**ATCR Biostatistics 209** **Spring 2024**

# REPEATED MEASURES HOMEWORK

## Hwk #4 (Repeated measures part 1) due 5/14/23

For the problems in this homework use the data set hers_subset_nodm.dta, available on the course web site. This is a subset of the data from the Heart and Estrogen/Progestin Study (HERS - Hulley, *et al*, 1998, *JAMA*), containing only those women with no diabetes at baseline and a few of the variables. HERS was a randomized hormone replacement study coordinated out of UCSF (and a precursor to WHI) for prevention of heart attacks among post-menopausal women with existing heart disease. For the first two questions, we are going to be interested in whether exercise seems to be related to glucose (for background see Section 4.1 of the text). The variables are described in the variables window, but you may need to expand it to see the descriptions.

1. (6 points)
    a. Reproduce the values in Table 4.1 by restricting the analysis to visit 0 (baseline).
    b. Now repeat the analysis in a., but using the data from all the visits and accommodating the correlation. How to the results compare? Suggest reasons for the differences.
    c. Build a model incorporating predictors as in Table 4.2 of the text. (You have average drinks per week, but not the variable drinkany).
    d. Graph the residuals to check for gross model violations. Provide a brief discussion of what you find and how you would address any problems (no need to do further analyses).
2. (4 points) Consider the effect of the treatment (variable name group) on the change in glucose over time. Model the changes over time as linear in visit and fit a model allowing different trends over time for the two treatment groups.
    a. What is the interpretation of each of the coefficients in the model?
    b. Is there a statistically significant effect of treatment on glucose?
    c. Is there evidence for lack of linearity in the response over time?
3. (3 points) Using the HERS data, fit a model with the outcome of whether or not someone is on hypertension medication (htnmeds). Use predictors of age, BMI and exercise >3 times per week (exercise).
    a. Provide interpretations of each of the coefficients.