

# **Introduction to the NHSN 2022 Baseline Models and Standardized Infection Ratio (SIR) Analysis Reports: Catheter-Associated Urinary Tract Infections**

**Irene Khan, Acute Care Analytics Team**

**Robert Wild, Statistics Team**

*Presented on behalf of the NHSN Rebaseline Team, DHQP, NCEZID, CDC*

June 3, 2025

# What you need to know before we begin

- **This webinar is designed to deepen your understanding of the SIR and the Rebaseline updates, helping you effectively apply these concepts in your healthcare facility.**
- **Prerequisites:**
  - A working understanding of the SIR, including its purpose and calculation
  - Familiarity with the concept of a baseline in healthcare surveillance data
  - Basic knowledge of NHSN's Rebaseline process and how it impacts interpretation of SIR data
- **Resources to review:**
  - [An Introduction to Updating the National Baseline](#)
  - [Prep Like a Pro: What to Expect from the 2022 HAI Rebaseline](#)
  - [Rebaseline Fact Sheet: What is the Rebaseline and Why it is Important?](#)
  - [How Will My SIR Change; Understanding the Impact of the 2022 HAI Rebaseline](#)
  - [Rebaseline FAQs](#)

# Disclaimers and Disclosures

On April 11, 2025, CMS published the fiscal year (FY 2026) Medicare Hospital Inpatient Prospective Payment System (IPPS) and Long-Term Care Hospital Prospective Payment System (LTCH PPS) proposed rule. CMS provided notice of technical updates the CDC National Healthcare Safety Network (NHSN) healthcare-associated infections (HAI) chart-abstracted measures with the new 2022 baseline, for both the Hospital-Acquired Condition (HAC) Reduction Program and the Hospital Value-Based Purchasing (VBP) Program. The HAI measures using the 2022 update to the standard population data will begin to be publicly reported on the Compare tool in Fall 2026 using four quarters of CY 2025 data.

# Disclaimers and Disclosures

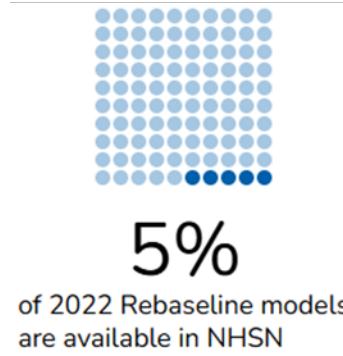
- **Questions about CMS Programs:**
  - **Acute Care Hospitals** (including PPS-Exempt Cancer Hospitals) - [QualityNet Question and Answer Tool](#)
    - Select “Ask a Question”, then select “HACRP – Hospital-Acquired Condition Reduction Program”
  - **Inpatient Rehabilitation Facilities (IRF)** - [irf.questions@cms.hhs.gov](mailto:irf.questions@cms.hhs.gov)
  - **Long-term Acute Care Hospitals (LTACH)** - [ltchqualityquestions@cms.hhs.gov](mailto:ltchqualityquestions@cms.hhs.gov)

# Disclaimers and Disclosures (continued)

- **This presentation does not include Patient Health or Identifiable Information (PHI/PII) data.** Images of fictitious data and facility information are for illustrative purposes only and do not represent actual NHSN data.
- **Currently available 2022 Baseline SIRs in NHSN:**
  - **Acute Care Hospital and Critical Access Hospitals only**
    - Central Line-Associated Bloodstream Infection (**CLABSI**)
    - Catheter-Associated Urinary Tract Infection (**CAUTI**)
    - *Clostridioides difficile* (**CDI**) LabID
  - **MRSA bacteremia LabID**
  - **SSI Complex 30-day model for adult inpatient colon (**COLO**) and abdominal hysterectomy (**HYST**)**
- **This webinar only covers CAUTI LabID.**
- A separate training webinar is available for each of the released 2022 Baseline SIRs available in NHSN

# Rebaseline Progress Tracker

- Additional 2022 baseline SIR and SUR reports will be added into NHSN in the future. Track our progress using the [Rebaseline Progress Tracker](#).



Progress Stage	Description	Status
Planning	<ul style="list-style-type: none"> <li>Establishing the timeline, scope, roles, and plan for the 2022 HAI Rebaseline project.</li> <li>Developing an initial communications and partner outreach strategy, including sharing preliminary plans with external partners such as the Centers for Medicare and Medicaid Services (CMS).</li> <li>Freezing NHSN HAI data from 2022; preparing analytic datasets that will be used for subsequent modeling work.</li> </ul>	Stage Complete
Research	<ul style="list-style-type: none"> <li>Conducting a literature review of recent studies that identified factors that are potentially associated, or not associated, with the incidence of HAIs.</li> <li>Evaluating clinical significance of potential risk factors to inform risk adjustment decisions.</li> </ul>	Stage Complete

SIR/SUR Reports (2022 Baseline) Available in NHSN	SIR/SUR Reports (2022 Baseline) Under Development in NHSN
<ul style="list-style-type: none"> <li>MRSA Blood LabID</li> <li>SSI – Complex 30-day</li> <li>CLABSI in ACHs and CAHs</li> <li>CAUTI in ACHs and CAHs</li> <li>CDI LabID in ACHs and CAHs</li> </ul>	<ul style="list-style-type: none"> <li>CLABSI in LTACHs and IRFs</li> <li>CAUTI in LTACHs and IRFs</li> <li>CDI LabID in LTACHs and IRFs</li> <li>MBI-LCBI</li> <li>VAE and pedVAE</li> <li>SSI – Complex Admission/Readmission</li> <li>SSI – All SSI</li> <li>SUR Models</li> </ul>

# Objectives

**At the end of this presentation, participants will be able to:**

- Identify, locate, and use key components and resources for the CAUTI SIR 2022 baseline, including:
  - Risk adjustment factors
  - Calculation for number of predicted events
  - 2022 Baseline SIRs and Data Quality Analysis Reports
  - 2022 Baseline Training Materials
- Explain the importance of risk adjustment factors and where these data are reported within NHSN.
- Analyze the new CAUTI SIR reports and evaluate the impact of different risk adjustment factors on the CAUTI SIR.

# Plan for Today

1. Robert will present the **new risk adjustment models** for **CAUTI**, discuss **statistical methods** for developing the new model, and will provide an example of how to manually calculate the number of predicted events (**SIR denominator**).
2. Irene will then provide details about the **new CAUTI SIR reports**, information about each **risk factor** used in the model, and guidance on how to review those risk factors in NHSN.
3. Live **Q&A** at the end for all presenters
  - Please submit questions in the Q&A box throughout the presentation. NHSN staff are standing by to answer questions.



# CAUTI SIR Model: 2022 baseline

Robert Wild, Statistics Team

# Standardized Infection Ratio (SIR)

$$\text{SIR} = \frac{\# \text{ observed HAIs}}{\# \text{ predicted HAIs}}$$

HAIs reported to NHSN

Calculated by CDC

- When # of observed HAIs is greater than the # predicted, the SIR will be greater than 1

$$\frac{5 \text{ observed CAUTIs}}{3.2 \text{ predicted CAUTIs}} = \text{SIR of } 1.6$$

- If # observed HAIs is less than # predicted, the SIR will be less than 1
- p-values and 95% confidence intervals (CI) provide information about statistical significance
- NHSN Resources:
  - [Statistics Calculator](https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/statscalc.pdf) (https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/statscalc.pdf)
  - [Guide to the 2022 Baseline SIRs](https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sir-guide.pdf) (https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sir-guide.pdf)

# Who Uses SIR Data?

- The SIR value provides information about the number of HAIs reported in your facility.
- This summary statistic is used by various organizations:
  - CMS: public reporting on Care Compare
  - State health departments may publish SIRs
  - Corporations
  - Non-profit or research groups
    - Leapfrog
  - CDC: national and state-level SIRs
  - Your facility!

Current HAI Progress Report  
ON THIS PAGE

Executive Summary  
2022 HAI Progress Report  
Data Tables  
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Acknowledgements  
Glossary

Antimicrobial Resistance & Patient Safety Portal

Cambridge Core | Browse | Services | Open research

Home | journals | Infection Control & Hospital Epidemiology | Volume 43 Issue 1 | The impact of coronavirus disease 2019 (COVID-19) on...

**The impact of coronavirus disease 2019 (COVID-19) on healthcare-associated infections in 2020: A summary of data reported to the National Healthcare Safety Network**

Part of: Highly Cited Papers

Published online by Cambridge University Press: 03 September 2021

Lindsey M. Weiner-Lastinger, Vaishnavi Pattabiraman, Rebecca Y. Konnor, Prachi R. Patel, Emily Wong, Sunny Y. Xu, Brittany Smith, Jonathan R. Edwards and Margaret A. Dudeck

Cambridge Core | Browse | Services | Open research

Home | journals | Infection Control & Hospital Epidemiology | Volume 44 Issue 6 | Continued increases in the incidence of healthcare-associated...

