4..5 Critical Analysis

Q: How powerful is the following statement in influencing your decision to buy the product?

"4 out of 5 dentists recommend chewing this gum for improved oral health"

A:

indicates majority) BUT why doesn't one recommend?
all but one gum

Critical Analysis

- Can be challenging since statistics are often presented in ***summary*** form. This makes it difficult to know <u>where</u> the data was collected, whether any <u>bias</u> was present or if other factors exist.
- One must be careful in analyzing and/or accepting statistics presented. Intentional or unintentional bias can <u>invalidate</u> statistical claims.
- Our best defense is to use <u>common sense</u> to decide whether to "believe" what the data is trying to persuade us to believe. We may also need to look deeper in order to find the correct meaning. Be cautious about accepting any claim that does not include information about the <u>sampling technique</u> and <u>analytic methods</u> used.

Some "tricks" to watch out for:

1. **Subtle wording that changes the meaning of information**
   e.g. Last year, the unemployment rate was 8.5%. This year, the unemployment rate has had a 1.5 percentage-point increase.

   ↳ not the same as 1.5 %

2. **The use of large numbers that can lead to misunderstandings about <u>the significance of data</u>.**
   e.g. Annual health-care spending in Ontario will increase next year by $80 million.

   → What are they spending on?
   does not factor in the size of population.
   Infrastructure?
   pop'n bubble coming up (seniors?)

3. **Comparisons that are made where the items are not weighted equally.**
   e.g. The following chart shows unemployment statistics, by province, for Canada.

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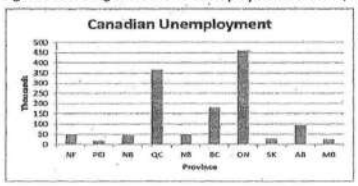
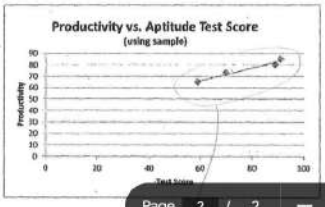
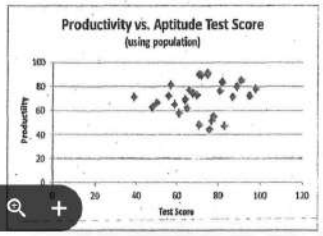
seniors?



← doesn't consider differences in population size; should use a rate (%)

4. **Small samples are used to represent larger populations which distort the data.**
e.g. A manager uses a systematic sample to choose every 7th employee from a roster of 30 employees to test how an aptitude test compares to employee productivity. He concludes that the company should only hire applicants who do well on the aptitude test.

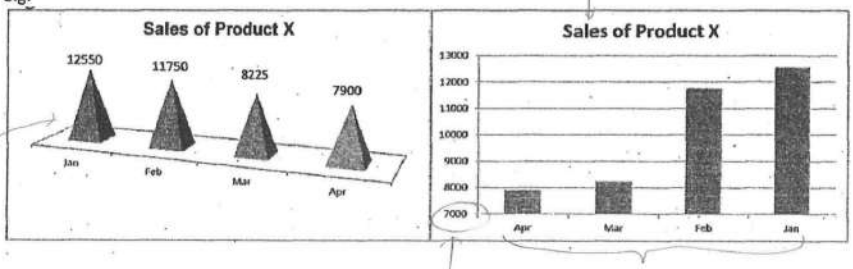




4 out of 30 employees is a poor sample

5. **The method(s) of presentation may not give the whole picture.**
e.g.

title ambiguous



all look equal in size

doesn't start at 0; changes look more drastic

7000 units of what?

backwards chronological order