

Fundamentals of Confounding Adjustment

Course Outline, 2026

Instructors: Joy Shi, Barbra Dickerman, Miguel Hernán

Teaching Fellow: Rienna Russo

Course Description

Causal inference from observational data often relies on appropriate adjustment for confounders. This online course uses a combination of video lectures and hands-on exercises to introduce different methods to adjust for confounding in the context of time-fixed treatments. By the end of course, students will be able to:

- Explain why models are generally necessary to adjust for confounding
- Estimate causal effects of point interventions with adjustment for baseline confounding using various modeling approaches
- Understand the relative advantages and disadvantages of each modeling approach

Pre-requisites

Participants are expected to have experience with the analysis of health databases in academic or industry settings, prior introductory courses on study design and data analysis, and working knowledge of R or SAS.

Participants are expected to complete the following before the start of the course:

- Watch first three lectures of *Causal Diagrams: Draw Your Assumptions Before Your Conclusions*
- Read Part I of Causal Inference: What If (Hernán MA and Robins JM, Boca Raton: Chapman & Hall/CRC 2020)

Course Outline

Module 1: Introduction to confounding and modeling

Module 2: Outcome regression

Module 3: Standardization

Module 4: Propensity score approaches

Module 5: Inverse probability weighting

Module 6: Models for causal survival analysis