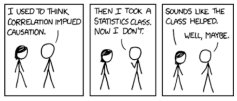
2.2: Causal inference

LECTURE 2: CAUSAL THEORIES & HYPOTHESES

1

Questions about cause and effect are everywhere

- Frequently encountered:
  - Taking Poli 210 will improve your ability to digest political science research.
  - Social media use leads to political cynicism.
  - Taking anti-malaria medication cure COVID-19?
- Easy to show whether *X* and *Y* move together. It's much much harder to demonstrate that *X* causes *Y*.
- Causality is one of the most central concepts in empirical social sciences.



2

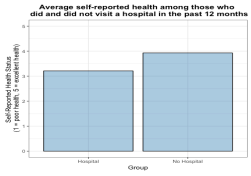
Do hospitals make people healthier?

Is this correct?

Individuals going to hospital are *on average* less healthy than individuals not going to hospital.

Survey respondents who reported going to a hospital in the past 12 months reported lower levels of health (*M* = 3.21) compared to those who did not go to a hospital (*M* = 3.93).

Conclusion: Hospital visits reduce health.



Source: National Health Interview Survey, 2005

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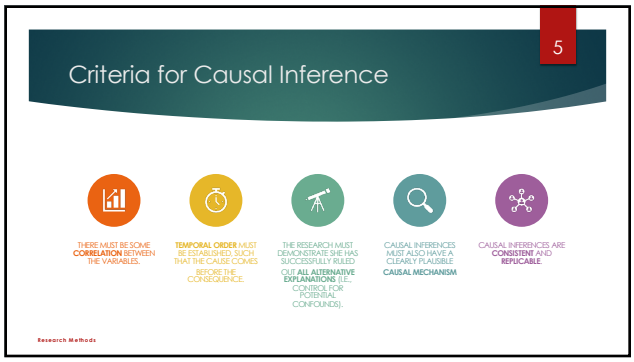
Potential Outcomes Framework

- Key causal question: Would the same individual given a different health score, had she not gone to the hospital?
- We can never observe both outcomes at the same time. This is the fundamental problem of causal inference; we observe only one of two potential outcomes.

Participant ID Number	Visited hospital?	Average self-reported health		Age	Education
		$Y_i(1)$	$Y_i(0)$		
1	1	2	?	55	College
2	0	?	3	42	High School
3	0	?	4	19	Graduate school
4	1	3	?	31	College
...	...	...	...	...	...
n	1	1	?	72	High school

4


5
Criteria for Causal Inference
THERE MUST BE SOME CORRELATION BETWEEN THE VARIABLES.
TEMPORAL ORDER MUST BE ESTABLISHED, SUCH THAT THE CAUSE COMES BEFORE THE CONSEQUENCE.
THE RESEARCH MUST DEMONSTRATE SHE HAS SUCCESSFULLY RULED OUT ALL ALTERNATIVE EXPLANATIONS (I.E., CONTROL FOR POTENTIAL CONFOUNDS).
CAUSAL INFERENCES MUST ALSO HAVE A CLEARLY PLAUSIBLE CAUSAL MECHANISM
CAUSAL INFERENCES ARE CONSISTENT AND REPLICABLE.
Research Methods

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