HW12: Baldness and Heart Disease? (assigned on Wed Nov 5; due on Mon Nov 10)
Topics: case-control studies, odds ratio, CI for odds ratio

You may work with one partner on this assignment, handing in one report with both names, provided that both of you contribute substantially to the work. Word-processed reports are much preferred to hand-written ones. Please copy/paste relevant, well-labeled computer output into a Word file as appropriate.

To investigate a possible relationship between heart disease and baldness, researchers asked a sample of 663 male heart patients to classify their degree of baldness on a 5-point scale. They also asked a control group (not suffering from heart disease) of 772 males to do the same baldness assessment. The results are summarized in the following table:

<table>
<thead>
<tr>
<th></th>
<th>None</th>
<th>Little</th>
<th>Some</th>
<th>Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart Disease</td>
<td>251</td>
<td>165</td>
<td>195</td>
<td>52</td>
</tr>
<tr>
<td>Control</td>
<td>331</td>
<td>221</td>
<td>185</td>
<td>35</td>
</tr>
</tbody>
</table>

a) Explain how you can tell that this is a case-control study.

b) What proportion of the men in this study have heart disease? Is it reasonable to use this proportion to estimate the proportion of men in general who have heart disease? Explain why or why not.

c) Calculate the odds ratio of having heart disease, comparing those with much baldness to those with no baldness. Also write a sentence interpreting what this odds ratio calculation means.

d) Determine a 95% confidence interval for the population odds ratio of having heart disease, comparing those with much baldness to those with no baldness. (Show the details of your calculations.)

e) Interpret this confidence interval.

f) Do the data provide strong evidence that having much baldness is associated with developing heart disease? Explain how your answer follows from the confidence interval.

g) Calculate the odds ratio of having heart disease, comparing those with some baldness to those with no baldness. Also determine a 95% confidence interval for the analogous population odds ratio. Then comment on whether the data provide strong evidence that having some baldness is associated with developing heart disease.

h) Repeat g) for comparing those with little baldness to those with no baldness.

i) Summarize your conclusions from this analysis.