Author's response to reviews

Title: Empowerment and Adequate Use of Antenatal Care among Women in Ghana: A Cross-Sectional Study

Authors:

Heather Sipsma (sipsmah@uic.edu)
Angela Ofori-Atta (angela.oforiatta@yahoo.com)
Maureen Canavan (maureen.canavan@yale.edu)
Christopher Udry (christopher.udry@yale.edu)
Elizabeth Bradley (elizabeth.bradley@yale.edu)

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Referee 1

Comment 1
The outcome indicator was based on the number of antenatal care visits. It is very likely that the course of pregnancy, physiological or pathological, is associated with both, the number of antenatal visits and also with the empowerment indicators. In fact, these indicators could be an expression of socio-economic deprivation which is usually associated with worst health status. To the extent these associations do exist, a bias could occur. Women with pathological pregnancies should be excluded from the analysis, also considering that maternal mortality in Ghana is so high.

Response
We understand the reviewer’s concern and have added the following sentences to the limitations, as the data needed to differentiate high-risk/pathological pregnancies from low-risk/normal pregnancies were not available (P. 11):

…we could not exclude women with pathological or high-risk pregnancies; the existence of such could be associated with both her number of antenatal care visits and empowerment, thus potentially confounding our results. We believe, however, that this confounding would potentially bias our results towards the null as pathological pregnancies are likely associated with higher numbers of antenatal care visits and lower levels of empowerment.

Comment 2
Particularly relevant is considered by the AA the interaction found between women education and empowerment; this result is emphasized in the abstract and in the conclusions. A significant association between physical abuse and adequate antenatal care among not educated women was found (OR=0.01, 95%CI=<0.01, 0.11). The confidence limits need to be clearly defined (what does
it mean <0.01??). The OR of "inadequate" care would be OR=100 (1/0.01) with 95%CI from 9.1 to a value that is >100?, 1000?..2000? A so large CI and also a not clearly defined CI are critical points which may indicate a problem with data.

Response

We thank the reviewer for pointing out these extreme values in the odds ratio (OR) and the confidence interval (CI), which has led us to thoroughly check our data and our analysis. After changing the outcome to "inadequate antenatal care" as suggested in Comment 8 (please see below), the estimates describing the association between physical abuse and inadequate antenatal care among women with no formal education are OR=84.37; 95% CI = 3.96, >999.99. The large OR and the extreme upper bound of the confidence interval are due to little variability in the data. In other words, among women who received no formal education, very few were victims of physical abuse and received adequate antenatal care. Despite low variability, we believe it is acceptable to maintain these variables in the model [Allison. (2008.) Convergence failures in logistic regression. Accessed 8/19/2014 at www2.sas.com/proceedings/forum2008/360-2008.pdf].

Furthermore, our model demonstrates adequate fit (Hosmer and Lemeshow test p-value = 0.22 and C-statistic=0.78), and it does not appear unprecedented to present these extreme values for confidence intervals in BioMed Central publications [e.g., Boyer et al. (2011). Severe community-acquired Enterobacter pneumonia: a plea for greater awareness of the concept of health-care-associated pneumonia; BMC Infectious Diseases; 11:120]. We, however, defer to the editor if additional changes are needed.

Comment 3

In all tables the absolute numbers of subjects should be inserted to allow the reader to understand and correctly interpret the results. In particular, the absolute numbers should be inserted in Table 2. In Table 3, it would be useful to add a column with the absolute numbers of subjects and a column with the percentage of adequate (or not adequate) use of antenatal care for each category of the listed variables.

Response

We appreciate the reviewer's comment and agree that knowing the sample size for each analysis is useful information. We included the unweighted number of subjects in each of the table headings; however we did not include the absolute numbers alongside the percentages throughout the tables, because the analysis is weighted such that the numbers of participants do not directly translate to the percentages presented. We believe we have used the most common way to present these data, but we defer to the editor if an alternative approach is preferred.

Comment 4

In Table 1, the wealth quintiles are listed, but this variable is never mentioned in the text. Why is that? This could be one of the most important factors to be taken
Response

We thank the reviewer for highlighting this oversight. We have thus added a description of the wealth quintiles in our Measures section, under “Socio-demographic characteristics” on P. 6 and have described the wealth distribution in our Results section on P. 7.

(P. 6)

We also included overall wealth which was estimated with a 5-level household asset index constructed with principal component analysis of groupings of durable assets and living conditions (e.g., ownership of a refrigerator or computer and if the household uses safe roofing material or electricity for cooking or lighting) [20, 21].

(P. 7)

Wealth was fairly evenly distributed across the sample.

Comment 5

The 95%CI of OR for physical abuse in the abstract (0.08, 0.76) is different from that in the table (0.08, 0.076).

Response

We thank the reviewer for pointing out this inconsistency and have ensured that inconsistencies have been eliminated.

Comment 6

To standardize the Table 2, in the last two rows the lines for emotional abuse=no and physical abuse=no should be deleted.

Response

We agree and have deleted the lines as recommended.

Comment 7

Why in the “sample population” session there are so different numbers of households: row 56: over 4000; row 63: 5009?

Response

We thank the reviewer for this comment and have deleted the first mention of the number of households (“over 4,000”) to remove this discrepancy.

