Author’s response to reviews

Title: Child marriage among boys in high-prevalence countries: an analysis of sexual and reproductive health outcomes

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Author’s response to reviews:

Abstract:

1. I would include the prevalence of early marriage of boys 20-24 in the abstract findings to help bring greater recognition of the issue to potential readers. I prefer to have data findings in the abstract, but if this is the convention of the journal that is fine. I believe papers are more likely to be explored when the abstract provides the ORs.

   Author response: We excluded the prevalence estimates and various odds ratios for all 15 countries included in this analysis in order to make the abstract reasonably succinct. However, I have now included mention that these 15 countries have prevalence levels ranging from 8.4% - 27.9%.

2. The interpretation could be made more compelling if it reflected on the value of findings for program and policy, rather than simply saying more research is needed.

   Author response: We have since incorporated this suggestion.
Introduction

1. First, please clearly define child marriage in the introduction as the marriage of any boy child below the age of 18 according to international law and definitions. It would also be useful to situate child marriage in the introduction within the Universal Declaration of Human Rights, the Convention on the Rights of the Child and international laws in relation to child marriage.

   Author response: We have since incorporated this suggestion.

2. Second, in the introduction it would be useful to expand on the potential consequences of child marriage on boys in your second paragraph. You indicate the consequences are less pervasive and seldom acknowledged, it would be useful to expand on these consequences and their potential impact on young men's health and well-being over time. Could you further explore the literature or hypothesize what the consequences of child marriage on boys would be in the short- and long-term? In terms of leaving school? Seeking employment and pressures of economic provisions over time? You mention early fatherhood and provisioning. What are the potential health and life consequences of these factors on boys and young men?

   Author response: We have since hypothesized more on the potential consequences of child marriage among boys. However, research on the consequences for boys is very limited and has been conducted in other countries, particularly high-income contexts. Based on our knowledge, this paper is the first to explore key reproductive health outcomes for men who marry during childhood across several low- and middle-income countries using nationally representative data.

3. While characterizing child marriage are you able to compare boy child marriage to girls’ child marriage if there is data available in the literature? Globally, how do the rates of boy child marriage compare to girl child marriage? In relation to this, do we know what age on average boys are married globally from the literature? Are boys married at a younger or older age on average than the girl child in relation to child marriage?

   Author response: This paper is complemented by another paper issued by the same authors that explores the prevalence of child marriage among boys regionally and globally, and also draws comparisons to child marriage levels for girls. This second paper has been accepted for publication and we have since referenced it in this article.
4. Moreover, you state that child marriage encourages sexual activity or sexual debut at an early age when boys know little about their sexual and reproductive health and are still physiologically developing. However, this would depend on the age the boy child is married. For example, if adolescent boys on average have an age of sexual debut between the ages of 15 to 19, and boys involved in child marriage are married at 15, how is this different than adolescents exploring their sexuality and average adolescent sexual debut? I think it would be useful to characterize at what age or how young boys are married to support this statement.

   Author response: We have since removed this statement.

5. In your introduction you state that you will explore the socio-demographic background of child grooms in countries where the practice is common. In relation to my two comments below, can you expand on where child marriage is common among boys and why it is common within these contexts? Is girl child marriage also common within these specific contexts? This would help situate your discussion and interpretation of your results and add value to the paper.

   Author response: As noted, this paper is complemented by another paper issued by the same authors that explores the prevalence of child marriage regionally and globally, and also draws comparisons to child marriage levels for girls. This second paper has been accepted for publication and we have since referenced it in this article.

6. Introduction: The objective suggests a very descriptive paper rather than an exploration of hypotheses, but the introduction suggests that the paper is hypothesis generated, with expectations that poorer, less educated and rural boys will be more likely to marry early, and that boys marrying early are less likely to report HIV and family planning awareness and use. It may be useful to reframe the introduction toward justifying these hypotheses.

   Author response: We have since incorporated this suggestion.

7. You should reconsider the use of the term 'groom', which designates a man who is about to be married or has recently been married. It does not make sense to say "child grooms currently aged 20-29" (abstract). It may be replaced with 'men married as children' or 'early married men'. (The word 'bride' is often incorrectly used the same way as groom in this case.)

   Author response: We have since incorporated this suggestion.
Methods/Results sections

1. Data were from MICS and DHS. It may be useful to explain why you used a given one of these for a given country. I assume it was to allow for use of most recent data available.

   Author response: We relied on the most recent data sources available for all countries to determine the top fifteen countries with the highest prevalence among men aged 20-24. The compilation of sources relied on the most recent data available and included the MICS, DHS, and other nationally representative surveys. I have since added a sentence in the methods section noting that the countries were identified based on their most recent prevalence estimates irrespective of the data source/survey series.

