

Module 4: Data Analysis

**Satellite Conference and Live Webcast
Tuesday, November 16, 2010
1:00 - 4:00 p.m. Central Time**

**Produced by the Alabama Department of Public Health
Video Communications and Distance Learning Division**

Faculty

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Objectives

- **Background**
 - **Review HAI Point Estimation**
 - **Incidence Density Rates**
 - **Proportion**
 - **Device Utilization Ratio**
 - **Risk Ratio**

Objectives

- **Standardized Infection Ratio (SIR)**
 - **Describe SIR**
 - **Calculate SIR**
 - **Interpret SIR**

Objectives

- **Facility Data Analysis**
 - **Steps to successful analysis**
 - **Central Line-Associated Bloodstream Infections (CLABSIs)**
 - **Catheter Associated Urinary Tract Infections (CAUTIs)**
 - **Surgical Site Infections (SSI)**

Objectives

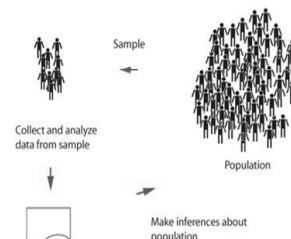
- **NHSN Version 6.3**
 - **Statistics calculator**
- **Create meaningful reports**
 - **Review process for creating output in the National Healthcare Safety Network (NHSN)**
 - **Customize output**
 - **Export data**

Objectives

- Alabama Department of Public Health (ADPH) Annual Reports
 - Describe structure of Alabama reports on HAIs

Point Estimates

$$\frac{\text{Numerator}}{\text{Denominator}} \times \text{Constant}$$



HAI Point Estimates

- Central Line-Associated Bloodstream Infections (CLABSI)
 - CLABSI Rate
 - Central Line Utilization Ratio
 - CLABSI Standardized Infection Ratio (SIR)
 - * NHSN Version 6.3 Feature

HAI Point Estimates

- Catheter Associated Urinary Tract Infections (CAUTI)
 - CAUTI Rate
 - Catheter Utilization Ratio

HAI Point Estimates

- Surgical Site Infections (SSI)
 - SSI Rate
 - * Available in “Advanced” section of the output option
 - SSI SIR
 - * NHSN Version 6.3 Feature

HAI Incidence Density Rates

- The Incidence Density Rate is a measure of the risk of developing an HAI within a specified period of time
- The Numerator is the number of new cases of disease
- The Denominator is “person-time” units

HAI Incidence Density Rates

- Example 1
 - Central Line-Associated BSI (CLABSIs) rate

$$\frac{12 \text{ CLABSIs}}{4,000 \text{ central line days}} \times 1,000 = 3.0$$

Example CLABSIs Rate Table

Unit	Summary Rate	CLABSIs Count	Central Line Days	CLABSIs Rate	Risk-Adjusted Rate	Incidence Density	Incidence Density Percentile	Patient Days	CL Line Days	Risk-Adjusted Patient Days	Proportion p-value	Proportion Percentile
ICU 2003010	0	36	0.0	0.7	0.7085	16	45	0.80	0.00	0.0000	0.0000	51
ICU 2003011	1	34	0.0	0.7	0.5789	21	45	0.80	0.00	0.0000	0.0000	75
ICU 2003012	0	34	0.0	0.7	0.4219	16	45	0.80	0.00	0.0000	0.0000	79
ICU 2003013	1	54	0.0	0.7	0.5293	46	101	0.65	0.00	0.0000	0.0000	46
ICU 2003014	1	311	2.6	0.7	0.7540	35	470	0.82	0.00	0.0000	0.0000	51
ICU 2003014	1	218	4.6	0.7	0.4688	16	45	0.80	0.00	0.0000	0.0000	21
ICU 2003015	1	494	4.5	0.7	0.6021	35	527	0.82	0.00	0.0000	0.0000	14
ICU 2003016	2	228	36.3	0.7	0.2062	28	101	0.95	0.00	0.0000	0.0000	14
ICU 2003017	0	403	0.0	0.7	0.5323	30	444	0.87	0.00	0.0000	0.0000	23
ICU 2003018	0	206	0.0	0.7	0.6773	16	389	0.82	0.00	0.0000	0.0000	31
ICU 2003019	0	88	0.0	0.7	0.9329	16	207	0.81	0.00	0.0000	0.0000	8

Proportion

- A fraction in which the numerator is included within the denominator
 - The Numerator is a sample of the total population
 - The Denominator is the total population
 - Often expressed as a percent

Proportion

- Examples
 - Device Utilization Ratio
 - Measures the total patient days in which a device was used
- $$\text{Urinary Catheter DU Ratio} = \frac{\# \text{ indwelling catheter days}}{\# \text{ patient days}}$$

Proportion

- Surgical Site Infection Rate
 - Measures the risk of SSI events by specific procedure and risk category
- $$\frac{4 \text{ SSI in hysterectomy patients}}{280 \text{ women undergoing hysterectomy}} \times 100 = 1.4\%$$

