

Two Sample Comparison based on Semi-Competing Risks Data

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SUMMARY

Semi-competing risks data are commonly seen in biomedical applications. In this article, we consider the problem of two-sample comparison based on a non-terminal event, say disease progression, which is subject to censoring by a terminal event such as death. Existence of possible dependent censoring complicates the analysis. The proposed methodology is developed under two types of assumptions. First, separate copula models are assumed for the two groups and then a flexible model measuring the group difference is imposed on the progression time. A competing approach for estimating the group-difference parameter is the method proposed by Lin et al. (1996) which requires making additional marginal assumption on the terminal event and implicitly assumes that the dependence structures in the two groups are the same. Although here we put an extra copula assumption on the observable region, we also propose a model checking approach to assess its validity. Via simulations, we compare the two competing methods based on their finite-sample performances and robustness properties if the imposed assumptions are violated. The proposed method is applied to a data set of bone marrow transplant provided in Klein and Moeschberger (2003).

Key words : Dependent censoring; Multiple events data; Transformation model; Copula model; Model selection.