

Accelerated failure time model under general biased sampling scheme

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Abstract

Right-censored time-to-event data are sometimes observed from a (sub) cohort of patients whose survival times can be subject to outcome-dependent sampling schemes. In this paper, we propose a unified estimation method for semiparametric accelerated failure time models under general biased estimating schemes. The proposed estimator of the regression covariates is developed upon a bias-offsetting weighting scheme and is proved to be consistent and asymptotically normally distributed. Large sample properties for the estimator are also derived. Using rank-based monotone estimating functions for the regression parameters, we find that the estimating equations can be easily solved via convex optimisation. The methods are confirmed through simulations and illustrated by application to real data sets on various sampling scheme including length-bias sampling, the case-cohort design and its variants. This is a joint work with Jane Paik Kim and Zhiliang Ying.