Reviewer's report

Title: Mapping HIV Prevalence Using Population and Antenatal Sentinel-based HIV Surveys: A Multi-Stage Approach

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Reviewer: J. Ties Boerma

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This paper presents an analytical model that uses a single national population survey with HIV testing and antenatal clinic HIV surveillance data to obtain better estimates for subnational areas, in this case districts in Malawi. The paper expands an approach developed and applied to Malawi a few years earlier. I have a few suggestions which can and should be made:

A key issue is the adjustment for non-response bias. The authors focus on the national level, but the effects should also be shown at the district level, which I understand to be the focus of this study.

Adjusting for nonresponse with sociodemographic and behavioural covariates has already been shown to lead to only modest changes, especially if response rates are high, as is the case in Malawi. The paper should provide information on how this differentially impacts district prevalence rates.

As acknowledged in the paper the main variable is however knowledge of HIV seropositivity as shown in other studies, including Malawi. It would be worthwhile to consider findings from other studies – especially the Floyd et al. – and also develop estimates using assumptions about the prevalence of non-responders using those other data.

The results refer to the maps in Figures 3 and 5. Maps are nice, but it would really be important to have tables with district level results. These tables should also include survey only based estimates, as well as ANC surveillance only based estimates, as well as confidence intervals.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:

'I declare that I have no competing interests