Understanding causal relationships is a central goal in social science and science in general. Correlations help to predict outcomes, but if we want to influence outcomes we need to understand causal pathways. It is not sufficient to observe what is happening, we need to know why it is happening.

Toolbox of causal inference

In this course students will learn the toolbox of causal inference econometrics with applications to the economics of health, human capital, and subjective wellbeing.

The empirical methods we will cover include multivariate regressions, panel data, difference-in-difference designs, instrumental variables, randomized control trials, and regression discontinuities. We will also discuss causal evidence derived from theoretical models and machine learning.

Health, human capital, and happiness as core applications

Health, human capital, and subjective wellbeing (“happiness”) are core dimensions of social welfare and inequality in our society. They matter as an outcome for people’s lives and they matter as an input into economic and social productivity. Moreover, health, human capital, and happiness are impacted by behaviors and by social and environmental conditions – factors that can be impacted via social policies. To develop effective social policies, however, it is crucial to understand the causal mechanisms driving these factors.
We will discuss fetal origins, the impact of air pollution on health, causes and consequences of mental illness in childhood and youth, the impact of income on health, trends in mortality, the economic drivers of fertility, happiness across countries and over time, and the roots of midlife crisis.

**Prerequisites**

Econ 202 (Intro to Microeconomics) and a 200-level statistics class (SESP 210, Stat 202, Stat 210 and Psych 201 are all suitable)

**Website**

The course webpage is on Canvas with the following course identifier:
020WI_SOC_POL_351-0_SEC20_AND_HDSP_451-0_SEC20

**Grading**

20% problem sets, 20% midterm, 60% final exam

**Exam dates**

Midterm: 2/11/2020
Final exam: 3/18/2020, 7-9pm

**Exam information**

Both exams will be closed book (no notes, books, etc.). There is no scheduled make-up time for either exam. If you anticipate a potential medical emergency (e.g., you are due to give birth on the day of the final) please talk to me as soon as possible. Neither the midterm exam nor the final exam can be taken before the scheduled date. I reserve the right to give an alternative version of the exam in case a student takes the exam outside of the scheduled time slot.

**Course material**

Slides form the core material of the course and are provided through the Canvas website. The slides often contain gaps to be completed during the lectures. Moreover, some additional concepts, discussions, or references may come up during the lectures. If you miss a class make sure to get lecture notes from a fellow student. The detailed course schedule (further below) lists papers and links that provide additional details to complement the material discussed in class. References marked with asterisk are obligatory to read.
Problem sets

There will be seven graded problem sets. They are due at the beginning of the Tuesday lecture following the assignment. The overall problem set grade is based on your six best problem sets. Late problem sets are not accepted under any circumstances.

You are allowed and encouraged to work with your classmates on the problem sets. However, problem sets are typically individualized and you must hand in your own set of answers with explanations in your own words (no identical copies of joint work). If a problem requires coding or calculations, you must show your own work.

Statistical software

Students are encouraged to use Stata, however, other statistical packages such as R can be used as well. The TA will provide introductory material for Stata, and R, and will offer an introductory session during the first office hour (Friday 11am, 1/10/2020). If you want to use Stata (as recommended), you can use it for free via SESP’s remote desktop access. There are online tutorials from SESP IT, here is the one for Windows, and here for Mac.

Office hours

My office hours are on Thursdays 2:00pm-3:00pm in my office, and by appointment (set up through email). The TA will also be holding office hours, on Friday 11:00am-12:00pm in Annenberg 107.
Course schedule

Week 1 – 1/7/2020 & 1/9/2020
Introduction
Methods: Regression basics
Topics: Models of health production
Extra: Stata introduction

Week 2 – 1/14/2020 & 1/16/2020
Methods: Panel data, fixed effects
Topics: Fetal origins

Week 3 – 1/21/2020 & 1/23/2020
Methods: Instrumental variables
Topic: Wealth-health relationship (Guest lecture: Michelle Yin)

Week 4 – 1/28/2020 & 1/30/2020
Methods: Difference-in-Difference
Topic: Pollution

Week 5 – 2/4/2020 & 2/6/2020
Methods: Randomized control trials
Topic: The health impacts of health insurance

Week 6 – 2/11/2020 & 2/13/2020
Midterm exam – in class
Topic: Opioids (Molly Schnell)

Week 7 – 2/18/2020 & 2/20/2020
Methods: Regression discontinuity
Topic: Mental health

Week 8 – 2/25/2020 & 2/27/2020
Methods: Mortality and fertility measures; inequality measures
Topic: Mortality inequality

Week 9 – 3/2/2020 & 3/5/2020
Methods: Empirical robustness and replicability (Timea Viragh)
Topic: Fertility

Week 10 – 3/17/2020 & 3/19/2020
Methods: Happiness measures and model-based evidence
Topic: Happiness
Detailed course schedule with references

Week 1 – 1/7/2020 & 1/9/2020

Methods: Regression basics (multivariate regression, clustering, measurement error, binary dependent variables)


Topics: Models of health production


Week 2 – 1/14/2020 & 1/16/2020

Methods: Panel data, fixed effects


Topics: Fetal origins


Week 3 – 1/21/2020 & 1/23/2020

Methods: Instrumental variables


Topic: Wealth-health relationship (Guest lecture: Michelle Yin)

Additional references:

*Individual Income*


*Aggregate income*


*Education*


*Health Behavior*

Nutrition


Smoking and drinking

Week 4 – 1/28/2020 & 1/30/2020

Methods: Difference-in-Difference


Topic: Pollution


  watch: https://www.youtube.com/watch?v=9_B11-i95FA (What did the Emissions Cheating Scandal Reveal about the Health Effects of Car Pollution?)
Week 5 – 2/4/2020 & 2/6/2020

Methods: Randomized control trials

- Duflo, Esther “Randomized Controlled Trials, Development Economics and Policy Making in Developing Countries”
  [https://www.princeton.edu/~deaton/downloads/Deaton%20Randomization%20revisited%20v5%202019.pdf](https://www.princeton.edu/~deaton/downloads/Deaton%20Randomization%20revisited%20v5%202019.pdf)
  watch: [https://www.youtube.com/watch?time_continue=138&v=UB1A62u9fBE&feature=emb_logo](https://www.youtube.com/watch?time_continue=138&v=UB1A62u9fBE&feature=emb_logo)

Topic: The health impacts of health insurance

RCT evidence


Quasi-experimental evidence

Week 6 – 2/11/2020 & 2/13/2020

Midterm exam – in class
Topic: Opioids (Molly Schnell)


Methods: Regression discontinuity


Topic: Mental health

- Schwandt, H. and Wuppermann, A., 2016. The youngest get the pill: ADHD misdiagnosis in Germany, its regional correlates and international comparison. *Labour Economics, 43*, pp.72-86.
Week 8 – 2/25/2020 & 2/27/2020

Methods: Mortality and fertility measures


Topic: Mortality inequality


Week 9 – 3/2/2020 & 3/5/2020

Methods: Empirical robustness and replicability (lecture by Timea Viragh)

- References TBA

Topic: Fertility


Week 10 – 3/17/2020 & 3/19/2020

Methods: Happiness measures


Topic: Happiness across countries, over time, and over age (a.k.a. midlife crisis)


