Author's response to reviews

Title: Patterns and determinants of care seeking for obstetric complications in rural northwest Bangladesh: Analysis from a prospective cohort study

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Author's response to reviews: see over
To BMC Health Services Research:

We thank both reviewers for indicating this article to be of importance in its field. We have addressed revisions requested by the reviewers in our point-by-point response below. In addition, we have applied these changes to our manuscript and indicated the line numbers where these changes were made. Upon the request of the editor, we have carefully edited the language and copyedited the manuscript to improve the writing style and grammar.

We look forward to a speedy review of this manuscript.

Reviewer 1:

Reviewer: Marge Koblinsky

Minor Essential Revisions

a. Ensure the number of the reference in the text is correct (e.g. Andersen’s Care-seeking Framework is listed in the text as 36; in the reference list it is 35). I have not checked others but it would be useful for you to check them. We have systematically gone through the references and corrected all text and references. The Andersen reference was originally misnumbered, we have corrected it to Reference #35.

b. In the Methods’ section, “Definitions of independent variables,” please do include how “service availability” was defined and measured. For example, I am not clear if you collected information on the continuous presence of an obstetrician and anesthetist; or did you just assume they were present if C-sections had been done? You do classify facilities by BEmOC vs CEmOC; again is this based on whether C-sections were done? Were essential supplies reviewed? As this is central to your conclusions, I don’t think you can just refer to another article. Information on classifications of service availability was added to lines 203-211. Two main levels of care were defined: basic emergency obstetric care (BEmOC) and comprehensive emergency obstetric care (CEmOC), with BEmOC facilities providing basic obstetric services and CEmOC facilities providing basic obstetric services as well as C-sections and blood transfusions. Definitions were based on the 2010 WHO Service Availability and Readiness Assessment methodology. Provision of C-sections was assessed on records of C-sections having been performed in the facility in past three months according to WHO SARA definitions.

c. Results-

I. Descriptive Characteristics, first para: you mention that 10,580 women had data on care seeking. While that is the number in Fig 2, Figure 3 starts with 10,380; no explanation for this is given. Please correct or explain. Figure 2 illustrates the overall cohort for this analysis, which consists of 10,580 women with obstetric complications or near misses for whom we have data on care seeking. As clarified in lines 174-178 and 247-249, care seeking patterns are presented separately for women with obstetric complications (n=10,380) and women reporting near misses (n=1,004) as different levels of information on providers sought were available for these two groups. (Data on one provider sought was available for women with obstetric complications, while data on up to four providers sought was available for near misses.) As a note, in response to a request from the second reviewer to simplify the number of figures we have removed the previous Figure 3 as all information illustrated was stated in the text.
II. Care-seeking patterns: para 1, sentence 1—your % of those seeking formal and informal care differs from those in figure 3. The text in the results has been corrected to correspond to the correct percentages which were previously reflected in Figure 3. Please see line numbers 42 and 263-264.

III. Care-seeking patterns: Second para—I did not have a figure 5 or 6 attached to the article. We had mistakenly included a reference to Figure 6 as a sub-analysis that was not included in this manuscript. In a request from the second reviewer to focus the number of sub-analyses and figures presented, we have removed the reference to Figure 6 and simplified the analyses. Three main figures are now presented in the manuscript.

d. This was a study embedded within an on-going project that did have an intervention. In your Introduction, it would be useful to include a description of the on-going intervention so your readers could determine if that might have impacted on use of providers by type. We have added information at the beginning of the methods section (lines 129-134) to explain the intervention tested in the parent trial (effect of daily maternal antenatal supplementation of multiple micronutrients on six-month infant mortality).

e. Figure 2: You separated care seeking by whether the woman had a spontaneous or induced abortion—but then did not follow up this separation throughout the analyses. As these are unique data, it would be most interesting to know if there was a difference in the complications reported and where they sought care among women with an abortion as compared with those women with a live birth. Or are there reasons for not continuing to analyze these data separately that you can discuss in the paper? We had originally investigated care seeking by type of pregnancy outcome as a sub-analysis, but had not included this text in order to simplify the analyses presented. In response to this request, we have included text on care-seeking patterns by type of pregnancy outcome in line numbers 277-279 and 361-366.

