ASSIGNMENT

ANKUSH SHARMA

* Researchers want to compare for a planned RCT the sample sizes needed (sig level of 0.05; type =two- sided) to detect a difference with a power of 90% under the assumption of
  1. a small effect size (0.2)

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* 1. a medium effect size (0.5)

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* 1. a large effect size (0.8).

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* 1. What is the power at large effect size when 36 subjects are enrolled?

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* Researchers want to compare the sample sizes needed within each group when comparing 5 groups using a one-way ANOVA in a planned RCT (sig level of 0.05) aiming for a power of 90% with
  1. a small effect size (0.2)

n = 77.98047, # subjects = 389.9023

* 1. a medium effect size (0.5)

n = 13.31145, # subjects = 6.55725

* 1. a large effect size (0.8)

5.853948, # subjects = 29.26974

* 1. What is the power when 40 subjects are enrolled?

Power = 0.9793113

* In a population study in Western Africa with an incidence proportion of infectious gastroenteritis of 30% in two neighboring villages a NGO implements a membrane filtration device cleaning water. Considering 150 villagers in each village, what effect size can be detected with a power of 80% at a significance level of
  1. 0. 01?

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* 1. 0.05?

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* ANOVA: Load the [NHANES subsetPreview the document](https://yu.instructure.com/courses/39395/files/1283376/download?wrap=1) into your R environment.
  1. Stratify the sample population in SBP tertiles.

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* 1. compare the age of subjects in the respective tertiles.

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* 1. compare the age of subjects applying Bonferroni correction.

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**CODE**

library("pwr")

#1) Researchers want to compare for a planned RCT the sample sizes needed (sig level of 0.05)

#to detect a difference with a power of 90% under the assumption of

pwr.t.test(power = 0.9, d=0.2,sig.level=.05,alternative="two.sided")

pwr.t.test(power = 0.9, d=0.5,sig.level=.05,alternative="two.sided")

pwr.t.test(power = 0.9, d=0.8,sig.level=.05,alternative="two.sided")

pwr.t.test(n=18, d=0.8,sig.level=.05,alternative="two.sided")

#2) Researchers want to compare the sample sizes needed within each group when comparing 5 groups using a one-way ANOVA

#in a planned RCT (sig level of 0.05) aiming for a power of 90% with

pwr.anova.test(k=5,f=.2,sig.level=.05,power=.9)

pwr.anova.test(k=5,f=.5,sig.level=.05,power=.9)

pwr.anova.test(k=5,f=.8,sig.level=.05,power=.9)

pwr.anova.test(k=5,f=.8,sig.level=.05,power=.9)

pwr.anova.test(k=5,f=.8,sig.level=.05,n=8)

#3) In a population study in Western Africa with an incidence proportion of infectious gastroenteritis of 30% in two neighboring villages a

#NGO implements a membrane filtration device cleaning water. Considering 150 villagers in each village, what effect size can be detected with

#a power of 80% at a significance level of

pwr.2p.test(n=45,sig.level=0.01,power=0.80)

pwr.2p.test(n=45,sig.level=0.05,power=0.80)

#4) ANOVA: Load the NHANES subset into your R environment.

#Stratify the sample population in SBP tertiles.

#ANOVA

pathname<-"C:/BME/Sem 2/Biostat/Class 10.csv"

df<-read.csv("C:/BME/Sem 2/Biostat/Class 10/lab.csv")

ls(df)

library(dplyr)

df$SBP\_cat<-ntile(df$SBP,3)

df$SBP\_cat<-factor(df$SBP\_cat)

summary(df$SBP\_cat)

library(doBy)

summaryBy(SBP~SBP\_cat,data=df,FUN=c(min, max))

aov(SBP~SBP\_cat,data=df)

#compare the age of subjects in the respective tertiles.

summary(aov(age~SBP\_cat,data=df))

#compare the age of subjects applying Bonferroni correction.

anova\_example<-aov(age~SBP\_cat,data=df)

TukeyHSD(anova\_example)

pairwise.t.test(df$age,df$SBP\_cat,p.adjust.method = "bonf" )