

Example 3.3: Claritin and Nervousness

An advertisement by the Schering Corporation in 1999 for the allergy drug Claritin mentioned that in a pediatric randomized clinical trial, symptoms of nervousness were shown by 4 of 188 patients on Claritin and 2 of 262 patients taking a placebo.

Research Hypothesis: The proportion who experience nervousness is greater for those who take Claritin than for those who take the placebo.

The data can be found in the file **Claritin.JMP**.

	Drug	Nervousness?	Count
1	Claritin	Yes	4
2	Claritin	No	184
3	Placebo	Yes	2
4	Placebo	No	260

Questions:

- What variables must be measured in order to address the research hypothesis?
Variable 1: Drug (takes on the values Claritin or Placebo)
Variable 2: Experience Nervousness? (takes on the values Yes or No)
- Which is the response variable? Which is the explanatory variable?
Response: Experience Nervousness?
Explanatory: Drug
- Fill in the following contingency table based on the data table from JMP.

Drug	Nervousness?		Row Totals
	Yes	No	
Claritin	4	184	188
Placebo	2	260	262
Total	6	444	450

- Find the proportion that experience nervousness in each group.

$$\hat{\pi}_{\text{Yes|Claritin}} = 4/188 = .0213 = 2.13\%$$

$$\hat{\pi}_{\text{Yes|Placebo}} = 2/262 = .0076 = .76\%$$

Next, use JMP to carry out Fisher’s Exact Test for these data.

<p><u>Step 1:</u></p>	<p>Convert the research hypothesis into H_0 and H_a.</p> <p>H_0: The proportion that experience nervousness is the same for those who take Claritin as for those who take the placebo.</p> <p>H_a: The proportion that experience nervousness is <u>greater</u> for those who take Claritin as for those who take the placebo.</p> <p>You could also write the hypotheses as follows:</p> <p>H_0: $\pi_{\text{yes} \text{Claritin}} = \pi_{\text{yes} \text{Placebo}}$</p> <p>$H_0$: $\pi_{\text{yes} \text{Claritin}} > \pi_{\text{yes} \text{Placebo}}$</p>												
<p><u>Step 2:</u></p>	<p>Determine the <u>p-value</u>.</p> <div data-bbox="341 934 1291 1129" style="background-color: #f0f0f0; padding: 5px;"> <table border="1"> <thead> <tr> <th>Fisher's Exact Test</th> <th>Prob</th> <th>Alternative Hypothesis</th> </tr> </thead> <tbody> <tr> <td>Left</td> <td>0.2032</td> <td>Prob(Nervousness?=Yes) is greater for Drug=Claritin than Placebo</td> </tr> <tr> <td>Right</td> <td>0.9514</td> <td>Prob(Nervousness?=Yes) is greater for Drug=Placebo than Claritin</td> </tr> <tr> <td>2-Tail</td> <td>0.2412</td> <td>Prob(Nervousness?=Yes) is different across Drug</td> </tr> </tbody> </table> </div> <p>p-value: .2032</p>	Fisher's Exact Test	Prob	Alternative Hypothesis	Left	0.2032	Prob(Nervousness?=Yes) is greater for Drug=Claritin than Placebo	Right	0.9514	Prob(Nervousness?=Yes) is greater for Drug=Placebo than Claritin	2-Tail	0.2412	Prob(Nervousness?=Yes) is different across Drug
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<p><u>Step 3:</u></p>	<p>Write a conclusion addressing the original research hypothesis.</p> <p>This study does not provide enough statistical evidence that the proportion that experience nervousness is greater for those who take Claritin than for those who don't.</p>												