Author's response to reviews

Title: Differences in risky sexual behaviors and HIV prevalence of circumcised and uncircumcised men in Uganda: Evidence from a 2011 cross-sectional national survey

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Author's response to reviews: see over
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The Editor in Chief,
BMC Reproductive Health

Dear Sir/Madam

Re: Response to Reviewer concerns and submission of revised manuscript

We are very pleased for accepting to have our manuscript peer reviewed by your journal, BMC Reproductive Health. This cover letter provides a point by point response to the concerns and comments raised by the reviewer. We have made changes as requested by the reviewer and explained some of the issues that seemed unclear in the original submission.

Below are the responses.

Reviewer's report and response to the comments:

1. It would be very helpful if the question posed by the title of this paper were answered by this paper; however, the data that were analyzed cannot address this question, and the title is misleading. The data come from the 2011 Uganda AIDS Indicator Survey (UAIS). While Uganda did start talking about SMC as soon as 2007 when the RCT in Rakai was completed and published, the SMC policy was not introduced until 2010, and very few circumcisions occurred under the SMC program. In other words, the results captured by the 2011 UAIS will not include any, or will include a trivial proportion, of circumcisions done under the surgical SMC program. Virtually all the circumcised men appearing in this dataset will have been circumcised traditionally or for religious reasons or for some medical condition (e.g., phimosis or repeated balanitis). Therefore, these data cannot address risk compensation (or sexual disinhibition) under the SMC program and they cannot say whether circumcision "is increasing risky sexual behavior." They can only tell us whether in 2011 circumcised men engaged indifference sexual behaviors from uncircumcised men. A more appropriate title would be something like: "Differences in risky sexual behaviors and HIV prevalence of circumcised and uncircumcised men in Uganda: Evidence from a 2011 cross-sectional national survey."

Response: Thank you very much for this suggestion of an improved title. We have changed the title to: "Differences in risky sexual behaviors and HIV prevalence of circumcised and uncircumcised men in Uganda: Evidence from a 2011 cross-sectional national survey."

Background:
2. Page 4: Delete the word "intact" throughout. This is a loaded term, used by anti-circumcision advocates. The word "foreskin" is sufficient. Of course the foreskin is "intact." Otherwise, the man would be circumcised.
3. References should be provided at the end of the sentence that ends, "...Chlamydia in female partners."

**Response:** We have provided the references and edited the text to read at the end as follows: “showed that male circumcision has a protective effect against HIV as well as reducing incidences of other sexually transmitted infections (STIs) like female genital ulcerations, bacterial vaginosis, trichomoniasis, human papilloma virus and Chlamydia in female partners[6]. Studies have also reported reduced risk of some STIs like Syphilis, chancroid and HSV-2 among circumcised men[3, 7, 8].”

4. In the next sentence, "by more than 60%" is incorrect. By "approximately 60%" would be more accurate. Only one of the trials had an over 60% protective effect.

**Response:** We have corrected this as required.

5. Page 5-6: "The possible reasons for the increased HIV prevalence in the population are twofold..." Surely there are myriad possible reasons. Rephrase to say, “Two of the possible reasons...” The increase in the numbers on ART is clearly one possible reason. Increase in sexual risk behaviors is another possibility. However, using the term "complacency" is a loaded term and should be avoided, as should in this context the term, "disinhibition." If indeed risky behavior has increased, there may be many reasons in addition to complacency or disinhibition. Similarly, the UAIS is referenced to support these claims and yet the UAIS explicitly states that it does not address these issues.

**Response:** We have edited and removed the term disinhibition. We have also rephrased the wording. The statement now reads: “Two of the possible reasons for the increase in HIV prevalence in the population are: first, as a result of the increase in clients on antiretroviral treatment leading to higher life expectancy among those infected[12] and the second reason could be attributed to increased risky sexual behaviors such as concurrent multiple partnerships, non-consistent condom use with non-marital and non-cohabiting partners, use of alcohol just before sex and transactional sex.”

6. Page 6: The entire second paragraph on this page is loaded with terms that indicate carelessness or lack of objectivity on the part of the authors.

