QAC 314 - Survival Analysis

Syllabus: Spring 2016

General Information

Instructor: Valerie L. Nazzaro  Email: vnazzaro@wesleyan.edu
Office: Allbritton 019  Office Hour: Friday 10-11am and by appointment
Classroom: Allbritton 204  Class Time: Tu/Th 10:30-11:50 am

Course Description

Survival or Event History Analysis focuses on modeling and analysis of time-to-event data—e.g., onset of a disease, duration of a strike, failure of a biological, a physical or a social system, recidivism, etc. The course introduces students to survival and hazard functions, the analysis of censored data using parametric and non-parametric estimation methods, and compares survival curves for different groups and discusses competing risk models. The emphasis is on the applications of the different methods with the objective of broadening computational skills in R and/or SAS, and to reinforce statistical writing and communication. These skills will be applied to a variety of problems in political science, public health, engineering, and medicine.

Course Materials

- Textbooks
- Software: The use of the R statistical environment (downloadable from cran.rstudio.com/) with the RStudio interface (downloadable from rstudio.org) is used to perform the analyses within this course. Although this program is available on all campus computers, you may want to download both R and R Studio to your personal computer.

Course Topics

The course schedule and readings will be maintained on Moodle. The following topics will be covered:

- Introduction to survival data, censoring and truncation, hazard and survival functions
• Kaplan Meier estimates of the survival function and comparison of groups (Log-rank and Wilcoxon)

• The Cox Proportional Hazards Model, effects of covariates on survival, fitting models, tests for significant effects

• Modeling with Cox Proportional Hazards Model, assessing and understanding assumptions, goodness of fit

• Stratification to incorporate time-varying covariates

• Parametric survival analysis, accelerated failure-time distributions

GRADING

• **HOMEWORK AND IN-CLASS ASSIGNMENTS (60%)**: A large portion of the class requires you to actually work with data. Homework and in-class assignments are important ways of reinforcing techniques and tools learned in class. Homework will be posted in Moodle and announced during class. You are welcomed and encouraged to collaborate with your classmates, but you must write up your own code and provide your own output and unique write-up - otherwise you will not receive credit. Please note that assignments are due before 11:55 pm on the due date. One assignment will be accepted up to 72 hours late. After that, you will not receive credit for late assignments.

• **EXAM (20%)**: There will be 1 take home exam given on around the 5th week of class. This is an individual exam and you are not permitted to discuss the exam with any other student or person. All clarification questions should be directed to me. All other resources may be used.

• **FINAL ANALYSIS (20%)** The final analysis is a demonstration of your knowledge and fluency with survival data analysis. You are welcome to analyze your own data (as long as it has the necessary features of survival data) or you will be assigned a dataset. You will analyze the data with the techniques you deem appropriate and communicate your findings. This must be done individually. More instructions on your final analysis will be given on March 1st.

Honor Code

Wesleyan University expects all students to be honest and committed to the principles of academic and intellectual integrity in their preparation and submission of course work and examinations. Students and faculty at Wesleyan University are part of an academic community defined by its commitment to scholarship, which depends on scrupulous and attentive acknowledgement of all sources of information, and honest and respectful use of college resources.
ACADEMIC ACCOMMODATIONS

Wesleyan University is committed to ensuring that all qualified students with disabilities are afforded an equal opportunity to participate in and benefit from its programs and services. To receive accommodations, a student must have a documented disability as defined by Section 504 of the Rehabilitation Act of 1973 and the ADA Amendments Act of 2008, and provide documentation of the disability. Since accommodations may require early planning and generally are not provided retroactively, please contact Disability Resources as soon as possible. If you believe that you need accommodations for a disability, please contact Dean Patey in Disability Resources, located in North College, Room 021, or call 860/685-5581 for an appointment to discuss your needs and the process for requesting accommodations.

FINAL NOTES

I am looking forward to a great semester! Please know that feedback on class is always welcomed and appreciated. I hope you all find the time to visit my office at least a few times throughout the semester.