Recurrent Event Data with Measurement Error

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Abstract

Recurrent event data arise frequently in many longitudinal follow-up studies. Examples include repeated hospitalizations, recurrent infections in HIV, and tumor recurrences. In contrast to the existing works, in our case the conventional assumption of independent censoring is violated since the recurrent event process is interrupted by some correlated terminal events. Further, some covariates may be measured with errors. To accommodate both informative censoring and measurement error, the occurrence of recurrent events is modelled through an unspecified frailty distribution and accompanied with a classical measurement error model. We propose two corrected approaches based on different ideas, and we show that they are numerically identical. The asymptotic properties of the proposed estimators are established, and the finite sample performances are examined via simulations. The proposed methods are applied to a real data.