Reviewer's report

Title: Evaluation of the Effectiveness of Building Local Capacity to Conduct Arsenic Testing Services in Bangladesh

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Reviewer: Craig M. Steinmaus

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This paper has public health importance in that many people in Bangladesh are exposed to high levels of arsenic in drinking water, and these exposures have been associated with cancer, heart disease, and many other serious outcomes. Because of the large numbers of people exposed, and the seriousness of these health outcomes, reducing arsenic exposures in Bangladesh should be considered a public health emergency. This paper has several important findings including the large number of wells that need arsenic testing (highlighting the need for more testing), the large number of unsafe wells that are still being used, the lack of knowledge about where safe wells were located, the lack of visible labeling of wells, and evidence that local villagers can do fairly accurate testing themselves. I have several mostly minor comments:

Background:
The last sentence of paragraph 2 in the Background is a repeat of an earlier sentence.

It seems the authors place strong emphasis on the link between well depth and arsenic concentrations. Perhaps they could add a sentence or two about how strong this relationship is.

Methods:
In the third full paragraph on page 4: how were the 20 villagers actually selected. Were they prior employees, had previous lab experience, simply a convenience sample of volunteers?

Results
They use the phrase “wells labeled green” throughout. Does this mean the wells had actually been painted green, if so, was the painting part of this study, or part of previous efforts. Or does it simply mean that the Hach testing was done as part of this study and the results came back as > 50? Use of this phrase is a little confusing at times.

Second paragraph. I think they mean Figure 4 when they reference Figure 3.

Discussion
Last full paragraph page 7, fist paragraph page 8, it seems the use of the phrase false negative or false positive for “wells labeled green” flip-flops across these
two paragraphs.

Table 1: This table is difficult to follow. If I am reading this correctly, it means that in 292 wells with arsenic levels between 10-50 ug/L (by ICP-MS), 161 of these wells were read as being above 50 ug/L by the Hach kit. If correct, this seems to signify a potentially major problem with the Hach kit, since it means that a very large number of wells that are probably meeting the Bangladesh standard of 50 ug/L (by ICP-MS), might be incorrectly read as “high” by the Hach kit and would be painted red or shut down. The authors should discuss this inaccuracy and how important they feel it is in a public health perspective. If they feel that 10 ug/L is a more appropriate standard, they could have a row in Table 2 on “Field kit Incorrect relative to 10”

**Level of interest:** An article of outstanding merit and interest 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:**

Ms. George, the lead author, was a student of mine 5 years ago, although we have not worked together since. Otherwise I have no competing interests.