

Robustness of uniform marginal designs for logistic mixed-effects linear models with covariates

Frans E. S. Tan¹ and Fetene B. Tekle²

¹ *Maastricht University, The Netherlands*

² *Tilburg University, The Netherlands*

Abstract

Optimal design theory deals with the assessment of the optimal joint distribution of all independent variables prior to data collection. In many practical situations, however, covariates are involved for which the distribution is not previously determined. These variables will be called prior-uncontrolled variables. The optimal design problem may then be reformulated in terms of finding the optimal marginal distribution for a specific set of variables. In general, the optimal solution depends on the unknown (conditional) distribution of the prior-uncontrolled variables. In this presentation sufficient conditions will be given under which the uniform design of a subset of independent discrete variables is D_A -maximin. The sufficient conditions are formulated for Generalized Linear Mixed Models with an arbitrary number of quantitative and qualitative independent variables and random effects. Further, we studied robustness of D_A -maximin marginal designs when some of the conditions for uniformity are invalid. In particular, the performance of the uniform marginal design is of interest when the range of regression parameters is not symmetric around zero. The performance of uniform designs when neglecting these variables will also be discussed.

Keywords

D_A - maximin, Marginal designs, Prior-uncontrolled variables, Uniform designs.

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