



Introduction to NHSN Analysis

Jaina Shah, MPH

ORISE Fellow

NHSN Acute Care Analytics Team (formerly Methods & Analytics Team)

NCEZID, Division of Healthcare Quality Promotion

Centers for Disease Control and Prevention

2022 NHSN Annual Training

Tuesday March 22, 2022

Learning Objectives

- Understand the scope and structure of NHSN data entry and analysis functions
- Understand how to modify NHSN reports in the application
- Gain exposure to more customized analyses available in NHSN
- Describe and show how to use NHSN analysis to conduct data quality checks
- Identify specific analysis reports found in the NHSN Reports Advanced Folder
- Understand the different NHSN Data Quality Activities in place

A Message About the Data

- All data in this presentation has been created in a testing environment and is for training purposes only. Information seen on images during this presentation do not represent any actual data submitted to NHSN by participating facilities.

Data Analysis Preparation

Data Entry Sources

■ Event

- All infection events: CLABSI, CAUTI, SSI, LABID, etc.

■ Procedure

- Place to add all procedures, with covariates. Used for Procedure records

■ Summary Data

- Summary data forms for Device-Associated and MDRO/CDI surveillance

■ Surveys

- Facility level data collected once a year for previous calendar year

NHSN Home
Alerts
Dashboard ▶
Reporting Plan ▶
Patient ▶
Event ▶
Procedure ▶
Summary Data ▶
COVID-19 ▶
Import/Export
Surveys ▶
Analysis ▶
Users ▶
Facility ▶
Group ▶
Logout

Accessing Data Entry Screens

3 Options: Add, Find, Incomplete

- Click 'Add' to enter data
- 'Find' is used to look for previously entered data forms.
- 'Incomplete' lists the forms that have been started, but all the required fields have not been completed.

The 'Find' and 'Incomplete' options are very useful for investigating data quality issues.

cdc Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

NHSN - National Healthcare Safety Network

NHSN Home

- Alerts
- Dashboard ▶
- Reporting Plan ▶
- Patient ▶
- Event ▶
- Procedure ▶
- Summary Data ▶
- COVID-19 ▶
- Import/Export
- Surveys ▶
- Analysis ▶
- Users ▶
- Facility ▶
- Group ▶
- Logout

Find Procedure

- Enter search criteria and click Find
- Fewer criteria will return a broader result set
- More criteria will return a narrower result set

Procedure Information

Facility ID:

Procedure #:

NHSN Procedure Code:

ICD-9-CM Code:

ICD-10 PCS:

CPT Code:

Procedure Date: To:

Patient Information

Patient ID:

Last Name:

First Name:

Social Security #:

Secondary ID:

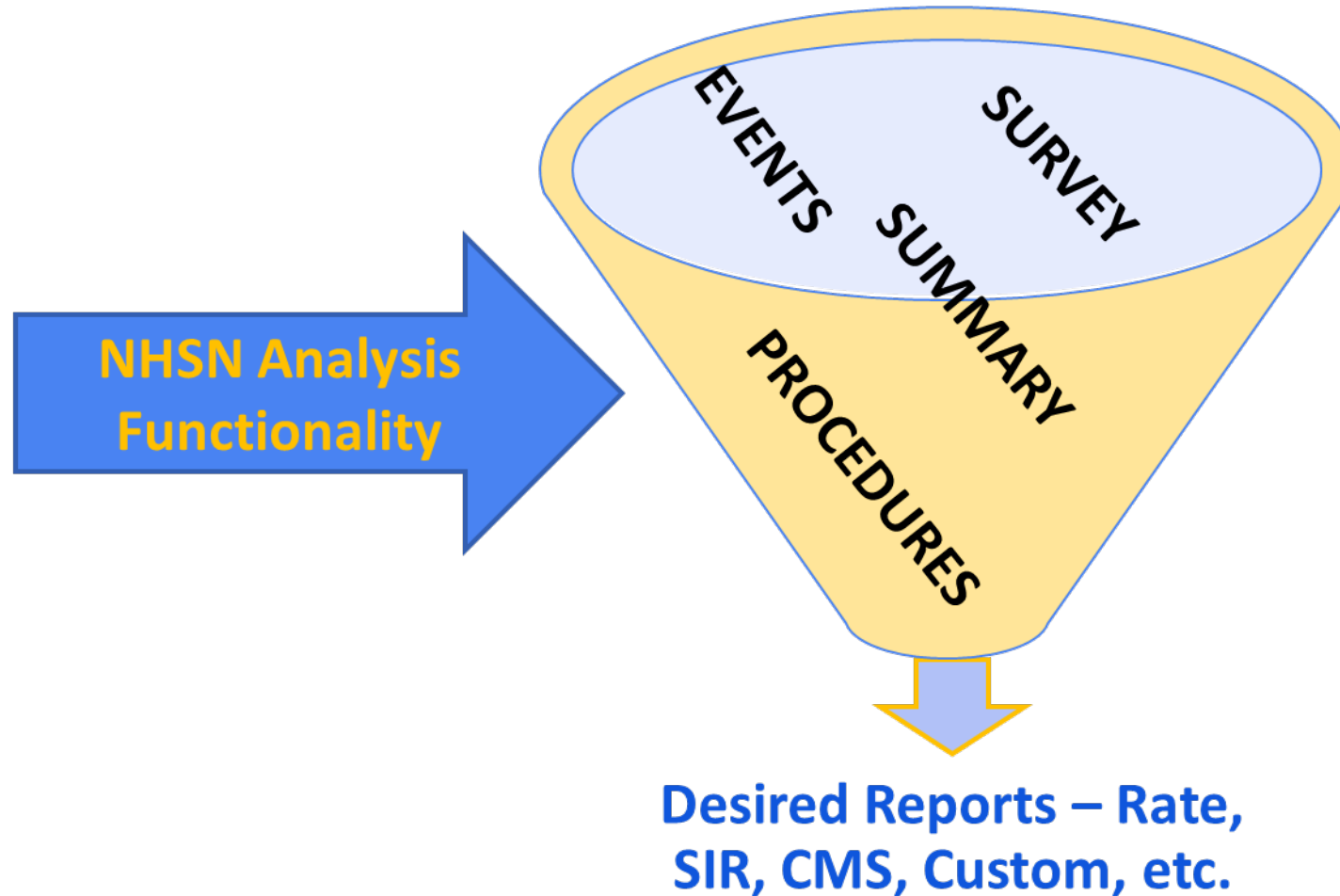
General Information

Completion Status:

Annual Surveys and Data Analysis

- Every year a new survey is entered into NHSN to reflect data from the prior calendar year
- SIRS will use the most recent annual survey on file for the current SIRs
 - Right now, majority should have completed a 2021 annual survey
 - Those values will be used to calculate 2021 and 2022 SIRs
- Under the new baseline, SIRS will be risk adjusted using the corresponding annual survey from that year
- If the annual survey from that year hasn't been completed, SIRs will be risk adjusted using the most recent available survey

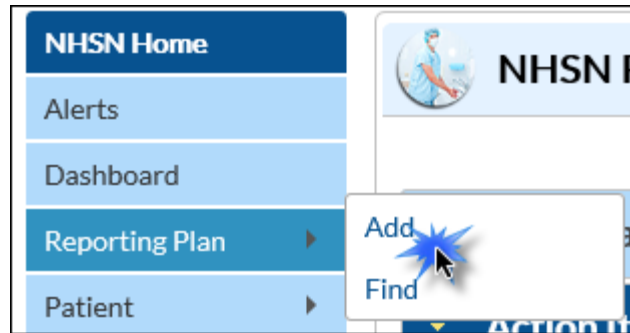
NHSN User Data Entry



Monthly Reporting Plans (MRPs)

- Used by all NHSN facilities to inform CDC which patient safety modules will be used in a given month
- Participating facilities must select the modules used, if any, the events, procedures, and/or locations that will be monitored in-plan
- MRP is the first in indicating what data will be submitted from NHSN to CMS as part of the Quality Reporting Program
- Only in-plan data are submitted to CMS in accordance with CMS's Quality Reporting Program

Accessing Monthly Reporting Plan



You can Add/Find a Monthly Reporting Plan using the left side menu bar. The 'Find' option is useful when investigating data quality issue.



