Biostatistics
Week XIII

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ACIBADEM
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ÜNİVERSİTESİ

Conflicting Results

- Researcher A conducts a study comparing the effects an intervention vs. placebo on reducing weight
  - 5 kg reduction among the intervention group ($p = 0.01$)
- Researcher B conducts a similar study comparing the effects an intervention vs. placebo on reducing weight
  - 5 kg reduction among the intervention group ($p = 0.35$)

Statistical Power

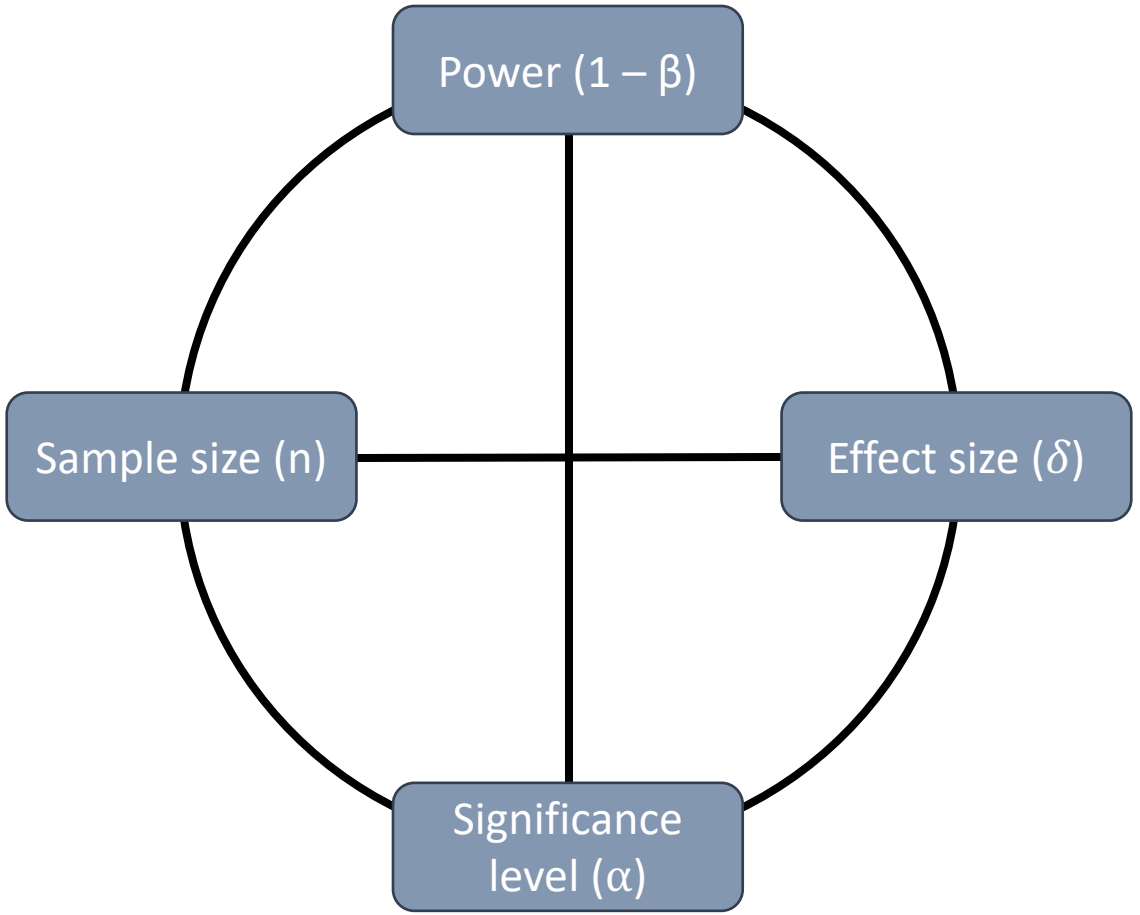
H_0	Decision	
	Fail to reject	Reject
True	Correct decision	**Type I Error** α
False	**Type II Error** **ß**	Correct decision

- **Statistical power** = $1 - \beta$
  - P(reject H_0| H_0 is false)

Statistical Power

- Power is affected by:
  - Significance level (α)
  - Effect size (δ)
  - Sample size (n)

Power Analysis/Sample Size Calculation



- Given any three, the fourth can be determined

Default Values

- Power = usually **0.80**, 0.90
- Significance level = usually **0.05**, 0.01, 0.001
- Effect size
  - Literature review
  - Pilot study
  - Cohen’s recommendations

Brief Summary

- Given any three of the following, the fourth can be determined:
  - Power
  - Significance level
  - Effect size
  - Sample size
- Determining sample size prior to starting a study is important
  - Too small of a sample size can under detect the effect of interest in your experiment
  - Too large of a sample size may lead to unnecessary wasting of resources