Author's response to reviews

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

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Version: 2 Date: 16 July 2008

Author's response to reviews: see over
The Editor  
BMC Public Health  

Re: MS: 1986297233196939 - Malaria Prevalence and Mosquito Net Coverage in Oromia and SNNPR Regions of Ethiopia

Dear Editor,

Thank you very much for your e-mail of 19 June 2008 giving us the opportunity to revise our manuscript. We are also grateful for the very constructive comments forwarded by the peer-reviewers. We have addressed their comments and have revised the manuscript in line with the suggestions. Below, we have provided a point-by-point response to the comments of the reviewers.

Sincerely,

The authors
Responses to Comments by Reviewer 1: Abdisalan Noor

Reviewer's report
Title: Malaria Prevalence and Mosquito Net Coverage in Oromia and SNNPR Regions of Ethiopia
Version: 1 Date: 26 May 2008
Reviewer: Abdisalan Noor

This study reports on the results of surveys carried out in Oromiya and SNNPR zones in Ethiopia on the use of insecticide treated nets and malaria parasite prevalence. The results are impressive and the study provides useful information from an area for which such data are rare. These should be important baseline data for further malaria control activities in the two zones. The manuscript is well written and reports most of the important findings. The study appears well-designed and the analysis properly undertaken.

Minor comments:
1. In reporting the results the authors repeatedly use two dashes (--) between the lower and upper 95% CI instead of a single -.  
   Response: Corrected

2. The authors need not rewrite the full version of CDDs in the discussion when this as already being explained in the introduction. They should stick throughout with the abbreviations once the full version have been written the first time they occur in the text.
   Response: Done, many thanks.

3. On page 13, para 1, the authors write SNNPRR. I think they mean SNNPR!
   Response: Corrected!

4. At beginning of the results section, the authors indicate that ‘comparison of CDTI/non-CDTI areas will be reported separately’. One is left with the impression that this is done within the manuscript but such results are not reported. Do the authors mean that the results will be reported elsewhere in another manuscript?
   Response: That is right, and we have now rephrased the sentence accordingly (Page 10 Paragraph 1)

5. I think Figure 3 and 4(a-b) can be put into one panel of figures beginning with reported cases and then annual incidence. In any case the incidence figure should come after the cases data from which it was partly constructed.
   Response: We have now changed the order of the figures for reported cases and that of incidence (Page 13 last paragraph; page 14, paragraph 2; page 24, Fig 3 & page 5, Fig 4). The number of cases for each month has been plotted over a two-year period Jan 2006 to Dec 2007 while the incidence data is for three consecutive years from Jul 2004 to Jun 2007. Therefore, we would prefer keeping the figures separately.
6. The tables can be condensed to one table or two large tables.

Response: The comment is well taken. However, the column headings are different in each and for the sake of clarity of presentation, we found it more helpful to leave the tables as they are.

Major comment:
7. This paper provides useful information and I recommend it for publication. The authors, however, could improve the paper by reporting the protective effectiveness of the nets/LLIN against parasite infection given that they have parasite and net use data among the same individuals. This is particularly important for low transmission areas, such as the study setting, where such information is lacking. A good reference to look at in this respect will be Noor et al 2008 in PLoS ONE.

Response: Thanks for suggesting a nice reference that we have now included in our manuscript. The protective effectiveness of ITN/LLINs against malaria parasite infection and the risk factors for malaria infection have been reported elsewhere. We have now included this information in the discussion (Page 16, paragraph 2).

Level of interest: An article of importance in its field  
Quality of written English: Acceptable  
Statistical review: No, the manuscript does not need to be seen by a statistician.  
Declaration of competing interests: I declare that I have no competing interests
Responses to Comments by Reviewer 2: Eline L Korenromp

Reviewer's report
Title: Malaria Prevalence and Mosquito Net Coverage in Oromia and SNNPR Regions of Ethiopia

Version: 1 Date: 2 June 2008

Reviewer: Eline L Korenromp

GENERAL COMMENTS
1. 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.

2. 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:
3. 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.

