Author's response to reviews

Title: Innovative approaches for improving maternal and newborn health - A landscape analysis

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Author's response to reviews: see over
Dear Nawsheen Boodhun:

Thank you for the review of our manuscript number 1994536563155968 on “Innovative approaches for improving maternal and newborn health” and to all four reviewers for their valued suggestions about our manuscript. We appreciate the opportunity to address the issues raised by the reviewers.

The following pages address the comments and concerns of the reviewers, which precede our responses and are in italics. We have identified the specific changes in the manuscript and discussed any suggestions that we did not incorporate into the text. We provide an additional draft indicating "tracked changes" so that you can more easily identify our edits to the original submission.

We hope that we have adequately addressed your suggestions and the recommendations of the reviewers, and that the manuscript will be acceptable for publication in BMC Pregnancy and Childbirth.

Karsten Lunze, on behalf of the authors:

Ariel Higgins-Steele, Aline Simen Kapeu, Linda Vesel, Julia Kim, and Kim Dickson
Reviewer 1

Major revisions

1. Breadth of review. The authors have chosen a very broad definition of “innovation” so the scope of their review and analysis is very wide, ranging from new technology to public-private partnerships. This means that no single area is reviewed in any depth. This can be useful in reviewing the “landscape” as the title suggests, and reflects what many countries and health service managers are faced with when wanting to keep up with the latest evidence. However, the authors should reflect more in the discussion and conclusion on how such a huge amount of accumulating knowledge should be managed and be made more accessible to those that need to know.

Thank you for the suggestion. In response, we have added to the discussion a paragraph on knowledge management indicating that country programme planners and managers could refer to the relevant sections for geographical orientation of innovations and for a summary of innovations within relevant health system building blocks.

Our aim was to summarize the landscape of innovative MNH approaches and analyze existing published evidence or lack hereof. As the reviewer rightly points out, we therefore could not conduct a systematic literature review strictly following the “participants, interventions, comparisons, outcomes, and study design (PICOS)” scheme. Indeed, we conducted this analysis to summarize existing evidence on maternal and newborn health innovations and thus assist in-country implementers with the management of existing knowledge. Information from this review has for example already been summarized as Case Studies and provided to UNICEF staff.

2. Conceptual framework and HIS / ICT: This is partly based on the WHO building blocks but the building block on health information is missing. This is not explained. It also brings a major gap in the analysis as all the very many ‘innovative’ interventions related to new information technology and ehealth is not included in the review. This gap should be addressed either by including a review of these innovative technologies or explain why this was not included (for example perhaps it was omitted because it has been covered extensively elsewhere).

We thank the reviewer for pointing out that the exclusion of the building block “health information system” needs a justification. The reviewer is correct in mentioning that this has been covered elsewhere. The Every Woman, Every Child Innovations Working Group for example have focused their work and reviews in this area. We therefore added the following justification to the methods section:

“We excluded the building block “health information system” from our analytic framework to somewhat limit the scope of this very broad analysis and to avoid redundancy with recently published reviews and work underway [17-20].”
3. Quality improvement: Paper suggests that this is an “innovation” but in fact this is routine management of MNH services, or should be. Would be more useful to pick up new ways in which QI initiatives have been introduced or successively scaled up.

We agree that quality improvement should indeed be routine in MNH services. We included them in our analysis when the implementers described it as innovative – that is new to the context or implemented in a new way according to our working definition of innovative approaches.
We did not find any scale-up evaluations for quality improvement strategies in our review.

4. Discussion: this currently has a considerable commentary on specific interventions, which overlaps with the results sections and the accompanying tables and appendices. The authors should restructure so that the results covers the summary commentary on innovative interventions, grouped by building block, and keep the discussion section for generic and cross-cutting issues, such as knowledge management and dissemination.
This is a helpful suggestion. Following the reviewer’s guidance, we have restructured the results section to summarize the innovative approaches and the discussion section for more general, broader considerations. The results section summarizes the innovative MNH approaches by building block, while the discussion section discusses generic and cross-cutting issues, again in the order by which we organize the results sections and tables. We included a reference to knowledge management and dissemination in the beginning of our discussion.

Minor revisions
1. Summary text on equity: not clear and requires review
We have substantially revised the concluding remarks on the importance of equity in MNH services to improve the clarity of our writing.

2. Use of the term “innovation”: the authors provide a definition earlier in the paper, but then go on to use the word ‘innovation’ in a very loose way, with phrases about “innovative” implementation and “innovative” evaluation. This should be amended so that the term is only used as defined.
Thank you for the suggestion. We have reviewed the text and modified the use of the term “innovation” accordingly. The use of the term innovation is indeed very variable in the medical and public health literature. In the revised text, following our working definition, we refer to “innovative approaches” in MNH.

