Reviewer's report

Title: Health impact assessment of waste management facilities in three European countries

Version: 2 Date: 8 December 2010

Reviewer: Julia Gohlke

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Review of: Health impact assessment of waste management facilities in three European countries

1. Is the question posed by the authors new and well defined?

   The question posed is sufficiently original comparing potential health impacts of waste streams in 3 different European countries. Given the scale of the issue, the question is as well defined as possible. The authors do acknowledge that although a full life cycle analysis is ideal, the study only focuses on the population level health impacts associated with living near an incinerator (air pollution) or land fill (reproductive). A complete health impact assessment would include occupational exposures for transport of rubbish and work at the site. In addition, it would require analysis of contamination of groundwater, lakes, rivers and streams. These limitations need to be stated clearly.

   The weakest part is that of a biological explanation for the health impacts from landfills. What is the causative agent/s causing increased adverse reproductive outcomes? Is it heavy metals, PAHs, solvents? Is exposure via inhalation, drinking water, soil-dermal? Without identifying the causative agent/s and a plausible mechanism of effect and exposure, the relationship seems too tenous to base a health impact assessment on.

2. Are the methods appropriate and well described, and are sufficient details provided to replicate the work?

   In general, the methods are very well laid out. A detailed appendix with further discussion of assumptions, calculations and sensitivity analyses is provided. Several clarification questions are noted below.

3. Are the data sound and well controlled?

   For this type of secondary data analysis, trusted data sources and complete literature reviews are necessary. The authors refer to a previous report in which the literature was evaluated to determine the most appropriate studies for estimating health impacts from incinerators and landfills. In addition they rely on population and exposure estimates based on national level databases. At each point they qualitatively evaluate the confidence in the data source using an approach from the IPCC. The IPCC clearly defines these confidence levels within the context of climate change research and scientists may be familiar with this scale in this regard. However, outside of climate change research, benchmarks
or anchoring points would be very helpful. It is important for the authors to provide previous examples where confidence was 'moderate' to give readers an idea of how this compares to other assessments. Can the authors give an example of a health impact assessment that was given high confidence?

4. Does the manuscript adhere to the relevant standards for reporting and data deposition?
   Yes.

5. Are the discussion and conclusions well balanced and adequately supported by the data?
   Yes. After reading the discussion outlining the uncertainties and limitations and the final conclusion of moderate confidence and very small health impacts seems to beg for a justification of why this work is important. Authors should outline the utility of the health impact approach—why was this exercise useful?—comparing across policy choices, identifying knowledge gaps, providing a framework for future comparative risk assessment, cost-benefit analyses etc. In addition, the population composition differences in proximity to landfills/incinerators is a unique and important contribution. Can you estimate the lives saved or health costs saved due to EU waste management legislation? Maybe this could be expanded and brought out in the discussion/conclusion?

6. Do the title and abstract accurately convey what has been found?
   Yes.

7. Is the writing acceptable?
   Yes.

Major Compulsory Revisions

1. For the exposure-response, a previous analysis is referenced describing a literature review to determine which studies to use. A short presentation of supporting studies is necessary, esp. for landfill study. At a minimum, plausible causative agent/s, exposure routes, and mechanism of effects should be presented. A correlational study without supporting is not sufficient to base a health impact study on.

2. The lessons learned or utility of the approach or findings should be expanded (see comment above under 5th question)

3. An expanded definition of the qualitative confidence assessment should be presented with examples to give readers a anchor to evaluate the present 'moderate' confidence level.

Minor Essential Revisions

Methods:

1. How were population and site characteristics of incinerators/landfills with data used for sites without data? Were statistics from nearest site with data used or were overall country averages used?
2. Please define threshold of waste mean on pg. 8 (last para. Of waste generation and management section).

3. Why were national limits used for exposure estimates (pg. 10—para. 2 under local air dispersion modeling)? Wouldn't exposures mostly be well under the national limit?

4. Please further explain why 105 years as a lifespan (pg. 15—Estimating YoLL-last line 1st para.)

5. Why are gas emissions used for landfill estimation of congenital anomalies? What gas is being emitted and causing congenital anomalies? Why 30 yrs. ? Any groundwater or soil contamination concerns?

Results:

6. In Figure 1, why is risk perception included? Why are greenhouse gases included? These were not part of the analysis—Does this figure serve a purpose in this manuscript?

7. Table 5—Please explain the total row—what is this a total of? The numbers in columns do not add up.

Level of interest: An article of importance in its field

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