



# Analyzing Device-Associated HAI Data

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# Learning Objectives

- Describe the Standardized Infection Ratio (SIR) and its use in the interpretation of device-associated data
- Discuss the risk-adjustment methods for Device-Associated SIR calculation
- Explain the use of the SIR data and the analysis reports
- Answer some frequently asked questions (FAQs)

# Why analyze HAI data?

- Analysis tools within NHSN help facilitate internal validation activities and help ensure accuracy
- Results generated from NHSN reports can help inform prioritization and success of prevention activities
- Data entered in NHSN may be used by: CDC, CMS, state health departments, corporations, special study groups, etc.

# What is the Standardized Infection Ratio (SIR)?

- 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 (2015)

$$\text{SIR} = \frac{\# \text{ Observed HAIs}}{\# \text{ Predicted HAIs}}$$

# How to interpret the SIR?

- 1 = number of infections reported as would be predicted given the U.S. baseline data
- Greater than 1 = more infections reported than what would be predicted given the U.S. baseline data
  - SIR of 1.50 = 50% more infections than predicted
- Less than 1 = fewer infections reported than what would be predicted given the U.S. baseline data
  - SIR of 0.75 = 25% fewer infections than predicted

# Number predicted less than 1.0

- SIR is only calculated when the number of predicted infections is at least 1.0
- When the predicted number of infections is less than 1.0, facilities have a few options for reviewing and interpreting HAI data in NHSN
  - A longer time period
  - Rates can be used
  - Run the TAP Reports to Review the CAD (cumulative attributable difference, which is the difference between the number of observed infections and the number of predicted infections, multiplied by the SIR)

# Why SIRs and not rates?

- SIR allows users to summarize data by more than a single stratum (e.g. location/unit)
  - Adjusts for differences in the incidence of infection among strata
  - Adjusts for various facility and/or patient-level factors that contribute to HAI risk within each facility
- 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
- Pooled mean rates cannot reflect differences in risk between populations

# Calculating the Number of Predicted Infections

- The number of predicted infections in NHSN is calculated based on the 2015 national HAI aggregate 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
- Negative binomial regression models are used when estimating incidence from a summarized population (e.g., CLABSIs in a Medical ICU)



# Using Models for Device-associated Infections

- General Negative Binomial Regression Model:

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

$\alpha$  = Intercept

$\beta_i$  = Parameter Estimate

$X_i$  = Value of Risk Factor (Categorical variables= 1 if present, 0 if not.)

$i$  = Number of Predictors

# General Negative binomial Regression Model

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

$\alpha$  = Intercept

$\beta_i$  = Parameter Estimate

$X_i$  = Value of Risk Factor (Categorical variables= 1 if present, 0 if not.)

$i$  = Number of Predictors

- For most variables shown in parentheses in the equation above, you would replace the variable name (and therefore multiply each parameter estimate) with a “1” or “0” depending on whether that factor is present in your facility (Yes=“1”, No =“0”)

# Factors Included in the Device-Associated Models: Acute Care Hospitals (ACHs)

Factor	CLABSI	CLABSI (NICU)	CAUTI	Total VAE	IVAC Plus
CDC Location	✓		✓	✓	✓
Facility Type	✓		✓	✓	
Medical School Affiliation*	✓		✓	✓	✓
Birthweight		✓			
Facility Bed size*	✓		✓	✓	✓

\*Variables taken from the Annual Survey

# Device-associated SIR Risk Adjustment

CAUTI

# Methods for Calculating the Predicted Number of CAUTI Infections in Acute Care Hospital

Effect	Parameter Estimate
Intercept	-10.2667
CDC Location Code: Burn Critical Care	3.3318
CDC Location Code: Cardiac Critical Care	2.5703
CDC Location Code: Medical Critical Care	2.3834
CDC Location Code: Surgical Critical Care	2.7034
CDC Location Code: Trauma Critical Care	3.1104
CDC Location Code: Neurologic Critical Care	3.3675
CDC Location Code: Neurologic Ward	2.8223
CDC Location Code: Surgical Ward	2.2532
CDC Location Code: Gynecology Ward	REFERENT

# Methods for Calculating the Predicted Number of CAUTI Infections in Acute Care Hospital (cont.)

Effect	Parameter Estimate
Intercept	-10.2667
Medical Affiliation*: Major	0.3744
Medical Affiliation*: Graduate	0.1313
Medical Affiliation*: Undergraduate/Non-teaching	REFERENT
Facility bed size*: $\geq 215$ beds	0.4901
Facility bed size*: 87-214 beds	0.2871
Facility bed size*: $\leq 86$ beds	REFERENT
Facility Type: General Acute Care Hospital	0.3927
Facility Type: Children's Hospital	0.4888
Facility Type: Surgical Hospital	REFERENT