**Continued increases in the incidence of healthcare-associated infection (HAI) during the second year of the coronavirus disease 2019 (COVID-19) pandemic**

Part of: SARS-CoV-2/COVID-19

Published online by Cambridge University Press: 20 May 2022

Lindsey M. Lastinger, Carlos R. Alvarez, Aaron Kofman, Rebecca Y. Konnor, David T. Kuhar, Allan Nkwata, Prachi R. Patel, Vaishnavi Pattabiraman, Sunny Y. Xu and Margaret A. Dudeck

Data.CMS.gov  
Centers for Medicare & Medicaid Services

Healthcare Associated Infections - Hospital

The Healthcare Associated Infection (HAI) measure is a patient safety measure. These measures are developed by Centers for Disease Control and Prevention (CDC) and collected through the National Healthcare Safety Network (NHSN). They provide information on infections that occur while the patient is in the hospital. These infections can be related to devices, such as catheters and urinary catheters, or sometimes occur without any device. Many healthcare-associated infections can be prevented when the facilities use CDC-recommended infection control practices.

Download full report (PDF, 34 MB)

# Brief Pause - Burning Questions Answered!

- **2022 Baseline for SIRs and CMS Quality Reporting Programs:**
  - Yes, the model type used for risk adjustment for the CAUTI SIR is the same type CMS has historically used for Quality Reporting Programs.
  - Currently, CMS continues to use the 2015 baseline models for Inpatient Prospective Payment System (IPPS).
  - HAI measures using the 2022 update to the standard population data will begin to be publicly reported on the Compare tool in Fall 2026 using four quarters of CY 2025 data.
- The **2022 Baseline for CAUTI SIR** is **now available** in the NHSN application for facility and group users to:
  - Use for internal analyses and to aid in your surveillance and prevention efforts
  - Begin to get comfortable with SIR values under the 2022 baseline – see how your facility compares to 2022 national data
  - Check out the new [Which baseline/report should I use?](#) fact sheet

# Methods for obtaining the SIR formula

- **CDC obtains the formula (model) for the number of predicted events by obtaining the parameters based on a single baseline year.**
  - We use facility data reported to NHSN (with exclusion criteria applied) with the characteristics (covariates) that will be assessed for the model.
- **CDC uses negative binomial regression for CAUTI events**
  - Models use **characteristics (factors)** reported to NHSN that significantly impact HAI incidence.
  - Each covariate is first evaluated in isolation in the (“univariate”) model to determine the optimal parameterization for that variable.
  - The final model is a linear combination of the optimal set of statistically significant validated covariates.
  - Levels of covariates included in the optimal model that were not statistically significant were collapsed.
- **Standard model diagnostics are used to ensure the assumptions of the technique are appropriately met.**

# Where do I find details of the risk adjustment models?

- **2022 NHSN Rebaseline webpage and resources:**

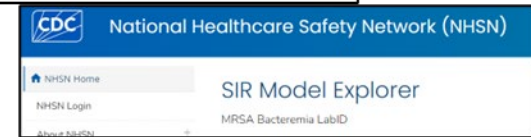
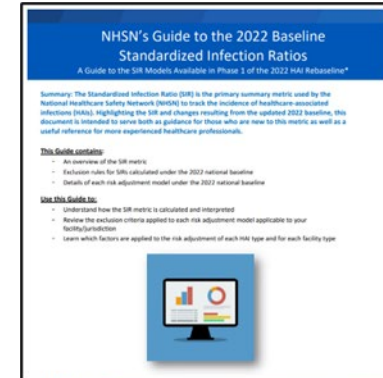
<https://www.cdc.gov/nhsn/2022rebaseline>

- **Updated SIR Guide (pdf):**

<https://www.cdc.gov/nhsn/2022rebaseline/sir-guide.pdf>

- **NHSN SIR Model Explorer, which includes parameters estimates for models:**

<https://www.cdc.gov/nhsn/2022rebaseline/sir-risk-factors.html>



Acute Care Hospitals (ACHs)
MRSA Bacteremia LabID Event Risk Adjustment in ACHs
Critical Access Hospitals (CAHs)
MRSA Bacteremia LabID Event Risk Adjustment in CAHs
Long Term Acute Care Hospitals (LTACHs)
MRSA Bacteremia LabID Event Risk Adjustment in LTACHs
Inpatient Rehabilitation Facilities (IRFs)
MRSA Bacteremia LabID Event Risk Adjustment in IRFs

# Knowledge Check

# Knowledge Check

**What type of regression model is used to build the predictive models for calculating the predicted number of HAI events?**

- A. Linear regression model
- B. Logistic regression model
- C. Negative binomial regression model
- D. Poisson regression model



# CAUTI 2022 baseline model for Acute Care Hospitals (ACH)

- **ACH 2022 baseline model includes 5 factors (characteristics):**
  - CDC location code
  - Total number of beds
  - Medical school affiliation
  - Average length of stay
  - Proportion of total beds that are ICU
- **See updated SIR guide for full details and footnotes:**

<https://www.cdc.gov/nhsn/2022rebaseline/sir-guide.pdf>

Risk factor	Levels	Parameter Estimate
Intercept		-10.2778
CDC location code	Critical Care Group 1	3.3086
	Critical Care Group 2	2.9823
	Critical Care Group 3	2.8105
	Critical Care Group 4	2.4744
	Critical Care Cardiothoracic	2.1594
	Step Down Group	2.6617
	Ward Group 1	3.0615
	Ward Group 2	2.7991
	Ward Group 3	2.6868
	Ward Group 4	2.6006
	Ward Group 5	2.4987
	Ward Group 6	2.0046
	Ward Group 7	REFERENT
Total number of beds	68–176 beds	0.2577
	177–420 beds	0.3347
	≥ 421 beds	0.4996
	1–67 beds	REFERENT
Medical school affiliation	Major teaching	0.2244
	Graduate/Undergraduate/Non-teaching	REFERENT
Average length of stay	5.7–6.5 days	0.0581
	≥ 6.6 days	0.1833
	1–5.6 days	REFERENT
Proportion of total beds that are ICU	≥ 0.141	0.0677
	< 0.141	REFERENT

# Location Type Groups: Critical Care and Step-Down

## CDC Location Code: Critical Care Group 1

Burn Critical Care - IN:ACUTE:CC:B  
Pediatric Medical Critical Care - IN:ACUTE:CC:M\_PED  
Pediatric Surgical Critical Care - IN:ACUTE:CC:S\_PED

## CDC Location Code: Critical Care Group 2

Neurosurgical Critical Care - IN:ACUTE:CC:NS  
Oncology Pediatric Critical Care - IN:ACUTE:CC:ONC\_PED  
Pediatric Burn Critical Care - IN:ACUTE:CC:B\_PED  
Pediatric Medical-Surgical Critical Care - IN:ACUTE:CC:MS\_PED  
Pediatric Trauma Critical Care - IN:ACUTE:CC:T\_PED

## CDC Location Code: Critical Care Group 3

Neurologic Critical Care - IN:ACUTE:CC:N  
Pediatric Surgical Cardiothoracic Critical Care - IN:ACUTE:CC:CT\_PED  
Trauma Critical Care - IN:ACUTE:CC:T

## CDC Location Code: Critical Care Group 4

Medical Cardiac Critical Care - IN:ACUTE:CC:C  
Medical Critical Care - IN:ACUTE:CC:M  
Medical-Surgical Critical Care - IN:ACUTE:CC:MS

## CDC Location Code: Critical Care Group 4 continued

Oncology Medical Critical Care - IN:ACUTE:CC:ONC\_M  
Oncology Medical-Surgical Critical Care - IN:ACUTE:CC:ONC\_MS  
Oncology Surgical Critical Care - IN:ACUTE:CC:ONC\_S  
Onsite Overflow Critical Care - IN:ACUTE:CC:OF\_ONSITE  
Prenatal Critical Care - IN:ACUTE:CC:PNATL  
Respiratory Critical Care - IN:ACUTE:CC:R  
Surgical Critical Care - IN:ACUTE:CC:S

## CDC Location Code: Surgical Cardiothoracic Critical Care - IN:ACUTE:CC:CT

## CDC Location Code: Step Down Group

Adult Step-Down Unit - IN:ACUTE:STEP  
Oncology Step-Down Unit - IN:ACUTE:STEP:ONC  
Pediatric Step-Down Unit - IN:ACUTE:STEP:PED  
Step down Neonatal Nursery (Level II) - IN:ACUTE:STEP:NURS

# Location Type Groups: Ward (Part 1)

## CDC Location Code: Ward Group 1

Burn Ward - IN:ACUTE:WARD:B  
Neurology Ward - IN:ACUTE:WARD:N  
Neurosurgical Ward - IN:ACUTE:WARD:NS  
Oncology Hematopoietic Stem Cell Transplant Ward - IN:ACUTE:WARD:ONC\_HSCT  
Oncology Pediatric General Hematology-Oncology Ward – IN:ACUTE:WARD:ONC\_HONC\_PED  
Oncology Pediatric Hematopoietic Stem Cell Transplant Ward – IN:ACUTE:WARD:ONC\_HSCT\_PED  
Oncology Leukemia-Lymphoma Ward - IN:ACUTE:WARD:ONC\_LL  
Oncology Leukemia Ward - IN:ACUTE:WARD:ONC\_LEUK  
Oncology Lymphoma Ward - IN:ACUTE:WARD:ONC\_LYMPH  
Onsite Overflow Ward - IN:ACUTE:WARD:OF\_ONSITE  
Orthopedic Trauma Ward - IN:ACUTE:WARD:T\_ORT  
Pediatric Medical Ward - IN:ACUTE:WARD:M\_PED  
Rehabilitation Ward (within Hospital) - IN:ACUTE:WARD:REHAB  
Stroke (Acute) Ward - IN:ACUTE:WARD:STRK