Example SSI Rate Table

ProcCode	RiskCat	Outpatient	SummaryRate	SSICount	ProcCount	SSIRate	SSI_Risk	P_pval	P_pct
CBG8	1	N	2007011	0	45	0.00	2.96	0.2324	10
CBG8	1	N	2007017	0	12	0.00	2.96	0.6975	10
NPRO	0	N	2008011	0	13	0.00	0.75	0.9071	25
NPRO	1	N	2008022	0	11	0.00	1.68	0.8304	25
NPRO	1	N	2008021	2	18	12.50	1.68	0.0260	100
NPRO	1	N	2008024	1	12	8.33	1.68	0.1839	100
NPRO	1	N	2008011	0	19	0.00	1.68	0.7255	25
NPRO	1	N	2007017	0	21	0.00	1.68	0.7014	25
NPRO	1	N	2007010	0	17	0.00	1.68	0.7504	25
NPRO	1	N	2007011	2	17	11.76	1.68	0.0325	100
NPRO	0	N	2008011	0	50	0.00	1.12	0.9583	25
NPRO	1	N	2008011	0	12	0.00	1.12	0.8733	25

Device Utilization Ratio

- **Step 1**
 - **Decide on the time period for your analysis**
 - **It may be a month, a quarter, 6 months, a year, or some other period**

Device Utilization Ratio

- **Step 2**
 - **Select the patient population for analysis**
 - **Type of location or a birth-weight category in a NICU**

Device Utilization Ratio

- **Step 3**
 - **Select the infections to be included in the numerator**
 - **They must be site-specific and must have occurred in the selected patient population**
 - **Their date of onset must be during the selected time period**

Device Utilization Ratio

- **Step 4**
 - **Determine number of device days which is used as denominator of rate**

Device Utilization Ratio

- **Device days are total number of days of exposure to device (central line, umbilical catheter, ventilator, or urinary catheter) by all patients in selected population during selected time period**

Device Utilization Ratio

- **Example**
 - **Five patients on the first day of the month had one or more central lines in place; five on day 2; two on day 3; five on day 4; three on day 5; four on day 6; and four on day 7**

Device Utilization Ratio

- Adding the number of patients with central lines on days 1 through 7, we would have $5 + 5 + 2 + 5 + 3 + 4 + 4 = 28$ central line days for the first week
- If we continued for the entire month, the number of central line days for the month is simply the sum of the daily counts

Device Utilization Ratio

- Example
 - Ten patients were in the unit on the first day of the month; 12 on day 2; 11 on day 3; 13 on day 4; 10 on day 5; 6 on day 6; and 10 on day 7; and so on

Device Utilization Ratio

- If we counted the patients in the unit from days 1 through 7 we would add $10 + 12 + 11 + 13 + 10 + 6 + 10$ for a total of 72 patient days for the first week of the month
- If we continued for the entire month, the number of patient days for the month is simply the sum of the daily counts

Device Utilization Ratio

- Step 5
 - Calculate the DU Ratio with the following formula

$$\text{DU Ratio} = \frac{\text{\# of device days}}{\text{\# patient days}}$$

Device Utilization Ratio

- With the number of device days and patient days from the examples above, $\text{DU} = 28/72 = 0.39$ or 39% of patient days were also central line days for the first week of the month

Device Utilization Ratio

- Step 6
 - Examine the size of the denominator for your hospital's rate or ratio
 - Rates or ratios may not be good estimates of the "true" rate or ratio for your hospital if the denominator is small
 - < 50 device days or patient days

Device Utilization Ratio

- Step 7
 - Compare your hospital's location-specific rates or ratios with those found in the tables of this report
 - Refer to Appendix B for interpretation of the percentiles of the rates/ratios

Interpret Device Utilization Ratio

- Step 1
 - Evaluate the rate (ratio) you have calculated for your hospital and confirm that the variables in the rate (both numerator and denominator) are identical to the rates (ratios) in the table

Interpret Device Utilization Ratio

- Step 2
 - Examine the percentiles in each of the tables and look for the 50th percentile (or median)
 - At the 50th percentile, 50% of the hospitals have lower rates (ratios) than the median and 50% have higher rates (ratios)

Interpret Device Utilization Ratio

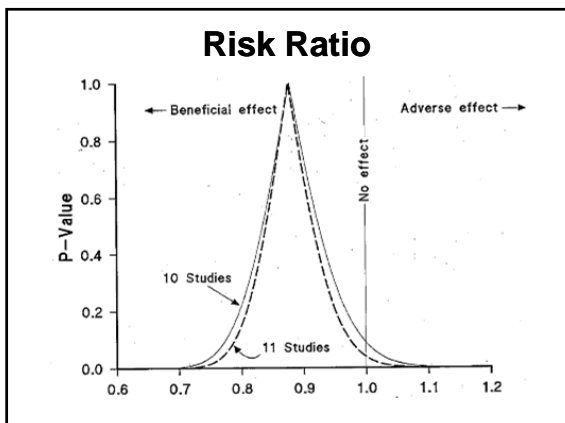
- Step 3
 - Determine if your hospital's rate (ratio) is above or below this median

Interpret Device Utilization Ratio

- Step 4
 - If it is above the median, determine whether the rate (ratio) is above the 75th percentile
 - At the 75th percentile, 75% of the hospitals had lower rates (ratios) and 25% of the hospital had higher rates (ratios)

Interpret Device Utilization Ratio

- Step 5
 - If the rate (ratio) is above the 75th percentile, determine whether it is above the 90th percentile
 - If it is, then the rate (ratio) is an outlier which may indicate a problem



- ### Risk Ratio Quick Guide
- **RR = 1**
 - Association between exposure and disease unlikely to exist
 - **RR >> 1**
 - Increased risk of disease among those that have been exposed
 - **RR << 1**
 - Decreased risk of disease among those that have been exposed



