



NHSN: Transition to the 2015 Rebaseline Guidance for LTCHs and IRFs

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Objectives

- Explain the elements of the new HAI risk models, as they relate to LTCHs and IRFs
- Review the use of the SIRs in relation to Centers for Medicare and Medicaid Services (CMS) programs
- Preview the new application interface
- Discuss additional resources and upcoming events

Target Audience

- This webinar is targeted towards those who work in the Long Term Care Hospital (LTCH) setting or the Inpatient Rehabilitation Facility (IRF) setting
 - The material today will focus on the new risk adjustment for these settings

A Review: The Standardized Infection Ratio (SIR) and National SIR Baseline

- **SIR** – A summary statistic that compares the number of healthcare-associated infections (HAIs) that were reported to the number of HAIs that were predicted to occur, based on a calculation using data for HAI events that occurred in a given referent time period

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

- **National SIR baseline** – The HAI incidence rate for a referent time period that is used to calculate the predicted number of HAIs for a subsequent time period
 - **The SIR is only calculated if the predicted number of HAIs is ≥ 1**

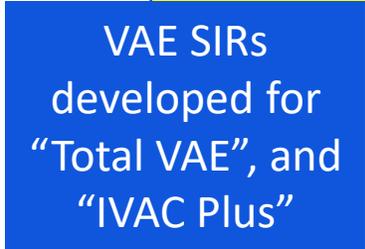
Risk-adjustment and the SIRs

- Baseline data are risk-adjusted and this risk adjustment is applied to the calculation of the predicted number of infections
- Why risk-adjust?
 - Enables HAI predictors to be taken into account in summary measures
 - To the extent possible, addresses concerns related to the complexity of patients receiving care in an institution
 - For CDI, adjusts for the test type when alternative testing methods are available

Basis for Using SIRs

- The SIR is a risk-adjusted composite measure that allows for scalability
 - For Example: An overall CAUTI SIR can be provided for an LTACH organization with multiple facilities
- Use of the SIR requires a baseline, from which progress can be measured
 - The baseline remains static for a number of years
- At some point, the baseline must be updated
 - No set standard on *when* to update a baseline
 - Decision on the timing of updating a baseline may be driven by policy, HAI surveillance definitions, etc.
- **Data reported to NHSN for CY2015 serve as the new baseline for SIRs**

The Rebaseline: New Models Developed at CDC

	HAI	ACHs	CAHs	LTACHs	IRFs
	CLABSI (non-MBI)	✓	✓	✓	✓
	Central Line SUR	✓	✓	✓	✓
	MBI	✓			
	CAUTI	✓	✓	✓	✓
	Urinary Catheter SUR	✓	✓	✓	✓
	VAE	✓	✓	✓	✓
	Ventilator SUR	✓	✓	✓	✓
	"All SSI" Models – Adults	✓			
	"All SSI" Models - Peds	✓			
	"Complex A/R" Models – Adults	✓			
	"Complex A/R" Models – Peds	✓			
	"Complex 30-day" Models – Adults (COLO and HYST)	✓			
	MRSA Bacteremia LabID	✓	✓	✓	✓
	CDI LabID	✓	✓	✓	✓

The Rebaseline: Modeling Approach

- Used in-plan data reported to NHSN for January–December 2015 (as reported by May 16, 2016)
- Included facilities from all states, territories, and DoD installations
 - IRF models include freestanding Rehab hospitals, as well as IRF Units within acute care setting
- Lead analysts applied consistent overarching methods and analytic approach
- Decisions made a priori, with subject matter experts, regarding which factors should or should not be considered potential risk factors in the model
- Data cleaning and outlier detection was performed prior to modeling work

Factors Included in the Model: Long Term Acute Care Hospitals (LTACHs)

