Reviewer's report

Title: Anemia and its associated factors among school-age children living in different climatic zones of Arba Minch Zuria District, Southern Ethiopia

Version: 0 Date: 06 Dec 2018

Reviewer: Patrick Mcgann

Reviewer's report:

The authors did an admirable job revising the manuscript and responding to the comments of the reviewers. However, there are remaining concerns, many of which are related to the definition of "school aged children" and the analysis of the data. These comments are detailed below.

1. Abstract - the authors state that the "prevalence of anemia was 146. Prevelance is a proportion/rate and should be reported as a percentage or proportion and not as absolute numbers. In the same sentence, the authors state that 146 had anemia and that 110 had mild and 35 had moderate anemia. Did one child have severe anemia? It would also be helpful here to define moderate and mild anemia in parenthesis. For example XX children had mild (Hb XX-XX g/dL) and XX had moderate (Hb XX-XX g/dL) anemia.

2. In the first line of the introduction, the authors state that under-nutrition is a cause of high child mortality. The authors should supply a reference. Also, for a paper about anemia, it makes most sense to begin the paper with a comment about anemia rather than under-nutrition. In fact, this whole first paragraph does not flow well going from under nutrition to overall mortality to school enrollment without discussion of anemia. The authors should consider revising the Background section to flow more naturally.

3. In the second paragraph of the introduction, the authors state that "more than 40% of SAC in developing countries suffer from anemia," but then state later that "the prevalence of anemia in SAC in Ethiopia is 23-38%." These do not seem to make sense when put in the same paragraph.

4. The authors state that anemia can cause "reduced muscle function" but not mention the effects of anemia upon growth, development, and energy level, which are likely more important in children than muscle function.

5. The authors state that iron deficiency and hookworm are contributors of anemia, but do not mention that hookworm can lead to iron deficiency and that the type of anemia seen in hookworm infection is actually iron deficiency anemia.

6. There remain many grammatical and spelling errors that affect the overall "flow" of reading the manuscript. A careful evaluation of the manuscript, ideally by a primary English speaker, would be
suggested to improve the overall wording of the manuscript.

7. The sample size description is still not clear. Sample sizes are selected to achieve what outcome or to detect what? The 95% confidence interval and 5% margin of error is mentioned but it is not clear what the CI or margin or error are in reference to.

8. As the authors describe the definitions of anemia (page 8, lines 155-158, the reference #28 is not appropriate and in reviewing the references, ref 28 is identical to ref 30. It is suggested that the authors verify that all references are accurate and update with the current version of the manuscript.

9. In the same lines (page 8, lines 155-158), the authors appear to use standard WHO definitions of anemia but not do so entirely. For example, Hb<11.5 is considered anemia for age 5-11 and Hb <12 is anemia for children 12-14 years. But for the classification of anemia, WHO uses Hb 11-11.4 as mild, 8-10.9 g/dL as moderate, and Hb<7 as severe anemia. The authors choose different numbers with unclear reasons/references for this categorization.

10. It is not clear how the authors define school age. The standard definition is age 6-12, but in the Results, the authors state that 65% of respondents were 6-11. The title of the manuscript and the emphasis of the discussion is on school age children but 35% of samples were from non-school age children. It is not clear if the analysis focused only on these 6-11 aged children or also included the children outside of this range. It appears that all participants were evaluated, which makes extrapolation of data to only the school aged children difficult. If the focus is not entirely on school aged children, the title and overall message of the manuscript should be changed.

11. To follow-up on the above point, the data is very confusing to analyze in relation to SAC or not. For example, the authors state that 65% of the 391 respondents were aged 6-11 (by definition, SAC). This would be 254 children. Then in the discussion of anemia (line 200-201), the authors state "the overall prevalence of anemia among SAC was 37.3% (146)." If there are 254 SAC, 146/254=57%. Thus, the reported data is not anemia among SAC but anemia among the entire cohort, 146/391=37.3%. This clarification of the definition of SAC affects the entire manuscript and needs to be resolved with possible repeated data analysis to make the conclusions more clear.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

No

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Unable to assess

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

No
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I am able to assess the statistics

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