**Sampling Distribution of Proportions**

(1) Mean of the Sampling Distribution:

* If p-hat is an unbiased estimator of p (which we assume it is…)
* $μ\_{\hat{p}}=ρ$

(2) Spread/Variability of Sampling Distribution:

* The larger the sample size, the smaller the standard deviation of the sampling distribution (large sample size = less variability)
* **IF** the population is at least 10 times the sample size…..
* $σ\_{\hat{p}}= \sqrt{\frac{ρ (1-ρ )}{n}}$

(3) Shape of the Sampling Distribution:

* **IF the population is Normally distributed**, then the Sampling distribution is Normally distributed.
* **OR…**
* **IF the sample size is large enough** (n$ρ $≥ 10 and n(1-$ρ$) ≥ 10) The overall shape of the distribution is approximately normal.

**Sampling Distribution of Means**

(1) Mean of the Sampling Distribution:

* If x-bar is an unbiased estimator of p (which we assume it is…)
* $μ\_{\overbar{x}}= μ$

(2) Spread/Variability of Sampling Distribution:

* The larger the sample size, the smaller the standard deviation of the sampling distribution (large sample size = less variability)
* **IF** the population is at least 10 times the sample size…..
* $σ\_{\overbar{x}}= \frac{σ}{\sqrt{n}}$

(3) Shape of Sampling Distribution:

* **IF the population is Normally distributed**, then the Sampling distribution is Normally distributed.
* **OR…**
* **IF the sample size is large enough** (depends on shape of population, but generally if **n** ≥ **30**) the overall shape of the distribution is approximately normal due to the **central limit theorem**.