BAYESIAN ANALYSIS FOR JOINT MODELLING OF LONGITUDINAL DATA AND SURVIVAL EVENTS IN MEAN-COVARIANCE MODEL

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Models for joint behavior of longitudinal data and survival events have become very popular in the last decade. Many models based on random effect link and fixed effect link between the longitudinal model and survival model are both developed. Most literature work uses a univariate random effect or a linear combination of lower-dimensional random effects to link these two models. In this work, we extend the univariate link to multivariate link in terms of multivariate random effects. This new modelling framework is more reasonable since. in the traditional longitudinal model, random effects may be multivariate or possible very high-dimensional. With a covariance decomposition approach, the joint mean-covariance modelling technique is used to estimate the mean and covariance simultaneously and deal with balance and unbalance longitudinal data. The key idea of this joint mean-covariance model is to decompose the covariance matrix using Cholesky decomposition and then model the lower triangular matrix and the diagonal matrix using regression model. We use a Bayesian approach to obtain the parameter estimates in the model. Gibbs sampler is used with adaptive rejection sampling method, with which we sample from the full conditional distribution of each parameter. Some real medical data analysis and simulation study show that the proposal method works reasonably well.