Stat 145, Fri 19-Mar-2021 -- Fri 19-Mar-2021 Biostatistics Spring 2021

Friday, March 19th 2021

Wk 7, Fr

Topic:: Central Limit Theorem

Central Limit Theorem

In summary, here is the take-away from the **Central Limit Theorem**.

Suppose you have a random sample of size n that is either

· i.i.d., or (like sampling us replacement)

• an SRS, with the sample size n being no more than 10% of the size of the population.

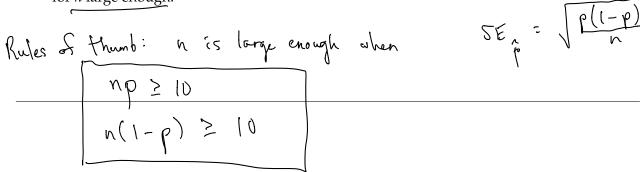
In the case that

1. the variable under consideration is quantitative, having population mean μ and standard deviation σ , then the sampling distribution for the sample mean \overline{X} is approximately Norm $(\mu, \sigma/\sqrt{n})$ for n large enough.

Can for σ sampling Jost for \overline{X} .

SE \overline{X} = \overline{X}

2. the variable under consideration is binary categorical, having population proportion p, then the sampling distribution for the sample proportion \widehat{p} is approximately Norm $(p, \sqrt{p(1-p)/n})$ for n large enough.



Since

- null distributions
- randomization distributions
- bootstrap distributions

are all specialized versions of sampling distributions, then so long as the sample statistic in question is the sample's $mean \ \overline{X}$ or the sample $proportion \ \widehat{p}$, we can expect the CLT to apply to these as well.

Explorations using apps at

https://onlinestatbook.com/stat_sim/sampling_dist/index.html

https://shiny.calvin.edu:3838/scofield/samplingDists/ https://shiny.calvin.edu:3838/scofield/cltProportions/