Dear CASAC Committee:

Thank you for the opportunity to submit written comments to the CASAC PM Advisory panel. These comments are being submitted on behalf of the American Thoracic Society. The American Thoracic Society (ATS) is a medical professional society whose 16,000 members include physicians who treat patients with lung disease and scientists who study the effects of air pollution on lung health. Members of the ATS Environmental Health Policy Committee have reviewed the draft Policy Assessment for particulate matter (PM) and we appreciate the detailed policy analyses reported in this document.

The ATS wish to emphasize the following points:

1. There is clear evidence of serious health effects, including death, at PM2.5 exposures below the current annual standard for PM. The ATS recommends lowering the annual standard to 8ug/m3.

2. There is clear evidence of serious health effects, including death, at PM2.5 exposures below the current 24-hour PM2.5 standard. The ATS recommends lowering the 24-hour standard to 25ug/m3.

The Annual Standard is Not Protective

There is clear evidence as shown in Figure 3-20 of premature mortality in association with PM2.5 exposure below the annual standard of 12 μg/m3. Recent studies (in particular Wang 2020, Wu 2020, Dominici 2019, Wang 2017, Di 2017, Shi 2016, Pinault 2016) have been conducted using follow-up years with lower annual exposure levels (e.g., below 11 μg/m3). Since these studies reflect current exposure levels and include large study populations, they should be weighted heavily in determining the PM levels that protect the health of the US population.

The ATS emphasize the analysis by Di (2017), of Medicare recipients with exposure levels below 12 μg/m3, which found linear associations with mortality as mean PM2.5 levels increased above 6 μg/m3. The 2016 Shi study also performed a restricted analysis of those with long-term exposures below 10 μg/m3, among whom average annual exposure was lower than 8.0 μg/m3. Studies in Canada with even lower PM2.5 exposures than the US provide relevant evidence that should not be ignored. For example, the 2016 study by Pinault found an increase in mortality in association with PM2.5 with a mean PM2.5 level of 6.3 μg/m3. Given the compelling evidence that annual PM2.5 exposures at 8 μg/m3 and above are associated with higher mortality, the ATS recommends revising the annual PM2.5 standard to 8 μg/m3.
Factoring into this recommendation is our concern for susceptible subgroups, and the mandate that the EPA protect public health with an adequate margin of safety. In particular, effects of long-term PM exposure on infants and children, such as lower birthweight (Fong 2019) and impaired lung function growth (Gauderman 2004), and asthma (Garcia 2019) are of particular concern because these effects are likely irreversible and impair health into adulthood.

The 24-Hour Standard is Not Protective
The ATS agrees with the conclusion of the Policy Document on page 3-7 that “there continues to be sufficient evidence to conclude that a causal relationship exists between short-term PM$_{2.5}$ and cardiovascular effects.” And the conclusion on 3-54 that “evidence is sufficient to conclude that a causal relationship exists between short-term PM$_{2.5}$ exposure and total mortality.” We also agree with the comment on 3-54 that studies “consistently demonstrated a linear relationship with no evidence of a threshold. Additionally, recent analyses conducted at lower PM$_{2.5}$ concentrations (i.e., 24-hour avg PM$_{2.5}$ concentrations <30µg/m$^3$) provided initial evidence indicating that PM$_{2.5}$-mortality associations persist and may be stronger (i.e., a steeper slope) at lower concentrations.”

There is clear evidence that even brief (24 hour) exposures to PM$_{2.5}$ at levels in the range of 25 to 35 µg/m$^3$ triggers acute respiratory and cardiovascular events, including mortality (Di, Dai 2017), stroke (Wellenius 2012), hospital admission risk (Wei 2021). Older persons, persons of color, and Medicaid eligible persons are particularly susceptible to these harmful effects (Di, Dai 2017). Based on this, as we did in 2012 (Thurston and Balmes. 2012), the ATS recommends lowering the 24-hour PM$_{2.5}$ standard to 25 µg/m$^3$. Critically, structural systems produce and perpetuate inequities in exposure to air pollution and subsequent health effects. While on average PM$_{2.5}$ exposures across the United States have declined, communities of color and environmental justice communities remain disproportionately exposed (Tessum 2021, Nardone 2020). The ATS emphasizes that lowering the 24-hour standard will be particularly beneficial for the health of these communities. Further, a more protective 24-hour standard will help develop a policy response to exposure hotspots.

We urge CASAC, in advising EPA about the PM standard, to consider the recommendations of the ATS, and establish a more protective PM NAAQS.

Sincerely,

Jack Harkema, DVM, PhD, DACVP, ATSF
Chair, ATS Environmental Health Policy Committee
American Thoracic Society

Alison G. Lee, MD MS
Vice Chair, ATS Environmental Health Policy Committee
American Thoracic Society

References:


