Reviewer’s report

Title: Association of the client-provider ratio with the risk of maternal mortality in referral hospitals: A multi-site study in Nigeria

Version: 0 Date: 30 Oct 2017

Reviewer: Ekechi Okereke

Reviewer’s report:

General Comments -

This study investigates the association between clients-provider ratios providing antenatal and delivery care in eight Nigerian referral hospitals and the risk of maternal mortality in the hospitals. The study attempts to explore the relationship between the number of maternal deaths and the total number of healthcare providers within the referral hospitals by adopting a cross-sectional study design and conducted across four out of the six geo-political zones of Nigeria. The paper was well-written, however comments below which are provided as feedback to the authors are classified as 'Minor essential revisions' which should be addressed before the manuscript is considered for publication and 'Discretionary revision' which are suggestions which the authors can choose to adopt or reject.

Minor Essential Revisions -

1. There is need for more descriptive information about the selected referral hospitals, for e.g. what is the estimated catchment population for each hospital? what are the referral systems and networks for the selected hospitals? on average what is the monthly number of complicated deliveries or emergency obstetric cases referred to these hospitals? More descriptive information about the selected hospitals will give much needed context and provide the reader with a greater appreciation of the selected hospitals.

2. It will be helpful for the authors to provide more information around the selection criteria for the selected hospitals for this study or the formative research which the study is based on. It is noted that the authors mentioned that the selected hospitals covered four out of the six geo-political zones of Nigeria and that there were two tertiary and six secondary level referral hospitals. Also on Page 8/9, the authors indicate that "only the hospitals that agreed to participate....were enlisted into the study", but the selection criteria used by the authors is not clear! So for instance, why was Karishi General Hospital and General Hospital Minna selected and not other referral hospitals within North-Central Nigeria? This also applies to other referral hospitals selected within other geo-political zones of the country. Hopefully, the selection criteria will also explain why the 2 tertiary hospitals selected for the study were in the northern part of Nigeria while no tertiary hospital was selected from the southern part of the country.

Discretionary revision -
1. Within the paper, it maybe good to substitute 'quantum' with another word e.g. number, density etc. as 'quantum' is not a term typically associated with health workers!

2. What further insights can be drawn from the entirety of the study's dataset as well as the statistical association between births-provider ration, ANC attendee-provider ratio and maternal mortality beyond the current inferences mentioned in the paper including the inference that there is negative association between number of maternal deaths and number of healthcare providers? Despite the fact that the stated null hypothesis of the study has been investigated, more inferential analysis may provide even more insights from the dataset of the study. The decision to undertake further inferential analysis is left to the discretion of the authors and the decision of the journal's editors and editor-in-chief.

Level of interest
Please indicate how interesting you found the manuscript:

An article whose findings are important to those with closely related research interests

Quality of written English
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Acceptable

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