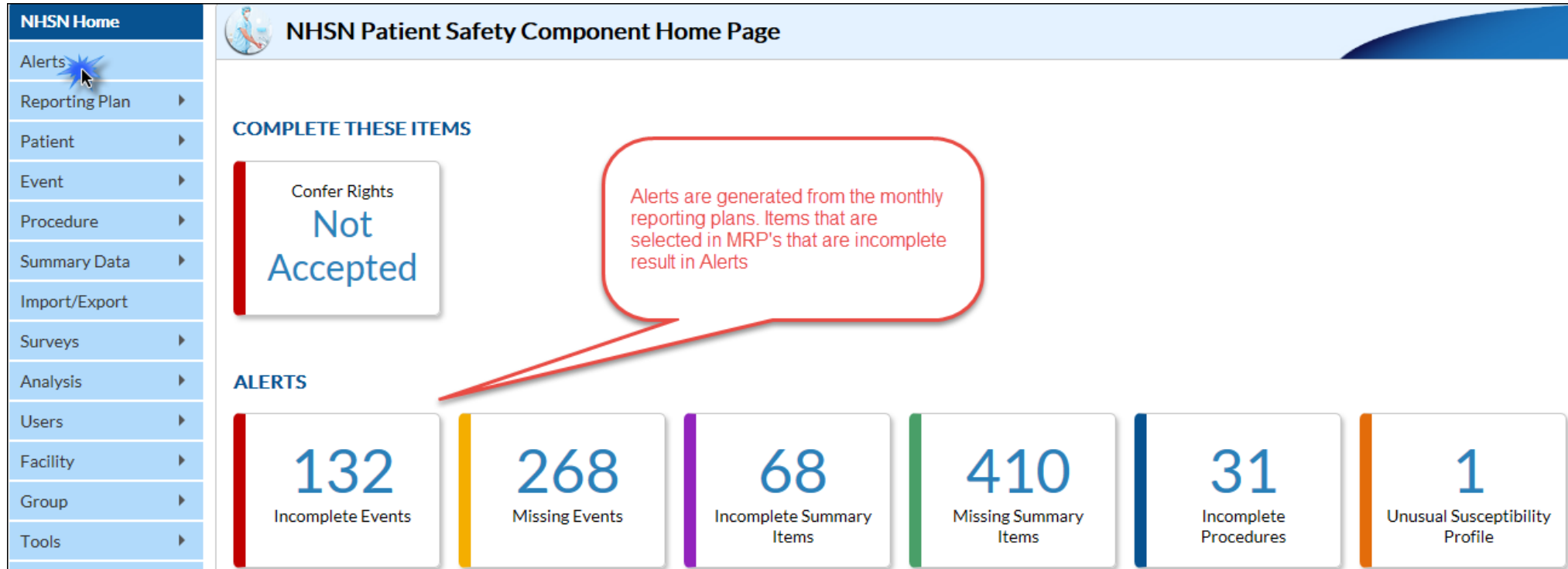
Knowledge Check

True or False

You can add Inactive Locations to monthly reporting plans

Alerts

- Alerts are automatic checks in NHSN that remind you of incomplete or missing in-plan data



- Before using the analysis function, make sure to clear all (relevant) alerts
- Found on the Home Page, or by clicking on the 'Alerts' tab on the sidebar

Alerts

- When an alert category is selected all incidents will be listed on a separate page for selection
- Each incident will need to be resolved in order for the alert category to clear

Incomplete Events	Missing Events	Incomplete Summary Data	Missing Summary Data	Incomplete Procedures	Missing Procedures	Missing Procedure-associated Events	Unusual Susceptibility Profile
-------------------	----------------	-------------------------	----------------------	-----------------------	--------------------	-------------------------------------	--------------------------------

The following are incomplete "In Plan" summary data records.

Page 1 of 7 | 10

Summary ID	Summary Data Type	Year	Month	Location Code
218	ICU	2005	September	MICU
260	ICU	2006	February	S-ICU
293	ICU	2006	March	S-ICU
4096	ICU	2013	February	INSURGCC
5576	ICU	2013	February	JOYREHAB
5902	ICU	2013	March	ICU
5903	ICU	2013	May	ICU
5904	ICU	2013	September	ICU
7964	ICU	2014	January	ICU-A
5779	ICU	2014	January	ICU/CCU

Page 1 of 7 | 10

View 1 - 10 of 68

View 1 - 10 of 68

All the alert categories from the previous page

Resolving Alerts

- Incomplete Summary Data Form
 - For DA and MDRO/CDI Events
- If there are no events for a given month, check the Report No Events box
- If not, alerts will appear if you have completed a summary form for a unit listed in your reporting plan but have not entered events.

Mandatory fields marked with *

Facility ID *: DHQP MEMORIAL HOSPITAL (ID 10018)

Location Code *: ICU - ICU

Month *: March

Year *: 2013

Total Patient Days *: 200

Central Line Days *: 50

Urinary Catheter Days *: 50

Ventilator Days *: 45

APRV Days *: 0

Report No Events

CLABSI:

CAUTI:

VAE:

PedVAP:

Final step: Generating Datasets

- After data entry is complete, the data must be first compiled into your user specific NHSN dataset
- After anything is changed in NHSN, generate datasets so that the change will be reflected in Analysis reports
- This is often the first thing we recommend when troubleshooting Analysis problems
 - NOTE: Unresolved alerts will prevent data from showing up in Rate and SIR reports, even if new datasets are generated

NHSN - National Healthcare Safety Network

Generate Data Sets (Patient Safety)

Reporting Data Sets

Include data for the following time period:

Beginning: 01/2019 Ending: 01/2022 [Clear Time Period](#)

Generate Reporting Data Sets

Last Generated:
January 12, 2022 3:15 PM
to include data beginning 01/2019

Allows to select the time period for which you want to generate datasets

Tells you when the dataset was last generated and will also appear as footnotes on

Navigation Menu:

- NHSN Home
- Alerts
- Dashboard
- Reporting Plan
- Patient
- Event
- Procedure
- Summary Data
- COVID-19
- Import/Export
- Surveys
- Analysis
- Users
- Facility
- Group

Sub-menu for Generate Data Sets:

- Generate Data Sets
- Reports
- Statistics Calculator

Navigating Data Analysis Reports

NHSN Analysis Reports

- Click on 'Reports' under the Analysis tab to see all available reports in NHSN
- The highlighted reports on the right are the most commonly used and basic report types

Analysis Reports

Expand All Collapse All Search

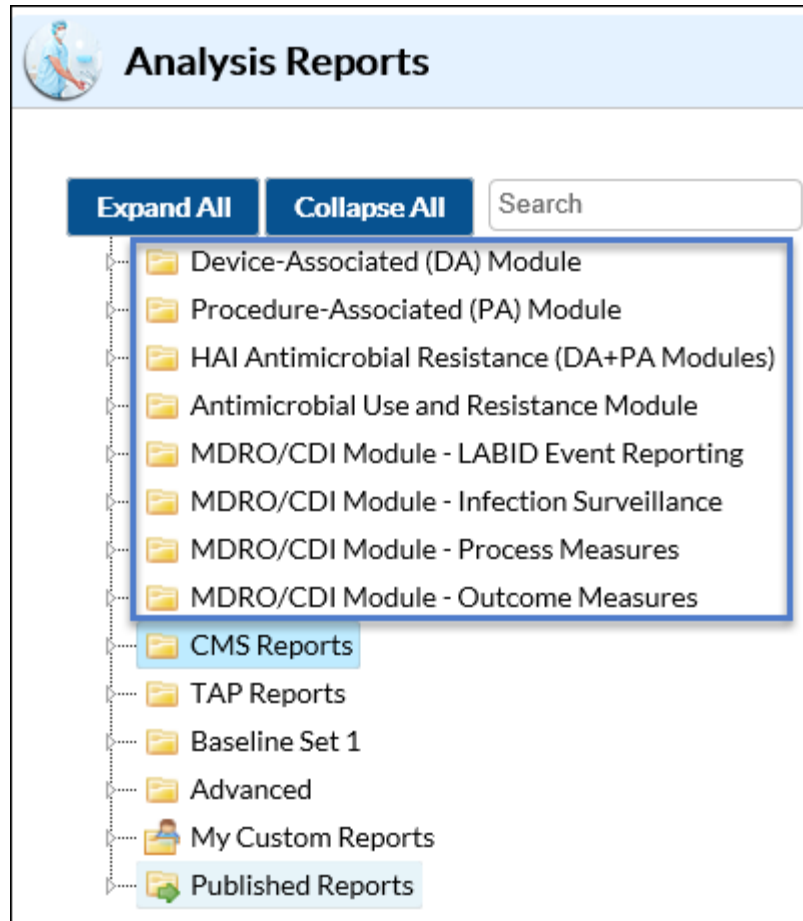
- Device-Associated (DA) Module
- Procedure-Associated (PA) Module
- HAI Antimicrobial Resistance (DA+PA Modules)
- Antimicrobial Use and Resistance Module
- MDRO/CDI Module - LABID Event Reporting
- MDRO/CDI Module - Infection Surveillance
- MDRO/CDI Module - Process Measures
- MDRO/CDI Module - Outcome Measures
- CMS Reports
- TAP Reports
- Baseline Set 1
- Advanced
- My Custom Reports
- Published Reports

NHSN Analysis Reports: Collapsed Folder

- Standard list of all report types.
 - Line List
 - Frequency Table
 - Bar/Pie Chart
 - Rate Table/Run Chart
 - SIR Report
- Clicking 'Run' will run a stock report using all CLABSI data for 2015 and forward
- Click Modify to create more specific reports

The screenshot displays the 'Analysis Reports' interface. At the top, there is a header with a user profile icon and the text 'Analysis Reports'. Below the header, there are two buttons: 'Expand All' and 'Collapse All', followed by a search input field. The main content area shows a tree view of folders. The 'Device-Associated (DA) Module' folder is expanded, and the 'Central Line-Associated BSI' folder is selected and highlighted in blue. Underneath, a list of report types is shown, each with a small icon representing its format: Line Listing - All CLAB Events, Frequency Table - All CLAB Events, Bar Chart - All CLAB Events, Pie Chart - All CLAB Events, Rate Table - CLAB Data for ICU-Other, Run Chart - CLAB Data for ICU-Other, Rate Table - CLAB Data for NICU, Run Chart - CLAB Data for NICU, Rate Table - CLAB Data for SCA/ONC, and Run Chart - CLAB Data for SCA/ONC. The 'SIR SIR - Acute Care Hospital CLAB Data' report is highlighted in blue. A context menu is open over this report, showing three options: 'Run Report' (with a play button icon), 'Modify Report' (with a gear icon), and 'Export Data Set' (with a download icon).

