ECNS 432
Ch. 12: Valuing Impacts with Experiments and Quasi-Experiments

- Chapter 12
  - EXTREMELY RELEVANT FOR MANY OFYOUR RESEARCH PAPERS!!!
    - When I ask you "what is your empirical model/method", I'm often referring to this stuff!

Experiments and Quasi-Experiments

- CBAs of any intervention require comparisons b/w alternatives
  - The program/policy subject to evaluation is compared to a counterfactual (i.e. the situation that would exist w/o the program/policy)
  - Impacts are measured as differences in outcomes b/w the two situations

- Internal validity: Depends on the particular way in which the comparison b/w the program and the situation w/o the program is made

- External validity: Refers to how well results generalize

- Ex. RCTs in developing countries

Commonly Used Evaluation Designs

- Design 1: Classical experimental design (somewhat of a gold standard)
  - Comparison of net changes b/w treatment and true control groups
- Structure

Classical experiment	Pre-observation	Treatment	Post-observation
Random assignment (treatment)	O_1	X	O_2
Random assignment (control)	O_3		O_4

  - Example: Pilot project of an educational program with random assignment
    - Sex education courses
      - Treatment (abstinence only)
      - Control (general sex educ.)
  - Advantages: Q. What does random assignment guard against?
  - Ans. Systematic differences b/w control and treatment groups
  - Disadvantages: Costly
    Ethics of random assignment
    External validity

Commonly Used Evaluation Designs

- Design 2: Classical experimental design without baseline data
- Structure

Classical experiment w/o baseline data	Pre-observation	Treatment	Post-observation
Random assignment (treatment)		X	O_2
Random assignment (control)			O_4

- Advantages: Similar to Design 1
- Disadvantages: If random assignment is done incorrectly (i.e. not truly random), then no pre-treatment characteristics available to make statistical adjustments
  - Can be an issue when sample sizes are small

Commonly Used Evaluation Designs

- Design 3: Before and After Comparison
  - No control group
  - No random assignment
- Structure

Before/After comparison	Pre-observation	Treatment	Post-observation
	O_1	X	O_2

- Advantages: Often feasible

  Relatively inexpensive

  Reasonable when factors other than treatment are unlikely to affect outcome (think of a true exogenous shock)
- Disadvantages: Does not control for other factors that may cause the change (especially problematic when you cannot observe and, thus, control for detailed characteristics for the affected individuals, groups, etc.)
- Ex. Supply-side drug intervention (Dobkin and Nicosia 2009, AER)

Commonly Used Evaluation Designs

- <u>Design 4:</u> Nonexperimental comparison w/o baseline data
- Structure

Nonexperimental comparison w/o baseline data	Pre-observation	Treatment	Post-observation
Treated group		X	O_1
Quasi-control group			O_2

- Advantages: Not much!

  Feasible, cheap
- Disadvantages: Danger of sample selection bias caused by systematic differences b/w treatment and quasi-control group
- Ex. Compare marijuana use in CA (med. marijuana legal) with marijuana use in UT (med.marijuana illegal) based on post-medical marijuana legalization data.

Commonly Used Evaluation Designs

- Design 5: Nonexperimental comparison w/ baseline data
- Structure

Nonexperimental comparison w baseline data	Pre-observation	Treatment	Post-observation
Treated group	O_1	X	O_2
Quasi-control group	O_3		O_4

- Most often used technique to evaluate large scale policies where randomized trials would be prohibitively costly
- Advantages: Permits detection of ***measurable*** differences b/w treatment and quasi-control groups
  - -i.e. provides info on how groups differed prior to treatment
  - -Can control for "selection bias" based on ***observable*** characteristics

Commonly Used Evaluation Designs

- Disadvantages: Sample selection bias is still an issue due to ***unobservables***

FOR YOUR PAPERS

- Think about the type of experimental design that is feasible
- If using hypothetical data, then try to design the ideal experiment (if you had the time and resources available)