Author's response to reviews

Title: Assessing the acceptability of rat trap use over pesticides for health risk reduction in poor urban communities through a survey

Authors:

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Author's response to reviews: see over
2 April 2012

Response to Environmental Health Reviewers

**MS: 137762321663484 - Assessing the acceptability of rat trap use over pesticides for health risk reduction in poor urban communities through a survey**

Thank you for the opportunity to revise our manuscript and submit it to your journal. We have revised the manuscript so that it meets the requirements of a research report. We have constructed a table (appended) describing how we have responded to each of the reviewers’ comments. If there are further suggestions from the reviewers, we would be happy to address these.

**General comments from the editorial team:**

<table>
<thead>
<tr>
<th>Reviewer’s comments</th>
<th>Authors’ response</th>
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<tbody>
<tr>
<td>Please remove the note on the first page and begin the manuscript with the title page.</td>
<td>The manuscript now starts with the title page.</td>
</tr>
<tr>
<td>Only the first letter of headings should be capitalized e.g. Abstract.</td>
<td>Changes have been made to all headings to adhere to the journal’s style.</td>
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<tr>
<td>Text should be placed below the headings.</td>
<td>Spaces between headings and text have been deleted.</td>
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<tr>
<td>The first section of the manuscript should be titled Background, not Introduction.</td>
<td>The heading on page 3 has been changed to “Background.”</td>
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<tr>
<td>There should be a space between the text and the citations.</td>
<td>A space has been added between all citations and text.</td>
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<tr>
<td>The section after the Background should be Methods and the section after the Discussion should be Conclusions. The headings after the Competing interests should read Authors’ contributions.</td>
<td>Changes have been made to all headings to adhere to the journal’s style and corresponding text added.</td>
</tr>
<tr>
<td>The funding information should be included in the Acknowledgements and the Respondent consent and Ethics approval mentioned in the Methods section.</td>
<td>Funding information has been included in the “Acknowledgments” instead of as a separate section. Information about Ethics approval and respondent consent has been moved to the “Methods” section on page 5.</td>
</tr>
<tr>
<td>In the References, please list full page citations e.g. 230-241 and list all authors up to 30 names before using et al.</td>
<td>References have been corrected to adhere to the journal’s style.</td>
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<tr>
<td>In the Tables, all horizontal lines should be visible. It is important that your files are correctly formatted.</td>
<td>Horizontal lines have been added to the tables.</td>
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Reviewer: Richard W. Clapp

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<tr>
<th>Reviewer's comments – Richard W. Clapp</th>
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<tr>
<td><strong>Minor Essential Revisions</strong></td>
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<tr>
<td>1. On p. 4, lines 3 and 13, the word</td>
<td>We have changed the word “predominately” to the more commonly used “predominantly” on Page 3.</td>
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<td>&quot;predominately&quot; is typically &quot;predominantly&quot; in American usage, although there is some confusion on this.</td>
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<td>2. On p. 8, third paragraph, the risk measure is described three different ways. It would be less confusing to use parallel language, such as &quot;was strongly associated with . . . (POR=. . ., 95% CI. . .)&quot;</td>
<td>Whether the traps had caught rodents was strongly associated with the intent to use traps in the future. The willingness to buy a rat trap from an informal market. Was strongly and significantly associated with the intention to use trap. Males were 7.02 times more likely than females... to have the intention of using traps in the future. Pesticide use at the time of follow-up was strongly associated with the intention to continue using pesticides in the future (Page 7, Last paragraph).</td>
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<td>3. On p. 10, sixth line from bottom of the page, &quot;them self&quot; should be &quot;themself&quot; or &quot;him or herself&quot;</td>
<td>On Page 10, Paragraph 2, the word “them self” was replaced with “him or herself”.</td>
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<td>4. On p. 11, first line of Conclusion, the sentence could begin &quot;With climate change expected to increase. . .&quot;</td>
<td>The sentence was changed as recommended (Page 11, Paragraph 3)</td>
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<td>5. Reference 16 repeats reference 2. The place where Ref. 16 appears in the text should indicate reference 2, instead.</td>
<td>The error was corrected. The correction had an impact on all references after Reference 16 and these were also corrected.</td>
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<tr>
<td>6. Reference 27 author initial is F Kamel, not R Kamel</td>
<td>The error was corrected.</td>
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<tr>
<td><strong>Discretionary Revision</strong></td>
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<td>1. Table 1 might include the number (or %) of male and female respondents</td>
<td>This was not included as Table 1 describes respondent’s attitudes and intentions. Additional tables have been added to the Appendix where it will be easier to see the number of males compared to females (Appendix 2, Table A2).</td>
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Reviewer: Leslie London

