Reviewer's report

Title: Blood levels of beta-hexachlorocyclohexane among people living close to an industrial area.

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Reviewer: Marc-Andre Verner

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In their study, Porta et al. report serum levels of \#-HCH in people living close to a chemical plant that produced lindane in the Sacco River Valley in Central Italy. They also identify determinants of serum \#-HCH levels. The high levels measured in this population raise concerns with regards to potential health effects of \#-HCH and warrant publication. However, some methodological shortcomings hamper the clear identification of sources of exposure, which in turn limit the public health benefits of this study.

MAJOR COMPULSORY REVISIONS

1. \#-HCH is a highly lipophilic compound (logKow = 3.8). Why didn’t the authors include BMI as a predictor of \#-HCH levels? Authors need to consider BMI or explain why they decided to overlook this potentially important factor.

2. One major limitation of this study is the lack of information on occupational exposures. Satellite images reveal that people within 1 km from the river are living on agricultural land (where lindane may have been used). Also, it took me a while to find the river in satellites images as it is a few meters wide at the most. I wonder whether it’s really the river that contaminated the area surrounding it or if the river is actually contaminated by agricultural runoff water. If the latter is true, then information on occupational exposures could explain much more variability in blood \#-HCH levels. Although occupational history is mentioned as a limitation of this study in the discussion, authors need to discuss the possibility that the higher levels around the river are caused by the agricultural use of lindane.

3. Even though the focus is on \#-HCH, I would have liked to see levels of other contaminants mentioned in their article in Italian (Epidemiol Prev 36(5 Suppl 4): 44-52). Correlations between \#-HCH and other contaminants for which exposure routes are more documented (e.g., PCBs, Hg) may help identify other sources.

4. How were the sources of food assessed in questionnaires? It is very likely that people ate food from both local and imported sources. Why did the author use categories that assume study participants eat food from one major source (commercial, local or own production)? Information on food frequencies would have been more informative.

MINOR ESSENTIAL REVISIONS
1. Abstract (results): Add the geometric standard deviation.
2. Abstract (conclusions): Specify which water you are referring to (well water vs. river water)
3. Introduction (1st paragraph): Authors should mention the human half-life of #HCH. See Jung et al. 1997. JTEH 51:23-34.
4. Methods (study population): Why did the authors only excluded people who lost more than 10 kg? Gaining 10 kg would also affect #HCH levels.
5. List of abbreviations: There are a lot of typos in this section.

**Level of interest:** An article of importance in its field

**Quality of written English:** Needs some language corrections before being published

**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.