

Estimating the treatment effect in the nonrandomized studies using propensity score in the presence of missing covariates

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Propensity score has been used widely as a bias reduction method when estimating treatment effect in nonrandomized studies. Since many covariates are generally included in the model for estimating the propensity score, the proportion of subjects with at least one missing covariate could be large. Since in general one cannot rule out that the mechanism of missingness may be non-ignorable, simply discarding subjects with any missing covariates may cause additional bias, thus offsetting the benefits of propensity score in reducing the bias and could also increase the variance of estimated treatment effect due to deleting a large number of subjects with missing covariates. There are several ways to handle missing values when modeling propensity scores (besides simply deleting them from the data): imputing missing values and creating indicator variables for missing covariates, pattern mixture models, and EM algorithm for joint modeling of propensity score and missingness. There is currently lack of literature on comparing performance of these methods. In this presentation, we will compare the performance of the three methods in terms of the bias, coverage, and MSE of estimated treatment effect using simulation under various propensity score models and missingness mechanisms.

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