Major Revisions

Reviewer: The main puzzle in this paper is about baseline use of pesticides for rat control. One the one hand, there are data for baseline use of pesticides buried in Table 1, as the answer to a retrospective question about use of pesticides prior to being given the trap, and no information is provided anywhere in the paper about prior use of rat traps. It is not clear if respondent households were asked at baseline about use (I suspect they were) but what would be really interesting would be to see the change in intention after use of the traps. Unless it is the case that all respondents at baseline were users or potential users of pesticides and none were users or potential users of traps, then the change in what people thought would be important to note. That would, of course, add a cohort component to the study, even though the units are households, not individual respondents. The authors should clarify if such data are available, and if not, explain the extent to which they think the finding at the follow up reflect a true change in use or intended use.

That said, the comparison of reported previous use (78%) to intended future use (29%) at the follow up (in table 1) is still impressive and worth making more of in the discussion, since it is not only the “acceptability of rat trap use” that is the focus of this paper but their acceptability “over pesticides.” The change from 78% to 29% certainly does show some preference for traps “over pesticides”, all the caveats of a cross-sectional study notwithstanding. It would have been even more elegant to have a baseline prevalence for intention to use traps.

Authors: In the baseline survey (the survey that the respondents had to complete before being given the rat traps), respondents were asked whether they were using rat traps and/or pesticides.

In the follow-up survey, respondents were asked retrospectively whether they had used pesticides before they were given rat traps (and this is reported upon in the article). Respondents were not asked whether they had previously used rat traps.

It was recommended that the data in the baseline survey and follow-up survey be kept separate because different people (from the same household) may have responded to the two surveys. This is problematic as certain questions in the both surveys relate to the individual and not the household. Nevertheless, data from the baseline survey has been added to the text below. The following sentences were added to the Discussion to emphasize the finding of the use of rat traps over pesticides.

The majority of respondents (78.3%) reported using pesticides at baseline. Although there was a significantly strong association between pesticide use at baseline and follow-up, more than half of the people using pesticide at baseline stopped using pesticide at follow-up. This demonstrates that many pesticide users were willing to give up their pesticide use and that it was quite rare for non-pesticide users to start using pesticide. Overall, just over a third (34.5%) of participants reported using pesticides at follow up and even fewer (29.2%) reported that they intended to use pesticides in the future. Of those that still intended to use pesticides, the majority intended to also use rat traps. This indicates that even when an individual is convinced of the effectiveness of pesticides, they may still be willing to simultaneously try alternatives.

In the baseline survey, only about a quarter (24.7%, n=44) of the respondents had ever used rat traps and less than half of them were using rat traps at the time of the baseline survey (n=19). With the majority of respondents (84.5%) in this acceptability study reporting
intention to use traps in the future, the results indicate a general willingness to change from using street pesticides to rat traps for rodent control. (Page 8, Paragraph 4)

**Reviewer:** The Title should reflect more closely what the project was about: It was not about ‘poor urban communities’ in general, but rather about findings from two specific poor urban communities (and I would add “in South Africa”). I do not think it necessary to have ‘through a survey’ in the title since that is the method. In short, I think a title “The acceptability of rat trap use over pesticides for health risk reduction in two poor urban communities in South Africa” would best capture the study.

**Authors:** The title has been changed to “The acceptability of rat trap use over pesticides for rodent control in two poor urban communities in South Africa”. The phrase “health risk reduction” was not included because it introduces ambiguity as the study did not ask respondents about their attitude to the health risk of pesticides. Thus this was not an overt factor in the acceptability of traps.

**Reviewer:** I don’t think the conclusion can ignore the need for better sanitation and waste control as solving the problem upstream. Vermin control at the end point can only be partially successful. While intervening on sanitation and garbage collection isn’t the focus of the paper, simply acknowledging this issue would make the paper more cogent as a Public health contribution. So, the use of rat traps could be more strongly argued if it were to take place in the context of comprehensive public health programmes to address problems of waste in poor communities.