2. Under outcome indicators (page 4-5) I would like to know why you have not looked at HIV prevalence. The DHS Program has conducted population-based HIV testing of women and men since 2001.

   Author response: Unfortunately, for this subset of countries, the DHS and MICS did not conduct population-based HIV testing of all women and men interviewed. We felt it was important to include HIV as part of the RH focus of this paper. Knowledge of HIV transmission was the only indicator with the most available and comparable data across the fifteen countries.

3. I appreciated that prevalence by age cohort was included, allowing for prevalence among males 20-24 to provide a more up to date indication of use of the practice. Could you provide data on <15 at marriage, and could you also show the same for wife's age at marriage? Is there data on wife's age at marriage? If yes, is early marriage for males associated with early marriage (and maybe even very young early marriage) for females? This may be a useful variable to consider.

   Author response:

   We have since provided an additional table in the appendix with data on the percent of men who married by age 15.

   Information on age at marriage was self-reported from each individual household member. As such, data on the wife’s age at marriage were only available for the current spouse living in the household and not for any former spouses. We had initially explored this by linking the data/responses from each married man to data/responses from his current spouse; however, in doing so, we were forced to exclude men who had more than one marital union since information on the first spouse (presumably living outside the household) was unavailable. We ultimately decided not to pursue this part of the analysis since the results might be biased due to the restricted sample.
4. Why wasn't rural residence included as a covariate in multivariable regressions for SRH outcomes?

Author response: Place of residence was explored in bivariate analysis but ultimately excluded from the multivariate models because in some countries there is considerable overlap with household wealth quintile. For example, in some countries, men living in urban areas comprised the entire top two wealth quintiles (fourth and richest) while those living in rural areas comprised the bottom (second and poorest). If we choose to explore place of residence further, it would be best to use reconstructed the wealth quintiles for urban and rural populations and then run the models separately. We chose not to do this because our sample size was already limited, particularly when the models were confined only to ever-married men.

5. Could you run a statistical test on difference in early marriage of males by age cohort? I agree that there appears to be no meaningful reduction, and it would be good to indicate that statistically.

Author response: In comparing the prevalence estimates for the five-year age groups, we have shown confidence intervals and the respective p-value to note differences that are statistically significant. I have added a sentence noting the countries where differences were significant at the P<0.01 level. We have also noted that in eleven countries, the prevalence appears to be higher among the youngest age group (aged 20-24) compared to the oldest age group (aged 45-49), although the confidence intervals for these estimates overlap.

6. Would there be benefit to including pooled analyses to test this, if cell sizes within country are too small to capture effect? Pooled analyses, as well as country specific analyses, may be useful across the paper, if you shift to hypothesis testing.

Author response: We chose not to conduct a pooled analysis 1) because our objective with this paper was to showcase country-level differences and 2) because the countries vary geographically and producing “average” estimates might undermine the importance of the country context.

7. You note in your results that in eleven countries, child marriage prevalence appears higher among the youngest men (20-24) than the oldest (45-49). This suggests an increase. Is this accurate?

Author response: Indeed, the results would suggest that for these countries, there appears to be an increase in prevalence among younger men aged 20-24 compared to older men aged 45-49. However, as we have noted in the limitations section, due to the small sample size in many of the surveys, the confidence intervals for these estimates overlap.
Discussion/Conclusion sections

1. Can you hypothesize or explore why child marriage of boys was highest in the selected countries, are there social or cultural practices within these countries that would mean boys are more likely to experience child marriage?

   Author response: Since child marriage among boys has received less attention than child marriage among girls, there is very little knowledge regarding “drivers of the practice” among this demographic that would allow us to propose any such hypotheses. However, we have added a sentence to the discussion sections suggesting the need for further research at the country level to explore any potential role of social or cultural practices.

2. As per reviewer 2’s comment, it would greatly strengthen this manuscript to situate the discussion of your results within the broader literature on child marriage, particularly in relation to the countries included in this analysis and what is known in relation to child marriage in these contexts as they represent very diverse regions.

   Author response: We have since elaborated further in the discussion section on how results from this analysis compare to findings from other research.

3. In the discussion or the conclusion you may elaborate more on possible research questions. It would also be good to investigate divorce rates among early married men vs men married as adults, and number of marriages/wives. Other issues to explore and compare are mental health indicators, alcohol/drug use, etc.

   Author response: We have since incorporated this suggestion as potential topics for future research.
4. There is little reflection on findings in the context of the broader literature, which offers parallel findings for girls, nor are country level differences explored to provide further insight into early marriage of boys by context. Interpretation of reasons for key findings, such as inadequate reductions in the early marriage of boys, would add to the value of the paper.

Author response: We have since elaborated further in the discussion section on the interpretation of results.