Reviewer's report

Title: Asthma incidence in children growing up close to traffic. A registry based birth cohort in southern Sweden.

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Reviewer: Andrea Ranzi

Reviewer's report:

General comment:
Lindgren et al. presented a study on the association between traffic-related exposure and higher incidence of asthma or other obstructive respiratory diseases. The use of dispensed medication as proxies of incidence of obstructive respiratory diseases, the exposure assessment through GIS information and dispersion models, and the consistent number of the study population make the work innovative and interesting.

The main criticism is related to a possible bias in the selection of study population, in particular related to socio-economic deprivation. The influence of socioeconomic status on drug use is documented.

- Major Revisions:

1) Selection of population. 18230 subjects were excluded because of no CHC-questionnaire data. It's about 65% of your initial cohort, and 70% of cohort with exposure data. I think this big reduction of the “registry based birth cohort” has to be accompanied by an analysis of possible changes in the structure of the population, in particular for potential confounders. No information on this is reported.

2) Related to previous point, the description of study population (Table 1) reports 96% of population with no problems to pay bills and 73% of population with >12 years of education of any parents (2 of 3 indexes used to define individual SES). A previous paper, cited by authors, indicates that 82% of Scania population and 81% of Malmo population is at low education. I understand the use of diverse metrics in the 2 studies (individual vs aggregate by census), but the difference is very relevant. Also the analysis restricted to children with high socio-economic status regarded 3464 cases (44%). There is a suspect of selection bias due to filling of questionnaire, and must be considered by authors. This shift towards high SES could explain also lower exposure levels to NOx, as reported by authors.

3) I understand that a birth cohort could be not representative of total population (although authors, in the introduction, correctly argued the need of registry based studies), but in this case this topic is important, because the influence of socioeconomic status on drug use (the main proxy of outcome) is reported in literature (see among others Laurent et al., 2009). Do the authors have more to say on the issue, based on their collection of data? [Laurent O. et al. (2009)]
Influence of socio-economic deprivation on the relation between air pollution and 
#-Agonist Sales for Asthma. CHEST, 135(3): 717-723

4) Information on SES at census level for all with exposure at birth addresses 
(26128) could help in a more efficient sensitivity analysis adjusted for SES 
(eTable3), to understand the potential role of selection of study population.

- Minor Revisions

5) Case definition is based on dispensed medication. Is there relevant 
differences, in Swedish experience, between dispensed and prescribed data? A 
reason to prefer prescribed data (in addition to the one mentioned by the authors 
at the beginning of discussion) could be that you are closest to the moment of 
diagnosis: it is the doctor who prescribes because of asthma (or not). Some 
information on this issue could be useful.

6) The authors note a greater exposure high traffic for those born in 2006. This 
strange proportion should be discussed. Did authors find a similar pattern for 
exposure to NO2? The traffic data on which exposure definition is based are the 
same over the whole period, or different for each year? If so, traffic data should 
be verified for 2006.

- Discretionary Revisions

7) Authors use an unusual metric to define high traffic roads (HTR). Following 
another study in the area, they choose a cut-off of 6 vehicles/min to distinguish 
between HTR and other roads. Most studies consider HTR as road with more 
than 10000 vehicles/day, that corresponds to 6.99 in authors’ metric. Could 
authors give a description of the distribution of this variable, to better understand 
if there is a big difference (or not, as reasonable) between these 2 definitions of 
HTR?

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Declaration of competing interests:

I declare that I have no competing interests.