Reviewer's report

Title: A 10-year time-series analysis of respiratory and cardiovascular morbidity in Nicosia, Cyprus: The effect of short-term changes in air pollution and dust storms.

Version: 1 Date: 15 February 2008

Reviewer: Ferran Ballester

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The present study outlines a relevant and new matter: air pollution in dust-storm days does it have a different impact on health than the one for non-stormy days?

The study has been carried out in Nicosia, Cyprus, where dust storms are frequent and the level of air pollution, mainly particulates; reach very high levels, several times above the level considered by international recommendations.

The methods used for the statistical analysis are adequate. However, the authors do not explain deeply enough the criteria used for the identification of dust-storm days. Succinctly, although some of the criteria used are mentioned, the objective criteria which define the classification of a day as a dust-storm day and not in any other case is not so clear.

It should be indicated if the diagnosis of hospital admissions corresponds to the diagnostic which caused the hospital admission.

On the other hand, the series of data on air pollution are not complete for all the period under study and, nevertheless, the authors do not explain adequately how they have built the indicators for air pollution in the 4 years during which one of the stations did not work. It does not seem adequate to build time indicators with missing time indicators of up to 50%. The daily pattern of pollutants is well-known, with higher levels during the day, especially in the case of ozone. Also, there are an important percentage of days where there are missing values and it is not explained if an imputation has been carried out.

Due to all these problems, the authors should carry out a sensitivity analysis, with the data for the 6 years during which both series coincide, to examine the possible changes in the results obtained. It should also be explored up to what extent the high percentage of missing values may have affected results.

The statistical methods should be revised by an expert. There could be a series of problems such as: lack of control of seasonality due to the use of only 4 degrees of freedom. This has been considered insufficient for admissions. The way in which the possible residual auto-correlation was built should also be explained.

In several studies a retarded effect of ozone has been observed, beyond lag 2. It
would be interesting for the authors to examine the possible retarded effect of this pollutant up to some further retard, especially for ozone.

Results: In the last paragraph of page 8, it is said that an association was found between PM10 and admissions in the colder months, however, such association was not significant (95%CI: -0.22, 3.85)

In the discussion and conclusion sections authors should recognise the limitations of the study more explicitly, for instance the imprecise definition of a dust-storm day, the lack of exhaustive data, possible problems in the classification of illness cause which motivates the admission, and low precision of results due to reduced sample size.

**What next?:** Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.