Reviewer's report

Title: Algorithms for converting estimates of child malnutrition based on the NCHS reference into estimates based on the WHO Child Growth Standards

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Reviewer: Jana Vignerova

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The paper provides algorithms for converting prevalence of obesity and malnutrition data, based on the NCHS references to the WHO standards (for children up to 5 years). The algorithms are clearly submitted by authors with an experience in statistics, data management and with in-depth understanding of issues related to growth charts.

The idea of the data conversion is original and useful. For keeping continuity of the WHO Global Database on Child Growth and Malnutrition it is necessary to find some tools for the data recalculation. The authors submit a tool which is evidently possible to apply - except in case of the age category of infants up to 6 months.

I have no comments on the algorithms and no comments on formal presentation of the paper. My comments concern rather the new WHO standards, mainly for children up to 6 months, and their use for the database recalculation.

The authors talk about this problem briefly in the discussion. For people, who are not familiar with the WHO standards in details, this may seem a minor problem. I find it a serious problem and I demonstrate my concern in the table and comments below (data used in the table is from one of the developed countries, 90% of children are exclusively breastfed at the time of hospital discharge):

% of children - Age 0 – 6 months % of children - Age 0 – 5 years
NCHS WHO WHO
Height/ Age < -2 SD 2.3 5 3
Weight/ Age < -2 SD 0.65 6 2.5
Weight/ Length < -2 SD 1.66 12 5
Weight/ Length > +2 SD 0.02 3 5

1. The paradox is that the population of this concrete country is taller from birth than the WHO standards. The 3rd centile of length is higher than the 3rd centile in the WHO standards in all age categories, except in the category 1 to 6 months.
2. More than 7 fold increase of the percentage of underweight children in the age category 0 to 6 months after recalculation using the WHO standards is alarming.
This could result in many more children bottle fed than exclusively breastfed, UNLESS a comprehensive strategy (not only training or simple adoption and dissemination of the charts) is implemented at national level. WHO should see itself responsible for ensuring that the new standards, which were to help promote exclusive breastfeeding and to contribute to prevention of obesity, do not have the opposite effect. The same applies in case of wasting in children.

Suggestion:
Complete the paper with a table demonstrating data from one country - before and after recalculation – and with a break down by age groups. To explain possible impact of the recalculation (and its subsequent routine use in practice) for children up to 6 months (and may be even up to 11 months). Propose element of a comprehensive strategy to prevent any negative impact on exclusive breastfeeding on the 0-6 month age group.

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I declare that I have no competing interests.