Author’s response to reviews

Title: Household, maternal, and child related determinants of hemoglobin levels of Ethiopian children: Hierarchical regression analysis

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Response to reviewers
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Household, maternal, and child related determinants of hemoglobin levels of Ethiopian children: Hierarchical regression analysis

Dear Editor,

First, we thank you for the opportunity to revise the manuscript. We are grateful for the time and effort the reviewers put on our work. Their comments have indeed helped us in improving the manuscript.

We have addressed all comments and revised the manuscript accordingly. Details of our response and changes made are provided in bullet points in front of the comments. The main changes made based on the comments are yellow highlighted in the revised manuscript. The document has also been format edited as per the journal formatting. In case it is easier for handling, we have also attached our “response to reviewers” as a supplementary file.

We thank you for the support and cooperation.

Best Regards,

Authors
Reviewer reports:

Lewis Li-Yen Hsu (Reviewer 1):

Response: We thank the reviewer for the comments. We found all comments valid and relevant. Thus, we have incorporated all points in the revised manuscript. Please find below details of our responses, in front of the comments.

1. This is a cross-sectional study examining determinants of hemoglobin level of Ethiopian children 6-23 months old, including household, maternal and child factors using hierarchical linear regression analysis of data gathered in the 2016 Ethiopian demographic and health survey (EDHS). It is presented well but would benefit from just a bit more clarification in the areas specified below.

   a. Page 6, line 41-42, states “More information about the survey methodology is found elsewhere.” Should state where this information can be found.
      - Response: The statement provided, with a reference. Page 6, lines 41-44.

   b. Page 13, lines 1-20: This statement about iron supplements seems too strong and too provocative “Our findings were in contradiction with existing public health recommendations.” Please consider rephrasing this sentence like “At first glance, our findings might appear to conflict with public health recommendations” Firstly, the authors go on to discuss 4 possible explanations why these data are not contradictory - these 4 nutritional insufficiency scenarios actually remain congruent with public health recommendations. In addition to these scenarios, other interpretations are possible for their finding that Iron supplementation was not associated with Hb level (page 10, line 40). Ongoing blood loss (e.g. from helminths), plumbism, or hemoglobinopathies are other potential etiologies for anemia that could be refractory to iron supplements.
      - Response: We have rephrased the statement as the reviewer suggested. Page 13, lines 8-13.

   c. Page 14, lines 52-59. Another limitation is that hereditary anemias are not considered in this discussion. The omission of hemoglobinopathies from the study is justified by data that the incidence is low for sickle cell and beta thalassemia in most of Ethiopia. Amare Deribew, Gizachew Assefa Tessema, Kebede Deribe, Yohannes Adama Melaku, Yihunie Lakew, Azmeraw T. Amare, Semaw F. Abera, Mesoud Mohammed, Abiy Hiruye, Efrem Teklay, Awoke Misganaw and Nicholas Kassebaum. Trends, causes, and risk factors of mortality among children under 5 in Ethiopia, 1990-2013: findings from the Global Burden of Disease Study 2013. Population Health Metrics, Advancing innovation in health measurement 201614:42. https://doi.org/10.1186/s12963-016-0112-2
      - Response: We have incorporated the reviewer’s suggestion by including the following statement as an additional limitation of the study. Page 14, line 57 to page 15, line 3.
         “…. we did not consider hereditary anemias in the study due to the lack of data in the dataset we used. However, it is less likely that our findings were affected by the lack of inclusion of hereditary anemias because the incidence of hereditary anemias is generally low in Ethiopia.”

2. Minor critique:

   a. Page 2, lines 8-9, consider changing “under-5 children” to “children under five years old”
      - Response: Comment incorporated, throughout the document.

   b. Page 2, line 15-16 “infant” should be plural- “infants”
      - Response: Comment incorporated, throughout the document.
c. In the abstract on page 2 in the first line of the results section (lines 34-35), households are referred to as “better off.” It would be important to distinguish what factors were used to determine this status.
   - Response: “Better off” has now been replaced by “rich household wealth category”. Page 2, line 37.

d. Page 4, line 11, “children are of particular concern: developing…” The colon (:) should be a comma (,)


e. Page 4, line 16-17, “infant” should be plural- “infants”
   - Response: Comment incorporated, throughout the document.

f. Page 4, line 18-19, remove the word “aged,” as it is redundant

g. Page 4, lines 26-29, remove “originating from various levels” or clarify what is mean by “various levels”
   - Response: “originating from various levels” has now been removed. Page 4, lines 26-27.