**Response:** This has been edited to reflect objectivity. The paragraph now reads in part: “Because SMC is promoted as one of the prevention methods for HIV, there is a possibility of some people perceiving it as much highly protective [14] against HIV infection. In this context, it is possible that negative sexual behavior changes [15-17] may result among circumcised men [18, 19].”

7. "The sexual disinhibition which undermines..." Change to "could undermine."

**Response:** This has been changed.

8. "In the context where circumcision is viewed as a "natural condom..." This is not a pervasive view and is hyperbolic. Express this more objectively. For example, "Because SMC is promoted as a method for prevention of HIV, there is the possibility..."
Response: Corrected as indicated in response to comment 6 above.

9. "driving them..." is too strong.

Response: removed this word.

10. "In low income countries..." It has little to do with "low income," it is about religion and culture. The same is true in the U.S. and Korea, which are not "low income countries."

Response: We have noted this and corrected the statement.

11. Page 7: Again, the authors need to be much more careful with their wording.

Response: The wording has been edited here to more objective language. The phrase “Such changes in sexual behavior are postulated in the behavioral risk compensation theory as observed in other studies [21, 22].” Has been deleted

12. "Circumcised men tend to engage in risky sexual behaviors..." Is that true universally? Provide references. Otherwise, change the language. Indeed, it is the purpose of the paper to see if circumcised men do indeed engage in more risky behaviors.

Response: We have noted this and removed the statement as indicated in response to comment 11 above

13. "The general belief that circumcision is 'an HIV vaccine.' This is hardly a "general belief." It has been pushed by a handful of researchers, but it is not generally accepted. Be careful.

Response: This has been taken care of and removed.

14. "Establishes..." I think you mean "assess" or "evaluates" or "investigates."

Response: Yes, we meant investigate and the correction has been done.

15. Change, "male circumcision status" to "self-reported male circumcision status."

Response: Changed appropriately

16. The analysis is restricted to those who had ever been sexually active. Please justify this. If circumcised men or uncircumcised men had a later sexual debut than those of the other status, this would affect the results. Part of sexual disinhibition could be earlier age at sexual debut. You could include all men, irrespective of prior sex, or do a separate analysis to see if the proportions of never having had sex men differed by circumcision status.

Response: Including every man regardless of ever having had sex would actually bias the results because all the risky sexual behaviors in this paper are focusing on only those men who had had sex. The RSBs cannot be applicable to those men who have never had sex. This was the inclusion criteria as indicated in the methods section. The "ABC" strategy has been the primary focus of HIV prevention in this setting. The median age at sexual debut which is 17 years has not changed significantly suggesting that the current HIV-prevention interventions have limited effect on this "A". We therefore analysed only respondents who have ever sexually been exposed to the risk of HIV-infection, in order to determine how the circumcision intervention may be associated with their sexual behaviors.
including the use/non-use of the already known strategies. There is no evidence that primary abstinence or delayed sexual debut have been affected by the circumcision intervention.

17. Please clarify how you handled non-marital sexual relations. Does this include all men who are not married? It looks as if (although it's difficult to tell - see below) circumcised men are less likely to be married. This would mean that all their sexual relations would fall under "non-marital sexual relations. Please clarify, and consider restricting this variable to only men who were married, if you haven't done so. This will also influence the variable "non-condom use last non-marital partner in last 12 months." If unmarried men are included here, then there could be a bias depending on possible differences in marriage status of circumcised vs uncircumcised men.

Response: Yes, Non marital relations in this paper included all men married or not who were sexually active in the 12 months preceding the survey. This has also been used in other studies e.g (Kong, X., et al., Assessment of changes in risk behaviors during 3 years of posttrial follow-up of male circumcision trial participants uncircumcised at trial closure in Rakai, Uganda. Am J Epidemiol, 2012. 176(10): p. 875-85.) Further, although the proportion reporting non marital sex in the last 12 months as a result of not being married is likely to be higher, we adjusted for marital status which takes care of any imbalances in the two groups.