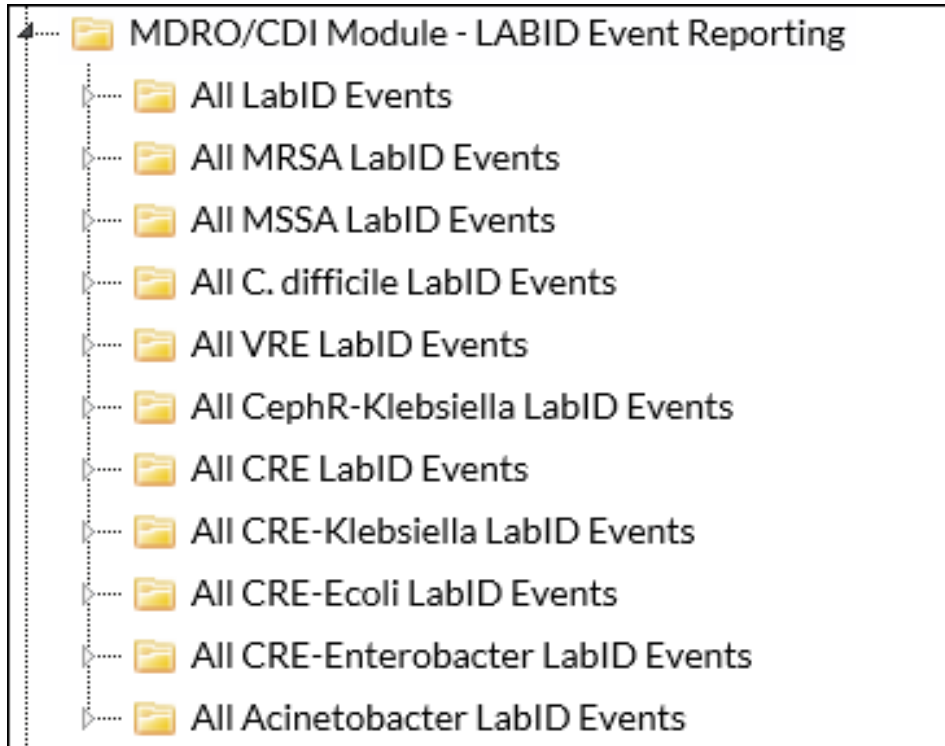
NHSN Analysis Reports: HAI Module Reports



Folders to provide specific analysis options for reportable HAIs



NHSN Analysis Reports: Collapsed LabID Folder



NHSN Analysis Reports: CMS Reports

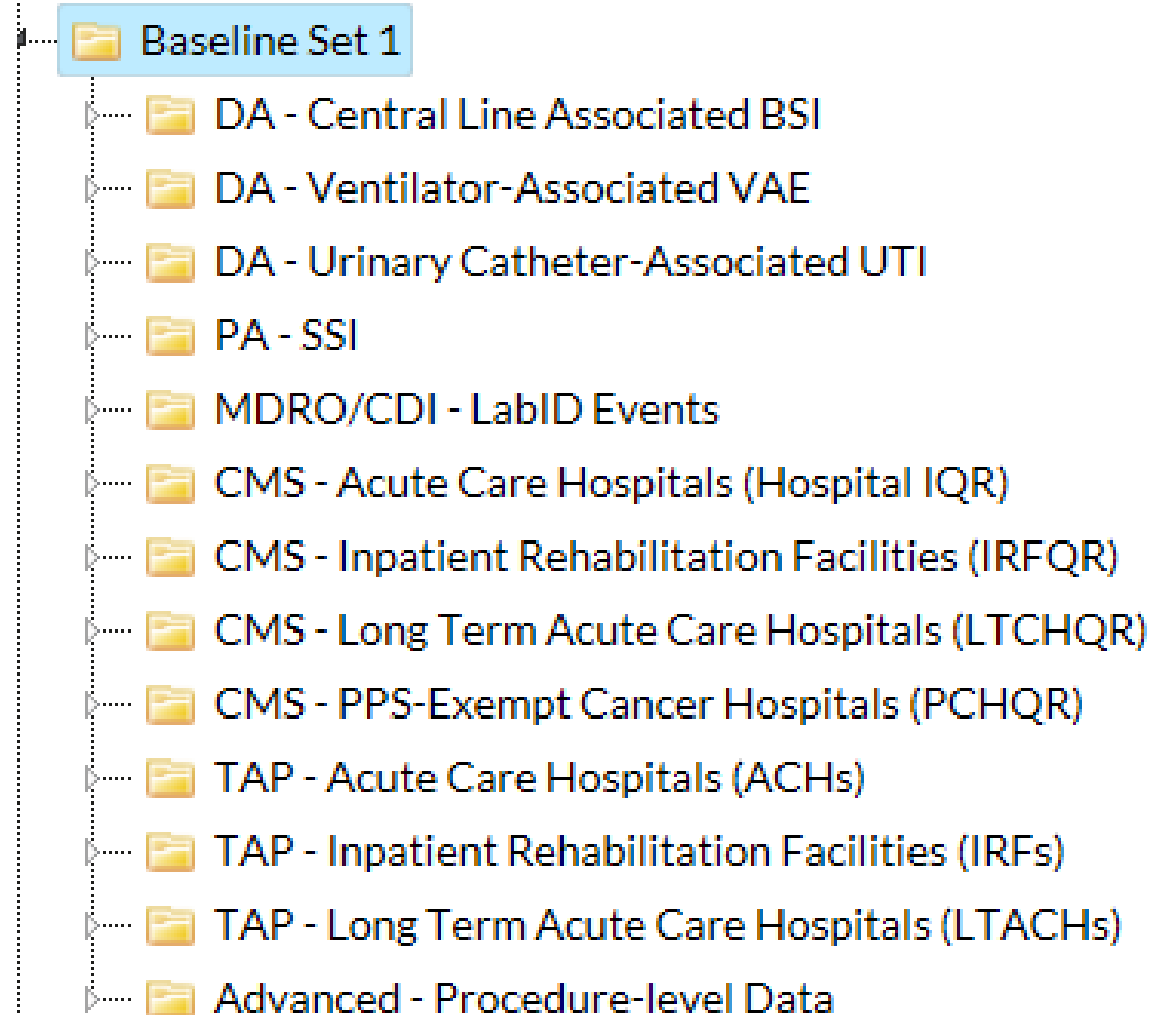


CMS Reports folder provide default reports that mirror CMS reporting requirements

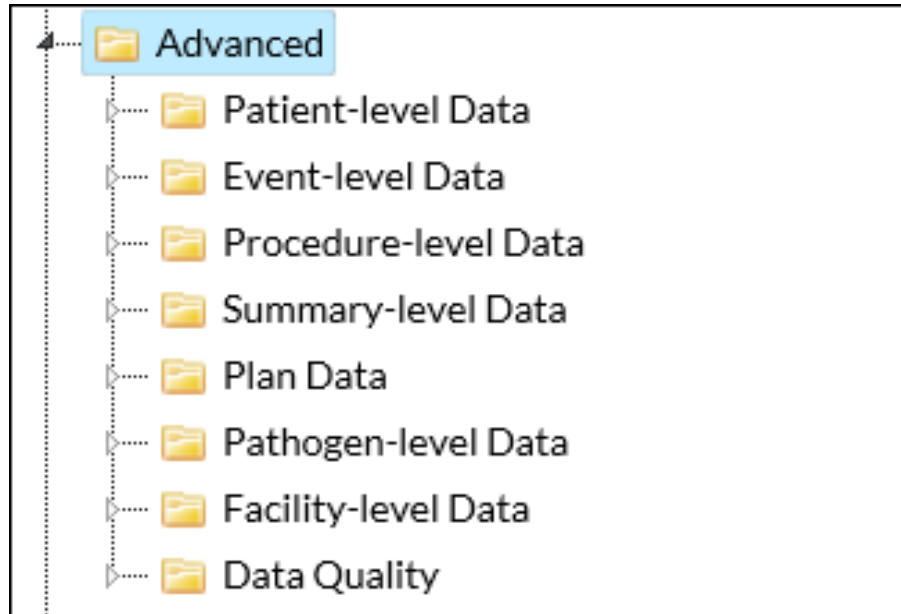


Baseline Set 1 Reports

- Contains archived reports with the Baseline Set 1 data
- Can only be run for 2016 data and before
- Data after 2016 must be run using 2015 Rebaseline Analysis Reports



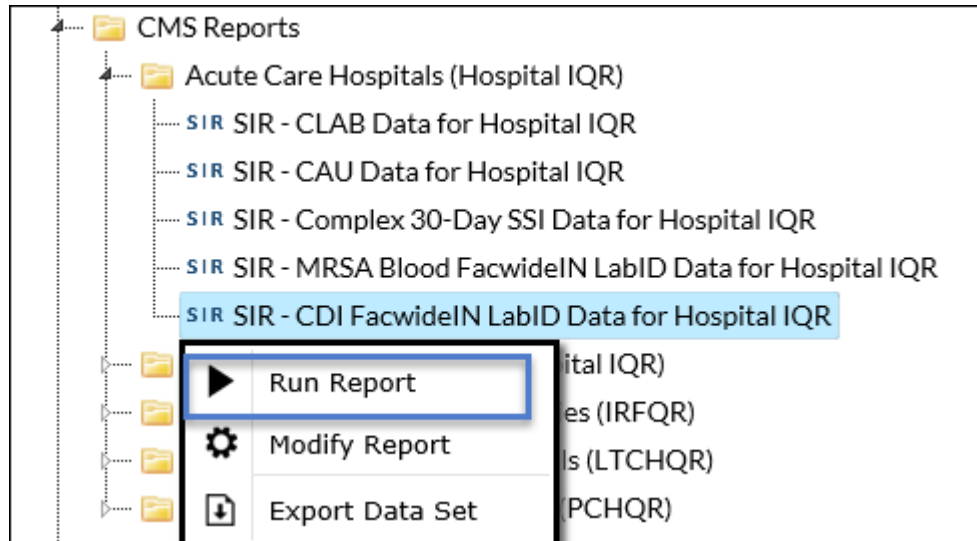
NHSN Analysis Reports: Advanced Folder



Advanced Folder include several reports that can be modified more to analyze specific data for your facility



