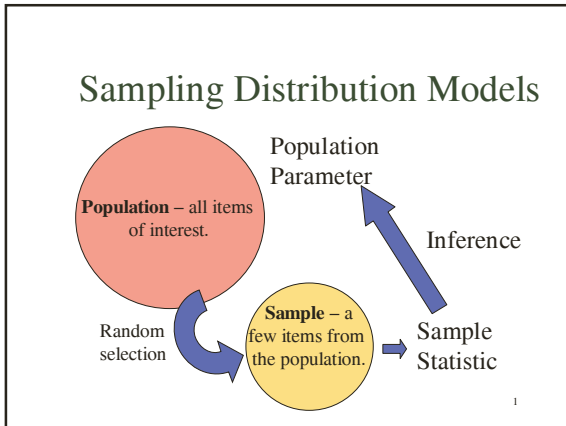


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Proportions

- * So far we have used the sample proportion, \hat{p} , to make inferences about the population proportion p .
- * To do this we needed the distribution of \hat{p} .

2

Distribution of \hat{p}

- * Shape: Approximately Normal if conditions are met.
- * Center: The mean is p .
- * Spread: The standard deviation is

$$SD(\hat{p}) = \sqrt{\frac{p(1-p)}{n}}$$

3

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Categorical Variable

- * When the response variable of interest is categorical, the parameter is the proportion of the population that falls in a particular category, p .

4

Quantitative Variable

- * When the response variable of interest is quantitative, the parameter is the mean of the population, μ .

5

Means

- * We will use the sample mean, \bar{y} , to make inferences about the population mean, μ .
- * To do this we needed the distribution of \bar{y} .

6

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Simulation

www.ruf.rice.edu/~lane/stat_sim/sampling_dist/index.html

7

Simulation

- * Simple random sample of size $n=5$.
- * Repeat many times.
- * Record the sample mean, \bar{y} , to simulate the distribution of \bar{y} .

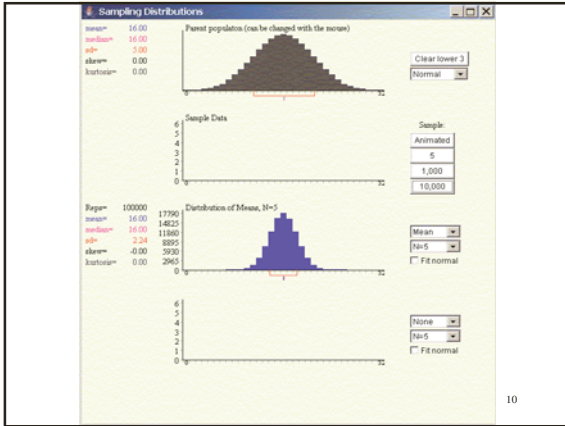
8

Simulation

- * Different samples will produce different sample means.
- * There is variation in the sample means.
- * Can we model this variation?

9

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Population

- * Shape: Basically normal
- * Center: Mean, $\mu = 16$
- * Spread: Standard Deviation, $\sigma = 5$

Distribution of \bar{y}

- * $n = 5$
- * Shape: Normal
- * Center: Mean, $\mu = 16$
- * Spread: Standard Deviation,

$$SD(\bar{y}) = \frac{\sigma}{\sqrt{n}} = \frac{5}{\sqrt{5}} = 2.24$$