The variable on condom use at last such sex is dependent as well on this and includes only men who say have had such sex. By removing non married men from this non marital relations variable, we lose those who did not use condoms with their casual partners in the next variable on condom use; a high risky sexual behavior.

18. You say that you included "ethnicity" in the multivariable analyses, yet there are 12 different ethnicities. Were all 12 included? Seems unlikely. Please specify how this variable was coded, since it is crucial there being only two or three ethnic groups that practice traditional MC.

Response: We included all the 12 grouped ethnicities in the multivariable analyses. This has been indicated in the methods section and the revised tables (3 and 4) now show how the variables were categorized.

Results
19. The presentation of the results should be revised because it is not possible to know how many men are circumcised and not circumcised by each variable. Provide a table that includes the following columns: variable with categories within each (as it now exists), number and percent circumcised, number and percent uncircumcised, total (circumcised plus uncircumcised) and percent, chi-square and p-value for difference in distribution of circumcised vs uncircumcised. This will allow the reader to see the differences in distributions of circumcised and uncircumcised men by variable. Further, the proportions provided should be the proportion within each variable category are circumcised and the proportion uncircumcised. So those two should add up to 100%, rather than show what proportion of circumcised men are within one category or another with the columns adding up to 100%. This way the reader can see the proportions in each category who are circumcised vs not circumcised. You can combine the results presented in Table 2 with this new Table 1, and you should include HIV status in this table as well.

Response: The aim of this study was to determine the difference in RSBs and HIV comparing the circumcised and uncircumcised men as the new title suggested and adopted also indicates. This suggested table would instead imply determining circumcision status by the varying characteristics. The outcome variable in this case would be circumcision status yet the
outcomes for this study are RSBs and HIV. This proposed table thus would not represent what
the study is about. Secondly, the group that has the highest N (uncircumcised) will certainly
have the biggest proportion for each variable except where the outcome is predominant like
among certain tribes or among Muslims.
To make the table clearer, we have included another column for the uncircumcised so that the
reader does not have to recalculate those proportions based on only one column as earlier
provided. We have also provided a column with p values for each value to establish differences
among values across groups of circumcised and uncircumcised men.

20. The "majority were aged 25-34 years (31%)." 31% is not a majority. You can say the
highest proportion circumcision was in that age group.

Response: This has been corrected. The write up has been changed.

21. "29% of the circumcised men were Bagisu, Sabiny or Bakonjo..." Please indicate
the proportion within each of these who were circumcised. Similarly, what % of Muslims were
NOT circumcised?

Response: These groups are now separated. We now have 2 categories of the circumcising
tribes; the “Bagisu/Sabiny” as one category because it is already collapsed in the AIS survey
data and the “Bakonjo” as another.

22. "Risky sexual behavior was made of four categories..." Please explain (in the methods) why
you chose 4 or more partners as the cutoff for risky or not risky. Was it because of the
distribution of the variable or some biological rationale, or because it has been used by others?
There is no obvious reason. Also, as indicated above, please explain who is included in the
variable "non-marital sex" and in non-use of condoms last non-marital partner." Do these
include or exclude single men? It looks in Table 1 that circumcised men are less likely to be
married, which would affect the results.

Response: The explanation has been included in the methods section on page 9. This is based
on the distribution of the variable with 4 as the median number of reported lifetime partners.
The explanation for “non-marital sex” variable has been included as indicated in response to
comment 17 above.

23. Page 11: The modeling has to be better explained, either here or in the methods section. I
assume the "unadjusted" model is just that, a bivariate analysis of each risk factor by
circumcision status. Is that correct? For the adjusted model, please specify exactly what
variables were included in the original model and how each variable was coded. If all the
variable that are mentioned were included, there would likely have been collinearity (e.g.,
residence and ethnicity and region; age and wealth and marital status) or effect modification.
Was this examined? How was it handled? Then indicate in the footnote at the bottom of the
table exactly which variables are included in the final model. It would be conventional and
helpful to provide a table of the ORs and 95% CIs for every variable remaining in the model, not
just the four risk behaviors. It is frankly suspicious that there is no difference between
the unadjusted and adjusted results for number of lifetime partners. One would expect this to be
associated with age and that the OR would change after controlling for confounders.