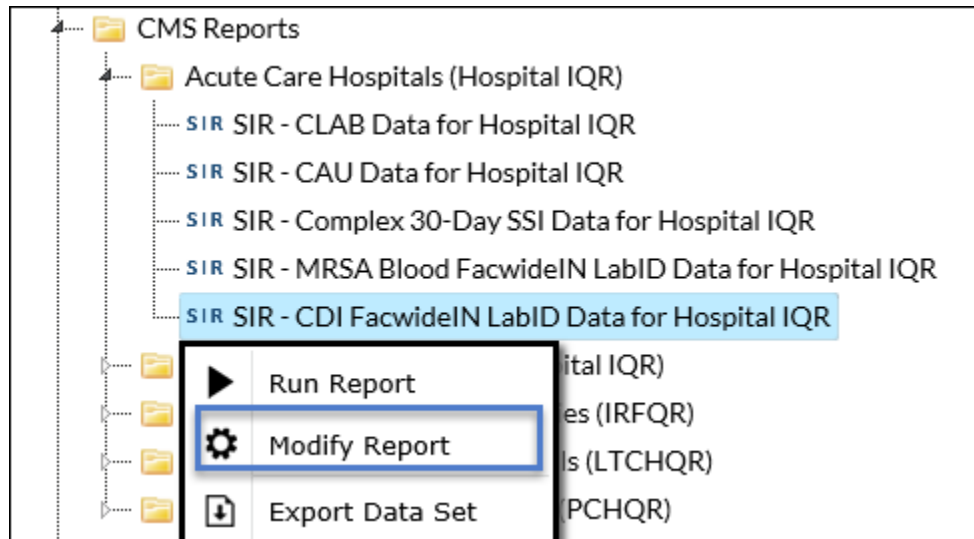
NHSN Analysis Reports: Run a Report



“Run Report” will provide output for all available data for this HAI with default variables displayed



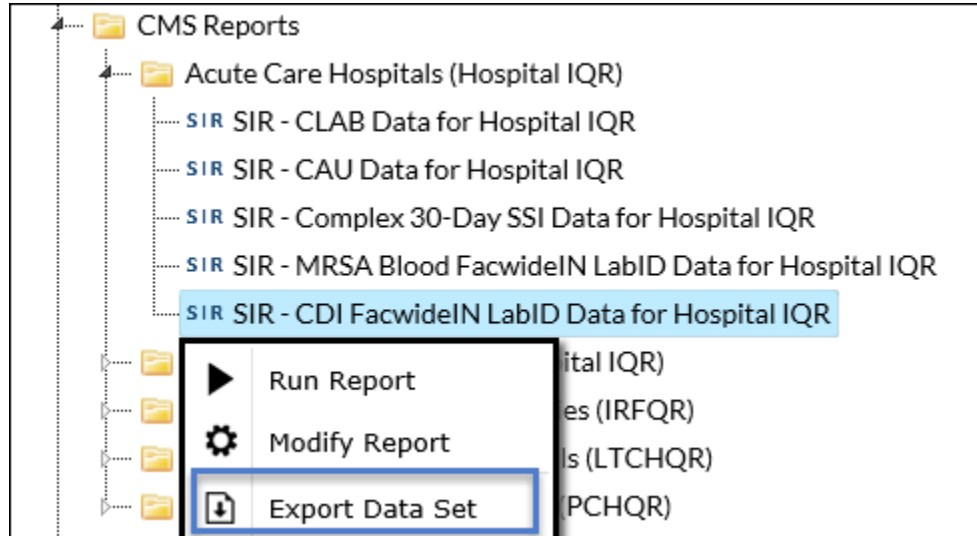
NHSN Analysis Reports: Modify Report



“Modify Report” will allow you to set specific time frame, select variables, and sort data you’re interested in looking at



NHSN Analysis Reports: Export Data



“Export Data Set” allows you to transfer your data to several different file types (.xls, .txt, .sas7bdat, etc.)



Modifying Analysis Reports : CLABSI SIR Report

- Show Descriptive Variable Names
- Analysis Data Set Source
- Type of Report
- When Data Set was Generated

Modify "SIR - Acute Care Hospital CLAB Data"

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

Analysis Data Set: bs2_CLAB_RatesICU Type: SIR Last Generated: [January 12, 2022 3:12 PM](#)

Title/Format Time Period Filters Display Options

Title:

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

Modifying Analysis Reports : Change Title

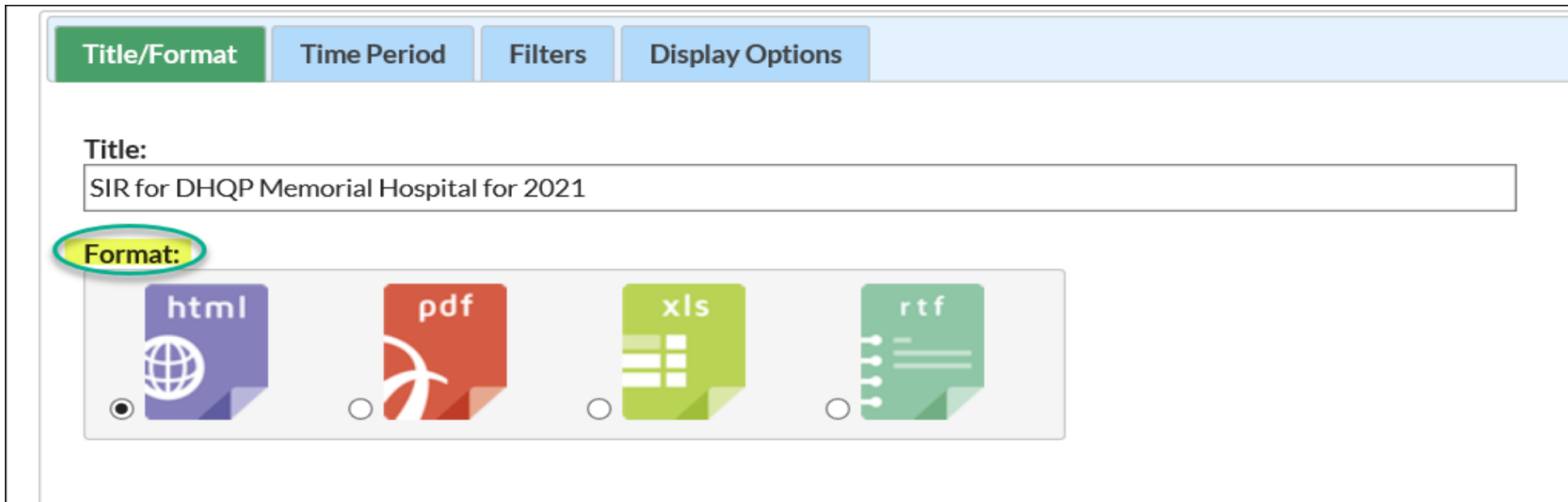
Title/Format	Time Period	Filters	Display Options	
Title: SIR for DHQP Memorial Hospital for 2021				

If you want to save a customized report, consider re-naming the title



Modifying Analysis Reports : Select Format

- Title/Format
 - You may choose the format in which the report is displayed, such as HTML , Excel, or PDF.
 - Default is HTML



The screenshot displays a user interface for configuring a report. At the top, there are four tabs: 'Title/Format' (highlighted in green), 'Time Period', 'Filters', and 'Display Options'. Below the tabs, the 'Title' field contains the text 'SIR for DHQP Memorial Hospital for 2021'. Underneath, the 'Format' section is highlighted with a yellow oval and contains four radio button options: 'html' (selected), 'pdf', 'xls', and 'rtf'. Each option is represented by a colored icon: a purple globe for 'html', a red document for 'pdf', a green spreadsheet for 'xls', and a green document for 'rtf'.

Modifying Analysis Reports: Time Period

- Allows for selection of a specific time period for your report
- Select a date variable from the “Date Variable” drop down menu and specify the beginning and ending date for the desired time period
- If the “Ending” date is left blank, the results will include all data from the beginning time period and forward

Modify "SIR - Acute Care Hospital CLAB Data"

Show descriptive variable names ([Print List](#)) Analysis Data Set: bs2_CLAB_RatesICU Type: SIR Last Generated: January 12, 2022 3:12 PM

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

Time Period:

Date Variable	Beginning	Ending	
<input type="text" value=""/>	<input type="text" value=""/>	<input type="text" value=""/>	<input type="button" value="✕ Clear Time Period"/>

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

Modifying Analysis Reports: Time Period

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

Time Period:

Date Variable	Beginning	Ending	
summaryYr ▼	2021	2021 x	<input type="button" value="Clear Time Period"/>

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

For this example, we are looking only at 2021 data at the annual level.



Modifying Analysis Reports : Filters

- Each addition of “group” and “rule” will allow you to specify values. After selecting a variable to filter, click in the empty box with the drop-down arrow to select the operator (e.g., “equal”) then specify desired values of that variable that should be included in the report.

