Sampling Distributions

Definitions, terminology, notation

Parameter	Number that describes a characteristic of a population
Statistic	Number that describes a characteristic of a sample
μ	Mean of a population
$\bar{x}$	Mean of a sample
σ	Standard deviation of a population
s	Standard deviation of a sample
p	Proportion of occurance of a parameter within a population
$\hat{p}$	Proportion of occurance of a statistic within a sample

Sample Proportions

Sampling Distribution — Distribution of a statistic ($\bar{x}$, for example) in many samples of a population

$$\hat{p} = \frac{\text{\# successes}}{\text{size of sample}} = \frac{X}{n}$$

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

p - proportion of successes in population; n - sample size

Validity requirements

These equations are valid if:

10% rule

$n \le 0.1N$

Large counts

$np \ge 10$

$n(1-p) \ge 10$

Sample Means

If you take an SRS of a large population (obeying the 10% rule):

$$\mu_{\bar{x}} = \mu$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}}$$

Calculator Note

On your graphing calculator, the normalcdf function calculates the probability that a variable will fall within a particular range, given the population mean and sample standard deviation.