

7.6: Key Terms

Average

a number that describes the central tendency of the data; there are a number of specialized averages, including the arithmetic mean, weighted mean, median, mode, and geometric mean.

Central Limit Theorem

Given a random variable with known mean μ and known standard deviation, σ , we are sampling with size n , and we are interested in two new RVs: the sample mean, \bar{X} . If the size (n) of the sample is sufficiently large, then $\bar{X} \sim N(\mu, \frac{\sigma}{\sqrt{n}})$. If the size (n) of the sample is sufficiently large, then the distribution of the sample means will approximate a normal distributions regardless of the shape of the population. The mean of the sample means will equal the population mean. The standard deviation of the distribution of the sample means, $\frac{\sigma}{\sqrt{n}}$, is called the standard error of the mean.

Finite Population Correction Factor

adjusts the variance of the sampling distribution if the population is known and more than 5% of the population is being sampled.

Mean

a number that measures the central tendency; a common name for mean is "average." The term "mean" is a shortened form of "arithmetic mean." By definition, the mean for a sample (denoted by \bar{x}) is

$$\begin{aligned}\bar{x} &= \frac{\text{Sum of all values in the sample}}{\text{Number of values in the sample}}, \text{ and the mean for a population (denoted by } \mu \text{) is} \\ \mu &= \frac{\text{Sum of all values in the population}}{\text{Number of values in the population}}.\end{aligned}\tag{7.6.1}$$

Normal Distribution

a continuous random variable with pdf $f(x) = \frac{1}{\sigma\sqrt{2\pi}}e^{-\frac{(x-\mu)^2}{2\sigma^2}}$, where μ is the mean of the distribution and σ is the standard deviation.; notation: $X \sim N(\mu, \sigma)$. If $\mu = 0$ and $\sigma = 1$, the random variable, Z , is called the standard normal distribution.

Sampling Distribution

Given simple random samples of size n from a given population with a measured characteristic such as mean, proportion, or standard deviation for each sample, the probability distribution of all the measured characteristics is called a sampling distribution.

Standard Error of the Mean

the standard deviation of the distribution of the sample means, or $\frac{\sigma}{\sqrt{n}}$.

Standard Error of the Proportion

the standard deviation of the sampling distribution of proportions

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