Author's response to reviews

Title: Criteria-based audit to improve a district referral system in Malawi

Authors:

Eugene J Kongnyuy (kongnyuy@gmail.com)
Grace Mlava (gracemlava90@gamil.com)
Nynke van den Broek (broek@liverpool.ac.uk)

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Author's response to reviews: see over
Dear Editors,

Ref: Criteria based audit to improve a district referral system in Malawi: a pilot study

Thanks for giving us the opportunity to resubmit the manuscript. We are pleased all peer-reviewers recommended minor revisions. We have addressed their comments and the next pages present the comments in quotation marks and in bold. Our responses follow the comments.

The comments have helped improved the manuscript, for which we are grateful. We hope this will meet the standards for publication in your journal.

Sincerely,

Eugene
"Question well defined
Yes. The authors wanted to see if criteria-based audit could improve the referral system. The authors have examined a crucial aspect of the three delays and suggested a method of improving it.

Method appropriate
Yes. A simple before and after study was used for this study. The design obviously has the same weaknesses as other before and after studies. A randomized trial of intervention versus no intervention would have been better, but presumably the costs of doing such a study were beyond the authors.

Data sound and controlled
The data is well presented and clear. Simple, appropriate statistics were used.

Adherence to standards
Yes"

Thanks for the compliments

"Discussion and conclusion well balanced and supported by data
Yes. I think the authors could add to the article by examining the question of sustainability. The authors found a significant improvement in the referral system after 3 months. Is this the Hawthorne effect or has it been sustained. Secondly to make this process relevant to other countries with similar circumstances the authors could have mentioned the costs of getting the meeting together to agree on criteria"

Thanks for the comments. The two issues raised have been appropriately addressed under the DISCUSSION section

"Does title and abstract accurately convey what has been found
Yes"

Thanks
Reviewer: A Dumont

Major compulsory Revisions

"1. This research is much more a pilot study than an accurate evaluation of criteria-based audit to improve a district referral system. I would change the title as follows: "Criteria based audit to improve a district referral system in Malawi: a pilot study"

The title has been changed. Thanks.

"2. The authors should give a more detail about the context: area of the districts (km²), density of the population, proportion of inhabitants living less than 5 km (or other cut-off) from the health facility, proportion of institutional deliveries (in both referral hospital and health centres) proportion of emergency obstetric unmet needs, proportion of Caesarean section, mechanism of financing emergency referral, size of maternity wards in the referral hospital and 12 health centres (number of deliveries per year), number of patients referred from health centres to hospital per year, functionality of the hospital and the 12 health centres (health workers, drugs and supplies, equipment, availability of emergency obstetric services...)

All these issues raised have been included either under the INTRODUCTION or METHODS. Thanks for the comments

"3. Inclusion criteria for the audit are not clear: all patients referred from health centers during the defined periods, including maternal deaths during transportation? Referrals for any indication or just for emergency obstetric complications? Which complications?"

This has been clarified under METHODS. Thanks

"4. The authors should explain why they repeated the audit just one time and why a 3-months period was chosen between the first audit and second one? Ideally, the measures should be repeated more than one time to assess sustainability of the audit based intervention".

We measured the referral system two times (not once) as described in this article. We have added under discussion that there are plans for long term follow up.

"5. The audit process should be described with more details: existence of an audit committee, qualification of the members of the audit committee, responsibilities of each member, training of each member, availability of a standardized data collection tool, who and how is each case reviewed (availability of analysis grid?), how make the recommendations, methods for implementing the recommendations, source of financing to implement recommendations, etc."
These issues have been addressed under the METHODS and DISCUSSION sections.
Thanks.

"6. The authors should describe the data collection: source of information, availability of standardized questionnaire, variables…. They should explain particularly how they collected information about the delays from the time the ambulance is called to when the ambulance brought the patient to the hospital, and how they monitored the feedback given to referring the health centers"

This has been described under METHODS. Thanks.

"7. The authors should add a table on patients' characteristics: age, parity, place of residence, provenance, indication for referral, diagnosed complications at arrival, mode of delivery, maternal and perinatal outcomes. These data would show us if the groups are comparable before and after the recommendations implementation. If not adjustment would be necessary".

This table has been included. Thanks.

"8. The authors should discuss the generalization of this success story. They should explain how the forces and weaknesses linked with the context of Salima district referral system help to the audit implementation and then to improve the process indicators"

This has been added under DISCUSSION. Thanks.

"9. The authors should discuss the sustainability of the audit-based intervention. This pilot study aims to test the feasibility of using criteria-based audit to improve a district referral system. However, we don't know if the results are sustainable. The authors should describe the actions involved given the audit recommendations and explain why the actions are sustainable"

This has been added under DISCUSSION. Thanks.

"10. The authors should recommend to carry out further study to control for confounding factors (control district for example) and to assess effectiveness in terms of process and outcome indicators".

This recommendation has been added. Thanks.