Stats: Data and Models Worksheet – Chapter 3

Smoking and Education

200 adults shopping at a supermarket were asked about the highest level of education they had completed and whether or not they smoke cigarettes. Results are summarized in the table on the right.

<table>
<thead>
<tr>
<th></th>
<th>Smoker</th>
<th>Non-smoker</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>High school</td>
<td>32</td>
<td>61</td>
<td>93</td>
</tr>
<tr>
<td>2 yr college</td>
<td>5</td>
<td>17</td>
<td>22</td>
</tr>
<tr>
<td>4+ yr college</td>
<td>13</td>
<td>72</td>
<td>85</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>150</td>
<td>200</td>
</tr>
</tbody>
</table>

1. Describe the W’s. If the information is not given, state that it is not specified.
   - Who:
   - What:
   - When:
   - Where:
   - How:
   - Why:

2. List the variables and indicate whether each is categorical or quantitative. If the variable is quantitative, state the units.

3. a) What percent of the shoppers were smokers with only high school educations? ____
   b) What percent of the shoppers with only high school educations were smokers? ____
   c) What percent of the smokers had only high school educations? ____

4. Using the empty bars on the right, create a segmented bar graph comparing education level among smokers and non-smokers. Label your graph clearly.

5. Do these data suggest there is an association between smoking and education level? Give statistical evidence to support your conclusion.

6. Follow-up question: Does this indicate that students who start smoking while in high school tend to give up the habit if they complete college? Explain.
1. Describe the W’s. If the information is not given, state that it is not specified.

Who: 200 adults
What: education level and smoking habits
When: not specified
Where: shopping mall
How: not specified. Was this a random sample, or were some people simply asked?
Why: to examine possible links between smoking and education level

2. List the variables and indicate whether each is categorical or quantitative. If the variable is quantitative, state the units.

Education level and whether or not the person smokes, both are categorical

3. a) What percent of the shoppers were smokers with only high school educations? \( \frac{32}{200} = 16\% \)
b) What percent of the shoppers with only high school educations were smokers? \( \frac{32}{93} \approx 34.4\% \)
c) What percent of the smokers had only high school educations? \( \frac{32}{50} = 64\% \)

4. Create a segmented bar graph comparing education level among smokers and non-smokers. Label your graph clearly.

5. Do these data suggest there is an association between smoking and education level? Give statistical evidence to support your conclusion.

These data provide evidence of an association between smoking and education level. 64% of smokers had only a high school diploma, while only 40.7% of non-smokers had only high school diplomas. Only 26% of smokers had four or more years of college, compared to 48% of non-smokers.

6. Follow-up question: Does this indicate that students who start smoking while in high school tend to give up the habit if they complete college? Explain.

These data do not indicate that students who start smoking in high school tend to give up the habit if they complete college. These data were gathered at one time, about two different groups, smokers and non-smokers. We have no idea if smoking behavior changes over time.