- ### Standard Infection Ratio
- A summary measure used to compare the HAI experience among one or more groups of patients to that of a standard population's
 - e.g. NHSN
 - Indirect standardization method
 - Accounts for differences in risk of HAI among the groups

- ### Standard Infection Ratio
- Ratio of Observed to Expected Infections
 - Risk-adjusted summary measure
 - Used to compare overall HAI rates or any two patient cohorts, groups, or hospitals

Calculating SIR

- To calculate O, sum the number of HAIs among a group
- To calculate E, requires the use of the appropriate aggregate data (risk adjusted rates)

$$SIR = \frac{\text{Observed (O) HAIs}}{\text{Expected (E) HAIs}}$$

Annual NHSN Report Edwards et al. AJC

612 Vol. 34 No. 9

Table 3. Pooled means and key percentiles of the distribution of central line-associated BSI rates and central line utilization ratios, by type of location, DA module, 2006 through 2007

Type of location	Central line-associated BSI rates*				Percentile					
	No. of locations	No. of CLABSI	Central line-days	Pooled mean	10%	25%	50% (median)	75%	90%	
One Critical care units										
B ₁ Burn	239	42,452	5.6	0.0	1.5	3.8	8.2	13.5		
C ₁ Coronary	373	181,079	2.1	0.0	0.0	1.2	1.9	3.4		
H ₁ Surgical cardiothoracic	397	275,194	1.4	0.0	0.6	1.3	3.0	4.2		
M ₁ Medical	1073	454,839	2.4	0.0	0.0	0.6	2.0	3.6		
M ₂ Medical/surgical, major teaching	692	342,214	2.0	0.0	0.0	0.6	2.0	3.6		
M ₃ Medical/surgical, all others	972	662,489	1.5							

Edwards JR et al. Am J Infect Control 2008;36:609-26.

Example CLABSI Rate Table Hospital A

Type of Location	# CLABSI	# Central line-days	CLABSI Rate	NHSN Rate	p-value	Expected # of CLABSI
Coronary	2	380	5.26	2.1	0.09	0.80
Cardiothoracic	1	257	3.89	1.4	0.15	
Medical	3	627	4.78	2.4	0.11	
Med/Surg, major teaching	2	712	2.81	2.0	0.32	
Total	8	1,976	4.05	---	---	---

Expected Number = 380 * (2.1 / 1,000) = 380 * 0.0021 = 0.8

Example CLABSI Rate Table Hospital A

Type of Location	# CLABSI	# Central line-days	CLABSI Rate	NHSN Rate	p-value	Expected # of CLABSI
Coronary	2	380	5.26	2.1	0.09	0.80
Cardiothoracic	1	257	3.89	1.4	0.15	0.36
Medical	3	627	4.78	2.4	0.11	1.15
Med/Surg, major teaching	2	712	2.81	2.0	0.32	1.42
Total	8	1,976	4.05	---	---	3.73

Standardized Infection Ratio (SIR) = $\frac{\text{Observed}}{\text{Expected}} = \frac{8}{3.73} = 2.14$

Confidence Interval for SIR

- A (1 - α)100% confidence interval for p

$$SIR_L = \frac{O}{E} \left(1 - \frac{1}{9O} - \frac{Z_{\alpha/2}}{\sqrt{9O}} \right)^3$$

$$SIR_U = \frac{(O+1)}{E} \left(1 - \frac{1}{9(O+1)} - \frac{Z_{\alpha/2}}{\sqrt{9(O+1)}} \right)^3$$

- Example normal curve values

90% confidence → z_{.05} = 1.645

95% confidence → z_{.025} = 1.96

99% confidence → z_{.005} = 2.58

Liddell FDK. JECH 1984;38:85-89.

Interpreting an SIR

- If SIR = 1, or O = E
 - Observed CLABSIs equals the expected CLABSIs based on NHSN
- If SIR is significantly >1
 - This suggests the institution may need further investigation for the contributing ICUs/locations

Risk Ratio Quick Guide



Risk Ratio Quick Guide

- RR= 1
 - Association between exposure and disease unlikely to exist
- RR >> 1
 - Increased risk of disease among those that have been exposed
- RR << 1
 - Decreased risk of disease among those that have been exposed

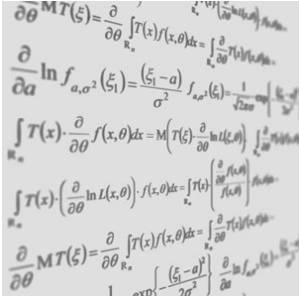
Hospitals SIRs Compared to 1

Hospital	SIR	p-value	Status group
A	1.2	0.12	Same
B	0.9	0.23	Same
C	2.7	0.001	High
D	0.7	0.002	Low
E	1.5	0.001	High

Hospitals SIRs Compared to 1

Hospital	SIR	95% Confidence Interval	Status group
A	1.2	0.7-2.4	Same
B	0.9	0.4-1.6	Same
C	2.7	2.3-3.8	High
D	0.7	0.3-0.9	Low
E	1.5	1.3-1.9	High

Facility Data Analysis




Steps to Successful CLABSI Analysis

- Step 1
 - Log in to NHSN Patient Safety Component Home Page
- Step 2
 - Select Analysis
- Step 3
 - Generate Data Sets

Steps to Successful CLABSI Analysis

- Step 4
 - Select Output Options
- Step 5
 - 5a. Expand “Device-associated Module”
 - 5b. Expand “Central Line-associated BSIs”
 - 5c. Expand “CDC Defined Output”

