

**ORAL Comments of Mary B. Rice MD MPH
On Behalf of the American Thoracic Society's Environmental Health Policy Committee**

**Comments for the US EPA Clean Air Scientific Advisory Committee (CASAC)
Teleconference on Particulate Matter
October 22, 2019**

Dear CASAC Members,

Thank you for the opportunity to speak at your teleconference today. I am a pulmonary and critical care physician and assistant professor of medicine at Harvard Medical School. I am the chair of the environmental health policy committee of the American Thoracic Society (ATS). I am speaking today on behalf of the ATS, whose 16,000 members include physicians who treat patients with lung disease, and scientists who study the effects of air pollution on lung health. We have reviewed the draft Policy Assessment for the particulate matter (PM), and we appreciate the detailed policy analyses reported in this document. We wish to emphasize the following points:

- 1. We are concerned about the lack of an independent CASAC for PM to advise your committee on the new PM standard**
- 2. There is clear evidence of serious health effects, including death, at PM_{2.5} exposures within the current annual and 24-hour standards for PM. Therefore, we recommend lowering both PM_{2.5} standards**
- 3. Studies show no evidence of a threshold below which health effects of PM do not occur, and therefore future cost/benefit analyses for PM rules should not falsely assume such a threshold exists**

Lack of a PM CASAC

This administration broke with EPA tradition and dismissed the PM CASAC review panel last year, leaving your 7-member chartered CASAC with the monumental task of reviewing all the scientific evidence to set all national ambient air quality standards. We are grateful that the dismissed committee convened anyway, and provided written recommendations today for your consideration. Our comments are in agreement with those of the Independent Particulate Matter Review Panel, and we urge you to consider their report.



The Annual Standard is Not Protective

There is clear evidence as shown in **Figure 3-3** of premature mortality in association with PM_{2.5} exposure within the annual standard of 12 µg/m³. Recent studies (in particular Shi 2016, Pinault 2016, Wang 2017, and Di 2017) 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.

We emphasize the analysis by Di (2017), of Medicare recipients with exposure levels below 12 µg/m³, which found linear associations with mortality as mean PM_{2.5} 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 PM_{2.5} 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 PM_{2.5} with a mean PM_{2.5} level of 6.3 µg/m³.

Given the compelling evidence that annual PM_{2.5} exposures at 8 µg/m³ and above are associated with higher mortality, **the ATS recommends revising the annual PM_{2.5} 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 longterm PM exposure on infants and children, such as lower birthweight (Fong 2019) and slower lung function growth (Gauderman 2004), are of particular concern because these effects are likely irreversible and impair health into adulthood.

The 24-Hour Standard is Not Protective

We disagree with the conclusion of the Policy Document on page 3-112 that “the available evidence supports ...retaining the current 24-hour standard with its level of 35 µg/m³.” We also disagree with the rationale on 3-112 that a 24-hour PM standard is only needed as a “supplement” to the annual standard. This rationale ignores the high incidence of acute health effects of short-term PM_{2.5} exposures. There is clear evidence that even brief (24 hour) exposures to PM_{2.5} at levels in the range of 25 to 35 µg/m³ triggers acute respiratory and cardiovascular events, including mortality (Figure 3-9; Di, Dai 2017), stroke (Wellenius 2012), asthma symptoms and respiratory hospitalization (page 3-30-3-31). There are large portions of the U.S. population, not just a “small number” of areas “confined to the Western U.S.” (3-112) who live in places that meet the annual standard, but are intermittently exposed to high PM levels from local sources (e.g. wood burning). 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/m³**.

No Evidence of a Health Effect Threshold for PM

The available evidence indicates that linear dose-response relationships between PM and health effects persist down to low levels of PM_{2.5}. There is no evidence of a threshold below which these health effects do not occur. This is most clearly illustrated in the 2017 NEJM study by Di which found linear associations between PM_{2.5} and mortality across the range of PM exposure. Therefore, we urge CASAC and EPA to avoid any threshold assumptions in future cost-benefit analyses of rules that affect PM. Such assumptions would lead to an underestimation of the health benefits of cleaner air.

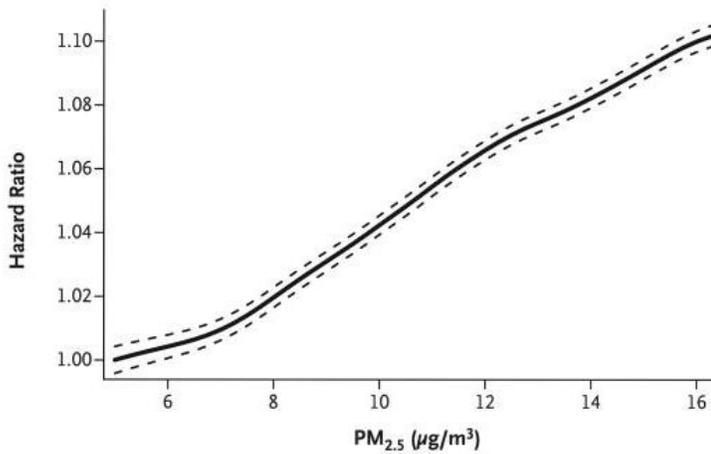


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A Exposure to PM_{2.5}



Concentration-Response Function of the Effect of Exposure to PM_{2.5} and All-Cause Mortality. Figure 3 from Di et al. (NEJM 2017).

The Clean Air Act specifies that the EPA should set the PM standard to protect public health with an adequate margin of safety. Clearly, the current annual and short-term PM standards allow substantial premature mortality and respiratory morbidity. There is no evidence of a threshold below which these health effects do not occur. We urge CASAC, in advising EPA about the PM standard, to consider the recommendations of the ATS, whose mission is to protect the respiratory health of children and adults. We will submit more detailed written comments subsequent to this hearing.

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