Factor	CLABSI	CAUTI	VAE	CDI	MRSA
Location Type (i.e., ICU, Ward)	✓	✓	✓		
Inpatient quarterly CO prevalence rate				✓	
CDI Test Type				✓	
Setting (i.e., Freestanding or within hospital)		✓	✓		
% single occupancy rooms				✓	
Facility Bedsize	✓		✓		
Length of Stay	✓	✓	✓		
Proportion of Admissions on Hemodialysis			✓		
Proportion of Admissions on a Ventilator			✓	✓	✓

Factors outlined above were obtained from the Annual Facility Survey for LTACHs:

http://www.cdc.gov/nhsn/forms/57.150_ltafacsurv_blank.pdf

Factors Included in the Model: Inpatient Rehabilitation Facilities (IRFs)

Factor	CLABSI	CAUTI	VAE	CDI	MRSA
Community onset (CO) prevalence rate				✓	
Setting (i.e., Freestanding or within hospital)		✓			
Proportion of Admissions within each diagnostic category		✓		✓	
primary diagnosis of stroke				✓	
primary diagnosis of orthopedic conditions				✓	
traumatic spinal cord dysfunction		✓		✓	
nontraumatic spinal cord dysfunction		✓		✓	

Factors outlined above were obtained from the Annual Facility Survey for IRFs:

http://www.cdc.gov/nhsn/forms/57.151_rehabfacsurv_blank.pdf

Will My Facility's SIRs Change?

- Yes
- CLABSI and CAUTI SIRs based on the 2015 baseline will be different than those calculated on the 2013 baseline
 - Different incidence
 - Different risk factors
 - Different method

Using Models for Device-associated Infections

- Previously, NHSN used Pooled Mean Rates for the calculation of # predicted device-associated infections, by location

$$\text{Number of predicted DA events} = \# \text{ device days} \times \left(\frac{\text{NHSN pooled mean}}{1,000} \right)$$

- Under the 2015 Rebaseline, CDC will use models for calculating the predicted number of infections

- General Negative Binomial Regression Model:

$$\text{Number of predicted DA events} = e^{(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots)} * \text{device days}$$

- Negative binomial regression models will also be used for LabID

Example: Will My Facility's SIR Change?

- Annual, facility-level CAUTI SIR from a freestanding LTACH, reporting for one ICU and one Ward, with an annual average LOS of 28.5 days

- Baseline 1 (2013 NHSN Data):

Year	# CAUTI	# device days	# predicted	SIR	P-value	95% CI
2015	2	880	2.199	0.910	0.9778	0.152, 3.005

- Baseline 2 (2015 NHSN Data):

Year	# CAUTI	# device days	# predicted	SIR	P-value	95% CI
2015	2	880	2.426	0.824	0.8658	0.138, 2.724

Rebaselined SIRs Shared with CMS

- CDC re-sent 2015Q1-2015Q4 data, under the new 2015 baseline, for the following measures:
 - **Hospital IQR:** CLABSI, CAUTI, SSI-COLO, SSI-HYST, MRSA bacteremia LabID, CDI LabID
 - **LTCHQR:** CLABSI, CAUTI
 - **IRFQR:** CAUTI
- The new baseline will continue to be used for rolling 4-quarter Public Reporting files
- CDC is sending 2016Q1+ data to CMS, under the new 2015 baseline, for all QRP HAI measures at each quarterly deadline
- SIRs calculated under the new 2015 baseline will be available within the NHSN application in January, 2017

What is Changing?