3. Use of bracketing when describing studies, for example (controlled) RCTs is confusing and should be removed or made clear. The Term cRCT and RCT is used in the paper, yet Annex B does not clarify difference.
The revised manuscript now specifies and spells out all study types we included in the analysis: randomized controlled trials (RCTs), cluster randomized controlled trials (cRCTs), controlled and uncontrolled pre-post and time series studies etc. We have also spelled this out in Annex B.

4. **LMIC needs clearer definition** (‘Low and Middle Income’ or ‘Lower Middle Income’)
   In the manuscript, LMIC refers to low- and middle income countries as spelled out in the introduction section’s first paragraph.

5. **Search criteria – not clear if this was only English language papers or not** (important as resulted in very few from Latin America – not clear if this is a language issue or due to less papers)
   We conducted the search in the respective databases without language restriction and added a sentence to the methods section:
   “We searched without language restrictions and included studies in English, French, Spanish and Portuguese.”
   While we included studies in the major languages used in Latin America, we cannot exclude a publication bias in our analyses, since we observed generally less publications out of Latin America than other regions with LMIC.

6. **Could comment more on the level of rigour of studies** (usefully supplied in results tables) in different categories (workforce, technology etc) and why this is the case.
   In the revised manuscripts discussion section, we comment on the rigor of the published studies included in this analysis, organized by the health systems building blocks.

7. **List of interventions in supplementary annex. Useful list but some are far too broad or oddly stand-alone – for example under Governance one intervention is “health system reform”**.
   Another lists a case study on health extension workers as one intervention; the introduction of community health workers has much more written about it than one case study.
   We have structured the supplemental table to be a comprehensive but accessible list of innovations included in our analysis. Country health reforms are part of the “Political leadership and governance” category. The involvement of community health workers is part of various innovative approaches in different health systems blocks.
Reviewer 2

This is an exceedingly impressive piece of exhaustive research. The supplemental table alone merits dissemination in an online journal. Discretionary revisions:

(a) Given the title, I was expecting some form of qualifier in the Introduction section for the word "innovative." I understand that the definition used is described in the Methodology, but I also wonder whether an acknowledgment should be made in the Introduction section to reflect the fact that the meaning of the word in this context is not necessarily universally agreed upon. As an example, putting the first use of the term (e.g., in line 76) in quotations, perhaps with a brief defining statement.

Thank you for the positive feedback. As suggested by the reviewer, we added a “qualifier” to the Introduction section:

“While there is currently no universal definition of innovations in MNH or a systematic description of the landscape of initiatives, tested or currently in implementation, the term ‘innovation’ is frequently used in the domain of MNH to describe new interventions and approaches to service delivery and behaviour change [10].” The varying use and understanding of the term “innovation” prompted us to conduct this study and analyze the landscape of innovations in MNH. To develop a working definition of “innovations” or “innovative approaches” for our analysis, we conducted the survey exercise described in the methods.

(b) The formatting of Table 1 could be improved. That there are multiple data elements contained within cells on the same line makes the information difficult to quickly digest, since families of data elements do not line up. For example:
"South Asia-19.24 (26%)" is all on one line, and so the data elements do not line up well with those in the line below it.

To increase the table’s readability, we have eliminated multiple data from lines to limit the information per line.

(c) The formatting of Annex B was odd in the printout that I received. The arrows and boxes do not seem to line up.

Thank you for pointing this out. We will work carefully with the BMC production team to ensure that the formatting correctly carries over to the produced manuscript.

Reviewer 3

[…] For example, it is not clear how training of "professional midwives in newborn care" or "training and support of TBAs" are to be considered "novel".

Following our working definition for MNH innovations as described in the methods section, we included interventions as innovative when they were new to the context, that is; had not yet been introduced in the giving context or to the given target audience. Also, some birth assistance
interventions were innovative in that they included newborn care where this was previously not included, rather focusing on only on maternal care.

Minor Essential Revisions

Line 376 spelling of "scarcity"

Thanks for noting. We have corrected the orthographic error.

Line 504 change sentence to read "quality care is available to all and that is not determined by..." (grammatical problem: care ... does not discriminate personal characteristics)

Consistent with the comment from reviewer 1, we have revised this paragraph.

Reviewer 4

Below I have some comments that might be useful in thinking about possible revisions.

1. This review aimed to simplify considerable complexity, and it was useful to describe innovations by health system building block – it may also be interesting for the authors to comment on whether the findings by building block were distributed evenly between Regions, or whether some innovation categories were tested in some places more frequently than others – and if so what the implications of this might be.

