Reviewer's report

**Title:** Particulate matter air pollution and respiratory symptoms in subjects having either asthma or chronic obstructive pulmonary disease: a European multicentre panel study

**Version:** 1 **Date:** 12 April 2012

**Reviewer:** Josep Maria Antó

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Current AQG for particulate matter are those regulating PM10 and PM2.5 and there is little information about the potential importance of coarse particles (PM 10-2.5). In the present short-term effects model the authors did assess the relationship between daily exposures to ambient particulate matter as measured by different metrics and respiratory symptoms in asthma and COPD patients. The study findings let the authors to recommend that by prudence coarse particles should also be regulated. The analysis was carefully conducted and the manuscript is clearly written. The authors used refined methods to assess the levels of particulate matter but they were apparently less stringent with the selection of patients and the measure of the outcomes. In its current form the manuscript has several limitations which makes the interpretation of the results difficult.

**MAJOR COMPULSORY REVISIONS:**

Pooling COPD and asthmatics in the same analysis is arguable as the day-to day variability in their symptoms use to be different. In addition the number of COPD patients in two centers was very small (5 and 2 respectively). The authors comment that an analysis restricted on the asthmatics yield very similar results but the results are not shown. Since the heterogeneity of the study population could be a relevant limitation I’d recommend to add and additional table with the stratified results or at least to have this included in an online supplement. In the analysis of the asthmatic patients it would be useful to use also the symptoms score as an outcome.

There is a risk of overinterpretation in the way that the authors describe and discuss their results. In tables 4-6 the study reports about 318 odd ratios of which, at the nominal level of significance, 13 are positive and 9 are negative. The corresponding figures for the coarse particles are 44, 4 and 1. In table 6 (incidence of symptoms) there are 3 positive and 5 negative associations, one of the later for coarse particles. So, a more balanced description of results and discussion about the risk of chance associations and the power of the study is needed.

**MINOR ESSENTIAL REVISIONS:**

The selection of the study population is not well described. The authors refer to a
previous paper (ref 16) which probably corresponds to a paper with a different title in pubmed. More information is needed about the disease definitions and how the patients were selected. For COPD patients it would be important to know whether the definition was based on the GOLD criteria. In addition, providing more detailed information in table 1 about asthma and COPD patients separately would help the readers to understand the study population.

In a separate paper (ref 16) the authors have reported no association between the different air pollutants and changes in lung function. Despite the lack of power, it would have been useful to examine the joint distribution of symptoms and PEF levels in the asthmatics during the same period. By contrast the authors comment on unpublished results showing an association between the levels of particles and the nitrate / nitrite component of EBC which would be consistent with the present results. Obviously, this is difficult to judge without seeing the results and adding these results to present study could make a much more convincing case. I wonder whether splitting symptoms, lung function and EBC in different papers may not be the right strategy.

DISCRETIONARY REVISIONS:

Taking into account the risk of asthmatics to report an increase of symptoms at the time of the allergenic season it would be useful to provide information about the time of the year when the measurements were taken. The latter may have been partially controlled as the authors adjusted for seasonal effects by including natural splines in the logistic model but on the other hand this may have removed part of the associations if the allergenic particles played a role in the coarse fraction.

For the coarse particles the IC limits for Amsterdam are very large. Was this due to the short range of coarse particles in this city? .

Is there any evidence about the validity of the 3 level grading of symptoms as used in the diary? The authors mention that the diary was based in diaries used in previous studies but don not comment on whether its validity has been assessed?

Phlegm was included as a symptom but is not included in the analysis.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests: 
None