Author’s response to reviews

Title: Socioeconomic determinants of malnutrition among mothers in the Amoron'i Mania region of Madagascar: a cross-sectional study

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We thank the 3 reviewers and the editor for the comments and suggestions to improve the manuscript. We took into account the comments. The explanations according to the interviewers' requests are below.

Seth Adu-Afarwuah (Reviewer 1):

- Table 3 and 4: Footnotes were added to the tables to stating the statistical methods used.

- Table 3: 2nd cycle education wasn’t the reference category for educational level when the dependent variable was MUAC < 220 mm because there are no women with MUAC < 220 mm in this category, so OR can’t be calculated.

- Table 4: We added the level of significance for the variables not included in the models (related to likelihood ratio test to remove variable). P-values are slightly different from those presented in the previous version: they are now those derived from the LR test as specified in the methodology, while the old ones were derived from Wald’s test. The differences are small and it doesn’t change the results.
Hasina Rakotomanana, M.S. (Reviewer 2):

• Line 83: we used the guideline for Measuring Household and Individual Dietary Diversity and the Guide to Measure Minimum Dietary Diversity for Women (the both cited in reference) to develop the questionnaire about 24-hour recall. We used one questionnaire for all variables collected (dietary, socioeconomic, nutrition status, …) and we tested it. Diet diversity data collection is well described because there are several methods used in food investigations. Collection of socioeconomics variables is not detailed because we use simple question such as: have you studied? In which class did you stop studying? ….

• Line 100-101: The ten foods groups is recommended by FANTA and FAO, so we don't want to specify FAO to avoid a sensitivity issue.

• Line 108, choice of 24-months threshold: birth interval less than 24 months defines a risk of morbidity for the mother. The median of birth interval was 25 months for our study (26 months for Madagascar in 2013).

• Line 133, about indicator conversion: categorical variables with more than two categories were transformed into indicators, binary variables coded 0/1, allowing comparisons with the category chosen as reference.

• Line 133, about another model building, for example, stepwise: we used a stepwise backward selection as indicated in the text.

• Line 194-198: With these sentences, we want to ask a question «Why is there a reduction in the prevalence of malnutrition while the socio-economic status of the population deteriorates»

• Line 202-203: In this part, we only want to summarize all factors significantly related to malnutrition.

• Line 227: We didn’t find a reference for household size threshold, so we used our median value.

Additionnal comments

• This study is a part of the global analyse of maternal malnutrition in this region. We have results on maternal feeding practice (more detailed), food frequency consumption, food security and evaluation of existing interventions by the mothers. We will identify indicators which capture the situation of maternal nutriton in the region after analyzing all of the data.
• We have not discussed the economic variables even if some of them are significant in bivariate analysis because of confounding factors that make them no significant in multivariate analysis.

• Table 1: arranged according your comment

• Table 3: arranged according the comment of the reviewer 1

Barbara Stoecker (Reviewer 3):

• L. 133. Yes, it is correct that all categorical variables with more than two categories were converted into indicators

• DHS included women of reproductive age (15-49 years), so women « under the age of 20 » were between 15 to 19 years