

# Demo Exercise: Statistics Calculator

## Description:

This exercise provides an introduction to using the statistics calculator in NHSN to compare two rates or two proportions to each other.

## Example:

You are interested in looking at the CAUTI rate in your 71ICU during the first half of 2012. Your facility participated in a prevention collaborative focusing on CAUTI in 2012, and you are curious to see whether or not your CAUTI rate and urinary catheter utilization ratio differ significantly between the first and second quarters.

The data below is from a CAUTI rate table for your facility.

Location	Summary Qtr	CAUTI Count	Urinary Cath Days	CAUTI Rate	Patient Days	Urinary Cath Util Ratio
71ICU	2012 Q1	<b>3</b>	<b>677</b>	4.431	1363	<b>0.497</b>
71ICU	2012 Q2	<b>1</b>	<b>720</b>	1.389	1531	<b>0.470</b>

Use NHSN's Statistics Calculator to answer the following questions:

1. Did the 71ICU's CAUTI rate change significantly between the first and second quarters of 2012?
2. Did the 71ICU's urinary catheter utilization ratio change significantly between the first and second quarters of 2012?

## Using the Statistics Calculator:

The Statistics Calculator can be found under Analysis > Statistics Calculator on the left navigation bar. It is used to determine whether a statistically significant difference exists between two numbers.

## Question 1:

The first question asks you to compare two rates, so the appropriate option to compare two incidence density rates is selected.

### Statistics Calculator

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

- Consider each 'data source' as one of the rates for comparison. Data source #1 will be the first quarter CAUTI rate, and data source #2 will be the second quarter CAUTI rate.

### Compare Two Incidence Density Rates

[HELP](#)

When comparing two incidence density rates (i.e. person-time), 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, the number of person-time units (i.e. exposure) as the denominator, and choose the multiplier you wish for the rate calculation. Press calculate. (See examples below)

	Data Source #1	Data Source #2
Group Labels:	2012 Q1	2012 Q2
Numerator(Number of events):	3	1
Denominator(Number of person-time units):	677	720
Multiplier:	1000 ▾	

Title: CAUTI rate comparison

**Example 1**  
To compare 2 C.difficile LabID incidence rates:

- Enter the # of CDI HO Incident LabID events
- Enter the # of patient days
- Choose the desired multiplier(i.e., 10,000)
- Press calculate
- Output will provide the CDI HO Incident LabID Event rates per 10,000 patient days and the p-value to indicate the level of statistical significance

**Example 2**  
To compare 2 Dialysis Event bloodstream infection rates:

- Enter the # of Dialysis Event positive blood cultures
- Enter the # of patient months
- Choose the desired multiplier(i.e., 100)
- Press calculate
- Output will provide the DE positive blood culture rates per 100 patient months and the p-value to indicate the level of statistical significance

**Example 3**  
To compare 2 central-line associated bloodstream infection rates:

- Enter the number of CLABSIs
- Enter the # of central line days
- Choose the desired multiplier(i.e., 1000)
- Press calculate
- Output will provide the CLABSI rates per central line and the p-value to indicate level of statistical significance

- The numerator is the CAUTI Count.

- The denominator is the number of urinary catheter days.

- Select the Multiplier value based on the type of rates you are comparing. In this case, CAUTI rates use a Multiplier of 1,000.
- You may create a title for the output.
- Click Calculate.

### Question 2:

The second question asks you to compare two device-utilization ratios. Select the appropriate option to compare two proportions.

## Statistics Calculator

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

- Consider each data source as one of the device-utilization ratios for comparison.
- The numerator is the number of urinary catheter days for each quarter.
- The denominator is the total number of patient days for each quarter.
- You may create a title for the output.
- Click Calculate.

## 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
<b>Group Labels:</b>	2012Q1	2012Q2
<b>Numerator (Number of Events):</b>	677	720
<b>Denominator (Number of Trials):</b>	1363	1531

**Title:** CAUTI device-utilization comparison

Calculate

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