\*Variables taken from the Annual Survey

# EXAMPLE 1: Applying Risk Model for CAUTI, NHSN 2015

$$\begin{aligned} &= \exp(-10.2667 + \\ &3.3318 * (\text{Burn Critical Care}^*) + \\ &2.5703 * (\text{Cardiac Critical Care}^*) + \\ &2.3834 * (\text{Medical Critical Care}^*) + \\ &3.1104 * (\text{Trauma Critical Care}^*) + \\ &2.7034 * (\text{Surgical Critical Care}^*) + \\ &3.3675 * (\text{Neurologic Critical Care}^*) + \\ &2.8223 * (\text{Neurologic Ward}^*) + \\ &0.3744 * (\text{Med School Aff: Major})^* + \\ &0.1313 * (\text{Med School Aff: Graduate})^* + \\ &0.4901 * (\text{Facility Bed Size} \geq 215 \text{ Beds})^* + \\ &0.2871 * (\text{Facility Bed Size } 87\text{-}214 \text{ Beds})^* + \\ &0.3927 * (\text{Facility Type: General Acure Care Hospital})^* + \\ &0.4888 * (\text{Facility Type: Children's Hospital})^* ) * \text{urinary catheter days} \end{aligned}$$

Effect	Parameter Estimate
Intercept	-10.2667
CDC Location Code: Burn Critical Care	3.3318
CDC Location Code: Cardiac Critical Care	2.5703
CDC Location Code: Medical Critical Care	2.3834
CDC Location Code: Surgical Critical Care	2.7034
CDC Location Code: Trauma Critical Care	3.1104
CDC Location Code: Neurologic Critical Care	3.3675
CDC Location Code: Neurologic Ward	2.8223
CDC Location Code: Surgical Ward	2.2532
CDC Location Code: Gynecology Ward	REFERENT

\* For these risk factors, if present = 1; if not = 0

# REMEMBER!

- The device-associated models are applied for each individual location
- Therefore, the only location-related parameter estimate that counts is the one linked to the location of interest



## Example 2: Applying Risk Model for CAUTI, NHSN 2015

- Facility Profile:
  - 202 beds
  - General Acute Care Hospital
  - Graduate Teaching Facility
  - Reporting for:
    - Burn Critical Care
  - With 636 urinary catheter days for January 2023

# Example 3: Applying Risk Model for CAUTI, NHSN 2015

$$\begin{aligned}
 &= \exp(-10.2667 + \\
 &3.3318*(1) + \\
 &2.5703*(0) + \\
 &2.3834*(0) + \\
 &3.1104*(0) + \\
 &2.7034*(0) + \\
 &3.3675*(0) + \\
 &2.8223*(0) + \\
 &0.3744*(0) + \\
 &0.1313*(1) + \\
 &0.4901*(0) + \\
 &0.2871*(1) + \\
 &0.3927*(1) + \\
 &0.4888*(0)) \quad \times \quad 636 \text{ urinary catheter days}
 \end{aligned}$$

Effect	Parameter Estimate
Intercept	-10.2667
CDC Location Code: Burn Critical Care	3.3318
CDC Location Code: Cardiac Critical Care	2.5703
CDC Location Code: Medical Critical Care	2.3834
CDC Location Code: Surgical Critical Care	2.7034
CDC Location Code: Trauma Critical Care	3.1104
CDC Location Code: Neurologic Critical Care	3.3675
CDC Location Code: Neurologic Ward	2.8223
CDC Location Code: Surgical Ward	2.2532
CDC Location Code: Gynecology Ward	REFERENT

Effect	Parameter Estimate
Intercept	-10.2667
Medical Affiliation*: Major	0.3744
Medical Affiliation*: Graduate	0.1313
Medical Affiliation*: Undergraduate/Non-teaching	REFERENT
Facility bed size*: ≥ 215 beds	0.4901
Facility bed size*: 87-214 beds	0.2871
Facility bed size*: ≤ 86 beds	REFERENT
Facility Type: General Acute Care Hospital	0.3927
Facility Type: Children's Hospital	0.4888
Facility Type: Surgical Hospital	REFERENT

\* For these risk factors, if present = 1; if not = 0

# Calculating the CAUTI Number Predicted

= [ exp (-10.2667 + 3.3318\*(1) + 0.1313\*(1) + 0.2871\*(1) + 0.3927\*(1) ) ] \* 636  
urinary catheter days

