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Improved empirical likelihood inference and variable selection for generalized linear models with longitudinal nonignorable dropouts

Lei Wang[1] · **Wei Ma**[1]

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Abstract

In this paper, we propose improved statistical inference and variable selection methods for generalized linear models based on empirical likelihood approach that accommodates both the within-subject correlations and nonignorable dropouts. We first apply the generalized method of moments to estimate the parameters in the nonignorable dropout propensity based on an instrument. The inverse probability weighting is applied to obtain the bias-corrected generalized estimating equations (GEEs), and then we borrow the idea of quadratic inference function and hybrid GEE to construct the empirical likelihood procedures for longitudinal data with nonignorable dropouts, respectively. Two different classes of estimators and their confidence regions are derived. Further, the penalized EL method and algorithm for variable selection are investigated. The finite-sample performance of the proposed estimators is studied through simulation, and an application to HIV-CD4 data set is also presented.

Keywords Inverse probability weighting · Missing not at random · Nonresponse instrument · Quadratic inference function · Variable selection

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✉ Lei Wang
lwangstat@nankai.edu.cn

Wei Ma
maweiha@gmail.com

[1] School of Statistics and Data Science, LPMC & KLMDASR, Nankai University, Tianjin 300071, China