PHS651 (Fall 2015)
ADVANCED REGRESSION METHODS FOR POPULATION HEALTH

Goals: The course “Advanced Regression Methods for Population Health” is designed to demonstrate the modern statistical methods for longitudinal data analysis. The course will bridge the gap between statistical theory and application by presenting a comprehensive account of models and case studies for diverse types of longitudinal data arising in health sciences. Related topics on observational data such as missing data and weighting will also be covered. The main emphasis is on the practical rather than the theoretical aspects of correlated data analysis, to generate deeper understanding of the principles underlying statistical estimation. Data sets from studies in health-related fields will be used as examples. Students of the course will be expected to:

1. Extend the knowledge of regression analysis beyond ordinal models
2. Describe the correlated feature of longitudinal and clustered data
3. Construct linear and generalized linear models for longitudinal data
4. Understand the assumptions, estimation and inference procedures
5. Implement diagnostic tools to assess model fitting
6. Apply the analysis procedures to the real data longitudinal studies
7. Interpret and present the analytic outputs substantively

Background required: A prior course in ordinary and logistic regression analysis is an absolute prerequisite. Knowledge of calculus, matrix manipulations, general linear models, statistical theory and the SAS/R packages are helpful.

Assignments and exams: Each section of the course will be accompanied by a homework exercise, to be completed in 1 or 2 weeks. Homework will receive full credit by being handed in and any comments responded to. There will be in-class midterm exams on October 12 and November 16 and a take-home final exam. Grade is based on 25% homework, 30% midterms, and 45% final exam.

Readings:
Other course material will be posted at Learn@UW.

Class and office hours:
Class meets MW 10-11:20 in room 758 WARF.

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