

NHSN Analysis Training

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Why is Analysis Important?

- NHSN analysis will give you an idea of what is going on in your hospital
 - You can look at rates, device-utilization, SIRs, and much more
 - It tells you where to focus your infection prevention efforts
- NHSN allows you to:
 - Compare yourself to national data via CDC published reports
 - Export and graph your own data for presentations within your hospital and to the public
- Collection of data is important
 - **HOWEVER**, it doesn't **MEAN** anything unless you look at it!

Agenda

- Introduction to NHSN Analysis
 - Toolbar
 - Run Basic Outputs
 - Interpretations
- Intermediate to Advanced NHSN Analysis
 - SIR
 - Advanced Options and Outputs
 - Interpretations
- Q & A

Introduction to NHSN Analysis

Where do you perform Analysis?

- NHSN Patient Safety Home Screen

NHSN 6.4.2.4 Home Page



Department of Health and Human Services
Centers for Disease Control and Prevention

NHSN - National Healthcare Safety Network | [NHSN Home](#) | [My Info](#) | [Contact us](#) | [Help](#) | [Log Out](#)

Logged into MDCH_SHARP (ID 14793) as GIBSONA4.
All Facilities Selected.

NHSN Patient Safety Component Home Page

Use the Navigation bar on the left to access the features of the application.

Assurance of Confidentiality: The voluntarily provided information obtained in this surveillance system that would permit identification of any individual or institution is collected with a guarantee that it will be held in strict confidence, will be used only for the purposes stated, and will not otherwise be disclosed or released without the consent of the individual, or the institution in accordance with Sections 304, 306 and 308(d) of the Public Health Service Act (42 USC 242b, 242k, and 242m(d)).

NHSN maintenance may occur nightly between 12am and 6am Eastern time.

 [Get Adobe Acrobat Reader for PDF files](#)

NHSN Toolbar

- Analysis
 - Generate New Data Set
 - If you have never performed analyses, you must go here first
 - Output Options
 - Where you'll be performing the analyses
 - Statistics Calculator
 - You can perform basic statistical calculations from here (with your own inputted numbers)

NHSN Toolbar

- Generate Data Sets
 - You will see:
 - The date you last generated a new dataset
 - If no new data has been added, you won't need to generate a new dataset
 - If you have added new information, you will receive the pop-up message on this screen

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NHSN - National Healthcare Safety Network | NHSN Home | My Info

Logged into MDCH_SHARP (ID 14793) as GIBSONA4.
All Facilities Selected.

Generate Data Sets

Generate Patient Safety Analysis Data Sets

Date Last Generated	Action
May 17 2012 9:37AM	Generate New

Clicking the "Generate New" button will schedule your data set generation. You may log out or continue to work in other areas of NHSN. When you return to this screen you will see a progress bar if still processing, otherwise, you will see a time completed.

Back

Generate new data sets?

▲ Your rights have changed. New rights will be applied when new data sets are generated. Would you like to generate new data sets now?

Yes, generate new data sets

No, leave existing data sets

NHSN Toolbar

- Generate Data Sets
 - First step in performing analysis in NHSN
 - Organizes data into a defined set
 - Freezes your data sets until the next report generation
 - Each user has his/her own analysis data set
 - May take several minutes

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Logged into NHSN State Users Test Facility #2 (ID 15165) as AGIBSON.
Facility NHSN State Users Test Facility #2 (ID 15165) is following the PS component.

Generate Data Sets

Generate Patient Safety Analysis Data Sets

Date Last Generated	Action
May 14 2012 3:50PM	<input type="button" value="Generate New"/>

Clicking the "Generate New" button will schedule your data set generation. You may log out or continue to work in other areas of NHSN. When you return to this screen you will see a progress bar if still processing, otherwise, you will see a time completed.

NHSN Toolbar

- Statistics Calculator

The screenshot displays the NHSN National Healthcare Safety Network (NHSN) interface. At the top, a blue header bar contains the text "NHSN - National Healthcare Safety Network". Below this, a white navigation sidebar on the left lists various menu items: NHSN Home, Alerts, Reporting Plan, Patient, Event, Procedure, Summary Data, Import/Export, Analysis, Surveys, Users, Facility, Group, and Log Out. The "Analysis" section is expanded, showing sub-items: Generate Data Sets, Output Options, and Statistics Calculator. The "Statistics Calculator" item is circled in red. The main content area on the right shows the user is logged in as AGIBSON and displays the "Statistics Calculator" tool with four options: Compare Two Proportions, Compare Single SIR to 1, Compare Two Standardized Infection Ratios, and Compare Two Incidence Density Rates.

NHSN - National Healthcare Safety Network

Logged into NHSN State Users Test Facility #2 (ID 15165) as AGIBSON.
Facility NHSN State Users Test Facility #2 (ID 15165) is following the PS component.

Statistics Calculator

- Compare Two Proportions
- Compare Single SIR to 1
- Compare Two Standardized Infection Ratios
- Compare Two Incidence Density Rates

Tips for NHSN Analysis

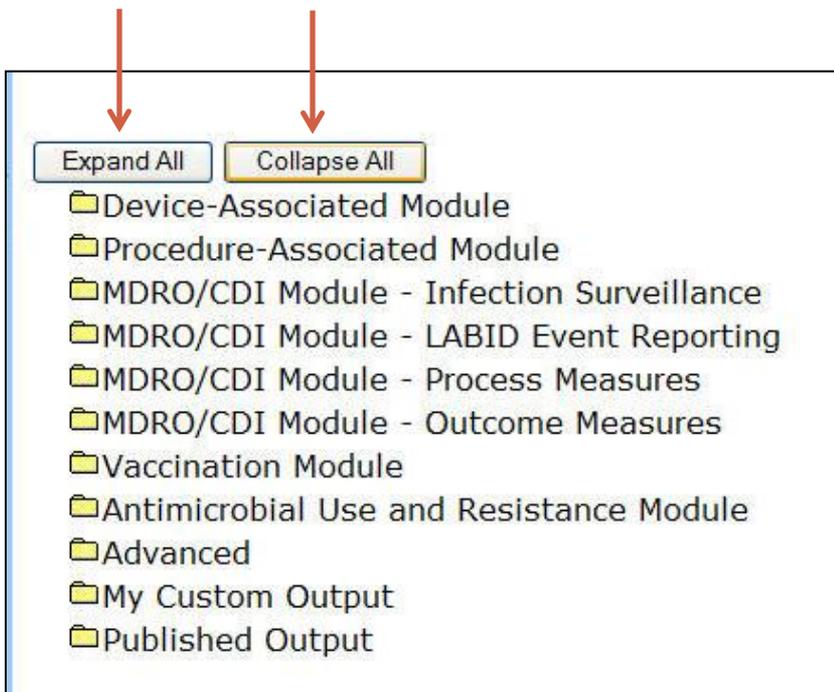
- Only generate new data sets if you want to include the most up-to-date data
- Always use the NHSN back button at the bottom of the screen – NOT your internet back button
 - The NHSN back button will take you to the previous screen – the internet back button could cause errors or take you to the wrong page
- Don't be afraid to play around in the analysis section – you won't harm any of your data!
 - Only the DISPLAY of information can change – NOT the numbers

Performing the Analysis

- NHSN Toolbar: Output Options
- You will see the Analysis Treeview Screen

The screenshot displays the NHSN Home interface. On the left is a blue navigation sidebar with the following menu items: NHSN Home, Reporting Plan, Event, Procedure, Summary Data, Analysis, Generate Data Sets, Output Options (circled in red), Statistics Calculator, Surveys, Users, Group, and Log Out. The main content area shows the user is logged in as MURADA. Below the login information are two buttons: 'Expand All' and 'Collapse All'. To the right of these buttons is the heading 'Patient Safety Component' with the sub-heading 'Analysis Output Options'. Below this heading is a list of folders representing different analysis modules: Device-Associated Module, Procedure-Associated Module, MDRO/CDI Module - Infection Surveillance, MDRO/CDI Module - LABID Event Reporting, MDRO/CDI Module - Process Measures, MDRO/CDI Module - Outcome Measures, Vaccination Module, Antimicrobial Use and Resistance Module, Advanced, My Custom Output, and Published Output.

