Reviewer's report

Title: Education and micronutrient deficiencies: an ecological study exploring interactions between women's schooling and children's micronutrient status

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Reviewer: Harold Alderman

Reviewer's report:
Comments for the authors of Education and micronutrient deficiencies.

This paper fills a gap in the literature; as the authors note, while there are various studies on the role of education in addressing stunting, there are few studies that look beyond stature to assess the association with micronutrient status. I find the conclusion regarding learning as opposed to education as well as the highlighting of the special case of iodine deficiency to be consistent with the evidence assembled.

However, I was asked to focus specifically on the econometric approach. There are always quibbles and alternatives that can be proposed. For example, it's a bit of a judgement call as to whether PPP conversion of GNI are needed or whether a five-year lag on education is adequate. I doubt that the results would be sensitive to these (and in the case of PPP, I know from my own work that it matters little). I would not recommend any further estimates if these were the only differences between the current study and others in the literature.

But, unless I misread the report, the approach here also differs from what is more or less standard in country level analysis. Wherever possible, fixed effects or first difference models are employed to control for country specific policy and infrastructure. Both references [2] and [3] use such models and in the latter case find that income elasticities vary appreciably with alternative approaches (fixed effects vs. first differences of shorter duration). This may be due to the cumulative nature of stunting or to the lag between changes in national income and the establishment of appropriate health and sanitation services or both. It may also be the case that
fixed effects matter more for the estimation of income responses that were addressed in the studies mentioned than they do for education. But the paper does not explore such models. At the least, this omission opens space for doubt as to potential biases that are relatively easy to preempt.

I suggest that, if the data permit, the models be re-estimated in first difference and/or with country fixed effects. As such models reduce variance of the independent variables and increase the errors in variable problem this may strain the data (but the use of a VIF - a technique with which I have no direct experience - seems a fair way to provide a diagnosis of the former potential issue). A Plan B if such estimates are not possible - and there should always be a Plan B - would be to acknowledge the limitation that is implied by the absence of fixed effects in the concluding discussion.

Other secondary considerations. Page 7 mentioned interactions of income and education. Of course, a coefficient of GNI*ED would, strictly speaking, not distinguish the impact of income on the education effect from the impact of education on the income effect. But the stratification seems to handle this in a clearer manner.

In various places the wording 'relationship weakening' is used for declining coefficients. These are not exactly the same concepts. One could have a smaller coefficient but one with greater precision. Would that be a 'weakening' of the relationship?

The discussion rightly distinguishes schooling from learning. While it is not necessary to cite for this paper, the authors might be interested in perusing Hanuschek and Woessmann Journal of Economic Literature 2008. Also, the published version of reference [4] in World Development 2017 illustrates that the association of education depends quite unexpectedly on the quality of school systems.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.
Yes
Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.
Yes

Are the conclusions drawn adequately supported by the data shown?
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