Reviewer's report

Title: Prenatal exposure to cooking gas and respiratory health in infants is modified by tobacco smoke exposure and diet.

Version: 1 Date: 27 June 2013

Reviewer: Deborah Jarvis

Reviewer's report:

This report describes results from a prospective study of infant health in the first year and examines the relationship of gas cooking with symptoms. Overall no associations are seen but there is some evidence that wheezing with use of gas for cooking is modified by maternal smoking in pregnancy, and otitis with gas may be modified by maternal intake of fruit/vegetables (10 interactions reported, 2 with p<0.05). These results are compatible with some of the hypotheses regarding health effects of indoor gas appliances – but results are very preliminary (although the gas/smoking interaction on wheeze is strong p<0.002), and require replication in future studies.

Major Compulsory Revisions

Please state whether FFQ has been used to derive intake of antioxidants and whether these have been tested as possible effect modifiers (and results)

Please state proportions using bottled gas and test/briefly report that effects same for mains and bottled gas (if they are). There is limited evidence that pollutants from bottled gas appliance may be different to that from mains.

The discussion 3rd paragraph addresses effect modification by diet on otitis/gas cooking. Much of the discussion is about the potential effects of the diet on lung anti-oxidant defence. Evidence that acute otitis is accompanied by low oxidant levels/oxidative stress is given - but this is not quite the same as saying that low antioxidant levels lead to more otitis. I think this paragraph could be restructured to explain the proposed biological mechanisms more fully.

Final two sentences of last paragraph on page 13 don’t really make sense. I think the point is being made that ‘exposure’ to gas derived UFP is occurring throughout the house.... (?)... and that therefore getting fixated on exposure measures that are kitchen based is inappropriate (??). The sentence – ‘By being aware of this lack of accuracy ....’ is contradictory when it states ‘misclassification bias is non-differential’. By definition bias is differential (?).....perhaps authors mean ‘misclassification of exposure is non-differential’ (?)

Minor Essential Revisions

Introduction – author states that WHO say that having a gas cooker leads to an increase of 28ug/m3 in indoor NO2. In the document quoted the WHO are merely quoting another study, - the original derivation of this figure came from the Hasselblad meta-analysis many years ago when he combined gas as a proxy
with directly measured NO2 studies. This sentence should be reworded.

Please state how/when information on smoking during pregnancy collected and how defined.

Second line discussion – accumulate – should be cumulative.

Discretionary Revisions

I am not sure if I consider ‘otitis’ to be a marker of respiratory health? Although I suppose in infants it is so closely linked to respiratory tract infections (?) – the title implies that gas cooking effects on respiratory health modified by diet and maternal smoking - but diet is modifying only the otitis outcome...... ? any other way of wording title?

It might be appropriate to reference recent results from PIAMA study showing no long term associations of gas cooking with respiratory health in children?

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

**Quality of written English:** Needs some language corrections before being published

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

**Declaration of competing interests:**

None