Reviewer’s report

Title: Determinants of Underweight, Stunting and Wasting among Schoolchildren

Version: 8 Date: 17 September 2014

Reviewer: Susan Tanner

Reviewer’s report:

Major Compulsory Revisions (which the author must respond to before a decision on publication can be reached)

Thank you for the revised manuscript. The authors have addressed several of my suggestions, but several questions remain. Additionally, because the manuscript now includes additional information, several new questions emerged with respect to analysis and results.

1. Descriptive data for household food security, personal hygiene scores, and nutritional intake variables are not presented in the manuscript. This would include overall % of children/households in each category or mean (SD) as appropriate, likely in Table 2. Because they are all discussed in the results/discussion, it would be valuable to have the overall patterns also included in the results section.

2. I still have some questions about correlation between variables in the multivariate regression models. It remains unclear if Helminthiasis, Ascariasis and Trichuriasis are intercorrelated variables. It seems that they would be given that Ascariasis is the most common helminth, so the majority of children who are positive for Helminthiasis would also be Ascariasis positive. This might present a problem of intercorrelation if they are all included in same regression model as indicated in Table 3-5. Please address how data analysis dealt with the potential problem of correlated variables.

3. Finally, Tables 4 seems to indicate that only children considered “stunted” but not those with severe stunting are marked as undernourished in the multivariate analysis. This is based on the numbers of children who are stunted in table 4 (15 in the 7-9 age category and 99 in 10-14 which is n=114 total, consistent with the number of stunted in table 1). However, where are children who are severely stunted (n=46)? The same pattern appears to be presented for underweight (only the 42 children in the -2 to -2.9 z-score range are noted as underweight in Table 3 and wasting (Table 5). Please clarify as it seems the ‘severe’ categories should be included as undernourished.

4. Finally, the initial suggestion to expand and clarify the interpretations of odds ratios for the food security variable remains. In both the abstract and the results sections, discussion of the AOR could be clarified and expanded. For example, the results state household food insecurity status (AOR=3.9; 95% CI 1.8-8.3) and maternal education are independent predictors for height for age (p. 12, lines 277). However this AOR is the increased risk of children living in severely food...
insecure households over that of living in a food secure household. Table 4 indicates that children living in moderately food insecure households have an even greater risk of being stunted compared to children living in food secure households after adjusting for other factors in the model. This non-linear pattern is consistent throughout all models, and it would be worthwhile to discuss.

5. The article contains many grammatical errors and it is essential that the article be proof-read and edited for English grammar.

6. The order of the tables and figures is inconsistent. Figure 1 should be the first figure discussed (currently the sampling strategy figure 2 is discussed first so it should become Figure 1). Table 1 should be discussed before Table 2, etc. Currently, I believe there are errors in Table numbering. Please correct. Additionally, I am not certain that the current Figure 1 (Conceptual framework) is critical to the manuscript because it is not discussed in any detail. Because the study does not confirm all of these factors and pathways, the figure is somewhat confusing. Consider integrating additional discussion of Figure 1 or consider possibly removing.

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

1. Table 1: Please include SD for average Z-scores (Height for age, BMI, and Weight for age). The column heading “No (%)” isn’t correct for all the lines as some are mean(SD) values, so it might be best to indicate what the data is on a line by line basis. Additionally, the title states that this includes children 7-14 years of age, but the footnote indicates only over 10 years of age. Please correct.

2. Table 5: The value 1 is missing for several rows indicating that it is the reference category (No ascariasis, no hookworm, no trichuiasis, etc)

3. Trichuris trichiura should be consistently capitalized.

4. Page 12: lines 268-271. There are multiple topics in this paragraph and no clear introductory sentence for the paragraph. Consider dividing this paragraph into several paragraphs.

5. The new discussion of “Operational definitions” is valuable. However, now that Table 1 and 2 contain descriptions of many of the key variables, some of the information is redundant. For example, Table 1 contains definitions of stunting, wasting, and under-weight. Information on large, medium and small family size is clear in table 2. Therefore, please consider if many of these definitions could be reduced in the main text.

- Discretionary Revisions

1. Are the results consistent if the continuous z-score values are used as the dependent variables in a multiple regression model instead of the logistic regression models with bivariate indicators of underweight, stunting, and low BMI for age?

3. Discussion, Last paragraph of the first page. Do the authors have information suggesting that T. trichurias is more likely to be chronic than the other infections?
Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Not suitable for publication unless extensively edited

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:

I declare that I have no competing interests