Reviewer’s report

Title: A cross-sectional analysis of residential greenness on blood pressure in 10-year old children: Results from the GINIplus and LISAplus studies

Version: 1 Date: 1 April 2014

Reviewer: emma eyre

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1. The research question and study aim is clear. The manuscript supports current literature examining BP and greenness using a cross sectional study in a German population of children aged 10 years. The title and abstract convey what has been found.

Major revisions

2 and 5. The study makes a good attempt to adjust for a range of variables which affect BP and NDVI (e.g. temperature, seasonality). However, there additional variables that affect BP and are influenced by surrounding environments that are not controlled. For example, physical activity, fitness, resting HR and HRV etc will affect BP. Levels of PA are also influenced by greenspace, urban and built environments. The study does not control for any of these variables. The two areas examined in this study have significant differences in BMI. In the results when BMI (with other variables) is adjusted for in the model, the P value associations between systolic BP and low NDVI are no longer significant. In the results section thus it is not clear whether the reported higher BP in the Wessel area is due to the significantly increased BMI that is reported for Wesel. Where BP values standardised for body size (height/weight or BMI) and sex?

Discretionary revisions

Secondly, it would be interesting to examine whether the increased BP seen in children living in the Wesel area is outside of the normal ranges for children. The national lung and blood institute in the US (http://www.nhlbi.nih.gov/guidelines/hypertension/child_tbl.htm) age, sex and height specific guidelines for a percentile height of 50 would suggest the 90th centile of BP is 115/75 for children aged 10. I am not sure if German percentiles are available but it would be interesting to note the clinical significance of these differences against normalised values in children. Given that the effect size is small this information would be useful.

3. The limitations should comment on the use of automated cuffs and how these can overestimate BP in children as described in Park MK, Menard SW, Yean C. Comparison of auscultatory and oxclloillometric blood pressures. Arch Pediatr Adolesc Med. 2001;155:50–53.[PubMed]. Secondly, was a child's cuff used to assess BP with?
The discussion would benefit from more insight into the mechanisms of why BP is increased in green areas. Specifically, when considering why BP may be increased in moderate verses high green areas would be useful. Specifically as the P value for low is above 0.05 when compared to high green areas, whereas moderate versus high is below 0.05. The explanation in line 305 states further evidence for biological mechanisms and in the intro (line 87-88) physiological but the study only obtains BP. It would have been useful to examine other physiological factors if understanding this theory for example, the assessment of HRV, the consideration of PA, psychological state (de stress) etc.

4. It is apparent that the study is based on a large sample from ongoing longitudinal studies. However, the detailed description of these studies makes lines 103-109 hard to grasp within the context of the current study. The addition of information relating to age and sex would help understand the sample presented in the method.

Line 151 it says that two measurements were obtained with a rest period of 2 minutes. The authors acknowledge that ideally 3 measurements are needed in the limitations. Is 2 mins a validated interval for between BP measurements? Can the authors refer to previous studies that have used this protocol?

5 and 6. The study considers additional cloud free days in the assessment of NDVI and obtains BP from a large sample of children. The majority of limitations with the study are acknowledged in the discussion.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

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

**Declaration of competing interests:**

I declare that i have no competing interests