Review of: "Population estimates of biomarkers of exposure to carbon monoxide, nicotine, and NNK in smokers and non-smokers"

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Potential competing interests: The author(s) declared that no potential competing interests exist.

Background: As the use of products that deliver nicotine without combustion of tobacco (potentially reduced risk tobacco products or PRRP) has gained more acceptance, there is need to accurately assess how switching from cigarette to PRRP affect the exposure to the harmful constituents associated to tobacco combustion. Determining the population level estimates of biomarkers of exposure would be helpful to ascertain the effects of switching to PRRP relative to cigarette smoking. In order to provide baseline values to assist in the assessment of the impact of switching to PRRP, Ayala-Fierro and colleagues present a manuscript in which they describe the use of published literature to estimate NNAL (4-[methylnitrosamino]-1-[3-pyridyl]-1-butanol), NEQ (total nicotine equivalents), and COHb (carboxyhemoglobin) in smokers and non-smokers.

Specific comments:

1. The description of systematic review and meta-analysis was quite complete. However, I prefer that the description of the process of inclusion and exclusion of studies be accompanied by flowcharts. Also, instead of using a single table to summarize the number of papers included in the meta-analysis, I think it is best to present a flowchart for each of biomarkers they estimated.
2. A more detailed description of the inclusion and exclusion criteria, especially the latter, would improve the description of their systematic review and make it more transparent and easier to follow.
3. I missed a more detailed description of the statistical analysis.
4. It was not clear to me whether geometric mean was used to report NEQ and COHb.
5. The report of total number of subjects included in the review (first line of 2nd paragraph in “Characteristics of the Included Studies”) should be removed as it does not reflect the number of subjects used to extract the estimates of each biomarker.

Conclusion:

A useful work especially for those working in the field dealing with tobacco-related health problems.