

Multilevel Modeling of the Progression of HIV/AIDS Disease among Patients under HAART Treatment

Authors : Awol Seid Ebrie

Abstract : HIV results as an incurable disease, AIDS. After a person is infected with virus, the virus gradually destroys all the infection fighting cells called CD4 cells and makes the individual susceptible to opportunistic infections which cause severe or fatal health problems. Several studies show that the CD4 cells count is the most determinant indicator of the effectiveness of the treatment or progression of the disease. The objective of this paper is to investigate the progression of the disease over time among patient under HAART treatment. Two main approaches of the generalized multilevel ordinal models; namely the proportional odds model and the nonproportional odds model have been applied to the HAART data. Also, the multilevel part of both models includes random intercepts and random coefficients. In general, four models are explored in the analysis and then the models are compared using the deviance information criteria. Of these models, the random coefficients nonproportional odds model is selected as the best model for the HAART data used as it has the smallest DIC value. The selected model shows that the progression of the disease increases as the time under the treatment increases. In addition, it reveals that gender, baseline clinical stage and functional status of the patient have a significant association with the progression of the disease.

Keywords : nonproportional odds model, proportional odds model, random coefficients model, random intercepts model

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