

Semiparametric transformation models with length-biased data

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Abstract

In survival analysis, assuming the distribution of the censoring times does not improve the efficiency in estimation of the survival distribution, as the distribution of the censoring times can be factored out from the full likelihood. On the other hand, incorporating the information about truncation time distribution in the estimation can yield substantial gains in efficiency (Wang, 1989, 1996). However, as a trade-off, it is well known that such efficiency gains can increase the complexity of the estimating procedure. To balance this trade-off, we expand the pseudo-partial likelihood method and the martingale estimating equation approaches for the semiparametric transformation models with survival data under length-biased sampling. Both pseudo-partial likelihood and martingale estimating equation approaches can be reduced as the partial likelihood in the special case of proportional hazards model. The proposed estimators are shown to be consistent and asymptotically normally distributed. A data analysis illustrates the methods.