Author's response to reviews

Title: Maternal morbidity in the first year after childbirth in Mombasa Kenya; a needs assessment

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Author's response to reviews: see over
Author’s reply: HIV and infant feeding, and need for long-term follow up of women also makes the traditional six week period invalid

Firstly, many thanks to both reviewers for their constructive and generous feedback on our manuscript. Below, we list each comment and how these have been addressed. As much additional text has been added to address these comments, we removed some unnecessary text from the manuscript to maintain avoid a large increase in word count.

First reviewer

Comment 1

I find the study of Chersich et al very interesting and informative. Research about postpartum morbidity in low-income countries is sparse and few studies have been conducted in sub-Saharan Africa. This study is a valuable contribution to the already existing body of knowledge, especially because it extends the postpartum period to one year after childbirth while most studies cover a period of 6 to 12 weeks.

**Author reply:** We include additional text to highlight the benefits and drawbacks of assessing women's health in the first year, as opposed to the conventional shorter period as the reviewer mentions (see 10 lines from bottom of page 3 background; and final paragraph of discussion p11).

Comment 2

Furthermore, the authors have investigated both physical and mental aspects of women's health after childbirth, whereas most studies focus merely on clinical morbidity. My comments and questions, which I will list below, are out of interest and for the purpose of clarification on certain issues. They can be labelled as ‘discretionary revisions’, but I hope the authors are willing and able to answer them.

**Author reply:** We address each point below and have made changes accordingly, which improve the manuscript markedly.

Comment 3

What is the reason to divide the first six months after childbirth in a period from 4 – 8 weeks, and 2 – 6 months and not 4 – 12 weeks and 3 – 6 months?

**Author reply:** After much debate among the co-authors, we selected the time periods in this study for the following reasons: they reflect the traditional infant immunizations schedule as close as possible and secondly as the first of these categories reflects the WHO definition of postpartum period. The study was intended to define the package of services which would be provided to women at these three time points, matching the specific needs of women at each point. Also we believed each of these periods would reflected a different health transition for women, namely: at 4-8 weeks the classic postpartum, and morbidity likely mostly likely directly
related to pregnancy; 2-6 months some pregnancy-related conditions, but a transition to general reproductive and sexual health; and around 9 months the more general diseases that could be addressed among women bringing their child for immunization.

Comment 4

Bacterial vaginosis and candida infection are reproductive tract infections, but to my knowledge not definitely related to ascending reproductive tract infections (PID) and a threat to, for example future fertility? Why have the authors chosen not to test for gonorrhea and/or Chlamydia?

Author reply: Previous studies among female sex workers in our setting have shown a relatively low prevalence of both Neisseria gonorrhoea and Chlamydia, much to our surprise (see for example: S Luchters, MF Chersich, et al Impact of five years of peer-mediated interventions on sexual behavior and sexually transmitted infections among female sex workers in Mombasa, Kenya. BMC Public Health 2008). We also have a particular interest in bacterial vaginosis and vaginal flora in our institution. Financial and logistical constraints, as well as a perceived low likelihood of high prevalence meant we did not do these tests. We have included gonorrhea and/or Chlamydia testing in some of our ongoing studies but don't have those results yet.

Comment 5

Psychosocial vulnerability: in the text the authors describe that 38 out of 499 women had experienced sexual or physical violence since childbirth. When the numbers in table 2 are counted, then 42 out of 499 women have experienced this. Are there women who experienced both types of violence?

Author reply: Yes, four women had experienced both sexual and physical violence since childbirth. This has been added to the text (please note on page 7, 6 lines from the top of the page).

Comment 6

Are the women who drank alcohol during pregnancy and breastfeeding the same as those who have currently hazardous or harmful alcohol use?

Author reply: Seven of the 38 women who drank alcohol during pregnancy and breastfeeding were classified as hazardous or harmful drinkers using the AUDIT tool. AUDIT scoring in the study questionnaire assessed drinking in the period prior to pregnancy, while a separate set of questions assessed drinking during pregnancy and breastfeeding. There was an error in the previous draft, where these time periods had been conflated. The distinction between these time periods has been made clear in the revised manuscript and we are very relieved this error was detected in time (please see page 7, 4 lines above the subheading Sexual behaviour and contraceptive use).

Comment 7
Were abdominal pain and vaginal discharge also associated with the diagnosis of reproductive tract infections?

**Author reply:** Only *Trichomonas vaginalis* infection was associated with reported genital symptoms. This information has been added (p.8, 4 lines from the page bottom). No association or trend was noted between symptoms and bacterial vaginosis or candida infection, even when the time periods were examined separately.

**Comment 8**

Is screening for cervical cancer well implemented program in the reproductive health services of Mombasa? In most low-resource countries it is not and I wonder if it is a good indicator of level of access to sexual and reproductive health services.

