Chapter 7

The Logic of Sampling

TERMS OF SAMPLING

- Element: Unit in the sample
- Population: what the sample represents
- Study population: from which sample actually selected
- Sampling unit: subset of study population
- Sampling frame: List of sampling units
- Observation element: Unit actually selected in sample
- Parameters: The summarized description of given variables in a population
- Statistic: The summarized description of given variables in a sample. Based on this, you want to estimate parameters.

Why do researchers use sampling techniques?

- If you sample is representative, you can make inference and generalize your result.
- Also, economical and practical. Doing every individual in the population is not always good. Sometimes, many errors or mistakes can be produced in the middle of survey.

What is inference?

- Population is a precisely defined set of elements from which a sample is drawn: e.g. all students in UCR. (Here, you really wants to get the information at the population level, not the sample level)
- You selected only some of students among all students in UCR. And then, you has got the average age of them, say 20.1 yrs. This is a statistic.
- Based on this score, you have to estimate the population parameter (i.e., the average of UCR students, say 22.3).
- No wonder, even if your sample is representative, your guess should involve some amount of error. (i.e., the difference between 22.3 and 20.1)

Becky determined that the mean weekly working hours of all students at her community college, the population she wished to study, was 10.1 hour. This value is called:

A. Statistic
B. Inferential indicator
C. Confidence level
D. Descriptive indicator
E. parameter

A descriptive mathematical value that summarizes empirical data contained within a sample is called

A. a parameter
B. a statistic
C. a mean
D. a population
E. an indicator

What is the unit about which information is collected in a sample, and that provides the basis of analysis?

A. Element
B. Population
C. Study population
D. EPSEM

Sabrina sample states first, then churches, and then church members. Each of these three is called:

A. Error source
B. Sampling unit
C. Sampling elements
D. Sampling ratio
E. Sampling interval

When people selected for a sample are not typical or representative of the larger population from which they have been selected:

A. A parameter
B. A statistic
C. A negative confidence interval
D. A negative standard error
E. A bias

Sampling allows researchers to overcome the problem of

A. overcrowded laboratories
B. biased subject response
C. not having access to the whole population
D. not having access to the proper statistical methods

It is important to choose a representative sample of the population to maximize

A. significant results
B. group differences
C. generalizability of results
D. creative outcomes

Probability Sampling

e.g. Random: Every sample unit in the population has an equal chance of being selected. The sample represents the population well. The probability of sampling error can validly be computed statistically.

Probability Sampling

e.g. Stratified: The proportion of various types of sample units in the sample is controlled by selecting a series of subsamples of specified sizes.

e.g. Clustered: A series of physical or geographic areas are selected, then a specific number of sample units are selected proportionally from each “cluster.”

Non-probability Sampling

e.g. Convenience: Some sample units have a greater change of being selected than others. The sample's representation of the population is inferior. It is invalid to compute the probability of sampling error.

The sampling technique in which each individual has an independent and equal chance of being selected is

A. systematic sampling
B. convenience sampling
C. quota sampling
D. simple random sampling

Non-probability sampling is different from probability sampling because

A. The likelihood of any one member of the population being selected is known
B. the likelihood of any one member of the population being selected in unknown
C. each member has an equal and independent chance of being selected
D. each member refuses to be selected

Sandra wanted to do a study of women who had participated in extramarital affairs. Since there is no sampling frame listing all such women, she visited a women's group and asked for volunteers among those who had such experience. She then asked each of those women for the names of other possible participants.

A. Quota sampling
B. Purpose sampling
C. Snowball sampling
D. Simple random sampling

Periodicity is a particular problem for which sampling design?

A. Simple random
B. Systematic
C. Cluster
D. Stratified
E. None of the above

Stratification is based on which principle?

A. A large sample produces a smaller sampling error
B. The greater the proportion of a population selected, the lesser the error
C. A homogenous population produces samples with smaller sampling errors
D. It is better to select multiple smaller samples than one large sample

Seth wanted to study only students who do very well in class because such students would best help him test his theory. He asked 20 professors for the names of high achieving students and he then interviewed them. Which one?

A. A reliance on available subjects
B. Purposive
C. Snowball
D. Quota
E. Simple random sampling

The sampling technique which selects subjects in proportional units according to important characteristics is

A. stratified random sampling
B. Proportional stratified sampling
C. cluster sampling
D. sampling error

Martin wanted to do a study of recycling club members employing a random sample. There is no master list of recycling club members in the US. She has only enough money to study 70 clubs. What would be best?

A. Quota
B. Stratified
C. Cluster
D. Systematic

Sampling Error Revisited

- Sampling error results because those in the sample are not perfectly representative of the population as a whole. (True/ False?)
- Any sample of less than the entire population will virtually always have some sampling error. (True/ False?)
- The greater the sampling error, the lower the reliability and validity of the sample data. (True/ False?)

Sampling Error and Sample Reliability

- They move in the opposite direction.
- The bigger sample size, the smaller sampling error. Therefore, the bigger sampling reliability.
- The bigger population variance, the bigger sampling error. Therefore, the smaller sampling reliability.

Sampling error reflects:

A. The degree of error to be expected for a given sample design
B. The mistakes we make in picking our sample
C. The probability of selecting each element
D. The degree to which out interval is incorrect in systematic sampling