
<td>1.715</td>
<td>2038</td>
<td>3.498</td>
<td>0.0103</td>
<td>1.418, 7.276</td>
</tr>
<tr>
<td>10000</td>
<td>31C0001043</td>
<td>2018H2</td>
<td>5</td>
<td>1.432</td>
<td>2077</td>
<td>3.492</td>
<td>0.0191</td>
<td>1.279, 7.740</td>
</tr>
</tbody>
</table>

1. This report includes CLABSI data from acute care hospitals for 2015 and forward excluding MBI events. For 2019 and forward, this report also excludes ECMO and VAD events.
2. The SIR is only calculated if the number predicted (numPred) is >= 1. Lower bound of 95% Confidence Interval only calculated when number of observed events > 0.
3. The number of predicted events is calculated based on national aggregate NHSN data from 2015. It is risk adjusted for CDC location, hospital beds, medical school affiliation type and facility Type.
4. If the risk factor data are missing, the record will be excluded from the SIR.

Source of aggregate data: 2015 NHSN CLABSI Data

Data contained in this report were last generated on February 26, 2019 at 12:28 PM.
This facility reported 6 central line-associated BSI (infCount) for CC or critical care units during the first half of 2018. This is the observed number of CLABSIs.

The overall SIR for this facility during this time period is 3.498, indicating that this facility observed more infections than predicted. The number of CLABSIs predicted to occur for the first half of 2018 is 1.715 and 1.432 for the second half.

An SIR will only be calculated if the number of predicted infections is ≥ 1.
Interpreting your SIR Report : SIR p-value

- SIR p-value is a statistical measure that tells you if the observed number of infections is significantly different from what was predicted.

- P-value less than 0.05 indicates that the number of observed CLABSI is statistically significantly different (higher or lower) from the number predicted.

- In this example, the p-value for the 2018H1 SIR is less than 0.05 and thus there is significant difference between the number of infections observed and the number of infections predicted.

<table>
<thead>
<tr>
<th>orgID</th>
<th>summaryYH</th>
<th>infCount</th>
<th>numPred</th>
<th>numcldays</th>
<th>SIR</th>
<th>SIR_pval</th>
<th>sir95ci</th>
</tr>
</thead>
<tbody>
<tr>
<td>10000</td>
<td>2018H1</td>
<td>6</td>
<td>1.715</td>
<td>2038</td>
<td>3.498</td>
<td>0.0103</td>
<td>1.418, 7.276</td>
</tr>
<tr>
<td>10000</td>
<td>2018H2</td>
<td>5</td>
<td>1.432</td>
<td>2077</td>
<td>3.492</td>
<td>0.0191</td>
<td>1.279, 7.740</td>
</tr>
</tbody>
</table>
Interpreting your SIR Report: SIR Confidence Interval

The 95% Confidence interval is a range of values in which the true SIR is thought to lie.

If the confidence interval includes the value of 1, then the SIR is not significant (the number of observed infections is not significantly different from the number predicted, using the same convenient cut point).

<table>
<thead>
<tr>
<th>orgID</th>
<th>summaryYH</th>
<th>infCount</th>
<th>numPred</th>
<th>numcldays</th>
<th>SIR</th>
<th>SIR_pval</th>
<th>sir95ci</th>
</tr>
</thead>
<tbody>
<tr>
<td>10000</td>
<td>2018H1</td>
<td>6</td>
<td>1.715</td>
<td>2038</td>
<td>3.498</td>
<td>0.0103</td>
<td>1.418, 7.276</td>
</tr>
<tr>
<td>10000</td>
<td>2018H2</td>
<td>5</td>
<td>1.432</td>
<td>2077</td>
<td>3.492</td>
<td>0.0191</td>
<td>1.279, 7.740</td>
</tr>
</tbody>
</table>
Interpreting your SIR Report: SIR Confidence Interval

- If the confidence interval includes the value of 1, then the SIR is not significant
  - i.e., if the lower bound is \( \leq 1 \) and the upper bound is \( \geq 1 \), then the SIR is not significant
An SIR will be calculated as long as the number of predicted infections is >.05.
Knowledge Check: An SIR will be calculated as long as the number of predicted infections is > .05.