**Authors:** The following sentence was added to the Conclusions section to acknowledge the need for waste control, sanitation and alternative methods of rodent control:

Rodent control with traps needs to occur together with public health measures aimed at alleviating the underlying factors contributing to rodent infestations, for example, through improving sanitation and waste control. (Page 11, Paragraph 3)

**Reviewer:** The authors should include as supplementary files, the questionnaire used and some of the 2X2 tabulations relating to the associations for which extremely high OR’s were presented – if only to assure the reader these Odds Ratio’s are not spurious.

**Authors:** Several tabulations and the questionnaire have been added as Additional files (Appendix 1 and 2).
<table>
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<td><strong>Minor revisions</strong></td>
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</table>
| 1. While the study concerns itself with the effects of a very specific intervention, I fear that the context in which the study was done, that of a seeming increase in urban poisonings of children with pesticides, attributable to intoxication with street-sold pesticides, referred to in references 9 and 10, is somewhat lost. Simply pointing to the potential contribution of a preventive intervention such as rat traps and the potential benefits of reducing harm in the form of acute pesticide poisoning in children, without claiming more than can be claimed from this study, would still help to situate this study better, and highlight its importance. | 1. Several sentences have been added to highlight the importance of this study: *In South Africa, similar action has not been taken even though there seems to be an increasing number of children treated for poisoning attributed to the intoxication of street pesticides [9-10, 19]. (Page 4, first paragraph)*  

*Determining which factors influence the use of non-toxic rodent control has the potential to lower the use of pesticides, especially street pesticides, and reduce the risk of child poisoning and other risks (Page 4, Last Paragraph, last sentence).* |
| 2. In the abstract,  
  a. A comment is made that ‘rodent infestations are an increasing problem’. This may be true but the paper does not present it as ‘increasing’ – rather just as a public health problem (It does warn that the problem may increase in future with Global Warming). Either the literature review in the introduction should justify why the problem can be described as (currently) getting worse, or the abstract text should be amended to remove ‘increasing.’  
  b. The Description of results used the term ‘predictor’ of trap use. Given that this is essentially a cross-sectional study, I would be more sanguine in attributing a time sequence (‘predict’) and simply use the term ‘association with ...’.* See earlier comment re lack of data at baseline. | a) The sentence in the Abstract was changed to “Rodent infestations are a public health problem...” (Page 2, Line 1)  

b) The Abstract was amended by removing the word “predictor” and replacing it with “significantly associated” (Page 3, Third paragraph, Last line). |
| 3. Methods  
  a. First line on page 6: I would describe the sampling as “Households were the units of sampling rather than individuals” rather than “Households formed the study sample…”  
  b. Systematic random sampling could only identify the household, not the adult interviewed, and it should be described in that way. Further, the authors should indicate how they selected an | a) The sentence was amended as recommended by the reviewer (Page 5, First paragraph).  

b) The section was amended to clearly identify that houses were randomly selected and an individual within that selected household was interviewed. The text reads as follows:  

*Systematic random sampling identified a* |
adult from each selected household. Was it the first adult to open the door, the head of household? Convenience selection?

c. Sample size: It would be expected to see something in the narrative of how Sample Size was estimated of an a priori prevalence estimate and an acceptable margin of error (not only mention of the size of the population).

d. Note that in the next sentence “The loss to follow up …”, the authors speak about respondents moving away, when it is actually families or households moving elsewhere. Given you did not need the same respondent at follow up visit, it is inconsistent to talk about ‘respondents’ moving away.

4. Analysis
a. It would be useful to be able to see the questionnaire to understand how use in future of traps was determined. This could be added as a supplementary file.

5. Results
a. I would cite income in values already converted to US$ and indicate they are converted values. (e.g. “… equivalent to US$x.xx…”). Similarly on page 11 in discussion, when pricing illegal pesticides, use the US$ equivalent (in cents!).

b. Again, I would like to see the results qualified by ‘reported’ such that “Most of the study respondents reported using the traps …”. Applies throughout.

c. I have to take a double take at Odds Ratios of 14.6 and 83.6. BMC allows for data from analyses to be included as Appendices and readers might want to reassure themselves these are not artefacts in estimating measures of effect. What this implies is that there is almost complete discordance in the 2X2 table for these contingencies and it would be useful to be able to

house from every tenth house starting from the local community centre in each area. The household head or adult at home was interviewed after obtaining written consent (Page 5, Paragraph 3).

c) The following text was added: A sample of two hundred households was selected, without a formal sample size calculation, as a practical sample size that would yield useful information (Page 5, Last paragraph).

d) This section was amended to be consistent. It now reads as follows: The fieldworkers were given addresses to locate the 199 selected houses. From these houses, it was possible to locate 175 of the families that had taken part in the baseline study. The loss to follow-up was due to one questionnaire being misplaced and some families moving elsewhere. It was not required that the same respondent be followed up, only that they were from the same family that was given the rat trap (Page 6, Paragraph 1).