f. Figure 2: The MMR that can be calculated from your data (23 deaths among all births in your area) is fairly low for Bangladesh. Were there other deaths that you have not recorded here because you have no data on complications and care seeking? It would be useful for you to mention something about the maternal deaths and whether you captured all of them and the care seeking behavior of these women. The diagram in Figure 2 illustrates data that were specifically analyzed and presented for this paper. This analysis represents a sub-sample and not the full cohort included in the parent trial. Estimates of MMR from this data do not represent the full cohort followed in the parent trial. Publications in press from the parent trial will present findings on MMR.

g. Discussion: 3rd para: Eclampsia not only has a higher case-fatality rate, but it should be mentioned that it is also much rarer (about 1/10th of the other complications according to your data). It has been noted in many earlier references that women/families can recognize seizures and antepartum hemorrhage with some medical validity but the others (PPH, obstructed labor, sepsis) are not well recognized by women (References noted). We thank the reviewer for these valuable additions. Text reflecting these incorporated changes and references can be found in line numbers 328-341.

Discretionary Revisions:

a. If you have information on the anemia status of the woman or other health related indicator, could you look at use of services for reported complications/near miss also using this variable? Unfortunately anemia status was not recorded for the women included in this analysis so we were unable to look at these patterns.
b. A limitation of your study is that you do not have the distance to an informal provider; I suspect they are closer to the woman than the formal providers. If that is so, it could be a reason for such high use of informal providers. A second variable re informal providers is their relationship to the woman—sister, mother-in-law. Can you comment on these issues in the article? We thank the reviewer for pointing out the limitation of not included data on distance to informal providers. We have included this text in our Limitations section in lines 402-405. While the study collected information on the type of provider sought (including a category for Relative), data on the specific relationship of relatives to women (such as sisters, mothers-in-law) was not included and represents a limitation in the data.

c. Discussion, para 3: There is mention of “pollution” without elaboration to make this statement understandable. We have added text in lines 335-341 to elaborate on this statement.

d. Discussion, para 4: There are recent reviews of adolescents and care seeking that may be useful to refer to: Adolescents may use services less than other age groups, and when this happens adolescents suffer a higher maternal mortality than other age groups (Nove et al., 2014). When in facilities, there is also discrimination; for example, in a multi-country survey, adolescents were found to have poorer coverage of prophylactic uterotonic, prophylactic antibiotics for caesarean section and antenatal corticosteroids for preterm delivery, and had poor pregnancy outcomes, such as prematurity, low birth weight, and severe neonatal conditions (Ganchimeg et al., 2014). We thank the reviewer for sharing these resources. We have added text reflecting these references to the discussion in lines 346-353.

**Level of interest:** An article of importance in its field

**Reviewer 2:**

**Reviewer:** Jean Christophe Fotso

**Reviewer’s report:**
The paper seeks to examine an important topic using data from a large prospective study. It has the potential to advance our understanding of health care utilization in rural North West Bangladesh. However, its quality would be enhanced by more focused analyses, with implications for health services in mind.

**Major Compulsory Revisions:**

Objectives: The interest of the study to the readership of the journal would be increased if the main objective of the paper, as stated on page 5 (Lines 123-124) was less general and more focused. For example, Lines 230-231 read: “Potential interactions between covariates such as distance to facility and availability of services were explored and added to the model if significant …”. Interactions should not be added based on p-values; instead they should be conceptualized beforehand, and ideally included as part of the objectives. For example an interaction between wealth and distance to facility would help examine if the effect of distance on care seeking behavior varies by wealth status, a finding which may have implications for service delivery. We thank the reviewer for this correction. We have clarified the objective of this paper in lines 123-124. In addition, we added text to clarify that we explored the interaction of distance to facility and availability of services based on our theoretical framework grounded on Andersen’s Care-Seeking Framework and previous studies by Gabrysch suggesting the importance of this relationship. This corrected language is reflected in lines 236-238 and 293-298.