- The following data elements are submitted to CMS:
 - Numerator (# of unique events)
 - Denominator (# of predicted events)
 - SIR
 - Total patient days
 - P-value
 - 95% Confidence Interval

Checking Your Data: Long Term Acute Care Facilities

Preparing for the CMS Deadline- CLABSI and CAUTI

- Clear all alerts
- Generate your datasets
- Run your CMS CLASBI and CAUTI reports
- The following CAUTI elements will match what NHSN sends to CMS
 - Number of CAUTIs (numerator)
 - Urinary catheter days
- The following CLABSI elements will match what NHSN sends to CMS
 - Number of CLABSI (excluding MBI-LCBIs)
 - Central line days
- For further guidance, follow the LTAC monthly checklist:
 - <http://www.cdc.gov/nhsn/pdfs/cms/ltch-monthly-checklist-cms-iqr.pdf>

The screenshot displays a hierarchical view of CMS Reports. Under the 'CDC Defined Output' folder, the following reports are listed:

Report Name	Run	Modify
SIR - CLAB Data for CMS LTCH PPS	Run	Modify
SIR - CAU Data for CMS LTCH PPS	Run	Modify
Rate Table - CLAB Data for CMS LTCH PPS	Run	Modify
Rate Table - CAUTI Data for CMS LTCH PPS	Run	Modify
Rate Table - MRSA blood LabID Data for LTCH PPS	Run	Modify
Rate Table - CDI LabID Data for LTCH PPS	Run	Modify
Rate Table - VAE Data for CMS LTCH PPS	Run	Modify

New Risk Adjustment Variables - CLABSI

- CDC Location
 - Review your facility CDC locations in NHSN
- Facility Bedsize
 - 2015 Annual Survey
- Length of Stay
 - 2015 Annual Survey

New Risk Adjustment Variables – CAUTI

- CDC Location
 - Review your facility CDC locations in NHSN
- Setting Type
 - 2015 Annual Survey
- Length of Stay
 - 2015 Annual Survey

CLABSI – Numerator Check

- Run a CLABSI Line List to identify MBI-LCBIs

Device-Associated (DA) Module

- Central Line-Associated BSI
 - CDC Defined Output
 - Line Listing - All CLAB Events

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

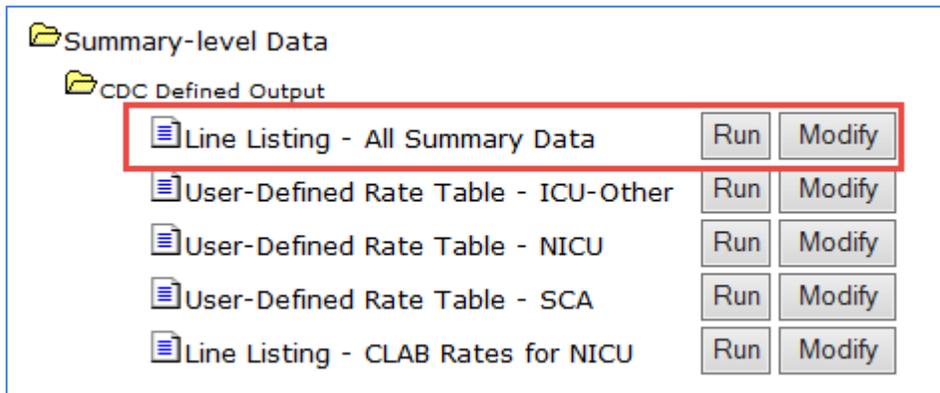
As of: October 3, 2016 at 2:08 PM

Date Range: CLAB_EVENTS evntDateYM 2015M02 to 2015M02

orgID	admitDate	eventID	eventDate	eventType	spcEvent	mbi_lcbi
	02/23/2015		02/26/2015	BSI	LCBI	N
	01/20/2015		02/02/2015	BSI	LCBI	Y
	02/05/2015		02/10/2015	BSI	LCBI	N
	02/02/2015		02/09/2015	BSI	LCBI	N
	02/01/2015		02/05/2015	BSI	LCBI	N

CLABSI – Denominator Check

- Run a Summary Data line list to identify all contributing summary data
- Include those additional ICU locations



