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## **Estimating Impacts in Policy Research (PADM-GP 2875)**

**Fall 2017**

**\*\*\* Draft; final version will be posted on the course website \*\*\*\***

This course covers selected analytic and design issues that are relevant to policy research and program evaluation. It applies and extends skills that are developed in other courses offered at the Wagner School. For example, the concepts of experimental and quasi-experimental design that are introduced in Program Evaluation and Analysis (PADM-GP.2171) are applied in understanding and critiquing research reports. Multivariate analytic skills introduced in Statistical Data Analysis: Multiple Regression (PADM-GP.2902) are extended to various types of research designs and analytic situations.

Your goals in this course should be to:

extend your familiarity with methodologic issues in policy research, including sampling, study designs, analytic approaches, and ethical matters.

enrich your professional vocabulary. Understand and use terms from program evaluation, econometrics and epidemiology.

get hands-on experience in analyzing and presenting data, including managing data, selecting appropriate analyses, interpreting computer output, and presenting your findings in writing and tables.

improve your skills in reading, understanding, and reporting on journal articles.

The course is not a comprehensive or exhaustive review of the field of policy-relevant research or program evaluation. It is not a statistics course, nor is it a course in how to evaluate a program. The focus is on impact analysis (rather than process evaluation, performance monitoring, cost effectiveness analysis, or evaluation synthesis, all of which are covered in other Wagner courses). There is a substantial amount of data analysis both in and out of class. There is also significant new statistical material presented. All of this is done using real world examples, to solidify the base for your career as a practitioner and consumer of the research that informs public policy.

### **Course prerequisites (neither may be taken concurrently)**

1. Program Evaluation and Analysis (PADM-GP 11.2171)
2. Statistical Data Analysis: Multiple Regression (PADM-GP 11.2902)

**Skill prerequisites.** Stata is used in this course, and I will assume that you are familiar with basic data analysis using that package. If you are not, K.C. Longest's [Using Stata for Quantitative Analysis](#) is an excellent primer, and working through over a period of a few weeks is an excellent way to get up to speed. In addition, I will assume that you are capable

with algebra at the pre-calculus level, are comfortable with algebraic notation, and understand the concept of a function.

**Textbook.** We will use Angrist and Pischke's Mastering Metrics (Princeton University Press, 2015); hereinafter, MM. Other course readings will be available electronically through the Bobst library. A few readings that aren't available as hardcopies are at Bobst as photocopies; you will need to plan to take the time to access them.

**Stata.** We will have several in-class labs using Stata. For those sessions, you should bring a laptop to class, or share with one of your classmates. The class website has information on buying/accessing Stata.

**Class website.** This is managed via NYU Classes. The site houses a number of resources, including our syllabus, powerpoints for each lecture, videos, assignments, datasets, article links and other core course documents. NYU Classes will be used to broadcast urgent matters such as assignment changes or glitches, class cancellations, and changes in office hours.

**Keeping up/missed classes.** This course moves quickly. There is a lot of work – most students spend many hours each week on the course. There is a fair bit of informal in-class give-and-take. Students who miss a class should consult a partner student.

**Preparation for class.** So that we can use class time efficiently, I will post a number of resources and exercises for review before class, including non-graded assignments. I will assume that you are prepared; come ready to contribute. I could call on students, drawing on the non-graded assignments (as is done in law schools). Bring your answers to the non-graded assignments as hardcopies – I will collect some of them, marking them “complete” or “incomplete.” Also bring electronic files or hardcopies of the powerpoints that we will use, so that you can follow along.

**Activity in class.** In addition to lecture and discussion of non-graded assignments, I will provide exercises for you to work in groups during class. These are meant to test and consolidate your understanding of the lecture content. You'll work in groups, and then we'll discuss answers together. Solutions to these exercises will be posted online after class, so that you don't need to scribble or type while we discuss.

**A note on journal articles.** Articles used in the course are taken from journals representing an array of sectors and disciplines. There is great variation in emphasis, presentation, and statistical approaches. Some articles are dense and complex, and may take hours to digest. You should keep at it, because reading journal articles is a skill that you can only learn by doing. I have tried to select papers that are accessible and not excessively technical. In some cases these are oldies-but-goodies. Don't worry that the research findings may be obsolete. Your goal is to learn to read and think critically.