= [exp (-6.1238)] \* 636 urinary catheter days

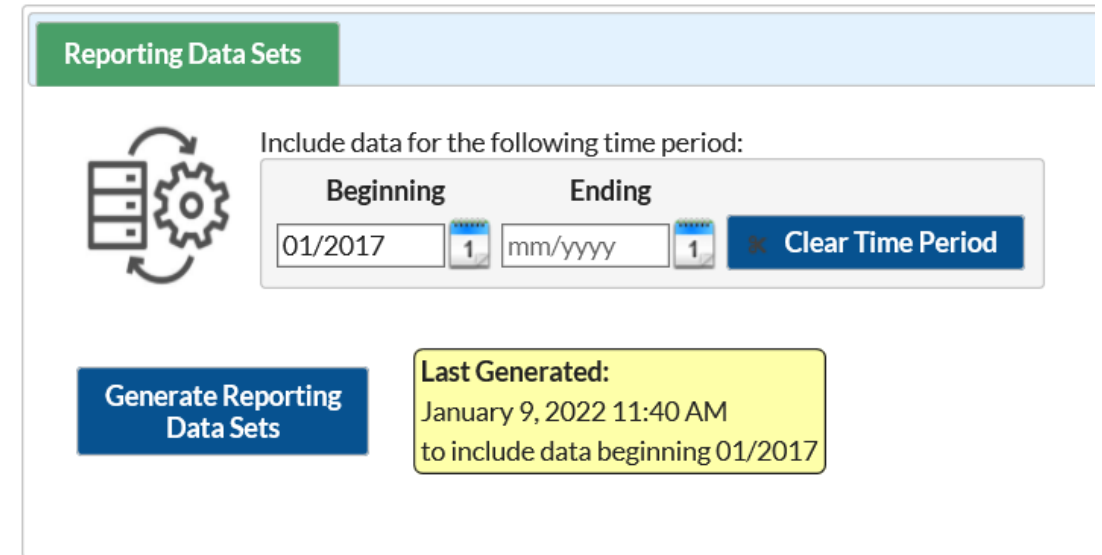
=0.002190117 \* 636 urinary catheter days

=1.392 predicted CAUTIs for January 2023 in Burn CC

# SIR Reports in NHSN

# Generate Datasets

- Always generate your datasets before analyzing your data!!
- Freeze your NHSN data at a specific point in time
  - Copy those data into defined datasets
- Datasets are user-specific
  - Each user in NHSN who wishes to analyze data must generate datasets



The screenshot shows a web interface titled "Reporting Data Sets". It features a green header bar with the title. Below the header, there is a circular icon with a server rack and a gear. To the right of the icon, the text reads "Include data for the following time period:". Below this text, there are two input fields: "Beginning" with the value "01/2017" and "Ending" with the value "mm/yyyy". Both fields have a calendar icon and a "1" in a small box. To the right of these fields is a blue button labeled "Clear Time Period". Below the time period selection, there is a blue button labeled "Generate Reporting Data Sets". To the right of this button is a yellow box containing the text "Last Generated: January 9, 2022 11:40 AM to include data beginning 01/2017".

# Device-Associated Reports in NHSN

Expand All Collapse All Search

- 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
- COVID-19 Module
- CMS Reports
- TAP Reports
- Baseline Set 1
- Baseline Set 2
- Advanced
- My Custom Reports
- Published Reports

- CMS Reports
  - Acute Care Hospitals (Hospital IQR)
    - SIR SIR - CLAB Data for Hospital IQR
    - SIR SIR - CAU Data for Hospital IQR
    - SIR SIR - Complex 30-Day SSI Data for Hospital IQR
    - SIR SIR - MRSA Blood FacwideIN LabID Data for Hospital IQR
    - SIR SIR - CDI FacwideIN LabID Data for Hospital IQR
  - Critical Access Hospitals (Hospital IQR)
  - Inpatient Rehabilitation Facilities (IRFQR)
  - Long Term Acute Care Hospitals (LTCHQR)
  - PPS-Exempt Cancer Hospitals (PCHQR)

# Standardized Infection Ratio (SIR) Table

- Urinary Catheter-Associated UTI
  - Line Listing - All CAU Events
  - Frequency Table - All CAU Events
  - Bar Chart - All CAU Events
  - Pie Chart - All CAU Events
  - Rate Table - CAU Data for ICU-Other/SCA/ONC
  - Run Chart - CAU Data for ICU-Other/SCA/ONC
  - Rate Table - CAU Data for NICU
  - Run Chart - CAU Data for NICU
  - SIR SIR - Acute Care Hospital CAU Data**
  - SUR SUR - Acute Care Hospital Catheter Device Use
  - SIR SIR - Critical Access Hospitals CAU Data
  - SUR SUR - Critical Access Hospitals Catheter Device Use
  - SIR SIR - Long Term Acute Care CAU Data
  - SUR SUR - Long Term Acute Care Catheter Device Use
  - SIR SIR - Inpatient Rehab Facilities CAU Data
  - SUR SUR - Inpatient Rehab Facilities Catheter Device Use

