Effect Size, Power, and Type I Error

January 10, 2019

1 Time in Hospital and Effect Size

In this exercise, we will use the data in the file `diabetes_data_clean.csv` to answer a few questions about patients time in the hospital. This will allow us to investigate measures of effect size when doing mean comparisons.

1.1 Urgent and Emergency Admissions

Suppose that we are interested in the extent to which patients' time in the hospital differs according to the admission type. In particular, suppose we are interested those patients admitted as either *"Urgent"*, *"Emergency"*, or *"Elective"*.

Using the tests and methods we have discussed previously, please answer the following questions:

1. Which group tended to stay in the hospital longer?

2. Is the difference statistically significant?

3. Using the appropriate measure of effect size, how would you describe the magnitude of the effect?

4. What does a post-hoc test with Type I error correction indicate?[1]

Note that this exercise has some similarities with Exercise 3.1 in the lab on hypothesis tests. You might want to consult the solutions for that exercise.

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[1]Feel free to select any appropriate post-hoc test multiple comparison procedure we have discussed (e.g., Bonferroni, TukeyHSD, etc.)

1.2 Diabetes Medications

Suppose now that we are interested in whether or not patients taking diabetes medication—as indicated by the `diabetesMed` variable—tend to stay as long as those who are not taking diabetes medication. Using the tests and methods we have discussed previously, please answer the following questions:

1. Which group tends to stay in the hospital longer (i.e., taking diabetes medication and not taking medication)

2. Is this a significant difference?

3. Using a measure of effect size, what would you say is the magnitude of the difference?

Generate a plot illustrating the difference between the two groups.