Author's response to reviews

Title: Determinants of fertility in Rwanda in the context of a fertility transition: A secondary analysis of the 2010 Demographic and Health Survey

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Version: 3
Date: 2 October 2014

Author's response to reviews: see over
To Dr. Pilar Valanzasca and the Reproductive Health Editorial Team,

Thank you for the opportunity to revise and resubmit this manuscript. We have responded to your questions and recommendations, and we have made corresponding revisions to the manuscript.

**REVIEW 1:**

**Major compulsory revision:**

*Why was the variable “Age” left out of the final model? The variable “Province” should also be considered.*

*Both multivariable models were adjusted for age, province, and urban/rural residence. This is indicated with an asterisk in Table 3. We did not report IRRs for province and urban/rural in the multivariable models because they were not statistically significant, but we kept them as conceptually important and potential confounders. We added the output for age to Table 3 as suggested.*

**Minor Essential Revisions:**

**Methods – Indicate whether permission to use the data was obtained from Measure DHS.**

*We added the following to the methods section: “Women provided informed consent before participating in the survey; we were granted permission by the MEASUREDHS Project to use these de-identified data for this analysis.”*

*L172 – 175 – The variable in question is “Type of Earnings” and not “Employment” unless type of earning is used as a proxy for employment. The variable “employment” presented in this section integrates types of earnings; how was it computed? Employment in DHS included small scale/subsistence agriculture work which is usually done by persons of low social economic status. I am not sure about Rwanda but persons that may refer to themselves as unemployed are those that are trained, have the skills but cannot find suitable work. These are usually persons of relatively higher social economic status.*

*We chose to combine variable “respondent currently working” (v714) with the variable “type of earnings from respondent's work” (v741) to prevent two variables with identical categories for not employed.*

*L221-227 - this part of the discussion is not clearly linked to the findings.*

*We modified the first sentence to clarify: “Multiple theories describe our finding that low fertility is associated with advancements in women’s education, higher wealth status, and delayed sexual debut.”*
L254-256 – could the authors provide a reference that relates to the observation?

Reference added. The sentence is now: Women from very large families tended to have slightly more children than women from average or small families which may reflect family pressure or norms [26], [27].

The authors could consider inclusion of other “partner” characteristics since one of the recommendations is male involvement in family planning.

We agree that it is essential to include data on male partner perceptions of fertility, which we do. Ideally, we would have considered additional variables from the male recode file, however, men were only interviewed in half of the households and therefore including these variables would have greatly reduced the sample size. Furthermore, the additional variable from that male recode file would have been socioeconomic and demographic in nature, and we feel that women and household variables serve as reasonable proxies for men’s socioeconomic and demographic characteristics in the context of Rwanda.

Discretionary Revisions:

The second part of the title could be omitted.

We have opted not to make this edit as we feel inclusion of “A secondary analysis of the 2010 Rwandan DHS” will help facilitate potential readers as to whether or not the paper is relevant to their interests.

In the introductory part, a brief review of fertility rates and predictors of fertility in the EA region could be useful.

We added fertility rates in East African Countries as follows: The average fertility rate in Rwanda dropped from 6.1 births per woman to 4.6 births per woman in 2010 after the percent of women using a modern method of contraception increased from 17% in 2005 to 52% in 2010 [10]. In other East African countries the fertility decline is still low: in Uganda fertility declined between 2006 and 2011, from 6.7 children per woman to 6.2 children [11]; in Kenya fertility dropped from 4.9 in 200 to 4.6 in 2008 [12] while in Tanzania the fertility was 5.7 in 2004-05 and slightly declined to 5.4 births per woman in 2010 [13].

Recommendations could be separated from the discussion

We created a subsection in the discussion section called “Recommendations” and consolidated recommendations from other subsections there.

Abbreviations could be integrated in the body of the article since they are few
Abbreviations are integrated in the body of the paper, but are also listed separately per the requests of the journal.

REVIEW 2:

Minor Essential Revisions

Lines 146-147: Recategorize variables: Religion and Residence as socioeconomic not demographic variables. Province is geographic not demographic variable.

We made changes to the sentence as suggested and it current reads: “Adjusted incidence rate ratios (IRR) with 95% confidence intervals (CI) are reported to assess the association of fertility with the demographic variables (age, number of siblings, number of unions), socioeconomic variables (education, wealth, religion, residence, types of earnings), geographic variable (province), fertility behavior and desires (age at first sex, unmet need for family planning, ideal number of children) and husband’s desire for children among ever married women”.

The headings of Tables 1 and 2 need changing to read: Percentage of ever married/cohabiting women by number of children and various characteristics.

We have made changes as suggested.

Discretionary Revisions

It may be better to merge ever married and cohabiting women with never married women and introduce the variable marital status of women for analysis.

We considered this approach, but because there is a fundamental difference in the fertility patterns among married and unmarried women, we prefer to keep these models as separate.

It may be better to further disaggregate 4+ category to 4-5 and 6+, which is known as high fertility. 4-5 children is not considered high fertility in African setting with an average of 6 children.

We prefer to keep the distinction between 1-3 and 4+ children in Rwanda because three children is the ideal that is promoted by policy makers and health experts. Rwanda is unique in East Africa for having a lower fertility rate and only 15% women would be included in an analysis of 6+ children.
I wonder if you can do a better organization of your Discussion section. Please see some suggestions about the organization of this section. Please follow this structure:

- Statement of principal findings of the study. Summarize key results with reference to study objectives.
- Strengths and weaknesses of the study
- Strengths and weaknesses in relation to other studies, discussing important differences in results and what your study adds. Whenever possible please discuss your study in the light of relevant systematic reviews and meta-analyses (eg Cochrane reviews)
- Meaning of the study: possible explanations and implications for clinicians and policymakers and other researchers; how your study could promote better decisions
- Unanswered questions and future research

Thanks to the reviewer who provided this framework for the discussion. Although the current is organized differently, we do believe we have touched on these main elements, mostly in the same order. We start with a summary of key findings, and then discuss three key results in the context of other research including implications. We follow with recommendations (as suggested above), then limitations of the dataset and study design. We hope this is satisfactory to the editor and are open to suggestions.

Warmly,

Dr. Vedaste Ndahindwa on behalf of the authors of “Determinants of fertility in Rwanda in the context of a fertility transition”