Reviewer's report

Title: A precautionary public health protection strategy for the possible risk of childhood leukaemia from residential exposure to power frequency magnetic fields

Version: 2 Date: 8 August 2010

Reviewer: Gary Marchant

Reviewer's report:

This paper performs an important and original function by attempting to apply the precautionary principle to potential risks (in particular risk of childhood leukemia) from power frequency magnetic fields. There has been much discussion of the precautionary principle in abstract and general terms, but at this general level the meaning and role of the precautionary principle is usually ambiguous and controversial. Only through attempting to apply the precautionary principle to particular problems will the appropriate role of the PP be illuminated and developed. Thus this paper serves a useful purpose by trying to apply the PP to the problem of power frequency magnetic fields, using the criteria from the EU'S communication on the PP, which is the most comprehensive official guideline for applying the PP available to date.

Overall, I think the manuscript does an admirable job of implementing its objective. My major criticism is that further clarification would be useful in several places. I also have a couple other minor suggestions. I would classify all of these suggestions as Discretionary Revisions.

Discretionary Revisions

- In the 1st para under Discussion, the last sentence lists the criteria from the European Commission but omits cost-benefit, even though that factor is discussed later in the paper

- in 1st sentence under "scientific uncertainty," end of sentence should be "bias, confounding or chance" rather than "bias, confounding and chance"

- in section on proportionality, the paper argues that "consideration of the risk in terms of likely magnitude and associated epidemiological uncertainty argues against a high level of intervention to reduce exposure." While it is likely difficult to do, it would be helpful to further explain how this determination is made. Isn't this an inherently subjective decision? Are there any quantitative or qualitative guideposts to help with this determination? Especially given the discussion elsewhere in the paper about possible susceptible subgroups, potential other health endpoints (e.g., Alzheimer’s), and the likelihood of a non-threshold dose-response, isn't this conclusion likely to be contested by others? How then can and should this determination be made? By some objective criteria of
acceptable risk? By some form of expert elucidation? By some form of comparative risk evaluation?

- the section on non-discrimination makes the argument that low voltage sources may also be associated with risk, and thus it would be discriminatory to take action only against high voltage power lines. But isn't the logical conclusion from this argument then that we should apply the PP and take action against either both or neither of these sources of risk?

- the last section on consistency states that analogy with chemical pollutants is "difficult to justify" given that there "is often clear supporting experimental evidence of harm." But surely there are chemicals where the risk evidence is similarly ambiguous as power frequency magnetic fields - isn't BPA an example of such ambiguity for example?

- under the heading "Examination of scientific developments," I do not understand the meaning/significance of the second sentence -- "Analogy has been drawn between the results of epidemiological studies and the preliminary screening tests that are used in healthcare and medicine." Are you saying that the data we have to date on power frequency magnetic fields is like a screening test and we must collect more robust observational data? If so, what kind of additional data should we collect, especially since much of the existing data of concern is in fact epidemiological data? Some further clarification would be helpful here.

- in the paragraph before the "summary" section, and in the summary paragraph, reference is made to the conclusion that low cost interventions should be pursued. Can the authors identify what they have in mind by low cost interventions? Some examples are given in the text 9e.g., info disclosure), but these are then disparaged as being ineffective, so it is unclear whether these are the interventions the authors recommend or whether there are different interventions they have in mind

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

**Quality of written English:** Acceptable

**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.