Methods:
- Variables: The variable on couple’s wantedness of the pregnancy deserves further clarifications. Were husbands’ reports obtained from husbands themselves or from their wives? If the latter, the authors should
explain why the couple variable (yet obtained from only one source) is superior to wantedness from mothers’ perspectives only, as widely used in the literature on maternal and newborn health. If the former, the description of the data source should clarify that husbands were also interviewed. Importantly, were the question to capture the idea of mistimed pregnancy (parents would have preferred to delay the pregnancy), or unwanted pregnancy (not wanted at all), or both? Women reported wantedness for both themselves and their husbands. Women were asked whether they had wanted their index pregnancies at the time they had them, whether they had wanted their pregnancies later, or whether they had not wanted their pregnancies at all. Women were asked the same questions of their husbands. In reviewing the literature, we agree with the reviewer that women’s report of husband’s wantedness may not add additional information. As such, we have re-categorized the wantedness variable to reflect women’s report of a wanted pregnancy, mistimed pregnancy, or unwanted pregnancy and have rerun analyses and adjusted inferences accordingly. Text reflecting these changes can be found in line numbers 193-196, 255-256, 281-283, 298-300, 356-365 and in Tables 1, 2, and 3.

- The first two paragraphs of the section on data analysis (Lines 207-219) should be part of the section on variables. We have moved these two paragraphs to the methods section (now lines 213-220) on definitions of independent variables as requested by the reviewer.

- The sentence in Line 221 (We tabulated …) is implicit and may be deleted. We have deleted this line.

- Why do the authors use both RRR and OR? Given the high proportions of women who sought care from both informal and formal providers, we used multinomial logistic regression to explore factors affecting care seeking from informal and formal providers compared to not seeking care (these results were presented as RRRs). We had added a sub-analysis with logistic regression to compare factors that affected care seeking from formal providers compared those who sought informal care as a different reference group (these results were presented as ORs). We recognize that these multiple analyses made the results non-interpretable and difficult to follow. In order to simplify analyses, we have kept the main multinomial logistic regression analysis and removed the sub-analysis with logistic regression as the results were not adding additional information. We have removed the previous Table 3 and reflected these changes in our analyses and inferences.

- Lines 235-237 refer to the Chi-squared test, yet none of the results tables (except Table 1) shows the Chi-square. We have removed this text; it had referred to results from sub-analyses that we did not include in this paper for simplification.

- As stressed earlier, interactions terms are not to be added in the models the way described by the authors. They should have been thought through during the design of the paper’s objectives. We thank the reviewer for this correction. We had explored the interaction of distance to facility and availability of services based on our theoretical and formal providers shown in Figure 1. Our framework was based on Andersen’s Care-Seeking Framework and the work of Gabrysch, which suggests that this interaction is important to explore. We have corrected our language in lines 236-238 and 293-298. to reflect this.

Results:
- As mentioned earlier, the analysis lacks focus. There are many tables and figures, yet the rationale of the analyses is not clear, and the linkages between these analyses less explicit. We thank the reviewer for this feedback. We have systematically edited the text of our manuscript and deleted tables and figures in order to streamline the results. We deleted the previous Figure 3 as it illustrated text that is presented in the results (lines 263-264) and was not adding new information. We also deleted the previous Table 3 which presented a confusing sub-analysis with logistic regression. We have removed the sub-analyses with logistic regression as these were not adding new information and retained our main results from multinomial logistic regression. The manuscript new presents more streamlined and focused analyses.
- The first paragraph (lines 242-246) and the associated Figure 2 are not really part of the characteristics. Figure 2 should be used in the methods section to clarify the target samples for the analyses. Since the analyses use different sub-samples, it is critical that these sub-samples are clearly described in the data section (NOT in the results section). We have moved up these lines and Figure 2 to the methods section (lines 243-249) as suggested by the reviewer. We have removed sub-analyses that were confusing and retained one sub-analysis using multinomial logistic regression to investigate care seeking by type of complication reported (lines 239-242).

- The inclusion of sub-sample sizes in the column headings of Tables 2-4 is confusing. The authors might want to use the text in the footnote of these tables to improve the titles, and then drop the “(n=xxxx)” from the column headings. We agree with the reviewer on this suggestion and have removed the n’s in Tables 2 and 3 and added them in footnotes rather than in the main text.

