

DETECTING HIGH-RISK AREAS IN DISEASE MAPPING USING EMPIRICAL AND FULLY BAYES PROCEDURES.

M. D. Ugarte¹, T. Goicoa¹ y A. F. Militino¹

¹Departamento de Estadística e Investigación Operativa, Universidad Pública de Navarra.

Disease mapping studies have experienced an enormous development in the last twenty years. Both an Empirical Bayes (EB) and a Fully Bayes (FB) approach have been used for smoothing purposes. However, an excess of smoothing might hinder the detection of true high-risk areas. Identifying these extreme regions minimizing the misclassification of background or normal areas is a primary goal in epidemiology. The FB approach exploits the posterior distribution of the relative risks to obtain reliable and smooth estimates, and then, Bayesian decision rules, have been investigated to detect raised-risk areas, but any similar study has been conducted under the EB approach. Within this framework, second order correct estimators of the mean squared error (MSE) of the log-relative risk predictor can be used to build appropriate confidence intervals for the relative risks. The aim of this work is to compare the ability of both EB and FB procedures to detect high-risk areas. The conclusion is that Bayesian decision rules are more powerful to detect raised-risk areas than EB confidence intervals, but it is very difficult to define a global criterion that can be routinely applied in every real setting.