Reviewer's report

Title: Postnatal Care by Provider Type: Studying Associations with Neonatal Mortality in sub-Saharan Africa

Version: 2  Date: 25 July 2014

Reviewer: Christiana Titaley

Reviewer's report:

General comments:

The research question posed by authors on the association between postnatal care services and neonatal mortality in sub-Saharan Africa is important to reduce newborn deaths particularly in developing countries. However, some major revisions are still required to improve the manuscript.

Major compulsory revisions:

1. Title: Authors might want make the title more specific and informative, e.g. by including the source of data (DHS) or method of analysis used in the study

2. Abstract:
   a. Methods
      • The objective of the analysis should be placed in the Background not in the Methods Section.
      • Please be cautious with using the word "effect". My suggestion is to keep "the association" rather than effect considering this is a cross sectional study.
      • Please clarify the type of PNC provider. Authors mentioned in the text that it is PNC within the first 7 days of life, not PNC provided ON day 7 as stated in the Abstract. Please check throughout the manuscript to ensure its consistency.
      • Please include the year of DHS used in the analysis.
      • Is the multilevel regression analysis is the multilevel "logistic" regression analysis?
   b. Results:
      • Authors might want to include the OR and 95% CI for factors significantly associated with the outcome.
      • Other factors associated with study outcomes apart from the PNC can be included briefly here.
   c. Conclusion:
      • Please be cautious and revisit the conclusion part to avoid misinterpretation that SBA is not required and only unskilled providers can enable sub-Saharan African
countries to save newborn lives.

3. Background:

- The background is too lengthy. Although it is good to have good literature research about the topic discussed in this analysis, authors can select only the most relevant ones related to the objective of the study. Some references can be used in the discussion section when comparing between the results of present analysis and previous literature.
- Authors might want to include information about the changes in the % of newborns receiving PNC by different skilled providers over time in sub-Saharan Africa.
- The objective of the manuscript can be mentioned clearer. Please make sure the objectively is consistently stated in the paper, including its association for each type of provider.
- There are some data requiring references, e.g. paragraph 1 line 3 and line 5; paragraph 2 line 5, etc. Please check the manuscript again.

4. Methods:

- Source of DHS is required.
- 1st sentence, suggestion to revise it into: ..."were pooled from ten "sub-Saharan African" countries - ....."
- Authors mentioned 31,799 samples across ten countries. What was the distribution by countries? A table might help.
- Authors needs to define the outcomes clearly, and please clarify if those "two study factors" are mutually exclusive or not? Then, are the "two outcomes" mutually exclusive? Please clarify.
- Did the main study variables refer to the "first" PNC? Please state it clearly.
- Please define the inclusion criteria clearly. Is this only woman's most recent delivery within the last 5 years? And what was the reasons for selecting this group of women? Authors had the information but they are all mentioned separately and might lead to some confusion.
- Authors needs to be specific about inclusion/exclusion criteria for each outcome. E.g:
  a. In the last sentence under "Outcome variable", authors mentioned that "... all neonates who aged one month or less were dropped from the analysis." I agree for this exclusion for neonatal deaths in the first 1 month. However, if this happens when examining neonatal deaths in the first week outcome, authors may had left out numbers of neonates born in the last 1 month who were still alive after their first day of lives.
  b. Furthermore, authors mentioned that "only women whose babies survived the first day of life were included in the analysis." This might be the best way to go for examining the association between neonatal deaths within the first week (0-7
days) and PNC on the first day. However, authors might want to consider this for examining the association between neonatal deaths within the first week (0-7 days) and PNC visit within the first week (0-7 days, if this is what authors meant). This is similar to the second outcome (deaths in the 1st month).

- On page 7, the first sentence authors wrote "The dependent variables were survival status in the first week of life and first month of life (early and late neonatal mortality)". Pls clarify this definition with all outcomes, does "first month of life" mean 0-28/0-30 days, meaning this does not refer to early neonatal mortality. Authors need to define all outcomes and key independent variables clearly.
- There are several parts that can be put in the Results section, such as the last sentence of the "Other independent variables". Pls check the manuscript again.
- Authors used "wealth quintile" as one of the independent variables. Was this the variable available in the dataset or did authors construct a new wealth index variable? If authors constructed a new variable, how was it constructed?
- Did authors use any elimination methods to come up with only several covariates showing significant results? This should be mentioned clearly. What was the level of significance used for the elimination?
- Were all analysis weighted by sampling probability?

5. Results:

- Authors do not need to explain all variables in Table 1. Authors can just mention the most interesting findings about Table 1.
- In Table 1, please correct the parity categories, should be "# 4" or "4+
- In Table 1, please provide a footnote for the definition on "skilled" and "unskilled" birth attendants.
- Authors might want to change the title "Bivariate" to better reflect the content of Table 2.
- The finding showing that PNC by skilled attendance had higher date rate than unskilled needs to be discussed later in the Discussion Section.
- For the multilevel modelling results, authors might want to write ORs and 95% CI to make the presentation clearer.
- Why are there only few covariates presented in the multilevel models? Were other variables not significant? Please make sure the process in mentioned clearly in the Methods Section.
- What about the results of the country level variance as shown in Table 3?
- Authors wrote there was "unskilled delivery in a facility"; why there were unskilled attendants working in a facility?

6. Discussion:

- I think the first paragraph is unnecessary since it is duplicating what was written
in the Results section.

- What can be potential programs that can authors to improve the involvement of traditional birth attendants and/or community health workers

- Are there any previous studies with similar findings as what authors found in this present study? If yes, were they different? Why authors think they are different?

- What are the strengths of this study?

- Please be cautious in interpreting the results of breastfeeding variable. There might be inverse causality occurred, e.g. infants might be too sick to be breastfed and he/she later died because of the sickness rather that, infants death due to the absence of breastfeeding.

- Authors might want to include discussion on other factors significantly associated with both outcomes, e.g. antenatal care and breastfeeding, briefly.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests