Significance Level Tutorial

Significance Level: the level at which any \(p\)-value less than this level is considered significant.

\(P < 0.05\) significance level in public health is the norm. This means that, based on the sample, the chance of wrongly rejecting a null hypothesis that is true is less than a 5\% (type 1 error).

\[ P \text{Value} = \text{the exact significance of the data.} \]

- When interpreting your results for this class anything greater than .05, including .051 should lead you to fail to reject the null hypothesis. Anything .05 or lower should lead you to reject the null hypothesis.

Having a \(p\) value of .01 rather than .05 does not make the observation "more" significant as it could be a reflection of the sample size and not the differences observed.

**Concept of the Central Limit Theorem:** Important when dealing with large sample sizes

- Sample size \((n)\) is greater than or equal to 30
- Use when sample size is less than 30
- Small sample sizes use \(t\)-distribution instead of the \(z\)-distribution
- Use the degrees of freedom \((df)\) which is sample size less one when we use confidence intervals based on \(t\)-distribution.
- Degrees of freedom is defined as \(n-1\)
- Use \(t\)-distribution when the population standard deviation is unknown
- Then use the \(t\)-distribution to account for the extra-variability.