Reviewer’s report

Title: Hourly Differences in Air Pollution and Risk of Respiratory Disease: a time-stratified case-crossover study

Version: 2 Date: 17 July 2014

Reviewer: Annunziata Faustini

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COMMENTS TO THE AUTHORS

I read this R1 version of the manuscript with pleasure and I have to acknowledge that the authors have adequately answered each of the many points I raised. Consequently, in my opinion the paper is now suitable to be reconsidered for publication.

However, I would still suggest that the authors improve the discussion. This is a feasible request and would make the paper more appropriate for a journal like Environmental Health.

There are specific points on which I would like to draw the attention of the authors:

# Though the authors justified the choice of studying respiratory effects in the elderly maintaining their strongest effect on that age group, I would suggest that the authors indicate this choice in the paper’s title, to avoid the impression that they neglected the important effects reported in children.

# More attention has to be paid in the discussion to the differences between the SPM and respirable fraction of particles (PM10) included in the SPM. It could be difficult to compare the results when they are used alternatively, and most papers use the respirable fraction.

# Some comments are needed about the results of many sensitivity analyses which don’t change the results. The consequences for the main methods adopted would make an interesting discussion.

# The authors cannot disregard the negative results of effect modifiers, in particular previous diseases on the relationship between SPM and respiratory diseases, and gender on the relationship between ozone and respiratory diseases.

# The first sentence of the conclusions should refer to the effects related specifically to the hourly differences in air pollution.

# Again in the conclusions, the sentence about the possible contribution of the finer timing on the onset of symptoms to better understand the mechanisms of damage that air pollution possibly causes on human health, is not supported enough by the results provided. This sentence could remain in the conclusions on the condition that the authors include a corresponding statement in their
hypothesis.