Author’s response to reviews

Title: Household food insecurity and symptoms of neurologic disorder in Ethiopia: An observational analysis

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Author’s response to reviews: see over
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Dear Dr Norton:

Thank you for the review of our paper. We are grateful for your and the reviewers' thorough read and edits, which we believe has led to an improved manuscript. We have, in this revised version, addressed all reviewer comments and summarize our edits to the MS below.

Reviewer 1:
Comments to authors on “Ethiopia: Food Insecurity and Neurologic Disorder” This is a very nice study that addresses important public health issues, described in a very well-written manuscript. It also makes an important contribution to the overall state of understanding about food security and its relationships to health outcomes. I have some small editing-type suggestions that you need to consider and deal with, and one larger technical statistical issue. I will list the small editing issues first, then the larger statistical issue. Generally I would like to see your study published, but you need to do some editing, and deal with the larger technical issue. This may require both minor and a somewhat more extensive revision.

We appreciate the reviewer's critical review of our work.

Minor essential revisions
1. In Background, in the first paragraph at the 4th line of text; it appears that a reference number is left without brackets.

This typo has been addressed in the present version of the MS.

2. In Background, in the second paragraph at the 4th line of text; please change the word “suggest” to “suggests”.

This word has been changed in the present version of the MS.

3. In Background, in the third paragraph at the 2nd line of text; I would change “an ND” to “a ND”.

This word has been changed in the present version of the MS.

4. In Methods, Sample, in the third paragraph at the 1st line of text; it seems to me that you should reverse “cohort baseline” to “baseline cohort.” That wording makes more sense to me, unless you have a specific reason for the current word order.

These words have been adjusted in the present version of the MS.

5. In the same paragraph at the 5th line of text; I suggest you change “children were unable to be located” to “children could not be located”.

These words have been adjusted in the present version of the MS.
6. In Methods, sub-section Survey Domains, first paragraph at the 3rd and 4th lines of text; please consider whether the wording “because food ran out or money was not enough to buy food in the last three months” is exactly consistent with the food security scale wording. In my experience food security survey researchers are encouraged to connect the lack of access to sufficient food specifically with inadequate household resources. Thus the condition “food ran out” would be specifically connected to “money was not enough to buy food.” Not doing so appears to leave open the possibility that household resources were sufficient but for some other reason household members were unable to obtain sufficient food (e.g., were too busy, etc.). This may seem like a minor point, but it is one that I believe is important. You can easily fix the situation by simply changing “food ran out or money was not enough to buy food” to “food ran out and we did not have enough money to buy food”. The general assumption is, I believe, that if the household has sufficient money, they can buy food unless there is no food to buy. In that case the nature of the problem changes to one of community food insecurity instead of household food insecurity, and a different kind of question is called for.

This has been adjusted in the present version of the MS.

7. In Methods, sub-section Dependent Variables, first (long) paragraph at the 15th and 16th lines of text; please delete one of the occurrences of the word “either” from the text in parentheses.

This has been adjusted in the present version of the MS.

8. In Results, in the fourth paragraph at the 2nd and 3rd lines of text; unless I am misinterpreting your results it appears as though food insecurity is positively associated with occurrence of most NDs. If that is the case then the statement that “Low FI was associated with higher odds of each indicator” is incorrect. Would it not be low food security (high food insecurity) that is associated with higher odds of each indicator? Please check this and be sure you state it correctly.

This has been corrected in the present version of the MS.

9. In Results, in the last paragraph, in which you discuss the primary results; I urge some caution that you do not diminish the findings regarding your primary hypotheses by giving equal emphasis to the control variables. You do not state a priori hypotheses regarding the control variables, and they are not the primary focus of your study. You are testing hypotheses about associations between food insecurity and occurrence of NDs, and you develop these hypotheses in your background/introduction. The control variables are relevant only insofar as they may be confounders whose relationships with either the predictor variable (food security status) or the outcome variables might lead you to erroneously conclude associations between the predictor and outcome. Here you discuss their associations with the outcomes with equal space and emphasis as those of the predictor with the outcomes. This gives the impression they are of equal importance, and in the context of your hypotheses they are not.
In the present version of the MS, we have tailored the “Results” section to focus more intently on the central exposure of interest in our analysis, which is food insecurity. Therefore, we have removed any descriptions of the relations between control variables and outcomes of interest.

Major Compulsory Revisions
1. There is a technical/statistical issue that you need to address. If I understand your design correctly, you have data on 450 husband-wife pairs, and you have food security and SES variables that apply to both members of the dyads. I.e., both the husband and wife in each household will have the same food security scale score (and hence category), and the same SES score. If I am not mistaken, this creates a multi-level or hierarchical situation in which the variance in food security status across all 900 individuals is composed of a household-level fixed effect, and a random individual-level effect. Similarly with SES status. Using the household’s food security status and SES status for both husband and wife limits the variance for these two variables since within-household scores for these variables are the same for both husband and wife; i.e., their correlation is 1 within dyads.