Steps to Successful CLABSI Analysis

- Step 6
 - To change Output, select “Modify”
- Step 7
 - 7a. Perform a “Run” on Line Listing – All CLAB Events
 - 7b. Perform a “Run” on Frequency Table – All CLAB Events

Steps to Successful CLABSI Analysis

- 7c. Perform a “Run” on Rate Table CLAB Data for ICU Other
- 7d. Perform a “Run” on SIR All CLAB Data

Steps to Successful CLABSI Analysis

- Optional
 - Step 8
 - 8a. Perform a “Run” on Bar Chart - All CLAB Events
 - 8b. Perform a “Run” on Pie Chart - All CLAB Events
 - 8c. Perform a “Run” on Control Chart CLAB Data for ICU Other

CLABSI Steps 1-5

CLABSI Step 6

Example of Analysis Modification Screen

Can export analysis and output datasets. Can change the design parameters of output here.

The top section allows you to modify output characteristics, such as output name, title, and format.

The middle section allows you to specify which data will be considered for the output. You can filter output by time or other criteria (e.g., limit to a single location or infection type.)

The bottom section allows you to specify how the data in the output will be displayed and organized (e.g., sort by location; group by quarter.)

CLABSI Step 7

National Healthcare Safety Network
Line Listing for All Central Line-Associated BSI Events

summaryYr	location	numCLDays	SIR	SIR_pval	SIR95CI
2009H1	MICU	1	2.826	0.2267	0.018, 1.679
2009H2	MICU	0	2.313	0.0990	1.295
2010H1	MICU	15	9.515	0.0600	0.882, 2.600

CLABSI SIR Table

CLABSI Step 7

National Healthcare Safety Network
Rate Table for Central Line-Associated BSI Data for ICU-Other

As of: November 9, 2010 at 4:22 PM
Data Range: All CLAB_RATESICU

orgID=10268 loccod=IN:ACUTE:CC:M

CLABSI Rate Table

location	summaryYr	CLABCount	numCLDays	CLABRate	CLAB_Mean	IDR_pval	IDR_pct	numPatDays	LineDU	LineDU_Mean	P_pval	P_pct
MICU	2010M04	1	476	2.1	2.6	0.6527	46	657	0.73	0.61	0.0000	68
MICU	2010M05	2	519	3.9	2.6	0.3847	77	698	0.74	0.61	0.0000	68
MICU	2010M06	3	449	6.7	2.6	0.1195	94	653	0.69	0.61	0.0000	68
MICU	2010M07	2	543	3.7	2.6	0.4062	75	683	0.80	0.61	0.0000	90
MICU	2010M08	3	530	5.7	2.6	0.1572	91	703	0.75	0.61	0.0000	90
MICU	2010M09	2	489	4.1	2.6	0.3574	79	683	0.72	0.61	0.0000	68

CLABSI Step 7

National Healthcare Safety Network
SIR for All Central Line-Associated BSI Data - Overall

As of: November 10, 2010 at 3:24 PM
Data Range: All CLAB_RATESICU

summaryYr	inCount	numExp	numCLDays	SIR	SIR_pval	SIR95CI
2009H1	1	2.826	942	0.35	0.2267	0.018, 1.679
2009H2	0	2.313	771	0.00	0.0990	1.295
2010H1	15	9.515	3763	1.58	0.0600	0.882, 2.600

If inCount in this table is less than you reported, aggregate data are not available to calculate numExp.
Lower bound of 95% Confidence Interval only calculated if inCount > 0. SIR values only calculated if numExp > 1.
Source of aggregate data: NHSI Report, Am J Infect Control 2009;37:783-805
Data contained in this report were last generated on November 2, 2010 at 3:19 PM.

CLABSI Step 8

National Healthcare Safety Network
Pie Chart for All Central Line-Associated BSI Events

As of: November 10, 2010 at 3:17 PM
Date Range: All CLAB_EVENTS
FREQUENCY of spcEvent

Location = MICU

LCBI 13
100%

Location = MSICU

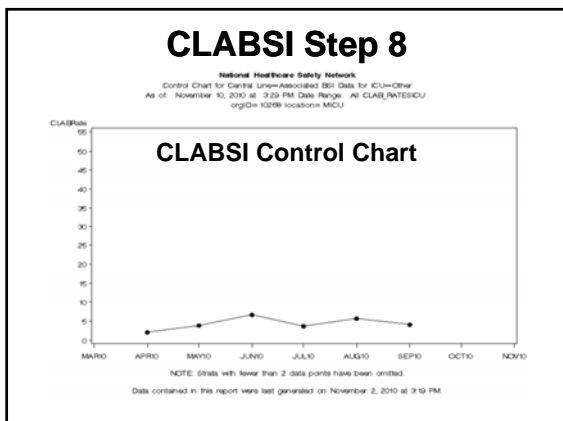
LCBI 3
100%

CLABSI Step 8

National Healthcare Safety Network
Bar Chart for All Central Line-Associated BSI Events

As of: November 10, 2010 at 3:14 PM
Date Range: All CLAB_EVENTS
Location = ICU

Data contained in this report were last generated on November 2, 2010 at 3:19 PM.



