Author's response to reviews

Title: Provider Type and magnitude of childbirth related complications among women at community level in Kenya: a case -control study

Authors:

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Shiphrah N. Kuria (shiphonk@yahoo.com)

Version: 2
Date: 16 June 2014

Author's response to reviews: see over
Date: 16th June 2014

Executive Director,
BioMed Central, Floor 6, 236 Gray's Inn Road,
London; WC1X 8HB, United Kingdom

Dear Sir/Madam

RE: Cover Letter for re-submission of the revised manuscript: Provider Type and magnitude of childbirth related complications among women in Kenya: a case –control study

Authors: Wilson N. Liambila*: wliambila@popcouncil.org; Shiphrah N. Kuria: shiphonk@yahoo.com

*Corresponding Author

We hereby re-submit our revised manuscript titled Provider Type and magnitude of childbirth related complications among women in Kenya: a case –control study to BMC Pregnancy and Childbirth.

The content and structure of the revised version is based on very useful comments that were forwarded to us by the Editorial Team at BioMed Central on 6th June 2014. All the comments have been incorporated in the revised manuscript.

We are indeed grateful that the revised manuscript has benefited immensely from the rich comments and inputs provided by the two reviewers.

Our feedback to comments appears below in two sections-A and B.

Kind regards

Wilson N. Liambila

Senior Programme Officer

Nairobi Office

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## Section A: Feedback to comments made by Reviewer No.1 – Desta Hailu

<table>
<thead>
<tr>
<th>Comment No.</th>
<th>Section and description of comments</th>
<th>Major compulsory revisions</th>
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</table>
| 1.          | Under the background section of the abstract, the gap why this research is required need to be briefly addressed. In addition, the recommendation given in the abstract should conform to the objective of this research (status of obstetric complications among cases and controls)  
**Response:** The text highlighted in green has been added to the background and conclusion sections to address the concerns raised by Reviewer No.1.  
**Background:**  
Kenya still experiences the twin problems of low skilled attendance during childbirth as well as a high maternal mortality ratio. Skilled birth attendance is critical in the provision childbirth related services. Yet, literature is scanty on the outcomes of childbirth related complications in situations where majority of women deliver under the care of non-skilled birth attendants such as traditional birth attendants, neighbours and relatives compared to those who deliver under the care of skilled birth attendants.  
The main aim of the study was to assess the nature of childbirth related complications between the skilled birth attendants and the non-skilled birth attendants. A secondary aim of the study was to assess the role of socio economic, demographic and health related factors in the occurrence and management of childbirth related complications among women in Western Kenya who had delivered in health facilities and at home.  
**Conclusion:**  
Skilled birth attendants in health facility deliveries were associated with higher odds of the occurrence of obstetric complications compared to deliveries that took place at home with the support of non-skilled birth attendants. Women cited many barriers that prevented them from seeking skilled care in health facilities. Those who sought care either presented late or did so on suspicion that they were at a higher risk of developing obstetric complications. The findings suggest need to address the barriers that prevent women from utilising skilled providers for delivery and in managing obstetric complications both in health facilities and in homes. |
| 2.          | Should be focused. Specially, avoid statements mentioned after the gap of this study.  
**Response:** Repetitions have been removed |
| 3.          | Methods:  
**Sample size determination:**  
Why sample size for analytical studies like case-control can be determined only based on the proportion of women in labour and during childbirth experience obstetric complications? Rather, the authors need to realize that, sample size for this study should be determined based on the distribution of factors affecting the outcome variable (Obstetric complication).  
**Response:** The sample size for this study was based on the proportion of women who experienced obstetric or pregnancy-related complications (the outcome or dependent variable). This is because for case-control studies, the issues of directionality (outcome to exposure) and timing (retrospective for exposure) are so important while considering sample sizes and even in sampling (where one has to always start with cases or an outcome then match this to controls). The first sentence under the subtitle: sample size for the case-control study-has been revised and now reads: “From previous studies reported by World Health Organization and the British Medical Bulletin [13], about 15% of women experience pregnancy and childbirth related complications.” See line numbering 132-133. |
Non response rate:
Why participants who were unable to meet inclusion criteria were considered as nonresponse. The authors should conduct their study only on those who fulfil inclusion criteria.

