Reviewer’s report

Title: New tools for dengue vector management: Insecticide treated materials and targeted interventions on productive breeding-sites in Guatemala

Version: 1 Date: 3 July 2012

Reviewer: Rajpal Singh R.S. Yadav

Reviewer’s report:

Major Compulsory Revisions

1. Title of the paper
   Drop the word “New” from the title “New tools for dengue vector management …”. Use of treated materials for vector management is no more new now.

2. Introduction
   Introduction, third paragraph: Provide clear information on what insecticide treated material were used. The sentence “…deployed as window/outdoor curtains (IT curtains) and 200L drum IT covers and targeting of productive breeding sites” is better rephrased such as “… deployed as window and external door curtains and covers of 200L drums, and targeting and elimination of productive breeding sites of Aedes aegypti …”. Also mention here the year(s) of the study.

3. Methods
   The study site, first paragraph, line 7: Is drinking water supplied by a pipeline? I believe households store water for their use, hence it is worthwhile to mention about water storage practices of the community and type of containers/drums used for this purpose.

   Design of the cluster randomized trial including sample size, line 3: clarify if the “buffer zones” were open spaces or houses.

   The first intervention to be tested: ITMs as insecticide treated curtains and 200L drum Covers

   This sub-title refers to use of ‘ITMs as insecticide treated curtains’ although they are made out of long-lasting insecticidal netting. Earlier the authors used the term “IT covers”; here they use 200L drum covers. To be consistent and clear, explain these devices once in detail in the beginning and then use simple terms such as treated curtains and treated drum covers, respectively.

   Line 1: The sentence “A total of 3,079 PermaNet® 2.0 curtains (100 % polyester treated with deltamethrin 55 mg/m² ± 25%) ….” is not clear. Did Vestergaard-Fransdsen supply readymade curtains and covers using the same materials that is used to manufacturer PermaNet 2.0 long-lasting insecticidal nets
? If so, clarify this and rephrase the description as: “….PermaNet® 2.0 (deltamethrin coated on polyester netting at 55 ± 13.75 mg/m2)”. The ±25% variation in chemical contents of a net constitutes a standard product specification for long-lasting nets and should be specified only if the manufacturer certified to this or if baseline chemical content of a sample of netting was determined.

Were the curtains and covers made of 75 or 100 denier netting?

Line 4: Is “dumuria” a brand name? Is it treated too? If yes, at the same dose that of curtains?

Line 10: How frequently the National services treated water containers in six clusters with temephos, and what dose was used?

The second intervention to be tested: ITMs and targeted intervention in productive containers

Description of the interventions applied is not properly written in this section. Improve the language.

Line 2: Since long-lasting nettings have a useful life of at least three years, why did they replace the old curtains? Were they lost, damaged or discarded by the households? What were the old curtains replaced with?

Bioassays for determining bioavailability of the insecticide, paragraph 1, line 11: Reference to Abbott 1925 is missing under the “References” section. In line 11, it is mentioned that bioassays were carried out in Mexico and Liverpool. Were they repeated or was the work shared?

Chemical analysis of netting materials

In intervention trials with treated nets or materials, it is important to determine the baseline chemical content of such materials to ensure that it conforms to the manufacturer’s specifications of the product. It is not clear if the chemical analysis was done at baseline? It is stated that “Other samples were analyzed at Vestergaard-Frandsen laboratories in Hanoi, Vietnam”. What were those “Other samples”? I am not sure if a standard analytical method was used in this case. Can you give reference to such analytical tests? WHO specifications for PermaNet 2.0 describe standard analytical tests to determine deltamethrin content in deltamethrin long-lasting (coated) nets (available at: http://www.who.int/whopes/quality/newspecif/en/).

Ethical aspects

Line 2: Make it clear that informed consent was obtained from heads of all participating households and not from all participants. Right?

4. Results

Characteristics of the study population, Line 1: The information contained in Figure 2 can be included in footnote to Table 1. In that case, delete Figure 2.
Line 4: Move the information on house characteristics to the section “The study site”.

The first intervention (ITMs) during the dry season and its acceptance, paragraphs 1 and 2: Authors have used the term “ITs”. What is this?

Vector breeding 6 weeks after the first intervention during the wet season, paragraph 1, last line: Table 3 should be Table 2.

The second intervention (IT curtains plus targeted interventions on productive containers) during the wet season and its acceptance: This is a long sub-heading. Moreover, treated covers were also put on the drums, which the sub-heading does not reflect. Avoid using the term ITs, which makes no sense.

There is no mention in the Results section of why old treated curtains were replaced with new ones (?) at month 17, i.e. at the beginning of the second intervention phase. What proportion of them had been found damaged or missing/removed at that time?

In 3 each of clusters where temephos was used, did it make any additional impact on pupal and Stegomyia indices.

Chemical analysis of ITs
Authors have interpreted that the deltamethrin content of treated curtain and covers showed satisfactory results. In case of PermaNet 2.0, the acceptable deltamethrin content should be 55 ± 13.75 mg/m² i.e within the range of 41.25–68.75 mg/m². Results of chemical analysis show that samples of curtain and covers tested at various timelines had very a low to a very high chemical content (when taking into account standard deviation of the mean content). Thus, many of them had deltamethrin content beyond the acceptable safety limits. Higher chemical content may pose risk to the users and overestimate performance, while lower doses make the product poor performing under operational conditions. Authors should clearly bring out this limitation in the discussion to better inform the readers and emphasize the need for use of good quality treated materials, which should be ascertained at the baseline or procurement stage.

Cost analysis of the intervention, line 4: The authors have used the term ITNs for curtains and water container covers. Use the terms consistently rather than ITM, ITs, IT curtains, IT covers, etc. Fig. 5 is actually Fig. 4. Table 5 gives all the details of costing, hence Fig 4 is unnecessary. I did not find reference to Table 5 in the text.

5. Discussion

Bioassays and chemical analysis, line 4: PermaNet 2.0 nettings are manufactured by a coating technology, therefore migration of deltamethrin content from within the fibres under sunlight exposure is not the most likely reason of increase in deltamethrin content. The variation in chemical content was
most probably due to variation in chemical content of the treated curtains and covers supplied.

6. Abstract
Methods: mention year of the study, avoid use of abbreviated terms IT or ITM; rephrase ‘coverage of windows/outdoors’ to ‘coverage of windows and exterior doorways with curtains treated with deltamethrin at 55mg/m2 and of 200L drums with similar treated material’; rephrase “larvicide” to “larviciding with temephos” and change “residual quantity of the insecticide” to “insecticidal content ..”.

Results: In the dry season, how discarded car tyres had pupae? Was it during the wet season immediately after the dry season? “Temephos in water tanks with >200L” should be “Temephos in water drums with >200L in 6 of 10 clusters”. Instead of using the term bioavailability, use “bio-efficacy of treated curtains and covers”. Clearly mention that impact was measured six weeks after the implementation of second intervention (17 months after baseline).

Minor Essential Revisions
Methods, The study site, first paragraph, line 6: correct ‘story’ to ‘storey’.
Methods, Design of the cluster randomized trial including sample size, Line 4: correct “meters” to ‘metres’.
Methods, Analysis of coverage and people’s acceptance, paragraph 1, line 5: Expand the term KAPs.
Results, Vector breeding at baseline during the dry season, paragraph 2, line 4: Suffix HI, CI and BI after their respective terms in this paragraph.
Discussion, Cost, line 3: Correct ‘stationary’ to ‘stationery’
References: Esu et al (2010) and Vanlerberghe et al. (2011) are not quoted in the text.

Level of interest: An article of importance in its field

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

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.