Modify "SIR - Acute Care Hospital CLAB Data"

Show descriptive variable names ([Print List](#)) Analysis Data Set: bs2_CLAB_RatesICU Type: SIR Last Generated: **January 12, 2022 3:12 PM**

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

Additional Filters:

AND OR

AND OR

equal
not equal
in
not in
less
less or equal
greater
greater or equal
between

Modifying Analysis Reports : Filters

- Add Group vs. Add Rule
 - Group = Will generate a table with a select number of rules (conditions) set.
 - Rules = Conditions that will restrict what type of data is populated within a group (table)
- Our SIR table will be populated with data only from locations that have the variable *locationType* equal to “CC”.
 - locationType equal to “CC” includes **only** all active critical care locations mapped to your facility during 2021 (1 Group, 1 Rule) .

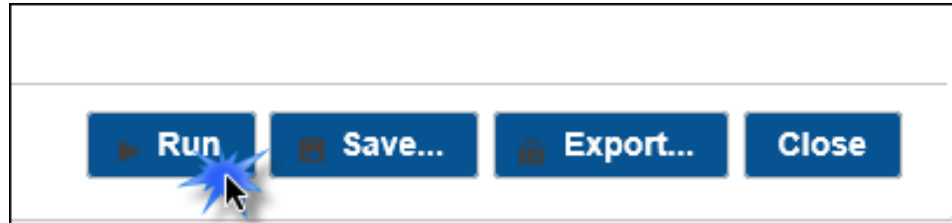
The screenshot displays a software interface for configuring filters. At the top, there are four tabs: "Title/Format", "Time Period", "Filters" (which is highlighted in green), and "Display Options". Below the tabs, there is a section labeled "Additional Filters:" with two buttons: "Show" and "Clear". The main area shows a hierarchical filter structure. At the top level, there are two options: "AND" and "OR", with "AND" selected. To the right of this level is a green "Add group" button. Below this, there is another level with "AND" and "OR" options, with "AND" selected, and a green "Add rule" button to the right. The main filter rule is displayed as a dropdown menu with the text "locationType", followed by a dropdown menu with the text "equal", and another dropdown menu with the text "CC - CC". To the right of this rule is a red "Delete" button.

Modifying Analysis Reports : Display Options

- “Display Options” tab allows you to view your report organized by a specific criteria
- Allows for the option to calculate and display results by time period – e.g., by month, year, quarter, or half year
 - Group By applicable to rates, SIRs, and SAARs

The screenshot shows a web interface for modifying analysis reports. At the top, a blue header bar contains the text "Modify 'SIR - Acute Care Hospital CLAB Data'". Below this, there is a row of controls: a checkbox labeled "Show descriptive variable names ([Print List](#))", and text indicating "Analysis Data Set: bs2_CLAB_RatesICU", "Type: SIR", and "Last Generated: January 12, 2022 3:12 PM". A horizontal menu below these controls has four tabs: "Title/Format", "Time Period", "Filters", and "Display Options", with the last tab highlighted in green. Under the "Display Options" tab, the section "SIR Options:" is visible. A "Group by:" label is followed by a dropdown menu that is currently open, showing the following options: "Cumulative", "summaryYH", "summaryYM", "summaryYQ", and "summaryYr".

Modifying Analysis Reports: Run Report



To generate the report you modified, select "Run"



Modifying Analysis Report: Interpreting Output

- Modified report by our set conditions:
 - Time Period = summaryYR 2021
 - Display Options = locationType="CC"

National Healthcare Safety Network
SIR for DHQP Memorial Hospital for 2021 - By OrgID

As of: January 13, 2022 at 1:12 PM
Date Range: BS2_CLAB_RATE SALL summaryYr 2021 to 2021
if (((locationType = "CC")))

orgID=10000 medType=M

orgID	ccn	infCount	numPred	numcldays	SIR	SIR_pval	sir95ci	SIR_pctl
10000	31C0001043	3	1.814	1608	1.653	0.3843	0.421, 4.500	93

The fields highlighted in the table indicate that NHSN completed the calculation.



Modifying Analysis Report: Interpreting Output

Modify "SIR - Acute Care Hospital CLAB Data"

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

National Healthcare Safety Network
SIR for DHQP Memorial Hospital for 2021 - By OrgID
As of: January 13, 2022 at 1:18 PM
Date Range: BS2_CLAB_RATE SALL summaryYr 2021 to 2021
if (((locationType = "CC")))

Facility Org ID=10000 Type of Affiliation=M

Facility Org ID	CMS Certification Number	Events	Number Predicted	Central Line Days	SIR	SIR p-value	95% Confidence Interval	SIR Percentile
10000	31C0001043	3	1.814	1608	1.653	0.3843	0.421, 4.500	93

This is what your report looks like when you show descriptive variable names.



Modifying Analysis Report: Interpreting Output

- SIR is the number of observed CLABSIs(Events) divided by the number of predicted CLABSIs
- (3 events/1.814 Number predicted = SIR of 1.653)
- $SIR \geq 1$ signifies more CLABSI events observed than predicted
- SIR will only be calculated if the number of predicted infections is ≥ 1

National Healthcare Safety Network
SIR for DHQP Memorial Hospital for 2021 - By OrgID
As of: January 13, 2022 at 1:18 PM
Date Range: BS2_CLAB_RATE SALL summaryYr 2021 to 2021
if (((locationType = "CC")))

Facility Org ID=10000 Type of Affiliation=M

Facility Org ID	CMS Certification Number	Events	Number Predicted	Central Line Days	SIR	SIR p-value	95% Confidence Interval	SIR Percentile
10000	31C0001043	3	1.814	1608	1.653	0.3843	0.421, 4.500	93

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
- $P\text{-value} \leq 0.05$ indicates that the number of observed CLABSIs is [statistically] significantly different (higher or lower) from the number predicted
- In this example, the p-value for the 2021 SIR is ≥ 0.05 and thus there is no significant difference between the number of infections observed and the number of infections predicted

National Healthcare Safety Network
SIR for DHQP Memorial Hospital for 2021 - By OrgID
As of: January 13, 2022 at 1:18 PM
Date Range: BS2_CLAB_RATE SALL summaryYr 2021 to 2021
if (((locationType = "CC")))

Facility Org ID=10000 Type of Affiliation=M

Facility Org ID	CMS Certification Number	Events	Number Predicted	Central Line Days	SIR	SIR p-value	95% Confidence Interval	SIR Percentile
10000	31C0001043	3	1.814	1608	1.653	0.3843	0.421, 4.500	93

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 (as in this example), 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).
- If the confidence interval includes the value of 1, then the SIR is not significant
 - i.e., if the lower bound is ≤ 1 and the upper bound is ≥ 1 , then the SIR is not significant.

National Healthcare Safety Network

SIR for DHQP Memorial Hospital for 2021 - By OrgID

As of: January 13, 2022 at 1:18 PM

Date Range: BS2_CLAB_RATE SALL summaryYr 2021 to 2021

if (((locationType = "CC")))

Facility Org ID=10000 Type of Affiliation=M

Facility Org ID	CMS Certification Number	Events	Number Predicted	Central Line Days	SIR	SIR p-value	95% Confidence Interval	SIR Percentile
10000	31C0001043	3	1.814	1608	1.653	0.3843	0.421, 4.500	93

Interpreting your SIR Report : SIR Percentile

- A percentile distribution is a score/value that allows to identify what percentage of other facilities have similar/lower SIR value compared to our facility
- SIR percentile of 93 as in this case means that 93% of facilities in the nation (with at least 1 predicted infection) have an SIR equal to or lower than 1.653

National Healthcare Safety Network
SIR for DHQP Memorial Hospital for 2021 - By OrgID
As of: January 13, 2022 at 1:18 PM
Date Range: BS2_CLAB_RATE SALL summaryYr 2021 to 2021
if (((locationType = "CC")))

Facility Org ID=10000 Type of Affiliation=M

Facility Org ID	CMS Certification Number	Events	Number Predicted	Central Line Days	SIR	SIR p-value	95% Confidence Interval	SIR Percentile
10000	31C0001043	3	1.814	1608	1.653	0.3843	0.421, 4.500	93

Knowledge Check

- What interval of time is NOT available for the Date Variable selection when you modify a CMS report?
 - A. Summary Year
 - B. Summary Week
 - C. Summary Month
 - D. Summary Half Year

Modifying Analysis Report: Saving Your Report



To save a modified report, select "Save"



Modifying Analysis Report: Saving Your Report

Specify a name for your Analysis Report:

Analysis Report Name: x

Overwrite existing Custom Analysis Report (Save)

Create a new Custom Analysis Report based on this one (Save as)

Enter a name that best describes the report for you and/or staff



Modifying Analysis Report: Saving Your Report

The screenshot shows a software interface with a folder tree on the left and a context menu on the right. The folder tree is organized as follows:

- Expand All | Collapse All | Search
- Device-Associated (DA) Module
 - Central Line-Associated BSI
 - Line Listing - All CLAB Events
 - Line Listing - BSI Events Excluded from the CLABSI Numerator
 - Frequency Table - All CLAB Events
 - Bar Chart - All CLAB Events
 - Pie Chart - All CLAB Events
 - Rate Table - CLAB Data for ICU-Other
 - Run Chart - CLAB Data for ICU-Other
 - Rate Table - CLAB Data for NICU
 - Run Chart - CLAB Data for NICU
 - Rate Table - CLAB Data for SCA/ONC
 - Run Chart - CLAB Data for SCA/ONC
 - SIR SIR - Acute Care Hospital CLAB Data
 - SUR SUR - Acute Care Hospital Central Line Device Use
 - SIR SIR - Critical Access Hospitals CLAB Data
 - SUR SUR - Critical Access Hospitals Central Line Device Use
 - SIR SIR - Long Term Acute Care CLAB Data
 - SUR SUR - Long Term Acute Care Central Line Device Use
 - SIR SIR - Inpatient Rehab Facilities CLAB Data
 - SUR SUR - Inpatient Rehab Facilities Central Line Device Use
 - Custom Reports
 - Jaina - SIR - ICU 2021 DHQP Memorial Hospital

The context menu, which is open over the 'Custom Reports' folder, contains the following options:

- Run Report
- Modify Report
- Delete Report
- Export Data Set
- Publish Report
- Rename Report

Custom report will be saved at the bottom of the folder in which you found the initial report.



