Causal Inference in Repeated Cross-Sectional Observational Studies

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Abstract

Inferring the causal relationship has been widely studied for cross-sectional design, with either binary treatment or multi-level treatment. The discussion is scarce when the crosssectional study is repeated over time for different participants. Such design has a time component, but it is different from a longitudinal observational study, in which the same sugject is observed for multiple times. In health stuides, it is quite common that a promissing/successful program is repeated over time with essentially the same protocol. Our research is motivated by an Italian smoking cessation study repeated every year from 2001 to 2006, aiming to compare the efficacy of medication plus counseling and counseling only strategies on smoking cessation. This talk sets up the potential outcome framework for the repeated cross-sectional study, identifies the assumptions needed for valid causal effect estimation, discusses possible ways to test some of the assumptions and suggests sensitivity analysis for untestable assumptions. A matching based estimating strategy is implemented to analyze the real data.