Econ 470/HLTH 470: Research in Health Economics
Spring 2020

Professor: Ian McCarthy
Class: MW 11:30am – 12:45pm
Room: Rich 211
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Course Description

This is a capstone course that combines health economics and human health content with data science. The course is therefore heavily applied in nature. You will complete an empirical research project using raw data and employ econometric methods to analyze a research question relevant to contemporary health care issues and/or health policy. You will also present your final work to the class. The content of the course is split into three general areas: 1) data management in the real world; 2) health policy and health care institutions; and 3) empirical methods in program evaluation and causal inference. Each area of the course will be covered by way of an example research question, which you can use to guide your own projects throughout the semester. By the end of this course, you will be able to:

1. Organize project files using *Git* and *GitHub*
2. Clean and manage several datasets using *tidy data* in *RStudio*
3. Summarize and visualize data with *RStudio* and the *ggplot2* package
4. Implement selected methods for causal inference using real data
5. Explain research results with a written report and presentation

Text and Other Materials

Since this is an applied research course, the bulk of the class time will be spent directly working with data. All data management and analysis will be done in *R* in order to maintain consistency across other statistics and econometrics classes. You will therefore be required to install *R* and *RStudio*. You will also need to set up a *GitHub* account, as this is how we will share the datasets and code files necessary for all research topics. Instructions on how to get these accounts set up will be provided during the first week of class.

Most of the required reading will consist of academic journal articles related to each research topic. We will also use two books in our empirical methods sections. These books are not required but are strongly recommended.

- Angrist, J. and J. Pischke. *Mostly Harmless Econometrics: An Empiricist's Companion*, Princeton University Press, 2009.
- Wickham, H. and G. Grolemund. *R for Data Science*, O'Reilly Media, 2016. There is a free version of this text available online, R for Data Science, Online Edition.

The main source of information for the class will be our class website, Econ 470/HLTH 470 Website. Here you will find links to all of the presentations, *GitHub* repositories, and assignments. I've also provided all of my underlying code files in the presentations so that everyone can easily replicate any analyses we do in class.

Prerequisites

Prerequisites for the class include Econ 320 (econometrics) and at least one of the following health economics and policy classes: HLTH 370, Econ 371, or Econ 372.

Course Outline

Below is a preliminary outline of specific topics and assignments throughout the semester. Based on our collective interests and discussions, and unforseen events such as weather, the timing of the material may change somewhat. Each section of the class is designed to last about 4 classes.

Getting Started	
Week 1	Version Control with *GitHub* Resources: GitHub Tutorial, happygitwithr.com Lesson 2 from *Data Science for Economists*, github.com/uo-ec607/lectures Activities: Setting up with *RStudio* and *GitHub*
Week 2	Struggling with data Resources: Data Wrangling in *R for Data Science*, r4ds.had.co.nz/wrangle-intro.html Activities: Application to Medicare Advantage data Assignments due: Homework 1 (data management), selection of research question
Research Topic 1: Hospital Pricing **Methods Topic 1:** Selection on Observables	
Background	How are hospital prices determined? Resources: Cooper *et al.* (2017), Darden *et al.* (2018)
Methods	Fundamental Problem of Causal Inference and Selection on Observables Resources: Angrist and Pischke, *Mostly Harmless Econometrics*, Chapters 2-3
Application	Hospital pricing and pay for performance Resources: HCRIS data Activities: Model specification in practice (Darden *et al.*, 2018) Assignment due: Homework 2 (selection on observables)
Research Topic 2: Demand for Cigarettes **Methods Topic 2:** Instrumental Variables	
Background	Literature on smoking and prices Resources: Gruber (2001), Ross & Chaloupka (2003)
Methods	Instrumental Variables Resources: Angrist and Pischke, *Mostly Harmless Econometrics*, Chapter 4
Application	Estimating a demand curve for cigarettes Resources: CDC Tax Burden on Tobacco Activities: IV and 2SLS in practice (Ross & Chaloupka, 2003) Assignment due: Homework 3 (instrumental variables)
Research Topic 3: Medicare Advantage **Methods Topic 3:** Regression Discontinuity	
Background	What is Medicare Advantage? Resources: Darden & McCarthy (2015), Gruber (2017)
Methods	Regression Discontinuity Resources: Angrist and Pischke, *Mostly Harmless Econometrics*, Chapter 6
Application	Quality ratings and insurance choice Resources: Medicare Advantage data Activities: Regression discontinuity in practice (Darden & McCarthy, 2015) Assignment due: Homework 4 (regression discontinuity)
Research Topic 4: ACA and Medicaid Expansion **Methods Topic 4:** Difference-in-Differences	
Background	Understanding the ACA and Medicaid expansion

	Resources: Obama (2016), Courtemanche *et al.* (2017)
Methods	Difference-in-Differences
	Resources: Angrist and Pischke, *Mostly Harmless Econometrics*, Chapter 5
Application	Effects of Medicaid Expansion on Insurance Rates
	Resources: KFF Medicaid expansion and CPS Data on Insurance Coverage
	Activities: Difference in differences in practice (Courtemanche *et al.*, 2017)
	Assignment due: Homework 5 (difference-in-differences)
Conclusion	
Extensions	Panel data, fixed effects, machine learning
	Resources: Angrist and Pischke, *Mostly Harmless Econometrics*, Chapter 5
Weeks 12-13	Paper presentations
	Assignment due: Final paper (week 13)

