

Analysis of multivariate current status data with dependent censoring

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Abstract

Multivariate current status failure time data consist of several possibly related event times of interest, in which the status of each event is determined at a single examination time. If the examination time is intrinsically related to the event times, the examination is referred to as the dependent censoring and needs to be taken into account. Such data often occur in, for example, clinical studies and animal carcinogenicity experiments. To accommodate the possible dependent censoring, this paper proposes a joint frailty model for event times and dependent censoring time. A likelihood approach using Gaussian quadrature techniques is developed for obtaining maximum likelihood estimates. Extensive simulation studies are conducted for investigating finite sample properties of the proposed method. The proposed method is illustrated with an analysis of patients with ankylosing spondylitis, where the examination time may be dependent on the event times of interest.

Keywords: multivariate current status data, dependent censoring, frailty model, Gaussian quadrature techniques