Author’s response to reviews

Title: Effect of household air pollution due to solid fuel combustion on childhood respiratory diseases in a semi urban population in Sri Lanka

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Editor comments

1) In the section “Ethics approval and consent to participate” in the Declarations, please give the reference numbers for the ethical approval

P025/04/2011

The number of the application for Ethics approval that was approved by the Ethics Review Committee of Faculty of Medicine, University of Kelaniya is given.

2) Please describe the role of the funding body in the design of the study and collection, analysis, and interpretation of data and in writing the manuscript.

The following sentence has been included in the ethical approval and consent to participate section: “The International Training and Research in Environmental and Occupational Health
(ITREOH) training grant of the Fogarty International Center through the National Institutes of Health supported this study.”

The funds covered all aspects of the study from data collection to writing the manuscript.

Editorial Board Comments

Introduction

- Page 5: the sentence “Household PM2.5 and CO levels in home environments were measured in selected households” should be removed.

This sentence was removed

Data collection

- Page 8: the classification of “high exposure” and “low exposure” is somewhat confusing; it would be better to use a more descriptive language to indicate the two categories throughout the whole manuscript.

Corrected

Children who were living in households where biomass fuel or kerosene oil were used as the principal type of cooking fuel, were classified as the high exposure group. Children living in households where LPG or electricity was used as the principal type of cooking fuel, were classified as the low exposure group. This has been clearly stated in the abstract and in the methods section.

We have kept this classification as it was the basis of our analyses.

Discussion

- This section should be improved adding and discussing strengths (longitudinal design; study location) and limitations (poor air pollution measurements, only focused on fuel type; short duration of air pollution measurements, which might be not representative of usual concentration of pollutants; self-reported respiratory data without clinical confirmation) of the study.
In addition to the limitations that have already been mentioned, the following paragraphs were added to the discussion.

“Although the major strength of this study is being a longitudinal one in which children were monitored on a regular basis over a 12-month period and incidences of symptom/disease episodes were recorded, there are a few limitations, some of which have already been highlighted, that need to be considered in the overall interpretation of the findings. We used self-reported data on respiratory symptoms without confirmation by a clinician which was the only way out given the nature of the symptoms and health care seeking behavior for such symptoms among the general public; as the children were monitored every month by the research team, we do not expect this to have much of an impact on our estimates, most of which are similar to findings previously reported.

We were able to monitor air quality only in a subsample of households, over a two-hour period during the preparation of the main lunch meal, which revealed higher concentrations of pollutants in houses using biomass and kerosene for cooking. This two-hour measurement during the preparation of the lunch meal may not reflect the actual exposure to indoor air pollutants resulting from cooking over a 24-hour period; it is likely that households cook more than once a day and inhabitants are exposed to higher concentrations of air pollutants over a 24-hour period that includes exposure to residual pollutants after cooking. As practices in Sri Lankan households are similar, we believe that our findings are representative of all households.

We classified children of households using biomass and kerosene as the “high exposure” group and children of households using LPG and electricity as the “low exposure” group, based on information obtained at baseline. It is possible that some households may have switched their energy source during the study. However, when air quality measurements were made in the subsample of households during the study, none of the households classified at baseline had changed their energy source for cooking; hence we surmise that our original classification of households is acceptable and likely to not have changed as there was no significant economic implications in terms of prices of different energy sources or the socio-economic status of families during the 12-month study period.”

Finally, the manuscript should be revised by a professional native speaking English. This has been done.
Reviewers comments

Conclusion and recommendation need to be improved

This section was modified as follows:

CO and PM2.5 concentrations were significantly higher in households using biomass fuel for cooking. There was a 1.6 times higher risk of LRTI and two times higher risk of infection induced asthma among children of households using biomass fuel and kerosene for cooking as compared to children of households using LPG or electricity, after adjusting for confounders. Use of cleaner fuels for cooking is recommended: if there are economic constraints, it is recommended that children are kept away from stoves, preferably outside the kitchen, while the stoves are lit.