Reviewer's report

Title: Cooking fuel choices and garbage burning practices of Accra households as determinants of birth weight: a cross-sectional study

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Reviewer: James Tielsch

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This manuscript reports a cross sectional, hospital-based study of birthweight and household fuel type and garbage burning practices in the urban population of Accra Ghana. There are limited studies in the literature on this topic so this study has the potential to provide important information to our understanding of this risk factor – outcome relationship. However, there are a number of issues that need to be addressed before it will contribute to the literature.

Major Essential Revisions

1) This is a hospital-based study and the study population consists of hospital deliveries in a single referral hospital who also presented for post-natal care at the same facility. Despite the authors’ claims that selection bias is unlikely, they provide no information about the characteristics of mothers from Accra who choose to deliver at this hospital as compared to other facilities or at home. It could be that this population is composed of higher risk women who chose a referral hospital because of their underlying risk. The authors need to discuss the potential for selection bias more completely.

2) Birthweight was assessed based on information in the “child health books”. They provide no information about this document. If the children were born at this hospital, why not use hospital records? What scale was used in the measurement of birthweight, is it regularly calibrated, when were weights measured?

3) Most of the analysis uses birthweight as a continuous variable. This is fine, but they should also conduct the adjusted analysis for low birthweight as well. Reporting odds ratios and 95% CIs would greatly enhance this report.

4) The authors have information on gestational age, but do not report it. Why not also present this outcome together with proportion pre-term? Even better would be the division of these outcomes into their more commonly used categories, appropriate-for-gestational-age & term; appropriate-for-gestational-age & pre-term; small-for-gestational-age & term; small-for-gestational-age & pre-term. This would provide much useful information regarding the potential timing of the insult during pregnancy.

5) The authors need to provide more details about how they calculated the exposure classification of low, med, high exposure. Did they use information on cooking behaviors, etc. besides type of fuel? How did they do this classification?
6) Nowhere do the authors acknowledge the limitation in defining exposure based on maternal report of fuel type. They did not conduct actual exposure measurements in the home so we have no information about how “true” exposures relate to their interview based categories. They need to at least acknowledge this limitation.

7) Their multivariate models all adjusted for gestational age of the infant at birth. Wilcox has suggested this adjustment is inappropriate (see Wilcox A, Am J Epid 2011; 174(9):1062-8.)

8) The authors language about causality is not appropriate from a cross-sectional study. The term “association” should replace “determinant” in the entire manuscript.

9) The authors also do not acknowledge the potential for unmeasured confounding. In almost all of the observational studies conducted to date, such potential confounding still exists and most investigators realize that variable like social class or educational level, etc. are very limited in their ability to correctly classify SES. The authors need to modify their claim to regarding the lack of potential confounding.

Discretionary Issues
1) Ref #2 is old and the primary literature should be cited instead of a WHO report.

2) The SD of BW is quite high, we usually expect a range around 400-450 but SDs were >600 in this report. How does this compare with other data from Ghana or even from this hospital?

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare that I have no competing interests.