Using NHSN Analysis Features for Prevention: Practice
Use of Targeted Assessment for Prevention (TAP) Reports and Statistical Calculator


This practice workbook is a guide to creating reports to assist in viewing your data from different statistical perspectives. TAP reports characterize your facility’s HAI data through ranking locations by priority and by CAD (cumulative attributable difference, the number of infections that a facility or location must prevent in order to meet an HAI reduction goal.) Although TAP Reports are available for both Facility and Group users, this workbook will focus only on TAP Report use by a facility user.

**Exercise 1:** Create a CLABSI TAP Report for your Facility

1. Always begin by generating a data set prior to using the Analysis feature to be sure all data are current.
2. In the NHSN Portal click Analysis → Output Options → TAP Reports → Acute Care Hospitals (ACHs) → CDC Defined Output → TAP Report - CLAB Data for ACHs → Modify.

Click in order:
1. Analysis
2. Output Options
3. TAP Reports
4. Acute Care Hospitals (ACHs)
5. CDC Defined Output
6. TAP Report - CLAB Data for ACHs
7. Modify

Run creates a TAP Report with all data from January 2012 to present.

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Patient Safety Component
Analysis Output Options

Expand All  Collapse All

- Generate Data Sets
- Output Options
- Statistics Calculator
- Survey
- Users
- Facility
- Group
- Log Out

1. TAP Reports
2. Acute Care Hospitals (ACHs)
3. CDC Defined Output
4. TAP Report - CLAB Data for ACHs
5. TAP Report - CAU Data for ACHs
6. TAP Report - FACWIDEIN CDI LabID data for ACHs

Inpatient Rehabilitation Facilities (IRFs)
Long Term Acute Care Hospitals (LTACHs)
Advanced
3. From the Analysis SIR screen, modify Output Name and Date Variable, then press "Run".

**Analysis SIR**

Modify Attributes of the Output:
- Last Modified On: 05/27/2015
- Output Type: SIR
- Output Name: TAP Report - California Hospital CLABSI Data
- Output Title: TAP Report - California Hospital CLABSI Data 2013

Select output format:
- Output Format: HTML
- Use Variable Labels

Select a time period or Leave Blank for Cumulative Time Period:
- Date Variable: SummaryYr
- Beginning: 2013
- Ending: 2013

Specify Other Selection Criteria:

Other Options:
- Group by:  

Instructions:
1. Name your report if you wish to save it for future use.
2. For Output Format, use HTML (or CSV if you plan to export to Excel).
3. Always check “Use Variable Labels”.
4. Select a Date Variable. We are choosing year (2013).
5. To include only specific data variables in your report (e.g., a certain location, age group, gender, organism type, etc.), you can add instructions to the Selection Criteria table. In this example, we are going to leave it blank.
6. Leave "Group by" option blank.
7. Click "Run"
4. Your facility TAP Report will look like the table below:

<table>
<thead>
<tr>
<th>NHSN Number</th>
<th>Facility Name</th>
<th># of infections that must be prevented by the facility to achieve HAI reduction goal</th>
<th>Ranked from most serious to least</th>
<th># of infections during chosen timeframe</th>
<th>Central line days during timeframe</th>
<th># of infections that must be prevented by the location to achieve HAI reduction goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facility Org ID</td>
<td>Facility Name</td>
<td>Location</td>
<td>CDC Location</td>
<td>Location Rank</td>
<td>Location</td>
<td>CDC Location</td>
</tr>
<tr>
<td>1</td>
<td>1MICU</td>
<td>IN ACUTE</td>
<td>CC: M</td>
<td>4</td>
<td>823</td>
<td>91</td>
</tr>
<tr>
<td>2</td>
<td>1SICU</td>
<td>IN ACUTE</td>
<td>CC: S</td>
<td>2</td>
<td>370</td>
<td>77</td>
</tr>
<tr>
<td>3</td>
<td>DLB</td>
<td>IN ACUTE</td>
<td>CC: MS</td>
<td>1</td>
<td>169</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>BMT</td>
<td>IN ACUTE</td>
<td>WARD: ONC, HSCT</td>
<td>1</td>
<td>80</td>
<td>17</td>
</tr>
<tr>
<td>5</td>
<td>JAWY</td>
<td>IN ACUTE</td>
<td>CC: MS</td>
<td>0</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>6956 NICU</td>
<td>IN ACUTE</td>
<td>CC, STEP, NURS</td>
<td>0</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>7</td>
<td>DLB6S</td>
<td>IN ACUTE</td>
<td>CC, STEP, NURS</td>
<td>0</td>
<td>100</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>ONC</td>
<td>IN ACUTE</td>
<td>CC: MS</td>
<td>0</td>
<td>134</td>
<td>61</td>
</tr>
<tr>
<td>9</td>
<td>ICU WEST</td>
<td>IN ACUTE</td>
<td>CC: NURS</td>
<td>0</td>
<td>212</td>
<td>49</td>
</tr>
<tr>
<td>10</td>
<td>DLB6S</td>
<td>IN ACUTE</td>
<td>CC: NURS</td>
<td>0</td>
<td>223</td>
<td>12</td>
</tr>
</tbody>
</table>