Response:
The revised sentence now reads: “The target sample took into account 15% non-response rate, which could be due to refusal or unavailability [14].” -See line numbering 137-138.

Informed consent.
Was it written? Specify. The Sampling procedure is not clear. How neighbouring controls were selected? Rather, population frame for both cases and controls should be developed and study participants should be selected using systematic or simple random sampling technique.

Response:
a) Yes-written informed consent was administered to study participants. The revised sentence now reads “Once an eligible woman was identified in the selected location, written informed consent to participate in the study was obtained and she was then recruited as a case.” -See line numbering 165-167.

b) The Sampling procedure is not clear. How neighbouring controls were selected? Rather, population frame for both cases and controls should be developed and study participants should be selected using systematic or simple random sampling technique.

Show clearly the way all how you could reach at your study participants.
Response: This concern has now been addressed: (see line numbering 158-165 in the manuscript)

"In each of the selected locations, the first house households were selected through a simple random process. Once a household had been selected, then the research assistants used a screening tool to identify an eligible woman who had experienced an obstetric complication in the past 12 months (a case). For each case identified and recruited, selection and recruitment of an appropriate control from the neighbourhood within the same location was conducted concurrently. The selected controls had similar demographic and socio-economic characteristics to the recruited cases. Thus, the procedure for identifying and recruiting cases and controls was repeated in each location until the required sample size was achieved”

4. Result:
Magnitude of respondents should be mentioned in the text section

Response: The word magnitude has now been added to the following text:

Figure 2 presents a summary of the occurrence and magnitude of obstetric complications and the type of attendant at birth (line numbering 301) page 12.
<table>
<thead>
<tr>
<th>How did you assess Quality of antenatal care? Did you address the input, process and output aspects of quality?</th>
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<tbody>
<tr>
<td><strong>Response</strong></td>
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<tr>
<td>This has now been addressed: (see line numbering 277-282 in the manuscript).</td>
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<tr>
<td>&quot;Quality of antenatal care was assessed on the basis of the standard practices and expected content of the planned visits. Examples of services assessed were: discussions about birth planning during the ANC visits, administration of iron pills/folate, use of anti-malarial pills, HIV testing and counselling, expected date of delivery (EDD) and tetanus toxoid inoculation among others. We also assessed whether during the antenatal visits, the provider checked the clients’ blood pressure, performed abdominal examination, blood levels (anaemia) and listened to the baby's heartbeat.&quot;</td>
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<tr>
<th>Tables’ and figures’ title should be written in full</th>
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<tr>
<td><strong>Response:</strong> This concern has now been addressed</td>
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</table>

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<th>5. <strong>Discussion</strong></th>
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<td>Do not waste your time justifying your own results. Compare and contrast with the finding of other and give justifications mainly for inconsistent results.</td>
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</table>

**Response:** This concern has now been addressed (additional citations introduced)

The authors mentioned that participants who gave birth under the supervision of skilled provider are more likely to develop obstetric complication than their counterparts. However, they also recommended that mothers should attend institutional delivery. This seems paradoxical idea.

**Response:** This concern has now been addressed (see line numbering 53-55 in the manuscript): "The findings suggest the need to address the barriers that prevent women from utilising skilled providers for delivery and in managing obstetric complications both in health facilities and in homes."
## Section B: Feedback to comments made by Reviewer Number 2 – Elizabeth Echoka

