

Population Characteristics and Surveys

POLS 603
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Review

- Causal inference in social science
- Functions, treatments, and dependent variables
- Experiments
- Individual and average causal effects
- Fundamental problem of causal inference
- Random treatment assignment
- Difference-in-means estimator

Sample vs. Population

- Suppose we want to know the characteristics of an entire population, how can we do this?
 - Sample the entire population
 - Alternative: Survey a sample from the population. If done properly, we can use the sample to infer characteristics of the entire population

Population (N)

The entire group of individuals that a study is interested in

Sample (n)

A subset of observations from the target population

Representative Sample

A sample that accurately reflects the characteristics of the target population

Example

- Is this class a representative sample of:
 - all U.S. residents?
 - TAMU students?
 - POLS graduate students?
 - POLS 603 students?
- Suppose we want to measure the opinion of TAMU students. How could we collect a representative sample?
- If we select students at random, is it important that all of the students selected participate in the survey?

Challenges to Random Sampling

- A complete list of observations in the population is the **sampling frame**. Obtaining the sampling frame can be very difficult!
- **Unit nonresponse** occurs when randomly sampled individuals refuse to participate
- **Item nonresponse** occurs when individuals in your sample refuse to answer survey items
- When survey participants provide inaccurate responses, this is known as **misreporting**
- You may also hear nonresponse and misreporting called **noncompliance**

Simple Random Sample

Randomly choosing units from the population

Quota Sampling

Specifying fixed quotas of certain respondents to be interviewed such that the resulting sample characteristics resemble those of the population



Random Assignment vs. Random Sampling

- **Random Treatment Assignment**

- Who receives the treatment is decided through a random process
- Makes treatment and control groups comparable
- Enables valid estimates of the average treatment effect

- **Random Sampling**

- Sampling is decided through a random process
- Makes the sample representative of the population
- Enables valid estimates of population characteristics