Interpreting CLABSI Rates

- **Step 1**
 - If it is below the median, determine whether the rate (ratio) is below the 25th percentile
 - At the 25th percentile, 25% of the hospitals had lower rates (ratios) and 75% of the hospitals had higher rates (ratios)

Interpreting CLABSI Rates

- **Step 2**
 - If the rate (ratio) is below the 25th percentile, determine whether it is below the 10th percentile
 - If the rate is, then it is a low outlier
 - May be due to underreporting of infections

Interpreting CLABSI Rates

- If the ratio is below the 10th percentile, it is a low outlier and may be due to infrequent and/or short duration of device use

Interpreting CLABSI Rates

- **Note**
 - Device-associated infection rates and device utilization ratios should be examined together so that preventive measures may be appropriately targeted

Interpreting CLABSI Rates

- For example, you find that the CLABSI rate for a certain type of ICU is consistently above the 90th percentile and the CLABSI utilization ratio is routinely between the 75th and 90th percentiles

Interpreting CLABSI Rates

- Your facility may want to limit the duration of central lines whenever possible (i.e., decrease unnecessary use) while at the same time optimize infection prevention strategies in patients for which the use of a central line is required

CAUTI



Steps to Successful CAUTI Analysis

- Step 1
 - Log in to NHSN Patient Safety Component Home Page
- Step 2
 - Select Analysis
- Step 3
 - Generate Data Sets

Steps to Successful CAUTI Analysis

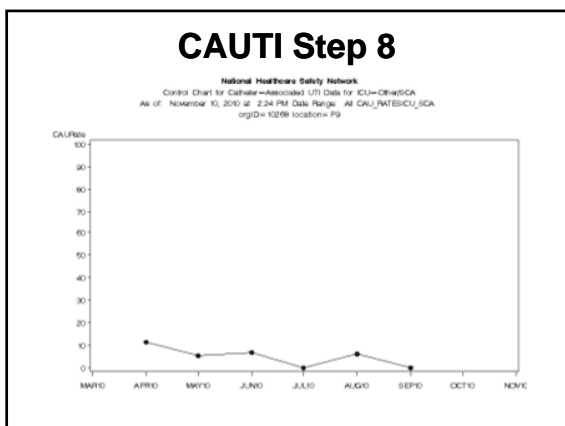
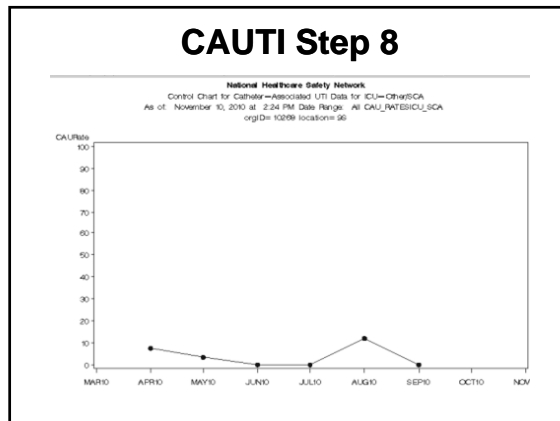
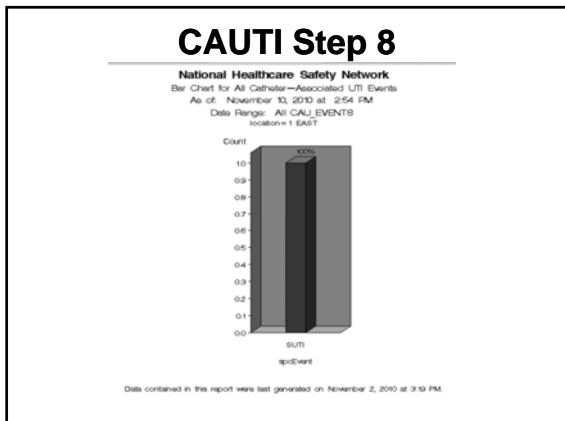
- Step 4
 - Select Output Options
- Step 5
 - 5a. Expand “Device-associated Module”
 - 5b. Expand “Urinary Catheter-associated UTI”
 - 5c. Expand “CDC Defined Output”

Steps to Successful CAUTI Analysis

- Step 6
 - To change Output, select “Modify”
- Step 7
 - 7a. Perform a “Run” on Line Listing – All CAU Events
 - 7b. Perform a “Run” on Frequency Table – All CAU Events

Steps to Successful CAUTI Analysis

- 7c. Perform a “Run” on Rate Table CAU Data for ICU Other/SCA



CAUTI Device Utilization Ratio

$$\text{Urinary Catheter DU Ratio} = \frac{\text{\# indwelling catheter days}}{\text{\# patient days}}$$

- ## CAUTI Device Utilization Ratio
- DU Ratio measures the proportion of total patient days in which indwelling urinary catheters were used
 - Indwelling catheter use is necessary for CAUTI
 - Therefore reducing your facility/location’s catheter device utilization rate, may lead to reduced CAUTI rate



Steps to Successful SSI Analysis

- Step 1
 - Log in to NHSN Patient Safety Component Home Page
- Step 2
- Select Analysis
- Step 3
 - Generate Data Sets

Steps to Successful SSI Analysis

- Step 4
 - Select Output Options
- Step 5
 - 5a. Expand “Procedure-associated Module”
 - 5b. Expand “SSI”
 - 5c. Expand “CDC Defined Output”

Steps to Successful SSI Analysis

- Step 6
 - To change Output, select “Modify”
- Step 7
 - 7a. Perform a “Run” on Line Listing – All SSI Events
 - 7b. Perform a “Run” on Frequency Table – All SSI Events