<table>
<thead>
<tr>
<th>Comment No.</th>
<th>Section and description of comments</th>
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<tr>
<td><strong>6.</strong></td>
<td><strong>Major compulsory revisions</strong></td>
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<tr>
<td>Use of the term postpartum women in the title is quite misleading. Postpartum is the period beginning immediately after birth and extending to about six weeks. If this term has to be used in the title, there is already a conflict between the title and inclusion criteria, for which is a woman who delivered within the last 12 months. Thus, there to revise the title (remove the word postpartum)</td>
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<td><strong>Response:</strong></td>
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<td>The word postpartum has been deleted from the title. The new title now reads as follows:</td>
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<td>‘Provider Type and magnitude of childbirth related complications among women at community level in Kenya: a case-control study’ (see line numbering 1 and 2)</td>
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<td><strong>7.</strong></td>
<td>Need for a clear description of provider type right from the beginning to guide the reader that the type is in regard to provision of skilled birth services at facility and outside the facility.</td>
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<tr>
<td><strong>Response:</strong></td>
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<tr>
<td>A much clearer definition of the type of health worker or attendant at childbirth now provided (see line numbering 11-14)</td>
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<tr>
<td><strong>8.</strong></td>
<td>Adopt the term “skilled birth attendance” (SBA) and use the abbreviation where appropriate throughout the manuscript for consistence when referring to the type of provider (i.e. SBA and non SBA)</td>
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<tr>
<td><strong>Response:</strong></td>
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<tr>
<td>The term “skilled birth attendance” (SBA) is now adopted and the abbreviation is used throughout the manuscript when referring to the process of using qualified health professionals to conduct say a delivery. Those providers who are not skilled are referred to in the manuscript as non-skilled birth attendants (non-SBAs). However, where appropriate the term “skilled birth attendants (SBAs) has been used in situations where the focus is on the professional staff rather than the process of using the staff.</td>
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<td><strong>9.</strong></td>
<td>In the last paragraph of the abstract describing the purpose of the study, the sentence is too long making it unclear. Consider revising to address the following:</td>
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<tr>
<td>Is the study assessing nature of complication between the SBA and the non SBA OR the role of socio economic, demographic factors and health related factors and occurrence of complication. If both are applicable, clearly separate the two aims of the study</td>
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<td><strong>Response:</strong></td>
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<tr>
<td>The revised text now reads:</td>
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<tr>
<td>The main aim of the study was to assess the nature of childbirth related complications between the skilled birth attendants and the non-skilled birth attendants. A secondary aim of the study was to assess the role of socio economic, demographic and health related factors in the occurrence and management of childbirth related complications among women in Western Kenya who had delivered in health facilities and at home. (see line numbering 16 to 20).</td>
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<td><strong>10.</strong></td>
<td>In methods section under study design, area and target population, remove information on study population since this adequately addressed under the target population subsection.</td>
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<td>Specific Change</td>
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<td>11.</td>
<td>In first paragraph under study area, refer to Comprehensive Emergency Obstetric care (CEmOC) and not comprehensive essential obstetric care (CEOC) to conform to the revised 2009 WHO guidelines on EmOC.</td>
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<td></td>
<td><strong>Response:</strong> Correction done. The term ‘Comprehensive Emergency Obstetric care (CEmOC)’ now inserted (see line numbers 96 and 100) and deleted the term comprehensive essential obstetric care (CEOC) to conform to the revised 2009 WHO guidelines on EmOC.</td>
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<tr>
<td>12.</td>
<td>In the study area, refer to the other two facilities in terms of basic EmOC or non EmOC for consistency in describing the facility level to manage complications.</td>
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<td><strong>Response:</strong> I have also replaced the term basic essential obstetric care (BEOC) with Basic Emergency Obstetric Care (BEmOC) –see line numbers 104 and 105 of the manuscript.</td>
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<tr>
<td>13.</td>
<td>Adopt either America or United Kingdom English for consistency in language throughout the manuscript</td>
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<td><strong>Response:</strong> I have chosen to adopt United Kingdom English throughout the manuscript.</td>
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<td>14.</td>
<td>In paragraph one of the target population, separate the direct causes of maternal morbidity and direct cause of maternal mortality. The morbidity issues are usually symptoms that eventually result to a complication and maybe death.</td>
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<td></td>
<td><strong>Response:</strong> This has now been addressed (see page 5- line numbering 129-130). Besides the causes of maternal mortality referred to above, women also experience severe maternal morbidities that may sometimes complicate into severe disability or death. Examples of maternal morbidity are: anaemia, maternal depression, infertility, obstetric fistula, uterine rupture and scarring and genital and uterine prolapse.</td>
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<tr>
<td>15.</td>
<td>Under Selection and matching of cases and controls, it is inappropriate to imply since the cases and controls were drawn from the same location, they had similar socio-economic profile. Clarify on this.</td>
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<td></td>
<td><strong>Response:</strong> This issue has now been addressed (see page 6- line numbering 152-154). Under Selection and matching of cases and controls, the revised text now reads: “Controls were individually matched to the cases on the basis of age and if both shared comparable socio-economic status such as type of housing, level of education and the main occupation”.</td>
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<tr>
<td>16.</td>
<td>In sampling procedures and data collection, the reference on “quality of care received during antenatal care, prevalence of disrespect and abuse of women seeking various reproductive health services”</td>
</tr>
</tbody>
</table>
(a) First data on quality of care received can only be collected qualitatively, because this is a perception by the women. You cannot measure quality of care quantitatively, but only qualitatively. Which brings a conflict, because the study was purely qualitative, using a structure interview guide? Kindly clarify.