Summary-level Data

CDC Defined Output

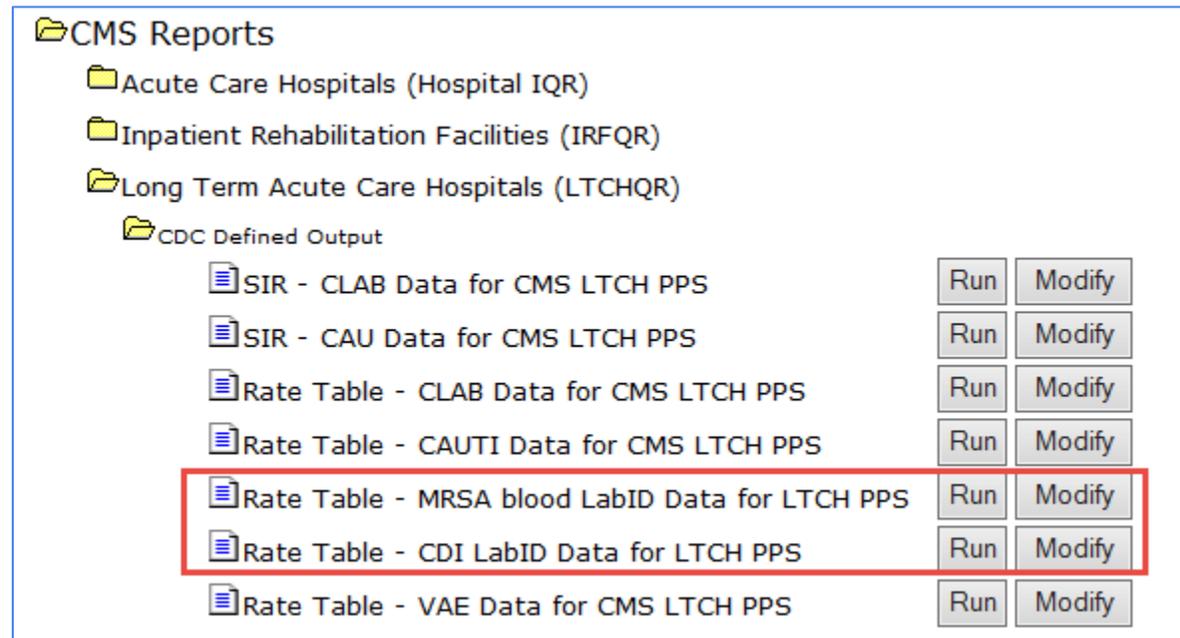
Line Listing - All Summary Data	Run	Modify
User-Defined Rate Table - ICU-Other	Run	Modify
User-Defined Rate Table - NICU	Run	Modify
User-Defined Rate Table - SCA	Run	Modify
Line Listing - CLAB Rates for NICU	Run	Modify

National Healthcare Safety Network
Line Listing for All Summary Data
As of: October 3, 2016 at 2:15 PM
Date Range: PSSUMMARY summaryYM 2015M02 to 2015M02

summaryYM	summarytype	locationtype	eventtype	numddays	numpatdays
2015M02	ICU	OTHER	CLAB	50	100
2015M02	ICU	CC	CLAB	98	197
2015M02	ICU	CC	CLAB	90	159

Preparing for Deadline – CDI LabID and MRSA LabID

- Confirm monthly reporting plans are accurate and no outstanding “Alerts”
- Use CMS LabID SIR report in NHSN to review # of LabID events and total patient days
 - Same # events and patient days you see in NHSN will be submitted to CMS for Q2



New Risk Adjustment Variables – MRSA and CDI LabID

MRSA Bacteremia:

- Introduction of MRSA SIRs
 - Proportion of Admissions on a Ventilator
 - Number of Admissions on a Ventilator / Total # of Annual Admissions

CDI LabID:

- Introduction of CDI LabID SIRs
 - Inpatient Quarterly CO Prevalence Rate
 - Review CDI Rate Tables
 - CDI Test Type
 - Review June 2015 FacWideIN denominator form
 - Percent of single occupancy rooms
 - # of single occupancy rooms / total number of beds * 100. (i.e., numSingOccRm/numbeds * 100)
 - Proportion of Admissions on a Ventilator