Steps to Successful SSI Analysis

- 7c. Perform a “Run” on SIR - All SSI Data by Procedure
- Step 8
 - 8a. Expand “Advanced”
 - 8b. Expand “Procedure-level Data”
 - 8c. Expand “CDC Defined Output”

Steps to Successful SSI Analysis

- 8d. Perform a “Run” on Rate Table-Specific Event SSI Rates by Procedure
- 8e. Perform a “Run” on Control Chart-Specific Event SSI Data by Procedure

Steps to Successful SSI Analysis

- Optional
 - Step 9
 - 9a. Perform a “Run” on Bar Chart - All SSI Events
 - 9b. Perform a “Run” on Pie Chart - All SSI Events

SSI Steps 1-5

SSI Step 6

SSI Step 7

National Healthcare Safety Network
Line Listing for All Surgical Site Infection Events
As of: November 10, 2010
Date Range: All SSI_EVENTS

orgID	procCode	outpatient	procCount	infCountAll
2010H1	10268	COLO	N	9
2010H1	10268	HYST	N	4

SSI Step 7

National Healthcare Safety Network
Frequency Table for All Surgical Site Infection Events
As of: November 10, 2010 at 1:56 PM
Date Range: All SSI_EVENTS

procCode	Table of procCode by spcEvent				Total
	DIP	IAB	OREP	SIP	
COLO	11	9	0	14	34
	17.46	14.29	0.00	22.22	53.97
	32.35	26.47	0.00	41.18	
	55.00	75.00	0.00	45.67	
HYST					29
	14.29	4.76	1.59	25.40	46.03
	31.03	10.34	3.45	55.17	
	45.00	25.00	100.00	53.33	
Total	20	12	1	30	63
	31.75	19.05	1.59	47.62	100.00

SSI Step 7

National Healthcare Safety Network
Incomplete and Custom Procedures not Included in SIR
As of: November 10, 2010 at 1:58 PM
Date Range: All SIR_ALLSSIPROC

orgID=

summaryYH	orgID	procCode	outpatient	procCount	infCountAll
2010H1	10268	COLO	N	252	9
2010H1	10268	HYST	N	304	4

Source of aggregate data: 2006-2008 NHSN SSI Data
Data contained in this report were last generated on November 2, 2010 at 3:19 PM.

SSI Step 8

SSI

- NHSN assigns surgical patients into categories based on 3 major Risk Factors
 - Basic SSI Risk Index
 - Operation lasting more than duration cut point hours, where duration cut point is approximate 75th percentile of duration of surgery in minutes for the operative procedure

SSI

- Contaminated (Class 3) or Dirty/Infected (Class 4) wound class
- American Society of Anesthesiologist (ASA) classification of 3, 4, or 5
 - Patient's SSI risk category is number of factors present at time of operation

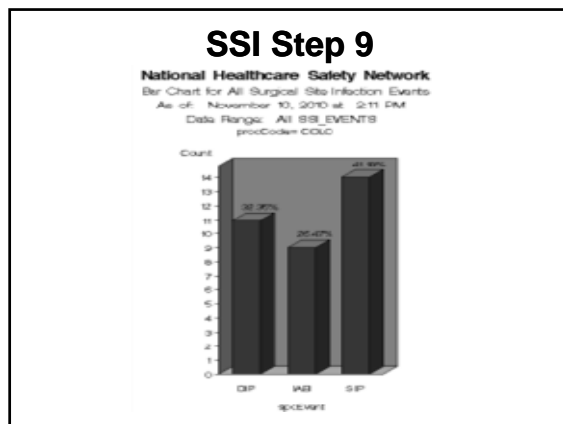
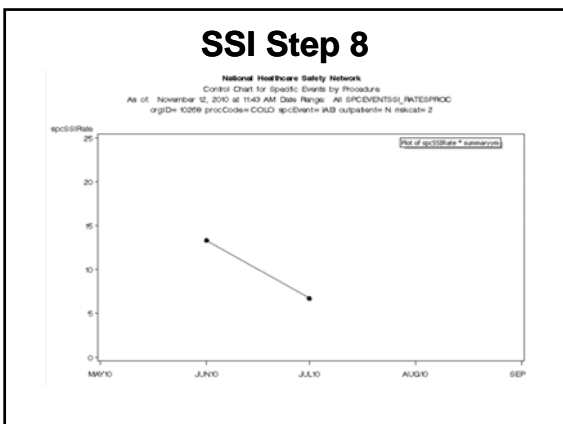
SSI

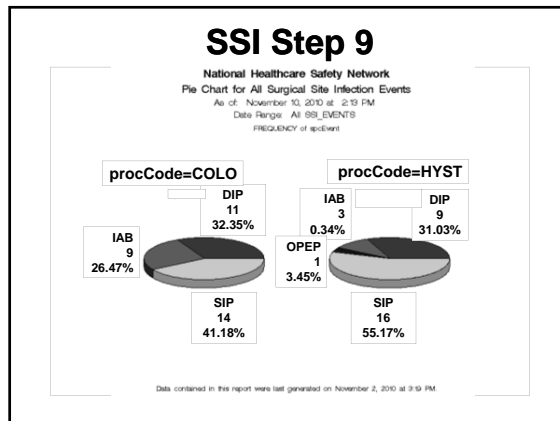
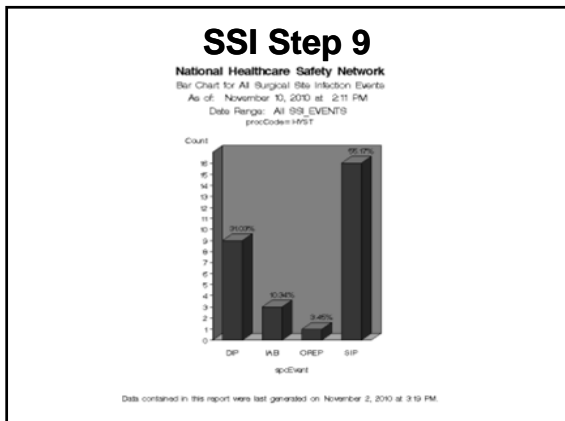
- Rate calculations will be performed separately for the different types of operative procedures and stratified by risk index

