

1.6: Key Terms

Key Term	Definition
Average	also called mean or arithmetic mean; a number that describes the central tendency of the data
Categorical Variable	variables that take on values that are names or labels, also known as qualitative variables
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.
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
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
Informed Consent	Any human subject in a research study must be cognizant of any risks or costs associated with the study. The subject has the right to know the nature of the treatments included in the study, their potential risks, and their potential benefits. Consent must be given freely by an informed, fit participant.
Institutional Review Board	a committee tasked with oversight of research programs that involve human subjects
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.

Key Term	Definition
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, also known as quantitative variable
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 successes divided by the total number 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 number 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.

Key Term	Definition
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 labels. These randomly selected labels 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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