

## Lesson 4.3 – The Use and Misuse of Statistics

**Goal: Assess the validity of conclusions presented in the media**

A **valid conclusion** is one that is supported by \_\_\_\_\_ data that has been \_\_\_\_\_ appropriately

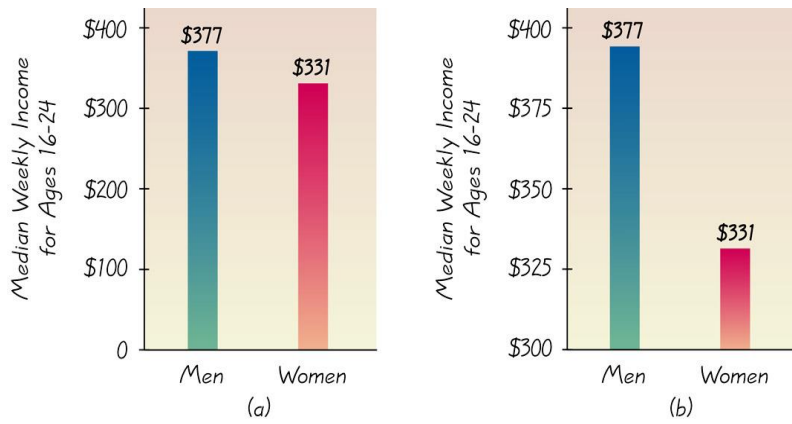
When you read a conclusion someone has made based on statistics, you must decide whether the conclusion is valid or not. To do this, ask yourself:

- Is there any \_\_\_\_\_ in the data collection, in the way the
  - sample was \_\_\_\_\_,
  - questions were \_\_\_\_\_, or
  - survey was \_\_\_\_\_?
- If the data involved \_\_\_\_\_, were they accurate?
- Are any \_\_\_\_\_ drawn accurate, or do they \_\_\_\_\_ the viewer?

### Assessing Graphs

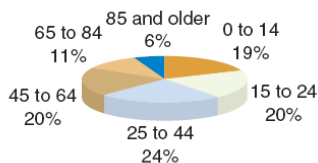
The graphs in each pair show the SAME DATA. Choose the graph that displays the data MORE accurately. Justify your choice.

1. Graphs comparing men and women’s weekly income



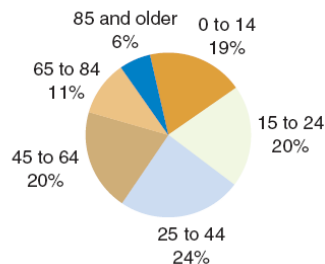
2. Canada’s population by age, according to the 2001 census

i) Ages of Canadians, 2001 Census



OR

ii) Ages of Canadians, 2001 Census



**Assessing How Data was Collected & Graphed**

Four Grade 9 students collected data on school lunch preferences. Is their conclusion valid? **To assess the validity, ask yourself:**

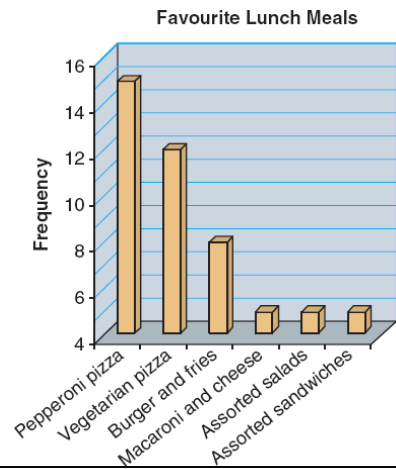
Was the sample size appropriate?

Was the sample representative?

Was the survey questions biased?

How was the survey conducted?

Is the graph constructed accurately?

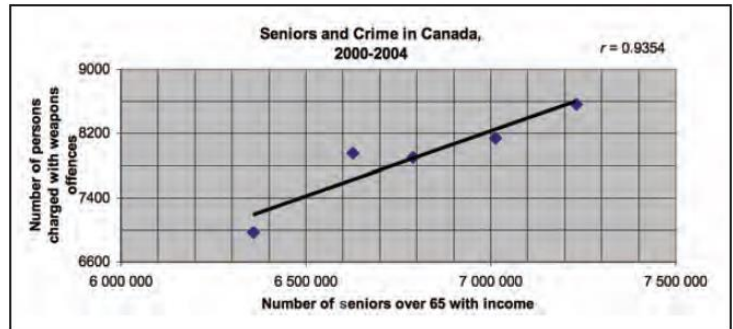


**Conclusion:** We asked students to tell us their favourite lunch meals and displayed the results in a bar graph. We conclude that the school cafeteria should serve more pizza since it is clearly the favourite lunch of students.

**Assessing Assumptions About Cause & Effect**

A group of grade 12 students performed a linear regression on data they collected from Statistics Canada about the number of seniors and the number of weapons crimes in Canada. Is their conclusion valid? **To assess the validity of the conclusion, ask your self these questions:**

- 1) Was there bias in the data collection?
- 2) Is the graph constructed accurately?
- 3) Is the correlation strong?
- 4) Does the analysis support a cause-and-effect relationship



**Conclusion:** There is a strong positive correlation between the two variables. As the number of seniors increases, weapons charges increase. Therefore, criminals in Canada are becoming older because of our ageing population.