Reviewer’s report

Title: Migration and Child Immunization in Nigeria: Individual- and community-level contexts

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Reviewer: Stella Babalola

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The manuscript addresses an important health topic with potentially relevant implications for improving community health. However, there are some points that should be addressed to make the paper publishable.

1. Some of the references cited to support claims about the current state of immunization are older than ten years old (e.g. references 1 and 2). Things have not remained static and newer evidence is available in literature;

2. The text needs thorough editing: some sentences are incomplete and there are significant typographical errors;

3. It is not clear how the authors arrived at eight full complement of vaccinations. Counting the various occurrences of each type of vaccine gives 9 (1 time for BCG, 3 times for DPT, 4 times for OPV and 1 time for measles);

4. Theoretical framework:
   a. Description of the migrant disruption hypothesis is not clear. The authors mentioned disruption of demographic processes and then give mother’s network of social and financial support as an example
   b. It is not clear how the three concepts (disruption, selection and adaptation will be operationalized

5. Data and methods:
   a. One wonders what motivated the choice of various explanatory factors. Based on literature? Determined through evidence from preliminary analyses?
   b. It is not clear how the authors combine birth order and birth interval. The authors mentioned birth order 2 – 4. What exactly does this mean? Which birth interval is relevant here? How about birth order 1 – 2?
   c. The inclusion of birth interval as a predictors implies that women with only one live birth are excluded from the analyses. Is that correct? Not sure why the authors decided to adopt this approach;
   d. The age groupings are not equal. It is not clear why the authors decide to use these groupings as opposed to the more conventional ones;
   e. The community contextual variables are actually compositional variables aggregated upwards. There are tow potential problems with this approach:
      i. The same variables that were used to derive the “contextual” variables were also included as individual variables. This could result in multi-collinearity. Using
the non-self mean might lessen this problem;
ii. The approach is subject to atomistic fallacy or the problem of making inference at a higher level with data collected at a lower level;
iii. At a minimum, the authors should mention these problems as limitations;

6. Statistical analysis:
   a. One wonders why the authors did not consider using incremental models (for models 3 to 5)

7. Results:
   a. It is somewhat unusual to see full immunization described as a risk;
   b. The way the authors explain mother and community-level heterogeneity in child immunization is awkward. For example, a significant variance of 13.2% at the mother’s level (model 2) indicates that the variance in immunization rate across mothers remain significant even after controlling for the variables included in the model. If the authors had calculated the residual intra-class correlation (ICC), it would have shown what proportion of the variance in childhood immunization was due to (unmeasured) factors operating at the mother’s level;
   c.

8. It is not clear how the data support some of the points made in the discussion. For example, in some models, the study found that the children of rural non-migrants were more likely to be immunized than children born to rural non-migrant mothers. The authors then concluded that migrant disruption explains the findings. This is not convincing. Similarly, the fact that demographic and socio-economic variables were significant predictors of childhood immunization was interpreted as pointing to migrant selectivity as an explanation although it is not clear how many of measured socio-economic and demographic variables actually preceded the migration experience.

9. The conclusion does not appear to derive from the findings.

These revisions are essential and should be made before the manuscript can be published

Level of interest: An article of importance in its field

Quality of written English: Acceptable

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

Declaration of competing interests:

I declare that I have no competing interests