Statistical Inference for Right-censored Data With Nonignorable Missing Censoring Indicators

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Abstract: We consider statistical inference for right-censored data when censoring indicators are missing but nonignorable, and propose an adjusted imputation product-limit estimator. The proposed estimator is shown to be consistent and converges to a Gaussian process. Furthermore, we develop an empirical process-based testing method to check the MAR (missing at random) mechanism, and establish asymptotic properties for the proposed test statistic. To determine the critical value of the test, a consistent model-based bootstrap method is suggested. We conduct simulation studies to evaluate the numerical performance of the proposed method and compare it with existing methods. We also analyze a real data set from a breast cancer study for an illustration.

Key words and phrases: MAR mechanism testing, Nonignorable missing censoring indicators, Survival function, Quasi-likelihood.