Author's response to reviews

Title: Validation of Public Health Competencies and Impact Variables for Low- and Middle-Income Countries

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Version: 5 Date: 28 November 2013

Author's response to reviews: see over
Cover letter – revision article Title: Validation of Public Health Competencies and Impact Variables for Low- and Middle-Income Countries

November 28, 2013

Dear sir, madam,

As requested by the reviewers, hereby we provide you with a list of the changes made:

Reviewer 1:
1. The question posed by the authors is somewhat confusing. My understanding from the paper is that the authors were seeking to validate impact variables and that they needed a consensus on the competencies in order to do so. The logical basis for this is not clearly articulated in the paper, because it is not clear how the impact variables were defined. Were the impact variables based only on the short list of competencies on which consensus was achieved? How were the impact variables created based on the competencies? And what is the relationship between the impact variables and the competencies? Is the fact that there was a high degree of consensus on the impact variables mean that the competencies are appropriate? It is not clear to me that this causality can be established. So it is not clear to me what exactly the authors are setting out to do and why.

- The authors are setting out to develop and validate public health competencies as well as outcome and impact indicators, across LMICs’ (as that was not done before). These competencies and indicators were devised using international reference and the existing learning objectives of the respective curricula, informed by knowledge of the respective contextual needs. The one set underpins the other, and considers impact through the lens of the curriculum. The authors used the competencies to derive the impact variables by inductive logic. As outcome and impact variables had not been derived before – the authors tried to formulate them and then to validate them.

The text has been made more clear to explain the purpose.

2. The authors claim that the reason for the use of the modified Delphi method is that “public health competencies had already been developed but not yet validated across LMICs, so a reasonable degree of concurrence could be expected”. This is not a clear statement. If the competencies were developed by each country separately, then what is the basis for assuming that concurrence could be expected? In any case, the authors seem to have decided a priori that they would only have one round of consensus with the experts before they even started the process. While it is important to get alumni viewpoints, it seems like the decision to stop after one round should have been done after and not before the first round was completed.

Also I was not clear about the scale. The authors state that they use the Likert Scale of “poor” to “excellent”. The actual question asked is not reported, but I assume from the scale that the question asked was whether the competency was relevant or not. But the impact variable uses the same scale and what is being measured is not clear. For example, if an impact variable is “Developed a small scale study or research proposal: it is not clear what a value of “poor” means in
this case. It also appears that the Likert scale used for the alumni is different from that used for the experts, and therefore the consensus reached by the experts and alumni may not reflect the same interpretation of the question. Finally, the process by which the competencies were consolidated or modified is not clearly described. For example, the authors state that “we decided to group ‘analytical/assessment skills’ with ‘public health sciences skills’, as it was felt there was too much overlap between the two competency groups”, but these are two distinct sets of competencies, and without further explanation the justification for why these were deemed to overlap is unclear. The authors need to describe the process through which 76 competencies were reduced to 23.

**Answer:**
- As for the Delphi rounds: at the start it was decided to consult experts and alumni in different rounds, instead of using the same experts for all three rounds. Based on the results a second round with either experts or after that with the alumni was not deemed to be necessary. This has been added in the article.
- As for the Likert scale: the statement posed to the experts was as stated in the paper: “Relevance” is taken to mean: this competency is expected of a Public Health Masters graduate working in the field of Public Health. This has been clarified in the text.
- The Likert scale for alumni was slightly adjusted to clarify the statements as follows: *Key: “Relevance” is taken to mean: this competency is expected of a Public Health Masters graduate working in the field of Public Health; where 5 signifies “a highly relevant competency for MPH graduates”; and 1 signifies “not a key competency expected of MPH graduates”. The authors feel however that this slight adaptation is not material in terms of results.*
- The process of consolidation and modification has been more clearly described, including the rationale behind the clustering of the competencies, ie safeguarding against “atomisation”, including references.

