Analyzing Longitudinal Data with Informative Observation and Terminal Event Times

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In many longitudinal studies, repeated measures are often correlated with observation times. Also, there may exist a dependent terminal event such as death that stops the follow-up. In this article, we propose a joint modeling for analysis of longitudinal data with informative observation times and dropout. We specify a semiparametric linear regression model for the longitudinal process, and the accelerated time models for the observation and the dropout processes, while leaving the distributional form and dependent structure unspecified. Estimating equation approaches are developed for parameter estimation, and the resulting estimators are shown to be consistent and asymptotically normal. In addition, some numerical procedures are provided for model checking. The finite sample behavior of the proposed estimators is evaluated through simulation studies, and an application to a medical cost study of chronic heart failure patients from the University of Virginia Health System is provided.

Key Words: Informative observation times, informative dropout, joint modeling, longitudinal data