METHODS IN HEALTH SERVICES RESEARCH

HPA 583b (Spring 2012)

Instructor: Doug McKee, 310-266-2438; douglas.mckee@yale.edu

Instructor Office Hours: LEPH 315, TBD

Teaching Assistants: Nick DeVito (nicholas.devito@yale.edu)
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TA Office Hours: TBD

Lecture Day/Time: Monday, 10:00-11:20am, LEPH 101
Lab Day/Time: Wednesday, 10:00-11:20am, LEPH 101
(Some labs will be in 47 College computer lab)

Course Description:
This is a course about the concepts, tools and approaches used to answer questions empirically. We will consider four types of questions. Description: what is the value (or distribution) of outcome variable Y? Association: does Y vary by explanatory variable X? Evaluation: what is the causal effect of X on Y? Forecasting: what will Y be in the future or under some alternate scenario?

Course Objectives:
The objectives of the course are to develop students’ abilities to:
(1) Conduct surveys to collect original data,
(2) Perform basic data management and analysis tasks using SAS,
(3) Understand, estimate and interpret ordinary least squares and logistic regression models,
(4) Evaluate and conduct quantitative policy evaluations,
(5) Apply regression models to generate forecasts, and
(6) Conceptualize and execute empirical research projects.

Prerequisites:
One semester of biostatistics or permission of the instructor.
Readings:

You can get away without purchasing any books for this class, but you will learn a lot more if you work through the Allison book and the Angrist and Pischke book as we cover individual topics. These will both also be excellent references if you see yourself doing any data analysis at all in the future. And if you’re going to continue writing SAS programs, I highly recommend the two SAS books. The Ayres book just shows how data analysis can be fun—it’s great casual reading. The articles assigned are either overviews of methods or good examples of methods in action. All the books will be on reserve at the medical library and the articles are posted to classes*v2.

- articles (available online through classes*v2)

Assignments:

*Lab assignments*. There will be 6 lab homework assignments involving SAS programming and application of the material taught. So the lab answers can be posted in a timely fashion, **no labs will be accepted for credit after the due date**. Labs will each be graded on a 0 to 2 point basis, and all labs should be turned in via the Classes V2 website.

*In-class quizzes*. **The first quiz will be given on February 15 and the second on April 4.** The quizzes will cover material presented in lecture and lab.

*Group research project*. In randomly-assigned groups of 4 or 5, students will conduct a multi-step research project that consists of: (1) developing a health-related (broadly considered) research question, (2) developing a brief survey instrument to collect data to answer that question, (3) cleaning the collected survey data and creating analytic variables, (4) analyzing the data (using SAS), (5) presenting the project in class, and (6) writing up a research report that describes the question, analysis and results. Part of the 1/11 lab will be devoted to a discussion of this assignment and its many deadlines/milestones.

*Final individual research proposal*. Students will be given a request for proposals (RFP) based on a ripped-from-the-headlines health care topic, and each student will develop and write up
his/her own research proposal. Students will turn in a write-up that includes a brief background, details on the data they would use (including how they would collect them), a description of the analytic approach, and a discussion of how their analysis addresses the issue and its strengths and limitations. Note that students need not actually execute their analyses. Part of the 4/9 lecture will be devoted to a discussion of this assignment. **Write-ups are due by 5pm on Friday, 5/4.**

**Requirements and Grading:**

- Lab assignments: 10%
- In-class quizzes: 30%
- Group research project: 35%
- Individual research proposal: 25%

**Honor Code:** All students are expected to comply with the Yale School of Public Health Code of Academic and Professional Integrity.

**Laptop Use Policy:** Laptops (and other computing devices) may be used only for class-related purposes, and laptop users are encouraged to sit near the back of the room to minimize class disruption.

**LECTURE AND LAB SCHEDULE:**

Mon 1/9: Course introduction and overview  
Wed 1/11: Group project overview & SAS fundamentals

**NO CLASS MONDAY 1/16 (Martin Luther King day)**

Wed 1/18: Data checking and creating variables (SAS)

Mon 1/23: Survey design  
Wed 1/25: Combining datasets & $\chi^2$ test (SAS)  
* HW #1 due

Mon 1/30: Model interpretation for linear regression  
Wed 2/1: Linear Regression (SAS)  
* HW #2 due

Mon 2/6: Model interpretation for logistic regression  
Wed 2/8: Logistic Regression (SAS)  
* HW #3 due

Mon 2/13: Causality and evaluation  
Wed 2/15: **QUIZ #1** (Covers Survey Design through Logistic Regression)  
* HW #4 due
Mon 2/20: Model building and selection
Wed 2/22: Model building and selection (SAS)
   * HW #5 due

Mon 2/27: Difference-in-differences
Wed 2/29: Project Help Session

SPRING BREAK (3/5 – 3/16)

NO CLASS MONDAY 3/19
Wed 3/21: Linear and Logistic Regression in Excel (Optional) (47 College Computer Lab)

Mon 3/26: Model-based prediction and policy simulation
Wed 3/28: Difference-in-differences and IV (SAS)

Mon 4/2: Analyses for group projects
Wed 4/4: QUIZ #2 (Covers Causality & Evaluation to Model-based Prediction & Simulation)
   * HW #6 due

Mon 4/9: Discussion of individual research proposal assignment
Wed 4/11: Project help session (47 College Computer Lab)

Mon 4/16: First set of student presentations of group research project
   * Final group research project write-up is due in class
Wed 4/18: Second set of student presentations of group research projects

Fri 5/4: Final individual research proposal write-up is due by 5pm
READING:

1. **Course introduction and overview (1/9)**


2. **Survey design (1/23)**


3. **Model interpretation for linear regression (1/30)**


   **Reference**


4. **Model interpretation for logistic regression (2/6)**


**Reference**


5. **Causality and evaluation (2/13)**


6. **Model building and selection (2/20)**


7. **Difference-in-differences (2/27)**

Dowd B, Town R Does x really cause y? Changes in Health Care Financing and Organization brief, 2002. (pp. 1-10)

**Reference**


8. **Instrumental Variables (3/23)**


Reference

**SPRING BREAK**

9. **Model-based prediction and policy simulation (3/26)**


Reference

**Additional reading for the course**

