Reviewer's report

Title: Comparison of the burden of diarrhoeal illness among individuals with and without household cisterns in northeast Brazil: a cross-sectional study

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Reviewer: Shams Arifeen

Reviewer's report:

I just have one main comment on the manuscript, and I suggest a "Major Compulsory Revisions":

This is an observational study, assessing the impact of intervention program comparing households who received the intervention with those that did not. I appreciate the basic study design used to evaluate the project - it is appropriate for the purpose. However, studies like these are very susceptible to biases, particularly to selection biases. The paper does not address this at all.

Specifically:

• In each of the study communities, the community determined which of the eligible families had a cistern built first. On what basis was this determined by the community? Could this have any relationship with the outcome of interest? It seems no attempt was made to capture this, why not?

• Allowing the interviewers to select the households to interview is a major source of bias. I understand that this was driven by the lack of a usable list of cistern recipients, but there are methods that could still have been used to ensure that interviewers did not just go to the most accessible families. While not much can be done about this now, at very least, there can be some discussion of this potential source of bias - beyond the simple mention that is now in the manuscript. Is there data to indicate how often did the interviewers select the first two families with cisterns that they found?

• Choosing as controls as the nearest household to the cistern households was an appropriate design choice. However, it is really important that data is presented comparing the intervention and control households in terms of both demographic characteristics and in terms of factors that could be independently associated with the outcome. While Table 3 shows no association between demographic characteristics and the outcome and thus suggest that these may not be important sources of bias, I suggest that the analysis be done separately for under-5 children and other ages. I suggest this for the other analysis too.

Discretionary Revisions:

Finally, it is a pity that the study team did not measure the actual use of the cistern and additional risk factors of diarrhoea. This observational study would really have benefited from such data and enabled us to better interpret the results that demonstrate an impact of the intervention.
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