**Author reply:** We agree that access to cervical cancer screening is a good indicator of access to high-quality sexual and reproductive services. Coverage of cervical cancer screening is very low in Mombasa: only 6% of women in this study had ever been screened (page 8, sentence above the subheading Clinical Morbidity). In our practical experience in Kenya, cervical cancer screening programmes are poorly effective. Likely these efforts have made minimal impact on the burden of cervical cancer in Kenya, with massive losses at each step of the programme. Latest Kenya guidelines recommend Visual Inspection with Acetic Acid but this is also poorly implemented. We have included a sentence on this and reference to a WHO report on this issue (WHO/ICO Information Centre on HPV and Cervical Cancer. Summary report on HPV and cervical cancer statistics in Kenya. 2007. [www.who.int/hpvcentre](http://www.who.int/hpvcentre)). See page 11, 6 lines from top of page)

**Comment 9**

Does type of delivery have any relation to the reported morbidity? (except the relation between cesarean section and anaemia).

**Author reply:** No association was detected between type of delivery and morbidity, except for anaemia and that women who had a caesarean section had fewer perineal lesions, as would be expected.

**Comment 10**

Is puerperal sepsis not merely related to the first six weeks after delivery, and is it not better to speak of pelvic inflammatory disease after this period?

**Author reply:** We agree, and have removed the word “puerperal”, referring to this as only “sepsis” (final sentence of 1st paragraph of discussion).

**Comment 11**
You have used references from 1988 – 1996 about the relation between bacterial vaginosis and complications in pregnancy. There is more recent literature about this controversial topic (Cochrane reviews). Could these be useful for your discussion?

**Author reply:** We included two suggested references on the issue of bacterial vaginosis and pregnancy complications. Firstly a Cochrane review which found evidence that infection screening and treatment programs in pregnant women may reduce preterm birth and preterm low birthweights. Secondly, to present a balanced view of this issue, we included a report from the U.S. Preventive Services Task Force which reached divergent conclusions to the Cochrane review (3 lines from bottom of page 9).

**Comment 12**

Can the authors put the high percentage of women who suffered from physical and sexual violence in a context and compare it to other studies? What I gather is that this is ‘normal’ in this population, but I find it shockingly high.

**Author reply:** We agree, these levels are remarkable and have established a sexual violence clinic in the hospital (see additional text on this on page 10, final sentence of first paragraph). Previous estimates of sexual violence among sex workers in this area are even twice as high.

**Comment 13**

Can the authors say anything about the relation between drinking behaviour and depression?

**Author reply:** The numbers of current drinkers and women with depression are too small to detect an association unfortunately. No association was noted between reporting ever having drunk and having depression.

**Comment 14**

Reference Nr 38: Lagro, MG must be Lagro, MGP.

**Author reply:** the change has been made.

**Reviewer two**

1. **Is the question posed by the authors well defined?**

**Comment 1a**

The questions is ill-defined. It is not clear whether there is a policy within the study area for women to have postpartum care, is the problem under utilization or nonexistence of the services? It would be useful to have a sentence explaining and summarising what is the gap.

**Author reply:** In Kenya, as in much of the world, postpartum services are recommended for all women. However, utilization of these services remains low (only 10% of women in this study had attended such care, see line 3 page 8). Part of the problem in our setting, is that the service
package for these women were ill defined; women bringing their child for health care would receive occasional services, in an ad hoc inconsistent manner. More detail has been added to clarify the research question addressed in this study and the problem in our setting, please see: the first 5-10 lines of the methods section; and line 9-11 of 1st paragraph on page 3.

Comment 1b

The author should link his findings in his previous work on postpartum morbidity among HIV positive women in Kenya.

Author reply: Additional text has been added in the discussion to link the findings of this paper with the previous report on morbidity patterns in HIV-positive women (please note page 10, line 5). Findings about acceptability and uptake of HIV testing in this population are also mentioned (please see the fourth line of page 10).

2. Are the methods appropriate and well described?)

Comment 2a

The methods need more details, why did the authors choose one year to study postpartum maternal morbidity?

Author reply: The rationale for selecting one year as the study period is mentioned in the introduction, but additional text has been included to highlight this issue in the final paragraph before the conclusion. We hypothesised that, to address effects of pregnancy and to support the transition to pre-pregnancy state, women would require services throughout the first year after childbirth. This assertion appears valid and much can be done, with relatively simple interventions, to address women’s health needs in this period. Mostly, the interface with women bringing their child to clinic in the first year represented for us an underutilized opportunity to address women’s needs. Demonstrating the needs of women in the latter part of the year, would provide justification for provision of services for these women. If study enrolment had been restricted to women in the first six weeks after childbirth, we felt that an important opportunity would have been missed to define women’s needs in the full transition period. Moreover, we argue in the conclusion that, given the high levels of reproductive morbidity in this setting, the previous focus on the first 6 weeks has limitations in this setting, women require a range of services at each interval when they attend child health clinics.