**TAP Report Results and Discussion:**

- **TAP Results:**
  - In the example above, California General Hospital (our fictitious test hospital) needs to prevent 6 infections overall to reach its target SIR. The 1MICU is listed at the most problematic location (ranking #1) which will require the prevention of 3 infections in order to reach the SIR goal.

- **Cumulative Attributable Difference (CAD):**
  - CAD is the number of HAI that must be prevented to meet reduction goals
  - Location CAD = observed infections - (predicted infections) x SIR\_Target (national CLABSI target 0.5)
    - Note the “predicted” number of infections can be found in the SIR output option analysis
    - SIR target can be chosen based on corporate/group goals, or state/national targets – our national target for CLABSI is currently 0.5 (meaning a reduction goal of 50%)
    - Lower target SIRs result in larger excess numbers of infections
  - Positive CAD = more infections than predicted
  - Negative CAD = fewer infections than predicted
  - If location level CADs are the same in a given facility, their ranks are tied.
  - Each locations CAD is calculated using the locations observed and expected rates.

- **No. Pathogens** refers to number of pathogens detected from 6 common pathogen groups:
  - CNS (Coag. Negative Staphylococcus)
  - Yeast (both candida and non-candida species)
  - K.pneumoniae/K. oxytoca
  - Staphylococcus aureus
  - Enterococcus species
  - E. Coli

- **Things to consider when reviewing the TAP Reports:**
  - the time period being included in the report
  - which locations were included in the analysis
  - any other factors which could limit the analysis

- New with NHSN summer 2015 release users will be allowed to specify a value for the multiplier used to calculate the CAD!
  - The current version of NHSN uses only HHS Action Plan Goal Target SIR as a multiplier. New version will allow users to customize using any desired goals (e.g. State SIR, National SIR, Collaborative/group Goal, etc.)
Part 2: Using the Statistics Calculator

This practice workbook will guide you through use of the statistics calculators; each of the calculators are tools which can help you determine if there are relative changes in your data and whether these changes are significant.

Can I compare a single SIR to one?

My CDI rates seem to be decreasing each year, but is the change statistically significant?

How do I compare two proportions?

A statistics calculator? Sign me up!

Are the differences in my CLABSI data due to chance?

How do I compare two SIRs?

The statistics calculator is located under Analysis on the left blue navigation bar. Use the various calculators with the data you obtained in "Output Options" to learn more about relationships between your facility's data.
Which calculator do I use?

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

1. **Compare Two Proportions**: Use this calculator to compare proportions such as device utilization ratios or SSI rates.

   1. Use NHSN Analysis to obtain information about the data you want to compare. Refer to CDPH HAI Program Using Analysis Series Lessons 1-4 for instructions on creating line lists or tables with the data you wish to compare.

   2. Open the Compare Two Proportions calculator and fill in the data boxes per instructions:

   - **Exercise 2**: Use Compare Two Proportions Calculator to compare 2013 and 2014 COLO SSI rates:

     - In 2013, California General Hospital performed 985 COLO procedures with 18 SSI. Prompted by the higher SIR, your department worked on an SSI PI Project to implement new strategies to decrease SSI.

     - Following the PI project, in 2014 California General Hospital performed 1048 COLO procedures with 8 SSI. Although the SSI number is lower, you want to compare these results to see if they are statistically significant.

     - Use the NHSN Compare Two Proportions Calculator to see if there is a significant difference between these two proportions.
Calculator Results and Discussion

For this example, the p-value of 0.0373 indicates that the 2013 COLO SSI data is significantly different (higher) than the 2014 COLO SSI data.

