

# Inferences for Ratios of Regression Parameters Using Bayesian Approach

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## Abstract

Inferences concerning ratios of general (generalized) linear model parameters arise in a variety of problems such as effective dose estimation (ED50), calibration, relative potency estimation, incremental cost-effectiveness ratio (ICER), and so on and so forth. In this talk, we highlight the drawbacks of interval estimation methods based on the classical frequentist approaches, namely, Fieller theorem and the Wald intervals, and then discuss alternative methods of establishing marginal (or simultaneous) intervals with more desirable properties (e.g., *finite-width* intervals). This can be achieved by employing Bayesian inference (e.g., see Ghosh *et al* (2003), Objective Bayesian inference for ratios of regression coefficients in linear models, *Statistica Sinica* 13:409-422). We extend this idea to that of simultaneously estimating several ratio parameters in generalized linear models. Due attention will also be given to softwares and procedures for generating the associated MCMC. The proposed method will be used to simultaneously estimate ratios of means of negative binomial distributions which is of interest in abundance studies.