Modifying Analysis Report: Exporting Your Report

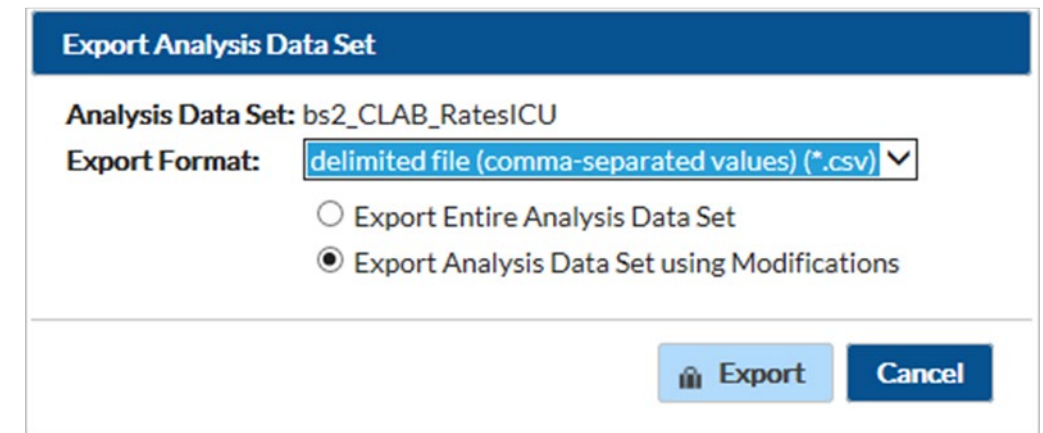
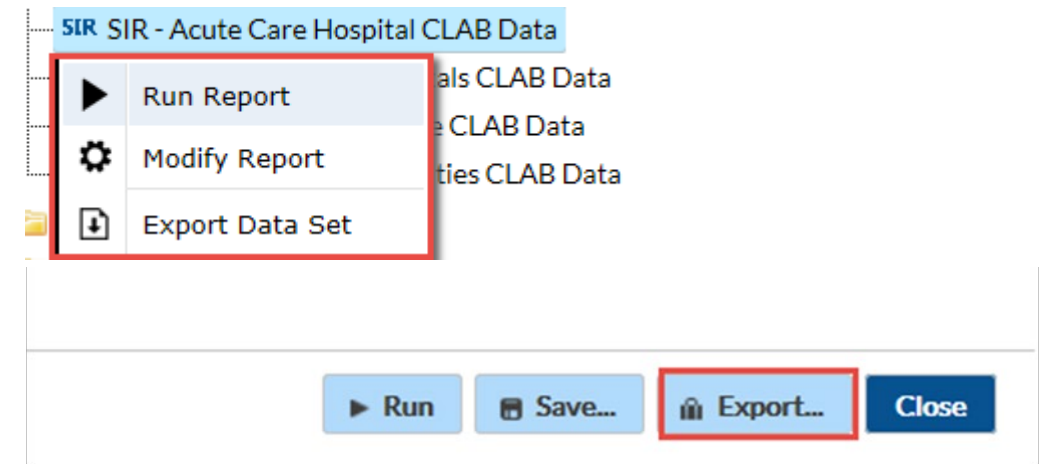


To export a modified report to a .Xls, .sas, .CSV and many more file types, select "Export"



Modifying Analysis Report: Exporting Datasets

- Export Analysis Data Set
 - Appears when you select your report type
 - Exports the entire dataset from which the resulting report is generated
- Export Output Data Set
 - Appears at the bottom of the Modify Screen
 - Two options:
 - Exports only data used in generating the report, for the specified time period and including selection criteria
 - Exports Analysis Data Set



Modifying Analysis Report: Exporting Datasets

Extract nhsn_export

Home Share View Compressed Folder Tools

Shah, Jaina (CDC/DDID/NCEZID/DHOP) > AppData > Local > Microsoft > Windows > INetCache > IE > OFM9IEYV > nhsn_export

Name	Type	Compressed size	Password p...	Size	Ratio	Date modified
SIRforDHQPMemorialHospitalfor20	Microsoft Excel Comma S...	1 KB	No	4 KB	81%	1/27/2022 3:46 PM

A	B	C	D	E	F	G	H	I	J	K	L	M
orgID	facType	medType	state	ccn	infCount	numPred	numclday	SIR_pval	SIR	sir95ci	SIR_pctl	locationTy
10000	HOSP-GEN M		GA	31C000104	3	1.814385	1608	0.3843	1.653	0.421, 4.50	93	

Example of exporting to an excel .Xls file



NHSN Analysis for Data Quality

Data Quality – What can impact my SIRs/SURs and Rates?

- Entry, edit, or deletion of events
- Changes to numbers of patient days, device days, admissions
- Removal or addition to monthly reporting plans
- Change in admission date, previous discharge date on LABID events
- Changes to relevant factors in the annual survey (e.g., medical school affiliation, facility bedsize)
- Resolution of “Report No Events” alerts

Data Quality – Places to look

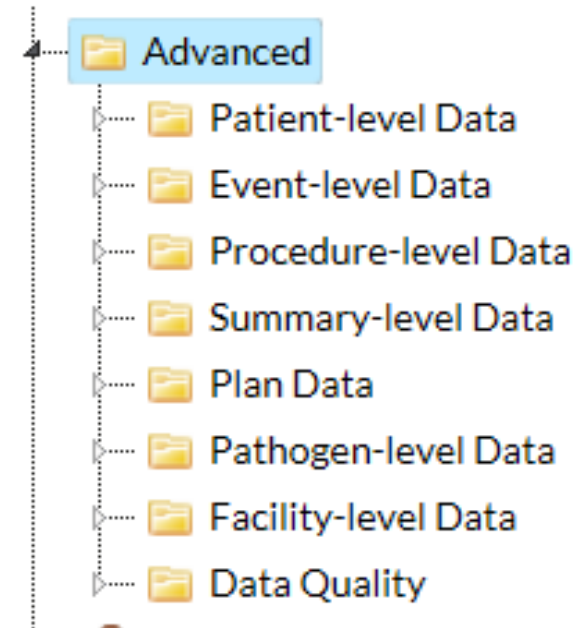
- Monthly reporting plans
 - Are the monthly reporting plans complete?
 - Are “Active” locations applicable to NHSN surveillance listed?
 - Are all appropriate procedures selected?
 - Are the appropriate lab specimens selected to collect for LABID data?
- Annual Survey
 - Are the number of beds updated from the previous survey year?
 - Has the hospitals medical school affiliation changed?
- Alerts
 - Have the alerts been resolved for the required analysis months?
- Using NHSN Analysis
 - Are new datasets generated?
 - Were new events entered after I ran my analysis?

Advanced Folder

- Many customizable options to create and save reports
- The “How to see and create Modify Dates_2020” document provides suggested variables to use
 - <https://www.cdc.gov/nhsn/pdfs/analysis/how2view-create-modify-dates-in-nhsn.pdf>
 - Can help inform if some data is a data quality issue or accurate

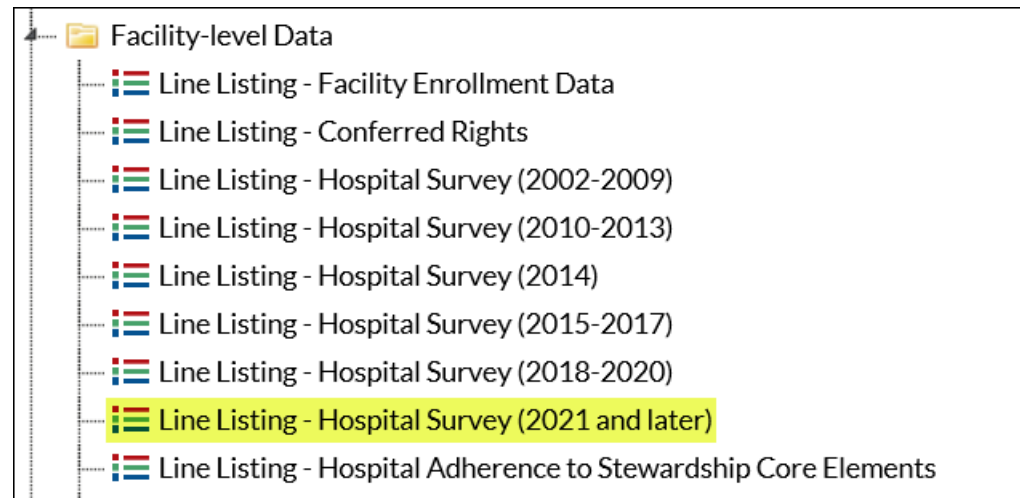
NHSN Advanced Folder

- A tool to assist users with data quality efforts
- Allows users to create custom reports at various levels to check their data
 - Event Data
 - Procedure Data
 - Summary Data
 - Monthly Plan Data
 - Facility Data
 - Data Quality



Analyzing the Annual Survey

- Analysis of the annual survey in NHSN datasets are a good tool for routine data quality checks
- Survey responses found on these reports can be easily compared to across multiple survey years
- The report can be accessed within NHSN Reports > Advanced Folder > Facility Level Data



Analyzing the Annual Survey (cont.)