- False: The SIR will only be calculated if the number of predicted infections is ≥ 1
- This rule was instituted to avoid the calculation and interpretation of statistically imprecise SIRs, which typically have extreme values
CAUTI (and CLABSI) SIR Reports in NHSN

- SIR Outputs will include 5 tables:
  1. Overall SIR for the facility
  2. SIR by location type
  3. SIR by CDC location
  4. SIR by individual locations
  5. Data Not Included in the SIR
CAUTI (and CLABSI) SIR Output - Table 1

- This table will include all the units for which your hospital reported data during that time period.
- For this example we used the Display Option by ‘Cumulative’

National Healthcare Safety Network
SIR for Catheter-Associated UTI Data for Acute Care Hospitals (2015 baseline) - By OrgID
As of: March 12, 2019 at 1:12 PM
Date Range: BS2_CAU_RATESICU_SCA summaryYr 2018 to 2018
if (((CCN = "12345" )))

<table>
<thead>
<tr>
<th>orgID</th>
<th>ccn</th>
<th>summaryYr</th>
<th>infCount</th>
<th>numPred</th>
<th>numucathdays</th>
<th>SIR</th>
<th>SIR_pval</th>
<th>sir95ci</th>
</tr>
</thead>
<tbody>
<tr>
<td>10018</td>
<td>12345</td>
<td>2018</td>
<td>1</td>
<td>4.097</td>
<td>3086</td>
<td>0.244</td>
<td>0.1013</td>
<td>0.012, 1.204</td>
</tr>
</tbody>
</table>
### CAUTI (and CLABSI) SIR Output - Table 2

- This table produces an SIR for each Location Type (e.g. ICUs, WARDS)

**National Healthcare Safety Network**

**SIR for Catheter-Associated UTI Data for Acute Care Hospitals (2015 baseline) - By OrgID/Location Type**

As of: March 12, 2019 at 1:12 PM
Date Range: BS2_CAU_RATESICU_SCA summaryYr 2018 to 2018
if (((CCN = "12345") )

<table>
<thead>
<tr>
<th>orgID</th>
<th>ccn</th>
<th>locationType</th>
<th>summaryYr</th>
<th>infCount</th>
<th>numPred</th>
<th>numucathdays</th>
<th>SIR</th>
<th>SIR_pval</th>
<th>sir95ci</th>
</tr>
</thead>
<tbody>
<tr>
<td>10018</td>
<td>12345</td>
<td>CC</td>
<td>2018</td>
<td>0</td>
<td>3.648</td>
<td>2780</td>
<td>0.000</td>
<td>0.0261</td>
<td>0.821</td>
</tr>
<tr>
<td>10018</td>
<td>12345</td>
<td>CC_ONC</td>
<td>2018</td>
<td>0</td>
<td>0.045</td>
<td>40</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>10018</td>
<td>12345</td>
<td>OTHER</td>
<td>2018</td>
<td>0</td>
<td>0.049</td>
<td>25</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>10018</td>
<td>12345</td>
<td>WARD</td>
<td>2018</td>
<td>1</td>
<td>0.354</td>
<td>240</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>10018</td>
<td>12345</td>
<td>WARD_ONC</td>
<td>2018</td>
<td>0</td>
<td>0.002</td>
<td>1</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
</tbody>
</table>
CAUTI (and CLABSI) SIR Output - Table 3

- This table produces an SIR for each CDC location type that has CAUTI data entered in the facility.

