Yale SCHOOL OF PUBLIC HEALTH

Biostatistics

Improving Estimation Efficiency for Left-truncated Competing Risks Regression under the Case-cohort Design

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ABSTRACT

The case-cohort study design provides a cost-effective study design for a large cohort study with competing risks outcomes. The proportional subdistribution hazards model is widely used to estimate direct covariate effects on the cumulative incidence function for competing risks data. In biomedical studies, left truncation often occurs and brings extra challenges to the analysis. Existing inverse probability weighting methods for case-cohort studies with competing risks data not only have not addressed left truncation, but also are inefficient in parameter estimation for baseline covariates. We propose an augmented inverse probability weighted estimating equation for left-truncated competing risks data to address these limitations of the current literature. The proposed estimators are consistent and asymptotically normally distributed. Simulation studies show that the proposed estimator is unbiased and leads to parameter estimation efficiency gain for the baseline covariates. We analyze the data for coronary heart diseases using the proposed methods.