

Reviewer's report

Title: Maternal Mortality in the informal settlements of Nairobi city: What do we know?

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Reviewer: Willibald Zeck

Reviewer's report:

This is a report about an important epidemiological and obstetric topic in a slum setting in a developing country, which might be interesting for policy makers and public health experts. Since pregnant women in East Africa are of increased health risk and the international community is focusing on Maternal and Child Health within the Millennium Developing Goals, it seems worthwhile to look at Maternal and Newborn Health services in such a setting. This study can be found merit and should be published. It might also encourage other study groups to go deeper in this important topic. However, the study fails on a number of counts to address the problem.

Major Compulsory Revisions:

Abstract:

1.) The authors report that 631 maternal deaths per 100,000 live births have occurred. However, the time frame is missing here. The time frame(s) of the study have to be included in the abstract (method section).

2.) In the abstract as well in the main paper the term "Maternal Mortality (Ratio)" has to be defined. In the abstract a short explanation might be sufficient. However, in the main paper the full definition has to be added and also a reference. In case the authors used the WHO definition, it should read: "Maternal death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental causes".

Main paper:

Background section:

1.) Again definitions + references concerning direct and indirect causes of maternal deaths are needed. The authors should explain the terms.

2.) "Given that most obstetric emergencies are often unpredictable, and that life-threatening complications occur in roughly 15 percent of all pregnancies, potentially every pregnancy is at risk of developing a complication."

The last part of that sentence is not contributory. It is common knowledge that every pregnant woman is at risk. Additionally, it is not the pregnancy which is at

risk rather than the women and the un/newborns. If the authors want the sentence to be included, it should read: "...Given that most obstetric emergencies are not predictable and that life-threatening complications occur in roughly 15 percent of all pregnancies, potentially every pregnant woman is at risk of developing a complication."

3.) The last paragraph in the background section has to go into the method section.

4.) More general information about circumstances in the slums (setting, surrounding, ethnicities etc.) is needed. Mind that this article will also be read by people who have never been in slums before! That would include that the distance from the next health facility is important as well as availability of means of transport.

5.) International Organizations have been emphasizing maternal health in so – called developing countries since 2005 (MDG´s) and even before that (Safe Motherhood Initiative). These efforts should be mentioned in the introduction, in order to legitimate the study. The lack and need of reports on MM in slums should also be mentioned here.

Method section:

1.) "...questionnaire adapted from the verbal autopsy tool developed by World Health Organization." A reference has to be quoted here. It is not sufficient to mention WHO without an appropriate reference. Where has this questionnaire been used before; is it standardized? The authors should consider an additional table displaying a rough overview of the questions concerned.

2.) How long have the "trained interviewer" been trained and what was their level of education? Was only one, or were more interviewers involved? Where they part of the slum community? Could the participation of local interviewers lead to bias when questioning the persons concerned? Were study participants contacted beforehand in order to ask them whether they wanted to participate in the study and to arrange a convenient time for an interview, if they were willing to participate? Were respondents given a time frame in order to decide whether to participate or not? How many of the considered participants refused to give consent? Did interviewers ensure that respondents were in a position to answer questions on this sensitive topic by explaining beforehand that answers to questions that made them feel uncomfortable should be refused? In fact, the interview process has to be explained more in detail.

3.) 10 (ICD10): a reference is needed.

Result section:

1.) "Table 1 shows the characteristics of female deaths, distinguishing between maternal deaths (during pregnancy or within 42 days of a pregnancy outcome), late maternal death (within one year of pregnancy outcome) and other, non maternal deaths." Again, it is not clear: what is the

definition of an early and late maternal death? Definitions + references on key issues are missing throughout the paper.

2.) "It is not clear whether the differences are due to measurement errors whereby the verbal autopsy tool over diagnoses HIV/AIDS..." Starting from that sentence down to the end of the result section: This part should go into the discussion section, as the authors are not presenting data, but already interpreting it.

Discussion section:

1.) WHO and other agencies are emphasizing "skilled birth attendance for every pregnant woman". Hence, it should be more emphasised that there is an international mandate on this issue. This would also help to legitimate the study.

2.) The authors are right when they state that pregnant women have limited access to emergency obstetric care. BUT: they will not seek care if their knowledge about pregnancy and delivery is poor. It is known that most of obstetric complications occur because of delays. What are the causes of delay in such a setting according to the author's experience? Does health education play a role? A study published in the Bulletin of the WHO in 2003 f.e. showed that at a community level, one additional year of education for household heads is associated with a 62% lower maternal death rate. What about cultural constraints? Do males in the family let pregnant women seek obstetric care when needed? Have interventions taken place to educate women in the area so far? The illiteracy rate and education in comparison to other studies should be discussed.

3.) "Finally, it is important to note that although most deliveries took place outside of a health facility, nearly all of them visited a health facility before death. This observation may imply poor quality or limited access to emergency obstetric care in this area. For most obstetric complications, timely access to life saving interventions is of paramount importance." Not only the distance from the next health facility is important but even more the availability of means of transport. Have the authors included means of transport in their assessments? Is the quality of medical care really that bad, or is it just the fact that women arrive so late at the facilities that medical personnel at the facility are just not able to intervene early enough? Maybe there are overwhelmed with cases that require emergency care.

Furthermore, the reader needs to know how health facilities are equipped in this area. Do they contain the "eight essential obstetric functions" recommended by the WHO? If not, the implementation of these functions could be one intervention to improve the situation.

4.) Most importantly the authors fail to consider a "way forward" from where they are now in their setting. What can we learn from the data to save maternal lives in future? What do the results mean for decision makers in the health sector (politicians, public health experts etc?) What steps have to be taken to reduce

maternal mortality in this population (education of women concerning obstetric danger signs, training for unskilled birth attendants, how can local resources be included in such interventions)? Where are gaps, how can they be filled? Hence, the emphasis of this paper should include “lessons learned” from the study and subsequent matching interventions. This is actually the most crucial point in this paper. What are the lessons learned from the data for policy makers and public health experts in particular? What about organisations in these areas? Who is currently active and who could/ should be involved in an interventional network in such a setting in the future (NGO’s, MoH, U.N. agencies??)?

Minor essential revisions:

Table 1: a legend is needed to explain maternal, late maternal and non-maternal female deaths

Table 3: a legend is needed to explain the abbreviation NUHDSS

Level of interest: An article of outstanding merit and interest in its field

Quality of written English: Acceptable

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