10. Construct a 2 x 2 table to examine the association between illness and the consumption of hamburger.

The 2 x 2 table allows the epidemiologist to focus in on a single item. It is basically the same procedure as calculating the attack rate, and the final numbers here correspond to the attack rate numbers in the table above.

Answer:

<table>
<thead>
<tr>
<th>Disease Status</th>
<th>Ill</th>
<th>Not Ill</th>
<th>Totals</th>
<th>Attack Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure to risk factor Ate hamburger</td>
<td>A (43)</td>
<td>B (11)</td>
<td>A + B (54)</td>
<td>A/(A + B) = 79.6</td>
</tr>
<tr>
<td>Did not eat hamburger</td>
<td>C (3)</td>
<td>D (18)</td>
<td>B + D(21)</td>
<td>C/(C + D) = 14.3</td>
</tr>
</tbody>
</table>

11. Calculate the relative risk for becoming ill from eating the hamburger.

Answer: \[ \frac{79.6}{14.3} = 5.6 \]

12. What does this value of the relative risk tell you about the association between illness and eating hamburger?

Answer:
People who ate a hamburger were 5.6 times more likely to become ill than were people who didn’t eat a hamburger.
13. Three of the people who became ill said they had not eaten a hamburger. How might you explain this?

Answer:
Possible explanations:
- Perhaps other foods became cross contaminated from the hamburger via dishes, knives, or serving utensils
- Perhaps these three all ate very well done hamburgers
- The infectious agent might not have been evenly distributed in the burgers.
- These three people may have remembered inaccurately.
- These cases could be completely unrelated to the outbreak.