Analysis Treeview



- Expand All: See all of the possible analysis options within this section of NHSN
- Collapse All: Will compress back all of the expanded folders
- Click on any of the folders to expand them individually
 - This will bring you to a “CDC Output” folder, which you can expand further to conduct your analyses

Run CDC-Defined Output

- Click “Run” to view any analysis with pre-defined settings
 - This will provide a cumulative output (can't specify date)
 - A pop-up output screen (HTML format) will appear, and will output only default specifications (created by NHSN).

The screenshot displays the NHSN National Healthcare Safety Network (NHSN) interface. At the top, the CDC logo is visible on the left, and the text "Department of Health and Human Services Centers for Disease Control and Prevention" is on the right. Below this, the NHSN logo and "National Healthcare Safety Network" are displayed. The user is logged in as "AGIBSON" from "NHSN State Users Test Facility #2 (ID 15165)".

The left sidebar contains a navigation menu with the following items: NHSN Home, Reporting Plan, Patient, Event, Procedure, Summary Data, Import/Export, Analysis (with sub-items: Generate Data Sets, Output Options, Statistics Calculator), Surveys, Users, Facility, Group, and Log Out.

The main content area is titled "Patient Safety Component Analysis Output Options". It features two buttons at the top: "Expand All" and "Collapse All". Below these are several folders representing different analysis modules: "Device-Associated Module", "All Device-Associated Events", "Central Line-Associated BSI", "Ventilator-Associated PNEU", and "Urinary Catheter-Associated UTI".

Under the "Urinary Catheter-Associated UTI" folder, there is a sub-folder labeled "CDC Defined Output". This folder contains a list of analysis options, each with a "Run" and "Modify" button. A red arrow points to the "Run" button for the first item, "Line Listing - All CAU Events". The other items in the list are: "Frequency Table - All CAU Events", "Bar Chart - All CAU Events", "Pie Chart - All CAU Events", "Rate Table - CAU Data for ICU-Other/SCA", "Run Chart - CAU Data for ICU-Other/SCA", "Rate Table - CAU Data for NICU", "Run Chart - CAU Data for NICU", "SIR - In-Plan CAU Data", and "SIR - All CAU Data".

At the bottom of the main content area, there are two more folders: "Central Line Insertion Practices" and "Dialysis Events".

Run Modified Output

The screenshot shows the NHSN (National Healthcare Safety Network) interface. The top header includes the CDC logo and the text 'Department of Health and Human Services, Centers for Disease Control and Prevention'. Below this, it says 'NHSN - National Healthcare Safety Network'. The user is logged in as 'AGIBSON' at 'NHSN State Users Test Facility #2 (ID 15165)'. The main content area is titled 'Patient Safety Component Analysis Output Options'. It features a tree view of output options under the 'Device-Associated Module' and 'CDC Defined Output' categories. A red arrow points to the 'Modify' button for the 'Rate Table - CAU Data for NICU' option.

Department of Health and Human Services
Centers for Disease Control and Prevention

NHSN - National Healthcare Safety Network

Logged into NHSN State Users Test Facility #2 (ID 15165) as AGIBSON.
Facility NHSN State Users Test Facility #2 (ID 15165) is following the PS component.

Reporting Plan
Patient
Event
Procedure
Summary Data
Import/Export
Analysis
Surveys
Users
Facility
Group
Log Out

Patient Safety Component
Analysis Output Options

Expand All Collapse All

- Device-Associated Module
 - All Device-Associated Events
 - Central Line-Associated BSI
 - Ventilator-Associated PNEU
 - Urinary Catheter-Associated UTI
 - CDC Defined Output
 - Line Listing - All CAU Events
 - Frequency Table - All CAU Events
 - Bar Chart - All CAU Events
 - Pie Chart - All CAU Events
 - Rate Table - CAU Data for ICU-Other/SCA
 - Run Chart - CAU Data for ICU-Other/SCA
 - Rate Table - CAU Data for NICU
 - Run Chart - CAU Data for NICU
 - SIR - In-Plan CAU Data
 - SIR - All CAU Data
 - Central Line Insertion Practices
 - Dialysis Events

Run	Modify

- Click “Modify” to change the settings of your output
 - This will allow you to change the time period, variables, and sort your output
 - You can then either Run or Export your data after modifications

Modification Screen

- Entire Modification Screen
 - This sample is from a Linelist
 - We will cover the modification screen in three sections
 - Attributes (top)
 - Filter (middle)
 - Run/Export (bottom)

CDC Department of Health and Human Services
Centers for Disease Control and Prevention

NHSN - National Healthcare Safety Network

NHSN Home | NHSN Home

Logged into NHSN State Users Test Facility #2 (ID 15165) as AGIBSON.
Facility NHSN State Users Test Facility #2 (ID 15165) is following the PS component.

Line Listing

Analysis Data Set: CAU_Events

Modify Attributes of the Output:

Last Modified On: **05/14/2012**

Output Type: **Line Listing**

Output Name:

Output Title:

Select output format:

Output Format:

Use Variable Labels

Select a time period or Leave Blank for Cumulative Time Period:

Date Variable:

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

Specify Other Selection Criteria:

[Show Criteria](#) [Column +](#) [Row +](#) [Clear Criteria](#)

| <input type="checkbox"/> |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Other Options: [Print Variable Reference List](#)

Modify Variables To Display By Clicking: [Modify List](#)

Specify Sort Variables By Clicking: [Modify List](#)

Select Page by variable:

Modification Screen – Section 1

CDC Department of Health and Human Services
Centers for Disease Control and Prevention

NHSN - National Healthcare Safety Network | NHSN Home | My In

Logged into NHSN State Users Test Facility #2 (ID 15165) as AGIBSON.
Facility NHSN State Users Test Facility #2 (ID 15165) is following the PS component.

Line Listing

Analysis Data Set: CAU_Events

Modify Attributes of the Output:

Last Modified On: **05/14/2012**

Output Type: **Line Listing**

Output Name:

Output Title:

Select output format:

Output Format:

Use Variable Labels

Navigation Menu:

- NHSN Home
- Reporting Plan
- Patient
- Event
- Procedure
- Summary Data
- Import/Export
- Analysis
 - Generate Data Sets
 - Output Options
 - Statistics Calculator
- Surveys
- Users
- Facility
- Group
- Log Out

Modification Screen – Section 1

- Attributes (Section 1)
 - Output Name: If you export your data, this will change the file name. You can leave this as-is, or type in your own created name.
 - Output Title: If you run or export your data, this will change the title at the top of the page. You can leave this as-is, or type in your own created title.
 - Output Format: Default is HTML
 - When you are using HTML format, you need to allow pop-ups from .cdc.gov

Modification Screen – Section 1

Import/Export

Analysis

- Generate Data Sets
- Output Options
- Statistics Calculator

Surveys

Users

Facility

Group

Log Out

Modify Attributes of the Output:

Last Modified On: **05/14/2012**

Output Type: **Line Listing**

Output Name:

Output Title:

 Department of Health and Human Services
Centers for Disease Control and Prevention

NHSN - National Healthcare Safety Network

Logged into NHSN State Users Test Facility #2 (ID 15165) as AGIBSON.
Facility NHSN State Users Test Facility #2 (ID 15165) is following the PS component.

