

Additive risk model for current status data with a cured subgroup

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Abstract Current status data arise when the exact timing of an event cannot be observed, and the only available information is whether or not the event has occurred at a random censoring time point. We consider current status data with a cured subgroup, where subjects in this subgroup are not susceptible to the event of interest. We model the cure probability using a generalized linear model with a known link function. For subjects susceptible to the event, we model their survival hazard using a partly linear additive risk model. We show that the penalized maximum likelihood estimate of the parametric regression coefficient is \sqrt{n} consistent, asymptotically normal and efficient. The nonparametric cumulative baseline function and nonparametric covariate effect can be estimated with the $n^{1/3}$ convergence rate. We propose inference using the weighted bootstrap. Simulations study is employed to assess finite sample performance of the proposed estimate. We analyze the Calcification study using the proposed approach.

Keywords Additive risk model · Cure model · Current status data · M-estimator