Reviewer’s report

Title: Proximate determinants of infant mortality in Ethiopia, 2016 Ethiopian Demographic and Health Surveys: Results of Survival Analysis

Version: 3 Date: 04 Nov 2019

Reviewer: M. Delnord

Reviewer's report:

Review

Congratulations to the authors for working hard on revising this paper. At this point, I still have some concerns on language, and some comments on content (methods and limitations).

Also, perhaps this is obvious for authors but actually it's not clear when reading the manuscript if included infants were born in 2011 and followed up for one year, or if infants were born between 2011-2015 and followed up for one year. Authors should add the actual birth years in Methods instead of saying "2826 infants born five years before the survey", and also check for time-period effects (was year included in the regression model?).

My comments are below reading linearly. When I mention "(replace)", I have tried to provide language edits/ suggestions which should replace the current text.

Abstract: please check English throughout. "to promote infant survival" not " increase the infant survival"

Title: "Results from a survival analysis" (replace current text)

P3

Background p3, line 20: "The infant mortality rate is a key population health indicator". "A high infant mortality rate can reflect poor quality of care and/or lack of access to care.

Line 35: add in which country

Line 38: upmost not upper most

Line 38: take out "Pertaining"
Line 40-43: check for spelling, typos and grammar

Line 43: hygiene not hygine

Lines 47-48: specify in which years there were declines in IMR

Line 56: "the risk of a child dying before his first birthday is higher in the African region (52 per 1000 live births), and over six times…" (replace)

P4

"In Africa, the main risk factors associated with a high number of infants deaths include: " (replace)

Line 9: add ref

Line 9: In addition, there is a higher prevalence in the region of those diseases that are infants are particularly vulnerable to such as: " (replace)

Line 14: "vary across income groups, by level of education, based on residence, maternal child bearing age" (replace)

Line 19-39: good

Line 44: check grammar - is or are if just one rate than "is"

Line 44. Take out "besides"

Line 51-52: "which accounts for a 50% reduction in the last 16 years". "Among those infants that do not survive, about 72% deaths occur before the first birthday" (replace)

Line 59: is crucial not "could be crucial" (replace)

Methods

P5.

Line 1. (...) relevant intervention strategies, that will contribute to reducing the burden of infant mortality in Ethiopia (add).

Line 1 The aim of this study was to assess the proximate, distal and intermediate determinants " (replace) - didn't you use Moses and Chen's framework to look at all three types of determinants.
I'm not sure why the title still includes just one type? Add definition for proximal vs distal vs intermediate in the text (maybe I missed it).

Line 47. The denominator in all analyses as 2628, which corresponds to the total number of infants born between 2011-2016 and followed up for one year (replace with this text if this is true)

Line 55. From "the" analysis on birth interval.

P6 line 14 "of the survey" not "during"

Check spacing line 22

Line 35-60: put in paragraph form and write sentences instead of just listing the variables and variable categories. i.e. For the distal factors we considered…

Line 60. I don't understand what you mean by the fact that birthweight was assessed depending on the mother's age/level of education? Please explain more clearly in the text.

Baby's birthweight is the same regardless of how educated the mother is technically..do you mean something else?

P7

line 1: mothers who "didn't know or could not estimate their infant's birth weight" (replace)

line 12: households "were" not "are"

line 21. Add ref

line 21 "were compiled' (replace)

line 37: We used Cox regression model in the survival analysis, statistical analyses were performed using STATA version 14 (replace)

Please add years of birth for the infants included in the study. Did you compile a 5 year mortality rate? (2011-2016), this needs to be written clearly in the text. (I would add in methods, the number of infants born in 2011,2012,2013,2014,2015) and check if there are significant differences in the number of infant deaths in these years)

line 44. Accounts for "censoring" in the data (replace)

line 46. "in" the univariate Cox regression analysis
Variables with a p-value < 0.25 in the univariate Cox regression analysis were included in the multivariate analysis. We estimated hazard ratios and their 95% confidence intervals. In the multivariate analysis, we used p < 0.05 as threshold for statistical significance.

P8

Line 41. I'm surprised at the number of infants born low birth weight: 31% seems high - could you please check or discuss this figure in the discussion compared to the literature in similar setting - this may indicate bias in mother’s recall (add in limitations).

Tables: replace label to Maternal level of education

P10.

