

Statistics: Sampling

This short paper is about sampling. In inferential statistics, one may measure the characteristics of samples drawn from populations rather than measuring the characteristics of whole populations. For example, one may measure the height of a portion of adult males in the United States to estimate the height of all adult males in the United States. Why sampling? Sampling is faster and is less costly.

Types of Samples

There are different types of samples. For example,

- Simple random samples
- Stratified samples
- Convenience samples
- Voluntary response samples

Simple Random Samples

A simple random sample, or SRS, is a sample drawn from a population in which every member of the population has an equal chance of being drawn. For example, one may draw names from a bowl.

Small SRS

Although simple random samples are unbiased, small SRS may not be truly representative of the population. For example, in the United States, the adult population is about 48.5% male and 51.5% female.^[1] A small SRS, where $n=10$, may result in six males and four females. Obviously, 60% males and 40% females is not a truly representative sample.

Stratified Samples

A stratified sample is a sample made up of simple random samples drawn from different segments of a population. The proportion of each sample to the total is equal to the proportion of each segment to the population. For example, for a small stratified sample, where $n=10$, one may draw 5 males and 5 females, which is more representative of the population.

Convenience Samples

Convenience samples are easy but biased. For example, one may sample only

one's friends.

Voluntary Response Samples

Voluntary response samples are biased. Unlike simple random samples, not every member of the population has an equal chance of being sampled.

Endnote

Howden, L.M. & Meyer, J.A. (2011). *Age and sex composition: 2010*. Washington, DC: U.S. Census Bureau.