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學 術 演 講

Extending t linear mixed models for longitudinal data with non-ignorable dropout applied to AIDS studies

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Abstract

One typical missing pattern in longitudinal data is dropout in the sense that some participants may withdraw prematurely and never return. Dropout is generally regarded as a non-ignorable mechanism when the probability of the occurrence of missing values is related to both observed and unobserved data. This paper aims at extending the t linear mixed models to cope with the problem of non-ignorable dropout for modeling continuous longitudinal data in the situation where outliers or heavy-tailed noises may be present. We consider the selection modeling strategy with a logistic link function to describe the relationship between the probability of missing process and some possible factors, including responses and extra covariates. A Monte Carlo expectation conditional maximization algorithm is developed to simultaneously compute maximum likelihood (ML) estimates of the missingness indexing parameters within the logistic link function and mixed-effects parameters of the full-data t linear mixed-effects (tLME) model that are of scientific interest. Additionally, the standard errors of the ML estimates can be calculated using the Monte Carlo version of the empirical information matrix. Two simulation studies are conducted to assess the capability of the tLME model in the presence of non-ignorable dropout and outliers. The performance is compared to its normal counterpart on the basis of information criteria indices, the precision of estimation for fixed effects and missingness indexing parameters, and the predictive accuracy of missing responses. The proposed methodology is demonstrated through a real-world example from an AIDS clinical trial, which provides practical implications when the non-ignorable dropout is considered in the analysis.

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地 點：本校數學館 527 教室（嘉義縣民雄鄉大學路 168 號）

茶 會：15:30~16:00 數學館四樓 409 室舉行

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