

From: [Mikko Paunio](#)
To: [Jenkins, Scott](#); [Yeow, Aaron](#)
Subject: Comment by Mikko Paunio on PM 2.5
Date: Tuesday, October 15, 2019 4:11:40 AM

To Chartered Clean Air Scientific Advisory Committee (CASAC) in their peer review of EPA's *Policy Assessment for the Review of the National Ambient Air Quality Standards for Particulate Matter (External Review Draft—September 2019)*.

I hereby forward to you my correspondence to a Dutch professor Jos Lelieveld (his comments to me are omitted), who recently with his colleagues, published a paper stating that air pollution causes more deaths globally than active smoking.

In addition to that, I make this statement based on my training and experience as a general environmental health specialist and vaccinologist (especially measles) - not as an air pollution expert:

It is my firm belief that causality between PM 2.5 exposure and mortality (CHD) does not have strong scientific bases, especially when we talk about emissions from centralized power production or industrial emissions from high stacks. Even if causality had been firmly established, for reasons related to dilution and centralized nature of these emission sources, these emission sources would have a minor public health effect compared to decentralized heating and cooking even in industrialized countries but especially if we look at the issue from a global perspective. The reason why I believe that overemphasis of literature convergence and publication bias resulting from the highly political nature of this discussion, are to blame why today, without reservations, even institutions like WHO make questionable statements about large public health effects even of low level PM 2.5 exposure. You simply cannot make firm scientifically sound causal inference from observational epidemiological studies, that rely on very low observed associations. I challenged by e-mail personally the 2003 World Health Organization working group's risk assessment on the very subject matter, when it was sent to comments to WHO member states before final publication. This risk assessment finally canonized the proposition that PM 2.5 kills.

Mikko Paunio, MD (MHS 1993 in Chronic Disease Epidemiology, Johns Hopkins Bloomberg School of Public Health), adjunct professor in general epidemiology in the University of Helsinki)

My peer reviewed publications (40) can easily be checked in PubMed, as I am the only Paunio M in the world. In my career I have worked in the following institutions: University of Helsinki, Johns Hopkins Bloomberg School of Public Health, Ministry of Social Affairs and Health (Finland), European Commission (permanent member of the Scientific Committee on Medicines and Medicinal Products; 2000-3, as a consultant epidemiologist 2003-2005).

MY E-MAILS TO PROF LELIEVELD LAST SPRING AFTER HE AND HIS COLLEAGUES HAD PUBLISHED A HEADLINE GRABBING PAPER ON THE

PUBLIC HEALTH EFFECTS OF AIR POLLUTION:

Dear professor Jos Lelieveld,

In your recent paper https://www.eurekalert.org/pub_releases/2019-03/esoc-apc030819.php based on modelling, it is proposed that ambient air pollution causes more deaths than active smoking.

Although the number of exposed to active smoking is less than that of those exposed to ambient air, the proposition is hard to accept as exposure levels of active smoking are on a totally different level. Furthermore, as there are significant problems of using non-reliable hazard functions, modelling might produce incorrect results.

The proposition "PM 2.5 kills" was canonized in 2003 through a work of a WHO working group. www.euro.who.int/__data/assets/pdf_file/0005/112199/E79097.pdf At the very end of the working group's mandate, its report was sent to member states for comments.

I raised then my concern that relative risks of magnitude 1.1-1.15 are not provable by observational analytic studies for reasons embedded in Hill's criteria of causal inference and more modern versions of it.

https://ajph.aphapublications.org/doi/full/10.2105/AJPH.2004.059204?url_ver=Z39.88-2003&rft_id=ori%3Arid%3Acrossref.org&rft_dat=cr_pub%3Dpubmed&

The working group - to my understanding - was relying exceedingly on convergence of literature but to fill the gap of not relying on strong association. Convergence might have resulted from publication bias. There are other issues, which are of concern e.g. the strange dose-response curve i.e. based on current accepted risk assessment you get considerable health effects already on very low exposure level and the effect seems quickly "flatten" with active smoking, where we talk about massive exposure of PM 2.5.

I am raising my concerns of your statement in the press release of your latest publication where you say:

"Since most of the particulate matter and other air pollutants in Europe come from the burning of fossil fuels, we need to switch to other sources for generating energy urgently. When we use clean, renewable energy, we are not just fulfilling the Paris Agreement to mitigate the effects of climate change, we could also reduce air pollution-related death rates in Europe by up to 55%."

The first sentence is simply incorrect as it is possible to achieve the very stringent WHO guideline levels in the Metropolitan Helsinki area by relying on coal based combined heat and electricity production. As a matter of fact coal now contributes a negligible fraction to ambient air pollution in Helsinki. Our most serious concern is small scale burning in urban suburban residential areas. You had a very similar concern in your recent Nature paper, which I rely heavily on the following publications, where I also write about ambient air pollution in Helsinki and how the Chinese are trying to copy our strategy now in Beijing:

<https://www.thegwpf.org/content/uploads/2018/01/Paunio-PublicHealth.pdf>

<https://www.thegwpf.org/content/uploads/2018/05/Paunio-EnergyLadder.pdf>

I am also unhappy with the content of the latter sentence in the above quotation of yours, as the whole co-benefit argument has been so unethically promoted within the United Nations climate change policy framework:

<https://www.thegwpf.org/better-for-health-to-ignore-the-climate-movement/>

I must say I also wonder what do you mean By "renewable energy", which would prevent almost 10 million deaths according to your new modelling based estimates attributable to ambient air pollution globally?

Yours sincerely,

Mikko Paunio, MD MHS, adjunct professor in general epidemiology in the University of Helsinki

Your EHJ article & PNAS 2018 & NO PM2.5 Deaths in US

Dear professor Jos Lelieveld,

In your response to me you wrote a lot of things I cannot accept. For example your advice to developing countries urging them to use renewables what ever that means is redundant. As I wrote in my reports Chinese government - especially in Beijing - takes now succesfully advice from experience gained in Helsinki.

However, this statement reveals that your are not familiar with epidemiological and public health reasoning:

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It is false statement as for example 1964 famous Surgeon General statement and position that smoking causes lung cancer in males and perhaps among females was based practically solely on analytic epidemiological evidence which was strong. One of the key aspects of evidence leading towards statement that tobacco causes lung cancer was strong the observed association (RR 10-20), now PM 2.5 literature relies on association at around 1.10-1.15, although this literature is used to promote similar policy choices, which also have major economic consequences.

In Hill's criteria and its modern refinements (e.g. of causal inference biological plausibility (in your words "toxicological research") plays a minor role. In Rothman and Greenland's essay they refine Hill's criteria and write for example this:

"Plausibility refers to the biological plausibility of the hypothesis, an important concern but one that is far from objective or absolute." You can find their essay here:

https://ajph.aphapublications.org/doi/full/10.2105/AJPH.2004.059204?url_ver=Z39.88-2003&rft_id=ori%3Arid%3Acrossref.org&rft_dat=cr_pub%3Dpubmed&

I agree, there is no need to continue this correspondence.

Yours sincerely, Mikko Paunio