Reviewer's report

Title: A prospective cohort study of the association between drinking water arsenic exposure and self-reported maternal health symptoms during pregnancy in Bangladesh

Version: 2 Date: 6 December 2013

Reviewer: Nicola Cherry

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• Major Compulsory Revisions

This is an interesting report of a prospective study of pregnancy related ill-health in an area of Bangladesh where water consumption is from wells with relatively low median arsenic concentration. 1262 women (of 1458 recruited) completed the study, which included data collected at enrollment (at <16 weeks of gestation, 28 weeks and delivery. At each point the woman was asked if she had experienced any of six groups of symptoms since (presumably) the start of the pregnancy at the enrolment interview, or since the previous interview. Symptom occurrence (yes/no) for the whole pregnancy was then analyzed by arsenic concentration in the well identified as water source at the enrolment interview.

While a good idea, there are some problems with the report.

Major compulsory revisions

1) Although the design is simple, the potential for biased responding is very appreciable as, at enrolment, women were told about the hazards of arsenic and advised about safe water options (not specified). They were then told the level of arsenic in their water supply. While ethically appropriate, the feedback of this information put the results of the study in question. This problem would have been very largely avoided by analyzing only symptoms reported at recruitment, before the arsenic results were known. Even this may not have entirely removed the problem as women may well have known if their normal water source had >50ug/l arsenic, as such wells may carry a red ‘unsafe’ marker, but the problem of bias might have been reduced (particularly if symptom elicitation preceded education about arsenic hazards).

2) While use of quartiles of exposure may be statistically efficient, the boundaries used cannot be interpreted in terms of existing guidelines (or provide very useful data to establish new ones). The results (table 3) suggest that there is increased risk of nausea/vomiting in quartiles 3 and 4. Quartile 3 has concentrations from 2 ug/l to 30 ug/l (with a geometric mean of 9) and quartile 4 from 32-1,400 ug/l (with a geometric mean of 106). For this reader it would be much more informative to use breakpoints at WHO and Bangladesh guidelines (of 10ug/l and 50ug/l) with perhaps a further division at 100ug/l. This would also have increased the credibility of the results – it seems unlikely than a concentration of 2ug/l would
carry an appreciable risk yet with the quartile boundaries the risk reported is barely distinguishable from that for an exposure exceeding 1000ug/l.

3) I found tables 1 and 2 almost impossible to understand. The authors have chosen to display only percentages (without counts) and the percentage chosen is of the total rather than the row (or, less useful, column). What I want from this table is to know the % of women in each quartile of arsenic (say) that have nausea. It is not there. The counts (but not %) are given in table 3 so with a hand calculator I can work this out for the main effect (though not confounders) but the reader shouldn’t have to work quite so hard.

Other suggested revisions

4) In tables 3 and 4 some results are shown in bold, others equally interesting or important are not. It would be helpful to be consistent.

5) I found the use of the terms controls and cases in these tables distracting. N yes/no would have been equally informative.

6) The discussion of bias (paragraph 2 page 11) appears superficial given the gravity of the problem for this study (see comment 1 above).

7) The review of the literature in the Introduction and Discussion is almost identical. If findings from the study have moved the topic forward it may be appropriate to revisit the literature review to say how. If not, simply delete.

Level of interest: An article whose findings are important to those with closely related research interests

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 interes