Reviewer’s report

Title: Determinants of maternal health services utilization in Uganda

Version: 2 Date: 8 October 2014

Reviewer: Natalie McGlynn

Reviewers report:

Dear authors,

Overall, this is a very good research paper on an important topic. However, in addition to some minor technical errors, there are a few areas that need some work. First of all, I recommend that the introduction be shortened substantially to better steer the reader towards the piece of research at hand. Also, the outcome variable needs to be better explained and perhaps revised. Lastly, the way in which Andersen’s Behavioural Model was used to guide the selection of potential predictors should be expanded upon. I believe that upon revision of these points, this will be a very successful paper.

Major Compulsory Revisions

1) The Introduction is far too long. Although the extent of background information and context provided is commendable, the overall purpose of this research paper gets lost in the overabundance of information. I recommend simplifying the introduction and cutting it down by two-thirds or more. This can be done by eliminating unnecessary background information that is not directly linked to the objective of the paper itself, writing more concisely by reducing detailed accounts of previous research, and bringing related points together. For instance, the authors refer to the ‘Ugandan Context’ at a later point in the introduction, but there are many Ugandan studies and contextual factors related to Uganda that are recounted before this.

2) Outcome variable. The description of the outcome variable needs to be clearer. From what I can tell, women in the best MHC group had at least 4 ANC visits + skilled personnel during ANC + post-natal care (all 3). However, the poor MHC and moderate MHC groups are very confusing. Does moderate MHC = 1-3 ANC visits + one of either delivery or postnatal care? What does ‘delivery’ mean? Delivered with a skilled attendant, or at a health facility?

And for poor MHC, is this a group of women who received no ANC (but may have delivered with a skilled attendant or had a post-natal checkup?). Altogether, this is very confusing, and it seems like there could be groups of women who could not be assigned a category. For instance, what about the women who had 4 ANC visits, but no postnatal care? Perhaps adding a table to describe how this variable was formed would be useful.

Minor Essential Revisions

1) Methods section of the abstract – Did you use the 2006 and 2011 DHS?
Methods section of the paper says 2006 DHS was used as well.

2) Methods section of the abstract, please describe the exact outcome variable that was used (What is the ideal maternal health care package?)

3) Abstract – State that Andersen’s Behavioural Model was used to incorporate appropriate predictor variables into the model.

4) Abstract, Results section – Are these findings from adjusted analyses? If so, please indicate.

5) Abstract, Results section – Please state the reference groups for the regional and SES findings. For the other significant factors, specify the direction of the finding (i.e. other significant factors were younger age, fewer children, Muslim religion).

6) Abstract, Results section – Write out the meaning of RRR the first time it is used.

7) Page 3 Lines 5-11. These last two sentences are awkward and lengthy. Please make them clearer i.e. “In an ecological multi-group study of many Sub-Saharan countries, maternal mortality ratio was significantly correlated with the inverse of ….”

-I won’t go into such detailed accounts of the Introduction, as I am anticipating a major revision. But here are some overall points to consider:

8) Page 3 line 19 – change ‘majorly’ to ‘most’

9) Remember to clarify the meaning of each acronym the first time it is used. For example ANC = Antenatal Care on page 4 – line 6; and Page 3. Line 13 – define MCH here, after its first usage.

10) Page 4 line 7 – Does PNC = Prenatal Care? Please specify.

11) Be consistent with the usage of acronyms vs. the full terms. On page 4, both ANC and ‘antenatal care’ (spelled out) are both used.

12) Page 5 – line ¾. If you are going to refer to the Focused ANC guidelines, please provide some background information, and explain what these guidelines are.

13) The word percent can be reduced to %. –Example, page 9 – line 9.

14) End of Introduction- this reads like a proposal of what will be done, not what was done – need to change to past tense and write what was actually done. Be very clear in the paper’s objective here.

15) Methods –this section could be more concise.

16) Methods – put the information about sample size and the age range of women before the section describing variables. After this, it is not necessary to keep repeating that the women were between the ages of 15 and 49.