## CDC Location Code: Ward Group 2

Dialysis Specialty Care Area - IN:ACUTE:SCA:DIAL  
Gerontology Ward - IN:ACUTE:WARD:GNT  
Jail Unit - IN:ACUTE:WARD:JAL  
General Hematology-Oncology Ward – IN:ACUTE:WARD:ONC\_HONC  
Oncology Mixed Acuity Unit (all ages) - IN:ACUTE:MIXED:ONC  
Pulmonary Ward - IN:ACUTE:WARD:PULM

## CDC Location Code: Ward Group 3

Adult Mixed Acuity Unit - IN:ACUTE:MIXED:ALL\_ADULT  
Medical Ward - IN:ACUTE:WARD:M  
Oncology Solid Tumor Ward - IN:ACUTE:WARD:ONC\_ST

## CDC Location Code: Ward Group 4

Gastrointestinal Ward - IN:ACUTE:WARD:GI  
Pediatric Mixed Acuity Unit - IN:ACUTE:MIXED:ALL\_PEDS  
Telemetry Ward - IN:ACUTE:WARD:TEL  
Vascular Surgery Ward - IN:ACUTE:WARD:VS

# Location Type Groups: Ward (Part 2)

## CDC Location Code: Ward Group 5

Adolescent Behavioral Health Ward - IN:ACUTE:WARD:BHV\_ADOL  
Behavioral Health/Psych Ward - IN:ACUTE:WARD:BHV  
Ear, Nose, Throat Ward - IN:ACUTE:WARD:ENT  
Medical-Surgical Ward - IN:ACUTE:WARD:MS  
Mixed Age Mixed Acuity Unit - IN:ACUTE:MIXED:ALL  
Pediatric Behavioral Health Ward - IN:ACUTE:WARD:BHV\_PED  
Pediatric Burn Ward - IN:ACUTE:WARD:B\_PED  
Pediatric Genitourinary Ward - IN:ACUTE:WARD:GU\_PED  
Pediatric Medical-Surgical Ward - IN:ACUTE:WARD:MS\_PED  
Pediatric Neurology Ward - IN:ACUTE:WARD:N\_PED  
Pediatric Neurosurgical Ward - IN:ACUTE:WARD:NS\_PED  
Pediatric Orthopedic Ward - IN:ACUTE:WARD:ORT\_PED  
Pediatric Rehabilitation Ward (within Hospital) – IN:ACUTE:WARD:REHAB\_PED  
Pediatric Solid Organ Transplant Specialty Care Area - IN:ACUTE:SCA:SOTP\_PED  
Plastic Surgery Ward - IN:ACUTE:WARD:PLS  
Orthopedic Ward - IN:ACUTE:WARD:ORT  
Solid Organ Transplant Specialty Care Area - IN:ACUTE:SCA:SOTP  
Surgical Ward - IN:ACUTE:WARD:S  
Well Baby Nursery (Level I) - IN:ACUTE:WARD:NURS

## CDC Location Code: Ward Group 6

Genitourinary Ward - IN:ACUTE:WARD:GU  
Gynecology Ward - IN:ACUTE:WARD:GYN  
Pediatric Surgical Ward - IN:ACUTE:WARD:S\_PED


## CDC Location Code: Ward Group 7

Antenatal Care Ward - IN:ACUTE:WARD:ANTENAT  
Labor and Delivery Ward - IN:ACUTE:WARD:LD  
Labor, Delivery, Recovery, Postpartum Suite - IN:ACUTE:WARD:LD\_PP  
Postpartum Ward - IN:ACUTE:WARD:PP

# How do I interpret an SIR model?

- Fictitious values for an example ACH facility:

- CDC location code = *Medical-Surgical Critical Care (Critical Care Group 4)*
- Total number of beds = *209*
- Medical school affiliation = *Non-teaching*
- Average length of stay (days) = *4.1*
- Proportion of total beds that are ICU = *0.18*
- Number of catheter days = *5,395*

 **View Annual Survey**

**Hospital Facility:**

- \* Number of Patient Days: 10000
- \* Number of Admissions: 2439
- \* Is your hospital a teaching hospital for physicians and/or physicians-in-training or nursing students? ☒ N - No  
If Yes, what type: ☐ MAJOR ☐ GRADUATE ☐ UNDERGRADUATE

Number of beds set up and staffed in the following location types (as defined by NHSN):

- a. \* ICU beds (including adult, pediatric, and neonatal levels II/III, III, or higher): 38
- b. \* All other inpatient locations: 171

Total Number of Beds Set Up and Staffed: 209

**National Healthcare Safety Network**  
**Line Listing for All Catheter-Associated UTI Events**  
As of: March 20, 2025 at 9:27 PM UTC  
Date Range: All CAU\_EVENT\$  
if (((location = "ICU" )))

orgID	location	locCDC	locCDCDesc	locationType	eventID	eventType	spcEvent	urinaryCath	urinaryCathDesc
10018	ICU	IN-ACUTE:CC:MS	Medical-Surgical Critical Care	CC	132283	UTI	SUT1	INPLACE	INPLACE - In place
10018	ICU	IN-ACUTE:CC:MS	Medical-Surgical Critical Care	CC	132284	UTI	SUT1	INPLACE	INPLACE - In place
10018	ICU	IN-ACUTE:CC:MS	Medical-Surgical Critical Care	CC	132285	UTI	SUT1	INPLACE	INPLACE - In place

# How do I calculate the SIR?

- Fictitious values for an example ACH facility:
  - CDC location code = *Medical-Surgical Critical Care (Critical Care Group 4)*
  - Total number of beds = 209
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	1–67 beds	REFERENT
Medical school affiliation	Major teaching	0.2244
	Graduate/Undergraduate/Non-teaching	REFERENT
Average length of stay	5.7–6.5 days	0.0581
	≥ 6.6 days	0.1833
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Proportion of total beds that are ICU	≥ 0.141	0.0677
	< 0.141	REFERENT

# How do I calculate the SIR?

## Fictitious values for an example ACH facility:

- CDC location code = *Medical-Surgical Critical Care (Critical Care Group 4)*
- Total number of beds = 209
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- Proportion of total beds that are ICU = 0.18
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Intercept	-	-10.2778
CDC location code	Critical Care Group 1	3.3086
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Medical school affiliation	Major teaching	0.2244
	<b>Graduate/Undergraduate/Non-teaching</b>	<b>REFERENT</b>
Average length of stay	5.7–6.5 days	0.0581
	≥ 6.6 days	0.1833
	<b>1–5.6 days</b>	<b>REFERENT</b>
Proportion of total beds that are ICU	≥ 0.141	<b>0.0677</b>
	< 0.141	REFERENT

# How do I calculate the SIR?

- Fictitious values for an example ACH facility:
  - CDC location code = *Medical-Surgical Critical Care (Critical Care Group 4)*
  - Total number of beds = 209
  - Medical school affiliation = *Non-teaching*
  - Average length of stay (days) = 4.1
  - Proportion of total beds that are ICU = 0.18
  - Number of catheter days = 5,395

Model equation for predicted number of events:

$$\begin{aligned} \text{Exp}[ & -10.2778 + 2.4744 \times 1 \text{ (CDC location code: Critical Care Group 4)} \\ & + 0.3347 \times 1 \text{ (Total number of beds: 177–420)} \\ & + 0 \text{ (Medical school affiliation: Non-teaching)} \\ & + 0 \text{ (Average length of stay: 1–5.6 days)} \\ & + 0.0677 \times 1 \text{ (Proportion of total beds that are ICU: } \geq 0.141) ] \\ & \times 5,395 \text{ (Catheter days)} = 3.294 \end{aligned}$$



# How do I calculate the SIR?

- Fictitious values for an example ACH facility

Model equation for predicted number of events:

$$\begin{aligned} & \text{Exp}[-10.2778] + 2.4744 \times 1 \text{ (CDC location code: Critical Care Group 4)} \\ & + 0.3347 \times 1 \text{ (Total number of beds: 177–420)} \\ & + 0 \text{ (Medical school affiliation: Non-teaching)} \\ & + 0 \text{ (Average length of stay: 1–5.6 days)} \\ & + 0.0677 \times 1 \text{ (Proportion of total beds that are ICU: } \geq 0.141 \text{ )} \\ & \times 5,395 \text{ (Catheter days)} = 3.294 \end{aligned}$$

## National Healthcare Safety Network

### Standardized Infection Ratio for Catheter-Associated UTI Data for Acute Care Hospitals (2022 baseline) - By OrgID

As of: March 20, 2025 at 9:01 PM UTC

Date Range: BS3\_CAU\_RATESICUOTHER\_SCA summaryYr After and Including 2004  
if (((location = "ICU" ) ))

orgID=10018

orgID	ccn	summaryYr	caucount	numPred	numcathdays	SIR	SIR_pval	sir95ci
10018	111111	2024	3	3.294	5395	0.911	0.9421	0.232, 2.478

# Knowledge check

**Where does the equation for the predicted number of events come from?**

- A. It is derived from historical data trends
- B. It is based on expert opinions and clinical guidelines
- C. It is derived directly from the negative binomial regression model
- D. It is calculated using a simple average of past events

