

Link function in marginal and random effects models: some notes on robustness to link mis-specifications

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Both in marginal and random effect models some attention has been recently devoted to the problem of the choice of the link function. The actual approach seems focused in analyzing suitable transformation of the response variables separately (Taylor 1996) or not (Oberg & Davidian 2000) from the transformations of the covariates. In our study we consider the robustness of both marginal and random effect models to link mis-specifications. A simulation study is conducted starting with some well known parametric link families (Aranda-Ordaz 1981), and estimated with standard link functions both using marginal and random effects models. We point out the advantages and the drawbacks associated with the choice of this data-driven kind of modeling and the difficulties in the interpretation of regression parameters, and therefore in understanding the influence of covariates, as well as problems related to loss of efficiency of estimates and overfitting. Some case studies in multi-center, observational research in oncology and in anesthesiology are discussed.

Keywords: GEE, random effects, link function, Aranda-Ordaz, multicenter studies.

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