

A Matching-Based Approach For Identification And Estimation Of The Survivor Average Causal Effect In Truncation By Death Problems

Even in a carefully designed randomized trial, outcomes for some participants can be missing, or more precisely, ill-defined, because they had died prior to outcome collection. This problem, known as truncation by death, means that a comparison between the treatment arms among the survivors does not correspond to a causal effect. Therefore, researchers often utilize principal stratification and focus on the Survivor Average Causal Effect (SACE). The SACE is the causal effect among the subpopulation that will survive regardless of treatment status. We present a new approach based on matching for SACE identification and estimation. We provide theoretical justification for the approach, and discuss various practical issues, including the choice of distance measures, post-matching SACE estimators, and non-parametric tests. We develop sensitivity analysis techniques for the needed assumptions and illustrate their use in real data analysis. We present simulation results demonstrating the utility of our approach.