# Critical Access Hospitals (CAH) Model Details/Risk Factors

- **CAH 2022 baseline model includes 2 factors:**

- Average length of stay
- Proportion of total beds that are ICU

Risk factor	Levels	Parameter Estimate
Intercept		-7.6495
Average length of stay	$\geq 6.5$ days 1-6.4 days	0.4257 REFERENT
Proportion of total beds that are ICU	$< 0.160$ $\geq 0.160$	0.4189 REFERENT

# Long-Term Acute Care (LTAC) Model Details/Risk Factors

- **LTAC 2022 baseline model includes 2 factors:**

- Average length of stay
- Proportion of total beds that are ICU

Risk factor	Levels	Parameter Estimate
Intercept		-7.8086
Average length of stay	$\geq 22.2$ and $< 27.7$ days	0.5783
	$\geq 27.8$ days	1.1001
	$\geq 1$ and $< 22.2$ days	REFERENT
Proportion of total beds that are ICU	$< 0.103$	0.3579
	$\geq 0.103$	REFERENT


# CAUTI 2022 baseline model for Inpatient Rehabilitation Facilities (IRF)


- IRF 2022 baseline model includes 5 factors:**

- Proportion of admissions with other neurological conditions
- Facility type
- Proportion of admissions with stroke
- Proportion of admissions with non-traumatic spinal cord dysfunction
- Proportion of admissions with brain dysfunction

Risk factor	Levels	Parameter Estimate
Intercept		-7.0380
Proportion of admissions with other neurological conditions	< 0.150 ≥ 0.150	0.3583 REFERENT
Facility type	Critical Access (CAH), Children's (CHLD), General Acute Care (GEN), Orthopedic (ORTHO), Surgical (SURG) Long-term Acute Care (LTAC), Rehabilitation (REHAB)	0.4051  REFERENT
Proportion of admissions with stroke	≥ 0.25 < 0.25	0.2143 REFERENT
Proportion of admissions with non-traumatic spinal cord dysfunction	≥ 0.064 < 0.064	0.3165 REFERENT
Proportion of admissions with brain dysfunction	≥ 0.123 < 0.123	0.2074 REFERENT

# NHSN Statistics Calculator

 **Statistics Calculator**



- [Compare Two Proportions](#)
- [Compare Two Incidence Density Rates](#)
- [Compare Single Proportion to a Benchmark](#)

The options below can be applied to the following standardized ratios: standardized infection ratios (SIRs), standardized utilization ratios (SURs), standardized antimicrobial administration ratios (SAARs), pathogen-specific standardized infection ratios (pSIRS), and standardized resistant infection ratios (SRIRs).

- [Compare Single Standardized Ratio \(for example, SIR\) to Nominal Value](#)
- [Compare Single Standardized Ratio \(for example, SIR\) to 1](#)
- [Compare Two Standardized Ratios \(for example, SIRs\)](#)

**NHSN - National Healthcare Safety Network** (ps1311-5db6c9655f-frzpk80)

**NHSN Home**

- Alerts
- Dashboard
- Reporting Plan
- Patient
- Event
- Procedure
- Summary Data
- Hospital Respiratory Data
- Infectious Diseases of Public Health Concern
- Import/Export
- Surveys

**Compare Single Standardized Ratio (for example, SIR) to 1**

When comparing a standardized ratio to 1, the hypothesis is that the ratio is not different from 1 (specifically, the number observed is not different than the number predicted). To perform a hypothesis test and calculate a p-value and 95% confidence interval, first select the type of ratio you wish to analyze. Then, enter the values for the appropriate number observed and number predicted. The standardized ratio will be displayed automatically. Click Calculate.

Type of ratio:

Data Source #1

Number Observed Infections:

Number Predicted Infections:

Standardized Infection Ratio: 0.911

Title:

- **Using the Statistics Calculator**

- <https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/statscalc.pdf>

# CAUTI SIR Reports (2022 baseline)

Irene Khan, Acute Care Analytics Team

How to run and use the new reports

## Before you begin...

Check monthly reporting plan for all locations that are reporting CAUTI data.

Verify or enter any UTI events. Confirm if the events are eligible CAUTI events.

Enter in catheter days for locations reporting UTI data.

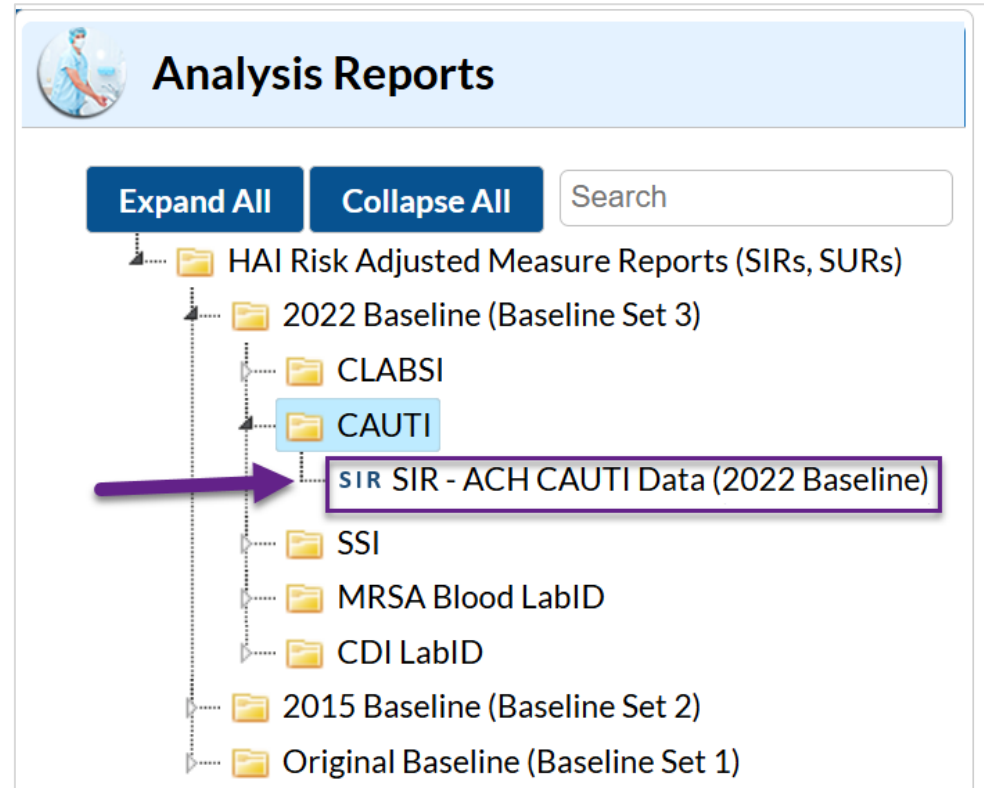
Resolve any outstanding alerts.

Generate a dataset to incorporate all changes.



# Analysis and Reporting Treeview

- **Required:** Generate datasets before running the new reports.
- Analysis treeview has been updated to include a new folder for the 2022 Baseline (Baseline Set 3) SIR reports under the 'HAI Risk Adjusted Measure Reports' folder.
- New CAUTI SIR (2022 Baseline) reports can be found under the 'CAUTI' subfolder.
- The SIR Report for 'ACH-CAUTI Data' is available.



# Report Modifications





Modify "SIR - ACH CAUTI Data (2022 Baseline)"

☐ Show descriptive variable names ([Print List](#))      Analysis Data Set: bs3\_CAU\_RatesICUOther\_SCA      Type: SIR      Last Generated (UTC): [March 11, 2025 12:46 PM](#)

**Title/Format**   Time Period   Filters   Display Options

Title:  
Standardized Infection Ratio for Catheter-Associated UTI Data for Acute Care Hospitals (2022 baseline)

Format:

☒  ☐  ☐  ☐ 

- Users will have the same options to modify the 2022 Baseline SIR reports in the NHSN application as the current reports.
- The following can be modified:
  - Title / Format
  - Time Period
  - Filters
  - Display Options

For more information on how to modify NHSN reports: [How to Modify a Report \(cdc.gov\)](https://www.cdc.gov/nhsn/dataquery/modifyreport.html)

# Details for the SIR Report for Acute Care Hospitals (ACH)

# Getting Started: Fundamentals for the new CAUTI SIR Reports (Part 1)

- The CAUTI SIR for all facility types is calculated on a location, locCDC, and location type.
  - Note: IRF units within a hospital will receive a separate SIR.
- The new SIR reports under the 2022 Baseline folder will only run for data from 2022 and forward.
- Footnotes have been updated with new details specific for the 2022 baseline model.
- NHSN's Guide to the 2022 Baseline SIR:  
<https://www.cdc.gov/nhsn/2022rebaseline/sir-guide.pdf>

# Getting Started: Fundamentals for the new CAUTI SIR Reports (Part 2)

- **Report Cadence:** The CAUTI SIR reports are available at the quarterly-level by default. Users will have the option to generate monthly, yearly, and cumulative SIRs.
- **Exclusions in the SIRs using the 2022 baseline year**
  - Data from facilities enrolled in NHSN using the facility type designation of Public Health Emergency Facility (HOSP-PHE/NG or HOSP-PHE/G)
  - Psychiatric Hospitals and inpatient psychiatric (IPF) units are excluded for SIRs using the 2022 baseline year
    - These facilities can still run 2015 baseline SIR reports, line listings and rate tables
- **Facility Types Included in ACH SIR Reports:**
  - HOSP-CHLD, HOSP-GEN, HOSP-MIL, HOSP-ONC, HOSP-ORTHO, HOSP-SURG, HOSP-VA, HOSP-WOM, HOSP-WOMCHILD

