

On a Semiparametric Estimation Method for AFT Mixture Cure Models

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When studying survival data in the presence of right censoring, it often happens that a certain proportion of the individuals under study do not experience the event of interest and are considered as cured. The mixture cure model is one of the common models that take this feature into account. It depends on a model for the conditional probability of being cured (called the incidence) and a model for the conditional survival function of the uncured individuals (called the latency).

This work considers a logistic model for the incidence and a semiparametric accelerated failure time model for the latency part. The estimation of this model is obtained via the maximization of the semiparametric likelihood, in which the unknown error density is replaced by a kernel estimator based on the Kaplan-Meier estimator of the error distribution. Asymptotic theory for consistency and asymptotic normality of the parameter estimators is provided. Moreover, the proposed estimation method is compared with a method proposed by Lu (2010), which uses a kernel approach based on the EM algorithm to estimate the model parameters. Finally, the new method is applied to data coming from a cancer clinical trial.