National Healthcare Safety Network
SIR for Catheter-Associated UTI Data for Acute Care Hospitals (2015 baseline) - By OrgID/CDC Location Code
As of: March 12, 2019 at 1:12 PM
Date Range: BS2_CAU_RATESICU_SCA summaryYr 2018 to 2018
if (!is.na(CCN = "12345") )

<table>
<thead>
<tr>
<th>orgID</th>
<th>ccn</th>
<th>loccdc</th>
<th>summaryYr</th>
<th>infCount</th>
<th>numPred</th>
<th>numucathdays</th>
<th>SIR</th>
<th>SIR_pval</th>
<th>sir95ci</th>
</tr>
</thead>
<tbody>
<tr>
<td>10018</td>
<td>12345</td>
<td>IN:ACUTE:CC:C</td>
<td>2018</td>
<td>0</td>
<td>0.200</td>
<td>125</td>
<td>.</td>
<td>.</td>
<td></td>
</tr>
<tr>
<td>10018</td>
<td>12345</td>
<td>IN:ACUTE:CC:CT</td>
<td>2018</td>
<td>0</td>
<td>0.130</td>
<td>100</td>
<td>.</td>
<td>.</td>
<td></td>
</tr>
<tr>
<td>10018</td>
<td>12345</td>
<td>IN:ACUTE:CC:CT_PED</td>
<td>2018</td>
<td>0</td>
<td>0.199</td>
<td>200</td>
<td>.</td>
<td>.</td>
<td></td>
</tr>
<tr>
<td>10018</td>
<td>12345</td>
<td>IN:ACUTE:CC:M</td>
<td>2018</td>
<td>0</td>
<td>2.982</td>
<td>2250</td>
<td>0.000</td>
<td>0.0507</td>
<td>1.005</td>
</tr>
<tr>
<td>10018</td>
<td>12345</td>
<td>IN:ACUTE:CC:MS</td>
<td>2018</td>
<td>0</td>
<td>0.137</td>
<td>105</td>
<td>.</td>
<td>.</td>
<td></td>
</tr>
<tr>
<td>10018</td>
<td>12345</td>
<td>IN:ACUTE:CC:ONC_M</td>
<td>2018</td>
<td>0</td>
<td>0.045</td>
<td>40</td>
<td>.</td>
<td>.</td>
<td></td>
</tr>
<tr>
<td>10018</td>
<td>12345</td>
<td>IN:ACUTE:WARD:STRK</td>
<td>2018</td>
<td>0</td>
<td>0.021</td>
<td>10</td>
<td>.</td>
<td>.</td>
<td></td>
</tr>
<tr>
<td>10018</td>
<td>12345</td>
<td>IN:NONACUTE:LTC</td>
<td>2018</td>
<td>0</td>
<td>0.049</td>
<td>25</td>
<td>.</td>
<td>.</td>
<td></td>
</tr>
</tbody>
</table>
CAUTI (and CLABSI) SIR Output- Table 4

- This table produces an SIR for each individual location that has CAUTI data entered in the facility.

<table>
<thead>
<tr>
<th>orgid</th>
<th>ccn</th>
<th>location</th>
<th>summaryYr</th>
<th>months</th>
<th>infcount</th>
<th>numPred</th>
<th>numucathdays</th>
<th>SIR</th>
<th>SIR_pval</th>
<th>SIR95CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>10018</td>
<td>12345</td>
<td>1152BHV</td>
<td>2018</td>
<td>1</td>
<td>0</td>
<td>0.095</td>
<td>30</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>10018</td>
<td>12345</td>
<td>3- WEST</td>
<td>2018</td>
<td>1</td>
<td>0</td>
<td>0.199</td>
<td>200</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>10018</td>
<td>12345</td>
<td>3E</td>
<td>2018</td>
<td>1</td>
<td>0</td>
<td>0.175</td>
<td>150</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>10018</td>
<td>12345</td>
<td>MD WARD</td>
<td>2018</td>
<td>1</td>
<td>1</td>
<td>0.065</td>
<td>50</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>10018</td>
<td>12345</td>
<td>MICU</td>
<td>2018</td>
<td>1</td>
<td>0</td>
<td>2.982</td>
<td>2250</td>
<td>0.000</td>
<td>0.0507</td>
<td>1.005</td>
</tr>
<tr>
<td>10018</td>
<td>12345</td>
<td>ONC M</td>
<td>2018</td>
<td>1</td>
<td>0</td>
<td>0.045</td>
<td>40</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>10018</td>
<td>12345</td>
<td>P_HSCT</td>
<td>2018</td>
<td>1</td>
<td>0</td>
<td>0.002</td>
<td>1</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
</tbody>
</table>
CAUTI (and CLABSI) SIR Output- Table 5

