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An insight on the misuse of logistic regression model in the face of non-convergence

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Background: Logistic regression model is widely used in health research for description and predictive purposes. Unfortunately, most researchers are sometimes not aware that the underlying principles of the techniques have failed when the algorithm for maximum likelihood does not converge. Young researchers particularly postgraduate students may not know why separation problem whether Quasi or Complete occurs, how to identify it and how to fix it.

Objective: This study was designed to critically evaluate convergence issues in articles that employed logistic regression analysis published in an *African Medical Journal* between 2004 and 2013.

Methods: Problems of Quasi or complete separation were described and were illustrated with the National Demographic and Health Survey dataset. Assessment of articles that employed logistic regression was conducted.

Results: A total of 581 articles were published, of which 40 (6.9%) used binary logistic regression. However, 24 (60.0%) stated the use of logistic regression in the methodology, while only 3 (12.5%) of these properly described the procedures. None of the articles assessed model fit while majority presented insufficient details of the procedures. In addition, of the 40 that used the logistic regression, the problem of convergence occurred in 6 (15.0%) of the articles.

Conclusion: Logistic regression tends to be poorly implemented in studies published between 2004 and 2013. Our findings showed that the procedure may not be well understood by researchers since very few described the process in their reports and may be totally unaware of the problem of convergence or how to deal with it.

Biography

Yusuf O B is a student of University of Ibadan, Nigeria. She has expertise in Medical Statistics and her research interests include: Mathematical Epidemiology of Infectious Diseases (Malaria), Multilevel Modeling and Analyses of Longitudinal Data.

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