Export Output Options

Exporting Option Line Listing - All CAU Events: Select data export format

Excel spreadsheet (*.xls)

Export Back

Output Name 

Modification Screen – Section 1

Import/Export

Analysis

- Generate Data Sets
- Output Options
- Statistics Calculator

Surveys

Users

Facility

Group

Log Out

Modify Attributes of the Output:

Last Modified On: **05/14/2012**

Output Type: **Line Listing**

Output Name:

Output Title: 

National Healthcare Safety Network

Line Listing for All Catheter-Associated UTI Events Output Title

As of: June 13, 2012 at 1:29 PM

Date Range: All CAU_EVENTS

orgID	patID	dob	gender	admitDate	eventID	eventDate	eventType	spcEvent	location
15165	092711	09/27/1985	M	08/02/2011	5369062	08/03/2011	UTI	SUTI	3T - MICU
15165	12345	12/29/1953	F	07/05/2011	5222627	07/08/2011	UTI	SUTI	4E - GI
15165	234567	11/30/1972	F	08/08/2011	5331584	08/14/2011	UTI	SUTI	3N - SICU
15165	234576	01/16/1972	F	08/11/2011	5331641	08/18/2011	UTI	SUTI	6S - SURG
15165	55930	10/26/1984	F	08/01/2011	5347622	08/04/2011	UTI	SUTI	3T - MICU
15165	578	04/06/1918	F	04/07/2011	4595109	04/14/2011	UTI	SUTI	4E - GI
15165	777255	05/19/1983	M	07/28/2011	5342371	08/01/2011	UTI	SUTI	7 EAST

Data contained in this report were last generated on June 5, 2012 at 3:20 PM.

Modification Screen – Section 2

→ **Select a time period or Leave Blank for Cumulative Time Period:**

Date Variable Beginning Ending

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

→ **Specify Other Selection Criteria:**

[Show Criteria](#) [Column +](#) [Row +](#) [Clear Criteria](#)

| <input type="text"/> |
|----------------------|----------------------|----------------------|----------------------|----------------------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

→ **Other Options:**

[Print Variable Reference List](#)

Modify Variables To Display By Clicking: [Modify List](#)

Specify Sort Variables By Clicking: [Modify List](#)

Select Page by variable:

Modification Screen – Section 2

- Filter (Section 2):
 - Date Variable:
 - Can specify by specific date, month, quarter, half-year, or full year. These variables are found in a drop-down menu under “Date Variable”
 - Other Selection Criteria
 - Can filter by location, event type, age of patient, etc...
 - These variables and options can be found in a drop-down menu in the table
 - Other Options
 - These are different for linelist, rate, graph, etc... (the screen shot is from a linelist)

Modification Screen

- Section 2

Select a time period or Leave Blank for Cumulative Time Period:

Date Variable: Beginning: Ending:

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

Specify Other Selection Criteria:

[Show Criteria](#) [Column +](#) [Row +](#) [Clear Criteria](#)

Variable	Operator	Value
dob	>	01/01/1970
contribDeath	=	Y

Other Options:

Modify Variables To Display By Clicking: [Modify List](#)

Specify Sort Variables By Clicking: [Modify List](#)

Select Page by variable:

Select Variables to include in Line Listing:

Available Variables

- acine
- admDateYH
- admDateYM
- admDateYQ
- admDateYr
- admToDisDays
- admToEvtDays
- ageAtEvent
- birthWt
- birthWtCode
- birthWtCodeDesc
- cdad
- cephRKleb
- completedFlag
- cr_diagEvent
- cr_diagTher
- cr_lab1cult1org
- cr_lab1cult2org
- cr_lab2cult1org
- cr_lab2cult2org
- cr_labPosBld
- cr_labPosDip
- cr_labPosGramSt
- cr_labPosUrine
- cr_labPositive
- cr_labPyuria
- cr_labPnd

Selected Variables

- orgID
- patID
- dob
- gender
- admitDate
- eventID
- eventDate
- eventType
- spcEvent
- location
- contribDeath

Select Sort Order in Line Listing:

Available Variables

- acine
- admDateYH
- admDateYM
- admDateYQ
- admDateYr
- admToDisDays
- admToEvtDays
- admitDate
- birthWt
- birthWtCode
- birthWtCodeDesc
- cdad
- cephRKleb
- completedFlag
- contribDeath
- cr_diagEvent
- cr_diagTher
- cr_lab1cult1org
- cr_lab1cult2org
- cr_lab2cult1org
- cr_lab2cult2org
- cr_labPosBld
- cr_labPosDip
- cr_labPosGramSt
- cr_labPosUrine
- cr_labPositive
- cr_labPyuria

Selected Variables

- ageAtEvent

Modification Screen – Section 3

- Exporting Data (Section 3):
 - At the top of the screen:
 - “Export Analysis Data Set”: will export all data as-is without any modifications or NHSN aggregate data (generally not recommended)

The screenshot displays the NHSN interface. At the top left is the CDC logo. To its right, the text reads "Department of Health and Human Services" and "Centers for Disease Control and Prevention". Below this is a blue bar with "NHSN - National Healthcare Safety Network". The main content area shows a user logged in as "AGIBSON" at "NHSN State Users Test Facility #2 (ID 15165)". A sidebar on the left contains navigation links: "NHSN Home", "Reporting Plan", "Patient", "Event", "Procedure", and "Summary Data". The main content area features the text "Line Listing" and "Analysis Data Set: CAU_Events". A button labeled "Export Analysis Data Set" is highlighted with a red arrow pointing to it from the right.

Modification Screen – Section 3

- At the bottom of the screen:
 - Click “Run”: will provide a new screen with output
 - Click “Save As”: will save your modifications for later use
 - Click “Export Output Data Set”: will export your data into a format of your choice
 - Recommended over “Export Analysis Data Set” at the top



Available Outputs

- Linelist:
 - Provides detailed information on different aspects of the data you're observing
 - You can create a Linelist within most modules
 - A linelist can provide the number of events, locations, and certain specifics about your data.
 - It will give you a good glimpse into your raw numbers of infections and locations.
 - You will not be able to calculate a rate through NHSN from this information.

Linelist

- Click “Run”
- You will get a pop-up screen (shown here) with your linelist using CDC specifications

Analysis Output Options

Expand All Collapse All

- Device-Associated Module
 - All Device-Associated Events
 - CDC Defined Output
 - Line Listing - All Device-Associated Events **Run** **Modify**
 - Frequency Table - All Device-Associated Events **Run** **Modify**
 - Bar Chart - All Device-Associated Events **Run** **Modify**
 - Pie Chart - All Device-Associated Events **Run** **Modify**
 - Rate Table - All Device Associated Data **Run** **Modify**
 - Central Line-Associated BSI
 - Ventilator-Associated PNEU
 - Urinary Catheter-Associated UTI
 - Central Line Insertion Practices
 - Dialysis Events

Department of Health and Human Services
Centers for Disease Control and Prevention

NHSN Output - Line Listing for All Device-Associated Events - Windows Internet Explorer

https://sdn7.cdc.gov/nhsn/analysisrequest.do?method=runFromList&NHSNSessionID=3976

