Reviewer's report

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

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Reviewer: A Dumont

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This is an important work that highlights the importance of the referral system in the management of emergency obstetric complications. The question posed by the authors is well defined. The methods are appropriate, but not well described. The data presented are incomplete. The discussion and conclusions are well balanced and adequately supported by the data; but the questions of generalization and sustainability of the results are not discussed. These limitations are not clearly stated. The abstract accurately convey what has been found; but the title should be modified. The writing is acceptable.

I recommend the following 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”

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

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?

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 the second one? Ideally, the measures should be repeated more than one time to assess sustainability of the audit based intervention.

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 he recommendations, methods for implementing the recommendations, source of financing to implement recommendations, etc …

6. The authors should describe the data collection: source of information, availability of a 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 heath centers.

7. The authors should add a table on patients’ characteristics: age, parity, place of residence (kms from health center), provenance (which heath centers?), indication for referral, diagnosed complications at arrival, mode of delivery, maternal and perinatal outcomes. These data would show us is the groups are comparable before and after the recommendations implementation. If not adjustment would be necessary.

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.

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 these actions are sustainable.
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.

I advise that this manuscript should be rejected because too small an advance to publish.

Level of interest
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- An article of importance in its field

Quality of written English
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- Acceptable

Statistical review
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- No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests
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I declare that I have no competing interests.

Open peer review
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I am happy for my signed report to be posted on the BMC Health Services Research website as part of the pre-publication history of this article.