Reviewer's report

**Title:** Adult asthma and traffic exposure at home-address, work-address, and self-reported daily time outdoor in traffic: A two-stage case-control study.

**Version:** 1  **Date:** 2 August 2010

**Reviewer:** Joachim Heinrich

**Reviewer's report:**

Using data from a big cross-sectional survey and an additional embedded case control study in adults from southern Sweden Lindgren et al reported increased risk for asthma prevalence in relation to living close (< 50m) to busy roads (> 10 cars/per minute). Additional information on traffic exposure at work place or by commuting did not add to the increased risk using traffic exposure to traffic related air pollutants at residential address. The exposure to NOX assessed by dispersion modelling on a grid of 250m x 250m did not show any increased estimates for asthma prevalence or asthma symptoms. The restriction of the exposure to traffic-related air pollutants at residential address was frequently critized. This manuscript is an attempt to overcome this shortcomings. The strength of the study was related to the inclusion of GIS based information of exposure to traffic related air pollutants at work place and additional information on exposure to traffic related pollutants while commuting. Therefore this paper substantially adds to what is known about traffic-related air pollution exposure in adults and asthma. The reported association between asthma outcomes and traffic at residential address was restricted to a very small exposed subgroup (< 2% of the total population) and no dose dependend association was reported. Overall the paper is well written and the discussion critically stated also the limitations of the study.

However, the paper could be improved when the following points could be considered.

**Major**

Medication against asthma was completely ignored in the definition of outcomes of interest. This is in particular questionable as asthma symptoms might be compensated by treatment. This needs to be added at least in the discussion section.

The sampling schemes of the cluster randomisation of the first survey and the frequency matching procedure of the case control study part require more attention in the statistical analysis. Obviously the authors do not think that a conditional logistic regression analysis is needed when the study design was a matched case control study. Also the statistical analysis of the first survey needs more sophisticated statistical methods such as SUDAAN, because of the cluster matching procedure.
The reported positive effect between exposure of traffic related pollutants and asthma related outcomes were restricted to very small proportion of the entire study population (< 2%). One might argue that this effect estimate is mainly driven by some geographical characteristics such as highly urbanized area. Because the study area of Scania combines very rural with highly industrialised areas one might speculate that the reported positive associations were related to urban/rural differences. This could be excluded if a variable for a degree of urbanisation such as community size is used as a potential covariate in the adjusted model. In particular the missing exposure - response function rises some doubts whether the reported positive association with the isolated highest exposed group is not confounded by other unmeasured factors.

Minor

p. 4, background 2nd section
In contrast to the last sentence of the 2nd section there are several empirical studies on potential health effects in relation to GIS based exposure models techniques.

p. 6, 1st sentence
Does the Swedish national road data base also covers busy roads within the bigger communities? If not, exposure estimates for subjects living in bigger cities could have been misclassified.

Asthma development is thought to have its origin mainly in early childhood. To compare asthma prevalence in adults with current exposure is an oversimplification of the etiology of asthma. A proper study design might be therefore restricted to those subjects who never have moved their entire life. This simply is not doable but needs a more cautious discussion. With regard the asthma symptoms this is a complete different study outcome, because of the triggering characteristics of traffic related air pollutants on respiratory health. If your comments on these specific outcomes, which seem to be similar but also have completely different meanings, would be very helpful to avoid misleading the reader.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:
'I declare that I have no competing interests'