Evaluation

The course is graded based on the research project (40%), presentation (30%), and problem sets (30%). Letter grades will be assigned at the end of the course based on total score achieved: (A = 100-93%, A- = 92.99-90%, B+ = 89.99-87%, B = 86.99-83%, B- = 82.99-80%, C+ = 79.99-77%, C = 76.99-73%, C- = 72.99-70%, D+ = 69.99-67%, D = 66.99-60%, F = <60%)

Research Paper

The bulk of the grade is based on a research project using publicly available secondary data. The paper will be an empirical analysis of a relevant topic in health economics and will focus on the appropriate use of empirical methods to evaluate the research question. Students can select among a list of 8 pre-approved research questions drawn from the four main health economics topics covered throughout the semester. The list of potential research questions and complete details on the project are available on the class website, Econ 470/HLTH 470 Website. It is critical to select a question as soon as possible.

Research Presentation

You will present your research project to the class in a 30-minute research presentation. All presentations will take place in the final two weeks of class.

Problem Sets

There will be five assignments throughout the semester – one for each of the four empirical methods and applications covered in class, and one assignment related to basic data management. Each assignment is worth 6% of your final grade.

Communication

I will predominately use our Econ 470/HLTH 470 Website to distribute materials, so please check the website regularly for new information. For any specific questions you have regarding the class or health economics more generally, I am happy to meet with you and discuss in person. Unless otherwise announced, I will always be available during my office hours. But if these times do not work for you, just send me an email and we can schedule another time to meet. I will do my best to respond to all emails within 24 hours, but please allow more time over the weekend.

Course Policies

Similar to a movie theater, we have a strict no screen policy in class (unless we are actively working with some data or applications). The purpose of this policy is twofold: 1) phones and computers are extremely useful but also extremely distracting, and in my experience, I've found that our discussions are much more engaging and informative when we avoid these distractions; and 2) this is really just an issue of mutual respect, both for our time in class as well as your classmates. The more we can be engaged and respectful of one another, the more we'll enjoy the class. There's also a good randomized study finding much better performance of students without computers!

Academic Integrity and Honor Code

The Honor Code is in effect throughout the semester. By taking this course, you affirm that it is a violation of the code to cheat on exams, to plagiarize, to deviate from the teacher's instructions about collaboration on work that is submitted for grades, to give false information to a faculty member, and to undertake any other form of academic misconduct. You agree that the instructor is entitled to move you to another seat during examinations, without explanation. You also affirm that if you witness others violating the code you have a duty to report them to the honor council. Students who violate the Honor Code may be subject to a written mark on their record, failure of the course, suspension, permanent dismissal, or a combination of these and other sanctions. The Honor Code may be reviewed at: `http://catalog.college.emory.edu/academic/policies-regulations/honor-code.html`.

Absence Policy

Missing 25% or more of class meetings will result in automatic failure of a course. In other words, students absent seven (7) or more times, in a course that meets twice a week, will receive a grade of "F" for the course. Absences include trips, appointments, interviews, conferences, illness, injury, as well as simply not showing up. Religious observances, school business, and major illness will be considered; however, notify me in advance of any planned absences and submit your assignment prior to the event. After any absence, it is your responsibility to find out what material, assignments, or announcements you missed.

Reading List

Cooper, Zack, Craig, Stuart V, Gaynor, Martin, & Van Reenen, John. 2017. *The price aint right? Hospital prices and health spending on the privately insured*. Working Paper. National Bureau of Economic Research.

Courtemanche, Charles, Marton, James, Ukert, Benjamin, Yelowitz, Aaron, & Zapata, Daniela. 2017. Early impacts of the Affordable Care Act on health insurance coverage in Medicaid expansion and non-expansion states. *Journal of Policy Analysis and Management*, **36**(1), 178–210.

Darden, M., & McCarthy, I. 2015. The Star Treatment: Estimating the Impact of Star Ratings on Medicare Advantage Enrollments. *Journal of Human Resources*, **50**(4), 980–1008.

Darden, Michael, McCarthy, Ian, & Barrette, Eric. 2018. *Who Pays in Pay-for-Performance? Evidence from Hospital Pricing*. Working Paper w24304. National Bureau of Economic Research.

Gruber, Jonathan. 2001. Tobacco at the crossroads: the past and future of smoking regulation in the United States. *Journal of Economic Perspectives*, **15**(2), 193–212.

Gruber, Jonathan. 2017. Delivering public health insurance through private plan choice in the United States. *Journal of Economic Perspectives*, **31**(4), 3–22.

Obama, Barack. 2016. United States health care reform: progress to date and next steps. *Jama*, **316**(5), 525–532.

Ross, Hana, & Chaloupka, Frank J. 2003. The effect of cigarette prices on youth smoking. *Health economics*, **12**(3), 217–230.