Reviewer’s report

Title: Single versus multivariate deprivation indices in resource allocation formulae: the case of the district resource allocation formula in Malawi

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Reviewer: Augustine Asante

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Title:
Single versus multivariate deprivation indices in resource allocation formulae: the case of the district resource allocation formula in Malawi

Purpose and interest
The paper examines whether there are differences between a single variable and a complex multivariable index of deprivation in the allocation of resources to health districts using the case of Malawi. It uses principal component analysis (PCA) for developing the multivariable index of deprivation. The subject of the paper is important; the issue of simple versus complex formula for allocating resources in the health sector has long been raised but not adequately debated, especially in the context of developing countries. This paper will contribute to filling the present gap in knowledge and may stimulate debate in other countries about what indices in a resource allocation formula are appropriate for enhancing inter-district equity. It will be of a particular interest to health policy-makers in Malawi and other African countries.

General Comments
The paper is well-structured and well-written. It is concise and easy to understand. The question is clearly defined; the methods are appropriate and adequately described. The issue itself, however, is not new as indicated earlier; it has been raised by several people although not well debated. What this paper brings to the debate is the concrete evidence from a poor country setting which has been lacking. Overall, it is a good piece of work; I only have very few specific comments for the authors to consider in revising the paper.

Specific comments
1. Page 4 (first paragraph): The authors specified four means by which health care resources are commonly allocated. In expanding on these methods they did not differentiate well between historical and bids by local governments. The four methods have to be clearly explained. Check the last part of the paragraph and revise the sentence.

2. Same page (p4 second paragraph): “Use of explicit resource allocation formulae is being widely used ….” – this sentence has to be revised/edited.
Same paragraph: “Besides, use of a formula promotes equity in the distribution, access and utilization of health care, which are some of the key determinants of health”. This is quite a sweeping statement - the use of formula may or may not promote equity in distribution of resources. There are instances where a formula is used but the allocation has not been equitable. It depends among other things on how well the formula is constituted to promote equity. In addition, utilization of health care depends on factors that have little to do with a resource allocation formula.

Same page last paragraph: “In most African countries, resources going to different districts or regions have not matched with need for health care”. Provide reference for this statement.

3. Page 5, second paragraph: “The district resource allocation formula in Malawi was reviewed in 2007/08 with a view to redressing geographical inequities in resource allocation”. Do you mean inter district or intra district resource allocation formula?

4. Page 13, last paragraph: “Most of the variables that were included in the deprivation index have been used in similar studies in developing countries except ownership of cattle and ownership of goats”. One or two examples of such studies will be useful here.

Other comments:
These issues need to be raised and discussed:
5. Ethical approval – Did you seek any ethical approval for the study?
6. Limitations – Does the study have any limitations at all?

**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.