Reviewer’s report

Title: Implementation of an educational intervention to improve hand washing in primary schools: process evaluation within a randomised controlled trial

Version: 2 Date: 30 June 2013

Reviewer: Matthew Freeman

Reviewer’s report:

The paper reports on a process evaluation of a school-based hygiene program in the United Kingdom. The paper has been refined and indeed greatly improved by the authors. This version of the paper has improved readability and structure and includes a number of important discussion points that can be relevant to the broader public health community about implementing school-based handwashing programs. The purpose of the study is well supported by the methods utilized.

Major compulsory revisions:
- In the methods section, you state that you used logit link. However in the results you report a risk ratio. A log-binomial model (link log) will produce a risk ratio, while link logit produces an odds ratio. Please reconcile.

Minor essential revisions:
- I appreciate the additional discussion of methods in this version of the manuscript, but I suggest that the authors revise and reorganize this section to provide additional clarity. Report the number of schools and each method in one place in a sentence such as, “A process evaluation was conducted that included school logs (n=178 schools), FGDs with pupils (n=8 schools), etc. Paragraphs within the analysis sub-section could be broken up into separate sections to describe the different methods, including paragraphs on outcome variables, quantitative analysis approaches, and qualitative analysis. I have made some specific suggestions below.

- I would still like to see additional literature cited in the discussion section that can situate these findings within the broader public health community interested in school-based health promotion programs. Are there other process evaluations that have shown similar results in terms of fidelity, etc. If this is only a process evaluation of a specific program in the UK, it may be of little added value to the rest of the sector.

- Table 1 requires a more specific title and overall N of schools. Column 2, reporting the mean number of minutes for FGDs is unnecessary. Perhaps additional columns reporting the intervention and control schools separately would be useful. Add the dates and footnotes to specify the analysis so that the table can stand alone from the paper.

- Table 2: The title, as it currently reads is unclear and doesn’t explicitly state the comparison being made. Use the word “compared to,” to discuss the ratio you
are reporting, rather than “or.” Use the title “univariate” not “univariable.” Use the title “Multivariable logistic regression” (this is not multivariate) and report “aRR” instead of “RR.” You don’t need to report so many significant digits for the p values, two (ie, p=0.53) is sufficient. The methods section needs to specify why you chose 194 pupil as the cut point for this analysis. Is that the mean? Is that a relevant number for external validity or should you choose a more appropriate set of ordinal values? Same with % eligible for free meals. I suggest you spend more time discussing these findings in the results and discussion as the variable uptake of the intervention is the key purpose of your study.

-Table 3: The title needs clarification. Are you considering the process evaluation to only be the 8 schools that received the FGDs? From the abstract, it appears that you categorize all data collection activities described as the process evaluation?

Discretionary revisions:
- In the abstract, the purpose is stated as to assess “fidelity, dose and reach.” In the results, the authors discuss reach, dose, fidelity, acceptability, and sustainability, in that order. I suggest you make the abstract match the results.
- Comma missing p2: “acceptable to schools[,] but its reach”
- Remove/add comma p3: “…where, when[,] and why variations…”
- Please check comma usage throughout the paper, as you alternate between application (i.e. see page 6) or not (see examples above) of the Oxford comma
- p6: “The resource [packs were] developed?”
- p7: “Four intervention and four control schools in the sub-study were purposively selected…” How were they purposively selected? Was their a reason to select specific types of schools?
- I suggest a separate section for ethics.
- p7: Suggest that you move the selection of schools to a separate section and more completely explain what was done in the full suite of schools, the 24 schools in the “sub-study” and then the 8 schools in the “process evaluation.” I though that the entire study was a process evaluation (informed by the title and discussion on p22 of the discussion), so I am confused by the heading on p8 (and title in table 3) that leads with a discussion of 8 schools that received FGDs. More clarity in one place in the manuscript of what schools were assessed for what components would be helpful.
- Please discuss the challenges of FGDs with children aged 6-7 (KS1). This seems awfully young for FGDs. Is there literature that supports the use of FGDs in children of that age? Were any participatory activities used?
- I’m confused about the timing of this evaluation. The methods state that the study was completed in April 2010, but also that control schools received the completed intervention in 2010. You report on the fidelity of the intervention in the control schools, which is quite interesting. Please clarify the timing of
implementation and data collection.

- p13: the first time you report an estimate and CI, you need to spell out risk ratio (RR) and 95% confidence interval (CI).

- “A description of the observed delivery of the intervention in the four process evaluation intervention schools is provided in Table 3, indicating that not all schools provided all components to all classes,” This does not make complete sense, what is “indicating”, the table or the findings in the table?

- In the dose section on page 13-14, percentages would be helpful for all univariate data, since keeping track of the overall N of the study is challenging. This is actually the case throughout the manuscript.

- Though shown in Table 2, there is no discussion as to why certain areas have higher fidelity in either the results or discussion sections.

- p20: “Fidelity of delivery was also reportedly better…” compared to what? “…using this model.” What model?

- p22. “The quantitative and qualitative methods used in the process evaluation were an effective mechanism by which to measure and explore intervention reach, dose, fidelity, acceptability and sustainability.” By what measure? It would be useful to introduce this paragraph as the strengths and limitations section.

**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 interests