Project 0: Examining Dental Data

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Introduction

Research Question:

Does treatment result in an average lower pocket depth and an average lower attachment loss after one year?
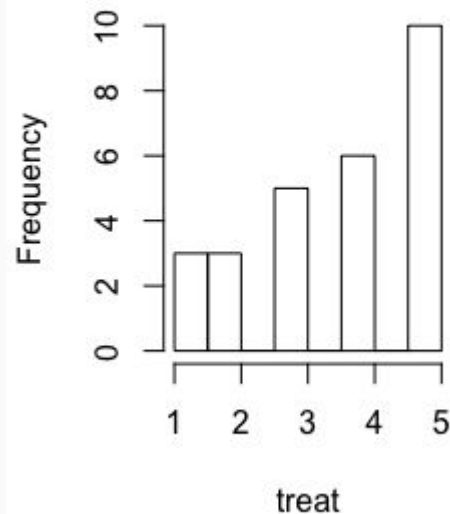
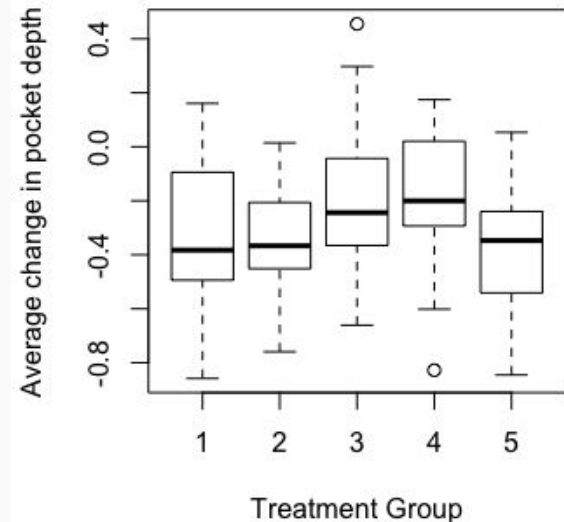Statistical Hypothesis:

H0: $u1=u2=u3=u4=u5=0$

Data Used

-> 130 patients randomized to 5 treatment groups

-> Evenly dispersed throughout treatment groups

-> There is 1 missing age, 1 missing smoker and 27 missing 1-year measurements

-> Two possible outliers in the attachment loss group

Analysis Technique

-> We know that subjects are randomized to treatment groups

-> Tested models with and without baseline measurement as a covariate

-> Went with the model with the lowest AIC (including baseline as a covariate)

-> Used the difference in measurements as my outcome

Summary of Results

Attachment Loss:

-> No significant associations between any of the treatments and a decrease in average attachment loss

Pocket Depth:

-> There is a significant association between the low treatment group (Treatment group 3) and an INCREASE in average pocket depth

Final Models:

- Hybrid
- attach_fit <- lm(attach_diff ~ factor(trtgroup) + attachbase,data = dental_data)
- pd_fit <- lm(pd_diff ~ factor(trtgroup) + pdbase,data = dental_data)

Conclusion

The treatment does not look like it is effective in reducing average attachment loss and pocket depth after 1 year.

However, we should consider the limitations of this study:

-> data from 1 clinic

-> predominantly white population

-> the NA's were not distributed evenly which further reduced our sample size