Author’s response to reviews

Title: Concordance between estimates of acute malnutrition measured by weight-for-height and by mid-upper arm circumference after age adjustment: population-representative surveys from humanitarian settings

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Marginal improvement in concordance between estimates of acute malnutrition measured by weight-for-height and by mid-upper arm circumference after age adjustment: analysis of population-representative surveys from humanitarian settings Eva Leidman, MSPH; Alexia Couture, MPH; Erin Hulland, MPH; Oleg Bilukha, MD PhD BMC Nutrition

Editor Comments:

In addition to the reviewers’ comments, please address the following editorial concerns:

1. Clean version

At this stage, please also upload a clean version of your manuscript without tracked changes or otherwise highlighted text as this may interfere with the production process.

A clean version has been uploaded.

2. Keywords
Please remove your keywords from the title page and add them to the end of your abstract instead.

Keywords have been moved from the title page to the end of the abstract (page 2, line 28).

3. Section headers

Please make sure your section headers adhere to our editorial guidelines (both in the abstract and main text)

- Change "introduction" to "background"

Abstract section headers were changed from “introduction” to “background.” Main text title was “background” and therefore left unchanged.

4. Tables

Please remove the shading from your tables as this may interfere with the production process

Tables have been updated to remove shading.

Anna Di Sessa (Reviewer 1): In my opinion, the ms is very interesting and well written.

We thank the reviewer for her comments.

Piyush Gupta (Reviewer 2): The Title needs to be short, crisp, and eye catching. It is too lengthy at present. Also avoid declarative Title.

The title of the manuscript has been modified to the followings:

“Concordance between estimates of acute malnutrition measured by weight-for-height and by mid-upper arm circumference after age adjustment: population-representative surveys from humanitarian settings”

However, we defer to the editors on whether to use the revised or original title. We note that BMC Nutrition has previously published manuscripts with declarative titles. For example, the manuscript [Custodio et al. BMC Nutrition (2018) 4:8] that encouraged this paper was titled
“MUAC-for-age more useful than absolute MUAC for nutritional surveillance in Somalia: results from nineteen cross-sectional surveys (2007-2016).”

Reviewer 2 (Reviewer 3): PEER REVIEWER COMMENTS:

GENERAL COMMENTS: Extremely well written paper and high quality data analysis. Very interesting.

This paper is very clear in regards to the aim of the study and the methods used to address the research questions. I feel the methods is extremely detailed and from my knowledge is done appropriately. The population is large and from how it is described, extremely diverse. The results are well documented in both text and figures/tables. The only detail I feel is missing is for Table 2 when there is an indication that a model was "adjusted". The authors need to document the variables added to the "adjusted" model and if the "adjusted" model is different than the first, unadjusted or base model, these findings need to be further discussed in the discussion. In general, I was very impressed with this study, the population used, the methods, and how the paper was clearly presented.

ADDITIONAL REQUESTS/SUGGESTIONS:

I was unclear what "adjustment" was made for Table 2. Please add the variables that were included in the "adjusted" model.

The unadjusted model included only acute malnutrition (WHZ < -2) prevalence. The adjusted model additionally included: (1) stunting (HAZ < -2) prevalence, (2) the two-category age ratio (6-23 v. 24-59 months), and (3) sex Ratio (Male to Female). We have modified the text to more clearly communicate this (Results Section, page 8, lines 163-165):

"Table 2 presents regression models with prevalence of MUACZ2 and MUAC as outcomes. Unadjusted models included only prevalence of WHZ2 as a predictor. Adjusted models additionally included HAZ2, age and sex ratios of survey samples as predictors."

We have modified the discussion of the models to more explicitly compare the results of the adjusted and unadjusted models are presented in the results (Results Section, page 8, lines 169-171):

“Coefficients for WHZ2 in both adjusted models were positive and less than 1.0, MUACZ2 (β_WHZ2=0.84) and MUAC125 (β_WHZ2=0.47). Coefficients of WHZ2 in the unadjusted models were smaller but not meaningfully different than those in the adjusted models [(β_WHZ2=0.70) and MUAC125 (β_WHZ2=0.36)]."