PubH 8811: Seminar: Health Services Research Methods

Fall 2014

Credits: 3
Meeting Days: Monday and Wednesday, September 3 – December 15, 2012
Meeting Time: 10:10 am – 11:40 pm
Meeting Place: 325 Lind Hall

Instructors: Bryan Dowd

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E-mail: dowdx001@umn.edu
Office Hours: By appointment

Required text:


Highly recommended text:


Other good texts:


Description and Course Objective:

The course covers problems encountered in empirical health services research. The course is organized around different estimation problems which arise in health services research data and covers, for each problem:

a. A description of the problem  
b. The consequences of the problem,  
c. The methods used to deal with the problem, and  
d. A review of the health services research studies which have applied (or should have applied) those methods

In class we cover (a) through (c), with references to (d). The applied readings primarily are left as out-of-class assignments, so that we can cover more topics in class.

An important part of the course is the computer exercises that allow the student to analyze data from health services research projects using the methods covered in class. I will distribute a handout for reading our MEPS dataset into R, but our exercises will assume you’re using (any version of) Stata.

Upon completion of the course, the student should be able to take descriptions of applied health services research problems, model the problem, identify potential problems in estimating the parameters of interest, and apply appropriate estimation procedures.

Grading:

Grading is based on three exams (which are weighted equally) and a set of shorter assignments including computer exercises. To receive an A in the course, students must have an A average on the exams, and turn in all the computer assignments. Shorter assignments typically are due one week after they are assigned. Late assignments are marked down one letter grade. Shorter assignments may not be turned in after the last class meeting. All computer assignments must be completed to receive a passing grade in the course. Students may collaborate on shorter assignments, but collaborating on exams is strictly forbidden and can result in dismissal from the program.

Assumed Level of Knowledge:

It is assumed that the student has completed, minimally, Biostatistics 7401-7402 with a B average. Thus, the following sections of Greene's text are assumed to be familiar to the student: Chapters 1-4 and Appendices A-D.
Schedule of Topics and Readings:

<table>
<thead>
<tr>
<th>Class Meeting</th>
<th>Topic</th>
</tr>
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<tbody>
<tr>
<td>1,2</td>
<td>Causal modeling and properties of estimators</td>
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Greene: Chapter 8: Endogeneity and Instrumental Variable Estimation
   Pages 251-254: Natural experiments and the search for causal effects, and Summary and Conclusions.
Kennedy: Chapter 1; Chapter 2, Section 2.1 - 2.8


Supplementary:


3 Violation of OLS assumptions: Overview and Non-normal errors

Overview
Greene: Chapter 2 – The Linear Regression Model

Non-normal errors
Greene: pp.127-131: Non-normal disturbances and large sample tests; p.277: Weighted least squares
Kennedy: Chapters 3 and 15

Dowd, Bryan E., Swenson, Tami, Kane, Robert, Parashurma, Shriram, and Robert Coulam. “Can Data Envelopment Analysis Provide a Scalar Index of Value?” Published “early view”
online in Health Economics (2013).


4 Violation of OLS Assumptions: Variable Specification and Functional form

Greene: Chapters 5: Hypothesis Tests and Model Selection
   Chapter 6: Functional Form and Structural Change
Kennedy: Chapters 4 to 6

5 Violation of OLS Assumptions: Heteroscedasticity and generalized linear regression

Greene: Chapter 9: The Generalized Regression Model and Heteroscedasticity
Kennedy: Chapters 7 and 8

6 Violation of OLS Assumptions: Autocorrelation

Greene: Chapter 20.7 – 20.9 Testing for autocorrelation; Efficient estimation when Ω is known; Estimation when Ω is unknown.
Kennedy: Chapter 8

7 Analysis of panel data: Fixed versus random effect models, and difference-in-differences

Greene: pp.156-158: Difference-in-Differences
   Chapter 11: Models for panel data
Kennedy: Chapters 18 and 19


8,9 Violation of OLS Assumptions: Missing Data, Measurement Error and
Stochastic Regressors

Missing Observations
Greene: Section 4.7.4: Missing values and data imputation

Stochastic Regressors: Measurement Error
Greene: Section 4.7.5: Measurement error
Kennedy: Chapter 10

Stochastic Regressors: Lagged Dependent Variables
Greene: Section 20.7.3-4 Testing in the presence of a lagged dependent variable; 20.9.3 Estimation with a lagged dependent variable
Kennedy: Chapter 10

10-11 Estimation

Greene: Chapters 12: Estimation Frameworks in Econometrics
  Chapter 13: Minimum Distance Estimation and the Generalized Method of Moments
  Chapter 14: Maximum Likelihood Estimation
Kennedy: Section 2.9, Chapter 14

12 Non-linear optimization methods
Greene: Appendix E

13-14 Discrete dependent variables: Binary logit/probit and interaction terms in non-linear models, standard errors of non-linear functions

Greene: Chapter 17: Discrete Choice
Kennedy: Chapter 16


Supplementary:

**15-16 Polychotomous dependent variables: Multinomial/conditional Logit; Multinomial probit; Ordered logit/probit.**

Greene: Chapters 17: Discrete Choice
Kennedy: Chapter 16


**17-19 Limited dependent variables: Tobit and two-part Models**

Greene: Chapter 18: Discrete Choices and Event Counts
Kennedy: Chapter 17:

*Supplementary:*


**20-24 Endogenous Explanatory Variables: Sample selection, Instrumental Variable Models, Natural Experiments, Residual Inclusion, Propensity scores**

Greene: Section 10.6: Simultaneous equation methods
19.5: Incidental truncation and sample selection
19.6: Evaluating treatment effects
Kennedy: Chapter 9


Optional:


25-28  **Endogenous Explanatory Variables: Simultaneous equations**

Greene: Chapter 8: Endogeneity and Instrumental Variable Estimation  
Kennedy: Chapter 11
Supplementary:


Optional


29-30 Analysis of duration data

Greene: Section 19.4: Models for Duration
Kennedy: 17. 4

Supplementary:


Amemiya, Takeshi. *Advanced Econometrics*. Section 11.2


Additional topics (time permitting)

Count data
Greene: 18.4: Models for counts of events

Regression discontinuity
Greene: 19.6.3: Regression discontinuity


*Supplementary:*


**Microsimulation**


**Matching and Linking data**

**Disability/Accessibility Statement**

1) It is University policy to provide, on a flexible and individualized basis, reasonable accommodations to students who have documented disability conditions (e.g., physical, learning, psychiatric, vision, hearing, or systemic) that may affect their ability to participate in course activities or to meet course requirements. Students with disabilities are encouraged to contact Disability Services for a confidential discussion of their individual needs for accommodations. Disability Services is located in Suite 180 McNamara Alumni Center, 200 Oak Street. Staff can
be reached by calling 612/626-1333 voice or TTY. The website is http://disserv3.stu.umn.edu/index2.html.

2) Letter grades will be determined by total effort as follows:

   A   = 95-100 points  
   A-  = 90-94 points   
   B+  = 87-89 points   
   B   = 83-86 points   
   B-  = 80-82 points   
   C+  = 77-79 points   
   C   = 73-76 points   
   C-  = 70-72 points   

   F (or N) – Represents failure (or no credit) and signifies that the work was either (1) completed but at a level of achievement that is not worthy of credit or (2) was not completed and there was no agreement between the instructor and the student that the student would be awarded an I.

   S – Achievement that is satisfactory will be expected to complete all assignments and receive a minimum of 70% to receive a passing scores (achievement required for an S is at the discretion of the instructor but may be no lower than a 70%).

   I – An incomplete grade ("I") is permitted only in cases of exceptional circumstances and following consultation with the instructor. In such cases, an "I" grade will require a specific written agreement between the instructor and student specifying the time and manner in which the student will complete the course requirements. Extension for completion of the work will not exceed one year. Additionally, some majors in the School of Public Health may place a hold on a student’s registration until an “I” is cleared up, or a plan for completion of the work submitted.

3) Students may change grading options without written permission as specified by the University and without penalty during the initial registration period or during the first two weeks of the semester. The grading option may not be changed after the second week of the term.

4) School of Public Health students may withdraw from a course through the second week of the semester without permission. No “W” will appear on the transcript.

After the second week students are required to do the following:

1. The student must contact and notify their advisor and course instructor informing them of the decision to withdraw from the course.
2. An email must be sent to the SPH Student Services Center (SSC)
(franc004@tc.umn.edu) from the student. The email must provide name, ID#, course number, section number, semester and year with instructions to withdraw from the course, and acknowledgement that the instructor and advisor have been contacted.

3. The advisor and instructor must email the SSC acknowledging the student is canceling the course. All parties must be notified of the student’s intent.

4. After the SSC receives all emails (student, advisor, instructor) the SSC will complete the process by withdrawing the student from the course. A “W” will be placed and remain on the student transcript.

After discussion with their advisor and notification to the instructor, students may withdraw up until the eighth week of the semester. There is no appeal process. For more information, contact the SPH Student Services Center at 612.626.3500.

A refund schedule for tuition and fees is listed in the University class schedule. Please refer to these dates when withdrawing from courses.

5) Scholastic dishonesty is a violation of the student conduct code and is defined as “any act that violates the rights of another student in academic work or that involves misrepresentation of your own work. Scholastic dishonesty includes (but is not limited to): cheating on assignments or examinations; plagiarizing, which means misrepresenting as your own work any part of work done by another; submitting the same paper, or substantially similar papers, to meet the requirements of more than one course without the approval and consent of all instructors involved; depriving another student of necessary course materials; or interfering with another student’s work.” Scholastic dishonesty in any portion of the academic work for a course shall be grounds for awarding a grade of “F” or “N” for the entire course. Please consult the student conduct code at: http://www1.umn.edu/regents/policies/academic/StudentConduct.html