- Urinary Catheter-Associated UTI
  - Line Listing - All CAU Events
  - Frequency Table - All CAU Events
  - Bar Chart - All CAU Events
  - Pie Chart - All CAU Events
  - Rate Table - CAU Data for ICU-Other/SCA/ONC
  - Run Chart - CAU Data for ICU-Other/SCA/ONC
  - Rate Table - CAU Data for NICU
  - Run Chart - CAU Data for NICU
  - SIR SIR - Acute Care Hospital CAU Data**
    - Run Report
    - Modify Report**
    - Export Data Set
  - SUR SUR - Acute Care Hospital Catheter Device Use
  - SIR SIR - Critical Access Hospitals CAU Data
  - SUR SUR - Critical Access Hospitals Catheter Device Use
  - SIR SIR - Long Term Acute Care CAU Data
  - SUR SUR - Long Term Acute Care Catheter Device Use
  - SIR SIR - Inpatient Rehab Facilities CAU Data
  - SUR SUR - Inpatient Rehab Facilities Catheter Device Use

# Standardized Infection Ratio (SIR) Table (cont.)

- **Report Modification:** *For the purpose of this example, the modifications that have been made are: **SummaryYQ was set to 2022Q3**, filtered by Critical Care (CC) locationType, and the report grouped by summaryYQ*

## Modify "SIR - Acute Care Hospital CAU Data"

Show descriptive variable names ([Print List](#))

Analysis Data Set: bs2\_CAU\_RatesICU\_SCA    Type: SIR    Last Generated: **March 3, 2023 12:58 PM**

Title/Format

**Time Period**

Filters

Display Options

Time Period:

Date Variable

Beginning

Ending

summaryYQ ▼

2022Q3

2022Q3

**✖ Clear Time Period**

Enter Date variable/Time period at the time you click the Run button



# Standardized Infection Ratio (SIR) Table – cont.

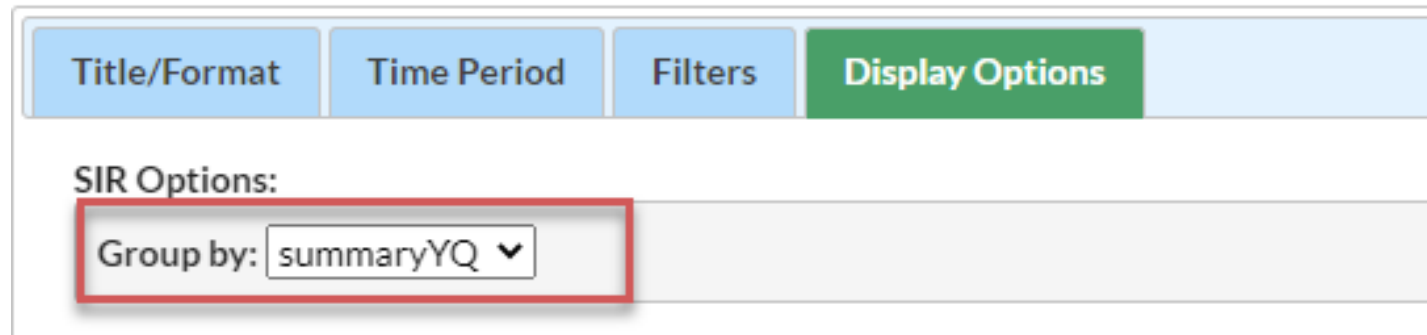
- **Report Modification:** *For the purpose of this example, the modifications that have been made are: SummaryYQ was set to 2022Q3, **filtered by Critical Care (CC) locationType**, and the report grouped by summaryYQ*

The screenshot displays a report configuration interface with the following elements:

- A navigation bar with tabs: Title/Format, Time Period, **Filters** (active), and Display Options.
- Below the navigation bar, the text "Additional Filters:" is followed by two buttons: "Show" and "Clear".
- A main configuration area containing:
  - A top-level logic selector with "AND" and "OR" options.
  - A nested configuration area with its own "AND" and "OR" selector and an "Add rule" button.
  - A filter rule highlighted with a red border, consisting of three dropdown menus: "locationType", "equal", and "CC - CC".
  - A "Delete" button located to the right of the filter rule.
  - An "Add group" button located at the top right of the main configuration area.

# Standardized Infection Ratio (SIR) Table – continued

- **Report Modification:** *For the purpose of this example, the modifications that have been made are: SummaryYQ was set to 2022Q3, filtered by Critical Care (CC) locationType, and the report **grouped by summaryYQ***



The screenshot shows a configuration interface for the SIR report. At the top, there are five tabs: 'Title/Format', 'Time Period', 'Filters', 'Display Options' (which is highlighted in green), and an unlabeled light blue tab. Below the tabs, the text 'SIR Options:' is displayed. Underneath, there is a 'Group by:' label followed by a dropdown menu. The dropdown menu is currently set to 'summaryYQ' and has a small downward arrow on the right side. A red rectangular box highlights the 'Group by:' label and the dropdown menu.

