Causal Inference with Missing Data: a Multiply Robust Empirical Likelihood Approach

Abstract: Pretest-posttest studies are commonly used for assessing the effect of a treatment or intervention in causal inference. We propose a unified approach to both testing and estimation of the treatment effect in non-randomized pretest-posttest studies where the posttest outcomes are subject to missingness. The proposed method is multiply robust in the sense that different working models can be simultaneously accommodated, and the validity of the inference only requires a certain combination of these working models to be correct. Thus, our method provides more protection against model misspecification. The proposed method is based on the calibration idea from survey sampling literature and the empirical likelihood theory. An empirical likelihood confidence interval can be constructed for the treatment effect and has better coverage probabilities than confidence intervals based on the Wald statistic. Simulations are conducted to demonstrate the finite-sample performances of the proposed methods. Further directions using these tools will also be briefly discussed in the context of causal inference, including covariate balancing, Bayesian empirical likelihood and R package development.

Time: Friday, Jan 25, 2019
Time: 4:00 – 5:00 PM
Location: CAB 657