

1.6: Chapter 1 Key Terms

Average

also called mean or arithmetic mean; a number that describes the central tendency of the data

Blinding

not telling participants which treatment a subject is receiving

Categorical Variable

variables that take on values that are names or labels

Cluster Sampling

a method for selecting a random sample and dividing the population into groups (clusters); use simple random sampling to select a set of clusters. Every individual in the chosen clusters is included in the sample.

Continuous Random Variable

a random variable (RV) whose outcomes are measured; the height of trees in the forest is a continuous RV.

Control Group

a group in a randomized experiment that receives an inactive treatment but is otherwise managed exactly as the other groups

Convenience Sampling

a nonrandom method of selecting a sample; this method selects individuals that are easily accessible and may result in biased data.

Cumulative Relative Frequency

The term applies to an ordered set of observations from smallest to largest. The cumulative relative frequency is the sum of the relative frequencies for all values that are less than or equal to the given value.

Data

a set of observations (a set of possible outcomes); most data can be put into two groups: **qualitative** (an attribute whose value is indicated by a label) or **quantitative** (an attribute whose value is indicated by a number). Quantitative data can be separated into two subgroups: **discrete** and **continuous**. Data is discrete if it is the result of counting (such as the number of students of a given ethnic group in a class or the number of books on a shelf). Data is continuous if it is the result of measuring (such as distance traveled or weight of luggage)

Discrete Random Variable

a random variable (RV) whose outcomes are counted

Double-blinding

the act of blinding both the subjects of an experiment and the researchers who work with the subjects

Experimental Unit

any individual or object to be measured

Explanatory Variable

the **independent variable** in an experiment; the value controlled by researchers

Frequency

the number of times a value of the data occurs

Lurking Variable

a variable that has an effect on a study even though it is neither an explanatory variable nor a response variable

Mathematical Models

a description of a phenomenon using mathematical concepts, such as equations, inequalities, distributions, etc.

Nonsampling Error

an issue that affects the reliability of sampling data other than natural variation; it includes a variety of human errors including poor study design, biased sampling methods, inaccurate information provided by study participants, data entry errors, and poor analysis.

Numerical Variable

variables that take on values that are indicated by numbers

Observational Study

a study in which the independent variable is not manipulated by the researcher

Parameter

a number that is used to represent a population characteristic and that generally cannot be determined easily

Placebo

an inactive treatment that has no real effect on the explanatory variable

Population

all individuals, objects, or measurements whose properties are being studied

Probability

a number between zero and one, inclusive, that gives the likelihood that a specific event will occur

Proportion

the number of observations in the category or quantitative interval of interest divided by the total number of observations in the sample

Qualitative Data

See Data.

Quantitative Data

See Data.

Random Assignment

the act of organizing experimental units into treatment groups using random methods

Random Sampling

a method of selecting a sample that gives every member of the population an equal chance of being selected.

Relative Frequency

the ratio of the number of times a value of the data occurs in the set of all outcomes to the total number of outcomes

Representative Sample

a subset of the population that has the same characteristics as the population

Response Variable

the **dependent variable** in an experiment; the value that is measured for change at the end of an experiment

Sample

a subset of the population studied

Sampling Bias

not all members of the population are equally likely to be selected

Sampling Error

the natural variation that results from selecting a sample to represent a larger population; this variation decreases as the sample size increases, so selecting larger samples reduces sampling error.

Sampling with Replacement

Once a member of the population is selected for inclusion in a sample, that member is returned to the population for the selection of the next individual.

Sampling without Replacement

A member of the population may be chosen for inclusion in a sample only once. If chosen, the member is not returned to the population before the next selection.

Simple Random Sampling

a straightforward method for selecting a random sample; give each member of the population a number. Use a random number generator to select a set of numbers. These randomly selected numbers identify the members of your sample.

Statistic

a numerical characteristic of the sample; a statistic estimates the corresponding population parameter.

Statistical Models

a description of a phenomenon using probability distributions that describe the expected behavior of the phenomenon and the variability in the expected observations.

Stratified Sampling

a method for selecting a random sample used to ensure that subgroups of the population are represented adequately; divide the population into groups (strata). Use simple random sampling to identify a proportionate number of individuals from each stratum.

Survey

a study in which data is collected as reported by individuals.

Systematic Sampling

a method for selecting a random sample; list the members of the population. Use simple random sampling to select a starting point in the population. Let $k = (\text{number of individuals in the population}) / (\text{number of individuals needed in the sample})$. Choose every k th individual in the list starting with the one that was randomly selected. If necessary, return to the beginning of the population list to complete your sample.

Treatments

different values or components of the explanatory variable applied in an experiment

Variable

a characteristic of interest for each person or object in a population

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