# Updated Analysis Data Sets

- The 2022 CAUTI ADS includes records available in the analytic reports.
- The change in the ADS name include 'bs3' to indicate the source analytic data set is from the 2022 rebaseline.
  - bs3\_CAU\_RatesICUOther\_SCA
  - bs3\_CAU\_RatesNICU

# Example CAUTI SIR Report Basics

## 1 National Healthcare Safety Network Standardized Infection Ratio for Catheter-Associated UTI Data for Acute Care Hospitals (2022 baseline) - By OrgID

2 As of: March 19, 2025 at 9:53 PM UTC  
Date Range: All BS3\_CAU\_RATESICUOTHER\_SCA

orgID=15331

3

orgID	ccn	summaryYQ	caucount	numPred	numcathdays	SIR	SIR_pval	sir95ci
15331	1234	2024Q1	5	10.411	10822	0.480	0.0754	0.176, 1.065
15331	1234	2024Q2	0	0.089	102			

- 4
1. 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  $> 0$ .
  2. The number of predicted events is calculated based on national 2022 NHSN data. Please see the SIR Guide for details on the HAI-specific risk adjustments and inclusion/exclusion criteria: <https://www.cdc.gov/nhsn/2022rebaseline/analysis-resources.html>
  3. By default, this report includes all data that meet the report criteria, which includes data not specified on the monthly reporting plans.
  4. At least one month of denominator data in at least one location included in this table were reported using the NHSN sampling method protocol.

Source of aggregate data: 2022 NHSN CAUTI Data

Data contained in this report were last generated on March 19, 2025 at 5:37 PM UTC to include data beginning January 2022 through July 2024 .

1. Title of the Report that includes the baseline year (e.g. “2022 baseline”)
2. Report Filters, Date Range with Analysis Data Set source name
3. SIR Table with SIR statistics and facility information
4. Footnotes include information on inclusions/exclusions as well as information on when the data sets were last generated

# Summary of Changes to the CAUTI SIR Reports

- **There are no changes to the display of the first 4 tables in the SIR Reports**
  - Table 1: overall facility SIR stratified by time period
  - Table 2: Stratified by Location Type/OrgID and time period
  - Table 3: Stratified by locCDC/OrgID and time period
  - Table 4: Stratified by Location/OrgID and time period.
- **The 5<sup>th</sup> table in the SIR Report, “CAUTI Data Not Included in the SIR,” is different from the 2015 baseline SIR reports. It will list:**
  - Records missing any risk factors that are used to calculate the number predicted
  - Any locations that meet the locCDC restrictions
  - Missing device days or unresolved alerts



# Description of CAUTI SIR Statistics

## National Healthcare Safety Network

### Standardized Infection Ratio for Catheter-Associated UTI Data for Acute Care Hospitals (2022 baseline) - By OrgID

As of: March 19, 2025 at 1:31 PM UTC

Date Range: All BSS\_CAU\_RATE SICUOTHER\_SCA

orgID=15331

orgID	ccn	summaryYM	caucount	numPred	numcathdays	SIR	SIR_pval	sir95ci
15331	1234	2024M01	3	7.389	8293	0.407	0.0868	0.104, 1.108
15331	1234	2024M02	1	0.751	841	.	.	
15331	1234	2024M03	1	2.291	1688	0.437	0.4343	0.022, 2.153
15331	1234	2024M04	0	0.056	57	.	.	

Source of aggregate data: 2022 NHSN CAUTI Data

Data contained in this report were last generated on March 19, 2025 at 1:21 PM UTC to include data beginning January 2022 .

- **caucount** = CAUTI event count (observed)
- **numPred** = Number of CAUTI predicted
- **numcathdays** = Number of urinary catheter days

Keys to Success with the SIR: <https://www.cdc.gov/nhsn/ps-analysis-resources/keys-to-success.html>

*Fictitious data used for illustrative purposes only.*

# Description of CAUTI SIR Statistics Contd.

## National Healthcare Safety Network

### Standardized Infection Ratio for Catheter-Associated UTI Data for Acute Care Hospitals (2022 baseline) - By OrgID

As of: March 19, 2025 at 1:31 PM UTC

Date Range: All B\$3\_CAU\_RATE\$ICUOTHER\_\$CA

orgID=15331

orgID	ccn	summaryYM	caucount	numPred	numcathdays	SIR	SIR_pval	sir95ci
15331	1234	2024M01	3	7.369	8293	0.407	0.0888	0.104, 1.108
15331	1234	2024M02	1	0.751	841	.	.	
15331	1234	2024M03	1	2.291	1688	0.437	0.4343	0.022, 2.153
15331	1234	2024M04	0	0.056	57	.	.	

Source of aggregate data: 2022 NHSN CAUTI Data

Data contained in this report were last generated on March 19, 2025 at 1:21 PM UTC to include data beginning January 2022 .


- If the SIR  $< 1.0$ , then there were fewer CAUTI events that were observed than predicted, based on the 2022 national aggregate data.
- If the p-value  $> 0.05$ , then we can conclude that the number of observed infections is not statistically significantly different than the number of predicted infections.
- If the confidence interval includes the value of 1, then the SIR is not significantly different than 1.

# Table 5- CAUTI Data Not Included in SIR

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

As of: March 24, 2025 at 4:08 PM UTC  
Date Range: All BS3\_CAU\_RATESICUOTHER\_SCA

orgID=15331



orgID	locationType	loccdc	location	summaryYM	caucount	numucathdays	numPatDays Surv	numAdmits Surv	medType	factype	numBeds	numICUBeds
15331	OR	IN:ACUTE:OR:CATH	CATHOREX	2024M01	0	30	660	100	G	HOSP-GEN	177	40
15331	CC	IN:ACUTE:CC:NS_PED	CC_NSPEDEX	2024M01	0	229	660	100	G	HOSP-GEN	177	40
15331	CC	IN:ACUTE:CC:NS_PED	CC_NSPEDEX	2024M02	0	30	660	100	G	HOSP-GEN	177	40
15331	WARD	IN:ACUTE:WARD:CD	CDINCL	2024M02	0	25	660	100	G	HOSP-GEN	177	40
15331	OR	IN:ACUTE:OR:LD	CSECEX	2024M01	0	20	660	100	G	HOSP-GEN	177	40
15331	OTHER	IN:NONACUTE:LTC:HSP	LTCPSCEX	2024M01	0	55	660	100	G	HOSP-GEN	177	40
15331	WARD	IN:ACUTE:WARD:OPH	OPHWRDEX	2024M01	0	40	660	100	G	HOSP-GEN	177	40
15331	OTHER	IN:ACUTE:OR_STEP	ORSTEPEX	2024M01	0	55	660	100	G	HOSP-GEN	177	40
15331	WARD	IN:ACUTE:WARD:ENT_PED	PEDENTEX	2024M01	0	50	660	100	G	HOSP-GEN	177	40
15331	CC	IN:ACUTE:CC:R_PED	PEDREX	2024M01	0	55	660	100	G	HOSP-GEN	177	40
15331	CC	IN:ACUTE:CC:R_PED	PEDREX	2024M02	0	30	660	100	G	HOSP-GEN	177	40
15331	SCA	IN:ACUTE:SCA:DIAL_PED	PEDSCAEX	2024M01	0	40	660	100	G	HOSP-GEN	177	40
15331	WARD	IN:ACUTE:WARD:IFM	SCHLINFE	2024M01	0	50	660	100	G	HOSP-GEN	177	40

- NEW: risk factors that go into calculating the number predicted are included in the table

*Fictitious data used for illustrative purposes only.*

# What if numPred is less than 1?

- If numPred is less than 1, the SIR, SIR p-value, and 95% confidence interval will not be generated in the SIR table.
- A longer time period can be included in the SIR calculation in order to reach the threshold of 1.0 predicted infection.
- CAUTI Rates can also be used to track changes at the location level over time.

## National Healthcare Safety Network

### Standardized Infection Ratio for Catheter-Associated UTI Data for Acute Care Hospitals (2022 baseline) - By OrgID

As of: March 19, 2025 at 9:53 PM UTC

Date Range: All BS3\_CAU\_RATESICUOTHER\_SCA

orgID=15331

orgID	ccn	summaryYQ	caucount	numPred	numucathdays	SIR	SIR_pval	sir95ci
15331	1234	2024Q1	5	10.411	10822	0.480	0.0754	0.176, 1.065
15331	1234	2024Q2	0	0.089	102	.	.	.