h. Page 4, lines 33-39 beginning with “Iron deficiency has been often considered…” and ending with widely held presumption.” These sentences don’t flow very well. Consider re-wording. “While iron deficiency has long been considered the single greatest factor contributing to anemia, accounting for almost 50% of anemia globally, recent reports suggest that iron deficiency is not as significant a culprit as was once thought.”
   - Response: Comment incorporated by adopting the reviewer’s suggestion. Page 4, lines 33-39.

i. Page 5 lines 12-15 Instead of “despite,” sentence could read “While some studies are available on the determinants of anemia or Hb level in Ethiopia, most studies did not account for the hierarchical nature…”

j. Page 5, line 29 “of the” is stated twice

k. Page 6, line 1-2, typographic: EDHS 2006 should say EDHS 2016

l. Page 6, line 9-10, no comma is necessary after “every five years”

m. Page 6, line 27, write out the abbreviation EA at least once to introduce that it stands for Enumeration Area. Otherwise, “Enumeration Area” appears only in Figure 1.
   - Response: We now have defined EAs where it was mentioned first. Page 6, lines 27-30.

n. Page 7, lines 9-10, should read “was carried out using…”

o. Page 7, lines 9-12, sentence “Residence altitude was measured and used to the Hb” does not make much sense. Please clarify.
p. Page 8, lines 51-56, the first sentence of the Analysis section has confusing wording. Consider re-structuring the sentences.

q. Page 8, lines 17-23, regarding history of infection- note here that this was self-reported
   - Response: Comment incorporated. Page 8, lines 22-25.

r. Page 8, lines 37-40, explain the abbreviations MDD and MMF
   - Response: Comment incorporated. Page 8, lines 42-52.

s. Page 9, line 12-15, the word “constructed” is repeated. Also, Victoria should be capitalized.

t. Page 10, lines 4-5 states (146.74%), should be 46.74%

u. Page 10, lines 12-13, could be useful to state the Hb cutoff used for determining anemia
   - Response: Comment incorporated. Page 9, lines 60-61.

v. Page 11, lines 24-28, could state “current breastfeeding …. Compared with those not currently breastfeeding,” instead of current breastfeeding (yes) or (no)

w. Page 11, lines 30-38, After Adjusting for covariate factors (place of residence…… prior to the survey) did not demonstrate significant association with Hb level (P>0.05)

x. Page 11, line 52-53 “household factors found to be associated with Hb level…”

y. Page 12, lines 24-27, “because of possibly due to limited the fact that health-enhancing practices and options are often limited among the poor”

z. Page 12, lines 31-39, the sentence starting with “This would be likely due to…” is confusing and could be re-worded for easier readability.

aa. Page 13, lines 44-45 “previous reports that showed Hb level to be influenced by”

bb. Page 14, lines 32-33 “biomarkers;” should be “biomarkers:” Change the semicolon to a colon.

cc. Page 15, line 19-20, “potentially” should be “potential”

   - The reviewer is much thanked for his/her help in improving the manuscript.
Grant J. Aaron (Reviewer 2)
- Response: We thank the reviewer for the comments. We have incorporated the comments in the manuscript. Please find below details of our responses, in front of the comments.

General comments:
Title: …hemoglobin levels…
- Response: Comment incorporated.

Abstract:
We analyzed data from a nationally representative …

Instead of saying only 28% were not anemic suggest saying that 72% were anemic.
- Response: Comment incorporated. Page 2, lines 34-35.

Discussion page 13 line 2. .. iron supplementation…
- Response: Comment incorporated.

Specific comments:

It’s mentioned but still not clear how this study differs substantially from the EDHS report? This should be further elaborated.

- Response: We have now added additional rationales for the study. Page 5, lines 12-49
- With regard to the difference with the EDHS report: DHS reports are descriptive, providing only prevalence information. They do not provide analytic information, for example on the level of association of predictor variables with an outcome variable of interest. In terms of anemia specifically, the DHS reports provide information on the magnitude (prevalence) of anemia by various sociodemographic factors like age, sex, region, etc. It doesn’t provide information on predictors of anemia or the association of the dietary and non-dietary factors with Hb level. For example, DHS provides the mean Hb levels by sex, but it doesn’t provide information if sex is associated with the Hb level or not. Thus, further analytic studies are necessary to determine whether a variable is linked to Hb level and to what extent linked if the link presents.
- The reviewer is much thanked for his/her help in improving the manuscript.