

SCMS Seminar



SEMIPARAMETRIC TRANSFORMATION MODELS FOR CAUSAL INFERENCE IN TIME-TO-EVENT STUDIES WITH ALL-OR-NOTHING COMPLIANCE

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Time: 10:00-11:00 a.m., Friday, October 24th, 2014

Venue: Room 2201, East Main Guanghua Tower, Handan Campus

Abstract: We consider causal inference in randomized survival studies with right censored outcomes and all-or-nothing compliance, using semiparametric transformation models to estimate the distribution of survival times in treatment and control groups, conditional on covariates and latent compliance type. Estimands depending on these distributions, for example, the complier average causal effect (CACE), the complier effect on survival beyond time t , and the complier quantile effect are then considered. Maximum likelihood is used to estimate the parameters of the transformation models, using a specially designed expectation-maximization (EM) algorithm to overcome the computational difficulties created by the mixture structure of the problem and the infinite dimensional parameter in the transformation models. The estimators are shown to be consistent, asymptotically normal, and semiparametrically efficient. Inferential procedures for the causal parameters are developed. A simulation study is conducted to evaluate the finite sample performance of the estimated causal parameters. We also apply our methodology to a randomized study conducted by the Health Insurance Plan of Greater New York to assess the reduction in breast cancer mortality due to screening.