Response:

The concern regarding the measurement of quality of care has now been addressed. See page 7 (line numbering 167-171 of the manuscript) under sampling procedures and data collection. The text has been corrected to reflect how clients responded to the questions.

May I also clarify that some of the questions on the structured guidelines had been extracted from the national protocols, standards and guidelines that seek to promote the concept of quality of care. For example, the WHO/National guidelines on focused antenatal care (FANC) anticipate:

- That pregnant women will seek ANC at least 4 times (during which they receive focused care depending on the nature of the visit and gestation age of the index pregnancy)
- That pregnant women will discuss their birth plan during the ANC visits
- That pregnant women will receive iron pills/folate
- That pregnant women will receive anti-malarial pills
- That pregnant women will receive an HIV test so that the mother knows her HIV status
- That pregnant women will be informed about their expected date of delivery (EDD)
- That pregnant women will involve other persons such as their partners while preparing for their birth plans
- That pregnant women will receive tetanus toxoid
- That during the antenatal visits, the provider will also:
  - Check clients’ blood pressure
  - Perform abdominal examination
  - Discuss Blood levels (anaemia)
  - Listen to the baby's heartbeat
  - During ANC, did the provider ask if you had received?

After asking the client the above questions the response is scored as: YES (if received services or underwent a certain expected procedure) or NO (if did not receive services or did not undergo a certain expected procedure). In this example—although YES and NO are categorical variables, they are nevertheless useful pointers to a particular direction and could therefore act as a proxy indicator for good quality of care (for those clients who received expected services or care) and poor quality of care (for those clients who did not receive expected services or care).

In the middle of the band, we expect some clients also to receive partial care e.g. they only received probably 3-5 services out of the expected 10 categories of services.

(b) Second, you cannot measure prevalence of disrespect, but proportion of women who reported disrespect and abuse.

Response:

The point regarding disrespect and abuse is now addressed. See page 7 (line numbering 171-175 of the manuscript) under sampling procedures and data collection. The text has been corrected to reflect how clients responded to the questions. The revised text now reads:

“Information was also obtained on the perception of women regarding the occurrence of disrespect and abuse of women while seeking various reproductive health services both at home and in health facilities as well as on details surrounding childbirth in terms of the type of attendants who conducted
the deliveries and the place of delivery”. Sub-title on page 10 (under results line numbering 243) and title of Table 6 (see page 30 line numbering 590) has been changed to reflect the corrections made.

17. In reference to the second subtitle in results on “Attendants at childbirth and place of delivery for cases and controls” an assumption is made that the fact that a woman delivered in a health facility means that it was by a skilled attendant. Was this fact investigated, and what informs this assumption if not? Secondly, it is plausible that the controls had fewer complications. Because there was no complication needing hospital attention. In setting where there is low hospital delivery, most women will seek care at the hospital when they experience a danger sign (refer to Echoka et al, 2014 on barriers to EmOC: accounts of survivors of life threatening complications). Thus, there is need to clearly bring this out and discuss the finding that most women who had complications were the one who were delivered by a SBA. This is expected, because the ones, who did not experience a complication, had no need to seek SBA.

