

STAT 796: Homework 7

Due **Monday**, March 18 at 11:59pm on Canvas.

1. Using the ICU dataset, fit a logistic regression model using vital status as the outcome. As predictors, include only visit type (**type**: elective or emergency), service (**service**: medical or surgical), and their interaction. You should obtain unusual estimates, and calculating confidence intervals will fail. Explain what is happening, and why you obtain irregular results.
2. Using the ICU dataset, investigate the potential relationship between CPR being provided prior to ICU admission (**cpr**) and vital status (**died**).
 - a. Identify potential confounder variables from among the measured variables available in the ICU dataset. Briefly explain your rationale for why each variable is a confounder.
 - b. Identify at least one confounder that is not present in the dataset. Explain why this variable is a confounder, and how you would measure it if you conducted the study (questionnaire, blood draw, medical records check, etc.).
 - c. Based upon your response to (a), what model will you fit? If adding variables not in (a), or excluding variables listed in (a), provide a brief explanation why.
 - d. Fit your model described in (c). In no more than three sentences, answer the question of interest: Is there a relationship between CPR prior to ICU admission and death at discharge?
 - e. After fitting your model, list at least four exploratory/sensitivity analyses you would like to run. Explain what you would expect to learn from each exploratory analysis. You do not need to run the analyses.
3. Identify a published manuscript related to your research interests that analyzes an association with a binary outcome.
 - a. Provide the citation for the manuscript.
 - b. Describe the question being addressed in the paper, including the exposure of interest and the outcome.
 - c. How do the authors quantify the exposure of interest? Explain how it is measured, and how it is represented (i.e. categorical, continuous, or binary).
 - d. What statistical method is used to analyze the question of interest?
 - e. In addition to the exposure of interest and the outcome of interest, what variables are included in the analysis? What explanation do the authors provide for including these variables?