During class, we will discuss some of the articles in depth. Other articles will only be mentioned in passing. For the final exam, you will be expected to understand the gist of all articles. I'll specify ten of them that you should know in depth.

**Getting help with assignments.** Most of the class assignments use Stata, and students often have questions. If/when you do, you can ask me, either during office hours or via

email. I'm happy to take email questions at any time, and can respond efficiently if you ask your questions clearly, attaching as a Word, or .pdf any output, tables, etc. Please don't send .smcl files, or anything that I can't read on my phone. Please always attach the relevant assignment sheet, so that I have it on hand to see what you're working on – this saves me having to consult the course website.

Other options for getting Stata help are: (a) through the consultants at NYU [Quantitative Data Services](#) at Bobst or (b) asking a fellow student. You're welcome to work together on assignments, though each of you must do your own Stata runs (create your own code), and write your own papers.

**Honor code.** The Wagner School [Honor Code](#) will be enforced. If you are unclear as to how the code applies to collaboration on assignments or to any part of the course, please ask.

**Course grades will be based on:**

1. Assignment 1 (15%) Affordable Care Act and health care use
2. Assignment 2 (5%) Estimates of impact with dichotomous data
3. Assignment 3 (15%) Impact of a mentoring program in New York City
4. Assignment 4 (15%) Enterprise zones and employment rates
5. Final Examination (35% of grade)
6. Class preparation and participation (15% of grade)
  - This includes your readiness with non-graded assignments, some of which will be collected.

The Wagner School [policy on incomplete grades](#) will be followed.

## TOPICS

**Week 1. September 5. A framework for estimating impacts.** Goals of the course, course mechanics. Impacts, outcomes and the counterfactual. Review of estimation concepts with extension to the regression framework.

To prepare:

- Take two hours to review your class notes and textbooks from Stat 1, Stat 2, and Program Analysis & Evaluation.
  - Pay attention to these terms: statistic, parameter, sample, population, estimation, confidence interval (aka “interval estimate”), sampling distribution, standard deviation, standard error (in general; specifically as it applies to means and differences of means), hypothesis test, p-value, OLS regression assumptions, coefficient, unbiased-ness, efficiency, “controlling for,” “holding constant,” impact, counterfactual.
  - Review the Stata analyses that you did in Stat 2.
- Review the 11 points document (posted under “Core course documents” on our website).
- By Week 3, read Chapters 1 and 2 of MM. For Ch. 1, focus on pp. 1-30; for Ch 2, focus on 47-79.

**Week 2. September 12. Validity in social research.** What is “validity?” Internal validity, external validity, validity in measurement, conclusion validity (aka “statistical power”). Discussion of Newcomb paper.

To prepare:

- Take time to review basic study designs and threats to validity from Program Analysis and Evaluation. Pay special attention to internal validity, threats to internal validity (but not in great detail), external validity.
- Watch the course video on statistical power (link posted on our course website)
- Read
  - *Measurement: Validity and Reliability, a QMSS e-lesson.* (url on course website).
  - *Newcomb, TM. Conservation program evaluations: The control of self selection bias. Evaluation Review. 1984; 8(3): 425-440.*
- Complete  
The non-graded assignment posted on our course website
- Keep working on the first two chapters of MM

**Week 3. September 19. “Holding constant,” “controlling for,” conditioning on observables:” stratification, propensity scoring.** What does it mean to hold constant? Discussion of strategies beyond regression: matching, stratification, propensity scoring.

To prepare:

- Watch class video on adding third variables (link posted on our course website)
- Read
  - Chapters 1 and 2 of MM. For Ch. 1, focus on pp. 1-30; for Ch 2, focus on 47-79.

