Author's response to reviews

Title: Mobile phones improve antenatal care attendance and quality of care in Zanzibar: A cluster randomized controlled trial

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Author's response to reviews: see over
It is with pleasure that we submit a revised version of our article “Mobile phones improve antenatal care attendance in Zanzibar: A cluster randomized controlled trial”.

We would like to thank editor and reviewers for their comments and input to further improve the article. Please find below a point-to-point description of the changes made.

Yours sincerely,

Stine Lund, MD, PhD Fellow

Editor’s Comments

1. Please clarify in your manuscript that The Medical Research Council of Zanzibar is an ethics committee.

This has been clarified (P4, line 91).

2. Please remove figure 1 from the main manuscript file and upload it as a figure file instead.

This has been done.

Reviewer 1

The Paper presents findings from an RCT that sought to establish if provision of mobile text reminders and health promotion content is associated with improved utilization of Focused ANC services in a developing country setup.
A very informative paper, which I believe would be quite informative for policy making. A few clarifications if added into the script would make it more convincing: there are discretionary revisions.

1. Regarding the intervention group: What was the proportion of vouchers that were actually used? What was the proportion of mothers in intervention group who actually received at least one unidirectional text messages?

   Available data has been included in the manuscript (P 11, lines 251-255).

2. Was there stock out of Tetanus Toxin or Malaria Medicines at any time during the course of the intervention in either control or test facilities?

   We conducted weekly supervision visits and supplied drugs if they were in stock-out. This has been clarified in the manuscript (P 8, lines 178-179).

3. Since the intervention was not blinded to the care providers, how can we be sure that improvements mentioned in the secondary outcome measures were not confounded by the intervention sites’ health provider knowledge? For instance, were providers in intervention facilities able to access the health promotion content that was being pushed through text reminders? Were the control facilities’ providers at the same level at baseline in terms of knowledge about the FANC guidelines?

   This topic has been added to the discussion of study limitations (P15, lines 341-345).

4. It is clear that the intervention did increase the ANC attendance. The assertion that needs more justification is that it increased the quality of care. Is the increase in uptake of malaria prevention and other adjunct interventions directly related to the quality of care? What constitutes "good quality of care in ANC services" a proper write up on this would make the paper more convincing in my opinion especially on the "improved quality of care" assertion.

   This section of the paper has been improved and updated with recent literature (P13, lines 299-309).

Conclusion
The paper is clear, flows logically, and written in an easy to understand manner. It appears to cover the area of practice quite well. It’s of relevance to policy makers in the region.

Thank you.
Reviewer 2

The authors report results of cluster RCT from Zanzibar testing effects of mobile phone intervention on antenatal care attendance and related quality of care. The results show improvements in ANC attendance. Several comments to improve upon the manuscript:

Major comments

1. The results of the same trial but on a different outcome have already been reported – this should come out clearly in the background/methods section; the authors should also state primary and secondary outcomes of the whole trial

   *This has been clarified in the manuscript outcome section (P 7, lines 142-151).*

2. Methods should state how sample size of 44 clusters and 2550 individual observations was calculated?

   *The study had 24 clusters and 2550 women enrolled. The sample size calculation has been included in the manuscript (P 7, lines 154-165).*

3. An example of SMS intervention (frequency and content) should be provided in Panel (in Kiswahili and English), eg. for women enrolled before 16 weeks

   *A panel with examples of text messages has been included in the manuscript (P 23).*

4. Intervention involves not only texting and airtime but also distribution of mobile phones to intervention group health workers – why, presumably health workers have their phones? This aspect should be addressed in the paper, potential effects on the outcomes and implications of the same for scale up

   *This issue has been included in the discussion (P 14, lines 329-338).*

5. Since you registered not only mothers with personal phones (38%) but also those with having access to someone else phone (?) these data should be reported.

   *This has been included in the discussion (P 14, lines 324-329).*

6. Do you know SMS intervention exposure status of mothers? Were mothers calling providers? Could they call providers in control group? If you have these data please report

   *Available data has been included in the manuscript (P 11, lines 251-255).*
7. Since routine health workers and research assistance collecting data seems to be the same individuals this inevitably affected the quality of practices – this should be addressed in limitations/discussion

*It has been addressed in discussion of study limitations (P 14-15, lines 338-341).*

8. The mHealth reviews in discussion section are already outdated – it is more appropriate to use the latest from Free et al (2013) in Plos Med and review appropriate studies in the discussion

*The literature used in the discussion has been updated and the sections revised accordingly (P 13, lines 299-309).*

9. Differences on antepartum referrals of 10% vs 5% without knowing if these were complicated pregnancies are hard to interpret thus more caution in the discussion on this

*This has been done.*

10. Abstract: please state that this was open label trial and state number of study facilities (clusters); in results section provide data on quality to support your conclusions on “trends”

*That the study is open label has been included (P 2, line 27). The number of study facilities was already mentioned.*

11. The title should be toned down and limited to attendance without quality aspect

*The title has been changed to:*

**Mobile phones improve antenatal care attendance in Zanzibar: A cluster randomized controlled trial**

Minor comments:
1. Background section should better address “study hypothesis” or potential link between mobile phone intervention and poor ANC attendance and quality

*The study hypothesis as been further emphasized in the background section (P 4, lines 82-84).*

2. Provide dates for the trial (pg 4)

*Dates have been added (P 4, line 89).*
3. Pg 5 subtitle should be “Randomisation and masking”
   
   This has been corrected (P 8, line 167).

4. Table 2, referral aspect in control group cannot be 57/1311 (5%)
   
   This was a typing mistake that has been corrected.