SSI Step 8

National Healthcare Safety Network
 Type III - Internal - All States - By Procedure
 Date Range: All Events - All States
 orgID=1028

Procedure	Procedure Code	Procedure Description	Procedure Category	Procedure Class	Procedure Risk	Procedure Count	Procedure Rate
COLC	1	2010Q1	1	A	1	19	0.00
COLC	1	2010Q2	1	A	1	2	0.00
COLC	1	2010Q3	1	A	1	2	0.00
COLC	1	2010Q4	1	A	1	66	0.00
COLC	1	2010Q1	2	A	2	21	0.00
COLC	1	2010Q2	2	A	2	50	0.00
COLC	1	2010Q3	2	A	2	0	0.00
COLC	1	2010Q4	2	A	2	29	0.00
COLC	1	2010Q1	3	A	3	15	0.00
COLC	1	2010Q2	3	A	3	12	0.00
COLC	1	2010Q3	3	A	3	88	1.92
COLC	1	2010Q4	3	A	3	68	1.74
COLC	1	2010Q1	4	A	4	21	2.44
COLC	1	2010Q2	4	A	4	10	2.00
COLC	1	2010Q3	4	A	4	65	1.87
COLC	1	2010Q4	4	A	4	56	1.47
COLC	1	2010Q1	5	A	5	41	4.00
COLC	1	2010Q2	5	A	5	82	2.42
COLC	1	2010Q3	5	A	5	7	11.43
COLC	1	2010Q4	5	A	5	22	0.00
COLC	1	2010Q1	6	A	6	29	0.00
COLC	1	2010Q2	6	A	6	43	0.00
COLC	1	2010Q3	6	A	6	70	0.00
COLC	1	2010Q4	6	A	6	172	0.00
COLC	1	2010Q1	7	A	7	66	0.00
COLC	1	2010Q2	7	A	7	79	0.00
COLC	1	2010Q3	7	A	7	27	0.00
COLC	1	2010Q4	7	A	7	112	1.75
COLC	1	2010Q1	8	A	8	61	1.56
COLC	1	2010Q2	8	A	8	29	0.00





NHSN, Version 6.3 Statistics Calculator

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

WHS National Healthcare Safety Network

Home Home Reporting Plan Events Procedure Summary Data Analysis Generate Data Sets Output Options Statistics Calculator Surveys Users Group Log Out

Statistics Calculator

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

Compare

Compare Two Proportions

When comparing two proportions (e.g. SSI Rates, Device Utilization ratios etc.), the hypothesis is that the rates are not different from each other. To perform a statistical test and calculate a p-value, enter the number of events as the numerator and the number of trials as the denominator (e.g. procedures, patient days) for two data sources. Press calculate.

	Data Source #1	Data Source #2
Group Labels:	General Medical Ward	General Surgical Ward
Numerator (Number of Events):	4	9
Denominator (Number of Trials):	17	36

Title: December 2010

Calculate Back

Compare

National Healthcare Safety Network
December 2010
As of: November 12, 2010 at 12:01 PM

	General Medical Ward	General Surgical Ward
Numerator	4	9
Denominator	17	36
Proportion	24%	25%
Proportion p-value	0.5	

Compare

Compare Two Standardized Infection Ratios

When comparing two standardized infection ratios, the hypothesis is that the two ratios are not different from each other. To perform a hypothesis test and calculate a p-value, enter the number of observed events and the number of expected events. The standardized infection ratio (SIR) for each data source will be displayed automatically. Press calculate.

	Data Source #1	Data Source #2
Group Labels:	MCU	SICU
Number observed:	8	10
Number expected:	4	3
Standardized Infection Ratio:	2.000	3.333

Title: December 2010

Calculate Back

Compare

Compare Single SIR to 1

When comparing a standardized infection ratio, the hypothesis is that the SIR is not different from one. To perform a hypothesis test and calculate a p-value, enter the number of observed events and the number of expected events. The SIR will be displayed automatically. Press calculate.

Data Source #1

Group Labels: ICU CLASS

Number observed: 12

Number expected: 8

Standardized Infection Ratio: 1.500

Title: December 2010

[Calculate] [Back]

Compare

Compare Two Incidence Density Rates

When comparing two incidence density rates, for example, two central line-associated bloodstream infection rates, the hypothesis is that the rates are not different from each other. To perform a statistical test and calculate a p-value, enter the number of events as the numerator and the number of person-time units as the denominator for each rate. Press calculate.

