Reading Tables of Rates and Percentages

JSM 2001 ASA
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Reading Tables of Rates and Percentages

1. The accidental death rate among teenagers
2. The teenagers’ accidental death rate is ...
3. The accidental death rate of teenagers is ...
4. The teenager accidental death rate is ...
5. The rate of teenager deaths is ...

4 and 5 are ambiguous; possessive is unstated.

Ambiguous Grammar

A. 25% of males are smokers
1. The percentage of males among smokers …
2. The percentage of males who smoke …

B. Among smokers, the percentage of males is 45%.
1. 45% of males are smokers.
2. 45% of smokers are males.

C. Among teens, the percentage of females who smoke
1. Among teens, the percentage of female smokers …
2. Among female teens, the percentage of smokers …

Semantics: #1 never matches; #2 always matches

Rates

Ambiguity of ‘by’


‘by’ means ‘distributed by’

Source: 1998 US Statistical Abstract. (See Table 152 for a better title)

Percents

Ambiguity of ‘by’

‘by’ means ‘among’ -- not ‘distributed by’


Rates

Ambiguity of ‘by’

‘by firearms’ means ‘by means of firearms’
‘by sex’ means ‘categorized by sex’

Source: 1998 US Statistical Abstract (See Table 152 for a better title)
Margin Value Rules

- Margin values (MV) are sums or averages
- Heading: Total or All means ‘all subjects’

If the numeric margin value is a:
1. A sum, then the pieces are parts
2. A 100% sum, then pieces are parts and the group of pieces is whole
3. An average, then pieces are wholes

A corner margin value can be a sum one-way and an average the other

Missing Margin Values

Margin values are typically omitted when:
1. Table indexes are non-exhaustive (e.g., non-contiguous dates: 1990, 2000). These indicators are usually wholes.
2. The indicator values obviously total 100%. These indicators are always parts.
3. The data are rates. These indicators are usually wholes.

Definitions of Smoking Prevalence Among U.S. Adults, 18 Years of Age and Older:

<table>
<thead>
<tr>
<th>Year</th>
<th>All</th>
<th>Males</th>
<th>Females</th>
<th>Whites</th>
<th>Blacks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1955</td>
<td>--</td>
<td>56.9</td>
<td>28.4</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>1965</td>
<td>42.4</td>
<td>51.9</td>
<td>33.9</td>
<td>42.1</td>
<td>45.4</td>
</tr>
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<td>1970</td>
<td>37.4</td>
<td>44.1</td>
<td>31.5</td>
<td>37.0</td>
<td>41.4</td>
</tr>
<tr>
<td>1980</td>
<td>33.2</td>
<td>37.6</td>
<td>29.3</td>
<td>32.9</td>
<td>36.9</td>
</tr>
<tr>
<td>1990</td>
<td>25.5</td>
<td>28.4</td>
<td>22.8</td>
<td>25.6</td>
<td>26.2</td>
</tr>
</tbody>
</table>

CHOICES: Among these adults,
- the percentage of smokers who are black
- the percentage who are black smokers
- the percentage of blacks who are smokers

Difficulties Reading Rates and Percentages in Tables

Percentage of Smoking Prevalence Among U.S. Adults, 18 Years of Age and Older:

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Recommendations

To be statistically literate, one should be able to describe and compare rates and percentages found in tables and graphs.

Students should learn the margin value rules. Ratio tables should provide margin values to help readers identify part and whole.

When margin values are not provided and the part-whole status is not readily determined, a margin-value example should be given.