*Fictitious data used for illustrative purposes only.*

## How is the # of predicted events calculated?

- The number of predicted infections in NHSN is calculated based on national HAI aggregate data from a baseline time period (e.g., 2022) and is adjusted for each facility using variables found to be significant predictors of HAI incidence during the baseline year.
- Negative binomial regression model is used to calculate number predicted infections when estimating incidence from a summarized location.
- The predicted number of infections is calculated by multiplying device days (e.g., catheter days) by the exponent of the parameter estimates.
- For further information on the models, please see the NHSN's Guide the 2022 SIR (<https://www.cdc.gov/nhsn/2022rebaseline/sir-guide.pdf>)

# Risk Factors: Annual Survey

- Total number of beds in the facility
- Medical school affiliation
- Total patient days
- Total number of annual admissions
- Average length of stay =  $\frac{\text{total \# of patient days}}{\text{total \# of annual admissions}}$
- Total number of ICU Beds
- Proportion of ICU Beds =  $\frac{\text{total \# of ICU beds}}{\text{total \# of beds in the facility}}$

# Location-level Exclusions from 2022 ACH CAUTI Model

- **Neonatal Intensive Care Units (NICU)**

- Neonatal Critical Care (Level II/III), Neonatal Critical Care (Level III), Neonatal Critical Care (Level IV)

NICUs do not have inplan CAUTI surveillance

- **Pediatric Critical Care Units**

- Pediatric Neurosurgical Critical Care
- Pediatric Respiratory Critical Care

Insufficient 2022 baseline data

- **Pediatric Wards**

- Pediatric Ear, Nose, Throat Ward
- Pediatric Behavioral Health Ward (**CMSIPF=Y**)
- Adolescent Behavioral Health Ward (**CMSIPF=Y**)
- Pediatric Rehabilitation Ward (within Hospital) (**CMSIRF=Y**)

Insufficient 2022 baseline data

# Location-level Exclusions from 2022 ACH CAUTI Model

- **Specialty Care Areas**

- Pediatric Dialysis Specialty Care Area

- **Chronic Care Units** (e.g. inpatient hospice, chronic Alzheimer's unit, chronic behavioral health/psych unit, chronic rehabilitation unit, chronic care unit, and ventilator dependent unit)

- **Operating Rooms**

- Cardiac Catheterization Room/Suite
- Cesarean Section Room/Suite
- Interventional Radiology
- Operating Room/Suite
- Post Anesthesia Care Unit/Recovery Room

Data from the location type is excluded from the SIR due to insufficient 2022 baseline data

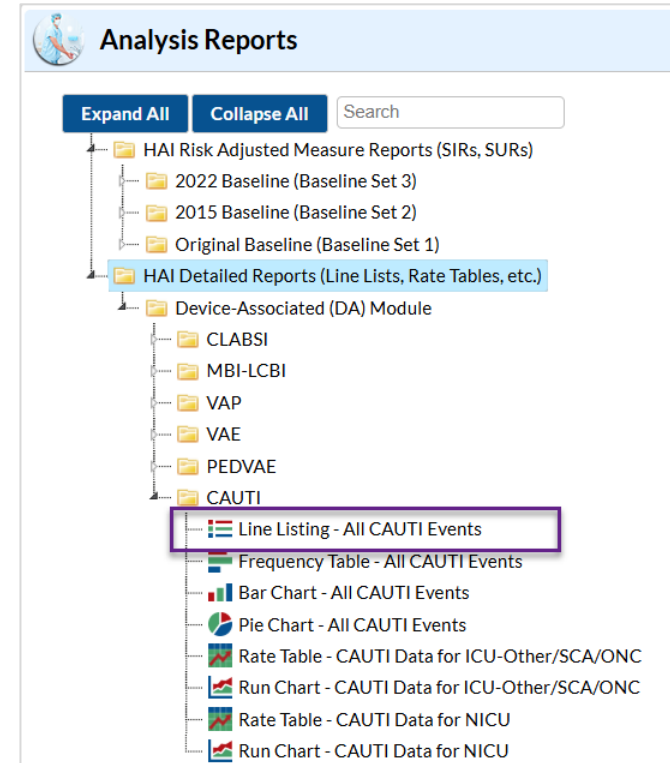


# Data Quality

How to ensure the quality and accuracy of the SIR report

# Data Quality: SIR Numerator, All CAUTI Events Line List

- **CAUTI events (e.g. SIR numerator)** can be verified by running the “Line Listing – All CAUTI Events”
- **Folder location**
  - HAI Detailed Reports (Line Lists, Rate Tables, etc.) >> CAUTI
- **Purpose**
  - Ensure CAUTI events entered in the application are recorded in the analysis reports



# Data Quality: SIR Numerator, Line Listing Report

## National Healthcare Safety Network

### Line Listing for All Catheter-Associated UTI Events

As of: March 20, 2025 at 2:40 AM UTC

Date Range: All CAU\_EVENTS

orgID	patID	dob	sex	admitDate	eventID	eventDate	eventType	spcEvent	location
15331	NICUTEST	01/01/2024	F	01/12/2024	132169	03/01/2024	UTI	SUTI	NURS4EX
15331	TEST3	04/04/1996	M	01/15/2024	129551	01/22/2024	UTI	SUTI	RBCAUM
15331	TEST3	04/04/1996	M	12/31/2023	132168	01/12/2024	UTI	SUTI	RBCAUNMS
15331	TEST4	12/17/1968	F	02/10/2024	129552	02/19/2024	UTI	SUTI	RBCAUMW
15331	TEST6	11/09/1966	F	12/29/2023	132218	01/24/2024	UTI	SUTI	RBCAUGW
15331	TEST9	01/01/1998	F	03/11/2024	129553	03/16/2024	UTI	SUTI	RBCAUB

Data contained in this report were last generated on March 19, 2025 at 5:37 PM UTC to include data beginning January 2022 through July 2024 .

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.

- The line listing includes default variables in the column headings. The report can be customized based on your facility's reporting needs by using the modify feature.

*Fictitious data used for illustrative purposes only.*

# Data Quality: SIR Denominator, All Summary Data Line List

The screenshot displays the 'Modify "Line Listing - All Summary Data"' interface. On the left, a file tree shows the hierarchy: Supplemental Reports > Summary-level Data > Line Listing - All Summary Data (highlighted with a purple box). The main panel has a blue header and a status bar indicating 'Analysis Data Set: PSSummary', 'Type: Line Listing', and 'Last Generated (UTC): March 19, 2025 5:43 PM'. Below the header are tabs for 'Title/Format', 'Time Period', 'Filters' (active), 'Display Variables', 'Sort Variables', and 'Display Options'. The 'Filters' tab contains an 'Additional Filters' section with 'Show' and 'Clear' buttons. A filter rule is configured with 'AND' logic, selecting 'eventType' and 'equal' to 'CAU - Catheter-Associated UTI' (this entire rule configuration is highlighted with a purple box). Buttons for 'Add group', 'Add rule', and 'Delete' are visible on the right side of the filter configuration area.

How to Summary Data Line List <https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/summaryline.pdf>

# Data Quality: SIR Denominator, All Summary Data Line List

## National Healthcare Safety Network

### Line Listing for All Summary Data

As of: March 20, 2025 at 2:53 AM UTC

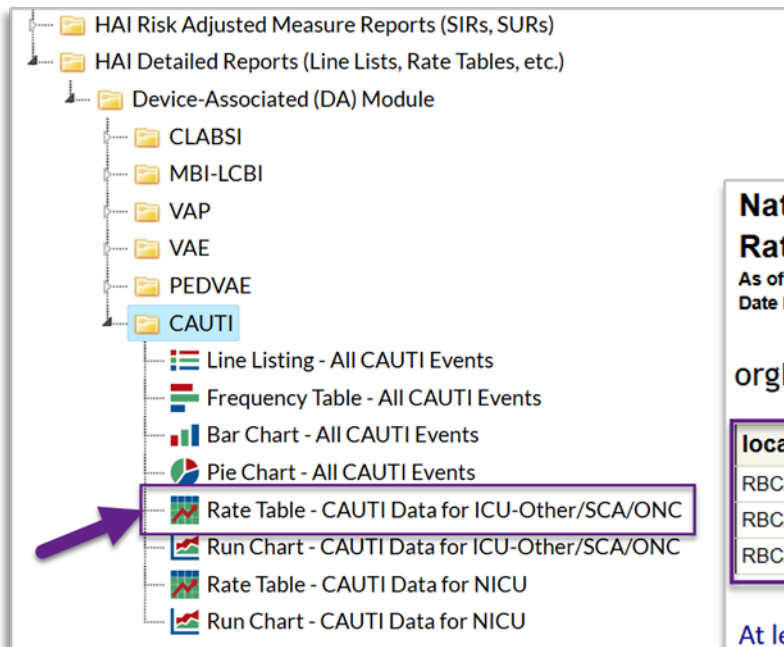
Date Range: All PSSUMMARY

if (((eventType = "CAU" ) ))

orgid	summaryYM	summarytype	location	loccdc	eventtype	birthwtcode	numpatdays	numddays
15331	2024M01	ICU	RBCAUB	IN:ACUTE:CC:B	CAU		500	400
15331	2024M01	ICU	RBCAUNS	IN:ACUTE:CC:NS	CAU		100	40
15331	2024M01	ICU	RBCAUN	IN:ACUTE:CC:N	CAU		100	45
15331	2024M01	ICU	RBCAUM	IN:ACUTE:CC:M	CAU		2000	1970
15331	2024M01	ICU	RBCAUST	IN:ACUTE:STEP	CAU		2000	1500
15331	2024M01	ICU	RBCAUMP	IN:ACUTE:WARD:M_PED	CAU		1500	1000
15331	2024M01	ICU	RBCAUBW	IN:ACUTE:WARD:B	CAU		100	58
15331	2024M01	ICU	RBCAUMW	IN:ACUTE:WARD:M	CAU		100	35

- Confirm your location-specific device days designated by the *numddays* column header.