3. a. The paper describes the criteria for how the experts and the alumni were selected, but since there is no detail about how these people were recruited, there is no information on whether these people are representative of the general stakeholder population, or whether there are characteristics that might cause their opinions to be biased. At the end of the paper, the authors state that since the MPH program convenors selected both the experts and the alumni, there is the possibility of bias. There is no discussion about what might have been done to reduce this bias.

b. The authors use a median of 4 or 5 for consensus, but a review of the data indicates that for almost all the competencies and the impact variables, the primary ratings were a 3, 4 or 5. While this indicates consensus, the lack of variation makes it difficult to interpret the results. Since all the raters gave most of the variables a high rating, it is not clear whether the consensus came about because every one agreed that the variables were important or whether there was pressure not to give assign low ratings.

c. There appears to be some country to country variability – it would be useful to compute the median for each country for each rating and identify any variables that have a low median score in one country – this will help to identify any cross country variability that is not presented or discussed.
d. Also in the rating of the impact variables, there are several qualitative comments about how difficult it is to rate the impact variables broadly without understanding the context and these were not reported in the discussion.

Answer:
a. Regarding the experts: the researchers aimed at maximum variation in the Public Health field. Respondents were recruited by the MPH convener of the respective schools through email or telephone. By using selection criteria for experts to ensure maximum variation, this bias was reduced. These comments have been added to the paper.

b. The researchers believe that there was no undue pressure not to give low rating, as there was much more variation in the impact variables and the fact that there was intra-rater variability mostly from 2-5, this might not have been the case.

c. Medians for each country were computed to identify cross country variability. With regards to the experts: Some cross-country variability was identified, with one school scoring overall lower regarding the competencies and variables; ie 4/23 competencies a median of 3, while other schools had only zero- one competency with a median of 3. For the impact variables at work the same school scored 3 variables less than 3, while others scored 1-3 with a median of 3. For impact variables on society there were two schools which scored 4 variables with a median of 3. The competencies and variables which were scored lower in the one schools, were also not rated high in other schools and were changed. With regards to the alumni: as for the competencies: alumni from 1 school scored 2 competencies at 3, alumni from 2 different schools scored 5/23 work impact variables at 3, alumni from other schools scored a median of 3 for zero, one or three variables. others scored a median of 1-2. With regards to the impact variables in society: alumni from 2 different schools scored 2-3 impact variables at 3. This has been added to the paper, as well as elaborated in the discussion.

d. More information on the qualitative comments have been added and this has been better clarified in the discussion.

4. Since the primary objective of this paper is consensus, there was little reporting of data other than the consensus ratings.

- No comment.

5. Part of the discussion sessions focus on the addition/deletion of competencies. This is not a conclusion for the data, but more an elaboration of the methods

Answer:
- The part on the addition/deletion of competencies has been transferred to the methods section.

Reviewer 2:

General points:

1. A number of the competencies and a few of the impact variables are double-, triple-, or even quadruple-barreled, thus conflating the potential measurement of the variables in practice
Answer:
- We have noticed this, and described more clearly the rationale behind the clustering of the competencies, working towards a competency based curriculum and safeguarding against “atomisation”, including references.

2. The study is well-conceptualized. The use of competencies assessed alongside workplace impact variables, and the use of both experts (inclusive of academe and employers) and alumni drawn into the validation process, is a useful means of checking education against its value/place in the field.
- Thank you.

Minor points:

1. Figure 1 on p. 3 is not necessary. I don’t see how the schematic of the process adds any value to the very simple and logical ordering of the steps in the authors’ work.
- We have removed the figure.

2. “Centers for Disease Control” needs “and Prevention” on p. 5
- We have added “and Prevention”

3. In Table 2 on p. 12:
   a. The parenthetical reference should be “as sent to alumni” (not “send”)
   b. “Public Health” does not need to be capitalized throughout. It can be lower-case.
   As for:
   a. We have changed “send” to “sent”
   b. We have left Public Health as a we feel, this represents the discipline, and not just the health of the population

Copy editing:
The previous version was copyedited by a native South Africa speaker, as well as a copyeditor from Britain, however indeed not the abstract. This version has been extensively copyedited by a native South African speaker, who has long time experience in copy-editing work.