- Select “Modify” if you’d like to edit the survey line list
- Select “Modify” to select specific survey questions/variables to be displayed
- Please view the resource guide “How to Modify a Line List” for more instruction on how to save and export your reports

Modify "Line Listing - Hospital Survey (2021 and later)"

Show descriptive variable names ([Print List](#)) Analysis Data Set: HospSurveyV7 Type: Line Listing Last Generated: January 12, 2022 3:11 PM

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

Display Variables:

Available Variables:

- absCommitCommun
- absCommitEnsureRes
- absCommitFormalSt
- absCommitNone
- absCommitPOC
- absCommitPresent
- absCommitResource
- absCommitSupport
- absCommitTime
- absCommitTrain
- absFormalProcAllergy
- absFormalProcCDI
- absFormalProcDisch
- absFormalProcDischMon
- absFormalProcEarly

Selected Variables:

- orgID
- surveyYear
- completedFlag
- name
- facOwnerDesc
- numICP
- totHrSurv
- totHrOth
- medAff
- medTypeDesc
- numBeds
- numICUBeds

Buttons: All, Selected, Selected, All, Up, Down, Undo

Annotations:

- Variables that will be included in the output
- Highlight any desired variables and move them to the right box "Selected Variables" to be included in the output

Buttons: Run, Save..., Export..., Close

Analyzing the Annual Survey (cont.)

- Output will be ordered by survey year and will include all completed surveys
- Information found on the report can help explain potential data quality issues found in other analysis (e.g. Medical School Affiliation Change)

National Healthcare Safety Network

Line Listing - Hospital Survey (2021 and later)

As of: January 29, 2022 at 5:01 PM

Date Range: All HOSP SURVEYV7ALL

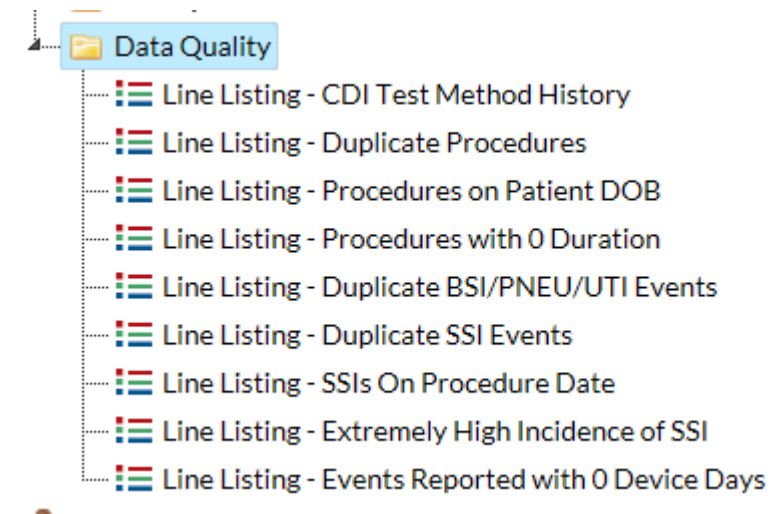
if (((completedFlag = "Y")))

orgID	surveyYear	name	facOwnerDesc	medAff	medTypeDesc	numBeds	numICUBeds	numAdmits	numPatDays	numICP	totHrSurv	totHrOth
10000	2021	DHQP MEMORIAL HOSPITAL	P - For Profit	Y	M - Major	300	50	2500	25000	10.00	20	20

- Surveys can always be edited and saved in NHSN if a correction needs to be made

Advanced Folder – Data Quality Folder

- Line lists:
 - CDI Test Method History
 - Duplicate Procedures
 - Procedures on Patient DOB
 - Procedures with 0 Duration
 - Duplicate BSI/PNEU/UTI Events
 - Duplicate SSI Events
 - SSIs on Procedure Date
 - Extremely High Incidence of SSI
 - Events Reports with 0 Device Days



Using Advanced Folder: Scenario

- Scenario: You want to confirm that COLO and HYST Inpatient and Outpatient Procedures were selected for 2021 Q1 data on your monthly reporting plans.

Using Advanced Folder: Scenario

There are two ways you can check this.



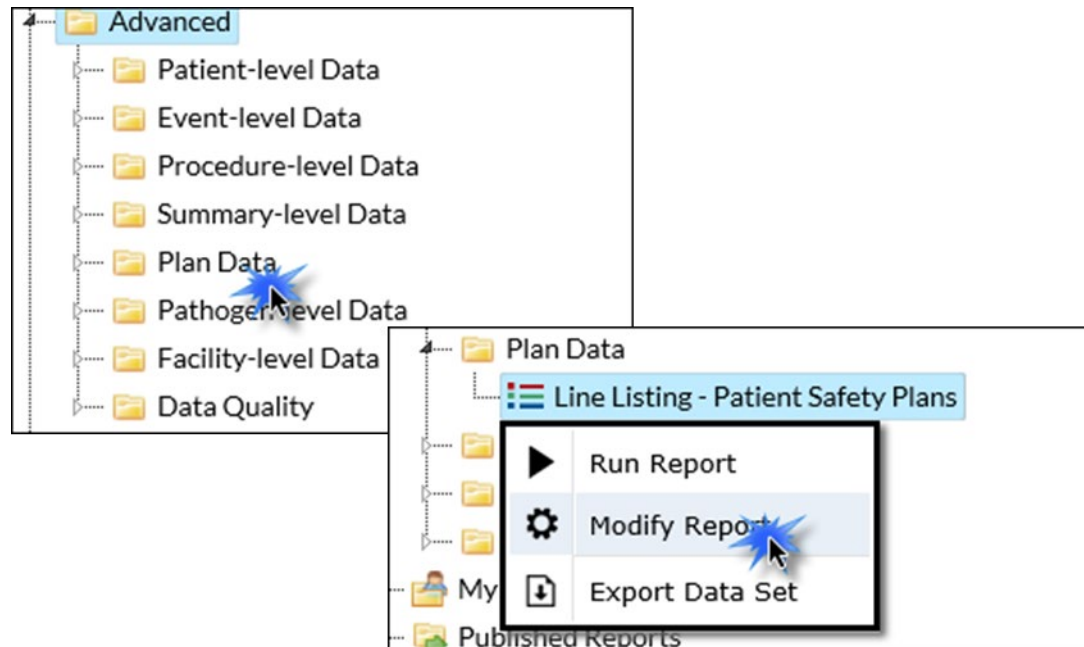
Using Advanced Folder: Scenario

Month	Year	Facility ID
December	2021	10000
November	2021	10000
October	2021	10000
September	2021	10000
August	2021	10000
July	2021	10000
June	2021	10000
May	2021	10000
April	2021	10000
March	2021	10000
February	2021	10000
January	2021	10000

1. Review each monthly reporting plan.



Using Advanced Folder: Scenario



2. Use the Advanced Folder to run a Patient Safety Plan line list



Using Advanced Folder: Scenario

Modify "Line Listing - Patient Safety Plans"

Show descriptive variable names [\(Print List\)](#) Analysis Data Set: Plan Type: Line Listing Last Generated: January 12, 2022 3:11 PM

Title/Format Time Period Filters Display Variables Sort Variables Display Options

	Beginning	Ending	
createDate			Clear Time Period
modifyDate	01/2021	03/2021	
planYM			

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

2. Use the Advanced Folder to run a Patient Safety Plan line list



Using Advanced Folder: Scenario

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

Additional Filters:

AND OR

AND OR

Procedure Code in

2. Use the Advanced Folder to run a Patient Safety Plan line list



Using Advanced Folder: Scenario

Display Variables:

Title/Format	Time Period	Filters	Display Variables	Sort Variables	Display Options	
Display Variables:						
Available Variables:				Selected Variables:		
0 CLIP Events Reported			All >>	Report Plan ID		
AR Option Plan?			Selected >	Facility Org ID		
AST Eligible~MRSA			< Selected	Plan YM		
AST Eligible~MSSA			<< All	Procedure Code		
AST Eligible~VRE				Procedure Code Description		
AST Timing~MRSA				Setting		
AST Timing~MSSA				SSI Plan?		
AST Timing~VRE				Create Date		
AU Option Plan?				User ID for Data Entry		
CAU Plan?				Last Modified		
CDC Location				Modify User ID		
CLAB Plan?						
CLIP In-Plan						
CMS Certification Number						
creEntero_gg						

2. Use the Advanced Folder to run a Patient Safety Plan line list



Using Advanced Folder: Scenario

Report Plan ID	Facility Org ID	Plan YM	Procedure Code	Procedure Code Description	Setting	SSI Plan?	Create Date	User ID for Data Entry	Last Modified	Modify User ID
5212	10018	2021M01	COLO	COLO - Colon Surgery	IN	Y	26JUN20:14:04	1797	11MAR21:14:28	8240
5212	10018	2021M01	HYST	HYST - Abdominal hysterectomy	IN	Y	26JUN20:14:04	1797	11MAR21:14:28	8240
5212	10018	2021M01	HYST	HYST - Abdominal hysterectomy	OUT	Y	26JUN20:14:04	1797	11MAR21:14:28	8240
5448	10018	2021M02	COLO	COLO - Colon Surgery	IN	Y	01MAR21:11:08	2534	06MAR21:09:36	8240
5448	10018	2021M02	COLO	COLO - Colon Surgery	OUT	Y	01MAR21:11:08	2534	06MAR21:09:36	8240
5448	10018	2021M02	HYST	HYST - Abdominal hysterectomy	IN	Y	01MAR21:11:08	2534	06MAR21:09:36	8240
5448	10018	2021M02	HYST	HYST - Abdominal hysterectomy	OUT	Y	01MAR21:11:08	2534	06MAR21:09:36	8240

