

Improving the scientific advice provided by the Clean Air Scientific Advisory PM Subcommittee

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Introduction

My participation on the U.S. EPA's Clean Air Scientific Advisory PM Subcommittee on Particulate Matter (CASAC-PM) was stimulating and enlightening. Everyone involved, committee members, EPA staff, and public presenters, were well-qualified, efficient, and dedicated. But it is important to explore possible improvements in the process, so I will summarize some of my personal observations to that end. Many of the problems arose from the outdated mandate that the U.S. EPA had to follow.

Specific problems

1. The mandate is too restrictive, and does not allow the full competence of the EPA to be used in protecting public health.

Evaluating air pollutants one-by-one can lead to air standards that do not make sense given the complexities of air chemistry (e.g. suppression of one pollutant can cause the mixture to have increased toxicity).

The mandate to err on the side of increased safety can also be a disservice to public health.

And the policy to set nationwide standards can place unreasonable burdens on some industries and some regions of the U.S. One size does not fit all.

2. Linear incrementalism, in which CASAC only comments on each step in a long process can lead to conclusions that do not pass a "common-sense criterion". The questions posed to CASAC-PM appeared to be restrictive, carefully-crafted, and led to inevitable conclusions. Is this top down policy rather than science up knowledge?
3. Defining particulate matter by aerodynamic mass fractions, with composition not taken into account, is poor science in my opinion. PM_{2.5} is not chemically defined and differs greatly in composition across the U.S. Use of PM_{2.5} punishes some regions and industries unfairly. Furthermore, it does not apply to ultrafine particles (the count can be quite large without having any appreciable mass). It is not actually known how harmful ultrafine particles might be.
4. The current risk assessment process is seriously flawed. It is based on individual mass fractions, and can lead to regulations that do not serve public health. For example, it is well known that increased income leads to longer life. Is the shutting down of some industry on balance good or bad? The 2009 National Academy of

Sciences Report (National Research Council, “Science and Decisions: Advancing Risk Assessment”, The National Academy Press, Washington, DC, 2009) advises that the “decision” to set a standard, not the “pollutant” is what must undergo risk assessment. The public must live with all of the relevant consequences of an air standard, not just selected effects of the substance under consideration (The general economy, jobs, and costs of goods and services have dominant impacts on public health, but they are not even considered by CASAC).

5. The public comments were not weighed and discussed by CASAC-PM in spite of the fact that most were well-reasoned and relevant. If the agenda included time for discussion of public comments and formal acceptance or rejection of their recommendations, the process might be improved. Quite often public comments are not in the linear process charge to the CASAC-PM subcommittee. One useful function the CASAC-PM subcommittee could provide is to select from the public comments points that the EPA should formally consider acting on and commenting on. Also, the CASAC-PM subcommittee should be given an opportunity to comment in writing on the EPA charge to the subcommittee.
6. The CASAC-PM subcommittee did not adequately inform the EPA Administrator on the pitfalls, scientific limitations, and even the range of adverse health consequences associated with the recommended PM standards. We were typically not asked to comment outside the specific charge to the subcommittee. Not understanding the feasibility, economic hardships, and unintended adverse health consequences can place the Administrator in the embarrassing position of issuing a standard that may harm public health more than it helps.
7. The public will not be adequately informed about the adverse effects associated with new standards. “Informed consent” is a fundamental ethical principle that should be applied to mandates, including air standards. Informed consent must include, and elucidate, the adverse consequences that flow from a decision. CASAC-PM was not allowed to adequately discuss the adverse consequences associated with air standards.
8. CASAC-PM subcommittee members should be informed, but they should also not be financially entangled with EPA funding. It would make sense that they be appointed for staggered, fixed-length terms by some non-EPA group.

The current process, although elegant and efficient, in my opinion is seriously flawed, narrow, and possibly ethically questionable. The process has the semblance of oversight without actually providing meaningful scientific oversight.

It is important to reiterate that all of the people involved performed their tasks enthusiastically and competently.

In Summary:

The U.S. EPA’s Clean Air Scientific Advisory Committee’s subcommittee on Particulate Matter (CASAC-PM) “advises” the EPA Administrator on setting National Ambient Air Quality Standards. Although the Committee and staff are qualified and dedicated, the process could be improved in the interest of the public good.

The current EPA focus is too narrow. Isolating individual pollutants, not considering PM composition, ignoring health tradeoffs, and imposing national standards, are all problematic. This focus may lead to over regulation of some technologies, industries, and regions.

The Risk Assessment process should be changed from a focus on individual PM mass fractions to a focus on the health-related consequences of PM standards themselves. The public faces all of the consequences of new standards, including unintended adverse consequences. As the public must live with all of the consequences of an air standard, regulation should take into account all of the downstream consequences, e.g. job loss, which has its own health consequences.

The process is linear without opportunities to discuss compliance feasibility, economic hardships, or unintended health effects that vary regionally. Such limited advice can mislead the EPA Administrator and the public with respect to the adequacy of the scientific advice provided by CASAC.

Although the CASAC-PM scientific advisory process is efficient and consistent with EPA's mandate, it is flawed. In particular, it gives the illusion of real scientific oversight.