Reviewer's report

Title: Air pollution from traffic and cancer incidence in a Danish cohort

Version: 1 Date: 16 May 2011

Reviewer: Tom Bellander

Reviewer's report:

I am pleased to review this manuscript that investigated the effect of long term exposure to ambient air pollution on various cancers. It is an interesting manuscript which is well-designed, written and analysed potentially useful paper for the advancement of this area of investigation. The study, as mentioned by the authors, is an exploratory study that has used a large Danish cohort study. I have no major concerns with the paper, but some points need clarification:

Introduction
Paragraph 3
1. As a background support, the authors provided citation of studies that link air pollution to lung cancer, but they failed to include the first study from the Nordic region.

Exposure assessment
Paragraph 1
2. The authors should specify the spatial resolution used for the study.

Paragraph 2
3. A short section on how the AirGIS was validated should be included in the text as some of the cited references are not publicly available.

Paragraph 3
4. The investigators mentioned that when NOx could not be calculated for the current address, it was imputed from either the previous or next address. This procedure is attractive in its simplicity, but obviously leads to an underestimation of the within-person variability of exposure. The authors should discuss possible bias because of this.

Statistical methods
Paragraph 2
5. The paper has included a long list of possible confounders, but there was no explanation on how certain confounders were chosen for a specific association. Furthermore, some tumours were adjusted for quite few confounders (brain for occupation only). The authors need to detail on what basis they have chosen these confounders. This information is essential and should be included in the methods.

Results
Paragraph 2
6. This part is very repetitive and is not clearly written. The authors also need to present only significant associations. The rest is already shown in the accompanied tables.

Paragraph 4
7. The authors state about the exposure-response function, that it did not significantly deviate from linearity for 19 sites. In view of the lack of significant effects this point is confusing and needs to be elaborated, and the criterion used to define the point needs to be mentioned.

Discussion
Paragraph 4
8. The authors argue that HPV infection might be more prevalent in areas with heavy pollution. Might there not also be differential compliance to screening for cervical cancer based on area of residence? In several countries highly polluted areas are inhabited by those who are economically disadvantaged. How the situation is Denmark?

Table 1
9. The authors might need to present a comparable result of study participants with fully eligible cohort. Lack of address history could e. g. indicate frequent moves and a less stable social life. A related question is whether there were differences between those who stayed in the same address throughout the study period and those who moved?

Figure 1
10. The investigators have included a figure which I think has a problem of scale. The 5-95 percentiles for NOx is 14.8 and 69.4 respectively and figure 1 shows a range of up to 400 µg /m3 which is mostly noise. It would be advisable to present the graph with a narrower scale or at least mark the observations on the X-axis.

11. In addition, the exposure response curves for the three cancers seem to be at different scales. While Y=0 is for average or typical exposure for the other sites, for cervical cancer Y=0 is at the top exposure level.

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