- This table produces a list of the locations that are not included in the SIR (e.g. missing data or outpatient locations)

<table>
<thead>
<tr>
<th>orgID</th>
<th>ccn</th>
<th>locationType</th>
<th>location</th>
<th>infcount</th>
<th>numucathdays</th>
</tr>
</thead>
<tbody>
<tr>
<td>10018</td>
<td>12345</td>
<td>SCA</td>
<td>IN:ACUTE:SCA:DIAL_PED</td>
<td>3U</td>
<td>0</td>
</tr>
<tr>
<td>10018</td>
<td>12345</td>
<td>OTHER</td>
<td>OUT:ACUTE:ED</td>
<td>454</td>
<td>0</td>
</tr>
<tr>
<td>10018</td>
<td>12345</td>
<td>OTHER</td>
<td>OUT:ACUTE:ED</td>
<td>454</td>
<td>0</td>
</tr>
</tbody>
</table>
Rate Tables

- Pooled means will **no longer appear** in the default device-associated rate tables for 2015 data and forward

### National Healthcare Safety Network

**Rate Table for Catheter-Associated UTI Data for ICU-Other/SCA/ONC**

As of: February 7, 2018 at 8:07 AM
Date Range: BS2_CAU_RATE SICU_SCA summaryYear 2017 to 2017

<table>
<thead>
<tr>
<th>location</th>
<th>summaryYM</th>
<th>CAUCOUNT</th>
<th>numcathdays</th>
<th>CAURate</th>
<th>numpatdays</th>
<th>CathDU</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 CENTRAL</td>
<td>2017M02</td>
<td>0</td>
<td>55</td>
<td>0.000</td>
<td>345</td>
<td>0.159</td>
</tr>
<tr>
<td>3 CENTRAL</td>
<td>2017M04</td>
<td>2</td>
<td>85</td>
<td>23.529</td>
<td>800</td>
<td>0.106</td>
</tr>
<tr>
<td>3 CENTRAL</td>
<td>2017M05</td>
<td>1</td>
<td>90</td>
<td>11.111</td>
<td>900</td>
<td>0.100</td>
</tr>
<tr>
<td>3 CENTRAL</td>
<td>2017M06</td>
<td>3</td>
<td>90</td>
<td>33.333</td>
<td>700</td>
<td>0.129</td>
</tr>
</tbody>
</table>

Data contained in this report were last generated on February 6, 2018 at 8:19 AM.
Beginning January 2015, the CAUTI definition excludes all non-bacterial pathogens and therefore, the number of CAUTIs reported in 2015 and forward may be lower than in previous years.
### National Healthcare Safety Network

**Medical Ward SIR compared to 1**

As of: March 7, 2019 at 9:07 AM

<table>
<thead>
<tr>
<th>Med Ward Number Observed</th>
<th>Med Ward Number Expected</th>
<th>SIR</th>
<th>SIR p-value</th>
<th>SIR95CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1.278</td>
<td>1.565</td>
<td>0.5032</td>
<td>0.262, 5.170</td>
</tr>
</tbody>
</table>

- Compare Two Proportions
- Compare Single SIR to 1
- Compare Two Standardized Infection Ratios
- Compare Two Incidence Density Rates
- Compare Single Proportion to a Benchmark
- Compare Single SIR to Nominal Value
FAQs
FAQs

- NHSN, when running my DA SIR reports, I am unable to find a CLABSIs that was entered in February 2019.
  - I have generated my datasets. It should be present!
  - Missing a CLABSIs from my Medical Ward (NSICU) that appear in our line list but not in any of the SIR reports.