Response: The survey was done specifically in these two regions because The Carter Center-assisted onchocerciasis program has been implemented in these areas since 2001. We have now included a sentence to clarify this (page 4, last paragraph and page 5, paragraph 1). The Ethiopian Government aimed to attain universal coverage with an average of 2 LLINs per household in malarious areas, and LLIN distribution was underway in all regions of the country during the time of the survey. Therefore, the ITN coverage in these regions would somehow reflect overall net coverage in the country although possible variations cannot be excluded depending on the distribution of LLINs to the household level during the time of survey. A similar survey in Amhara region reported slightly lower household ITN/LLIN coverage. We have now discussed these in the manuscript (page 17, paragraph 1).

4. 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.
Response: We agree with the point, and we have now included an explanation about the two overlapping domains, which are within the study regions (Page 5, paragraph 2).

5. 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

Response: Page 13 refers to completeness of the routine surveillance data collected from July 2006 through March 2007. It is true that the survey was conducted in 2007. We have now rephrased the sentence on pp 13 to clarify the point.

6. Methods, Sample size estimation:
   * First sentence, about overlapping domains, again not clear.

Response: We have now rephrased the sentence, “The sample was estimated to determine prevalence of malaria and mosquito net coverage and use within: 1) each of the two regions; 2) the CDTI areas of the two regions combined; and 3) non-CDTI areas of the two regions combined” (page 5, paragraph 3).

   * 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…

Response: By precision we meant the margin of error for 95% confidence interval. Our expected prevalence was 8% and we calculated our sample size allowing for the margin of error of 2% (which means the expected upper level of 95% CI would be 10% and the lower level would be 6%). Regarding net utilization, we assumed it would be in the range of 25% and we allowed for 5% margin of error in our sample size calculation (with the expected 95% CI of 20%-30%). We have now replaced “precision” with “margin of error for 95% confidence interval”

   * 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?

Response: As you can see from the objective of the study, the primary aim was to generate point estimates (and 95% confidence intervals) with adequate precision, and not testing a hypothesis of difference between different groups. During analysis, groups have been compared with regard to parasite prevalence and coverage and utilization of key interventions, but that was not the primary aim of the survey, neither was it considered in sample size calculation.

7. 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.

Response: That is right. We have indicated that in bracket (page 7, paragraph 2).
8. 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 …?

Response: “reporting completeness” defined (page 13, paragraph 3); The sentence rephrased (page 14, paragraph 1); and the period of survey corrected. Here, July 2006-March 2007 refers to the period for which completeness of IDS data was assessed.

MINOR ESSENTIAL REVISIONS
9. 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

Response: Edited.

10. 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.’?

Response: Rephrased (page 13, paragraph 3).

11. Discussion, p.15:
* ‘The mean number of ITN per household increased from nearly zero…’
  According to p.11, you mean LLINs here?

Response: DHS 2005 did not estimate LLIN; it measured ITN (which also included LLIN), and we have explained that in the discussion (page 15, last paragraph). But our survey estimated the mean number of LLINs. Whether LLIN or ITN the mean number was nearly zero in 2005, and that of LLIN alone in 2007 was 0.5 per household. We have now replaced it with “ITN/LLIN to minimize confusion (page 16, paragraph 1).

* … the Global fund singled out Ethiopia in its 2006 annual report as a country… (Insert 2006)

Response: Inserted, thanks.

* 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…?

Response: DHS 2005 actually estimated that 8.5% and 9.1% of households were ever sprayed (not within 6 months) with insecticide in Oromia and SNNPR, respectively. Only 2.1% of the households were sprayed with insecticide in both regions in last 6 months preceding the DHS 2005. We are, therefore, comparing “ever sprayed” (DHS 2005) against the 18.5% sprayed in past 12 months (current survey).

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

Response: Done.

13. Figure 3: Legend: Correct ‘2004 to 2007’.

Response: Corrected, thanks.

DISCRETIONARY REVISIONS

14. 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?

Response: We appreciate the suggestion. We have now included this information (Page 11, paragraphs 3; page 14, paragraphs 1& 2).

15. Discussion, p.14:
   * ‘… malaria is more PREVALENT in SNNPR than in Oromia (not: problematic).

Response: Rephrased

   * ‘… 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.

Response: Thanks for the input; we have included the sentence (page 14, paragraph 2).

   * 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 …

Response: Rephrased
Tables 2 & 3 could be merged into 1 table?

**Response:** Your point is well taken. However, as these two tables present two different issues (Net coverage at household level vs. utilization at individual level), we would prefer to leave the tables as they are.

**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'