Reviewer's report

Title: Impact of air pollution on pulmonary function and respiratory symptoms in children during different seasons of the year. A cohort study.

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Reviewer: Chantal Raherison

Reviewer's report:

1. The question posed by the authors is interesting and well defined

Major compulsory revisions

2. Methods: selection of children is well defined and randomly selected from the total student registry. Health outcomes were obtained from ISAAC questionnaire Spanish version. However, if definition of obstructive pattern is clear, the definition of restrictive pattern is subject to caution, as FVC is one of criteria, but TPC could be more indicated.

Each participant was interviewed and underwent to a forced spirometry during each season of the year in a panel study of four measurements per subject.

3. The major concern of the study is evaluation of exposure to pollutants. It is not appear in the methods, how the exposure was assess: quantitative linear model? dispersion model? Another major concern is the lack of PM measurement. (PM 2.5 or PM 10) which has an effect on lung

4. Results: For prevalence of allergies according to ISAAC questionnaire, prevalence should be divided according to age (6-7 yrs) and (13-14 yrs) respectively. Moreover, prevalence term should be replace, as ISAAC protocol need a sample representative of children with 1500 or 3000 subjects to compare real prevalence according to countries.

5. Results : Children in school 1 are more exposed to pollutant than children in school 2,

Health outcomes from ISAAC questionnaire should be appeared in a separate table.

In table 4, how did the authors include the following variables in the model: pollution exposure to O3, SO2, NOx, season.

6. How did the authors analyse the seasons in the model (categorical variable in four classes?)?

7. How did the authors define atopy?

8. In table 4: what does smoking mean in the table, active smoking? as the authors underline that they adjusted on passive smoking.

9. Did the authors take into account the interaction between pollutants, and the interaction between O3 and summer?

10. The results are scarced, discussion could mentioned the methodological
problem of evaluation of exposure to pollutant. The authors should discuss the external validity of the results.

**Level of interest:** An article of limited interest

**Quality of written English:** Acceptable

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

**Declaration of competing interests:**

I declare that I have no competing interests