In the last sentence at the bottom of page 9 you state “Adjusting for potential interviewer/group clustering had no effect on odds in any model.” Depending on what this sentence means, the concern regarding multi-level effects may have been addressed, but it is not clear that it was. I believe you should consult with a statistician to verify whether the adjustments referred to here were made to address the multi-level effects, and to obtain appropriate language to describe the adjustments and the reasons they were tested if it was to deal with the multi-level issue. You should also mention this issue in the “limitations” section, or the section in which you discuss limitations. I believe one way to deal with this issue would be to use the household as the unit of analysis instead of individuals. This would cut your sample size in half (and might affect the significance of some findings) and require modifying the ND outcome variables to make them also household-level variables by, for example, making composite variables indicating whether either the husband or wife experienced ND symptoms (or both). Another way would be to stratify your analysis sample by gender and run separate models for men and women. You may have done this already since you mention that women were more likely to report co-morbid disorders. I think the most important thing for you to do is consult with someone familiar with multi-level modeling to determine the implications of using household-level food security status and SES variables together with individual-level ND, age and gender variables. You may find that the restriction in variance for the two household-level variables is not critical and your results are correct, but you need to determine that, and to tell your readers.

We thank the reviewer for his diligent attention to our analysis. In the present version of the MS, we have, as suggested, re-analyzed among women and men separately, so as to avoid any confusion about hierarchical data structure and appropriate level of analysis.

Reviewer 2:

The study is well done and the findings are interesting and may have an important implication in
public health. There are some suggestions/comments about this manuscript.

*We thank the reviewer for the continued interest in our MS.*

Major Compulsory Revisions

1) Please give the cut-off point used to define FI in the current study. Was the standard cut-off point used? If so, whether is the prevalence of FI in this sample similar with other populations with similar SES?

*In the present version of the MS, we specified cut-offs for FI categories used in analyses.*

2) Please re-group subjects into 3 or 4 categories according to their FI status and test whether there is a positive trend between FI status and risk of having ND.

*In the present version of the MS, we further differentiated our FI variable into three categories, as suggested: secure, moderate food insecurity, and severe food insecurity, allowing for comparison in odds of each outcome by degree of food insecurity.*

3) Individuals with one certain ND could have a higher likelihood to having other NDs and therefore it is important to adjust for each other in the final models. Moreover, it would be better to have an additional table to show the relationship between different NDs.

*We appreciate the reviewer’s suggestion. However, we do not feel that mutually adjusting for NDs would be true to the aims of our analysis. We were not necessarily interested in associations between FI and NDs independently, but rather FI and the range of NDs that may be associated with FI. Therefore, we feel that clustering of NDs is not a challenge to the robustness of our findings, but rather, suggests that FI and neurological syndromes, which include several neurological symptomatical findings, may be related. In order to more clearly address the question of clustering, which the reviewer rightly suggests that we consider, we have included an added table in this present version of the MS, which includes data about the degree of clustering between NDs in our sample. Through this medium, the reader can view and consider the degree and patterns of ND clustering in our sample, thereby educating the findings of our analyses.*

4) It would be also of interest to see whether there was a significant association between FI status and the number of NDs.

*We appreciate the reviewer’s suggestion. However, we have included analyses regarding the relation between FI and comorbid disorders, which we feel adequately addresses the relation of interest in the suggestion here.*

5) Whether all ND cases were confirmed by neurologists? If not, please address this in limitation section.
We have addressed this limitation in the limitations paragraph of the “Discussion” section of the present version of the MS.

Minor Essential Revisions
6) One major concern is that the investigators failed to collect dietary intake data and therefore were unable to know whether the observed associations between FI and NDs were due to malnutrition or other factors. This should be addressed in the discussion section.

We included the following in the limitations paragraph of the “Discussion” section of the present version of the MS: “Third, our covariate set was limited and therefore, there may be residual confounding of the association between FI and each symptom aggregate. Of particular note, we did not collect data about dietary intake, and therefore, it is plausible that the observed associations could be confounded by malnutrition.”

7) In a recent study, FI was found to be associated with a lower cognitive function in a Hispanics living US. It would be important to cite this study: Gao X, Scott T, Falcon LM, Wilde PE, Tucker KL. Food insecurity and cognitive function in Puerto Rican adults. Am J Clin Nutr. 2009;89;1197-1203

This important and relevant citation has been included in the present version of the MS.

8) It would be important to give more details regarding the asset index in the method section and in footnote of tables.

We have included the following in the present version of the MS, both in the “Methods” section and as table footnotes: “A set of material assets was asked of each household, including the possession of household electricity, a television, a radio, a phone/mobile, and/or tapedeck/VHS/DVD player; items were summed and household’s socioeconomic status was categorized based on whether the household was above or below the median asset ownership, which was one of the above assets per household.”

If you have any questions or comments please do not hesitate to contact the corresponding author. Thank you for your continued interest in this manuscript. We look forward to hearing from you.

Sincerely yours,

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