Reviewer's report

Title: Transition in household's sanitation practices over time in rural Bangladesh: a cross-sectional comparative study

Version: 1 Date: 22 August 2013

Reviewer: Benjamin Arnold

Reviewer's report:

This study summarizes the results of a large, longitudinal cohort followed in rural Bangladesh to measure the change in sanitation conditions observed during a program implemented by BRAC. The study makes an important contribution to the literature documenting the current state of sanitation conditions in rural Bangladesh, and the changes that take place over time. There are several areas where the authors could improve the clarity of their reporting, which I have summarized below.

Benjamin Arnold, PhD
Division of Epidemiology
University of California, Berkeley

MAJOR COMPULSORY REVISIONS

(1)
As written, it remains unclear whether the authors used a repeated cross-sectional design or a longitudinal design. After reading the entire article, I think that it is a longitudinal design, but it remains unclear (particularly given the authors' description as a "cross-sectional" study). The following three comments relate to this central reporting issue.


A more standard name for repeated cross-sectional surveys in the same study population a “repeated cross-sectional design” if the same households were not surveyed in each round. However, based on the description of the sampling design on Page 8, this design appears to be a longitudinal cohort study where the same households that were enrolled in the baseline were visited again in two follow-up visits. If this is correct, then the study design should be described as a “longitudinal cohort study”.


Please clarify of the same households enrolled in the baseline survey were visited again in the midline and endline surveys. The description implies this, but this point remains unclear (particularly given the current name used for the
design is cross-sectional rather than longitudinal).

Methods. Data Collection, Management, and Analysis. Page 9

“The analysis was performed on the matched households in all the three surveys (26,404 in each survey, giving a total of 79,212 households).”

The authors should specify what they mean by “matched households.” Do they mean households that were present in all 3 rounds? Or do the authors mean something else by “matching” in this context? This point remains unclear and it is difficult to interpret exactly what the study did with respect to household enrollment and follow-up.

(2)


The Methods do not include an adequate description of the statistical methods used to analyze the data from this study. The details of the analysis should be described in the Methods section, including model selection methods and standard error calculations that account for the multi-stage clustered survey design. Currently, it is unclear how the Chi-Square tests and logistic regression analyses accounted for the complex survey design and (potentially) repeated measures within households.

On Page 13, the results in the paragraph beginning “Probability of not using sanitary latrines…” are reported as if they are prevalence ratios, but the authors used logistic regression, and the default parameter of interest estimated by the model is the odds ratio. The authors should clarify what the parameter of interest was (odds ratio, prevalence ratio) and if it was a prevalence ratio how they estimated it using logistic regression. For outcomes that are highly prevalent, as hygienic latrines are in this study, the use of logistic regression to estimate Odds Ratios (ORs) is discouraged because the OR does not estimate the prevalence ratio or the risk ratio for common outcomes. The use of log-binomial regression or modified poisson regression would be more appropriate, and they are straightforward to implement using the software package used by the authors (Stata). The following articles include details on appropriate methods:

McNutt, L.-A.; Wu, C.; Xue, X. & Hafner, J. P.
Estimating the relative risk in cohort studies and clinical trials of common outcomes.
Am J Epidemiol, 2003, 157, 940-943

Zou, G.
A modified poisson regression approach to prospective studies with binary data.

Yelland, L. N.; Salter, A. B. & Ryan, P.
Performance of the modified poisson regression approach for estimating relative risks from clustered prospective data.
“A major limitation of this study is the absence of control groups which may trigger the questions whether the changes in sanitation situation is because of WASH interventions. However, inclusion of baseline survey prior to the WASH intervention and visiting the same households in midline and end line surveys allow that the changes are due to the intervention.”

The second sentence that claims that changes in latrine use over time can be attributed to the WASH program because the same households were visited over time. However, without a control group, there is no way to identify what would have happened under a counterfactual scenario of no intervention. The changes observed could under-estimate or over-estimate the effect of the program on latrine use and conditions. If the authors are willing to assume that in the absence of the program there would be no change in toilet conditions in this population then the changes would be 100% attributable to the intervention, but that is a very strong assumption and the authors should clarify whether they are willing to make this assumption, and if so, what their justification is for making it.

The reporting of results in this manuscript could be greatly improved overall if the authors followed guidelines in the STROBE statement:

The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies.

The current manuscript has numerous grammatical mistakes throughout and needs to be edited by a native English speaker.

MINOR ESSENTIAL REVISIONS

“Considering the maximum possible ratio of 50%...”
I assume that the authors mean to write: “Conservatively assuming an outcome prevalence of 50%...”
Reports of the number of households enrolled and lost to follow-up generally belong in the Results section (not the Methods section).

(8)
Results. Page 12.
“Quality of sanitary latrines use increased significantly from baseline to end line in terms of latrine cleanliness (baseline 33.4%, midline 50.8%, end line 53.3%)…”
What is the definition of “latrine cleanliness” ? This measure is not defined and so it is unclear exactly what the authors mean. A clear definition would help readers to interpret this outcome measurement.

(9)
Table 3.
I find this table very confusing. I think that the information it contains is important, but it’s almost impossible to interpret the information in the current layout. The authors should consider breaking the table into separate pieces for baseline to midline and baseline to endline, and should include a more thorough description of what the contents of each cell contain. For example,

(10)
Table 4.
“Odds ratio of selected variables indicating probability of not using sanitary latrine”
The odds ratio does not estimate the probability -- it estimates the odds of the outcome (where odds = p/[1-p]).

(11)
Table 5.
“The success of WASH programme in reducing OR”
The title is very unclear. What does the “OR” in the title mean?

DISCRETIONARY REVISIONS

(12)
The paragraph beginning “The intervention is being offered in the community…” is a very lengthy description of the program. It would be more appropriate to include a very brief description in the Introduction, and move the majority of this material into the Methods section.

(13)
Methods. Operational Definition. Page 10
“Operational Definition” should probably be changed to “Outcome definition” or “Operational Definition of Sanitary Latrines”

(14)
Table 4.
This table could be improved by including columns with the prevalence of each outcome for the groups to enable the reader to clearly see the differences between groups.

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

Quality of written English: Not suitable for publication unless extensively edited

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:
I declare that I have no competing interests.