- *Devaney B, Bilheimer L, Schore J. Medicaid costs and birth outcomes: The effects of prenatal WIC participation and the use of prenatal care. Journal of Policy Analysis & Management. 1992; 11(4): 573-592.*
- Complete an “11-points” discussion of the Devaney et al. article.
- Skim, without getting into the details
  - *Austin PC. An introduction to propensity score methods for reducing the effects of confounding in observational studies. Multivariate Behavioral Research. 2011; 46(3): 399-424.*

**Week 4. September 16. In-class lab** Preparation for Assignment 1

To prepare:

- Review bivariate statistics from Stat 1, by reading chapters 5 and 6; and regression with dummies in Chapter 9 of the *Wagner Way* (posted under “Course documents”).
- Watch three course videos: these will acquaint you with some Stata maneuvers, and introduce you to bivariate analysis with Stata; see links posted on our website.
- Complete  
The non-graded assignment that goes with the videos; bring hardcopy to class.
- Bring your laptop to class.

**Week 5. October 3. Dichotomous outcomes, non-linear functions & heterogeneous treatment effects.** The linear probability, logit and probit models. Clarification of what “non-linearity” means. Solidifying your understanding of the models.

To prepare:

- Complete the non-graded assignment on percent change and percentage point change.
- Download, review and print the Master Table that is posted on our course website.
- Bring to class a calculator that can take natural exponents ( $e^x$ )
- Read
  - *Stock JH, Watson MW. Introduction to Econometrics, Second edition, Chapter 11, “Regression with a binary dependent variable” (on reserve @ Bobst)*

**Week 6. October 10. Heterogeneous treatment effects, continued: coding using interaction terms.** In-class exercises with interactions; preparation for Assignment 3.

To prepare:

- Watch three course videos on interactions (links on course website). Bring your questions to class.
- Read
  - *Magnuson K, Lahaie C, Waldfogel J. Preschool and school readiness of children of immigrants. Social Science Quarterly. 2006; 87.5(Supp.): 1241-1262.*
- Download and read Assignment 3, and bring it to class.

**ASSIGNMENTS 1 & 2 due**

**Week 7. October 17. Difference in differences.** Logic of D-in-D: Assumptions; tests of assumptions. In-class exercise.

To prepare:

- Watch the course video on D-in-D (link on course website).
- Read
  - *Chapter 5 in MM. Focus on pp. 178-204.*
  - *Newcomb, TM. Conservation program evaluations: The control of self selection bias. Evaluation Review. 1984; 8(3): 425-440. This is a re-read, posted under Week 2.*
  - *Currie J, Walker R. Traffic congestion and infant health: Evidence from EZ-Pass. American Economic Journal: Applied Economics. 2011; 3: 65-90.*
  - *Torche F. The effect of maternal stress on birth outcomes: Exploiting a natural experiment. Demography. 2011; 48:1473-1491.*
- Complete  
An 11 points discussion of the Currie and Walker paper, and the non-graded assignment on our course website.

**Week 8. October 24. Panel data 1 (Theory).** The logic of panel data analysis. True panels versus versus pooled cross sections. Two period panel data, multi period panels. Method of first differences; fixed effects estimation. Assumptions, strengths, limitations of the panel data strategy.

To prepare:

- Read
  - *Stock JH, Watson MW. Introduction to Econometrics, Second edition, Chapter 10 ("Regression with panel data"); on reserve in Bobst, and then*
- Watch the course video (link on course website), and then
- Read
  - *Ferdinand AO, Menachemi F, Sen B et al. Impact of texting laws on motor vehicular fatalities in the United States. American Journal of Public Health. 2014;104(8):1370-1377.*
  - *Kowalski-Jones L, Duncan G. Effects of participation in the WIC program on birth weight: Evidence from the National Longitudinal Survey of Youth. American Journal of Public Health. 2002;92(5):799- 804.*
  - *Xu Z, Hannaway J, Taylor C. Making a difference? The effects of Teach for America in high school. Journal of Policy Analysis and Management. 2011; 30(3):447-469.*
- Complete:  
The non-graded assignment on our course website.

**Week 9. October 31. Panel data 2 (Practice).** Characteristics of panel data. Time fixed effects. Analysis with fixed effects – options in Stata.

To prepare:

- Reread from last week
  - *Chapter 10 of S & W, ("Regression with Panel Data").*
- Download and read Assignment 4 before class, and arrive with an analysis plan.
- Bring your laptop to class

## ASSIGNMENT 3 due

**Week 10. November 7. The Regression Discontinuity (RD) approach.** The paradigm for classic RD: examining the data, analyzing the data. Assumptions and violations of the assumptions. Interpretation of estimates.