# Standardized Infection Ratio (SIR) Table - continued

- Output/Results

## National Healthcare Safety Network

### SIR for Catheter-Associated UTI Data for Acute Care Hospitals (2015 baseline) - By OrgID

As of: February 9, 2023 at 2:09 PM

Date Range: BS2\_CAU\_RATESICU\_SCA summaryYQ 2022Q3 to 2022Q3

orgID=10018 medType=' '

orgID	ccn	summaryYQ	infCount	numPred	numcathdays	SIR	SIR_pval	sir95ci	SIR_pctl
10018	88888	2022Q3	5	1.582	2350	3.161	0.0284	1.158, 7.007	100

1. This report includes CAUTI data from acute care hospitals for 2015 and forward.
2. The SIR is only calculated if the number predicted (numPred) is  $\geq 1$ . 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, medical school affiliation type, hospital beds, 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 CAUTI Data

Source of Percentile Distribution: 2020 National HAI Progress Report: <https://www.cdc.gov/hai/data/portal/progress-report.html>

Data contained in this report were last generated on February 9, 2023 at 1:59 PM to include data beginning May 2022 .

## Standardized Infection Ratio (SIR) Table(continued)

OrgID	CCN	SummmaryYQ	infCount	numpred	Numcldays	SIR	SIR_pval	Sir95ci	SIR_pctl
10018	66666	2022Q3	5	1.582	2350	3.161	0.0284	1.158,7.007	100

- This facility reported 5 catheter-associated UTI (infCount) for CC or critical care units during the third quarter of 2022. This is the observed number of CAUTIs
- The overall SIR for this facility during this time period is **3.161**, indicating that this facility observed **3 times more infections** than predicted. The number of CAUTIs predicted to occur for the third quarter of 2022 is **1.582**

# Interpreting your SIR Report: SIR p-value

OrgID	CCN	SummmaryYQ	infCount	numpred	Numcldays	SIR	SIR_pval	Sir95ci	SIR_pctl
10018	66666	2022Q3	5	1.582	2350	3.161	0.0284	1.158,7.007	100

- 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 CAUTIs is [statistically] significantly different (higher or lower) from the number predicted
- In this example, the p-value for the 2022Q3 SIR is less than 0.05 and thus there is significant difference between the number of infections observed and the number of infections predicted

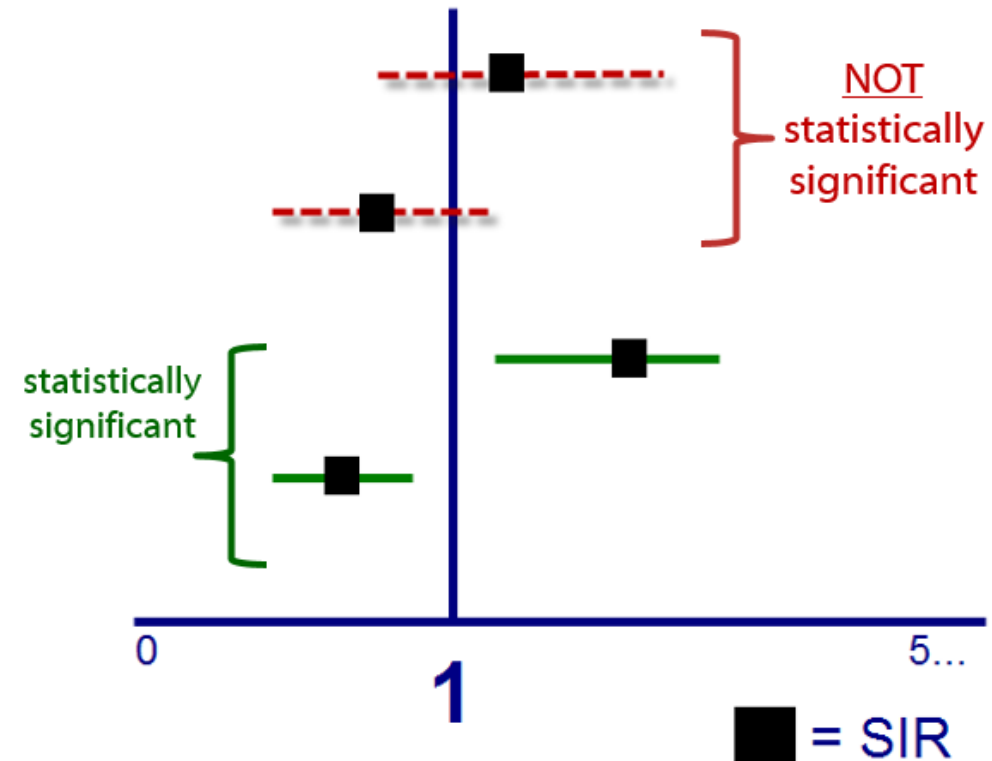
# Interpreting your SIR Report: SIR Confidence Interval

OrgID	CCN	SummmaryYQ	infCount	numpred	Numcldays	SIR	SIR_pval	Sir95ci	SIR_pctl
10018	66666	2022Q3	5	1.582	2350	3.161	0.0284	1.158,7.007	100

- 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)

