Marginalized Frailty Models for Multivariate Survival Data

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Abstract

We consider a semiparametric normal transformation for multivariate survival times. Estimation of an association parameter is easily implemented with existing software using a two-stage estimation procedure. In contrast to other models for multivariate survival data, our association parameter can take negative values and we are able to test whether the association parameter is equal to zero. Asymptotic properties are derived under the two-stage estimation scheme. Simulation studies verify finite sample utility. We apply the method to a Children’s Oncology Group multi-center study of acute lymphoblastic leukemia. The analysis estimates marginal treatment effects and examines potential clustering within treatment institution.