Review Facility-onset LabID Events and Patient Days

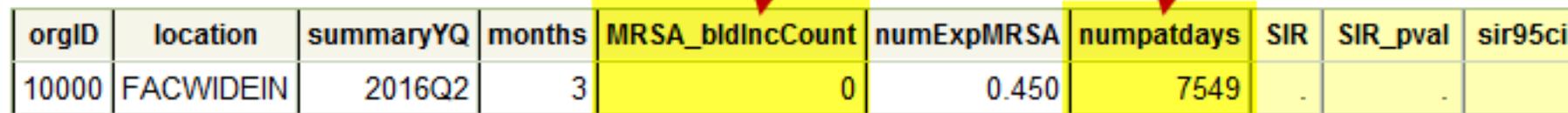
National Healthcare Safety Network

SIR - MRSA Blood FacwideIN LabID Data for CMS IPPS

As of: October 11, 2016 at 9:53 AM

Date Range: LABID_RATE\$MRSA summaryYr After and Including 2013

if (((mrsaLabIDPlan = "Y")))



orgID	location	summaryYQ	months	MRSA_bldIncCount	numExpMRSA	numpatdays	SIR	SIR_pval	sir95ci
10000	FACWIDEIN	2016Q2	3	0	0.450	7549	.	.	

- Follow regular data quality assessment to confirm accuracy
 - MRSA or CDI event line list to review facility-onset events
 - Summary data line list or manual review of monthly denominator data
 - Troubleshooting tips for MRSA and CDI: http://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/mrsacdi_tips.pdf

CDI Test Type on June FacwideIN Summary Record

General

Setting: Inpatient Total Facility Patient Days *: 1500 Total Facility Admissions *: 500

Setting: Outpatient Total Facility Encounters :

If monitoring MDRO in a FACWIDE location, then subtract all counts from patient care units with unique CCNs(IRF and IPF) from Totals:

MDRO Patient Days*: 1200 MDRO Admissions*: 400 MDRO Encounters:

If monitoring *C. difficile* in a FACWIDE location, then subtract all counts from patient care units with unique CCNs(IRF and IPF) as well as

CDI Patient Days*: 1000 CDI Admissions*: 350 CDI Encounters:

For this quarter, what is the primary testing method for *C. difficile* used most often by your facility's laboratory or the outside laboratory?

NAAT - Nucleic acid amplification test (NAAT)

- CDI test type indicated on the June summary record will be used in the calculation for # predicted events
- PCR testing should be indicated by selecting NAAT

Inpatient Community-Onset Prevalence Rate

- Review 2016 Q2 CO prevalence rate, found in the *C.difficile* rate tables

MDRO/CDI Module - LABID Event Reporting

- All LabID Events
- All MRSA LabID Events
- All MSSA LabID Events
- All *C. difficile* LabID Events
- CDC Defined Output
 - Line Listing for All CDIF LabID Events
 - Frequency Table for All CDIF LabID Events
 - Bar Chart for All CDIF LabID Events
 - Pie Chart for All CDIF LabID Events
 - Rate Tables for CDIF LabID Data
 - SIR - CDI FacwideIN LabID Data

National Healthcare Safety Network
Rate Table - All CDIF LabID Events by Location
CDI Prevalence - Community-Onset Admission Prevalence Rate

As of: October 4, 2016 at 5:16 PM
Date Range: All LABID_RATE_SCDIF

summaryYQ	months	location	CDIF_admPrevCOCCount	numadms	CDI_COprevRate
2016Q2	3	FACWIDEIN	0	4834	0.000