Missing COLO
procedure for OUT in
January



Using Advanced Folder: Scenario

Report Plan ID	Facility Org ID	Plan YM	Procedure Code	Procedure Code Description	Setting	SSI Plan?	Create Date	User ID for Data Entry	Last Modified	Modify User ID
5212	10018	2021M01	COLO	COLO - Colon Surgery	IN	Y	26JUN20:14:04	1797	11MAR21:14:28	8240
5212	10018	2021M01	HYST	HYST - Abdominal hysterectomy	IN	Y	26JUN20:14:04	1797	11MAR21:14:28	8240
5212	10018	2021M01	HYST	HYST - Abdominal hysterectomy	OUT	Y	26JUN20:14:04	1797	11MAR21:14:28	8240
5448	10018	2021M02	COLO	COLO - Colon Surgery	IN	Y	01MAR21:11:08	2534	06MAR21:09:36	8240
5448	10018	2021M02	COLO	COLO - Colon Surgery	OUT	Y	01MAR21:11:08	2534	06MAR21:09:36	8240
5448	10018	2021M02	HYST	HYST - Abdominal hysterectomy	IN	Y	01MAR21:11:08	2534	06MAR21:09:36	8240
5448	10018	2021M02	HYST	HYST - Abdominal hysterectomy	OUT	Y	01MAR21:11:08	2534	06MAR21:09:36	8240

Only two months worth of data in this table



Using Advanced Folder: Scenario

Report Plan ID	Facility Org ID	Plan YM	Procedure Code	Procedure Code Description	Setting	SSI Plan?	Create Date	User ID for Data Entry	Last Modified	Modify User ID
5212	10018	2021M01	COLO	COLO - Colon Surgery	IN	Y	26JUN20:14:04	1797	11MAR21:14:28	8240
5212	10018	2021M01	HYST	HYST - Abdominal hysterectomy	IN	Y	26JUN20:14:04	1797	11MAR21:14:28	8240
5212	10018	2021M01	HYST	HYST - Abdominal hysterectomy	OUT	Y	26JUN20:14:04	1797	11MAR21:14:28	8240
5448	10018	2021M02	COLO	COLO - Colon Surgery	IN	Y	01MAR21:11:08	2534	06MAR21:09:36	8240
5448	10018	2021M02	COLO	COLO - Colon Surgery	OUT	Y	01MAR21:11:08	2534	06MAR21:09:36	8240
5448	10018	2021M02	HYST	HYST - Abdominal hysterectomy	IN	Y	01MAR21:11:08	2534	06MAR21:09:36	8240
5448	10018	2021M02	HYST	HYST - Abdominal hysterectomy	OUT	Y	01MAR21:11:08	2534	06MAR21:09:36	8240

Comparing the Create Date and Last Modified variable can help identify if the plan was changed



Data Quality with NHSN

- Use the NHSN guide to the SIR to identify important factors in your facility's data that can impact SIRs
- Work with staff to develop a list of routine checks that you can perform on a monthly, quarterly, and/or annual basis
- Modify and save NHSN reports to help expedite and organize your processes

Ongoing NHSN Data Quality Activities

ACAT Data Quality Checks

- NHSN application built with business rules in place
 - “ALERTS” tab within the application that performs data quality checks
- NHSN ACAT team routinely reviews data reported to NHSN for data quality errors
 - discrepancies based on the facility’s pattern of reporting
- Facilities contacted (Data Quality Outreach) for confirmed or suspected data quality flags

Data Quality Outreach – CLABSI example

- Data quality issue identified in CLABSI event form for Time to BSI infection (TTI) and average length of stay (LOS)
- Discussion with PATT team helped to decide the “cut-off” for the outreach
 - BSI infections – 6 months/183 days for TTI and LOS
- SMEs conducted analysis to identify facilities that exceeded the cut-off of 183 days
 - ~200 records/facilities exceeding the cut-off

Next Steps

- Facilities were contacted through emails with the following information:
 - DQ outreach email that outlines the issue
 - Instructions for fixing any data entry errors, if needed
- Replies are requested from the facilities to verify the accuracy of the data

DQ Outreach Feedback

- About 65% of the facilities responded to the outreach
- Majority of these facilities reported that the data entered was correct and that they had patients with long length of hospital stay and greater time to infection
- Some facilities reported data entry errors and corrected the forms
- Feedback from each DQ outreach is documented to capture the responses

DQ Checks and Outreach Resources

- We created a website dedicated to routine and targeted outreaches
- We created a DQ corner in the quarterly NHSN newsletter

December 2021

NHSN
NATIONAL HEALTHCARE
SAFETY NETWORK

CENTERS FOR DISEASE CONTROL AND PREVENTION
NHSN E-Newsletter

Patient Safety Component	
AUR Module Updates	2
Patient Safety Component Facility Survey	3
Documents Updates	4
Webpage Update and Name Change	4
Analysis Updates	5
Reminder! Data for CMS Data Reporting Programs Due Soon!	6
Outpatient Procedure Component (OPC)	
No updates at this time	--
Long Term Care Facility (LTCF) Component	
LTCF Updates	7
Healthcare Personnel Safety Component	
Updates to Weekly COVID-19 Vaccination Modules	7
Dialysis Component	
NHSN Dialysis COVID-19 Module Update	8
Mark Your Calendars – Q3 2021 QIP Deadline	8
Biovigilance Component	
No updates at this time	--
General NHSN Information	
CDA Corner	9
Data Quality Corner	13
NHSN Training Updates	14
NHSN Help Desk: Activity Update	15
NHSN Enrollment Update (as of December 03, 2021)	15

Page 1

Data Quality Corner

UPDATE! [C-Section Duration of Labor and Your SSI SIR](#)

The CDC continues to conduct regular assessments of the completeness, accuracy and timely submission of the data received in NHSN. During a recent data quality analysis, CDC identified several facilities reported '0' for the required field 'duration of labor' for all their cesarean procedures (CSEC) reported to NHSN. Since the duration of labor is used in the risk adjustment of the SIR denominator and impacts your SIR, NHSN recommends that all facilities review their data routinely for accuracy and completeness.

The 'duration of labor' data field is used in the risk adjustment of the "All SSI Data" and "Complex admission/readmission (A/R) SSI" SIR denominator for both pediatric and adult patients. This variable, in addition to others, is used to determine the likelihood of infection following a c-section procedure. To receive the appropriate risk adjustment for each CSEC procedure, it is important to report the duration of labor data field (in addition to all the other factors used in the risk adjustment of the SIR denominator) correctly. Remember that the sum of each patient's procedure risk, gives you the predicted number of infections.

UPDATE! [C-Section Duration of Labor Definition](#)

Definition: See Page 5 of Instructions for Completion of Denominator for Procedure Form (CDC 57.121):
https://www.cdc.gov/nhsn/forms/instr/57_121.pdf

The duration of labor on the c-section denominator form is conditionally required. If operative procedure is CSEC, enter number of hours the patient labored in the hospital from beginning of active labor to delivery of the infant, expressed in hours. The documentation of active labor can be supplied in the chart by a member of the healthcare team or physician. Active labor may be defined by the individual facility's policies and procedures but should reflect the onset of regular contractions or induction that leads to delivery during this admission. If a patient is admitted for a scheduled CSEC and has not yet gone into labor, the duration of labor would be 0. Hours should be rounded in the following manner: ≤30 minutes round down; >30 minutes round up.

UPDATE! [Length of Stay \(LOS\) and Time To Infection \(TTI\) DQ Outreach](#)

The Device Associated (DA) team has recently started DQ outreach to NHSN facilities for presumed outliers to LOS and TTI calculations for CLABSI, CAUTI and VAE (LOS only) data that are likely to impact the accuracy of data in NHSN. The NHSN application does not produce soft alerts for LOS and TTI outliers. Please respond to the respective outreach emails if you have any questions or concerns for data resolution. If you have any additional questions or concerns about the above DQ items, please email us at NHSN@cdc.gov with the subject line 'DA Data Quality'.

Data Quality Resources

- DQ Resources

<https://www.cdc.gov/nhsn/ps-analysis-resources/data-quality/index.html>

- DQ Corner Newsletter

<https://www.cdc.gov/nhsn/pdfs/newsletters/q4-2021-nl-508.pdf>

Additional Resources

- Data Entry and Analysis Training
<http://www.cdc.gov/nhsn/training/analysis/index.html>
- NHSN SIR Guide
<https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sir-guide.pdf>
- NHSN SUR Guide
<https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sur-guide-508.pdf>
- Analysis Quick Reference Guides
<https://www.cdc.gov/nhsn/PS-Analysis-resources/reference-guides.html>
- 2015 Rebaseline Page
<https://www.cdc.gov/nhsn/2015rebaseline/index.html>

Additional Resources

- How to see and create Modify Dates_2020
- <http://www.cdc.gov/nhsn/pdfs/analysis/how2view-create-modify-dates-in-nhsn.pdf>
- How to Modify a Report
<https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/howtomodifyreport.pdf>
- How to Run Analysis on Custom Fields
<https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/customfields.pdf>

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 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.



Thank You!

NHSN@cdc.gov