Author’s response to reviews

Title: Neurocognitive impact of metal exposure and social stressors among schoolchildren in Taranto, Italy.

Version: 0 Date: 25 Mar 2019

Reviewer: Christoph van Thriel

Reviewer's report:

Summary:

The authors present the results of an epidemiological study among school children in Italy that are environmentally exposed to various neurotoxic metals (e.g. lead). Biomonitoring data (blood, urine, hair) and geographical location of the children's residence form the source of emissions were used to quantify the exposure. In addition to these pollutions the socio-economic status (SES) of the families were used to find associations with the cognitive development of the 299 children. The WISC and selected tests from the CANTAB were used to assess the cognitive status of the children. Weak, but in some cases significant correlations between the biomarkers and the distance to the source could be confirmed. The geographical location of the children's residence form the source of emissions was significantly associated with most of the dependent variables indication better performance in more distant areas. Low SES showed a strong impact on the WISC scores while the lead concentration in blood (BPb) were associated with CANTAB test scores. Based on these findings the authors modeled the interaction between BPb and SES and showed a significant interaction of low SES and high BPb on some WISC subscores. Based on these findings the authors concluded that epidemiological studies investigating neurodevelopmental effects of should included interactions of SES with the quantity of the environmental exposure.

Evaluation:

The study is well conducted and provides some novel findings with respect to the developmental neurotoxicity of metals due to environmental exposures. After minor revision (see comments) it can be accepted.
Comments:

Please provide details about the substitution of values below LODs.

Please think about excluding extrem values (see table 2 max) as log-transformation might not be sufficient. Are there any ideas about such extrem values and maybe a box-plot can be given

Please provide the intercorrelations between the biomonitoring values.

Please address the striking gender and SES frequency differences of the 0-1 km group (Table 1)

Please avoid addressing non-significant association and their discussion (see discussion)

BMI has been mentioned in the list of abbreviations but is not used in the text. It could be a more of SES related malnutrition. Please think about using this variable.

Please provide all details of the statistical analyses as Notes under the tables (e.g. included covariables etc.)

Table 5: please correct the alignment of the third line

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