# Interpreting your SIR Report: SIR Confidence Interval (cont.)

- 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



# Interpreting your SIR Report: SIR Percentile

OrgID	CCN	SummmaryYQ	infCount	numpred	Numcldays	SIR	SIR_pval	Sir95ci	SIR_pctl
10018	66666	2022Q3	5	1.582	2350	3.161	0.0284	1.158,7.007	100

- The percentile distribution of facility-specific SIRs are calculated along with the annual SIRs published in the healthcare-associated infections (HAI) Progress Report
- These facility-specific SIRs are used to create national percentile distributions for each infection and device type if at least 20 facilities had sufficient data to calculate an SIR or SUR
- SIR Percentile can be interpreted as, 100% of facilities in the nation (with at least 1 predicted device day) had a SIR equal to or lower than 3.969



# CLABSI (and CAUTI) 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

# CLABSI (and CAUTI) 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 **Group by** ‘Cumulative’

## National Healthcare Safety Network

### SIR for Catheter-Associated UTI Data for Acute Care Hospitals (2015 baseline) - By OrgID

As of: February 14, 2023 at 11:29 AM

Date Range: BS2\_CAU\_RATE\$ICU\_SCA summaryYQ 2022Q3 to 2022Q3

orgID=10018 medType=' '

orgID	ccn	infCount	numPred	numcathdays	SIR	SIR_pval	sir95ci	SIR_pctl
10018	68888	5	1.582	2350	3.161	0.0284	1.158, 7.007	100

# CLABSI (and CAUTI) SIR Output – Table 2

- This table produces an SIR for each Location Type (eg.ICUs, WARDeS)

## National Healthcare Safety Network

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

As of: February 14, 2023 at 12:11 PM

Date Range: BS2\_CAU\_RATESICU\_SCA summaryYQ 2022Q3 to 2022Q3

orgID=10018 medType=' '

orgID	ccn	locationType	summaryYQ	infCount	numPred	numcathdays	SIR	SIR_pval	sir95ci	SIR_pctl
10018	66666	CC	2022Q3	5	1.582	2350	3.161	0.0284	1.158, 7.007	98
10018	66666	WARD	2022Q3	0	3.945	8100	0.000	0.0194	, 0.759	15

# CLABSI (and CAUTI) 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: February 14, 2023 at 12:11 PM

Date Range: BS2\_CAU\_RATE\$ICU\_SCA summaryYQ 2022Q3 to 2022Q3

orgID=10018 medType=' '

orgID	ccn	loccdc	summaryYQ	infCount	numPred	numcathdays	SIR	SIR_pval	sir95ci
10018	66666	IN:ACUTE:CC:C	2022Q3	5	1.582	2350	3.161	0.0284	1.158, 7.007
10018	66666	IN:ACUTE:WARD:JAL	2022Q3	0	0.979	1800	.	.	
10018	66666	IN:ACUTE:WARD:M	2022Q3	0	0.762	1400	.	.	
10018	66666	IN:ACUTE:WARD:MS	2022Q3	0	1.519	3100	0.000	0.2188	, 1.972
10018	66666	IN:ACUTE:WARD:T_OR	2022Q3	0	0.684	1800	.	.	

# CLABSI (and CAUTI) SIR Output – Table 4

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

## National Healthcare Safety Network

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

As of: February 14, 2023 at 12:11 PM

Date Range: BS2\_CAU\_RATE\$ICU\_SCA summaryYQ 2022Q3 to 2022Q3

orgid=10018 medType=' '

orgid	ccn	location	summaryYQ	months	infcount	numPred	numcathdays	SIR	SIR_pval	SIR95CI
10018	66666	4855	2022Q3	1	0	0.979	1800	.	.	
10018	66666	5G	2022Q3	1	5	1.582	2350	3.181	0.0284	1.158, 7.007
10018	66666	AMSW-1	2022Q3	1	0	0.735	1500	.	.	
10018	66666	CR795A	2022Q3	1	0	0.762	1400	.	.	
10018	66666	MEDSURWARD	2022Q3	1	0	0.784	1600	.	.	
10018	66666	T_ORT	2022Q3	1	0	0.684	1800	.	.	

# CLABSI (and CAUTI) SIR Output – Table 5

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

## National Healthcare Safety Network CAUTI Data Not Included in SIR

As of: February 14, 2023 at 2:13 PM

Date Range: BS2\_CAU\_RATESICU\_SCA summaryYQ 2022Q3 to 2022Q3

orgID=10018 medType=' '

orgID	ccn	locationType	loccdc	location	infcoun	numucathdays
10018	88888	OTHER	OUT:ACUTE:ED	ED	0	123

**Review: FAQs**

# Missing CLABSI event from SIR Reports

- NHSN, when running my DA SIR reports, I am unable to find a CLABSI that was entered in January 2022.
  - I have generated my datasets. It should be present!
  - Missing a CLABSI from my Medical Ward that appear in our line list but not in any of the SIR reports.

