

## HOMEWORK #5

(Due Thursday, February 21 in class)

### Reading:

H&L: Finish reading Chap. 7 (§7.3-7.4)  
B&D II: §5.6

### Articles:

### Homework:

- 1) Fit a stratified Cox model to the herpes data using the treatment (acyclovir) group as a ‘true’ stratification variable and time from end of primary episode to first recurrence/last seen as the time variable. Include in the model terms for duration of the primary lesion and its interaction with acyclovir group, considered as a factor. Then fit separate models to each of the first three acyclovir groups that contain duration of the primary lesion as the sole regression variable. Identify the relationship between the regression coefficients estimated in the separate analyses and those in the stratified analysis and explain why it occurs.
- 2) Now repeat the exercise in problem #1 but include in all of the models the additional terms HSV type (as a factor), gender and age. Are the relationships between the regression coefficients for duration of the primary lesion and its interaction with acyclovir group the same as before? Explain why you see what you see.
- 3) Still using the herpes dataset, refit the model from HW4, problem #3 but now accounting for staggered entry due to duration of the primary lesion by starting follow-up at its end. Compare the coefficient for duration of primary lesion in this model to the one obtained in HW4, #3. Explain the differences you see and discuss their interpretation?
- 4) The Welsh nickel refinery workers data discussed in class are available on the course website. Construct a categorical variable AFEG for age at first employment in three categories: 10-24, 25-29 and 30-54 years. Using time since first employment as the “fundamental time variable”, plot the cumulative hazard of nasal sinus cancer death for these three age groups. Now change the fundamental time variable to (current) age; note this still involves left truncation at the age at entry to the study. Again plot the cumulative hazard of nasal sinus cancer death for the three age-at-hire groups. Compare the two plots and discuss in relation to the results of the regression analysis shown on p. 8.23 and the corresponding figures for mesothelioma occurrence in asbestos insulation workers shown on p. 8.33 of the lecture notes.