The questionnaire has been added as a supplementary file in Appendix 1.

a) Converted US$ have been cited as recommended. (Page 7, Paragraph 2 and Page 11, Paragraph 2).

b) The text has been amended to use the word “reported” (Page 8, Paragraph 2).

c) Bivariate tables have been included as supplementary files in Appendix 2. In addition, the tabulations and regressions were re-checked. This resulted in a change of the odds ratios in the stepwise regression model.

d) The co-intention of use of traps
eyeball this to confirm. I suggest that the authors be asked to confirm the veracity of these Odds Ratios and to include some of the preliminary bivariate analyses which would presumably have had some 2X2 contingency tables for the associations for which these astronomical Odds Ratios were produced.

d. Related to the above, is the question whether there was co-use (or co-intention to use) of pesticides and traps. It would be useful to see the %s of respondents who were prepared to use both.

6. Discussion

a. The fact that pesticide use at follow up was so strongly associated with intention to use pesticides in future implies that users who remain users have very strong allegiance to pesticides. Does this mean that once you are convinced that pesticides are the best way to deal with pests, you are always going to be convinced? In other words, if you start using pesticides, can you stop? This brings me back to the earlier question about change in practice – are those who used pesticides at follow up the same who used pesticides at baseline? Were there baseline users who at follow up had switched?

b. A second question related to the above is co-use of traps and pesticides. This didn’t get presented in the data and it would be interesting to see. Did respondents report co-use and, if so, how common was it, and did it affect intention to use – either to use pesticides or traps

c. The discussion ends with a very strong note that cost will ‘determine’ sustainability. This may be true, but I am not sure the data presented in this study justify such a strong statement. The data pointed to gender, to experience of the trap’s success and to willingness to buy at a vendor. “Determine” is a very linear causative relationship when I think the authors have data and would agree that risk perceptions and choices for vermin control are multifactorial – so cost may be important, even very important, but I am not sure “ultimately determine” does justice to their study.

d. The discussion of limitations talks about study power as lacking. It is true that one will almost never have sufficient power to show modest associations in the absence of a very large sample, such as a population-based survey. But I

and pesticides is presented in the supplementary files in Appendix 2. It is also now presented in the Results by the addition of the following sentence:

Several respondents (21.7%) reported that they intended to use both pesticides and rat traps in the future (Page 7, Last line of Paragraph 3).

a) Baseline and current use of pesticide was strongly associated (only 1 non-user of pesticide at baseline started using pesticide at follow-up). Of the 137 baseline pesticide users, 58% had stopped using pesticide at follow up, demonstrating that many people could change their pesticide use. Table A7 in Appendix 2 demonstrates this and the following sentences were added to the Discussion:

The majority of respondents (78.3%) reported using pesticides at baseline. Although there was a significantly strong association between pesticide use at baseline and follow-up, more than half of the people using pesticide at baseline stopped using pesticide at follow-up (Appendix 2, Table A7). This demonstrates that many pesticide users were willing to give up their pesticide use and that it was quite rare for non-pesticide users to start using pesticide (Page 8, Paragraph 4).

b) Of the entire sample, 21% reported co-intention of use. These people formed the majority of people that still intended to use pesticides. A tabulation of the intention to use pesticides and rat traps has been added to the supplementary files (Appendix 2, Table A6). The following sentence was also added:

Of those that still intended to use pesticides, the majority intended to also use rat traps (Page 9, Paragraph 1).
am not sure this is such a problem in this study. There were POR’s that were astronomical in this analysis – OR’s over 10 and one of over 80. There was no power lacking there, since both were statistically significant. And what ‘weaker predictors’ would have been relevant? Also, I would have thought that the limitations could have mentioned the design issue of respondent versus household (as in 4b. above). Respondents at the follow up may not have been entirely familiar with how traps were used, or may not have been responsible for any pest control, so this may have resulted in misclassification. In the absence of any details of how the adults were selected from the households, it is difficult to see if this could have been a problem or not.

use rat traps (Page 9, Paragraph 1).

c) The authors agree with the reviewer’s comment in c. The phrasing of the sentence was changed to reflect that the price of the traps are important but will not “ultimately determine” whether they are used or not. The sentence was re-phrased:

The affordability of traps is important as this may affect the sustainability of its use (Page 11, Paragraph 1).

d) The reviewer’s point about the power of the study is correct and thus the sentence about the study lacking power has been omitted.

