Reviewer's report

Title: Predictors of Beta-Hexachlorocyclohexane Blood Levels among People Living Close to a Chemical Plant and an Illegal Dumping Site

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Reviewer: T.J. Hartman

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Review: Predictors of Beta-Hexachlorocyclohexane Blood Levels among People Living Close to a Chemical Plant and an Illegal Dumping Site

The goal of this study was to evaluate the determinants of B-HCH blood levels in people living near a chemical plant in Italy. In 1990 two illegal landfills were discovered close to the site of the plant. Subsequently, milk and soil near the site were also contaminated. A surveillance program was established in 2009 to track the potentially exposed population. The present analyses describe the association between consumption of specific foods and body fatness and blood levels of B-HCH.

Major comments:

Introduction: I found this section to be very long and would suggest shortening it. Some of the information could fit in the discussion.

Methods: Some helpful details are not included in the methods.

Was there an incentive to participate in this study?

How were participants recruited and by whom?

What information is available for the ~13% of participants who did not participate?

During what time period were the blood samples collected and how and where were they stored prior to laboratory analysis?

Are the other contaminants mentioned (lines 157-158) to be included in another similar manuscript? It's a little strange that you mentioned analyzing them in the laboratory but then they are not included in this manuscript. If these contaminants are not associated with the chemical plant and dumping site you may want to remove this.

In comparison to the blood B-HCH section, the exposures information (questionnaire) lacks detail. For example, what was the time frame of reference? What instrument was used to collect
information on dietary intake and what were the possible responses? Were the exposures collected so that a dose response could be evaluated or were the questions only yes/no?

Line 143-144 - What does this mean? "We also included in the program all the components of an eligible family even though they did not live any longer in the area at risk?"

Line 189, 190 - please define these categories

Were there missing data and if so, how were those data handled?

Line 224-226 - The sentence about the crude association doesn't really add anything.

Discussion: Final sentence - I'm not sure where the genetic factors idea is coming from. That wasn't evaluated in this manuscript.

Declarations section: Unless that is the style for this journal a number of these items would fit better in the methods section.

Tables/figures: The figures could go into online supplementary material.

The GMR in table 1 would fit better in table 2 because then it is easier to see what happens with the additional variables.

Minor comments:

Abstract line 31 - high values of B-HCH in [what] among

Line 35 and other places in the text: Sacco River

Line 45 mean [blood, plasma or serum?] concentration

Line 50 associated with higher

Line 54 greater contamination among older people and those drinking and washing from private well water and consuming locally produced food

Line 63 The general population

Line 72 comes

Line 79 et al. and in other places in text

Line 83 (BMI) Then use abbreviation thereafter

Line 83 food groups
Soil analysis indicated contamination was greatest near the river.

Despite the plant closure,

cook or wash and among those eating local food

This study included

participating in the

the method

after adjusting

for drinking, cooking, washing or irrigating.

First paragraph in discussion. You have used "general population" four times in a couple of sentences, suggest editing.

mainly through the food chain

Also body fatness seemed to play a role in [Here do you mean because the larger person likely consumes more contaminated foods thus has greater exposure or because the contaminants are stored in adipose tissue? Or both? This comment also applies to the paragraph beginning at line 308].

In the literature

lower dose

body fat

participated in the surveillance program were selected because they lived in or owned land in the area near the Sacco River; thus,

one another. Usually

everybody was

the distant past (e.g., ~ how many years)

expertise

Table 3 omit the word "meat" behind Chicken, Pork, Lamb, Rabbit, Liver.
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