File Edit View Favorites Tools Help

National Healthcare Safety Network
Line Listing for All Device-Associated Events
As of: January 10, 2013 at 3:31 PM
Date Range: All DA_EVENTS

orgID	patID	dob	gender	admitDate	eventID	eventDate	eventType	spcEvent	location	centralLine	permCentralLi
15165	11-600-4	08/06/1961	F	01/05/2012	7242073	01/10/2012	BSI	LCBI	3T - MICU	Y	
15165	1234	07/01/1960	F	06/06/2010	3295588	06/07/2010	BSI	LCBI	3T - MICU	Y	
15165	12345	12/29/1953	F	11/08/2010	3847277	11/11/2010	BSI	LCBI	ICU	Y	
15165	12345	12/29/1953	F	11/04/2010	3866519	11/08/2010	BSI	LCBI	ICU	Y	
15165	123456	12/01/1960	M	01/10/2009	2734113	01/15/2009	BSI	LCBI	ICU	Y	
15165	123456	12/01/1960	M	07/13/2011	5206878	07/25/2011	BSI	LCBI	5N	Y	
15165	123456	12/01/1960	M	08/04/2011	5331101	08/17/2011	BSI	LCBI	7 EAST	Y	
15165	1235	07/01/1960	F	06/02/2010	3295969	06/10/2010	BSI	LCBI	3T - MICU	Y	
15165	1235451	10/21/1943	M	09/16/2010	3628440	09/17/2010	BSI	LCBI	ICU	Y	
15165	1236	01/01/1940	F	06/10/2010	3297753	06/15/2010	BSI	LCBI	3T - MICU	Y	
15165	1237	01/01/1940	F	06/05/2010	3298751	06/12/2010	BSI	LCBI	3T - MICU	Y	
15165	125678	07/20/2006	F	07/29/2011	5331795	08/05/2011	BSI	LCBI	6E - PED	Y	
15165	145367	08/27/1991	M	08/01/2012	7905364	08/07/2012	BSI	LCBI	4N-TRAUMA	Y	

Done Internet 100%

Antimicrobial Use and Resistance Module
Advanced

Linelist Interpretation

- A linelist provides detailed information on different aspects of the data you're observing
 - Generally considered a “snapshot” of your data
 - It can show you:
 - Raw number of infections
 - Locations in your hospital
 - Distribution of community-onset, healthcare-onset within the infections in your hospital
 - It doesn't show:
 - Denominator data (i.e. patient days, device-days, procedures, etc...)

Rate Table and DU Ratio

- Click “Run”
- You will get a pop-up screen (shown here) with your rate table and DU ratios using CDC specifications

Patient Safety Component
Analysis Output Options

Expand All Collapse All

- Device-Associated Module
 - All Device-Associated Events
 - CDC Defined Output
 - Line Listing - All Device-Associated Events
 - Frequency Table - All Device-Associated Events
 - Bar Chart - All Device-Associated Events
 - Pie Chart - All Device-Associated Events
 - Rate Table - All Device Associated Data**
- Central Line-Associated BSI
- Ventilator-Associated PNEU
- Urinary Catheter-Associated UTI
- Central Line Insertion Practices
- Dialysis Events

Centers for Disease Control and Prevention

NHSN Output - Rate Table for All Device-Associated Data - Windows Internet Explorer

https://sdn7.cdc.gov/nhsn/analysisrequest.do?method=runFromList&NHSNSessionID=3976

File Edit View Favorites Tools Help

National Healthcare Safety Network
Rate Table for All Device-Associated Data
As of: January 10, 2013 at 3:36 PM
Date Range: All DA_RATES

Device-Associated Rates

orgID=15165 loccdc=IN:ACUTE:CC:M location=3T - MICU

evnttype	inf	numdays	rate	NHSN_mean	IDR_pval	IDR_pctl
CAU (cath assoc UTI)	0	0	-	2.4	1.0000	-
CLAB (central line assoc BSI)	5	995	5.025	1.8	0.0339	97
VAP (vent assoc PNEU)	0	0	-	1.4	1.0000	-

Source of aggregate data: Am J Infect Control 2011;39:798-816.
Data contained in this report were last generated on January 10, 2013 at 3:10 PM.
Device-specific rates will only be generated for time periods with reported device days

National Healthcare Safety Network
Rate Table for All Device-Associated Data
As of: January 10, 2013 at 3:36 PM
Date Range: All DA_RATES

Device Utilization Ratios

orgID=15165 loccdc=IN:ACUTE:CC:M location=3T - MICU

device	numpatdays	DU	NHSNdu_mean	P_pval	P_pctl
Urinary Catheter	900	0.000	0.73	0.0000	0

Done

Antimicrobial Use and Resistance Module

- Advanced
- My Custom Output

Rate Table Modifications

- Section 1

- Output name and title (same)
- Output format (same)
- Date variable:
 - Uses a SummaryDate variable (ex. summaryYM, summaryYH, etc...)

Analysis Rate Table

Analysis Data Set: DA_Rates

Modify Attributes of the Output:

Last Modified On: **01/10/2013**

Output Type: **Rate Table**

Output Name:

Output Title:

Select output format:

Output Format:

Use Variable Labels

Select a time period or Leave Blank for Cumulative Time Period:

Date Variable

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

Rate Table Modifications

- Section 2
 - Specify other selection criteria (same)
 - Note: you cannot choose which variables to display
 - Group by: SummaryYM, SummaryYQ, etc...

Specify Other Selection Criteria:

[Show Criteria](#) [Column +](#) [Row +](#) [Clear Criteria](#)

▼	▼	▼	▼	▼

Other Options:

[Print Variable Reference List](#)

Group by: ▼

Show Histogram

Rate and DU Ratio Interpretations

- A rate table provides information to calculate rates within your data as well as basic aggregate rates calculated by NHSN
 - Typically: number of infections per 1,000 or 10,000 patient days or device days
 - NHSN rates are unadjusted
- A device utilization (DU) ratio provides a ratio of device days to patient days
 - Only calculated for CAUTI, CLABSI, VAP/VAE (device modules)
 - It will always be <1 (a lower number is ideal)

Rate Table Interpretation, cont.

National Healthcare Safety Network
Rate Table for Catheter-Associated UTI Data for ICU-Other/SCA
 As of: May 29, 2012 at 3:25 PM
 Date Range: CAU_RATESICU_SCA summaryYQ 2011Q1 to 2011Q3

Org ID=15165 CDC Location=IN:ACUTE:CC S

Location	Summary Year/Month	CA UTI Count	Urinary Catheter Days	CA UTI Rate	NHSN CAU Pooled Mean	Incidence Density p-value	Incidence Density Percentile	Patient Days	Cath Util Ratio	CathDU_Mean	Proportion p-value	Proportion Percentile
3N - SICU	2011M08	1	720	1.389	3.0	0.3657	36	1450	0.497	0.76	0.0000	8

Source of aggregate data: Am J Infect Control 2011;39:798-816.
 Data contained in this report were last generated on May 14, 2012 at 3:50 PM.

- Location: The location in your facility in which the infection occurred
- Summary Yr/Month: Year and month of the included data
- CAUTI Count: number of infections in your facility
- Urinary Catheter Days: number of catheter days in your facility for that location
- CAUTI Rate: your facility's rate per 1,000 catheter days
- NHSN CAU pooled mean: NHSN rate per 1,000 catheter days in a facility/unit like your own (source of the aggregate data will be on the footer for each rate table)

Rate Table Interpretation, cont.

National Healthcare Safety Network
Rate Table for Catheter-Associated UTI Data for ICU-Other/SCA
 As of: May 29, 2012 at 3:25 PM
 Date Range: CAU_RATESICU_SCA summaryYQ 2011Q1 to 2011Q3

Org ID=15165 CDC Location=IN:ACUTE:CC:S

Location	Summary Year/Month	CA UTI Count	Urinary Catheter Days	CA UTI Rate	NHSN CAU Pooled Mean	Incidence Density p-value	Incidence Density Percentile	Patient Days	Cath Util Ratio	CathDU_Mean	Proportion p-value	Proportion Percentile
3N - SICU	2011M08	1	720	1.389	3.0	0.3657	36	1450	0.497	0.76	0.0000	8

Source of aggregate data: Am J Infect Control 2011;39:798-816.
 Data contained in this report were last generated on May 14, 2012 at 3:50 PM.

- Incidence Density P-Value: demonstrates if your rate is significantly different from the national rate. It is common practice that if a p-value is <0.05 , the values are considered significantly different (either higher or lower) than your hypothesized variable (typically the national value, especially in NHSN calculations)
- Incidence Density Percentile: what percentile your data is in, within all of NHSN.
 - For example, if your Incidence Density Percentile is 36, then your value is in the 36th percentile nationally. This means that you have a higher value than 35% of all facilities, and 64% of facilities have a higher value than your facility.

