Standardized Infection Ratio (SIR) Table

Surgical-Site Infections

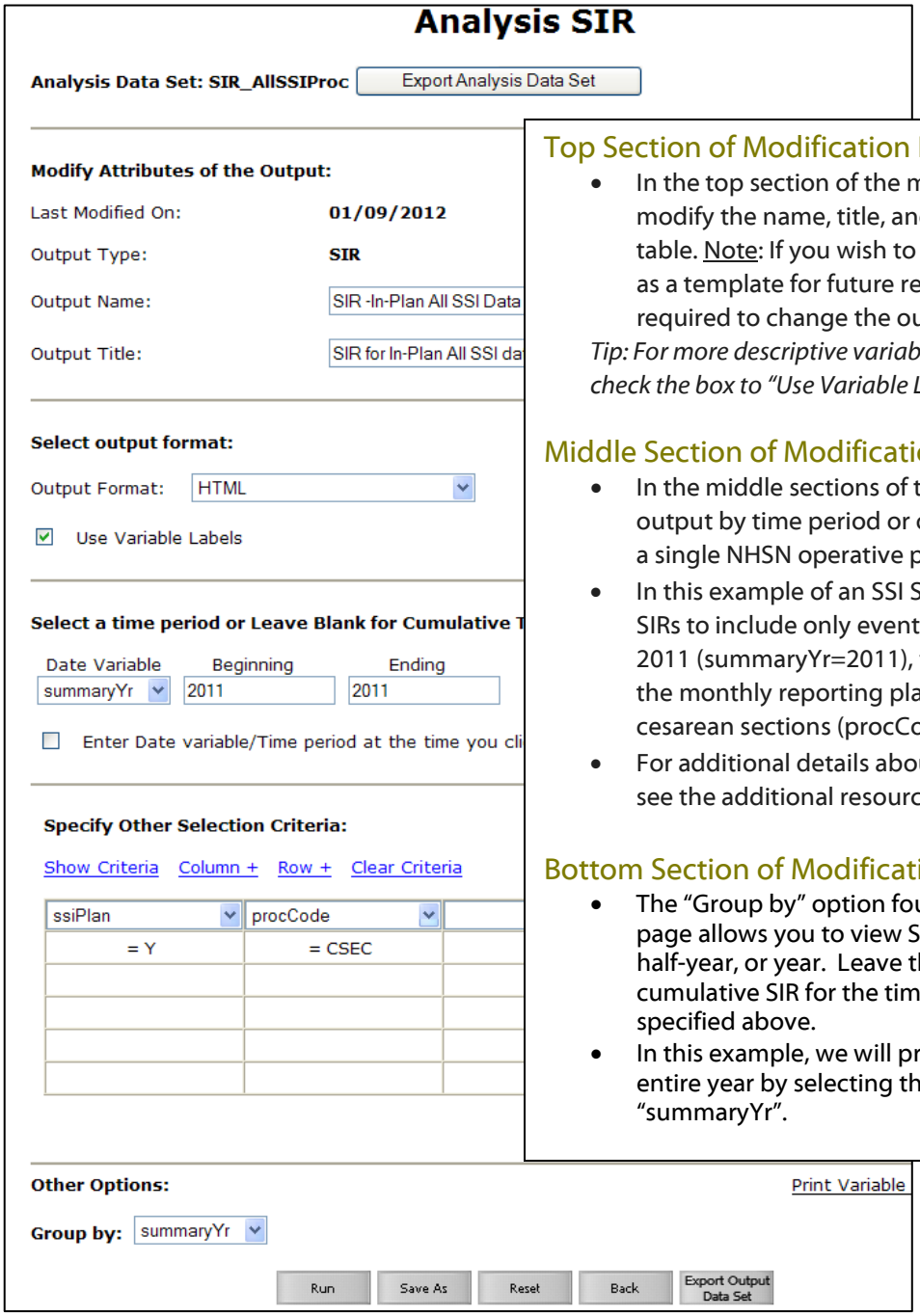
Description

The standardized infection ratio is a risk-adjusted summary measure that compares the observed number of infections to the expected number of infections based on NHSN aggregate data. This document describes how to calculate and interpret the SSI SIR.

Example

Below is an example of an SIR table for SSI surveillance that occurred for in-plan cesarean sections (CSEC) for 2011.

Modification Page



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 (e.g., limit to a single NHSN operative procedure category).
- In this example of an SSI SIR, we have limited the SIRs to include only events and denominators for 2011 (summaryYr=2011), from those procedures in the monthly reporting plan (ssiPlan=Y) and for cesarean sections (procCode=CSEC).
- For additional details about how to use this section, see the additional resources listed on page 2.

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 one SIR for the entire year by selecting the Group By variable "summaryYr".

Output/Results and Interpretation

National Healthcare Safety Network

SIR for In-Plan All SSI data by Procedure - By OrgID

As of: February 29, 2012 at 10:39 AM

Date Range: SIR_ALLSSIPROC summaryYr 2011 to 2011

if (((ssiPlan = "Y") AND (procCode = "CSEC")))

Org ID	Summary Yr	Procedure Count	All SSI Model Infection Count	All SSI Model Number Expected	All SSI Model SIR	All SSI Model SIR p-value	All SSI Model 95% Confidence Interval
10018	2011	91	1	1.340	0.746	0.6127	0.019, 4.158

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 9, 2012 at 3:41 PM.

- This facility reported 91 CSECs (procedure count) and 1 SSI (All SSI Model Infection Count) during 2011.
- The number of SSIs expected (All SSI Model Number Expected) for this time period was 1.340. For each operative procedure category, the number of expected SSIs is calculated based on statistical modeling of a standard population's data during the baseline time period (2006-2008).
- The SIR is the number of observed SSIs (numerator) divided by the number of expected SSIs (denominator) (e.g., 1/1.340 = 0.746). An SIR will only be calculated if the number of expected infections is ≥ 1. When the expected number of infections is <1, it is considered too low to calculate a precise SIR and comparative statistics. When this occurs, you may wish to group your SIRs by a longer time period, such as calendar year (summaryYr).
- The SIR p-value is a statistical measure that tells you if the observed number of infections is significantly different from what was expected. A p-value less than 0.05 (an arbitrary and conveniently used cut point) indicates that the number of observed SSIs is (statistically) significantly different (higher or lower) from the number expected. In this example, the p-value for the 2011 SIR is greater than 0.05 and thus there is no significant difference between the number of infections observed and the number of infections expected.
- The 95% Confidence Interval is a range of values in which the true SIR is thought to lie, however the SIR reported under the SIR column is the most likely value. If the confidence interval includes the value of 1 (as in this example), then the SIR is not significant (the number of observed infections is not significantly different from the number expected, using the same convenient cut point). The statistical evidence should be interpreted as insufficient to conclude that the SIR is different than 1.

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
SSI Risk Model Paper: http://www.cdc.gov/nhsn/PDFs/pscManual/SSI_ModelPaper.pdf
NHSN Newsletter: Your Guide to the Standardized Infection Ratio:
http://www.cdc.gov/nhsn/PDFs/Newsletters/NHSN_NL_OCT_2010SE_final.pdf