Response:

The point observed by the reviewer No.2 around an assumption we had made to the effect that a woman who delivers in a health facility is usually attended to by a skilled provider is an important one. In the current study we have adopted the observation made by reviewer 2 as a limitation of the study – since we didn’t observe the attendants conducting deliveries (see line numbering 447-453 page 18). However, there is need to point out that a review of recent data from the Demographic Health Surveys in Sub-Saharan Africa shows that the proportion of deliveries that occur in health facilities which are not assisted by skilled birth attendants are very few. The implication being that even though we have noted this point as a study limitation (see line numbering, it doesn’t affect in any way the overall findings or conclusions of the study.

The second point made by the reviewer No.2 about women seeking care in health facilities only when they experience danger signs in settings where there is low hospital delivery is valid. We have revisited this observation in the discussion section (see line numbering 382-388).

18. In results, there is need for a profile of facilities visited by the women, in terms of perhaps ability to provide EmOC.

Response:

In the household tool- we sought information on whether the woman delivered at home or in a health facility. We did not explore further the profile of the facilities visited by the women and particularly if they had the capacity to provide emergency obstetric care. Being a case –control study we had restricted the exposure factor to a health facility and not to the sub-sets or typologies of health facilities.

19. In subsection on Management and referral of obstetric complications, hemorrhage was the major complication reported. It would be interesting to clarify on how hemorrhage, which is a major obstetric complication and a leading cause of maternal mortality in Kenya, was successfully managed at home.

Response:

The findings section has been beefed up to address this issue. The new text that has been added (see line numbering 230-237) now reads as follows:

“With regard to the management of cases at home or in health facilities, the approach followed was similar. Either the provider or care-giver discussed the problem with the client or relatives and reassured them or gave drugs to stabilise the patient. Other approaches included counselling the patient
or calling for help (i.e. other persons, neighbours, providers, vehicle, ambulance; etc.). With regard to the administration of drugs or performing certain technical procedures such as manual removal of the placenta or retained membranes at home (in case of postpartum haemorrhage), these activities were mainly performed by community midwives.”

NB: We have been very careful not to dwell on haemorrhage alone BUT rather use the query raised to explain how various complications (including haemorrhage) were managed.

20. Concern1: In subsection on Main Reasons for home deliveries, the last paragraph referring to “women cited poor quality of care”, need for a description of what women perceived as poor quality of care.

Response:

What women perceived as poor quality of care is described in line numbering 261-269 on page 11. The revised text reads follows:

Poor quality of care in health facilities encompasses issues such as limited flexibility in choosing freely the best position to deliver (some health providers insist that a woman in labour should lie or deliver a baby while in a particular position), mothers being left to be taken care of by trainee nurses or students and lack of follow up by health facility staff unlike the TBAs who are often available to their clients. Other factors that were cited as contributing to poor quality of care include the fact that women in labour are expected to buy supplies e.g. cotton wool, gloves e.t.c. and aren’t free to choose trusted persons to assist them during childbirth (one is assisted by any staff on duty). In addition, women mentioned that after delivery in the health facilities (particularly the public sector), one isn’t provided with critical supplies and services such food, warm beverages, and bathing water.

Concern2: In addition, quality of care during ANC cannot be assessed based on number of visits as stated. Perhaps what was done, based on the standard practices during ANC may provide some insights on quality of care (e.g. was nutritional counseling done HIV counseling and testing, etc)

Response:

In addition, revised text that reflects how quality of care during ANC was assessed has been inserted in the findings section: (see line numbering 277-284). It is reproduced below:

“Quality of antenatal care was assessed on the basis of the standard practices and expected content of the planned visits. Examples of services assessed were: discussions about birth planning during the ANC visits, administration of iron pills/folate, use of anti-malarial pills, HIV testing and counselling, expected date of delivery (EDD) and tetanus toxoid inoculation among others. We also assessed whether during the antenatal visits, the provider checked the clients’ blood pressure, performed abdominal examination, blood level and listened to the baby’s heartbeat. A review of some of the findings indicates that the proportion of women who developed birth plans was as low as 49.8% for the cases and 48.8% for the controls (Table 8).

21. The subsection on “Occurrence of obstetric complications and demographic and socio-economic factors” in results should appear much earlier in the results section for good flow.

