

# Standardized Infection Ratio (SIR) Table

*MRSA bacteremia and C.difficile LabID events*

## Description

The SIR is a risk-adjusted summary measure that compares the observed number of LabID events to the expected number of LabID events based on NHSN aggregate data from 2010-2011. This document explains how to calculate and interpret the SIR; **while the example below is for MRSA bacteremia, the *C. difficile* LabID event SIR is calculated and interpreted in a similar manner.**

The example below demonstrates how to generate SIR tables for FacWideIN MRSA bacteremia LabID event surveillance.

## Example

You are interested in viewing your MRSA bacteremia LabID event SIR from the 3<sup>rd</sup> quarter of 2012 – 1<sup>st</sup> quarter of 2013, and you would like the SIR for each quarter to be calculated separately.

## Locating the SIR report option

To find the MRSA bacteremia LabID event SIR report, click 'Analysis' > 'Output Options' from the left navigation bar in NHSN. Then navigate as follows through the tree-view diagram: MDRO/CDI Module- LabID Event Reporting > All MRSA LabID Events > CDC Defined Output > SIR – MRSA Blood FacwideIN LabID Data. Click Modify to the right of this option.

**Patient Safety Component**  
Analysis Output Options

Expand All Collapse All

- Device-Associated Module
- Procedure-Associated Module
- MDRO/CDI Module - Infection Surveillance
- MDRO/CDI Module - LABID Event Reporting
  - All LabID Events
  - All MRSA LabID Events
    - CDC Defined Output
      - Line Listing for All MRSA LabID Events Run Modify
      - Frequency Table for All MRSA LabID Events Run Modify
      - Bar Chart for All MRSA LabID Events Run Modify
      - Pie Chart for All MRSA LabID Events Run Modify
      - Rate Tables for MRSA LabID Data Run Modify
      - SIR - MRSA Blood FacwideIN LabID Data Run Modify**

## Modification Page

### Analysis SIR

Analysis Data Set: LABID\_RatesMRSA

Export Analysis Data Set

#### Modify Attributes of the Output:

Last Modified On: 05/23/2013

Output Type: SIR

Output Name: SIR - MRSA Blood FacwideIN LabID Data

Output Title: SIR - MRSA Blood FacwideIN LabID Data

#### Select output format:

Output Format: HTML

Use Variable Labels

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

Date Variable Beginning Ending  
summaryYQ 2012Q3 2013Q1 Clear Time Period

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

#### Specify Other Selection Criteria:

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



#### Other Options:

[Print Variable Reference](#)

Group by: summaryYQ

Run

Save As

Reset

Back

Export Output  
Data Set

#### Top Section of Modification Page:

- In the top section of the modification page, you can modify the name, title, and output format of the SIR table. **Note:** If you wish to save your modifications as a template for future reports, you will be required to change the output name. *Tip:* For more descriptive variable labels on your SIR table, check the box to "Use Variable Labels" (recommended).

#### Middle Section of Modification Page:

- In the middle sections of the page, you can filter output by time period or other criteria.
- In this example, we have limited the SIR report to include only events and summary data from 2012Q3-2013Q1 (summaryYQ).
- For additional details about how to use this section, see the additional resources listed at the bottom of this guide.

#### Bottom Section of Modification Page:

- The "Group by" option found at the bottom of the page allows you to view SIRs by month, quarter, half-year, or year. Leave the option blank to see a cumulative SIR for the time period you have specified above.
- In this example, we will produce SIRs for each calendar quarter by selecting the Group By variable "summaryYQ". Note that the LabID event SIRs will not be generated at the month level (i.e., selecting summaryYM will result in SIR tables with descriptive data, but without an SIR).

## Output/Results

### SIR - MRSA Blood FacwideIN LabID Data

As of May 23, 2013 at 2:27 PM

Date Range: All LABID\_RATESMRSA

Org ID	Location	Summary Yr/Qtr	Months	MRSA Blood Incident LabID Count	MRSA Blood Incident LabID Number Expected	Patient Days	SIR	SIR p-value	95% Confidence Interval
10587	FACWIDEIN	2012Q3	3	.	.	.	.	.	.
10587	FACWIDEIN	2012Q4	3	3	1.021	20600	2.938	0.0842	0.606, 8.587
10587	FACWIDEIN	2013Q1	3	2	1.066	20589	1.876	0.2885	0.227, 6.777

Includes only inpatient facility-wide (FACWIDEIN) data relevant to MRSA Blood LabID reporting.

The number expected and SIRs are not calculated when Group By = summary YM.

