

# Biostatistics 209 Homework #1

Due April 14, 2009 *by hardcopy in class*

*For Questions 1-3, use the dataset pbc.dta.*

Question 1: Fit a Cox proportional hazards model to the PBC data with terms for histology and bilirubin

- (a) Adjusting for bilirubin, does histology appear to be predictor of risk of death?
- (b) Implement the likelihood ratio test to verify (a).
- (c) Calculate the HR and its confidence interval of death comparing Grade 2 histology to Grade 1.
- (d) Calculate the HR and its confidence interval of death comparing Grade 3 histology to Grade 2.
- (e) Calculate the HR and its confidence interval of death comparing Grade 4 histology to Grade 3.
- (f) Calculate a test for trend and interpret the result.  
*Note p. 82 of the textbook gives the appropriate linear combination for the trend test.*

Question 2: In the same model as you used in Question 1,

- (a) Calculate the HR and its confidence interval of death for every standard deviation increase in bilirubin.
- (b) How many units (mg/dL) increase in bilirubin will result in a HR of death in the same magnitude as a histology of Grade 2 compared to Grade 1?

Question 3: In the same model as you used in Question 1, calculate the likelihood ratio test for the effect of bilirubin (adjusting for histology). How do the results compare to the Wald test (aka Z test)?

*For Question 4, use the dataset actg019.dta*

Question 4: Do problem 7.6 in the textbook.