Semiparametric Varying-coefficient Study of Mean Residual Life Models with right-censored and length-biased data

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Abstract: Right-censored length-biased data occurs frequently in observational studies and the probability of observing the data is proportional to the length of failure time. It causes great challenges to data analysis. Therefore, existing methods for traditional survival data cannon be used to length-biased data. Mean residual life models is an important characteristic of evaluating the remaining life of a subject having survived up to a given time. In this paper, we consider a flexible semiparametric varying-coefficient mean residual life model with length-biased data, in which some covariate coefficients are allowed to vary as functions of other variables. Making using of inverse probability method(IPW), we develop a three-step method to estimation, which can improve the efficiency of the estimation.

Also, both independent censoring and dependent censoring are considered. Furthermore, the asymptotic properties of the estimation are established. Simulation studies are conducted and shows that the proposed methods performs well. Finally, an illustrative example is given.