Bayesian modeling of random effects covariance matrix in baseline-logit random effects models

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To analyze longitudinal nominal data, baseline-logit random effects models are commonly used. The random effects covariance matrix in the models must specify three correlation components: the correlation between categories at each time point, correlation within separate categories over time and cross-correlation between different categories at different times. In addition, modeling of the random effects covariance matrix in the models is challenging due to high-dimensionalty and positive-definitness of the covariance matrix. To solve these restrictions and account for the correlation compoents, we propose modified Cholesky decomposition (MCD). Therefore, the random effects covariance matrix captures a wider class of sophisticated correlations and the estimated covariance matrix is guaranteed to be positive-definite. In addition, we propose Bayesian methods for the proposed models and conduct Markov Chain Monte Carlo using the JAGS program. We also use the proposed models to analyze real data from from the McKinney Homeless Research Project.