Reviewer's report

Title: Measures of handwashing behavior and indicators associated with hand hygiene in rural Bangladesh

Version: 2 Date: 1 June 2010

Reviewer: Amy Pickering

Reviewer's report:

General: This study finds that washing both hands with soap is an uncommon practice in rural Bangladesh. It also finds a significant association between hand cleanliness and water present at handwashing stations within households. The results of this study are relevant for the design of hand hygiene interventions in rural Bangladesh and contribute to ongoing research to identify reliable indicators of hand hygiene behavior.

Minor Essential Revisions

1. A listed objective of the study is to “compare various measures of hand hygiene,” however this objective seems broader than the focus of the presented results and discussion, which is the comparison of hand cleanliness with “household characteristics” (tables 4 and 5). Please revise objective to match data analysis and results.

2. Background: Please provide a literature review of the use of hand cleanliness as an indicator of hand hygiene behavior and describe how this paper contributes to important gaps in the literature (for example the relationship between hand cleanliness and hand hygiene behavior measured by structured observation has not been published before).

3. Methods, data analysis, paragraph 3: Please clarify how “specific characteristics” were selected. Suggest differentiating between household characteristics (i.e. wealth, latrine use) and other indicators of hand hygiene behavior (i.e. caregivers’ handwashing behavior). Why isn’t the association between self reported handwashing behavior and hand cleanliness reported?

4. Methods, Instruments and Data Collection, paragraph 4: The following phrase is unclear: “followed by pre-testing in the field consecutive two days.”

5. Methods, Data analysis, paragraph 1: What does “for the cross sectional survey” refer to?

6. Results, paragraph 3: First sentence should specify when subjects did not wash their hands. Do these numbers represent all key times?

7. Table 4: Caption should specify results are from bivariate analysis.

8. Table 5: OR and p-value appear to be missing under mothers/caregivers for
“separate soap available for handwashing.”

9. Table 5: Economic score is described as a “categorical variable” but appears to be an ordinal variable.

10. Discussion, paragraph 4: It should be mentioned that although hand cleanliness was associated with water at a handwashing station, it was not associated with observed handwashing behavior as measured by structured observation.

Discretionary Revisions

11. Suggest defining “spot check.” Term may be considered jargon by some.

Minor issues (not for publication)

12. Abstract: In results section, delete “their” in following phrase: “14% of all persons observed washed their both hands with soap after defecation.”

13. Methods, Data analysis, paragraph 1: “primary outcome variable” should be changed to “primary outcome variables.”

14. Methods, Data analysis, paragraph 2: “primary outcome variable” should be changed to “primary outcome variables”.

15. Results, paragraph 4: Add the word “of” to “51% mothers/caregivers” and “37% children.”

16. Discussion, last paragraph: Change “that” to “they” in second sentence.

17. A few times throughout the paper generalized estimating equations were referred to as “general estimated equation.” Please correct these typos.

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

Quality of written English: Needs some language corrections before being published

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.