Can you tell me what is going on?
FAQs

- Review CLABSI protocol for changes to reporting measures
- Modify CLABSI line list to incorporate additional variables
Identifying excluded events

- CLABSI events that are identified as MBI-LCBI, ECMO, and VAD will be excluded from CLABSI numerator
- MBI-LCBI reports used for analyzing MBI-LCBI events
Running the MBI-LCBI reports

![Mucosal Barrier Injury CLABSI]
- Line Listing - All MBI CLABSI Events
- Frequency Table - All MBI CLABSI Events
- Bar Chart - All MBI CLABSI Events
- Pie Chart - All MBI CLABSI Events
- Rate Table - MBI-CLABSI Data (ICU/Other)
- Run Chart - MBI-CLABSI Data (ICU/Other)
- Rate Table - MBI-CLABSI Data (NICU)
- Run Chart - MBI-CLABSI Data (NICU)
- Rate Table - MBI-CLABSI Data (SCA/ONC)
- Run Chart - MBI-CLABSI (SCA/ONC)
- SIR - Acute Care MBI-CLABSI Data

National Healthcare Safety Network
SIR for MBI-CLABSI Data (2015 Data) - By OrgID
As of: March 5, 2019 at 11:47 AM
Date Range: All BS2 CLAB MBI RATESALL

<table>
<thead>
<tr>
<th>orgID</th>
<th>ccn</th>
<th>summaryYQ</th>
<th>infCount</th>
<th>numPred</th>
<th>numclidays</th>
<th>SIR</th>
<th>SIR_pval</th>
<th>sir95ci</th>
</tr>
</thead>
<tbody>
<tr>
<td>10000</td>
<td>31C0001043</td>
<td>2019M1</td>
<td>1</td>
<td>0.250</td>
<td>150</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>10000</td>
<td>31C0001043</td>
<td>2019M2</td>
<td>1</td>
<td>0.320</td>
<td>360</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
</tbody>
</table>

Fabricated data
FAQs

- NHSN, when running my CMS IQR SIR reports, I am unable to find a CAUTI that was entered in January 2019.
  - Datasets have been generated.
  - Missing a CAUTI that appears in our Device-associated CAUTI SIR report but not in the CAUTI IQR SIR report.

Can you tell me why this CAUTI is not appearing in my reports?
Identifying excluded event/location

- Identify the excluded event and determine location of event
- Event occurred in the Telemetry ward, which is not a location that will be included in the CMS IQR report for CAUTI
## Hospital IQR reports for CLABSI and CAUTI

<table>
<thead>
<tr>
<th>CLABSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Q1 2011 - adult, pediatric, and neonatal ICUs</td>
</tr>
<tr>
<td>Start Q1 2015 - adult and pediatric medical, surgical, and medical/surgical wards</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAUTI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Q1 2012 - adult and pediatric ICUs</td>
</tr>
<tr>
<td>Start Q1 2015 - adult and pediatric medical, surgical, and medical/surgical wards</td>
</tr>
</tbody>
</table>
What changes can potentially impact my SIRs?

- Entry or deletion of events
- Changes to number of patient days, device days, admissions
- Removal or addition to monthly reporting plans
- Changes to relevant factors in the annual survey (e.g., medical school affiliation, facility bedsize)
- Resolution of “Report No Events” alerts
Summary

- These are YOUR data – know what your data says about your facility
- Understand the data that derive your analytic results
- Understand how you can customize the reports in NHSN to give you the data you need
- Data from your facility can help drive prevention measures and reduce HAI burden
Device Associated Analysis Resources

- Analysis Resources: [https://www.cdc.gov/nhsn/ps-analysis-resources/index.html](https://www.cdc.gov/nhsn/ps-analysis-resources/index.html)
- NHSN Analysis Training: [https://www.cdc.gov/nhsn/training/analysis/index.html](https://www.cdc.gov/nhsn/training/analysis/index.html)

Help with any analysis outputs: email [NHSN@cdc.gov](mailto:NHSN@cdc.gov)
Thank you!

NHSN@cdc.gov

For more information, contact CDC
1-800-CDC-INFO (232-4636)

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.