Testing for spatio-temporal interaction in disease mapping

Ana Fernández-Militino

Department of Statistics and Operations Research, Publich University of Navarra (Spain)

Abstract. *Data on disease incidence or mortality over a set of contiguous regions have been commonly used to describe geographic patterns of a disease helping epidemiologists and public health researchers to identify possible etiologic factors. Nowadays, the availability of historical mortality registers offers the possibility of going further describing the spatio-temporal distribution of risks. The literature on spatio-temporal modelling of risks is very rich and it is mainly focused on the use of conditional autoregressive (CAR) models from a fully Bayesian perspective. However, the computational burden associated with the procedure makes the Empirical Bayes approach a plausible alternative. In this context, it is of interest to test for separability between space and time, as an absence of space-time interactions makes the model simpler. In this work, a score test is derived because it only requires to fit the simpler model. A bootstrap test is also considered for comparison purposes. Results will be illustrated using brain cancer data in Spain for the period 1996-2005.*

Keywords.