Author’s response to reviews

Title: The Social determinants of Health Facility Delivery Among Reproductive Aged Women in Ghana

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Author’s response to reviews:

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The Social determinants of Health Facility Delivery Among Reproductive Aged Women in Ghana

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Thank you very much for the very helpful and detailed feedback on our paper. We found the comments very constructive and helpful. We believe that the quality of our manuscript is considerably improved as a result of incorporating the changes recommended by the reviewers. The explanation of what we have changed in response to the reviewer’s concerns is given point by point in the following pages.

Editor’s comments:

Your manuscript "Use of Health Facility Delivery Among Reproductive Aged Women in Ghana: How Do Perceived need and Sociodemographic Factors Matter?" (REPH-D-19-00118) has been assessed by our reviewers. Although it is of interest, we are unable to consider it for publication in its current form. The reviewers have raised a number of points which we believe would improve the manuscript and may allow a revised version to be published in Reproductive Health.

Response:
We thank the editor for the feedback, and we addressed the comments of the reviewers in our revised manuscript.

Reviewer: 1

Abstract
Authors described that "In terms of parity, first time mothers were 58% (95% CI = 1.18-2.12) times more likely to deliver at health facility than those who had given birth three or more times before". What does it mean 58% times? Do you mean this 0.58 times? If yes, the statement should be changed into less likely since OR is less than 1 compared to the reference...... correct in all sections! I suggest to add effect size of odds ratio within bracket (Adjusted OR=xx; 95% CI=…) for all findings.

Response:
The adjusted odds ratio for first time mothers relative to those with at least three births was 1.58, indicating greater use of health facility delivery among first time mothers when compared to mothers who had three or more births. To clarify the statement in the revised manuscript, we rephrased the sentence and included the adjusted odds ratio. These changes were repeated for other findings in the abstract and results sections of the paper. We also added the CI as recommended by the reviewer.

Introduction

What do mean by perceived need factors? Please explain more in this section/ in method section.

As authors indicated in method section, the Anderson theoretical model includes three types of factors: predisposing, enabling and need factors. Why do authors emphasized to examine the need factors? And why not they drop predisposing and enabling factors in the analysis. Give explanation in method section/introduction the reason for this.

Response:
First, predisposing factors refer to characteristics that exert influence prior to the occurrence of the given health behaviour, by encouraging or inhibiting the uptake of health facility delivery. Predisposing characteristics include all characteristics that might condition individual’s perceptions of need and use of health facility delivery. These predisposing factors can take the form of demographic factors (age), reproductive history (parity), cultural belief (religion), civil status (marital status), and social factors (education) among other factors. Second, enabling factors are related to the resources that facilitate or impede the utilization of health services
which include financial status, resources in the community and other factors. Third, Andersen’s model proposes that “Need” for care is important for influencing behaviour. The explanatory predictors considered in the study were grouped into predisposing factors (age, marital status, religion, parity, maternal education), enabling factors (financial status and place of residence) and perceived need. Since this dataset does not include a variable representing actual medical need for facility delivery, we used the variable ‘told about pregnancy complications’ as a proxy for perceived need for health facility delivery. Andersen’s model, in addition to an extensive review of the empirical literature [18 23 25 26], was used as guide to select potential factors associated with health facility delivery use.

Methods

The 2014 DHS included 9396 women of reproductive age. What was the response rate? Please add it.

Response:

Response rate was stated in the method section of the revised paper. The response rate for the survey was 97%.

For variable classification:

* "financial status (poor, middle, rich)"- how do you come up to classify financial status as "poor, middle, rich?" Do you use the wealth quintile/index classification? Please explain.

* Education (no education, primary, at least secondary)- explain level of primary education and secondary. Is primary education from grade 1-6/8? indicate grade classification? What about informal education?

Response:

Financial status was created from the wealth index that was already available in the GDHS dataset. The GDHS generated the wealth index based on information about household assets by using principal component analysis (PCA). The wealth index is comprised of 5 categories namely poorest, poorer, middle, richer and richest. The Financial status variable used in this study is comprised of 3 categories: poor (poorer, poorest), middle, and rich (richer, richest) as reported in a similar studies. Likewise, education was reclassified into no education, primary (grade 1-6), and at least secondary (above grade 6). The secondary data from the Ghana Demographic and Health survey (GDHS) did not capture informal education.
Statistical analysis:

Selection of candidate variables for multivariable model, authors used p<0.2. Where did authors get this? Give reference. According to DAVID W. HOSMER; and STANLEY LEMESHOW book entitled as- Applied Logistic regression, 2000 second edition, suggested that "Any variable whose univariable test has a p-value < 0.25 is a candidate for the multivariable model along with all variables of known clinical importance, page 95". Please consider this!

