

Section 7.3: Uses and Misuses of Statistics

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statistical techniques can be used to:

- describe a data set
(calculate mean/median/etc, graph)
- compare two or more different sets
- determine if a relationship exists between variables
- test hypotheses (does acupuncture help patients with carpal tunnel syndrome?)
- make estimates about population characteristics based on samples
(we do this in Chapter 10)

but statistics can also be used to mislead!

things to look for:

① suspect samples

- does the sample actually represent the population?

psychology studies often done on undergraduates at research institutions

- is it a convenience sample?

- what is the sample size?

if too small, results do not

if too small, results do not generalize well

② ambiguous averages

- are they using the mean or the median?

recall that the mean is pulled towards the tail for skewed distributions

and is heavily influenced by outliers

③ using different scales / units

"the budget increased by \$200,000"

vs.

"the budget increased by 0.3%"

↑
in comparison to what?

④ detached statistics

"our brand of device runs 10% faster"

faster than what?

the competition?

the older version?

claims that don't specify
comparison is to

what the
can be suspect

⑤ implied connections

"eating fish may help to lower your cholesterol"

"studies suggest that ..."

"studies suggest that ..."

"taking vitamin C will prevent colds in some people"

note: this wording implies connections between variables that may not actually exist

⑥ misleading graphs

(we did this already)

⑦ faulty survey questions

- is the question loaded in some way

"should the province increase funding for higher education?"

vs

"should the province raise your taxes to increase funding for higher education?"

- is the intent of the question difficult to figure out?

- too wordy?

- technical terms?

- contains double negatives

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example: explain briefly why the claims of the following

example: explain briefly why the claims of the following studies may be suspect

① since most automobile accidents occur within 24 km of a person's residence, it is safer to make longer trips

- most trips are within 24 km, so that's where you'd expect most accidents to occur

② it is estimated that in Scanich, there are 100,000 raccoons. (totally made up number). Clearly, Scanich has a raccoon problem.

- is this the number we should expect? is this the number that other similar municipalities have?