24. The same comments regarding the models in Table 4 as above.
Response: Thank you so much for this adjustment. In the models in table 3 and 4, the background characteristics included in the models have now been indicated in the tables. We had not included this because of the length of the table (running over 3 pages).

The explanation has been included on page 10 indicating that all the background variables were as categorization in table 1. We have also made adjustments and dropped region because of collinearity with ethnicity which we have retained. We run a VIF and tolerance and have only included those factors that passed the test. Yes, it is true that the likelihood of having more sexual partners increases with age but this is controlled for. The pattern is now indicated in the new table. The AORs after considering background characteristics only indicate a negligible change in the level of significance although slightly different now after dropping region. The RSBs significant before adjusting remained so even after adjustment.

For models in Table 4, we indicate in the footnote that non marital sex and condom use at last non marital sex were omitted from the HIV and circumcision model because of collinearity.

Discussion
25. Page 14. "...outside Uganda (18, 20). These references are not correct. Ref 18 has no evidence and ref 20 was a study inside Uganda.

Response: This has been corrected. Reference 18 has been removed and other studies from Zimbabwe and Uganda included in lieu of this.

26. "This is often in cases where men view circumcision as an HIV vaccine..."This is completely unfounded. If circumcised men do engage in riskier behaviors (and this is not found in most studies), it is a leap of faith to say that it is because they believe MC is like a vaccine, especially in 2010 when SMC had not been widely promoted for HIV prevention in Uganda. Please be more cautious in your statements and assumptions.

Response: The statement has been edited as well and the phrase above removed.

27. "...for the worse..." is judgemental.

Response: deleted

28. "In the study by Reiss..." Yes, some men (one I think) stopped using condoms temporarily, and others increased the number of partners, but overall the paper supported the notion that there was NOT sexual disinhibition.

Response: This has been noted and the notion taken into account.

29. The Orange Farm trial did not show "risk compensation at play." Circumcised men reported more sexual encounters (not sexual partners), but adjusting for behavior, the HR for circumcision did not change, indicating no RC.

Response: The statement has been edited to reflect “sexual contacts” as the paper in the reference itself states. We had interpreted contacts to mean partners.

30. "We believe that risk compensation in our study is the most plausible explanation..." If risk compensation is changing one's risk behaviors to compensate for a perceived reduction in risk, how is it that men who have been circumcised much of their lives (81% of men in the UAIS sample were circumcised before age 19), suddenly in one year decide that they are more protected. You cannot conclude that there is risk compensation unless you compare, say,
the 2004 results to the 2011 results, or you compare the 2011 results to the next UAIS. All you can say, assuming that it holds true after redoing the analyses, is that circumcised men have riskier behaviors. You do not have evidence that it is due to risk compensation.

**Response:** This statement has been changed to read as follows: “Even though there is no empirical evidence in this study to ascertain that risky sexual behaviors observed among the circumcised men are a result of risk compensation, it may be one of the possible explanations. Another possibility could be that men with risky sexual behaviors decide to undergo circumcision to reduce their chances of HIV infection.”

31. Page 16: Other limitations should include: the analysis was restricted to only those who were ever sexually active, that circumcision status was reported by the participants, not verified, and that sexual behaviors were by self-report.

**Response:** These limitations have been included.

Conclusion

32. Delete "uptake." You cannot say "risk of HIV prevalence. This is a cross-sectional study. Just state that HIV prevalence was lower in circled men.

**Response:** Deleted

33. "There is a need to 'repackage the safe male circumcision messages'." The SMC messages already do caution men from engaging in risky behaviors after circumcision. This is gratuitous and not based on evidence.

**Response:** The statement has been edited to read: “Safe male circumcision messages need to continue to emphasize the risk of HIV infection even after circumcision. Intensified individual tailored counseling pre and post SMC procedures may play a role in reducing these behaviors.”

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

**Response:** We have edited and proof-read the paper to address the language corrections to our best ability.

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

We are grateful for the review and look forward to disseminating our work through this journal.

Sincerely,

Simon P.S. Kibira

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