Data Source #1 **Data Source #2**

Group Labels: Med Ward CAUTI Surg Ward CAUTI

Numerator(Number of events): 20 14

Denominator(Number of person-time units): 4000 2500

Title: December 2010

[Calculate] [Back]

Compare

National Healthcare Safety Network


December 2010

As of: November 12, 2010 at 12:08 PM

	Med Ward CAUTI	Surg Ward CAUTI
Numerator	20	14
Denominator	4000	2500
Proportion	5%	6%
IDR p-value	0.3552	



Modify

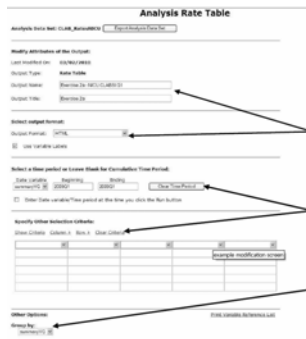


Patient Safety Component

Analysis Output Options

Select Modify

Customize



Example of Analysis Modification Screen

Can export analysis and output datasets. Can change the design parameters of output here.

The top section allows you to modify output characteristics, such as output name, title, and format.

The middle section allows you to specify which data will be considered for the output. You can filter output by time or other criteria (e.g., limit to a single location or infection type.)

The bottom section allows you to specify how the data in the output will be displayed and organized (e.g., sort by location, group by quarter.)

Customize

Select Output Format
The Output Format can only be changed for non-graphical output. Pie Charts, Bar Charts, and Control Charts are displayed in HTML only.

Variable names vs. Variable labels
Variable names are the names given to types of data in the spreadsheet. For example, "ageAtHVAdtRun" is a Variable name. In this case, if you selected "Use Variable Labels" in the "Select output format" section, "ageAtHVAdtRun" would be replaced by Variable label "Age at Reaction" as a column heading on your report.

Filter by Time Period
Select a date variable from the drop-down.

The list of variables can differ with each output option & analysis dataset selected. Date formats are shown below:

Specify by	Date variable	Beginning	Ending
Date	eventDate	01/01/2009	12/31/2009
Year	eventDateYr	2009	2009
Half-year	eventDateYH	2009H1	2009H2
Quarter	eventDateYQ	2009Q1	2009Q4
Month	eventDateYMA	01/2009	12/2009

*Use calendar year; if fiscal year is desired, specify time period by date or month range.

Customize

Filter by Additional Criteria

- The drop-down menu in the "Specify Other Selection Criteria" allow you to select a variable for filtering.
- Click in the row below the variable to specify desired values for your output.

TIP: Use the "IN" operator to select multiple values of a variable. For example, location IN (22ICU, 72ORTH0). Many variables, such as location, supply drop-down menus for selection; other variables allow a free text field entry of values.

Various operators can be selected to modify the output.

Operator	Meaning
=	Equal to
>	Greater than
>=	Greater than or equal to
<	Less than
<=	Less than or equal to
≠	Not equal to
IN	In a set of defined values
IN	Not in a set of defined values
Between	Within a range of defined values

TIP: When filtering data in a text-entry field, the value must be entered in CAPS. For example, msa = Y.

Customize

TIP: Double-check your filtering by clicking "Show Criteria". This box will display the parenthetical equation used to filter your data.

Other Options
Print the variable reference list from any modification screen or the NHSH website. This document includes every variable name in NHSH with a corresponding, more descriptive, variable label.

Line Listings
Specify variables to include as columns in the line listing by clicking the "Modify List" link for "Modify Variables to Display."

- You can move variables from the available list to the selected list by double-clicking them or using the provided directional arrows (and back to the available list by the same method).
- You can re-order the selected variables by first highlighting a variable, then using the "Up" and "Down" buttons to move the highlighted variable to the desired position. You can repeat this process until all variables are in the desired order.

Customize

The "Specify Sort Variables" is an identical utility where you select the variables you wish to sort on. Be careful not to sort by too many!

If you specify a "Sort" or "Page By" variable, remember to include that same variable in your line listing!

Frequency Tables
Change Row, Column, and/or Table Options to modify how your frequency table is calculated and displayed.

Rate Tables & SIR Tables
The Group by option allows you to select a summary variable for monthly, quarterly, or annual rates/SIRs. Leave the Group by option blank if you would like a cumulative rate/SIR for a time period specified above.

Customize

Name and Save Modified Output

The Run button at the bottom of the design page allows you to view the modified output.

TIP: Remember to close the HTML output window before running another output option. Once you've modified output to your liking, change the Output Name and Output Title to represent this specific output. The modified output option can be saved by clicking the Save As button. All modified and saved output can be found in the "Custom Output" folders.

Modify Attributes of the Output:

Last Modified On: 03/03/2010

Output Type: Rate Table

Output Name: NICU CLABSI Rates-2009

Output Title: CLABSI Rates, NICU, 2009

Buttons: Run, Save As, Reset, Back, Export Output Data Set

Export Data

- A user can perform three types of exports
 1. Facility Data Export
 2. Analysis Data Set Export
 3. Output Data Set Export

Export Data

- A user may export their facility's entire data, a specific Analysis Data Set, or Output Data Set using a number of popular file formats
 - e.g. MS Excel

Export Data

Export

Export

Excel Output

ADPH Reports

- ADPH will publish an Official Annual Public Report that will be available for public consumption
 - This report will not include patient identifiers
 - It will include facility identifiers

ADPH Reports

- **In addition to these annual reports, ADPH may develop additional reports, such as those requested by the HAI Council or facility specific reports, both of which would not be publicly published**
 - **These reports would most likely occur as quarterly reports**

Questions?