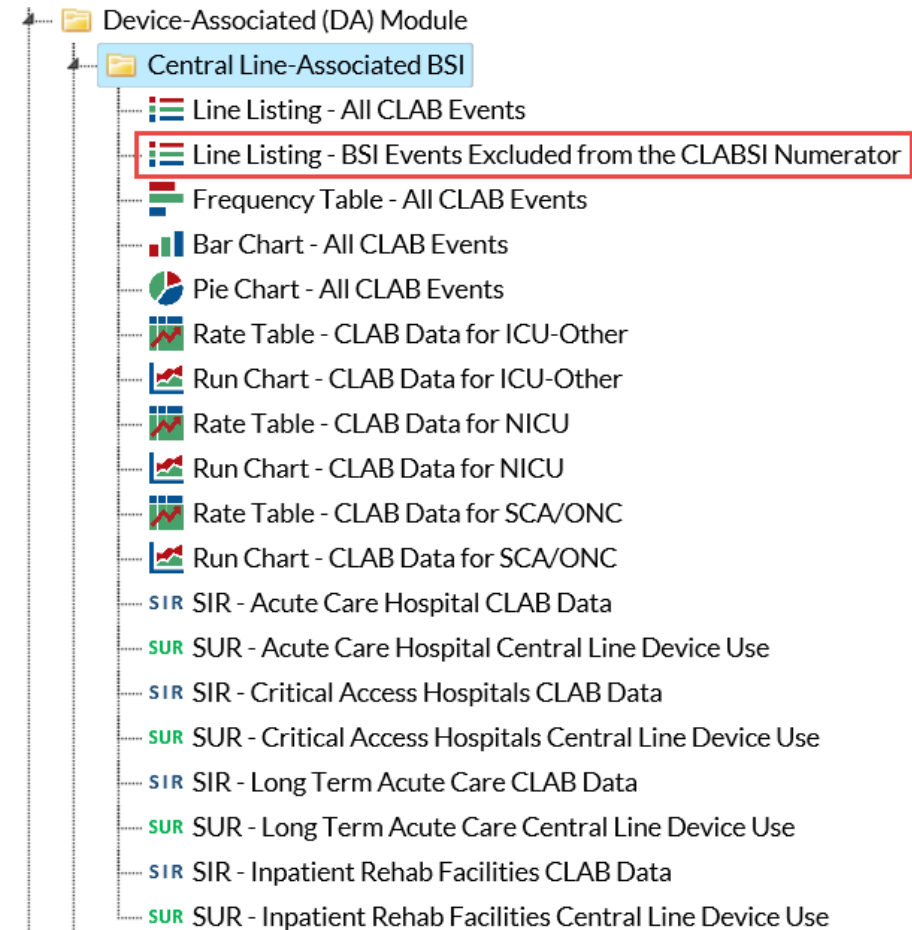
Can you tell what is going on?





# Missing CLABSI event from SIR Reports - (cont.)

- Review CLABSI protocol for reviewing the exclusion criteria for BSI events.
- Run the “BSI Events excluded from the CLABSI numerator” line list.
- This line list will allow you to view a facility’s BSI events that will be excluded from the CLABSI DA module SIR, rate tables, and CMS CLABSI SIR reports.



# Identifying excluded events

- CLABSI events that are identified as Mucosal Barrier Injury Laboratory-Confirmed Bloodstream Infection (MBI-LCBI), Extracorporeal life support (ECMO) and Ventricular Assist Device (VAD) BSI events, Munchausen Syndrome by Proxy (MSBP), Epidermolysis bullosa (EB), Patient self-injection, and Pus at vascular access site and are indicated by the new variable clab\_exclude.
  - MBI-LCBI reports used for analyzing MBI-LCBI events.

## National Healthcare Safety Network

### Line Listing for BSI Events Excluded from the CLABSI Numerator

As of: February 16, 2023 at 1:52 PM

Date Range: CLAB\_EVENTS evntDateYr After and Including 2022

if (((clab\_exclude = "Y" ) ) )

orgID	patID	dob	gender	admitDate	eventID	eventDate	eventType	spcEvent	location	ecmo	vad	mbi_lcbi	msbp	eb	siteBldMatch	matchSite	clab_exclude
10018	11003	05/17/1956	F	08/02/2022	110929	08/19/2022	BSI	LCBI	5G	Y	N	N	N	N	N		Y

<u>Measure</u>	<u>Exclusions</u>	<u>Calculation</u>	<u>Application</u>
<b>CLABSI SIR</b>	MBI-LCBIs, ECMO, VAD, MSBP, EB, Patient self-injection, and Pus at vascular site	$\frac{\text{The number of Observed CLABSIs}}{\text{The number of Predicted CLABSIs}}$	Both location specific and summarized measure
<b>CLABSI Rates</b>	MBI-LCBIs, ECMO, VAD, MSBP, EB, Patient self-injection, and Pus at vascular site	$\left( \frac{\text{The number of CLABSIs for a location}}{\text{The number of Central Line Days for that location}} \right) \times 1000$	Location specific measure only
<b>Central Line SUR</b>		$\frac{\text{The number of Observed Central Line Days}}{\text{The number of Predicted Central Line Days}}$	Both location specific and summarized measure
<b>DUR</b>		$\frac{\text{Central Line Days for a location}}{\text{The Patient Days for that location}}$	Location specific measure only

