Author's response to reviews

Title: Collecting household water usage data: telephone questionnaire or diary?

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Author's response to reviews: see over
Dear Editors,

Re: Original Article entitled: ‘Collecting household water usage data: telephone questionnaire or diary?’ for submission to BMC Medical Research Methodology Journal.

Please find attached a manuscript entitled ‘Collecting household water usage data: telephone questionnaire or diary?’ for consideration for publication in your journal. Another version of the same manuscript has been submitted previously (MS 3153138182605090) and we were advised that: ‘...If at some stage you are able to fully address all of the referees’ concerns, you may wish to consider a new manuscript to BMC Medical Research Methodology...’

All of the referees’ concerns have been addressed and we submit this revised manuscript for consideration. Find below our comments and a summary of the changes (in bolded italics) made to the manuscript in response to the reviewers’ comments.

The article is in accord with the breadth of coverage of your journal and addresses the important issue of exposure assessment and data collection survey methods. It is important that information about survey methods is disseminated as such information assists in the design and conduct of future studies, the interpretation of results of existing studies and ultimately, in improving derived exposure estimates.

This study described in the manuscript was conducted as a University survey and was approved by Monash University Standing Committee on Ethics in Research involving Humans.

The manuscript is an original work, has not been previously published and is not under consideration for publication elsewhere. There is no competing financial interest of the authors and all authors of the manuscript have read the manuscript, have agreed that this revised manuscript is ready for submission to a journal and accept responsibility for the manuscript’s content.

Yours Sincerely,

Joanne O'Toole
In their conclusions, the authors state that the diary offered advantages over the CATI because the diary was not subject to recall bias and allowed the water usage of the entire household to be collected rather than an individual’s estimate of this usage. This is really not all that surprising is it? Surely something more than that can be obtained from this study. A significant problem with the study is that it uses kappa as the main summary measure. By doing so, the authors collapse all comparisons into one summary statistics and thus leave themselves with comparatively little to discuss. The measures of water usage collected are quantitative – measured on a continuum – and kappa is not a particularly useful statistics and likely to be misleading. Maclure and Willett (1987) have a particularly good discussion of the limitations of kappa as a measure of agreement. In method comparison studies, one needs to consider both reproducibility and validity, both of which are obscured by the use of a single summary measure. To this end, an alternative and more illuminating approach is offered by Bland and Altman (Altman and Bland, 1983; Bland and Altman, 1986; Bland and Altman, 1999). Using Bland-Altman plots to compare each of the measures of water usage would allow one to visually assess the performance of one method with the other. It is entirely reasonable to expect that the CATI measure will be biased in comparison to the diary, but what is the nature of this bias. Kappa will provide no answer to this question, but a Bland-Altman plot will. Maclure and Willett (1987) discuss the use of measures that are biased, yet are still useful in epidemiological studies.

We have taken the suggestions of this reviewer and have now also used Bland-Altman scatter plots to visually assess the performance of the CATI versus the diary for water activities where continuous numerical estimates were obtained by both data collection tool and where significant numbers of the surveyed households undertook a particular water-using activity.

My feeling is that in your paper you are struggling to find something useful to say, but your analysis is so condensed that you are leaving yourself with little to say. So provide more detail and give yourself more to discuss. A useful summary could also be provided of the cost involved in each method. Suppose you were intending to survey 5,000 households. Itemize the costs involved in using the CATI method and compare this with the costs of using the diary method. What would be the expected response using these approaches? Estimate how long it would take to collect the data using each method. With this, you now have the opportunity to discuss what is gained or lost by one method compared with the other, both in terms of timeliness and cost as well as bias and precision of the water usage estimates obtained.

The logistics and costs associated with each data collection tool are now discussed. Table 1 for example, presents summary information about the CATI and diary characteristics and data handling up to the point that statistical analysis is performed. An estimate of time...
input for each of the CATI and diary is given. The relative merits of CATI versus diary are discussed in relation to future trends and non-response as well as the bias inherent in the water usage estimates obtained.

Title: Collecting household water usage data: telephone questionnaire or diary?
Version: 1 Date: 15 April 2009
Reviewer: Patrick Levallois
Reviewer's report:
It is not clear how the results of this study could be useful for Quantitative Microbiological Risk Assessment. If human can be exposed to microbes through the use of recycled water for garden watering, toilet flushing or water use in the laundry, more details should be given about this kind of exposure in the introduction and discussion section.

The following text was added in the introduction to make clear how the results of this study could be useful for Quantitative Microbial Risk Assessment as follows:

“....Good quality contemporaneous data about the duration and frequency of water-using activities (particularly in circumstances where water restrictions may be implemented due to water shortages, as is currently the case in Australia) combined with information about the total volume per exposure event is needed to obtain the total volume exposure per person per annum. This information, in combination with the number of residual micro-organisms present in the source water and the dose response of micro-organism(s), can then be used to obtain an estimate of the annual probability of infection associated with micro-organism(s) of concern for designated water-using scenarios. Knowing the exposure volume per person per annum for a particular water-using scenario (e.g. toilet flushing) and water type, it is possible to determine the minimum level of water treatment necessary to achieve a predetermined health target and/or to determine whether substitution of one water type with another will lead to an unacceptable increase in the magnitude of risk.

The need for exposure information leads to questions about how such data are best collected. Each survey method has advantages and disadvantages associated with its use. The rationale for use of a particular survey method is often based on its practicality, cost and the complexity of the questions to be answered. This study was undertaken as a sub-set of a larger project that collected information about the duration and frequency of household recycled water use....”

Also the study variables considered in the questionnaire should include specific variables that could be use later to evaluate more quantitatively direct or indirect exposure to pathogens from recycled water. Otherwise the study presented has good methodology for comparing telephone questionnaire to diary for household recycled water use.

“...Only ‘direct’ exposure of householders to recycled water was assessed, with no consideration given to incidental simultaneous exposure by others....”