Table 1 shows the geographic distribution within each health system building block. Innovative approaches by building block vary widely between regions, as shown in this Table (numbers are line percentages):

<table>
<thead>
<tr>
<th>Service</th>
<th>Workforce</th>
<th>Community</th>
<th>Technology</th>
<th>Finance</th>
<th>Governance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central/Eastern Europe, CIS</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>East Asia and Pacific</td>
<td>33</td>
<td>33</td>
<td>17</td>
<td>0</td>
<td>17</td>
</tr>
<tr>
<td>Eastern, Southern Africa</td>
<td>31</td>
<td>31</td>
<td>13</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>Latin America</td>
<td>35</td>
<td>35</td>
<td>6</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Middle East, Northern Africa</td>
<td>60</td>
<td>0</td>
<td>0</td>
<td>20</td>
<td>0</td>
</tr>
<tr>
<td>South Asia</td>
<td>29</td>
<td>22</td>
<td>21</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>West, Central Africa</td>
<td>35</td>
<td>15</td>
<td>4</td>
<td>0</td>
<td>38</td>
</tr>
<tr>
<td>Unspecified</td>
<td>16</td>
<td>19</td>
<td>5</td>
<td>58</td>
<td>0</td>
</tr>
</tbody>
</table>

We discussed this table’s inclusion into the paper and agreed not to include it, since the information is included the other, exhaustive table. However, we are prepared to include the table if the editor so prefers or could also include in a web annex.

2. Linked to point 1, it was important that the manuscript included context in the discussion.
We agree that the implementation of innovations is indeed highly dependent on their context. The innovations we reviewed were implemented in different contexts. In our manuscript, we provide a global overview and give the global context of MNH innovation.

3. *In its current structure the results section presents a non-standard mix between listing innovations or life-saving interventions, reporting impact where impact data exists, and discussing study designs for innovation-testing studies – sometimes with more weight given to the later e.g. Results lines 173-185. This seems like a lot for one manuscript to tackle: did they consider keeping content about study design to the discussion?*

This comment is consistent with comment #4 from reviewer 1. As outlined, we have restructured the results and discussion sections, so that the results summarize the innovative MNH approaches by building block, while the discussion section discusses broader issues.

4. *The authors could consider addressing one important inconsistency. Early on in the manuscript (Introduction, line 82) the language around “innovative approaches” and “interventions” is conflated. In the definition (Methods, line 92) innovative approaches are defined as those that aim to improve coverage and utilisation of services. Thus innovative approaches are not life-saving interventions in themselves. It is important that this distinction be consistently applied. There are examples where the Results section reports on life-saving interventions but not the innovative approaches to deliver them (e.g. Results, line 216 on chlorhexidine).*

We thank the reviewer for pointing out the need to improve our writing to clarify that innovative approaches are not synonymous with innovative interventions. We have rewritten the results section on health technologies to reflect that many interventions indeed are not new, but iterations aimed at the appropriate use in LMIC.

5. *In methods and reporting of results it was not clear how documents arising from search of grey literature were handled, nor how these contributed to the analysis.*

We did not specifically search for gray literature, but included gray literature we found in our database search. While some of the databases include only peer-reviewed literature, others also list reports. These gray literature reports were all descriptive, and we graded them accordingly. To clarify, we added a sentence to the methods section:

“We did not specifically conduct a search for gray literature, but included gray literature found in the database search.”

6. *It was good that the dates of the search were included under Methods, and one could argue that a considerable number of manuscripts reporting innovative approaches have been published since November 2012 – probably worthy of mention in the discussion.*

The long time period from conduct of database review to publication is indeed an important limitation of the study. We have therefore added a note to the paper’s limitations section:
“Finally, considerable time has elapsed from database review to publication. This means that while our study can give indications of the NMH innovations landscape and existing evidence and gaps, it should be considered potentially incomplete and interpreted with caution.”

7. *I may have missed this, but did not understand how the determination of what was being ‘primarily assessed’ by studies was made (Results, line 132). Was this always reported by original reports, or sometimes determined by the authors of this review?*

Thank you for pointing out the need for clarity on the categorization of innovations. This was done at the time of the grading of evidence in each study, either following the original reports. Where this was not specified in the paper, the determination was indeed made by the two reviewers. We have amended the methods section to briefly describe the process:

“Finally, two reviewers categorized innovations and graded the evidence of included studies.”

8. *The discussion included interesting text about study design challenges for innovation testing on a large scale. An additional perspective would be to comment on the typographies that study authors used to describe their innovations: was it always clear which innovations had been tested?*

We recognize that many study design challenges for innovation testing are related to the difficulties of “doing” research in resource-limited environments with limited budgets. Some papers described several innovations, while in other instances the same innovation was described in several publications. We summarize this in Annex A.

9. *Some important limitations were addressed, although this section needs careful editing to improve clarity.*

We edited and revised the paper’s limitations section to improve clarity. We also noted the long time period of this paper’s progress to publication as important limitation for the audience to consider.