Also, misclassification may have been a problem and thus the following sentence was added:

Also, the person who was interviewed in the household may not have been responsible for pest control for the family. (Page 11, Paragraph 2).

Discretionary Revisions

1. Methods

a. The text “The same fieldworkers ... were successfully located” could do with some editing down. For example, it would read more concisely as “The same fieldworkers follow up households in November 2009 to administer the acceptability survey. Of the 199 original respondents, 175 households were successfully located.”

b. The study is essentially a cross-sectional study in a population who were given an intervention to use. I would not mention the absence of a control group since that is likely to confuse readers. You did make a comparison between users/intenders and non-users/intenders, so it gets confusing to state you had no control group. What I would suggest is that you explain clearly and upfront the study design used, since it is a bit buried and takes a little bit of reflecting to understand what is being compared.

a) Changes were made as suggested. However, this section underwent some changes to clarify 3d (above).

b) The following sentences were added to clarify the study design:

The study design for this research was a cross-sectional survey. At the end of the baseline study respondents were given an intervention (rat traps). A follow up study was conducted 6 months later to assess the use of the rat traps and whether people intended to use traps and/or pesticides in the future. This article only presents the findings from the follow-up survey and compares respondents who said they would use rat traps in the future to those who said
2. Analysis
   a. In defining the outcome variables, strictly speaking what was being measured was reported use or reported intention to use, rather than actual use or actual intention. The text should ideally reflect this. (1st paragraph page 7)

   b. The text of the 1st sentence in the last paragraph on page 7 ends a bit awkwardly. It is not clear what the subject of the sub-clause is meant to be. Can the authors make this clearer in the text? (‘… and also used to gauge acceptability …’) Perhaps splitting the sentence will be best.

   a) The word “reported” was inserted to make the distinction clearer.

   
   Reported intention to use rat traps in the future was analysed as the main dependent variable (Page 6, Paragraph 2).

   b) The sentence was split into two sentences as recommended:

   Multivariate logistic regression analyses were performed to assess the association between the independent and dependent variables. Thus reported “intended trap use” was the main outcome of interest and this variable was also used to gauge whether respondents found the rat traps to be an acceptable alternative to pesticides (Page 7, Paragraph 1).

3. Results
   a. I would cite income in values already converted to US$ and indicate they are converted values. (e.g. ‘… equivalent to US$xx…’). Similarly on page 11 in discussion, when pricing illegal pesticides, use the US$ equivalent (in cents!).

   a) Converted US$ have been cited as recommended.

4. Discussion
   a. At the head of page 10, the authors describe respondents ‘reported’ problems with wooden traps. This is presumably information they shared outside of the main study methods, since this finding does not emerge from the Results. If so, can you use a different verb as ‘reported’ implies that it was data you solicited in the questionnaire (for example, use ‘described’). In this way, it is clear it is not part of your results.

   b. The sentence “… in order for the intervention to be accepted …” needs a bit of clarity. When the authors describe what “… is currently used and available,” do they mean commercially available in stores?

   a) Changed the word “reported” to “described” as suggested.

   b) The authors mean that the traps should be of a better quality than the wooden traps that are more commonly available. This has been clarified as follows:

   “…the product needs to be of a better quality than that which is currently used or available in the most accessible shops, especially in poor urban areas”. (Page 10, Paragraph 1)

   c) A table of gender vs problems with traps has been added to the Additional files (Table A2). Also the following sentence was added:

   Of those that had problems, females
of problems in use by gender. Rather than it ‘appeared that more females had problems…’, one can say whether it is or isn’t the case.

d. Given the above point, the recommendation for an informal vendor to demonstrate rat trap use would presumably be strengthened by the demonstrator being a female vendor herself?

(79%) had more problems using the traps compared to males (21%) (Appendix2, Table 1) (Page 10, Paragraph 2).

d) Although this is a good point, it may be unrealistic to expect a public health intervention to include the gender of the informal vendor.