- The proportion 1.827% (2013) is higher than the 0.763% (2014) proportion
- A p-value less than 0.05 is considered significant
2. Compare Single SIR to 1: Use this calculator to calculate an SIR and its p-value.

1. Use NHSN or your surveillance data to determine the number of HAI infections that occurred in your location, within your desired time frame.

2. Use NHSN published data or State published data to obtain the number of expected CDI infections for the location.


3. Open the Compare Single SIR to 1 calculator and fill in the data boxes per instructions:

   [Image: Compare Single SIR to 1]

   **Exercise 3:** Use Compare Single SIR to 1 Calculator to find SIR and p-value:
   
   - Your facility reports CDI data for a fiscal year beginning in July. You need to create a SIR for 12 months of CDI data for your Medical Unit, beginning July 2013.
   - You had 16 CDI infections on your Medical Unit in Fiscal Year 2013.
   - NHSN data indicates the expected number of CDI infections for your Medical unit was 14.345 for Fiscal Year 2013.

   ➤ Use the NHSN Compare Single SIR to 1 calculator to find the SIR and p-value.
Our Medical Unit CDI SIR for Fiscal year 2013 is 1.115. This means that our CDI is over 10% higher than that of a similar medical unit.

In this example, the p-value and Confidence Interval (CI) indicate that the SIR is not statistically different from 1 (p-value >0.05; CI crosses 1).

This calculator is recommended for SIRs that are calculated using aggregate data from a source other than NHSN (e.g. State aggregate).
3. **Compare Two Standardized Infection Ratios**: Use this calculator to compare two SIRs to each other

   1. Use NHSN Analysis to obtain two SIRs you would like to compare. Refer to CDPH HAI Program Using Analysis Series Lessons 1-4 for instructions on tables with this information.

   2. Open the Compare Two Standardized Infection Ratios calculator and fill in the data boxes per instructions:

   ![Compare Two Standardized Infection Ratios Calculator](image)

   - **Exercise 4**: Use Compare Two Standardized Infection Ratios Calculator to compare 2013 and 2014 MRSA BSI SIRs

     - In 2013, California General Hospital had 12 HO cases of MRSA BSI; NHSN indicated an expected rate of 13.576.

     - In 2014, California General Hospital had 16 HO cases of MRSA BSI; NHSN indicated an expected rate of 14.268.

     ➢ **Use the NHSN Compare Two Standardized Infection Ratios calculator to see if there is a significant difference between these two SIRs.**
**Calculator Results and Discussion**

- Although there was an increased number of MRSA BSI from 2013 to 2014, it was not statistically significant. This can be noted by the p-value >0.05 and the CI that includes 1.
- Since the 2014 SIR is 12% over the expected rate of HO MRSA BSI, this facility should review practices that would lead to elevated rates of MRSA transmission (e.g. isolation practice compliance, MRSA screening, etc.)
- When the 2013 and 2014 SIR values are compared, the 2014 SIR shows an increase by 126.8%.
4. **Compare Two Incidence Density Rates**: Use this calculator to compare two incidence density rates from different time periods or groups.

3. Use NHSN Analysis to obtain information about the data you want to compare. Refer to CDPH HAI Program Using Analysis Series Lessons 1-4 for instructions on creating line lists or tables with the data you wish to compare.

4. Open the Compare Two Incidence Density Rates calculator and fill in the data boxes per instructions:

   ![Compare Two Incidence Density Rates Calculator](image)

   1. Label to identify data source
   2. Data for comparison
   3. Choose multiplier for your density rate (see examples if unsure which to choose)
   4. Title of Report
   5. Calculate

**Exercise 5**: Use Compare 2013 and 2014 CDI Incidence Density Rates:

- In 2013 California General Hospital had 133 HO CDI cases for 134,845 patient days.
- In 2014 California General Hospital had 105 HO CDI cases for 141,722 patient days.

  ➢ **Use the NHSN Compare Two Incidence Density Rates calculator to determine if the rates are statistically different from one another.**
### Calculator Results and Discussion

- **For this example the p-value is 0.0281**, indicating that the 2012 CDI Incidence density rate is significantly higher than the 2013 CDI incidence density rate.
- **The multiplier allows you to view rates as they are normally displayed.**
  - If you are unsure which multiplier to use
    - refer to NHSN calculations, CDPH Public Report (Key Findings) or calculator examples.