The Philosophy of Causal Inference

Cause versus causal effect.

- We need a "treatment."
- We need a comparison.

Potential outcomes framework.

- $Y_i(0)$ and $Y_i(1)$.

Causal inference is a missing data problem.
(The "Fundamental Problem of Causal Inference.")

- We never observe *both* potential outcomes.
- We observe $Y_i(0|\, T_i = 0)$, $Y_i(1|\, T_i = 1)$,
  but not $Y_i(1|\, T_i = 0)$, $Y_i(0|\, T_i = 1)$.

The Practice of Causal Inference

Two assumptions.

1. SUTVA.
2. Ignorability.

Randomization as the basis for valid inference (Fisher).

Without randomization we need conditional independence.

- $Y_i(0), Y_i(1) \perp T_i \mid X_i$

How important is the mode of inference?

Lessons and Issues for Social Science

This applies to qualitative and quantitative research.

Treatment assignment.

- "Design-based" research.

Assumptions: testable and untestable.

"Regression is evil" (and other stuff is better).

Can we have principled methods?

Should we abandon "fundamentally unanswerable questions"?

Going Beyond Causal Inference

Causal inference is a powerful and compelling framework for thinking about this stuff.

What is the role for descriptive work?

What is the role for data mining?

What is the role for theory?

Are causal effects always interesting??