Author's response to reviews

Title: Millennium development health metrics: where do Africa's children and women of child bearing age live?

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Author's response to reviews: see over
Dear Sir/Madam,

Please find enclosed our revised manuscript, now entitled ‘Mapping populations at risk: Improving spatial demographic data for infectious disease modeling and metric derivation’. We thank the editorial team for their comments and believe that the manuscript is now improved as a result.

Our responses to the editorial team’s comments are below in red:

It is difficult to understand what is being compared in order to make claims about the superior performance of subnational data. What exactly did you do for each of the two outcome metrics you use, and in particular, how did you calculate the national estimate that you use as a comparator? Please provide significantly more explanation around these issues.

We have now added significant additional text to the methods, results, discussion, figure legends and protocols S1 to address these requests and have highlighted these additions in red in the new documents. The comments are a little confusing however, as nowhere in the text do we state that utilising subnational data produces ‘superior performance’ – we are aiming to highlight quantitatively the differences that occur in switching from an assumption of age/sex structure homogeneity across a nation to accounting for the heterogeneity that exists. It is hopefully clear though, given the large differences in demographic structures that exist within nations, that accounting for this with contemporary and well-validated datasets should improve the fidelity of output health metrics that focus on specific risk groups.

Also, how much of the difference in outcome metrics is due to different data sources being used at national and subnational levels?

We have aimed throughout to limit and test the extent to which differences arise due to the datasources used, rather than the subnational information introduced. The UN population prospects data that have been used to derive national-level age/sex adjustments in many previous studies is based primarily on the same census data that we have used for most countries. Moreover, to minimize differences caused through projecting to 2010, we adjust all our population totals at the national scale to match exactly those cited by the UN, ensuring that any differences arising in output health metrics are primarily due to accounting for subnational heterogeneity. We state this on P9: ‘For both datasets, national population totals were adjusted to match UN reported numbers to ensure that any differences seen in numbers at risk were due solely to the addition of sub-national information on under 5 year old proportions.’ Finally, it is clear that the biggest potential for differences arising due to different types of
data rather than the subnational demographic heterogeneity recorded, comes from those countries for which we use household survey data to derive contemporary age/sex structures. Thus in Protocol S1 we make sure that we test the fidelity of the household-survey derived estimates against census-derived estimates where matching time periods for both exist – the results show strong correlations, indicating that the comparisons undertaken between health metrics derived using subnational versus national-level age/sex structures are likely fair ones, as the UN estimates are also based primarily on the same census data. We have put words to this effect in the new manuscript.

We hope these changes and responses are satisfactory and are happy to respond to any further requests,

Best wishes,

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