Improving the Robustness of Doubly Robust Estimators in Missing Data Analysis

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Abstract

Estimators that are robust against model misspecifications are highly desired. In missing data analysis, doubly robust estimators are consistent if either the model for selection probability or the model for data distribution is correctly specified. We will present a method that exhibits an improved robustness. This method can simultaneously account for multiple models for both selection probability and data distribution. The resulting estimators are consistent if any one model is correctly specified. In addition, these estimators achieve maximal possible efficiency when both quantities are correctly modeled and are not sensitive to near-zero values of estimated selection probability. This new method is based on the calibration idea from sampling survey literature and has a strong connection to empirical likelihood.