New Risk Adjustment Variables – VAE SIR

- Introduction of Total VAE SIRs
 - Factors included in the risk adjustment
 - Location type (i.e., ICU, Ward) – Review your facility locations
 - Setting Type – Annual Survey
 - Facility bed size – Annual Survey
 - Average length of stay – Annual Survey
 - Percent of annual admissions on a ventilator
 - $\text{Number of Admission on a Ventilator} / \text{Total \# of Annual Admissions}$
 - Percent of annual admissions on hemodialysis

Review VAE Events and Ventilator Days

**National Healthcare Safety Network
Rate Table (Ventilator Days) for Ventilator-Associated Event Data for ICU-Other/SCA/ONC
Total VAE**

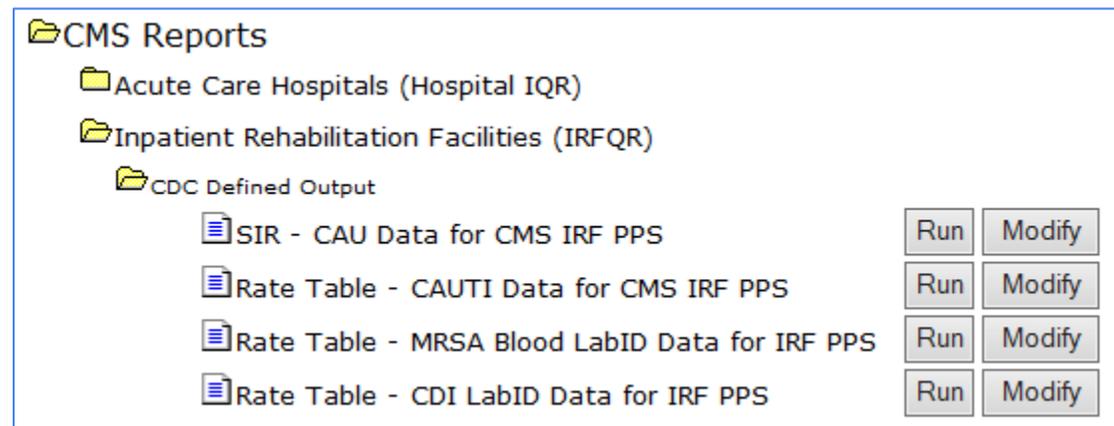
location	summaryYQ	months	VAECount	numventdays	VAERate	VAE_mean	IDR_pval	IDR_pctl	numpatdays	VentDU	VAEDU_mean	P_pval	P_pctl
CTICU	2015Q1	1	1	300	3.333	6.2	0.6058	40	1000	0.300	0.32	0.3073	55

- Follow regular data quality assessment to confirm accuracy
 - VAE Count and number of vent days

Checking Your Data: Inpatient Rehabilitation Facilities

Preparing for the Deadline

- Clear all alerts
- Generate your datasets
- Run your CMS CAUTI, MRSA, and CDI LabID reports
- For more guidance, follow the IRF checklist:
 - <http://www.cdc.gov/nhsn/pdfs/cms/irfs-acute-monthly-checklist-cms-iqr.pdf>



New Risk Adjustment Variables – CAUTI

- Setting Type - Annual Survey
- Percent of annual admissions with primary diagnoses are taken from the NHSN Annual IRF Survey, and calculated as the # of admissions with the primary diagnosis / total # of annual admissions * 100:
 - Traumatic spinal cord dysfunction
 - Non-traumatic spinal cord dysfunction

New Risk Adjustment Variables – MRSA and CDI LabID

MRSA Bacteremia:

- Introduction of MRSA SIRs
 - Intercept Only model

CDI LabID

- Introduction of CDI LabID SIRs
 - Location of IRF (unit within hospital vs. free-standing)
 - Reporting of community-onset events
 - Percent of annual admissions with the following primary diagnoses
Number of admissions with the primary diagnosis / total number of annual admissions * 100:
 - Orthopedic conditions
 - Stroke
 - Traumatic + non-traumatic spinal cord dysfunction