Response:

Agreed. The subsection on “Occurrence of obstetric complications and demographic and socio-economic factors” in the results section has been shifted to page 8 (line numbering 202-205)

22. In discussion, on leading causes of obstetric complications and referral practices, anemia during pregnancy is not a leading complication. Unless referring to loss (ante or postpartum haemorrhage),
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<td>which is very different from anemia. Revise</td>
<td>Response: This comment has now been addressed and revisions made (see line numbering 311-313).</td>
</tr>
<tr>
<td>23. In the last part of the second paragraph in discussion referring to “Women whose complications were managed mentioned that they received drugs and counseling services…………Investments into such locally available opportunities could help address some of the referral related challenges such as long distances travelled to health facilities and other factors that contribute to delays in decision making to seek care at the community level”, if the study did not investigate the community providers capacity to manage complications, the assumptions in the statement should not be made.</td>
<td>Response: This comment has now been addressed and revisions made (see line numbering 317-326).</td>
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<td>Avoid restating the findings in the discussion.</td>
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<td><strong>Minor Essential Revisions</strong></td>
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<tr>
<td>1. Remove the words “the” from the title but can be used only after reference to the terms has been made.</td>
<td>Response: (see line numbering 1 and 2). The word “the” has now been removed from the title The revised title now reads: “Provider Type and magnitude of childbirth related complications among women at community level in Kenya: a case –control study”</td>
</tr>
<tr>
<td>2. The background in the abstract requires beefing up to reflect the issues under investigation.</td>
<td>Response: This has been addressed. The phrase “Kenya still experiences the twin problems of low skilled attendance during childbirth as well as a high maternal mortality ratio” has now been added and precedes the original sentences (see line numbering 11 and 12).</td>
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</table>
| 3. The abstract require beefing up to include the data collection approaches | Response: This has been addressed. The new text for the methods section of the abstract (line numbering 22-36) now reads: A case-control study was conducted among women aged 15-49 years at the community level in 2013 through individual matching of controls to cases on the basis of age and comparable socio-economic status such as type of housing, level of education and the main occupation. Data were collected at the
household level through structured interviews. A total of 294 women who had experienced various obstetric complications and 291 who did not have any complication at childbirth were selected as cases and controls respectively. Cases were obtained first before the controls through a cross-section survey that involved random stratification of administrative divisions and their respective locations. Information was collected on various demographic and socio-economic characteristics such as age and women’s perception about the quality of care received from their attendants. All independent variables were analysed initially in bivariate models and those that were significantly associated with obstetric complications (dependent variable) were included in multiple logistic regression model in order to control for confounding factors and to measure the independent effects of each exposure variable on occurrence of complications. Odds ratios (ORs), with 95% confidence intervals, were computed to show the association between the occurrence, magnitude and the extent to which childbirth related complications were managed by skilled and non-skilled attendants.

4. In background section of the abstract consider revising the sentence “Skilled attendants are critical in the provision of delivery services” to “skilled birth attendance (SBA) is critical in provision childbirth related services”

Response:
Done: The revised sentence now reads: “Skilled birth attendance is critical in the provision childbirth related services” (see line numbering 12 page 1).

5. In the last paragraph of the background remove the word “serious” complications and replace with “major” complications

Response:
Done: The word “serious” now removed.

6. The first subtitle on results, refer to “of women” or “Participants” and not of cases and controls

Response:
The word: ‘women’ has now been deleted from the subtitle. The revised title (see line numbering 191 page 8) now reads: Demographic and socio-economic characteristics of Participants.

7. Last sentence in results, on social economic and demographic characteristic of women, change “social-economic” to socio-economic

Response:
The last sentence in the results section on social economic and demographic characteristic of women the word “social-economic” now changed to: socio-economic (see line numbering 199-200; page 8).

8. The second subtitle in results “Attendants at childbirth and place of delivery for cases and controls” requires revision for clarity and consistency.

Response:
The initial subtitle in results “Attendants at childbirth and place of delivery for cases and controls” has now been revised for clarity and consistency. The new sub-title now reads: Skilled and non-skilled birth attendants and place of delivery (see line numbering 206 page 8; Table 4 on page 28 line numbering 584 has also been revised for clarity and consistency).