A NON-LINEAR CUMULATIVE LOGIT MIXED MODEL WITH TIME VARYING PHASES AND COVARIATES

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A non-linear cumulative logit mixed model is presented to estimate the time-related prevelences of individual categories with temporal decomposition to reveal consitituents of the patterns of the prevelences and their determinants. This model enables us to perform a marginal analysis for logitudinal ordinal data in which population-averaged effects of covariates can depend on time. The main features of this model are: 1. cumulative odds can be decomposed into 3 different time phases (for example, early, constant and late); 2. each phase is independently modulated by a time function and a random intercept; 3. covariates that are associated with the prevalences may or may not be independent of the time phases. We evaluate the model by simulated data. The application of this model is illustrated for logitudinal assessment of graded heart valve regurgitation following aortic valve repair. We also show through the data analysis that some covariates are modulated by the time phases and some are not.