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Correspondence

Analyzing trends- A comment on epidemiological trends of RF/RHD in school children of Shimla in north India

Sir,

I read with interest an article on epidemiological trends of RF/RHD in school children of Shimla in north India by Negi *et al*[1]. The authors deserve appreciation for their efforts as the topic is not just relevant but also timely. This will be a good addition to the available medical literature on RF/RHD in India. However, I have some concerns regarding the statistics used in analysing epidemiological trend in this study. The authors report on the use of Z-test, chi-square test and Fisher exact test, which may not be appropriate.

The strength of epidemiologic analysis is in its capacity to capture health outcomes in a population by understanding their frequency and distribution in terms of person, place, and time. Trend analysis is one aspect of this analytic triangle. It becomes important in knowing as to a health condition or indicator has increased or decreased over time, and if it has, how quickly or slowly the increase or decrease has occurred. Inspite of being a robust epidemiological tool trend analysis has some limitations; particularly when trend analysis is to be undertaken for a small area or small population, changes over time in other factors related to the condition of interest must also be considered. The question is whether comparing the health condition of a community from 1995 to 2010, is meaningful? Is it really the "same" community at the two endpoints of the trend analysis, or is any observed trend confounded by changes in factors other than the indicator being studied. To overcome some of these limitations statistical tests specifically suited to trend analysis are employed. In this regard a statistical test to assess whether the observed trend is statistically significant was developed by Mantel (Mantel's trend test)[2]. The test is based on strengthening the common chi-square test (employed by the authors) to analyse trends. Alternatively for assessment of trends in linear proportions, Cochran-Armitage trend test (a chi-square for trend assessment) could be used[3]. Further, regression analysis can be used.

It has several advantages over the chi-square test for trend. In general, regression modelling has the advantage of jointly considering the information contained in the series of counts or rates, rather than considering each time point separately. Analyzing the series of rates as a unit in effect imposes stability, and consequently, the confidence band around the set of predicted values from regression analysis will be narrower than the confidence limits calculated around each count or rate separately; any statistical test based on regression results, therefore, will be more powerful.

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