Comment 2b

The authors seems to use the term postpartum and afterbirth interchangeably, in the background authors very well defined the term postpartum period according to WHO.

Author reply: The reviewer highlights a very valid point and an important inconsistency in the submitted manuscript. In the revised manuscript, we have avoided use of the term postpartum, replacing it by text specifying the specific time period being referred to. As this is major issue,
also mentioned by reviewer one, we reference several other studies which have referred to the postpartum period in more general terms (please see page 3, second paragraph, line 4).

Comment 2c

Do they relate the morbidities in their study to pregnancy?

Author reply: In the paper we attempt to draw a distinction between three groups of diseases: those related or aggravated by pregnancy, those associated with breastfeeding and the return of sexual and reproductive function; and intercurrent illnesses common to all women of reproductive age (final paragraph of Background section). We also acknowledge that this distinction is difficult to make (line 8 of the first paragraph of the Discussion). In parts of the revised manuscript we have attempted to increase the distinction between these groups of conditions (see first paragraph of discussion, page 10, first 5 lines).

Comment 2d

Details on ethical issue needs to be addressed more clearly, patients who had positive HIV and syphilis results how were they contacted, how many were not found and how many managed to be treated.

Author reply: HIV test results were provided the same day for women accepting testing (as mentioned on page 5, final sentence above the subheading Study measures and data analysis). A member of the study team accompanied women who tested HIV positive to enrol in the specialised HIV clinic at the hospital for further HIV care, treatment and support services (page 5, final sentence above the subheading Study measures and data analysis). We maintained a log of patients who had abnormal tests requiring to be traced, such as syphilis. Tracing and follow up of patients with specific conditions was also often discussed in team meetings. We made agreements with other departments such as mental health and casualty that study participants could receive treatment for conditions detected in the study. We used all available contact information and field workers, if required, to trace patients. To the recollection of the study team, we traced all women who needed such care, the standard operating procedures in the study detailing the list of study conditions and actions taken is included below as an appendix for further information.

3. Are the data sound?

Comment 3a

Yes but the tables could be simplified – for example percentages should be rounded to the nearest whole number. Tables should include number and percentage or percentage only to make them less crowded and easy to read.

Author reply: We have altered the tables as suggested, which improves their presentation markedly. Similarly, to be consistent, we present percentages rounded to the nearest whole number in the results text.
5. Are the discussion and conclusions well balanced and adequately supported by the data?

Comment 5a

The discussion would be strengthened by a more detailed presentation of the findings as compared to previous studies.

Author reply. To address this comment, we repeated our literature search and identified several additional relevant studies which were conducted in comparable populations in Africa. Text has been added in the discussion section accordingly (there are now 52 references, rather than 38 in the original manuscript; see specifically first line of page 10; line 4 of page 4; and the last sentence of the second and third paragraph on page 10).

Comment 5b

Most of the previous studies he quoted concentrated on the puerperium period, the authors should discuss the advantage of their methodology of including one year postpartum period as compared to the previous studies.

Author reply. As mentioned above, we have added text on the rationale and advantages of examining the health of women throughout the first year after childbirth, rather than only within the first six weeks, a population which seldom attends postpartum follow up clinics (please also see the last paragraph of the Discussion). We also have added a sentence to the introduction to state that this study aims to examine alternative models for provision of postpartum services for women, and hence we selected a longer study period.

6. Are limitations of the work clearly stated?

Comment 6a

There is not enough discussion of the strengths and weaknesses of the study.

Author reply: We have included an additional paragraph on the strengths of the study and added text on the limitations as noted below in comment 6b (see final paragraph of the Discussion section and last sentence of the second last paragraph of the Discussion).

Comment 6b

It is not really clear what is the relationship between self-reported symptoms and clinically verifiable conditions in this study. Validity studies for self-reported signs and symptoms of a range of reproductive morbidity depict that such information has limited utility for identifying medically defined conditions but is important for assessing perceptions of ill-health. Most of the time this type of self reported ill health is associated with various forms of recall and response bias.
Author reply: This limitation has been added, as suggested (please see the last sentence of the second last paragraph of the discussion, page 11).

Comment 6c

The authors seem to conclude that the year after child birth women have high level of morbidity, how do they relate the morbidities to pregnancy? Especially in women who are so labelled late postpartum?

