

Score tests for independence in competing risks models

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Abstract

Competing risks occur when each subject may experience mutually exclusive causes of failure. In the latent failure time framework, the existence of underlying latent variable for each kind of risk is assumed. The marginal distributions of these variables are then the main quantities of interest. We present here some score tests for independence between the latent failure times modelled with parametric or semiparametric regression models. We model the dependence using copulas, featuring a parameter for the dependency between failure times, and construct score tests on this parameter. We present some simulation results and an application to real data related to the number of years in power for rulers. The competing risks are the manner by which a leader lost power, namely exit by constitutional means, by nonconstitutional means and by death due to natural causes or administrative censoring (end of study).