DU Ratio Interpretation, cont.

National Healthcare Safety Network
Rate Table for Catheter-Associated UTI Data for ICU-Other/SCA
 As of: May 29, 2012 at 3:25 PM
 Date Range: CAU_RATESICU_SCA summaryYQ 2011Q1 to 2011Q3

Org ID=15165 CDC Location=IN:ACUTE:CC:S

Location	Summary Year/Month	CA UTI Count	Urinary Catheter Days	CA UTI Rate	NHSN CAU Pooled Mean	Incidence Density p-value	Incidence Density Percentile	Patient Days	Cath Util Ratio	CathDU_Mean	Proportion p-value	Proportion Percentile
3N - SICU	2011M08	1	720	1.389	3.0	0.3657	36	1450	0.497	0.76	0.0000	8

Source of aggregate data: Am J Infect Control 2011;39:798-816.
 Data contained in this report were last generated on May 14, 2012 at 3:50 PM.

- Patient Days: number of patient days in your facility
- Catheter Utilization Ratio: catheter days / patient days (in your facility)
- Catheter DU Mean: NHSN DU from the urinary catheter aggregate data shown at the footer of the rate table
- Proportion p-value: test to see if your facility's DU is significantly different from the NHSN DU
- Proportion percentile: the percentile your facility's DU ranks in all of NHSN for catheter days

Intermediate to Advanced NHSN Analysis

Important Analysis Terms

- P-value
- 95% Confidence Interval
- Percentile

P-Value

- Provided to you by NHSN for many analyses
- Test of significance
- It is the probability that an outcome occurred by chance alone
 - If it is very small ($p < 0.05$ or less than 5%) then:
 - We conclude that our rate or ratio is significantly different than the pooled mean, expected, or the previous value
 - $P < 0.05$ is a cut-point that is widely accepted

95% Confidence Interval

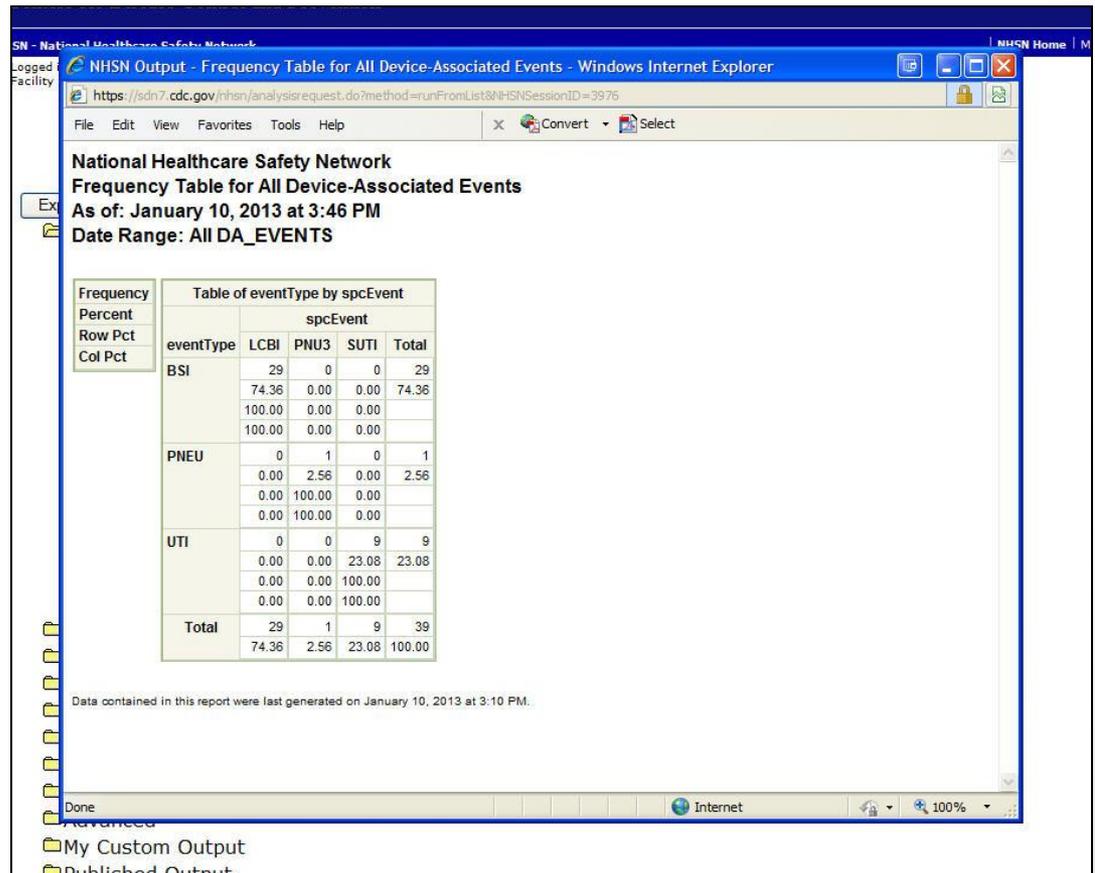
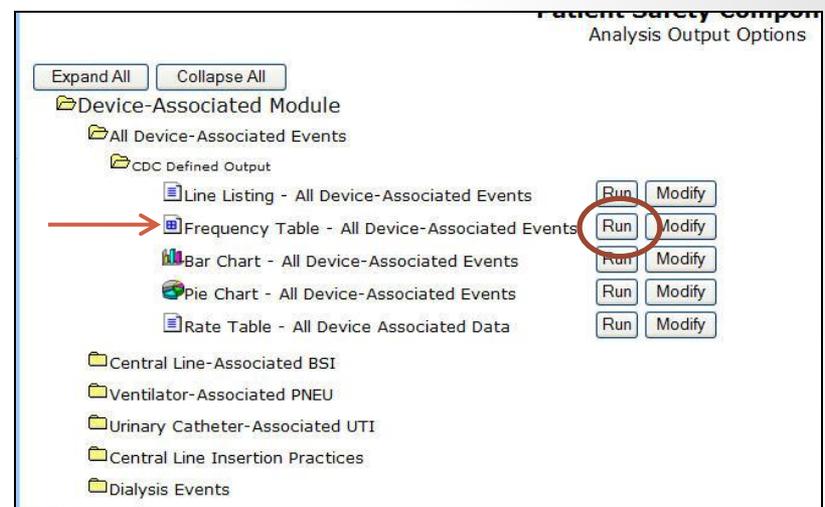
- Another demonstration of statistical significance
- Means: out of all times a value (rate, SIR, etc...) may be calculated, 95% of the time, the true value falls within the range given
 - If the number 1 is in the middle of the range (and 1 was your “expected” value), then your value is not significantly different
 - If the number 1 is not included in the range given, then it is significantly different (higher or lower).

