

**Potential outcomes problem set**  
**Due Sunday, June 22 at 5 pm**

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Review of core concepts

1. What is the **Fundamental Problem of Causal Inference (FPCI)**? Why does it create challenges for empirical research? In what way is the FPCI a “missing data problem”?
2. What are the **two key assumptions** required for causal inference under the **potential outcomes framework**? Explain why each is necessary.

Application

3. Suppose a researcher is interested in the following research question:

*How does gubernatorial partisanship shape welfare spending in New England (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont)?*

Draw the **box model** you would use to answer this question. What are the treatment and outcome? What are the units? What are the values on the tickets?

4. Imagine there is a **fixed amount of federal welfare money** available to the six New England states. What assumption of the potential outcomes framework might this violate, and why?

5. A researcher conducts the same study across **all 50 U.S. states** and finds that **Democratic governors spend less on welfare**. He concludes:

“This proves that electing a Democratic governor reduces welfare spending!”

Using the potential outcomes framework, explain what this researcher would need in order for this causal claim to be justified. Be specific about the necessary assumptions.