

A SEMIPARAMETRIC ESTIMATOR FOR THE PROPORTIONAL
HAZARDS MODEL WITH LONGITUDINAL COVARIATES
MEASURED WITH ERROR

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A common objective in longitudinal studies is to characterize the relationship between a failure time process and time-independent and time-dependent covariates. We assume that time-dependent covariates follow a linear mixed effects model with normal measurement error and that the hazard of failure depends on underlying random effects describing the covariate process and other time-independent covariates through a proportional hazards relationship. A routine assumption is that the random effects are normally distributed; however, this need not hold in practice. We develop a method for estimating the proportional hazards model parameters that requires no assumptions on the distribution of the random effects by exploiting the conditional score approach of Stefanski and Carroll. Large sample properties are established, and finite sample performance is assessed and compared to competing methods via simulation.

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