Percentile

- A value at which a percent of the distribution falls at or below
 - Meaning: if you are at the 30th percentile for a rate, 29% of hospitals had a lower rate, and 70% of hospitals had a higher rate than you
 - Therefore, being in a low percentile is best in NHSN

Frequency Table

- Click “Run”
- You will get a pop-up screen (shown here) with your frequency table using CDC specifications



Frequency Table Modifications

- Section 1
 - Output Name and Title: Same
 - Output Format: Same
 - Time period: Same as linelist

Frequency Table

Analysis Data Set: DA_Events

Modify Attributes of the Output:

Sets
ator

Last Modified On: 01/10/2013

Output Type: Frequency Table

Output Name:

Output Title:

Select output format:

Output Format:

Use Variable Labels

Select a time period or Leave Blank for Cumulative Time Period:

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

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

Frequency Table Modifications

- Section 2
 - Specify Other Selection Criteria (same)
 - Choose your row and column variables
 - Check what you would like displayed

Specify Other Selection Criteria:

[Show Criteria](#) [Column +](#) [Row +](#) [Clear Criteria](#)

Other Options: [Print Variable Reference List](#)

Selected Variables to include in output:

Row: **Column:** **Page by:**

Frequency Table Options:

Table percent - Display cell frequency divided by table total

Missing - Include observations with missing values

Print the table in list form

Two-Way Table Options:

Row Percent - Display cell frequency divided by row total

Column Percent - Display cell frequency divided by column total

Expected - Expected cell frequencies

Chi-square - Test for independence

Frequency Table Interpretation

- A frequency table compares one variable to another in table form
 - Good to get certain counts and percentages of one variable per another variable
 - For example, different event types at each location type throughout your hospital or the specific events within each event type (displayed in this presentation)
- Chi-square – test for independence

Bar and Pie Charts

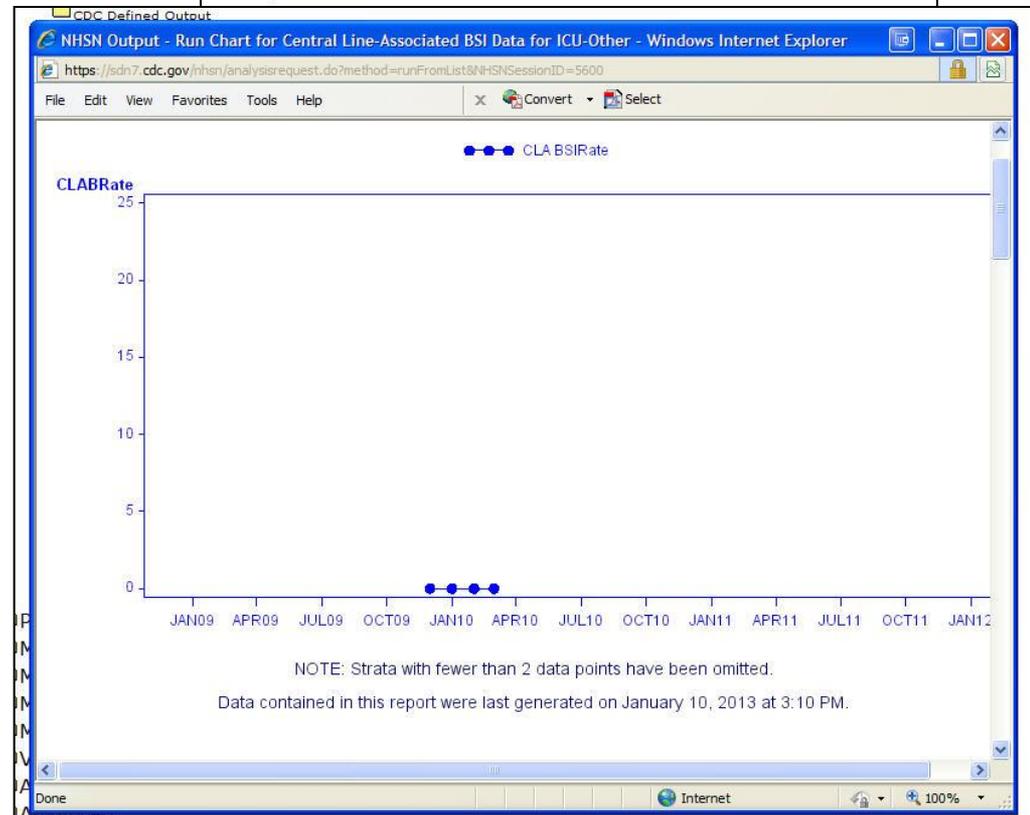
- Provides basic bar and pie charts
- Represent counts of records meeting certain criteria (i.e. a graphical representation of the frequency table)
 - NOTE: these options do not present rates or SIRs (just counts)
- Can modify to display the variables you want to see
- Export rates and other advanced analyses to Excel for better graphing options

Run Charts

- Click “Run”
- You will get a pop-up screen (shown here for ICU CLABSI data) with your run chart using CDC specifications

Central Line-Associated BSI

- CDC Defined Output
 - Line Listing - All CLAB Events [Run] [Modify]
 - Frequency Table - All CLAB Events [Run] [Modify]
 - Bar Chart - All CLAB Events [Run] [Modify]
 - Pie Chart - All CLAB Events [Run] [Modify]
 - Rate Table - CLAB Data for ICU-Other [Run] [Modify]
 - Run Chart - CLAB Data for ICU-Other [Run] [Modify]**
 - Rate Table - CLAB Data for NICU [Run] [Modify]
 - Run Chart - CLAB Data for NICU [Run] [Modify]
 - Rate Table - CLAB Data for SCA [Run] [Modify]
 - Run Chart - CLAB Data for SCA [Run] [Modify]
 - SIR - In-Plan CLAB Data [Run] [Modify]
 - SIR - All CLAB Data [Run] [Modify]
- Ventilator-Associated PNEU
- Urinary Catheter-Associated UTI



Run Chart Modifications

- Top part – same as others (Date variable – summary date)
- Choose the chart variable to run your output on
 - Display overlay line – will provide a reference line of your choice

Specify Other Selection Criteria:

[Show Criteria](#) [Column +](#) [Row +](#) [Clear Criteria](#)

▼	▼	▼	▼	▼

Other Options:

[Print Variable Reference List](#)

Chart Variable: CLABCount ▼

Group by: location ▼

Control Chart Options:

- Display Overlay Line(s)
 - NHSN Aggregated Pooled Mean Local Pooled Mean
 - Reference Line with value =
- Smoothing Enabled
 - 3 Point Moving Average
 - 5 Point Moving Average

Run

Save As

Reset

Back

Export Output
Data Set

Run Chart Interpretations

- Allows you to graph rates and DU ratios over time
- Can include NHSN pooled mean and/or other defined reference line
- Good to use to take a graphical look at your rates and DU ratios throughout time and compare to some sort of reference

Standardized Infection Ratio

- $SIR = \text{observed \# infections} / \text{predicted \# infections}$
- More NHSN SIR information can be found at:
 - www.cdc.gov/nhsn/PDFs/Newsletters/NHSN_NL_OCT_2010SE_final.pdf
- Currently, SIR data is available for CAUTI, CLABSI, and SSI
 - MRSA bacteremia and CDI SIRs will be available February 2013

Running the SIR

- Click “Run”

The screenshot displays the 'Patient Safety Component Analysis Output Options' window. It features a tree view on the left and a list of reports on the right. The tree view is expanded to show the following structure:

- Expand All
- Collapse All
- Device-Associated Module
- Procedure-Associated Module
 - All Procedure-Associated Events
 - SSI
 - CDC Defined Output
 - Line Listing - All SSI Events
 - Frequency Table - All SSI Events
 - Bar Chart - All SSI Events
 - Pie Chart - All SSI Events
 - SIR - Complex AR SSI Data by Procedure
 - SIR - Complex AR SSI Data by Surgeon
 - SIR - In-plan Complex AR SSI data by Procedure
 - SIR - In-plan Complex AR SSI data by Surgeon
 - SIR - All SSI Data by Procedure
 - SIR - All SSI Data by Surgeon
 - SIR - In-plan All SSI Data by Procedure
 - SIR - In-plan All SSI data by Surgeon
 - Line Listing - Procedures Excluded from SSI SIR
 - Post-Procedure PNEU
 - MDRO/CDI Module - Infection Surveillance
 - MDRO/CDI Module - LABID Event Reporting

On the right side, each report has a 'Run' and a 'Modify' button. A red bracket on the left groups the SIR reports from 'SIR - Complex AR SSI Data by Procedure' down to 'SIR - In-plan All SSI data by Surgeon'. A red arrow points to the 'Run' button for 'SIR - In-plan All SSI Data by Procedure'.

