The choice of disease cluster detection methods in epidemiological research with an example on the clustering of childhood mortality in rural Burkina Faso, West Africa

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Abstract:

Many disease cluster detection models and methods have been proposed over the last fifteen years. These methods can be classified as: space tests when they deal with the identification of clusters in space; time tests when they test for temporal clustering within a single time series or in several time series simultaneously; and space-time tests when they are used to detect clustering of labelled objects in space, time and space-time. The complexity increases with space tests being referred to as either global, local or focused. The large number of tests available does not enable a quick choice of the appropriate test for a specific purpose. This paper therefore provides a review of the majority of the available tests. Its objective is to enable a quick selection of the most appropriate test for the researcher's purpose. An example of the practical application of one of these tests to investigate the clustering of childhood mortality in rural Burkina Faso in West Africa is presented. Although the paper unavoidably deals with statistical models, more emphasis is placed on when to use the tests and what their outputs are, rather than on statistical theory.