Causal Estimation on for the Proportional Hazard Model with Prevalent Sampling

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Abstract

This talk considers two different approaches for estimating the causal survival function from prevalent survival data: a bias-correction method and an approach based on the propensity score. The analytical problem arises because the outcome measurements as well as the covariates are partially observed due to the prevalent sampling. The missingness in data comes from two different sources: One is due to the hypothetical potential outcome framework; the other is caused by the prevalent sampling scheme. Statistical analysis without adjusting bias from both sources of missingness will lead to biased results in causal inference. In this paper we developed a semiparametric approach to estimate the causal survival function and proposed a method to correct the propensity scores. A sensitivity analysis is conducted based on corrected propensity scores. Large sample properties of our estimators based on empirical processes are derived in this article. The proposed method was motivated by and applied to the Surveillance, Epidemiology, and End Results (SEER)-Medicare linked data for women diagnosed with breast cancer.