17) Methods – Does MHC utilization refer to a woman’s last birth? Or are you including information from all births for each woman (I’m assuming this is not the case since there is no mention of accounting for clustering effects). The sample size should refer to your inclusion criteria i.e. the number of women aged 15-49
who given birth to at least one child in the last 5 years.

18) Methods – provide more information about the sampling methods employed in the Uganda DHS (was it sampling proportional to population size?). How were households selected?

19) Methods – Is the skilled personnel necessary during ANC visits or delivery, or both?

20) Methods, p. 12, line 13 – please describe what SDA stands for.

21) Methods, p. 12 – I recommend just outlining all variables used, not ‘some’, and outline how these variables fall into components of Andersen’s Behavioural Model. As it is, the use of Andersen’s Behavioural Model seems arbitrary. Provide more information about how the variables fall into this model.

22) Methods p. 12 line 23 – What is MHSB?

23) Methods, p. 13, line 18 – Write out that the reference category was ‘Poor MHS category’ that is sufficient.

24) Methods, p. 13 – At one point you call risk estimates as ‘odds ratios’, and another ‘risk ratios’, I believe these terms are interchangeable in Multinomial regressions, but I recommend keeping terminology consistent.

25) Methods, p. 13 – Issues of redundancy. At the top of page it says “separate ORS are determined for all independent variables […] with the exception from the reference category’. This line is re-stated at the end of the page.

26) Methods – statistical analysis. Please be more concise in explaining the analysis. Also report what alpha was set at (alpha = 0.05?). Other than multinomial regression, what analyses are you running? Univariate and chi-squares?

27) Methods – what percentage of people had missing data? What was done with missing data?

28) Methods – were survey weights used? Please describe them.

29) Methods – Ethical considerations: please insert this section when describing the dataset and the DHS in general.

30) Results p. 14, line 20 – ‘in the’ repeated

31) Results. Bivariate descriptions are unnecessarily long.

32) Results. Multivariate Analysis. I am confused by the authors use of ‘Model 1 and Model 2’. From what I understand, a multinomial regression would simultaneously assess the odds of desirable and moderate MHC utilization compared to the referent group, at the same time (Therefore within 1 model). Using the terms Model 1 and Model 2 makes it seem like two separate logistic regressions were performed, or that they are two separate analyses with different covariates.

33) Results. Why were some variables not included in the regression model? In the bivariate table 2, it is shown that a very high number of never married women use undesirable MHS. This could be a very useful pocket of women to pinpoint for policy and programs to improve MHS, but it doesn’t appear that this variable
was included in the regression.

34) Discussion. Begin the discussion by summarizing all multivariate multinomial regression results.

35) Discussion p. 21 – Limitations. I would also mention that a major limitation is the inability to adjust for other variables that could affect the outcome. Please list these variables. For example, perhaps prior use of the health system, or distance to medical centres could have impacted the outcome, but were unable to be accounted for.

Discretionary Revisions

36) Methods, p. 12 – I would consider adding a table to better describe the outcome variable.

Some notes about the Tables:

Table 1 - Title. What is meant by year of survey? It was mentioned earlier that the 2006 and 2011 DHS surveys were used, but the number of women from each survey is not specified.

Table 2 - I would consider taking the Significance (p), column out, since all are significant. I would put a note at the bottom specifying that all were significant at the <0.01 level, as well as the statistical test used.

Table 3 - Define what RRR means

Table 3- Are these analyses adjusted? For what variables? Please specify in the title, or in a note.

Table 3 - As mentioned previously, the words 'Model 1 and Model 2' are misleading, as I think just one model was employed. I would take out 'Model 1', and put in 'Odds of Desirable/Ideal.'

Table 3 - In the note, I would specify what ** means.

Table 3 - I'm not sure what you mean by probability >F = 0.00.

Level of interest: An article of importance in its field

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

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:

I declare that I have no competing interests