Author's response to reviews

Title: How effective is good domestic kitchen hygiene at reducing diarrhoeal disease in developed countries?: A systematic Review and reanalysis of the UK IID study

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Author's response to reviews: see over
Reviewer: Allison Aiello
Reviewer's report:

General
This manuscript is a both a review of the literature as well as a novel research study assessing the relationship between domestic kitchen hygiene and development of diarrhea. The review is novel in that it focuses specifically on domestic kitchen hygiene as opposed to overall household hygiene characteristics. The topic of the study is interesting and timely. The objectives are clear but the methods, results, and conclusions require further organization and focus. There are several issues that should be addressed in order to enhance the overall methodology and presentation of the manuscript.

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

• Methods: There is very little information on the UKIID study. What was the methodology for this study? What kind of study was it? How were the subjects selected? How many individuals participated? Who funded the study? What was the purpose? How were subjects interviewed? How did they define illnesses and collect illness data? What are the strengths and limitations of the dataset as it applies to the questions that are being asked in this study? In addition, further information on demographics of the subjects included in the analyses (compared to those excluded) should be presented (i.e. age range, gender, income, education, etc). Also, all factors assessed in the analyses should be described.

>>We have added more information about the UK IID study and given the references to sources where more information can be obtained.

• The overall conclusions of the review do not coincide with the results. The results indicate that there is a very limited body of research in this area and that there are no randomized studies that have compared rigorous kitchen hygiene education components to a control group that received no education (and no hygiene products). Note that E. Larson's study is really a comparison of product types (antibacterial versus plain)-- not changes in kitchen hygiene habits. Given that the author's results show that there is a lack of rigorous research on this topic, it is not possible to firmly conclude that "poor domestic kitchen hygiene practices are not important risk factors for diarrhoeal disease". It is clearly premature to conclude that domestic hygiene is "not important" since the research used to assess the questions of interest is generally flawed, limited, and inconsistent.

We still consider that the balance of evidence is pointing towards the conclusion that poor domestic kitchen hygiene is not a risk factor for diarrhoeal disease. However, we have added a further chapter and reference on limitations due to potential recall bias and have modified our conclusions,

• In the discussion the authors mention issues regarding the use of expert opinion. This is an interesting commentary. However, an introduction to the argument including a definition and example of an expert opinion would assist with the flow of the discussion.

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)
Results section, second sentence. This sentence is not clear. What does "only one high quality study, 9 medium and one high quality studies" mean? Does this mean there were two high quality studies?

Corrected
- There are several grammatical and spelling errors that should be fixed. See first sentence of the introduction (use of "and" instead of "an"). See methods. "Children and Adults" in second sentence are capitalized in the middle of the sentence. There are more instances of these errors throughout the manuscript and should be corrected.
- Version of SPSS and source of this program should be stated.

Reviewer: Stephen R Palmer
Reviewer's report:
Review for BMC Public Health
‘How effective is good domestic kitchen hygiene at reducing diarrhoeal disease in developed countries?’: A systematic review and reanalysis of the UK IID study.

1. Is the question posed by the authors new and well defined?
No formal systematic review has been undertaken to answer this question. The question is well defined.

2. Are the methods appropriate and well described, and are sufficient details provided to replicate the work?
The search strategy outlined in the systematic review is clear and sufficiently described to replicate the work. The selection of studies, appears robust but may not be readily repeatable as there is no indication of whether a selection protocol was applied in identification of the 48 studies and then the final 14 studies.

3. Are the data sound and well controlled?
- 14 studies were included in the systematic review. I wonder whether the criteria were too specific and potentially relevant papers missed. I acknowledge that the authors state that if negative studies were missed it would be unlikely that the basic conclusions would change.
- Little comment is made about the impact of bias, either information bias relating to the ‘self reported diarrhoea’, recall bias in the case of the case control studies and perhaps more importantly the reporting of exposures (practices) that may have contributed to the outcome - was there evidence of information bias, particularly exposure suspicion bias. Did the authors review the papers for bias and in their opinion did this impact any of the reviewed studies and therefore their conclusions?
- The authors acknowledge that the outcome (diarrhoea) was self reported in 4 studies if these studies were removed would the conclusions been different?
- Were any of these issues relevant to the IID survey?
4. Does the manuscript adhere to the relevant standards for reporting and data deposition?
   I believe so
5. Are the discussion and conclusions well balanced and adequately supported by the data?
   In the main the discussion and conclusions are balanced. The issues of negative associations and confounding are considered and the comments made on the study funded by a disinfection manufacturer are valid. However, I think there are a number of questions remaining:
   • The impact of bias
   • Given the heterogeneity of outcome measures and particularly risk factors, I feel that whilst the evidence does not support the hypothesis it cannot infer no risk from poor kitchen hygiene and therefore the objectives of the review remain unanswered, do the authors’ think that a case control study be commissioned that considers the issues raised in the discussion?
   • With the exception of the authors’ last conclusion: ‘Public health messages should be directed at encouraging adequate cooking of raw foods’, I feel the statements are supported by the evidence presented in the text. Whilst adequate cooking of foods is known to be an important contributor of foodborne disease, its importance in relation to other hygiene risk factors in the home is not sufficiently considered in this paper.
6. Do the title and abstract accurately convey what has been found?
   Yes, with the exception of the conclusion on adequate cooking of raw food
7. Is the writing acceptable?
   The writing is acceptable and the text easy to read.

REVISIONS
Revisions to be considered:
• Discretionary Revisions (which are recommendations for improvement but which the author can choose to ignore)
• Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)
• Major Compulsory Revisions (which the author must respond to before a decision on publication can be reached)
I feel that the issues I raised on bias and the erroneous conclusion should be considered before publication

> We have added a section on differential recall bias and modified our final conclusions.