# 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 SIR - Acute Care MBI-CLABSI Data

## National Healthcare Safety Network SIR for MBI-CLABSI Data (2015 Data) - By OrgID

As of: February 16, 2023 at 2:38 PM  
Date Range: All BS2\_CLAB\_MBI\_RATESALL

orgID=10018 medType=' '

orgID	ccn	summaryYQ	infCount	numPred	numclays	SIR	SIR_pval	sir95ci
10018	66666	2022Q2	0	0.001	50	.	.	
10018	66666	2022Q3	0	0.046	2600	.	.	

# Missing CAUTI event from CMS IQR Report

- NHSN, when running my CMS IQR SIR reports, I am unable to find a CAUTI that was entered in October 2022.
  - 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

- Run CAUTI line list to identify the excluded event and determine location of event

## National Healthcare Safety Network Line Listing for All Catheter-Associated UTI Events

As of: February 17, 2023 at 9:36 PM  
Date Range: All CAU\_EVENTS

orgID	patID	dob	gender	admitDate	eventID	eventDate	eventType	spcEvent	location
10018	106761	03/15/1921	F	08/03/2022	110922	08/05/2022	UTI	SUTI	5G
10018	1098776	04/24/1980	F	08/01/2022	110921	08/03/2022	UTI	SUTI	5G
10018	11-12-669	02/01/1949	M	05/01/2022	110349	05/04/2022	UTI	SUTI	MEDSURG64
10018	11008	09/23/1962	M	08/15/2022	110923	08/19/2022	UTI	SUTI	5G
10018	11010	10/16/1955	M	08/02/2022	110933	08/06/2022	UTI	SUTI	ED
10018	11011	01/15/1953	M	08/01/2022	110924	08/05/2022	UTI	SUTI	5G
10018	11018	03/02/1947	F	08/18/2022	110925	08/22/2022	UTI	SUTI	5G

- Event occurred in the Emergency Dept, which is not a location that will be included in the CMS IQR report for CAUTI

## National Healthcare Safety Network SIR for CAUTI Data for Hospital IQR (2015 Baseline) - By OrgID/Location

As of: February 17, 2023 at 9:36 PM  
Date Range: All BS2\_CAU\_RATES\_CMS

if (((utiPlan = "Y") AND (locationType IN ("CC", "CC\_ONC" ))) OR ((utiPlan = "Y") AND (locCDC IN ("IN:ACUTE:WARD:M", "IN:ACUTE:WARD:MS", "IN:ACUTE:WARD:S",

orgid=10018 medType=' '

orgid	ccn	location	summaryYQ	months	infcount	numPred	numcathdays	SIR	SIR_pval	SIR95CI
10018	66666	5G	2022Q3	1	5	1.582	2350	3.161	0.0284	1.158, 7.007
10018	66666	AMSW-1	2022Q3	1	0	0.735	1500	-	-	-
10018	66666	CR795A	2022Q3	1	0	0.762	1400	-	-	-
10018	66666	MEDSURG64	2022Q2	1	1	0.025	50	-	-	-
10018	66666	MEDSURWARD	2022Q3	1	0	0.784	1600	-	-	-

# Hospital IQR reports for CLABSI and CAUTI

## **CLABSI**

Start Q1 2011 - adult, pediatric, and neonatal ICUs

Start Q1 2015 - adult and pediatric medical, surgical, and medical/surgical wards

## **CAUTI**

Start Q1 2012 - adult and pediatric ICUs

Start Q1 2015 - adult and pediatric medical, surgical, and medical/surgical wards

# Summary

- These are YOUR data –know what your data says about your facility.
- Understand the data that derive your hospital's analytic reports.
- 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.



# Resources

- A Guide to the SIR: <https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sir-guide.pdf>
- Analysis Output Quick Reference Guides: <http://www.cdc.gov/nhsn/ps-analysis-resources/reference-guides.html>
- Analysis Resources: <https://www.cdc.gov/nhsn/ps-analysis-resources/index.html>
- CMS Requirements: <https://www.cdc.gov/nhsn/cms/index.html>
- NHSN Location Mapping Checklist: <https://www.cdc.gov/nhsn/pdfs/cms/Location-Mapping-Checklist.pdf>
- NHSN Analysis Training: <https://www.cdc.gov/nhsn/training/analysis/index.html>

# Questions or Need Help?

Thank you!

Send email:  
**NHSN@CDC.gov**

For more information, contact CDC  
1-800-CDC-INFO (232-4636)  
TTY: 1-888-232-6348 [www.cdc.gov](http://www.cdc.gov)

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.