Comment 8

I think that the association would be more easily interpretable by using the odds of “inadequate” care instead of odds of “adequate” care. For example, women who experienced physical abuse are 4 times more likely to have “inadequate” care compared to women who have not experienced this abuse:

OR= 4 (1/0.25), 95%CI= 1.32, 12.5.
Response
We agree and have modified the text and tables throughout the manuscript to reflect this suggestion.

Comment 9
Is information on the time of the first antenatal visit available? It would be a better indicator of adequate prenatal care.

Response
We understand the reviewer’s comment; however, we preferred to use the World Health Organization’s definition of “adequate antenatal care” for the basis of our analysis, which does not take into account the timing of the first visit. The World Health Organization recommends at least four antenatal care visits throughout a woman’s pregnancy in order to ensure a safe delivery.


Comment 10
The empowerment indicators are not standard measures. The AA indicate two references for these measures, both are studies conducted in India. To what extent these measures are valid in different cultural context?

Response
We agree that the empowerment indicators are not necessarily standard measures, although we believe that these are measures commonly used in the literature. To address the reviewer’s comment, we have added the following to the limitations in our Discussion section, P. 11:

…although we attempted to use several constructs to measure empowerment based on prior literature taken primarily from Asia and East Africa, it is not clear to what extent these measures are generalizable to Ghana. Future efforts to validate measures of empowerment for Ghana or West Africa generally are warranted.

Comment 11
Was, the variable "partner control index", used in the logistic model? There are no comments on this in the text.

Response
No, the partner control index was not included in the final logistic model as it was not significant in this multivariable model. We have modified the text on P. 8 in order to clarify the empowerment variables included in the final model:

In our multivariable analysis, only one empowerment variable, physical abuse, was independently associated with inadequate use of antenatal care.
Comment 12
I have some doubts about the strategy of building the model. I think I would have kept the socio-demographic variables and the variable "overall health", although not statistically significant, as was done for the variable "education."

Response
As recommended, we included all socio-demographic variables in our multivariable logistic regression model and have updated our Statistical Analysis section (Pp. 6-7; please see below; underlined is new) and our Table 3. We removed non-significant empowerment variables in the way previously described. Our results with respect to our empowerment variables remain unchanged.

We included all socio-demographic variables and then used backwards elimination to derive the most parsimonious model relative to the empowerment variables.

Referee 2
Comment 1
Although empowerment is key concept for maternal health, you did not mention about partner abuse or domestic violence (DV) concept. You have to mention about how violence against women leads to poor quality of women’s health. I recommend you to add references or guidelines about DV at the background chapter. Now I thought there are poor references.

Response
We thank the reviewer for this insight and have added the following text and reference, as recommended (P. 3):

Additionally, studies often neglect to consider experiences of partner abuse alongside other aspects of empowerment. Partner abuse is the attempt to control one’s partner by through emotional, physical, or sexual violence [14]. Evidence suggests that experiences of partner abuse may reduce the woman’s ability to use antenatal care [15-17].

Comment 2
In the background chapter you have to define partner abuse and how it is related to empowerment. It is clearer to describe the problems. You have to add key words about partner abuse.

Response
We agree and have defined partner abuse in the Background on P. 3 (please see below). We have also included “partner abuse” as a key word.

Partner abuse is the attempt to control one’s partner by through emotional, physical, or sexual violence [14].
Comment 3
The methods chapter, you have to write about ethical consideration. And if you got permission from ethical committee, then you wrote the number or the name of committee.

Response
We have included the name of the Ethics Committee that reviewed and approved the protocol, as recommended, on P. 4:

This study was approved by the Yale Human Research Protection Program (protocol number 901004605).

Comment 4
The results chapter you wrote not only %, but also the number of subjects. As for the table, you add the number of subjects for each cell.

Response
We appreciate the reviewer’s comment and agree that knowing the sample size for each analysis is useful information. We have included the total number of women included in our analytic sample in the first sentence of the Results section (P. 7):

Women in our sample (N=418) had a mean age of 31 years; and 95% were married (Table 1).

We also included the unweighted number of subjects in each of the table headings; however we did not include the absolute numbers alongside the percentages throughout the tables, because the analysis is weighted such that the numbers of participants do not directly translate to the percentages presented. We believe we have used the most common way to present these data, but we defer to the editor if an alternative approach is preferred.

Comment 5
The discussion chapter, you have to mention about the violence against women. The result showed the inadequate antenatal checkup behavior, because of abuse from partner, you have to figure out the relationship about violence against women. As for no chance to education of women, these are big problem not only health problem but also society problem.

Response
We agree with the reviewer and have included the following sentence on P.10:

Women who experience physical abuse not only experience negative physical and mental health consequences related to the abuse [23] but may also experience sub-optimal levels of reproductive health care, potentially also affecting their own and their babies’ health. Hence, antenatal care providers who care for women who are not receiving adequate care may want to consider
screening for or making provisions for additional care or services women may need due to consequences of physical abuse and low empowerment, particularly because physical abuse co-occurs alongside many other instances of partner control.

We also agree that educating these women is a substantial problem for society at large. We have emphasized this point also in the Discussion on P. 10:

Last, although improving access to education and ensuring quality educational programs may be challenging, our research suggests education may be a powerful tool for reducing the effects of low empowerment on women’s health.