Response:

We thank the reviewer for the suggestion and we have made the recommended changes. We used p-value < 0.25 instead of p-value < 0.2 for selection of variables for the adjusted model. Also, Hosmer and Lemeshow (2000) was cited as reference.

Multivariate is different from Multivariable. Please use the word multivariable model in your paper. No need to mix both.

Response:

We thank the reviewer for this clarification. The required changes were done so multivariable model was used throughout the paper.

How did authors accounted for clustering effects in their model? Since DHS employed a nested cluster sampling design. Just for consideration, for cluster data, the recommended model is multilevel logistic/linear regression. Please explain your approaches to eliminate clustering effect or intra-cluster correlation coefficient (ICC) …..

Response:

We employed Taylor series linearization method, which is a variance estimation procedure used by PROC SURVEYLOGISTIC in SAS version 9.4, to adjust for clustering effect. Additionally, the weighting factor obtained from GDHS was used to adjust for sampling error and non-response to ensure validity of the findings.

I suggest to refer the recent American Statistical Association (ASA) paper for use of p-value. ASA recommended researches to use effect size, 95% confidence interval for statistical significant conclusion instead of p-value. ASA strongly advised not to relay on p-value for conclusion.

Response:
American Statistical Association (ASA) recommendation was considered and referred to in the paper. Point estimates and corresponding 95% confidence intervals were used to adjudged significant associations in the manuscript alongside p-values.

Results

Revise results based on the comments given in method section.

Better to report median of age instead of mean/average age. Mean is affected by extreme values/outliers.

Response:

The median age for the study respondents was 29 years which is close to the average age of 29.7 years. This appears to suggest that the distribution of age was somewhat symmetrical and was not greatly affected by outliers. Hence this study reported mean age with standard deviation instead of median age.

Describe the sample distribution of respondents by their financial status; followed by description of % of respondents by delivery place.

Response:

This information is now presented clearly in Table 2 and also in the paper.

No need interpretation/speculation in result section- as authors said "This study observed a general trend of health facility delivery decreasing with higher parity" -take out

Response:

We deleted the sentence in the revised manuscript as the reviewer suggested.

Wrong to say ….89% times…. See my comments in abstract section. Either you to say 0.89 times or 89 times…. Or say .....89% higher in xx group compared to the reference…

For example, authors correctly described in one of their variables as " First-time mothers were 2.77 (95%CI = 2.19-3.50) times more likely to have health facility delivery than women who had given birth three or more times" do same for other variable description. correct your the manuscript accordingly!
Response:

We revised the interpretation of the findings in the abstract and the results section of the revised manuscript to accurately describe the variables as suggested.

Make consistent to report your findings across in the manuscript. Example, (OR =1.65, 95%CI=1.29-2.11). this is the best way to report in your paper. (effect size , with corresponding 95% CI).

Response:

The manuscript was updated to reflect consistent reporting of the results, as recommended by the reviewer.

Multivariable analysis result: It is better to describe your statistical analysis/modeling strategy in method section instead of result section. How do you control/manage confounding, interaction effect, multicollinearity ..VIF, AIC……all should be described articulately in method section. Not in result section

Response:

We thank the reviewer for the suggestion and we moved the description of the model building procedure from the results section to the methods section under the heading “Statistical analyses”.

Table 3: replace odds ratio with "unadjusted odds ratio" in the column

Response:

Table 3 was revised as suggested and now reads “Unadjusted Odds ratio and 95% Confidence interval of having health facility delivery - Univariable logistic regression analyses”

In Table 4: replace odds ratio with "adjusted odds ratio" in the column

Response:

We changed table 4 as suggested and is now titled “Adjusted Odds ratio and 95% Confidence interval of having health facility - Multivariable logistic regression analyses”
Reviewer: 2

General aspects:

Thank you for submitting your article on the use of health facility delivery among reproductive aged women in Ghana. Your manuscript summarises an interesting analysis of health service data and clearly outlines potential factors that limit women's ability to deliver in a safe environment. The use of a proxy measure for perceived need is interesting but in doing so care must be taken not to over emphasize the findings from this section of the analysis and reporting - please consider changing the title of your paper to reflect the majority of the data is on sociodemographic factors.