Author reply: As mentioned above, in the manuscript we present three groups of conditions (those related to or aggravated by pregnancy; those associated with lactation or return of reproductive function; and intercurrent illnesses). Some morbidities such as anaemia may be related to the effects of pregnancy and childbirth, especially in women who had a caesarean section for example.

7. Do the authors clearly acknowledge any work upon which they are building, both published and unpublished?)

Comment 7a

Yes, however most references are for studies done outside Kenya, it would be appropriate to quote more studies done in Kenya about postpartum morbidity or state clearly if this is the first work of its kind in Kenya. There have been few studies in Africa which examined morbidity in a similar study population as investigated in this study.

Author reply: As suggested, we have included additional references and information from studies in Kenya and similar settings (please see also line 4 of page 4).
Appendix: Standard Operating Procedures: Laboratory Aspects of Postpartum Survey

<table>
<thead>
<tr>
<th>Bio. Source</th>
<th>Media</th>
<th>Lab test</th>
<th>Form title</th>
<th>Treatment</th>
<th>To contact patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood</td>
<td>7ml edta tube</td>
<td>Syphilis</td>
<td>Sero.</td>
<td>Benzathine Penicillin 2.4 MU IM stat</td>
<td>Contact patients the same day if positive</td>
</tr>
<tr>
<td></td>
<td>7ml edta tube</td>
<td>Hb</td>
<td>Malar. hb and urine</td>
<td>Give 3 months iron for all women with Hb between 7gm/dl and 11gm/dl. If severe anaemia (&lt;7gm/dl) but clinically well give 3 months iron and a letter for local health centre, or if unwell refer to casualty and give 3 months iron</td>
<td>Contact patients if Hb &lt;7gm/dl in 1 month</td>
</tr>
<tr>
<td></td>
<td>Finger prick slide</td>
<td>Malaria</td>
<td>Malar. hb and urine</td>
<td>Provide malaria treatment Co ART, should be available in pharmacy soon, otherwise we have to purchase it</td>
<td>Contact patients the same day if malaria smear positive</td>
</tr>
<tr>
<td>Urine</td>
<td>Beaker</td>
<td>Leukocytes</td>
<td>Malar. hb and urine</td>
<td>Increase fluids (2L per day EXTRA), offer repeat dipstix if asymptomatic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Beaker</td>
<td>Nitrites</td>
<td>Malar. hb and urine</td>
<td>Increase fluids (2L per day EXTRA), If symptomatic treat for UTI (nalidixic acid/ nitrofurantion)</td>
<td>Do not contact patients</td>
</tr>
<tr>
<td>Pap smear and exam</td>
<td>Slide</td>
<td>Cervical cytology and lesions noted</td>
<td>Cytolo report</td>
<td>Refer to colposcopy clinic, nurse to write letter to GOPD, ICRH to pay fees of 1500</td>
<td></td>
</tr>
<tr>
<td>Gynae: high vaginal swab and exam</td>
<td>Slide</td>
<td>Gram stain for PMNs, candida, trichom.</td>
<td>Micro.</td>
<td>Candida: clotrimazole 1 pessary intravaginally daily X 6 days,(nocte) Trichomoniasis:metronidazole 2g Vaginal discharge: clotrimazole 1 pessary intravaginally daily X 6 days AND metronidazole 2g stat (exclude pregnancy) Cervicitis on examination: Norfloxacin 800mg stat AND doxycycline 100mg BD X 7 days (exclude pregnancy) AND treat partner</td>
<td>Contact patients with trichomoniasis after one month</td>
</tr>
<tr>
<td>Wet prep and Vag. Ph</td>
<td>Swab tip</td>
<td>Bacteria vaginosis</td>
<td>Micro</td>
<td>Metronidazole 2g stat</td>
<td></td>
</tr>
</tbody>
</table>

**Referrals for patients**

<table>
<thead>
<tr>
<th>Medical condition</th>
<th>Diagnosis</th>
<th>Form title</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV positive</td>
<td>Two positive HIV tests with different test kits</td>
<td>Not needed</td>
<td>Handheld referral to CCC Not applicable</td>
</tr>
<tr>
<td>Sexual violence</td>
<td>During sexual violence questions</td>
<td>Small paper slips</td>
<td>Refer to Goshen counselling</td>
</tr>
<tr>
<td>Depression</td>
<td>During postpartum blues questions</td>
<td>Letter to Mental ward</td>
<td>Write a referral note requesting patient to come on next Monday or Thursday from morning hours to Dr Francesca Ongeche mental ward one floor above KB offices (Caroline, Jacinta to explain directions to Mental ward)</td>
</tr>
<tr>
<td>General medical problems, including unwell women</td>
<td>During physical exam or history taking</td>
<td>Letter</td>
<td>Casualty</td>
</tr>
</tbody>
</table>