Reviewer’s report

Title: Association between Leukocyte Telomere Shortening and Exposure to Traffic Pollution: a Cross-Sectional Study on Traffic Officers and Indoor Office Workers

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Reviewer: Barbara Hoffmann

Reviewer’s report:

This well written and interesting manuscript covers a novel aspect of air pollution epidemiology. The authors apply a sound design and methodology to investigate the link between traffic exposure and cardiovascular and cancer morbidity. Their use of circulating leukocyte telomere length, a marker of biological aging, is a novel approach to examine possible intermediate pathways leading from traffic exposure to observed clinical and subclinical manifestations of chronic disease. It can therefore contribute to a better understanding of air pollution and chronic disease outcomes.

I really do not have much to remark other than some mostly minor aspects:

Major aspects

1. The exposure assessment conducted in this study consists of two aspects: First, the authors select traffic officers who are thought to be highly exposed on a long-term basis due to their occupation. A reference group with low chronic occupational exposure to traffic is chosen from office workers. In addition, acute personal exposure on the day before the blood draw is measured. It would be helpful for the understanding of the time scale of the hypothesized effect to be more clear about the expected time frame of exposure and outcome and to comment on how well the acute personal exposure assessment relates to chronic traffic exposure. It would also be very convincing to see that the duration of high chronic traffic exposure, which is probably the more relevant exposure metric for this specific outcome than prior day quantitative exposure, is an independent predictor of LTL.

Minor aspects

2. I would like to hear a more detailed discussion on the possible pathogenic component(s) of “traffic exposure” and how they relate to the measured markers of traffic exposure in this study. Also, could noise, which is also an important traffic emission, play a role in this observed association?

3. Please elaborate a little bit on the hypothesized biologic link of traffic exposure – LTL - observed clinical and subclinical outcomes such as progressed atherosclerosis and cancer.

4. As the authors state, LTL represent a marker of biological age and therefore
reflect chronic influences on the organism. While I recognize that the authors have included the most important determinants such as age, sex and smoking habits in their analysis, it would be interesting to explore in more detail possible other differences between the two groups that are known to be related to oxidative stress and inflammation.

5. In the background section (page 3, 2nd paragraph), the authors refer to time-series and longitudinal studies, two of the cited papers however are based on a case-crossover study (Peters et al.) and a cross-sectional study (Hoffmann et al.).

6. A few sentences in the results section are redundant because they contain information given in the methods section. These could be deleted.

**Level of interest:** An article of importance in its field

**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.