Reviewer's report

Title: ENVIRONMENTAL INJUSTICE AND CHILDHOOD LEAD EXPOSURE IN PERIURBAN (GER) AREAS OF DARKHAN AND ERDENET, MONGOLIA

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Reviewer: Diogo Francisco Santos Pestana

Reviewer's report:

The paper titled "ENVIRONMENTAL INJUSTICE AND CHILDHOOD LEAD EXPOSURE IN PERIURBAN (GER) AREAS OF DARKHAN AND ERDENET, MONGOLIA", provides a nice and compared examination of lead exposure between children in the ger districts and the city proper.

The study shows that children in the ger communities of the urban areas of Mongolia are socio-economically disadvantaged and disproportionately exposed to lead, leading to increased risk of behavioral problems among these children, even at BLL <5 μg/dL previously defined as the level of concern. So, it reaffirms the notion that there is no safe blood lead concentration in children.

I think it is an interesting paper, addressing the very important topic of environmental injustice, well written and with some novelty. I believe that the paper could provide an important contribution of the topic dealt, however I also make some comments which can be considered by authors to improve the quality of the paper.

Comment 1: In Methods, Statistical analysis section (page 5), the authors describe the tests used, which are parametric. However, it is unclear whether the normal distribution was verified. Since this is often not the case for exposure to contaminants, this should be clarified.

Comment 2: Following the previous comment, I believe the Table captions should be more detailed, namely because it is not completely clear in the tables and their respective captions what tests are used and what is being compared.

Comment 3: In page 5, line 39 the authors say "In order to explore the effect of the various explanatory variables on BLL, children were divided into 2 groups: those with BLL ≥5μg/dL and BLL>5μg/dL."

Should not it be "BLL ≥5μg/dL and BLL<5μg/dL"? This should be corrected.
However, it is not clear throughout the description of the results and tables where there is this division into two groups. Is it in the results presented in Tables 2 and 3? This should be clarified.

Comment 4: Following the previous comment, Tables 2 and 3 indicate that Pearson's correlations were applied, but from what I've come to realize, in this work, this analysis seems to be done between categorical variables and not between continuous variables. Therefore, Pearson's correlation should not be used. Is there any missing information in the description and in the tables? This should be clarified and corrected.

Comment 5: In page 5, line 42 the authors say "One hundred forty one (41.7% of total) had BLL<3.3μg/dL detection limit. For these cases, a value of 1.65μg/dL was used in statistical calculations.". What was the rationale behind the choice of 1.65μg / dL for all values below the detection limit. Since the percentage of values below this limit is high, data analysis may be affected. For this reason, authors should explain and justify this option.

Comment 6: The authors report that there are differences in lead exposure between children in the ger districts and the city (Table 1), but explore this relationship only considering the two cities together. Since the cities had different characteristics and even had different exposure levels (Table 1), would the comparisons between ger districts and city be similar between the two cities? It would be interesting to present some reference to this evaluation.

Comment 7: In page 7, line 56 the authors say "Parental education and parental work in an environment with lead were significantly correlated with children's BLL". Some of the risk factors are not well described, namely "work in an environment with lead" where the corresponding parameter was "Occupation". They should be clarified.

Comment 8: In page 10, line 19 the authors say "Our results are consistent with those of Enkhbat et al [16]) who did not find any significant difference between the BLL of women who live in ger tents versus the city dwellers in UB.". Isn't this statement contradicting the results of the study that show that there are differences in lead exposure between children in the ger districts and the city?

Comment 9: In page 10, line 46 the authors say "(Table 5). These effects were observed at the low average BLL (< 5 μg/dL) of the children that participated in this study.". As mentioned in previous comments, it is not explicit how this assessment was carried out. I assume that a division into two BLL groups was made, but this is not explicit in Table 5. Descriptions should be improved to make interpretation easier.
Comment 10: In page 13, line 19 the authors say "This study contributes further evidence showing that BLL <10 μg/dL, previously defined by the CDC [25] as the level of concern, is a threat to children's health.". Should not it be "BLL<5μg/dL"? This should be corrected.

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

Yes

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