

1.4 Biases

(1)

No study is perfect. Even a properly designed experiment can have biases.

Def A bias is the degree to which a procedure will over or underestimate a population's true parameter.

* Types of Bias

- Voluntary Response Bias will only capture the opinionated, or interested, and non-introverted person.
- Self-Interest Bias is the polling organization's sponsor making an attempt to make their product more desirable.

Ex Ford Pinto marketing questions will avoid safety issues and focus on affordability.
(History: Rear end collision frequently resulted in exploding gas tanks!)

Also, Companies polls frequently lead you along a certain path to their desired topic.

• Next consider

Ex People have known for 1000's of years that the Earth is round. Do you feel the earth is round?

this is an example of a

• **Leading Question Bias** is where the question being asked "begs the pollsters desired response"

Ex " Do you favor decreasing the heavy tax burdens that the middle-class families must suffer with? "

vs.

" Do you favor decreasing taxes on middle-class families? "

vs.

" Do you favor increasing taxes on middle class families so as to have better schools, more safety & better health? "

BTW: My motto is " The Properly Educated person will make the correct choices. "

• Non-Response Bias is that that occurs when people are unable to, or unwilling to, respond

EX Do you favor legalizing gambling in residential shopping centers?

The opinion of the non-responders might be that they oppose the topic being addressed but they do NOT want potential conflict or confrontation.

"Surveys with a lot of non-responses are biased"

• Sampling Bias occurs when the sampling process fails to cover all aspects or regions of a population.

EX You poll only in front of your church, synagogue or temple.

(Selection Bias = Sampling Bias but intentionally including or excluding segments of the population)

- To avoid all of these biases we must seek a truly simple random sample (SRS)

ie, every one (or every object) has to have an equally likely chance of being chosen.

- In addition to comprehensive coverage you also need to have sufficiently large data taken.
- Failure to meet SRS., large enough & independence IS

Garbage In → Garbage Out.

ex A poll discovered that College Seniors have better study habits than Freshmen have.
 at issue here: 20% to 30% of Freshman, Sophomore and Juniors have dropped out in part to poor study habits.

"If you have a room of people of varying heights, forcing the short people to leave will raise the average BUT it does not make anyone taller!"

First you have to get good data!