# Data Quality: Rate Table to Identify Numerator and Summary Data



## National Healthcare Safety Network

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

As of: April 25, 2025 at 6:24 PM UTC

Date Range: All BS3\_CAU\_RATESICUOTHER\_SCA

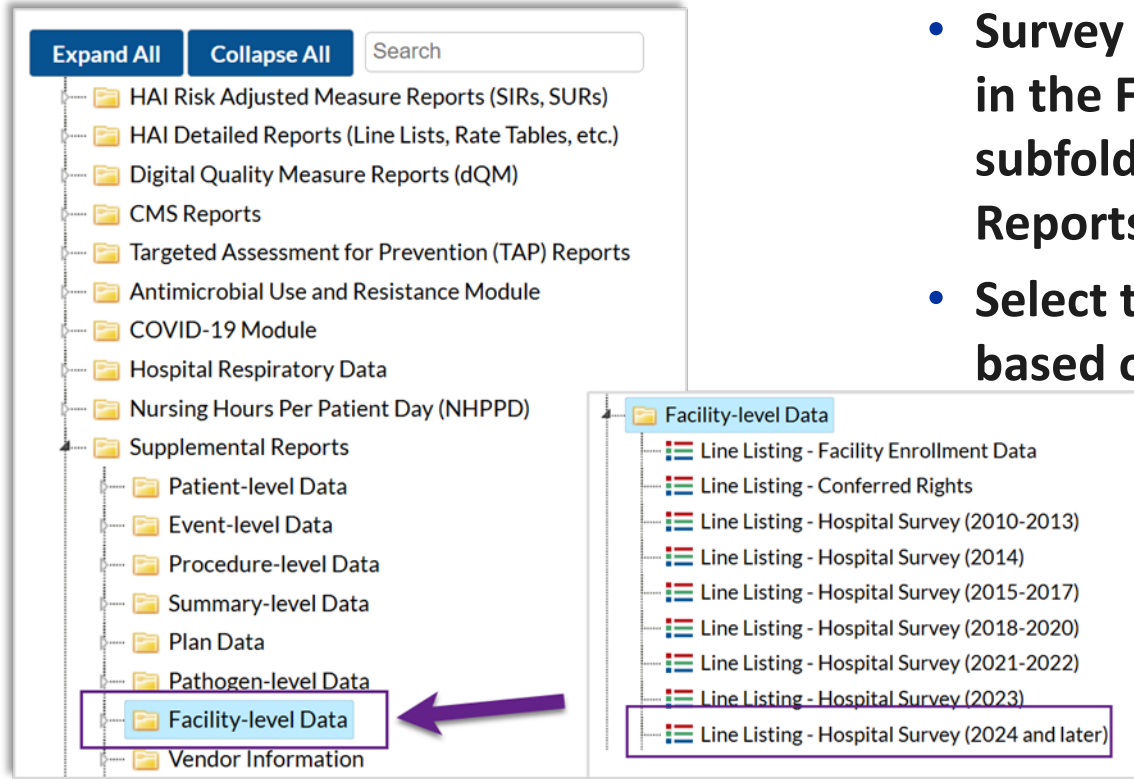
orgID=97038 loccdc=IN:ACUTE:CC:B

location	summaryYM	CAUCount	numucathdays	CAURate	numpatdays	CathDU
RBCAUB	2025M01	0	400	0.000	500	0.800
RBCAUB	2025M02	0	50	0.000	80	0.625
RBCAUB	2025M03	1	1000	1.000	1100	0.909

At least one month of denominator data in at least one location included in this table were reported using the NHSN sampling method protocol.

Data contained in this report were last generated on April 25, 2025 at 6:11 PM UTC to include data beginning January 2022 .

# Data Quality: Hospital Survey Line Listing Report



- Survey level data can be found in the Facility-level Data subfolder under “Supplemental Reports.”
- Select the Line Listing Report based on the survey year.

# **New Resources for Understanding the Rebaseline**



# Education & Analysis Resources Webpage

- Explore three tabs on this webpage:
  - Understanding New Models
  - Using New Reports in NHSN
  - Education & Training on the Rebaseline


## Education & Analysis Resources

2022 HAI Rebaseline

[Print](#)

[Return to 2022 NHSN HAI Rebaseline Home Page](#)

Note 3 tabs




Understanding New Models


Using New Reports in NHSN


Education & Training on Rebaseline


### Implementation Toolkit

This toolkit offers essential resources for understanding the implications of the 2022 Rebaseline. The resources below aim to facilitate the adoption of the new baseline by healthcare facilities and organizations that use NHSN to track HAI incidence. It includes a detailed implementation guide, a factsheet for baseline analysis, and tailored talking points for infection prevention staff and organizations that use or publish SIRs.

[Implementation Guide and Change Log](#)  [PDF – 473 KB] – This guide provides comprehensive details on implementing the 2022 baseline within the NHSN application and highlights the new features and functionalities introduced in the 2022 baseline SIR reports, offering a clear comparison to the 2015 baseline SIR reports.

[Which Baseline Should I Use for Analyses?](#)  [PDF – 291 KB] – This factsheet provides considerations and recommendations for analyzing SIRs or SURs under the 2015 and 2022 national baselines.

[Rebaseline Talking Points: Infection Prevention Staff & Hospital Leadership](#)  [PDF – 633 KB] – This document provides talking points for hospital infection prevention staff to communicate with hospital leadership. It explains the reasons behind NHSN's updated SIR and SUR calculations using 2022 data and offers insight on interpreting the updated metrics.

[Rebaseline Talking Points: Groups and Organizations that Use or Publish SIRs](#)  [PDF – 638 KB] – This document summarizes NHSN's 2022 HAI Rebaseline and highlights its implications for organizations that use or publish SIR and SUR data from NHSN, ensuring they understand the changes and their impact.

# Need more information on the new CAUTI SIR Reports?

- Review Implementation Guide & Change Log
  - Covers inclusion & exclusion rules
  - Lists the differences in functionality between the 2022 baseline SIR report and the 2015 baseline SIR report
  - Highlights minor changes made to other CAUTI reports due to rebaseline implications (e.g., names of analysis datasets)

## Implementation Guide and Change Log NHSN's 2022 HAI Rebaseline

Table 6. Changes in CAUTI Analysis Reports

Topic	Behavior in current (2015 baseline) SIR reports or non-SIR reports	Behavior in new (2022 baseline) SIR reports or non-SIR reports	Affected Reports
Numerator variable name in the SIR report	Infcount	CAUCount  <i>Note: The algorithm for the numerator has not changed. Only the variable name has changed.</i>	• All CAUTI SIR reports
Changes to locations included in the Acute Care Hospital CAUTI SIR	N/A	The following locations are <b>excluded</b> from the 2022 baseline Acute Care Hospital CAUTI SIR that were previously <b>included</b> in the 2015 baseline SIR:  - IN-ACUTE-CC-NS_PED - IN-NONACUTE-LTC-HSP - IN-NONACUTE-LTC-BHV - IN-NONACUTE-LTC-REHAB - IN-NONACUTE-LTC - IN-NONACUTE-LTC-R - CMS-IPF-Units  The following locations are <b>included</b> in the 2022 baseline Acute Care Hospital CAUTI SIR that were previously <b>excluded</b> from the 2015 baseline SIR:  - IN-ACUTE-WARD-GU_PED - IN-ACUTE-WARD-OF_ONSITE - IN-ACUTE-CC-OF_ONSITE	• SIR – ACH CAUTI Data (2022 Baseline)
New analysis dataset for the Rate Table report	The rate table reports currently uses the 2015 baseline (bs2) analysis dataset.  <i>Note: There is no change to any calculations in this report</i>	The rate table reports will now use the 2022 baseline (bs3) analysis dataset.  <i>Note: There is no change to any calculations in this report</i>	• Rate Table – CAUTI Data for ICU-Other/SCA/ONC • Rate Table – CAUTI Data for NICU

# Explaining the Rebaseline to Colleagues

## 2022 HAI Rebaseline Talking Points: Infection Prevention Staff & Hospital Leadership

*Note: While the talking points below focus on the SIR, the concepts apply to the SUR as well.*

**Bottom Line:** The 2022 healthcare-associated infection (HAI) Rebaseline will update the national baseline year from 2015 to 2022 for calculations of the standardized infection ratio (SIR) and standardized utilization ratio (SUR). This update will allow hospitals to compare their incidence of HAIs to more recent national data (i.e., data reported to NHSN for 2022). This document can assist hospital infection prevention staff by providing talking points to share with hospital leadership about why NHSN has updated SIR and SUR calculations using 2022 data, and how to interpret the updated metrics.



### Explaining the 2022 Rebaseline to Hospital

Currently, NHSN used data reported from 2015 as the baseline year for SIR calculations. There have been updates to surveillance definitions, diagnostic testing & practice science, technology, and hospital operations that make it useful for CDC to update this process of updating the national baseline is conveniently referred to as the

- » NHSN has updated the national baseline data used to calculate the SIR (predicted infections).
- » This new baseline is derived from national HAI rate data reported to NHSN.
- » In more detail, the national baseline comprises HAI data from a single risk adjustment models. These models are crucial for calculating the SIR. The 2022 NHSN data were used to re-fit the statistical models in NHSN to update the baseline for predicting the number of HAIs that might occur in the future.

