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Linear and quantile mixed-effects models comparison in traumatic brain injury clinical trials

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Abstract

The aim of this project was to assess the applicability and the robustness of Linear Quantile Mixed-Effects Models (LQMM) as compared to Linear Mixed-Effects Models, for the analysis of longitudinal data. Specifically, we focused on Linear Quantile Mixed-Effects Models using the Laplace distribution introduced by Geraci and Bottai in 2007. First, we addressed the advantages and the disadvantages of LQMM when considering the median instead of the mean as measure of central tendency. Second, we present the gain given by LQMM when modeling the first and third quartiles as valid and robust alternative to subgroups analysis. Data from the multicenter prospective randomized controlled trial of the effectiveness of amantadine hydrochloride in promoting recovery of function following severe traumatic brain injury, a randomized, placebo controlled, double blind clinical trial, was used in our application. LQMM can be very useful in characterizing the treatment effects among sub-groups of patients. In particular we address on the characterization based on patients in Vegetative State (VS) and Minimum Consciousness State (MCS). We also discuss the inefficiency of LQMM when the outcome is measured with high precision.

Biography

Sara Algeri is an Italian statistician and she is currently a Ph.D. student at Texas A&M University, College Station, TX.
Sara received both her bachelor's and master's degrees from the University of Milano-Bicocca, Milano, Italy. In the last year of her master's studies, she worked at Mount Sinai School of Medicine, New York as visitor master's student.
This experience has been crucial in developing her interest in Biostatistics and Cinical Trials.
Her current research mainly focuses on longitudinal data analysis, bayesian statistics and statistical applications in genetics.