

THREE TESTS FOR SPACE-TIME INTERACTION: A COMPARATIVE EVALUATION

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1. Introduction

The study of low order epidemics has required developing methods suitable for the analysis of the temporospatial relationship between cases. This acquires particular importance in conditions of unclear etiology where the direction of research can be greatly influenced by an indication that cases tend to occur in clusters. Mantel [1] has critically reviewed a number of methods applicable also in the absence of knowledge of the basic population. This characteristic is quite intriguing, since epidemiologic methodology has traditionally insisted on adequate definition of the denominator population.

The merit of two specific approaches, namely, the ridit method of Bross [2] and the sum of empirical clusters device of Ederer, Myers and Mantel [3], is immediately evident from their ability of demonstrating randomness where this would be anticipated, for example, addresses of traffic fatalities [4], or of revealing the expected clustering of cases in diseases of known infectious origin [3].

It is, however, difficult to evaluate adequately their respective usefulness as investigative tools in the study of the temporospatial distribution of diseases of undetermined etiology, for example, childhood leukemia. In fact, several considerations may restrict the direct comparability of the two methods as well as of the resulting conclusions.

Methodologically, one approach [2] is based on the general premise that within all possible $n(n - 1)/2$ pairs, temporospatial clustering is reflected in an overrepresentation of pairs with short spatial and temporal distances. The other [3] considers the maximum number m_1 of cases occurring in any one of

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