Reviewer’s report

Title: State of inequality in malaria intervention coverage in Sub-Saharan African countries

Version: 0 Date: 13 Jul 2017

Reviewer: Fernando Wehrmeister

Reviewer’s report:

The manuscript "State of inequality in malaria intervention coverage in Sub-Saharan African countries" submitted to BMC Medicine is a very interesting paper that brings inequalities on malaria interventions to spotlight. It discusses an important issue on global health, since malaria is one of the major causes of infant death deaths, around 10% of total deaths. The authors evaluated the use of ITN in children and women, and other preventive and curative interventions related to malaria. A very well detailed report was made by the authors.

Major concerns:

* Although the authors did a very detailed report on the manuscript, the paper seems to be written by economist and sometimes it is hard to follow for those who do not have this background. The findings from the study could interest for policy makers, public health researchers and donors and maybe they need a friendlier way to understand the results.

* Authors calculate the estimates for each outcome using means instead of proportions. In the case of dichotomous variables, the mean would be the same as proportion, however the standard error using means will be based on normal distribution and not using binomial distribution. For concentration index this is not a problem, however for the estimates it will affect the confidence intervals. I suggest the authors recalculate the standard errors for each proportion, using binomial distribution.

* I will suggest the use of slope index of inequality for an absolute measure of inequality instead the use of difference between the poor and the least poor groups. It considers all the distribution of the wealth and not only the extremes of this distribution. Please see this document: https://doi.org/10.1371/journal.pmed.1001390

* It is not clear which strategy the authors used to determine a pro-poor, inequitable and no difference for the inequalities between countries. Did they used a statistical test? Or simple compare the confidence interval for concentration index? This should be clarified in method session.

Minor concerns:
* Did the authors perform a kind of consistent analysis of their calculated results? DHS and MIS surveys have report and the results could be compared to the calculated by the authors. Also, the Statcompiler (www.statcompiler.com) have this kind of information.

* Did the authors consider the complex sample of DHS or MICS on their estimates? If yes, it should be mentioned in the methods session.

* I suggested all tables be presented as proportion in a scale from 0 to 100%. It turns easier to understand.

* I look at figures 1 and S1 and did not understand why the marker were weighed for sample size. Why this is important? In some cases, is hard to see the confidence intervals for the measures in each country.

* I think figure 3 did not add substantial contribution and could be removed from the manuscript. Or the authors could perform the same analysis for the 30 countries included. Some confidence intervals in figure 3B are very large probably due to small sample sizes in some groups.

* Between the lines 320-331, the authors discussed limitation on the use of data from different periods. One suggestion is the use of a multilevel approach to estimate trends for the outcomes. A very interesting paper on this was recently published. Please see: http://dx.doi.org/10.1016/S2214-109X(17)30077-3

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.

Unable to assess

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

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