CDI LabID and MRSA LabID Continued

- IRFs that are located within another facility type (e.g. ACH), those IRF events will be excluded from the ACH event count

Additional Resources

Rebaseline Educational Tools

- Rebaseline Website
 - <http://www.cdc.gov/nhsn/2015rebaseline/index.html>
- Quarterly Newsletters
- Coming Soon!
 - Updates to existing documents on website
 - Rebaseline Compendium
 - The NHSN Standardized Infection Ratio (SIR): A User's Guide to the SIR
 - SUR User's Guide

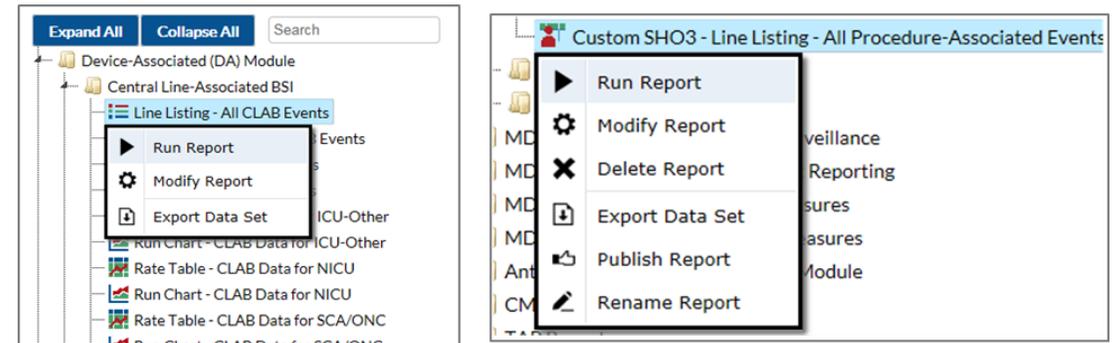
NHSN Trainings and Webinars

- **November 30th**: Rebaseline Webinar Part II: “Running the New SIRs in NHSN”
- **March 2017**: NHSN Annual Training – detailed review of each new SIR by HAI type
 - Stay tuned for details

November 30th: Running the New SIRs in NHSN

- Preview of the new application interface
- New reports
- Putting the rebaseline into practice
- Annual surveys
- Registration Link:

— <https://cc.readytalk.com/r/ffs5js17p967&eom>



The image shows a screenshot of the 'Modify SIR - All CLAB Data' form. At the top, it displays 'Analysis Data Set: CLAB_RatesICU' and 'Type: SIR'. Below this, there is a checkbox for 'Show descriptive variable names'. A navigation bar contains tabs for 'Title/Format', 'Time Period', 'Filters', and 'Display Options'. The 'Time Period' tab is active, showing a 'Time Period:' section with a 'Date Variable' dropdown, 'Beginning' and 'Ending' input fields, and a 'Clear Time Period' button. A checkbox at the bottom reads 'Enter Date variable/Time period at the time you click the Run button'. A dashed box labeled 'EXAMPLE' is positioned to the right of the form.

Additional Rebaseline Resources

- Updating the National Risk-Adjustment of HAI Data – March 2016
 - <http://www.cdc.gov/nhsn/pdfs/training/2016/updating-national-risk-adjustment-dudeck.pdf>
- APIC 2016 NHSN Members Meeting – June 2016
 - <http://www.cdc.gov/nhsn/pdfs/newsletters/nhsn-members-meeting-2016.pdf>
- NHSN Newsletters
 - http://www.cdc.gov/nhsn/pdfs/newsletters/nhsn-enewsletter_dec-2015_final.pdf
 - <http://www.cdc.gov/nhsn/pdfs/newsletters/nhsn-nl-march-2016.pdf>
 - <http://www.cdc.gov/nhsn/pdfs/newsletters/nhsn-nl-june-2016.pdf>

Questions?

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