Sample Size and Power for Two Sample Proportions

Use to interactively explore the relationships between Power, Sample Sizes, and Alternative Proportions in testing a hypothesis comparing two independent population proportions. See the **Two Proportions Test and Confidence Interval** guide to learn how to perform a statistical test comparing two population proportions.

Sample Size and Power - Two Sample Proportion

1. Select **DOE > Sample Size Explorers** and choose **Power >Power for Two Independent Sample Proportions**.
2. Choose the type of test: **One-Sided** or **Two-Sided** and choose **Alpha** (significance level for the test).
   The Null Hypothesis is that the two proportions are equal. Here we chose a two-sided alternative which is used to test that the two proportions are not equal.
   This null and alternative hypothesis can be written using notation as $H_0: p_1 = p_2$ vs. $H_A: p_1 \neq p_2$
3. Enter values for the **Group 1** and **Group 2 Population Proportions** under H_A to base the analysis on.
   Here we consider the scenario where **Proportion 1** is 0.50 and **Proportion 2** is 0.75.
4. Select parameter to solve for. Here we chose Total Sample Size.
5. Enter a value for the **Power**. Here we entered 0.80.
   The solution of Total Sample Size of 110 (n_1=55 and n_2=55) is displayed.
6. Use the interactive cross-hair tool (or type in values) for **Power**, **Sample Sizes**, and **Assumed Proportions** to study the relationship between these parameters solving for many different scenarios.

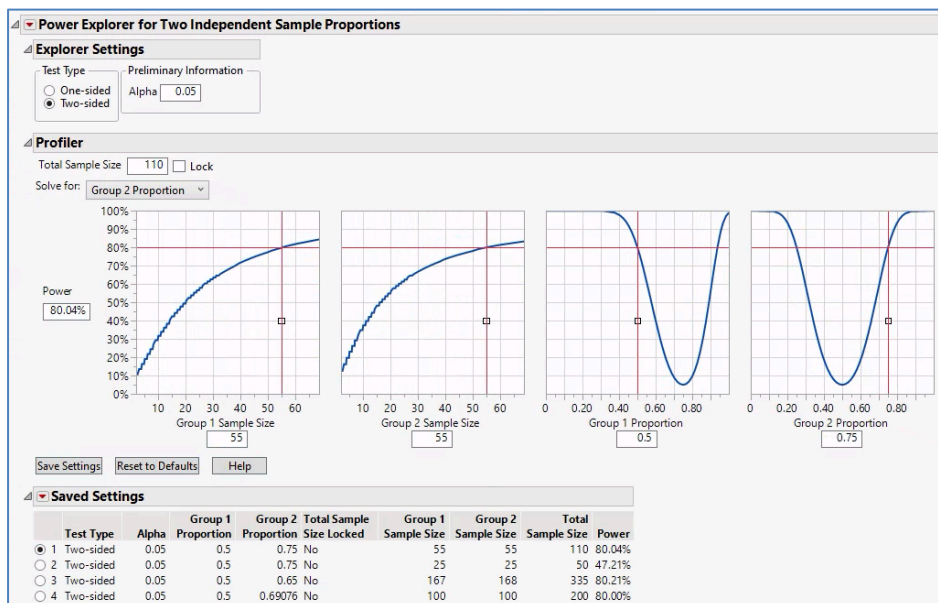The settings and solution for each analysis performed can be saved. The table of saved settings shows the results of five different analyses performed when testing the hypothesis $H_0: p_1 = p_2$ vs. $H_A: p_1 \neq p_2$

1. What sample size is needed to achieve a power of 80% assuming p_1=0.50 and p_2=0.75?
   Answer: 110 (n_1 = 55 and n_2 = 55)
2. What is the power with a sample size of 25 in each group assuming p_1=0.50 and p_2=0.75? *Answer: Power = 47.2%*
3. What sample size is needed to achieve a power of 80% assuming p_1=0.50 and p_2=0.65?
   Answer: 335 (n_1 = 167 and n_2 = 168)
4. What difference from 0.50 for the proportion of group 2 can be detected with 80% power using a sample size of 100 in each group?
   Answer: 0.69

Note: Determining sample size to achieve a desired margin of error in a Confidence Interval can be done using **DOE > Sample Size Explorers > Confidence Intervals > Margin of Error for Two Independent Sample Proportions**.

Visit **Design of Experiments Guide > Sample Size Explorers** in **JMP Help** to learn more.