Reviewer’s report

Title: Associations of greenness, greyness and air pollution exposure with children’s health: a cross-sectional study in Southern Italy

Version: 0 Date: 19 Sep 2018

Reviewer: Lizan Bloemsma

Reviewer’s report:

This is an interesting study that examines the associations of several urban-related environmental exposures with symptoms in children. The inclusion of both "green" and "grey" spaces is novel. The analyses have been performed properly, but some aspects need more clarification (see also my comments below). Also, the manuscript should be checked by a native English speaker in order to improve the English language of the manuscript. I have a suggestion for the analyses for this study: The aim of the study is to "simultaneously evaluate the associations between indicators of urban-related environmental exposures with symptoms in schoolchildren". However, as far as I understand, you have only performed single-exposure models (i.e. one exposure per regression analysis). Because the environmental exposure are correlated, it would be interesting to perform multi-exposure analyses. You could, for example, include the NDVI and NO2 concentrations in one model.

You can find the remainder of my comments below:

Abstract:

1. Line 7: "A comprehensive approach is advisable to estimate..." Why?

2. In the Methods section of the abstract, please mention the country in which the study has been performed.

3. Line 16/17: "Exposures to greenness and greyness..." Add: at the home addresses.

4. Results section: You use 'risk of symptoms', but you show OR's. A better term is the 'odds of symptoms'.

5. Conclusion: I would not use the words 'account for', but 'are associated with'.

Introduction:

6. Page 4, line 31: I would start the alinea with: "Because of the increasing urbanization, there is growing interest on environmental exposures within urban settings, such as traffic intensity, household density and natural and green space."
7. Page 4, lines 41-46: Remove the sentence about the NDVI. This sentence is more suitable for the Methods section of the manuscript.

8. Page 4, lines 58-60: Remove the sentence about CORINE, this sentence is more suitable for the Methods section of the manuscript.

9. Page 5, line 26: "LUR modeling was applied to explain..." Remove this sentence.

10. Page 5, lines 33-34: "emphasizing that NO2 exposure can cause adverse respiratory outcomes". This implies causality. Remove this part of the sentence.

11. Page 5, lines 50-51: Change "using the three aforementioned indicators (NDVI, CORINE and LUR)" into "using green, grey and air pollution".

Materials and Methods:

12. Page 6, lines 45-53: When did the parents complete the questionnaires (what year, which months)?

13. Page 8, lines 1-24: I would remove the formula and the technical description of the NDVI (until reference 32).

14. Page 8, line 33/34: "The NDVI assessment was based on individual addresses". I don't understand this sentence. I would assess the average NDVI in a circular buffer (or multiple) around the children's homes. I do not understand what buffer you have chosen, and what the reasons are for this buffer size.

15. Page 8, lines 43-50: The alinea about CORINE is very vague. Please add some information about the land-cover classes, especially information about the classes mentioned in Table 1. What do the classes DUF and CUF exactly comprise?

16. Page 10, alinea "Statistical power": This is very short and unclear. If you want to say anything about statistical power, please give more information.

17. Page 10, line 55/56: "the highest FSES (>49.5, 1st quartile)". FSES is not an exposure, so don't use it in this sentence.

Results:

18. Page 11, lines 11-25: I would skip a few descriptive statistics in the text of the Results (for example about passive smoke and maternal smoking during pregnancy) and include the median (IQR) of the NDVI and NO2 levels in the text. The exposures are of interest.
19. Page 11, lines 26-42: The alinea about the self-reported symptoms is very long. The reader can find the numbers in Table 2, so please shorten this part of the Results.

20. Page 12, line 4/5: "only one house was excluded since..." Do you mean excluded from the analyses?

21. Page 12, lines 14-16: I would mention in the text whether the correlations are positive or negative. "A significant positive correlation was found between NO2...".

22. Page 12, lines 25-41: You use the term 'risk of symptoms', but it should be 'odds of symptoms'.

Discussion:

23. Page 13, lines 29-32: Could you say something about the study population from the study by Lovasi et al.?

24. Page 13, lines 49-57: Do you have a possible explanation why you found that a very low exposure to greenness was associated with a higher risk of self-reported nasal symptoms?

25. Page 14, lines 24-29: Could you say something about the study population (e.g. the age of the children) from the study that used pooled data of European birth cohorts?

26. Page 15, lines 41-47: "These results are in agreement with numerous studies demonstrating that elevated concentrations of traffic-related air pollutants in the near-road environment are associated with numerous adverse human health effects". However, in your study, you do not find statistically significant associations of NO2 with the symptom score. Only living in proximity to HTRs (and not the air pollutants) seems to be associated with the symptom score. So, if it is not the higher NO2 concentrations near high-traffic roads, what does explain the association between distance to HTR's and a higher symptom score?

Tables and Figures:

27. Table 1: Please do not use the term 'Host'.

28. Table 1: Remove the three rows with the n(%) of children within quartiles of exposures (for example: "NDVI: "<0.1504 (1st quartile)"). By definition, each quartile should include approximately 25% of your study population.

29. Table 1: In the row 'Residential surrounding greyness (300-m buffer), n(%)' I expected a 'median (IQR)'.

30. Table 3: Please also show the unadjusted results.
31. Figure 2: The Figure legend (on the right side of the Figure) only includes numbers and is not clear. I would make a legend only for the three classes of interest (DUF, CUF and coniferous forests) and not use numbers but tekst in this legend.

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