

Retrospective and Prospective Detection of Changes in Risk Around a Prespecified Point

Peter A. Rogerson
Departments of Geography and Biostatistics
University at Buffalo
Buffalo, NY 14261 USA

There are several approaches one may use to model or test for potential risk around point sources of interest. These approaches have been developed almost universally to (a) fit model parameters to estimate the nature and significance of decline in risk as one moves away from the point source, or (b) assess the significance of a test statistic based upon the null hypothesis of no raised incidence around the source.

In this paper, I assume that the data on the locations of cases and controls often used for these questions may be arranged in temporal order (for example, data might consist of the date of diagnosis for both case and control diseases). I then illustrate how conventional modeling approaches may be adapted to (a) use the entire dataset to examine retrospectively the null hypothesis of no temporal changepoint, where the model parameter changes from one value to another, and (b) use the dataset observation by observation, to detect as quickly as possible a change from one model parameter to another.