CDC-Defined SIR

National Healthcare Safety Network
SIR for All SSI Data by Procedure - By OrgID
 As of: January 14, 2013 at 1:21 PM
 Date Range: All SIR_ALLSSIPROC

orgid=15165

orgid	summaryYH	procCount	infCountAll	numExpAll	SIRAll	SIRAll_pval	SIRAll95CI
15165	2009H1	145	3	3.442	0.872	0.5492	0.180, 2.547
15165	2009H2	6	0	0.176	-	-	
15165	2010H1	2	0	0.015	-	-	
15165	2010H2	9	3	0.224	-	-	
15165	2011H1	5	1	0.037	-	-	
15165	2011H2	7	3	0.226	-	-	
15165	2012H1	220	1	8.292	0.121	0.0023	0.003, 0.672
15165	2012H2	2	1	0.117	-	-	

If infCount in this table is less than you reported, aggregate data are not available to calculate numExp.
 Excludes Superficial Incisional Secondary (SIS) and Deep Incisional Secondary (DIS) SSIs.
 Lower bound of 95% Confidence Interval only calculated if infCount > 0. SIR values only calculated if numExp >= 1.
 Source of aggregate data: 2006-2008 NHSN SSI Data
 Data contained in this report were last generated on January 10, 2013 at 3:10 PM.

National Healthcare Safety Network
SIR for All SSI Data by Procedure - By OrgID/ProcCode
 As of: January 14, 2013 at 1:21 PM
 Date Range: All SIR_ALLSSIPROC

orgid=15165

orgid	procCode	summaryYH	procCount	infCountAll	numExpAll	SIRAll	SIRAll_pval	SIRAll95CI
15165	AAA	2009H2	1	0	0.089	-	-	
15165	APPY	2009H2	1	0	0.007	-	-	
15165	BRST	2010H2	2	0	0.017	-	-	
15165	CARD	2009H1	43	2	0.572	-	-	
15165	CBGB	2009H1	52	0	1.505	0.000	0.2220	2.451
15165	CBGC	2009H1	49	0	1.341	0.000	0.2616	2.751
15165	CHOL	2011H1	1	0	0.002	-	-	
15165	COLO	2010H2	1	1	0.099	-	-	

Done Internet 100%

MDRO/CDI Module - Process Measures

SIR Interpretations

- How does NHSN calculate the SIR?
 - Logistic regression model
 - Adjusts data to account for certain variables (example age, med-school affiliation, location type, etc...).
 - Why?
 - By factoring these variables out of the equation, they make it possible to fairly compare numbers between two completely different hospitals, states, etc...

SIR Interpretations

- Summary measure that can be used to compare infections in your hospital to a standard population
- Indirect standardization method
- Allows us to account for differences within groups

- Standard (Reference/Baseline) Populations:
 - CAUTI: 2009 NHSN aggregate data
 - CLABSI/SSI: 2006-2008 NHSN aggregate data
 - MRSA bacteremia/CDI: 2010-2011 NHSN aggregate data
 - The standard population reference is displayed at the bottom of each output on the run screen

SIR Interpretations

- Number of Predicted Infections:
 - The number of infections predicted by NHSN for your facility during this time period. Prediction is based on analysis of similar facilities and calculated by NHSN using a logistic regression model. It accounts for certain variables depending on the module:
 - SSI: age, ASA score, procedure duration, medical school affiliation
 - CAUTI: type of location, medical school affiliation, bed size of location
 - CLABSI: type of location, medical school affiliation, bed size of location
 - MRSA bacteremia: bed size, teaching type, and prevalence
 - CDI: bed size, teaching type, CDI test type (PCR, EIA, other), and prevalence

SIR Interpretations

- SIR:
 - Compares the number of infections in your facility to the number of predicted infections. An SIR of 1 means that the same number of infections occurred as were predicted. An SIR less than 1 means the facility is having fewer infections than predicted.
 - For example, an SIR of 0.5 means that the facility had 50% fewer infections than predicted. Similarly, an SIR greater than 1 represents an elevated number of infections at the facility. For example, an SIR of 1.25 may be interpreted as 25% more infections than predicted.
 - NOTE: SIRs are only calculated if the number of predicted infections is greater than or equal to 1.

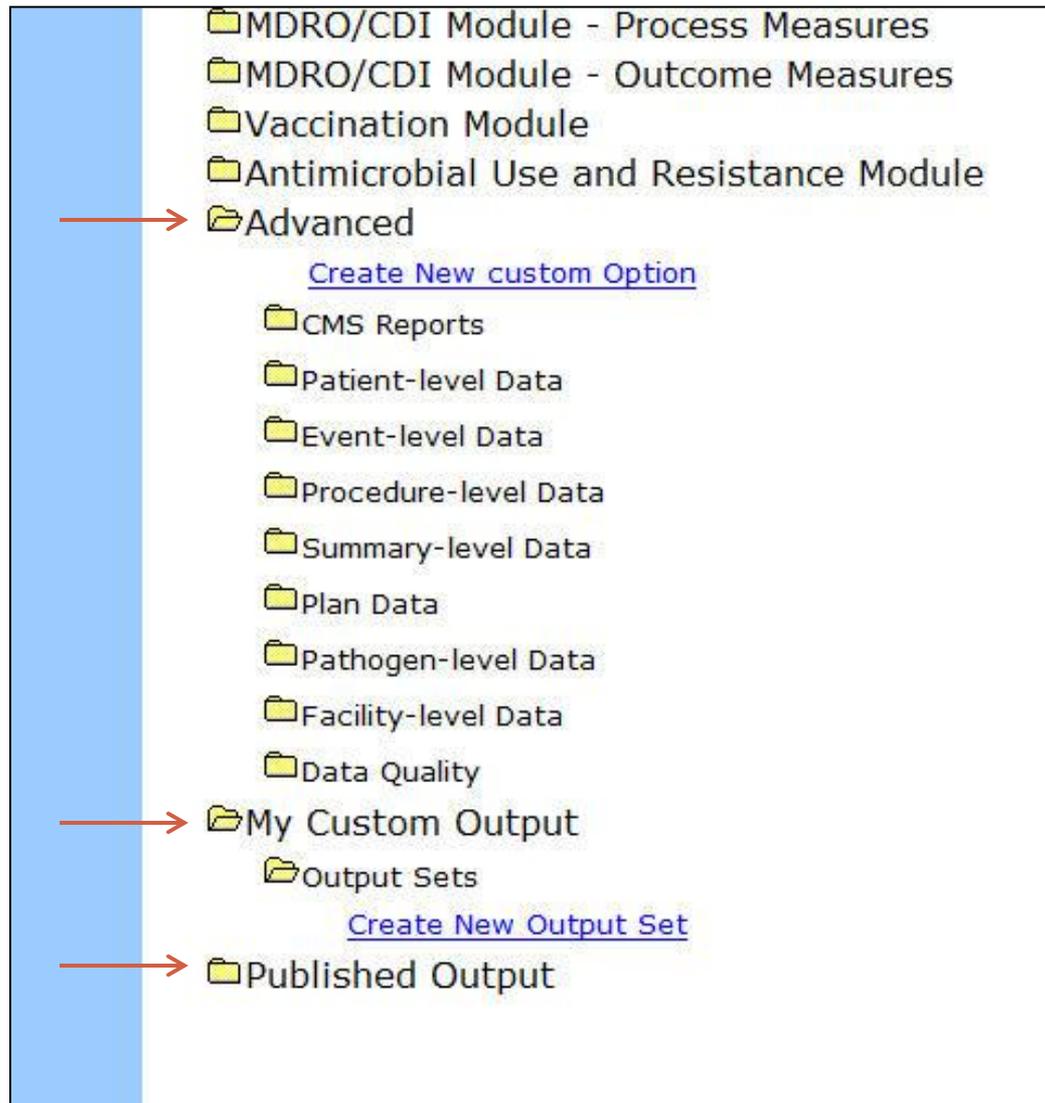
SIR Interpretations

- SIR-Associated p-value:
 - The p-value for the SIR at your facility compared to the expected value of 1.
 - A p-value is a test of significance and difference, comparing the results at your facility to expected (expected SIR=1). P-values less than or equal to 0.05 are considered statistically significantly different than the expected.
 - A number significantly lower than 1 is desirable (having an SIR that is lower than expected and p-value less than 0.05).