Response:

This research adopted and modified the Andersen’s health care utilization model which is hinged on three factors namely: predisposing, enabling and need characteristics. The study aims to investigate the influence of perceived need; predisposing (age, religion, marital status, parity, education); and enabling factors (place of residence, financial status) on the use of health facility for delivery. We did not intend to emphasize the perceived need factor. We used perceived need (being told about complications) as a proxy for need since the data did not contain variables reflecting actual medical need. We revised the interpretation of perceived need variable in the manuscript and discussed the limitations of using the proxy measurement of need in the limitations section.

We agree with the reviewer that the title of the manuscript could also give the wrong message. We changed it from “Use of Health Facility Delivery Among Reproductive Aged Women in Ghana: How Do Perceived Need and Sociodemographic Factors Matter?” to “The Social Determinants of Health Facility Delivery Among Reproductive Aged Women in Ghana”

The data is well presented but to aid clarity please ensure the descriptive text matches the data in the tables and adopts a consistent approach.

Response:

We thank the reviewer for this comment and we made the necessary recommended changes throughout the manuscript.

Comments related to specific parts of the paper:

Abstract
Results: Please include a data point for clarification of the statement on urban women with a higher likelihood of health care facility delivery (6.71 95% CI =4-76-9.44))

Response:

We made the recommended change. The abstract now reads “First, urban women had a higher likelihood of health facility delivery than rural women (Adjusted OR=2.21; 95%CI=1.53-3.19)”

Introduction

1st paragraph Line 30 to 33 - please revise sentence.

Response:

The sentence was revised to

“The Government of Ghana has introduced initiatives such as free maternal health care services, Community-based Health Planning and Services (CHPS), and improved antenatal care and education in an effort to improve access to health facility delivery; these initiatives have been successful in increasing the use of health facility deliver, however, it remains inequitably distributed [15 16].”

Results

Age - please revise the statement Line 15 About one third of women (73.9%) - the statement does not correlate with the data.

Response:

The sentence was corrected, and the statement now reads “About three-quarters (73.9%) of the women aged 15-24 years delivered at health facility”

Education - please revise the statement Line 41 to report to two decimal places (69.3)

Marital status - please revise to report all data points to two decimal places

Parity - please revise to report all data points to two decimal places

Response:
We understood that reviewer 2 seems to suggest one decimal place rather and two decimal places. Because asking for just 3 (education, marital status and parity) out of 8 variables to be reported to two decimal places would not yield consistent result reporting. Moreover, careful review of research articles from reproductive health journal revealed that one decimal place appears to be the conventional way of reporting research findings. For this reason, we replaced the rounded data points with one decimal place data points to describe percentages for education, marital and parity variables according to table 2 in the descriptive results section. For instance, regarding education: 69.3% was reported instead of using about 70% to describe health facility delivery among women with primary education.

Regarding marital status, health facility delivery for married and unmarried were reported as 72.7% instead of 73% and 71.8 instead of 72% respectively.

Concerning parity, health facility delivery among first time mothers was revised to 84.6% to replace 85% that was reported previously in the descriptive results section. Likewise, 78% was revised to 78.3% for mothers who have given birth twice while 66% was changed to 65.9% for mothers with at least 3 births.

Bivariate analysis results - please review your reporting of the data points and ensure that you are consistent with how your report OR, the CI and comparisons for each variable.

Line 22 - report data point OR related to CI and not %.

Line 56 - report data point OR related to CI and not %.

Response:

We thank the reviewer for the comments and we have revised the manuscript accordingly. Unadjusted odds ratios and corresponding 95% confidence intervals were reported, and findings described in percentage terms were corrected. For example, the sentence “The results revealed that women who had given birth twice were 73% (95%CI = 1.35-2.21) times more likely …..” was rephrased to “The results revealed that women who had given birth twice were 1.73 (95%CI = 1.35-2.21) times more likely …..”

Multivariate Analysis results – please review your reporting of the data points and ensure that you are consistent with how you report OR, CI and comparisons for each variable. It is preferable to state the OR rather than the % if you then report the CI for the OR.

Response:

We revised the paper according to the recommendation of the reviewer.
Discussion

Line 46 - please review language here - are you referring to low income settings or developing economies.

Response:

The sentence “…..maternal health programming especially in low-income and lower middle-income countries” was rephrased to “…..maternal health programming especially in developing economies”.

Take care in your reporting of the findings related to perceived need. It may be helpful to note in the discussion that you have used a proxy measurement, the sample size for this calculation was smaller and the CI for the OR from the multivariate analysis is very close to 1 (1.02) with a p value of 0.03 - please be careful not to conclude too strongly on this finding.

Response:

We agree with the reviewer and we revised the reporting of this result accordingly. The limitations of using this proxy measurement were also acknowledged in the discussion section under the study strengths and limitations heading.