To prepare:

- Read
  - *Chapter 4 in MM. Focus on pp. 147-164.*
  - *Niu SX, Tienda M. The impact of the Texas top ten percent law on college enrollment: A regression discontinuity approach. Journal of Policy Analysis and Management. 2010; 29(1) 84-110.*
  - *Dee TS, Wykoff J. Incentives, selection, and teacher performance: Evidence from IMPACT. Journal of Policy Analysis and Management. 2015; 34(2): 267-297.*
- Complete  
The non-graded assignment on our course website.

**Week 11. November 14. Instrumental Variables (IV) approach.** Assumptions of instrumental variables analyses; consequences of violations of assumptions; interpretation of estimates.

To prepare:

- Read
  - *Doyle JJ. Causal effects of foster care: An instrumental variables approach. Children and Youth Services Review. 2013;35: 1143-1151.*
- Watch  
The course video (link on course website), and then
- Read
  - *Figlio D et al. Does prenatal WIC participation improve birth outcomes? New evidence from Florida. Journal of Public Economics. 2008;93:235-254.*
  - *French MT, Popovici I. That instrument is lousy! In search of agreement when using instrumental variables estimation in substance use research. Health Economics. 2011;20:127-146.*
- Complete  
The non-graded assignment on our course website.

**Week 12. November 21. Randomized experiments.** The logic of random assignment. Methods and logistics in social experimentation. Residual threats to validity. Analysis of random assignment data to using the instrumental variables approach (ITT versus LATE). Cluster randomized trials.

To prepare:

- Watch the course video “Different estimates of program impact,” which is intended as an introduction to the chapter from the Bloom chapter, below.
- Read

- Bloom, HS. "Constructing instrumental variables from experimental data to explore how treatments produce effects" (Chapter 3) pages 75-88 from H. Bloom, ed. *Learning More From Social Experiments*.
- Chapter 3 in MM. Focus on pp. 98-122, which deals with IV analysis of random assignment data.
- X Gine and DS Karlan. *Peer monitoring and enforcement: Long term evidence from microcredit lending groups*. (Working paper, January 2008).
- Quint, J. *Research advances: Using cluster random assignment*. Document posted on MDRC's website.
- Complete  
The non-graded assignment on our course website.

## ASSIGNMENT 4 DUE

**Week 13. November 28. Ethics in social research.** Overview of issues in social research ethics. Federal regulations to protect human subjects. The Institutional Review Board (IRB). Informed consent. Case discussion: Evaluation of the NYC Homebase program.

To prepare:

- Read
  - Blustein J. *Toward a more public discussion of the ethics of federal social program evaluation*. *Journal of Policy Analysis and Management*. 2005; 24 (4): 824-846; and 851-852; and the exchange that followed.
  - Oakes JM. *Risks and wrongs in social science research: An evaluator's guide to the IRB*. *Evaluation Review* Vol. 26 No. 5, October 2002 443-479.
  - Epstein, H. *Lead poisoning: The ignored scandal*. *The New York Review of Books*. 2013.
  - Pollack J. *The lead-based paint abatement repair and maintenance study in Baltimore: Historic framework and study design*. *J. Health Care Law and Policy*. 2002;6: 90 – 110.
  - *Erica Grimes v. Kennedy Krieger Institute* (Court of Appeals, Maryland; September term, 2000. Nos. 128, 129). Excerpt: pages 25-29.
  - Buckley C. *To test housing program, some are denied aid*. *NY Times*. 12/9/2010, page A1
  - *Testimony in favor of the Homebase evaluation*. *New York City council hearing*, Document dated December 9, 2010.
  - *1/25/14NYC Department of Homeless Services. Findings from the Homebase Evaluation (.pdf of presentation, June 2013)*
- Complete  
The non-graded assignment on our course website.

**Week 14. December 5. Wrap up and review.**

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The final exam will be given on **Tuesday, December 19<sup>th</sup>** during the usual class period. You may bring a "cheat sheet," which is an 8.5x11 inch page, with handwritten notes on one side.