SIR Interpretations

- SIR-Associated Confidence Interval:
 - Another demonstration of statistical significance. A 95% Confidence Interval means that, out of all the times an SIR may be calculated, 95% of the time the true SIR falls within this range. There are two numbers given, the upper and lower bounds.
 - If the interval between the two numbers includes 1, then your observed number of infections are not statistically significantly different than expected (interpreted as being “fair”). If the interval does not surround 1, then your observed number of infections is statistically significantly different than expected (either higher or lower).
 - Note that the lower bound of 95% Confidence Interval is only calculated if the number of all infections is greater than zero.

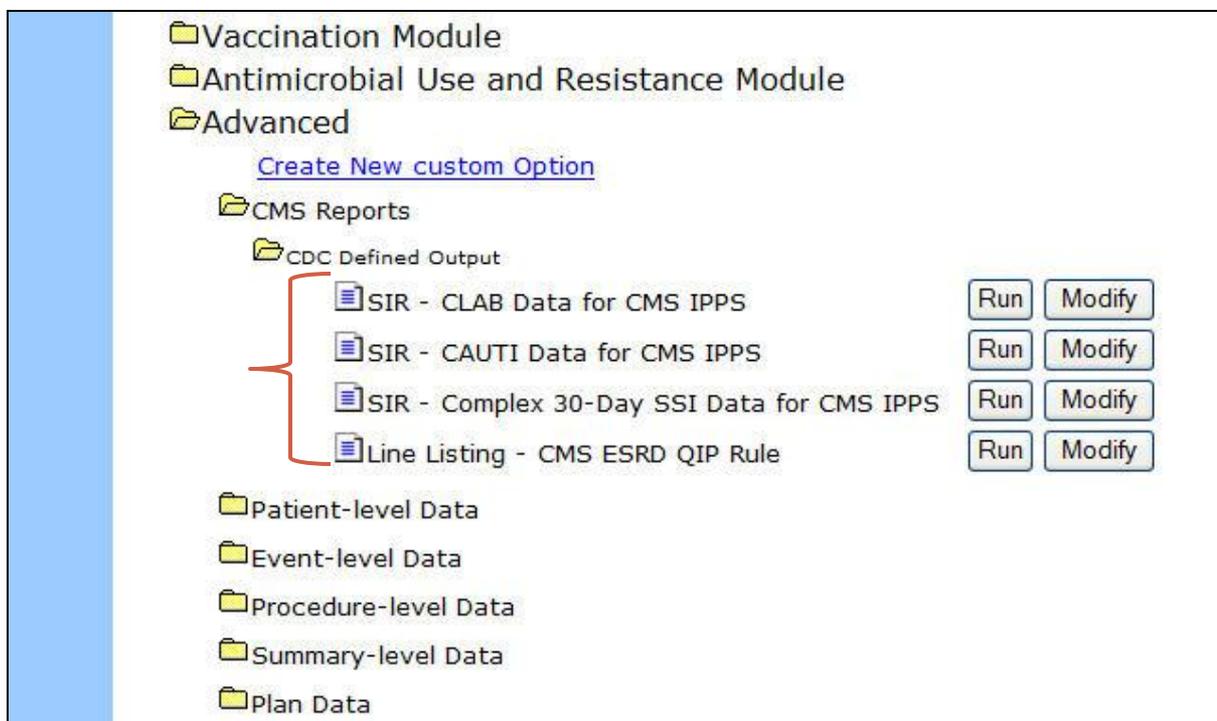
Advanced Analysis Options



Advanced Analysis Options

- Advanced Folder
 - CMS Reports
 - Patient, Event, and Procedure-level data (Summary data)
 - Reporting Plan and Facility Information
 - Antibiogram Data
 - Custom Outputs
 - Create your own output from scratch or modify CDC-defined settings
- Output Sets
 - Run multiple reports simultaneously with the click of one “Run” button
- Published Outputs

CMS IPPS Module



- Advanced Folder
 - CMS Reports
 - CDC Defined Output

CMS IPPS Module

- When you run these, it will mirror what CMS will be seeing
- If something doesn't look right, now you can check it out
 - First, check your alerts section (missing procedures, missing checked "report no events" box, etc...)
 - If some events are missing, run that event-type linelist (ex. missing SSIs, run the SSI linelist)
- NOTE: CMS SSI data will only include deep incisional primary and organ/space SSIs with an event date that is within 30 days of the procedure
 - Always check the footnotes of the tables – they will tell you what is excluded

Custom Reports

- Advanced – Create New Custom Option
- Analysis Data Set: choose any type of analysis variable you would like
- Depending on the variable, choose your output type (linelist, rate table, run table, etc...)

Create Custom Output

Analysis Data Set:

Modify Attributes of the Output:

Output Type:

Output Name:

Output Title:

Select output format:

Select a time period or Leave Blank for Cumulative Time Period:

Specify Other Selection Criteria:

Other Options: [Print Variable Reference List](#)

Output Sets

- Sometimes, you may want to run the same multiple reports on a regular basis
- Put these reports into an Output Set, and run them with one click
- Go to Advanced – My Custom Output – Create New Output Set

Output Sets

The screenshot shows a web form titled "Output Set". At the top right of the form area is the title "Output Set". Below the title, there is a note: "Mandatory fields marked with *". There are two input fields: "Output Set Name*" and "Output Set Title:". Below these fields is a horizontal line. Under the line, there is a section titled "Output Options*" with a button labeled "Add Output Options". Below this button is a table with a header row "Output Name" highlighted in blue. At the bottom right of the form are two buttons: "Save" and "Back".

- Give it a Name and Title
- Click “Add Output Options”
- A list of all output options (CDC-defined and Custom) will appear
- Choose all output options you want in your set and click “Submit”

Output Sets

- Let's say you want all of the CMS SIR Reports in an Output Set
 - You can then move them up and down so they run in a specific order
 - Save your output
 - You will still be able to modify each individual report within the set

Output Set

Mandatory fields marked with *

Output Set Name*:

Output Set Title:

Output Options*

Output Name	Up	Down	Modify	Delete
SIR - CAUTI Data for CMS IPPS	<input type="button" value="Up"/>	<input type="button" value="Down"/>	<input type="button" value="Modify"/>	<input type="button" value="Delete"/>
SIR - CLAB Data for CMS IPPS	<input type="button" value="Up"/>	<input type="button" value="Down"/>	<input type="button" value="Modify"/>	<input type="button" value="Delete"/>
SIR - Complex 30-Day SSI Data for CMS IPPS	<input type="button" value="Up"/>	<input type="button" value="Down"/>	<input type="button" value="Modify"/>	<input type="button" value="Delete"/>

Publish Output

- At the bottom of every custom output, you have the option to publish your custom option or set
- If you modify a CDC-Defined output, then click “Save As”, the option to publish will show up at the bottom
- This will allow all users at your facility to view your output option
 - If you’ve modified certain output options, publishing them will allow others to view and use the same output options



Next Steps

- Now...
 - You can analyze your hospital's data and understand it
- Next...
 - You can present this information to your hospital leadership
 - You can present this information to the public
 - You can use these data to initiate prevention strategies to reduce rates in your hospital

Questions?

- Please contact:
 - Allison Gibson Murad, MPH
 - murada@michigan.gov
 - 517-335-8199
- www.michigan.gov/hai
- Please listen in to our monthly NHSN calls
 - 4th Monday of every month at 10am
 - Agenda and call-in information can be found on our website