

THE FOCUSED INFORMATION CRITERION IN LOGISTIC REGRESSION TO PREDICT REPAIR OF DENTAL RESTORATIONS

Cecilia CANDOLO¹

- **ABSTRACT:** *Statistical data analysis typically has several stages: exploration of the data set; deciding on a class or classes of models to be considered; selecting the best of them according to some criterion and making inferences based on the selected model. The cycle is usually iterative and will involve subject-matter considerations as well as statistical insights. The conclusion reached after such a process depends on the model(s) selected, but the consequent uncertainty is not usually incorporated into the inference. This may lead to underestimation of the uncertainty about quantities of interest and overoptimistic and biased inferences. This framework has been the aim of research under the terminology of model uncertainty and model averaging in both, frequentist and Bayesian approaches. The former usually uses the Akaike's information criterion (AIC), the Bayesian information criterion (BIC) and the bootstrap method. The last weighs the models using the posterior model probabilities. This work consider model selection uncertainty in logistic regression under frequentist and Bayesian approaches, incorporating the use of the focused information criterion (FIC) (CLAESKENS and HJORT, 2003) to predict repair of dental restorations. The FIC takes the view that a best model should depend on the parameter under focus, such as the mean, or the variance, or the particular covariate values. In this study, the repair or not of dental restorations in a period of eighteen months depends on several covariates measured in teenagers. The data were kindly provided by Juliana Feltrin de Souza, a doctorate student at the Faculty of Dentistry of Araraquara - UNESP. The results showed that the BIC, FIC and Bayesian averaging matches and the weights calculated enhanced the discussion concerning the choice of a best model.*
- **KEYWORDS:** *AIC; Bayesian model averaging; FIC; logistic regression; model averaging.*

¹Universidade Federal de São Carlos - UFSCar, Centro de Ciências Exatas e de Tecnologia, Departamento de Estatística, Postal Box 676, Postal code 13.565-905, São Carlos, São Paulo, Brasil. E-mail: cecilia@ufscar.br