Author’s response to reviews

Title: Quality Medicines in maternal health: Results of Oxytocin, Misoprostol, Magnesium Sulfate and Calcium Gluconate Quality Audits

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Author’s response to reviews:
Reviewer reports:
Hans Hogerzeil (Reviewer 1): General comments
It is good to record the quality of essential medicines in such a systematic way - this gives interesting reading; there are not so many such studies with a general sampling frame (not focusing on suspected sample only).

I think the introduction is too long; there is too much lecturing on the use of these medicines. The research questions are not very well described.
All in all, the paper is rather long and sometimes a little repetitive (e.g. epidemiological data repeated in the discussion)

Specific comments
3/34: Is strengthening the supply chain the best solution? Or just better procurement? Is it initial quality or deterioration in the supply chain that has caused the problems? (see also below)
Strengthening the supply chain is one of the observable solutions as it includes better procurement and proper assessment of the initial quality prior to procurement. Although the initial quality provides a baseline and a pivot for comparison. Future studies will seek to establish a baseline.

Methods: The description of the sampling method is rather long; can be shortened or referred to an appendix
Parts of the sampling method has been shortened.

11/35: All samples were registered. But how do you know these were not falsified medicines? They may have been fakes.
Physical identification/visual inspection was performed on all samples and all met the registration requirement. Substandard and falsified products were not easily identified during the study.

19/4 When the overall level of failures is low, there is not much point in presenting the regional or facility differences (as there are none)
Although this is true, the data provided was mainly presented as an overall comparison.

20/8 Did you measure availability? I did not see any results. Availability studies were not done as this was not the focus of the study.

20/31 I think the highest failure rate was 87%, not 25%? (Figure 2):
From figure 2, the failure rates are zone specific hence is not indicative of the total failure rate of Oxytocin injection in total samples drawn.

20/38 You cannot conclude that the reason is degradation, as you did not do a longitudinal study. Other studies have concluded that the initial quality was often more of a problem than the degradation as such (see below). In any case, they can both be problematic. I personally should recommend to procure better products, properly assessed by regulators; then the initial quality is good and the resilience against high temperatures is also better.
The authors stated that “Degradation is one of the likely causes of the failure rate” (Discussion Line 24). This does not totally exclude the contributions of poor initial quality and regulatory assessment. The authors also mentioned that proper surveillance monitoring and regulatory actions are important to ensure the quality of medicines in circulation.

See also:
See also the latest report of the Lancet Commission on Essential Medicines Policies (Wirtz et al) (2016 online; Jan 2017 printed) - contains a detailed graph with quality results for misoprostol.

Thank you for the informative article suggestions.

Edward T. Dassah (Reviewer 2): Please include all comments for the authors in this box rather than uploading your report as an attachment. Please only upload as attachments annotated versions of manuscripts, graphs, supporting materials or other aspects of your report which cannot be included in a text format.
Please overwrite this text when adding your comments to the authors.
The manuscript in its current form would require some revisions to improve its quality

1. Topic: The topic in its current form is suggestive of an assessment of child birth and quality of medicines. However, the study did not assess any component of child birth; this should be taken out of the topic and the topic rephrased to reflect the current study.
Quality Medicines in Maternal Health: Results of Oxytocin, Misoprostol, Magnesium Sulfate and Calcium Gluconate Quality Audits

Methods
Apart from the sample size estimations, the methods section does not include a statistical analysis section describing how the data was analysed to obtain the stated results. This should be included.
Analysis of the sample data obtained from this study was performed using the R Language and Environment for Statistical Computing. Results section, Line 8
Results
On page 8 (line 7), the authors state that; "Table 3 shows the sample distribution". However in the subsequent write ups for the 4 drugs, the number of samples analysed is at variance with what is stated in Table 3; oxytocin (159), misoprostol (166), magnesium sulfate (163) and calcium gluconate (148). This difference has only been explained for magnesium sulfate. The authors should give reasons for the difference in the remaining 3 drugs.
Reasons for the variance in the sample distribution is stated in the first paragraph under Results; “The expected number of samples as derived from the sample size calculation could not be achieved because the availability of these products in most of the public health facilities was limited. In addition, due to damaged samples and incomplete packaging information, the number of analyzed products for each commodity varies with the number of sampled products”.

Discussion
The authors did not compare their findings to any existing literature in the field, making it difficult to put the findings in context.

Page 17 lines 28-30, the authors think that the high failure rate of first line PPH treatment may be contributing to the high maternal mortality rates in different parts of the country. Comparing the failure rates in different parts (eg southeastern and northeastern) with their respective maternal mortality rates to support their claims would be beneficial. Unfortunately, there is no adequate data to show the maternal mortality rates in the various zones of the country.

Page 17 lines 50-51, the authors make a categorical statement that "...private health facilities are more frequented that the public facilities" without any supporting reference. They should provide the necessary reference.
Due to the lack of reliable data, this statement has been erased.
The authors should highlight the limitations of the study more clearly.
The limitations of the study has been included
The stated conclusions are not related to the current study findings. The authors should ensure that the conclusions emanate from the study findings.

Conclusion has been edited to properly relate the current study findings.