Reviewer's report

Title: Malaria Prevalence and Mosquito Net Coverage in Oromia and SNNPR Regions of Ethiopia

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Reviewer: Eline L Korenromp

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GENERAL COMMENTS
This is a well-designed, well-analyzed and well-documented study of recent progress in ITN and IRS coverage in 2 regions of Ethiopia. The comparison between parasite prevalence rates measured in the survey and malaria cases recorded in health facilities and the IDS for these regions is very interesting and supports the clinical and epidemiological importance of the increases in intervention coverage.

The discussion adequately describes the overall recent history of ITN scale-up, for Ethiopia as a whole. Important limitations and issues in the interpretation of data, such as the season of the survey relative to the malaria peak transmission season, are appropriately acknowledged.

MAJOR COMPULSORY REVISIONS:
The presentation and conclusion of the study could be strengthened if more explanation was given on the study area:
- Why was the survey done specifically here?
- How does this area of Ethiopia compare to other areas with malaria in terms of ITN coverage etc.? For example, I recently reviewed a quite similar cluster survey conducted in Tigray region, which may be published in another scientific journal later this year.
- Methods, p.5, 1st paragraph: The sampling of two regions Oromia and SNNPR and then ‘two overlapping domains based on coverage by the CDTI program’ is not quite clear. Were these 2 domains within Oromia and SNNPR, or …? I actually wonder whether these 2 other overlapping domains need at all be mentioned given that the current manuscript does not report on their survey results. On the other hand, the Discussion paragraph on p.15/16 clarifies this much better – so alternatively please merge that explanation into the Methods.
- Methods, p.4: The survey was conducted in January 2007, but pp. 13 specifies July 2006 through March 2007 as the survey period. Please double-check and make consistent
- Methods, Sample size estimation:
  - First sentence, about overlapping domains, again not clear.
- 2.0% precision: what is the definition of precision, and how did you calculate it? It would surprise me that parasite prevalence could be measured more precisely than ITN coverage...

- Does statistical ‘power’ (i.e. the probability of not rejecting the null hypothesis when in reality it holds true) not feature in your sample size calculations?

Methods, Household questionnaire (p.7): What is your definition of ‘any mosquito net’: I presume this includes, besides conventional ITNs and LLINs, also untreated nets? Please specify.

Results, Routine surveillance, p.13:
- Please define ‘reporting completeness’.
- Rephrase: ‘The ratios of P.falciparum to P. vivax differed between the regions and the indicators: being 1.4 among cases recorded in IDS in Oromia, 4.3 for prevalent infection measured in the survey in Oromia, and 2.7 in IDS and 2.1 for prevalence in the survey in SNNPR’.
- ‘the period of the survey (July 2006-March 2007) and “the year of the survey (2006-2007)”: Please double-check against specification in Methods: January 2007, or …?

MINOR ESSENTIAL REVISIONS

Abstract, Results: … but differend markedly between regions: Please state ‘…THE 2 regions…’, to clarify that the only, simple comparison done here is between (and not within) the 2 regions

Methods, Routine surveillance data: Suggest to rephrase 2nd sentence as something like.

‘In order to assess whether the survey was done in a representative year… we extracted the total annual malaria cases recorded in the IDS for Oromia and SNNPR regions over the years 2004 through 2007, and compared the resulting reported case incidence rate between 2007 and the 3 preceding years.’ ?

Discussion, p.15:
- The mean number of ITN per household increased from nearly zero…” According to p.11, you mean LLINs here?
- … the Global fund singled out Ethiopia in its 2006 annual report as a country… (Insert 2006)
- I am not sure if the data presented provide conclusive evidence of ‘good news’ with respect to the trend in IRS coverage, given that the cut-off period for spraying differed between the 2005 DHS and 2007 current survey. E.g. if in Oromia and SNNPR spraying schemes carefully alternated among houses and/or clusters so as to cover every house once per 12 months rather than once per 6 months, ‘8.5%-9.1% sprayed in last 6 month’ would be roughly the same as ‘18.5% in past 12 months’. Or…?

Figure 1, Legend: Specify in January (?) 2007.
DISCRETIONARY REVISIONS

Results, Malaria prevalence, p.12: The among-cluster variation in parasite prevalence is impressive. Could you, for comparison, say anything about cluster-by-cluster variation in ITN and IRS coverage?

Discussion, p.14:
· ‘… malaria is more PREVALENT in SNNPR than in Oromia (not: problematic).
· ‘… differences in parasite species ratio between survey and routine data’: Apart from seasonal variation, these differences may also relate to differences between falciparum and vivax episodes in treatment seeking (e.g. if a larger proportion of falciparum cases report to health facilities than vivax cases, because of more severe symptoms), or in the duration of infection – which will affect parasite prevalence in the survey (but not case incidence in the routine system.
· Suggest to rephrase last sentence: Therefore we focus the comparison on ITN coverage between our survey and the DHS on the use of conventional ITNs, using the DHS definition of …

Tables 2 & 3 could be merged into 1 table?

Level of interest: An article of importance in its field

Quality of written English: Needs some language corrections before being published

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:
'I declare that I have no competing interests'