The Rebaseline will ensure that the risk adjustment models are better able to capture relevant

The NHSN application has built-in analysis reports that calculate SIRs for each

## 2022 HAI Rebaseline Talking Points: Organizations & Private Payors

*These talking points summarize NHSN's 2022 HAI Rebaseline and highlight implications for organizations that may use or publish SIR and/or SUR data from NHSN.*

**Bottom Line:** The Centers for Disease Control and Prevention (CDC) is updating the national baseline used to calculate the denominators of healthcare-associated infection (HAI) standardized infection ratios (SIRs) and standardized utilization ratios (SURs) to 2022 data. This Rebaseline effort is important to continually improve patient safety and to drive efforts to reduce HAI rates. At the same time, this Rebaseline will impact the way facilities and organizations interpret HAI incidence and device utilization metrics.



### The Situation:

The National Healthcare Safety Network (NHSN) 2022 HAI Rebaseline refers to the process of updating the risk adjustment models used to calculate the denominators of all healthcare-associated infection (HAI) standardized infection ratios (SIRs) and standardized utilization ratios (SURs) in the [Patient Safety Component](#) of NHSN using data reported from 2022. CDC will use 2022 data to update the source of aggregate data and the risk adjustment models used to create the denominators for the SIRs and SURs and will serve as the new baseline to measure HAI prevention progress at the local, state, and national levels.

The prior NHSN baseline used data reported from 2015. Since then, there

The Rebaseline will ensure that the risk adjustment models are better able to

New reports are being built in the NHSN application for NHSN facilities and

No timeline has been established for the adoption of the 2022

- Talking Points to help you present the Rebaseline to colleagues, leadership, or other organizations that may use NHSN data

<https://www.cdc.gov/nhsn/pdfs/rebaseline/Talking-Points-Hospital-Leadership.pdf>

<https://www.cdc.gov/nhsn/pdfs/rebaseline/Groups-Organizations-Use-Publish-SIRs.pdf>

# Model Explorer

- Review risk adjustment factors used in the calculation of number of predicted events.
- View risk adjustment tables directly in web browser, organized by facility type.

The model explorer is available.  
<https://www.cdc.gov/nhsn/2022rebaseline/tables/table-6.html>

### Acute Care Hospitals (ACHs)

- [CLABSI Risk Adjustment for ICU and Ward Locations in ACHs](#)
- [CLABSI Risk Adjustment for Neonatal Intensive Care Units \(Level II/III, Level III, and Level IV NICU locations in ACHs\)](#)
- [CLABSI Risk Adjustment for SCAs \(Specialty Care Areas\) and Oncology Units in ACHs](#)
- [CAUTI Risk Adjustment in ACHs](#)
- [MRSA Bacteremia LabID Event Risk Adjustment in ACHs](#)
- [CDI LabID Event](#)

### CAUTI Risk Adjustment (ACHs)

The number of predicted CAUTIs under the 2022 baseline is calculated using a negative binomial regression model and is risk adjusted based on the following variables found to be statistically significant predictors of CAUTI incidence. Information about the statistical properties of NHSN risk adjustment models, including how the number of predicted events is calculated, is available in NHSN's [Guide to the SIR \(2022 baseline\)](#). [\[PDF – 1MB\]](#).

Parameter	Parameter Estimate	Standard Error	P-value
Intercept	-10.2778	0.1497	<0.0001
<a href="#">CDC Location Code: Critical Care Group 1</a>			
Burn Critical Care – IN:ACUTE:CC:B			
Pediatric Medical Critical Care – IN:ACUTE:CC:M_PED	3.3086	0.1786	<0.0001
Pediatric Surgical Critical Care – IN:ACUTE:CC:S_PED			
<a href="#">CDC Location Code: Critical Care Group 2</a>			
Neurosurgical Critical Care – IN:ACUTE:CC:NS			
Oncology Pediatric Critical Care – IN:ACUTE:CC:ONC_PED			
Pediatric Burn Critical Care – IN:ACUTE:CC:B_PED	2.9823	0.1493	<0.0001
Pediatric Medical-Surgical Critical Care -IN:ACUTE:CC:MS_PED			

# NHSN 2022 Rebaseline Resources

Title	Link
2022 NHSN Rebaseline Webpage	<a href="https://www.cdc.gov/nhsn/2022rebaseline">https://www.cdc.gov/nhsn/2022rebaseline</a>
CAUTI Troubleshooting Guide (2015 baseline)	<a href="https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/clabsicauti_sirtroubleshooting.pdf">https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/clabsicauti_sirtroubleshooting.pdf</a>
2022 Baseline SIR Guide	<a href="https://www.cdc.gov/nhsn/2022rebaseline/sir-guide.pdf">https://www.cdc.gov/nhsn/2022rebaseline/sir-guide.pdf</a>
Implementation Guide	<a href="https://www.cdc.gov/nhsn/pdfs/rebaseline/Implementation-Guide-Change-Log.pdf">https://www.cdc.gov/nhsn/pdfs/rebaseline/Implementation-Guide-Change-Log.pdf</a>
Model Explorer	<a href="https://www.cdc.gov/nhsn/2022rebaseline/sir-risk-factors.html">https://www.cdc.gov/nhsn/2022rebaseline/sir-risk-factors.html</a>
Which baseline should I use? Fact Sheet	<a href="https://www.cdc.gov/nhsn/pdfs/rebaseline/Which-Baseline-Should-I-Use.pdf">https://www.cdc.gov/nhsn/pdfs/rebaseline/Which-Baseline-Should-I-Use.pdf</a>

# NHSN 2022 Rebaseline Resources

Title	Link
Infection Prevention Staff & Hospital Leadership Talking Points	<a href="https://www.cdc.gov/nhsn/pdfs/rebaseline/Talking-Points-Hospital-Leadership.pdf">https://www.cdc.gov/nhsn/pdfs/rebaseline/Talking-Points-Hospital-Leadership.pdf</a>
Groups and Organizations that Use or Publish SIRs Talking Points	<a href="https://www.cdc.gov/nhsn/pdfs/rebaseline/Groups-Organizations-Use-Publish-SIRs.pdf">https://www.cdc.gov/nhsn/pdfs/rebaseline/Groups-Organizations-Use-Publish-SIRs.pdf</a>
Rebaseline FAQs	<a href="https://www.cdc.gov/nhsn/pdfs/rebaseline/22-Rebaseline-FAQs-Final-Version.pdf">https://www.cdc.gov/nhsn/pdfs/rebaseline/22-Rebaseline-FAQs-Final-Version.pdf</a>
Intro to Rebaseline Quick Learn	<a href="https://www.youtube.com/watch?v=pMYwYIV86Ek">https://www.youtube.com/watch?v=pMYwYIV86Ek</a>

# NHSN Patient Safety Analysis Resources

Title	Link
<a href="https://www.cdc.gov/nhsn/ps-analysis-resources/index.html">Patient Safety Analysis Resources Webpage</a>	<a href="https://www.cdc.gov/nhsn/ps-analysis-resources/index.html">https://www.cdc.gov/nhsn/ps-analysis-resources/index.html</a>
<a href="https://www.cdc.gov/nhsn/ps-analysis-resources/reference-guides.html">Patient Safety Analysis Quick Reference Guides</a>	<a href="https://www.cdc.gov/nhsn/ps-analysis-resources/reference-guides.html">https://www.cdc.gov/nhsn/ps-analysis-resources/reference-guides.html</a>
<a href="https://www.cdc.gov/nhsn/ps-analysis-resources/data-quality/index.html">Patient Safety Data Quality Webpage</a>	<a href="https://www.cdc.gov/nhsn/ps-analysis-resources/data-quality/index.html">https://www.cdc.gov/nhsn/ps-analysis-resources/data-quality/index.html</a>
<a href="https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/howtomodifyreport.pdf">How to Modify a Report</a>	<a href="https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/howtomodifyreport.pdf">https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/howtomodifyreport.pdf</a>
<a href="https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/statscalc.pdf">NHSN's Statistics Calculator</a>	<a href="https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/statscalc.pdf">https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/statscalc.pdf</a>

# NHSN Rebaseline Questions

- **NHSN Users with SAMS access:**
  - Submit questions through [NHSN-ServiceNow](https://servicedesk.cdc.gov/nhsncsp) (https://servicedesk.cdc.gov/nhsncsp)
- **Those without SAMS or ServiceNow access:**
  - Email the NHSN Help Desk at [nhsn@cdc.gov](mailto:nhsn@cdc.gov)
- **Questions about CMS Programs:**
  - **Acute Care Hospitals** (including PPS-Exempt Cancer Hospitals) - [QualityNet Question and Answer Tool](#)
    - Select “Ask a Question”, then select “HACRP – Hospital-Acquired Condition Reduction Program”
  - **Inpatient Rehabilitation Facilities (IRF)** - [irf.questions@cms.hhs.gov](mailto:irf.questions@cms.hhs.gov)
  - **Long-term Acute Care Hospitals (LTACH)** - [ltchqualityquestions@cms.hhs.gov](mailto:ltchqualityquestions@cms.hhs.gov)



# For any questions or concerns, contact the NHSN Helpdesk

- **Use subject line: “2022 HAI Rebaseline”**
- **NHSN-ServiceNow** to submit questions to the NHSN Help Desk.
- Access new portal at **<https://servicedesk.cdc.gov/nhsncsp>**.
- If you do not have a SAMS login, or are unable to access ServiceNow, you can still email the NHSN Help Desk at [nhsn@cdc.gov](mailto:nhsn@cdc.gov).
- All media inquiries please contact CDC Media Office at [media@cdc.gov](mailto:media@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.

