CLUSTERING AND SPATIAL VARIATION IN RISK

Denis Enăchescu, Cornelia Enăchescu

lntitute for Mathematical Statistics and Applied Mathematics, Academy of Romania, Bucharest, Romania

Abstract:

Motivated by recent interest in the possible spatial clustering of rare diseases, the paper presents two approaches to the assessment of spatial clustering. The first approach emphasizes estimation of the nature and physical scale of the clustering effects rather than testing for their existence. The second approach presents a scan statistic that can detect irregular shaped clusters within relatively small neighborhoods of each region. A Monte Carlo test of significance is given and the performance is examined in comparison with that of the Kulldorff's circular spatial scan statistic. An application to data on the spatial distribution of childhood leukemia and lymphoma in Nord Pas de Calais region (France) is described.

Keywords: spatial clustering, childhood leukemia, scan statistics, K-functions, complete spatial randomness, scan statistic, Monte Carlo method