Learning Objectives

* Construct and interpret confidence intervals for the population proportion
* Perform and interpret a one-sample Z test for one proportion
* Calculate and interpret odds ratios
* Perform and interpret a chi-squared test of independence/homogeneity
* Perform and interpret Fisher’s Exact Test

Dataset and description

Dataset: (Attached)

A description of the variables is available here: [Hypoxia Data Dictionary.pdf](https://canvas.pitt.edu/courses/159938/files/11090874?wrap=1)[Download Hypoxia Data Dictionary.pdf](https://canvas.pitt.edu/courses/159938/files/11090874/download?download_frd=1)

This is a study of intraoperative mean arterial pressure in obstructive sleep apnea patients undergoing weight loss (bariatric) surgical procedures.  Participants are 281 adult patients diagnosed with obstructive sleep apnea within two years prior to their bariatric surgery. In addition to mean arterial pressure, the dataset includes information on demographics, nocturnal oxygen status, comorbidities, type and duration of surgery, vasopressors, and heart rate.  The source of these data is the study by Turan et al. “Relationship between Chronic Intermittent Hypoxia and Intraoperative Mean Arterial Pressure in Obstructive Sleep Apnea Patients Having Laparoscopic Bariatric Surgery”. *Anesthesiology* 2015; 122: 64-71.

Directions

Part 1: One proportion

Perform a one-sample Z test using an 0.05 significance level to see if the prevalence of coronary heart disease (CAD) in this population is greater than the U.S. prevalence of 7.2%. In your write up, include the following:

* a table of CAD counts
* descriptions of the null and alternative hypotheses in **words** (not symbols)
* check the conditions to be able to use the test
* the value of the Z test statistic (careful here!)
* the p-value
* your decision about the null hypothesis (reject/fail to reject)
* a conclusion about the hypothesis test
* an interpretation of the matching confidence interval

Part 2: Contingency Table

Perform a chi-squared test of homogeneity using an 0.05 significance level to see if the rate of coronary artery disease differs by sex at birth (variable name: female). In your write up, include the following:

* a table of counts of CAD by sex
* descriptions of the null and alternative hypotheses in **words** (not symbols)
* check the conditions to be able to use the test
* the value of the test statistic
* the p-value
* your decision about the null hypothesis (reject/fail to reject)
* a conclusion about the hypothesis test

Calculate and interpret the odds ratio for having CAD for females compared to males.

Also perform a Fisher's exact test and report only the p-value. Does this change the overall conclusion from above?