Line 42 the infant survival probability varied by maternal level of education (replace)

Line 54-59: redundant with methods.

P11 line 7-9: sex of the child were included in the multivariate cox regression (replace)

Line 14 "in comparison", not "in relation" (replace)

Line 19: remove "Moreover"

Line 19: was "lower" not "reduced" (replace)

Line 29 "for infants both with a preceding birth interval shorter than 24 months" (replace)

line 34 take out "It showed that".

Line 37 take out "for"

Line 50 take out "of infants"

Line 52 take out "size of" (in all other instances as well throughout the text, you can refer to 'small size infants' not "small size of infants")

Line 57 take out "This was found that"

P12

Line 4 "Similarly size at birth was significantly associated with infant mortality" (replace line 4-5)

Line 12 "than for female infants" (replace)

Line 16: fitness statistic (replace)
Table 2 skip a line

Table 2: fix labels "maternal level of education" + Size of infants at birth (add birth weight categories in grams in the table) + Breastfed "at" birth (not upon)

Discussion

P13. Line 52 Replace 'is being emphasized' with "is a global priority"

P14 Line 16 this study on 'the' proximate determinants (replace)

Line 26 were statistically (replace)

Lines 32-44: In this study, about 4.8% of infants died before their first birthday. Infant were most at risk during the early months of life which is when approximately, 65% of infants deaths occurred. We found that the infants mortality rate in Ethiopia is relatively higher than the one reported in Tanzania. In Tanzania, about 96% of infants survive their first year, and 56% of infant deaths occur during the neonatal period. This difference could be due to poorer antenatal care practices, and short follow up time for the infants. (replace).

Line 50: In this study, infants of mothers with a higher level of education or secondary education had a lower risk of infant mortality (32 and 41% respectively) compared to the reference category. (replace)

Line 52 Another study conducted (replace)

Line 58-59 was significantly associated with child survival (replace) which contributes through different mechanisms (not informative).

P15

Line 4: A study by Mustafa et al. showed that Kenyan mothers with a higher level of education have a better socioeconomic status, tend to be more aware of good childcare practices and their child's health status. (replace)

Line 6-11 this is redundant with results and should not be in the discussion, rephrase and summarize

Line 14 this finding is (replace)

Line 16 less than two years (replace) not "below"
Line 20-1 in which infants of mothers with a higher level of education were less at risk of dying during infancy (replace) compared to the reference category.

Line 27 A previous study conducted using the EDHS2011… (replace)

Line 29 "singleton" not singleton

Line 42 "high-risk pregnancies" not births

P16

Line 27 "this study also showed that the size of the child at birth was significantly associated with infant mortality" (replace)

Line 32 showed that small birth size was associated with a (replace)

Line 37 poor nutritional status may influence size at birth and thereby could affect the risk of infant mortality as well. (replace)

Line 40 "was a significant risk factor" not "had significant"

Line 42 Another study in Ethiopia (replace) (…) this is also supported by other studies in which (replace)

P17.

Limitations: Authors need to check the reviewers' comments and elaborate more than this on the limitations of the study. Writing line 4 "inconclusiveness of important variables" as a limitation is really not informative - please explain why these were inconclusive using standard epidemiological terms on bias (recall, selection, etc…)

Please also discuss age-period and/or cohort effects in the limitations, and how these might affect the results. Have there been changes in ANC policies between 2011-2015 that might affect differently babies that were born in 2011 vs babies born in the later period.

Line 9 "might have had an effect on the strengths of the associations that we observed, as well as on the accuracy of our estimates as indicated by their confidence intervals" (replace)

Conclusion: please revise language and check for typos and grammatical errors. I have gone through most of the text already, this was quite tedious. Please ensure that all abbreviations are described in the text also.
Line 24: "was significantly associated with" not "had significant association"

Figure 1 Flowchart is too succinct and not informative. Please check that the steps described in the Methods section are reflected in the chart.

Figure 3 Add (Ns) + check title and add how long the follow-up was + years of birth of children included in the study.

Figure 4. Will you print in color? Because as is the difference between the lines by size at birth is hard to tell. Add medians for survival in each risk category (see http://sphweb.bumc.bu.edu/otlt/MPH-Modules/BS/BS704_Survival/BS704_Survival_print.html)

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Please indicate how interesting you found the manuscript:

An article whose findings are important to those with closely related research interests

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Please indicate the quality of language in the manuscript:

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