Reviewer’s report

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

Version: 1 Date: 21 February 2015

Reviewer: Gaetano Marrone

Reviewer’s report:

Major Compulsory Revisions
- This is a prediction model. Have you tested the quality of the prediction somehow?
- You use weights. When using weights would be good to have a description of the weights distribution, among several reasons, also to check for the presence of outliers (and it is important to report what you have done with outlier weights). Can you tell something more about weights distribution?
- For the third model you use a Bayesian approach. Why you use a Bayesian approach and not a frequentist approach?
- In the joint spatial model you choose a Gamma with parameters (0.5, 0.0005). Why you choose these parameters?
- Which software you have used for the analysis?
- The number of eligible and interviewed men in the results section does not match the numbers in Figure 1.
- In table 2, I believe the title should not contain "accepted" HIV status, but should be "Effects of socio-demographic characteristics on HIV status".
-- In the first sentence of the paragraph "Data Source" is not clear, something must be missing.

Discretionary Revisions
- Would be nice to share the software codes used for creating the models

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'