Lower bound of 95% Confidence Interval only calculated if infCount > 0. SIR values only calculated if numExp >= 1.

If a quarter's prevalence rate is >0.88, the number expected will not be calculated for that quarter.

SIR excludes those months where patient days and/or admissions are missing, required survey-level data are missing, or verification of 'report no events' has not been completed when 0 events have been reported.

Source of aggregate data: 2010-2011 NHSN MRSA Blood LabID Data

Data contained in this report were last generated on May 23, 2013 at 2:12 PM.

### MRSA Blood - Quarters with Outlier Prevalence Rate

As of May 23, 2013 at 2:27 PM

Date Range: All LABID\_RATESMRSA

Org ID	Location	Summary Yr/Qtr	MRSA Blood Admission Prevalence LabID Count	Admissions	MRSA BSI Admission Prevalence Rate
10587	FACWIDEIN	2012Q3	2	223	0.897

If a quarter's prevalence rate is >0.88, the number expected will not be calculated for that quarter.

Data contained in this report were last generated on May 23, 2013 at 2:12 PM.

## Interpretation

The first table of the output lists the facility's MRSA bacteremia LabID event SIR for each quarter in the specified time period.

- This facility reported 3 months of FACWIDEIN data for each quarter in this time period.
- The hospital observed 2 incident hospital-onset MRSA LabID events and 20,589 patient days in the first quarter of 2013.
- This facility expected 1.066 incident hospital-onset MRSA LabID events in the first quarter of 2013. The number of expected hospital-onset MRSA LabID events is calculated using a regression model based on NHSN baseline data from 2010-2011. More information can be found in the risk adjustment document listed at the bottom of this guide.
- The SIR is the number of observed MRSA LabID events (numerator) divided by the number of expected events (denominator); in this example, the 2013 Q1 SIR is calculated as  $2/1.066 = 1.876$ .

Note: the SIR will only be calculated if the number of expected infections is  $\geq 1$ .

- An SIR p-value less than 0.05 (an arbitrary and conveniently used cut point) indicates that the number of observed LabID events is statistically significantly different (higher or lower) from the number expected. In this example, the p-value for the first quarter of 2013 is greater than 0.05 and thus there is no significant difference between the number of infections observed and the number of infections expected.
- If the confidence interval includes the value of 1 as in this example (0.227 – 6.777), then the SIR is not significant (the number of observed infections is not significantly different from the number expected, using the same convenient cut point).

The second table in the output will list data from any quarter with a MRSA bacteremia community-onset prevalence rate that is above a pre-determined cut point (0.88) and considered an outlier. The MRSA bacteremia LabID event SIR and comparative statistics cannot be calculated for any quarter with an outlier prevalence rate.

*Note: the community-onset prevalence rate cut point for C.difficile infections is 1.78.*

- For 2012 Q3: This facility's MRSA bacteremia prevalence rate of 0.897 is considered an outlier, and therefore no SIR data appear in the first table.
- The second table shows that the facility had 2 community-onset MRSA LabID events and 223 admissions in the third quarter of 2012. The MRSA prevalence rate is calculated as  $2/223 * 100 = 0.897$ .

## Additional Resources

Introduction to NHSN Analysis: <http://www.cdc.gov/nhsn/PDFs/training/intro-AnalysisBasics-PSC.pdf>

How to filter your data by time period: <http://www.cdc.gov/nhsn/PS-Analysis-resources/PDF/FilterTimePeriod.pdf>

How to filter your data on additional criteria:  
<http://www.cdc.gov/nhsn/PS-Analysis-resources/PDF/SelectionCriteria.pdf>

NHSN Newsletter: Your Guide to the Standardized Infection Ratio:  
[http://www.cdc.gov/nhsn/PDFs/Newsletters/NHSN\\_NL\\_OCT\\_2010SE\\_final.pdf](http://www.cdc.gov/nhsn/PDFs/Newsletters/NHSN_NL_OCT_2010SE_final.pdf)

Risk Adjustment for Hospital-onset *C.difficile* and MRSA Bacteremia LabID Events:  
<http://www.cdc.gov/nhsn/PDFs/mrsa-cdi/RiskAdjustment-MRSA-CDI.pdf>

Using the MRSA Bacteremia SIR output option for CMS IPPS:  
<http://www.cdc.gov/nhsn/PDFs/CMS/CMS-IPPS-MRSA-SIR.pdf>

Using the *C.difficile* Infection SIR output option for CMS IPPS:  
<http://www.cdc.gov/nhsn/PDFs/CMS/CMS-IPPS-CDI-SIR.pdf>