EMR 2021

XVII Escola de Modelos de Regressão

ST7 – RECENTES AVANÇOS NA MODELAGEM DE ANÁLISE DE SOBREVIVÊNCIA APLICADA À SAÚDE

Coordenadora: Vera L. D. Tomazella – UFSCar, Brasil.

Survival models induced by zero-modified power series discrete frailty: Application with a melanoma data set

Vinicius Calsavara - Biostatistics and Bioinformatics Research Cedars-Sinai Medical Center, Estados Unidos

Survival model with a frailty term is an extension of Cox's proportional hazard model, in which a multiplicative random effect is introduced in the hazard function to accommodate unobserved heterogeneity. Usually, the frailty distribution is assumed to be continuous and non-negative. However, this assumption may not be true in some situations. A discretely distributed frailty model that allows units with zero frailty can be more realistic on a variety of problems. Zero frailty can be interpreted as long-term survivors commonly found in clinical data. We proposed a new discrete frailty-induced survival model with a zero-modified power series family, which allows modelling zero-inflated or zero-deflated depending on the parameter value. Parameter estimation was performed by the maximum likelihood method, and Monte Carlo simulation was conducted to evaluate the performance of the model. Its practice relevance is illustrated in a real medical dataset from a population-based study of incident cases of melanoma diagnosed in the state of São Paulo, Brazil.

A defective cure rate quantile regression model for male breast cancer data

Agatha Rodrigues - UFES, Brasil

In this presentation, we will particularly address the problem of assessing the impact of clinical stage and age on the specific survival times of men with breast cancer when cure is a possibility, where there is also the interest of explaining this impact on different quantiles of the survival times. To this end, we developed a quantile regression model for survival data in the presence of long-term survivors based on the generalized distribution of Gompertz in a defective version, which is conveniently reparametrized in terms of the q-th quantile and then linked to covariates via a logarithm link function. This proposal allows us to obtain how each variable affects the survival times in different quantiles. In addition, we are able to study the effects of covariates on the cure rate as well. We consider Markov Chain Monte Carlo (MCMC) methods to develop a Bayesian analysis in the proposed model and we evaluate its performance through a Monte Carlo simulation study. Finally, we illustrate the advantages of our model in a data set about male breast cancer from Brazil.

Joint work with Patrick Borges (Department of Statistics - Federal University of Espírito Santo, Vitória, Brazil) and Bruno Santos (School of Mathematics, Statistics, and Actuarial Science - University of Kent, Canterbury, UK)

Joint modeling of competing risks survival and longitudinal data

Gisele Tunes – IME-USP, Brasil

In many observational studies, patients are followed until death, or another outcome of interest is observed, and several clinical variables are also measured during follow up. When longitudinal data is available as well as survival, it may be of interest to understand the effect of prognostic variables in both longitudinal and survival outcomes. In this work, a joint model for competing risks survival data and longitudinal data is discussed. A parametric approach is presented, along with simulation results and real data application.

Joint work with Renato Santos da Silva