- Lines 252-253 mention p-values, yet these are not indicated in Table 1. As indicated by the key for Table 1, variables with significant p-values are starred. The variables of women’s age, parity, wealth index, employment, literacy, and pregnancy wantedness are starred according to the footnotes at the bottom of Table 1 (lines 750-753).

- The sub-section on care-seeking patterns (Lines 255-274) is based on Figures 3, 4 and 6. What about Figure 5? The version of the manuscript I have only has Figures 1-4. Most readers will grapple with the content of Figure 4, yet the issue it is supposed to describe is very straightforward. We appreciate this feedback from the reviewer. We had mistakenly included a reference to Figure 6 as a sub-analysis that was not included in this manuscript. In response to the reviewer’s request to focus the number of sub-analyses and figures presented, we have removed the reference to Figure 6, removed the previous Figure 3 as it was not adding new information, and have rerun and simplified the analyses presented. We have retained previous Figure 4 (currently Figure 3) in order to represent the complexity of care-seeking patterns. We have added text in lines 264-273 and in the figure legend to further clarify this figure.

The authors need a better way to report in the text the figures from the tables. Writing for example (RRR 1.51 95%CI 1.33-1.75) as in Line 281, may not be acceptable. An improved version may be (RRR of 1.51; 95%CI of [1.33-1.75]). We appreciate this suggestion and have incorporated this revision into our presentation of relative risk ratios and 95% CIs throughout the manuscript.

- There is no transition from the results in Table 2 to the ones in Table 3 (i.e. from Lines 280-284) to Lines 285-291). We have added a transition between these two sections in lines 291-292.

- The expression “… pregnancy wantedness discouraged any care …” (Line 309), is not acceptable. The phrase “decreased distance” (e.g. Line 311) should be replaced with “short distance”. We have applied the corrections suggested by the reviewer in lines 303 and 310.

Others:

- Reference #47 is listed for the first time (in Line 140) before the references #39-46. We have systematically gone through and corrected all references in the manuscript. We have corrected this reference in line 142, which should have been stated as Reference 37 and has been corrected.

- There are few instances where citation of references is not clear. For example, since the sentence in Lines 115-117 is pretty obvious, did studies in references 27, 34, and 35 make the same (obvious) point or did they indeed improve the understanding of factors that influence care seeking from formal and informal providers? We have systematically gone through and corrected all references in the manuscript.
to make citations more clear. We agree with the reviewer that the references in lines 116-118 were unnecessary and have removed these.

- The expression “lack of pregnancy wantedness” (Line 278) is not adequate. The right expression is “unwanted (or unplanned) pregnancy”. Respondents are not members of wealth quartiles; instead, they fall into the wealth groups. The expression “membership in the highest household wealth” (Line 280) is thus not adequate either. We have corrected these terms in lines 283 and 285 as requested by the reviewer. In addition, we have reclassified the pregnancy wantedness variable and clarified the results to be more interpretable.

**Minor Essential Revisions:**

- The section on strengths and limitations could focus on limitations only, and the first paragraph (Lines 381-388) moved to the beginning of the discussion or the conclusion section. We have incorporated this suggestion from the reviewer and moved the first paragraph of the previous limitations section to the conclusion section and focused on limitations.

**Discretionary Revisions:**

- Line 160: Is it about definition or classification of providers? I would vote for the former. We have corrected the heading to classification of providers as suggested by the reviewer in line 162.

- Line 178: You could delete “Definitions” in the title. We have incorporated this revision.

- Distance variable: Given that about 80% of the sample falls in the category >10km, it may be good to split this category into two (e.g. 10-15km, and >15km). While we explored additional cutoffs for the distance variable, they did not lead to differences in our inferences regarding distance. As adding cutpoints did not add new information, we kept the original cutpoints are presented in the original analysis.

**Level of interest:** An article of importance in its field

We thank the reviewers for the thoughtful comments to improve this manuscript and hope for a speedy review of our paper.

Sincerely,

Shegufta Shefa Sikder, PhD