

March 28, 2023

Subject: Reconsideration of the National Ambient Air Quality Standards for Particulate Matter – Proposed Rule

Dear Environmental Protection Agency,

The 36 undersigned neurological health organizations and other groups with expertise and concerns for brain health write to you today to request the Environmental Protection Agency strengthen the proposed fine particulate matter (PM<sub>2.5</sub>) annual standard to 8 µg/m<sup>3</sup> and the daily standard to 25 µg/m<sup>3</sup>. These standards are the most stringent standards currently being proposed by the EPA. The World Health Organization’s recommendations are an annual standard of 5 µg/m<sup>3</sup> and a daily standard of 15 µg/m<sup>3</sup>.<sup>1</sup> However, these levels may not be adequate for protecting those at risk.<sup>2</sup>

For many neurological diseases, diagnosis can be complex, difficult to identify, and delayed. Even if diagnosed appropriately, for some diseases, like Parkinson’s disease, there may be no treatments to slow, stop, or reverse disease progression. Even further, for many neurological diseases like Parkinson’s and Alzheimer’s, there are no cures currently available.

Neurological diseases are complex and have varied causes and/or associations, including genetic and environmental risks. With these complexities at play, one of our best options is to prevent and reduce exposures leading to neurological disease. Air pollution, particularly fine particulate matter (PM<sub>2.5</sub>) is one such environmental exposure.

Scientific evidence validates the association between PM<sub>2.5</sub> and brain health. A recent article by Cor-Slechta et al. 2023 reviews the links of PM<sub>2.5</sub> to neurodevelopmental disorders like autism spectrum disorder, attention deficit hyperactivity disorder, and schizophrenia, as well as neurodegenerative diseases like Parkinson’s disease, Alzheimer’s disease, and multiple sclerosis.<sup>3</sup> Dementia has also been linked to PM<sub>2.5</sub>. For example, one study estimated U.S. dementia deaths from PM<sub>2.5</sub> exposure as 6.1 deaths per every 100,000 people.<sup>4</sup>

A 2021 study of New York state illustrated an association for particulate matter to Parkinson’s disease and ALS.<sup>5</sup> This study found these associations even though the average PM level in the study was 8.1 micrograms per cubic meter. This average level is lower than both the current

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<sup>1</sup> “WHO Global Air Quality Guidelines. Particulate Matter (PM<sub>2.5</sub> and PM<sub>10</sub>), Ozone, Nitrogen Dioxide, Sulfur Dioxide, and Carbon Monoxide.” (Geneva: World Health Organization, 2021).

<sup>2</sup> Environmental Protection Agency, “Particle Pollution and Your Patients’ Health,” *Patient Exposure and the Air Quality Index* (blog), March 3, 2023, <https://www.epa.gov/pmcourse/patient-exposure-and-air-quality-index>.

<sup>3</sup> Deborah A. Cory-Slechta, Alyssa Merrill, and Marissa Sobolewski, “Air Pollution–Related Neurotoxicity Across the Life Span,” *Annual Review of Pharmacology and Toxicology* 63, no. 1 (January 20, 2023): 143–63, <https://doi.org/10.1146/annurev-pharmtox-051921-020812>.

<sup>4</sup> Benjamin Bowe et al., “Burden of Cause-Specific Mortality Associated With PM<sub>2.5</sub> Air Pollution in the United States,” *JAMA Network Open* 2, no. 11 (November 20, 2019): e1915834, <https://doi.org/10.1001/jamanetworkopen.2019.15834>.

<sup>5</sup> Yanelli Nunez et al., “Fine Particle Exposure and Clinical Aggravation in Neurodegenerative Diseases in New York State,” *Environmental Health Perspectives* 129, no. 2 (February 2021): 027003, <https://doi.org/10.1289/EHP7425>.

standard at 12  $\mu\text{g}/\text{m}^3$ <sup>6</sup> and the standards currently being proposed by the EPA at 9 or 10  $\mu\text{g}/\text{m}^3$ .<sup>7</sup>

Researchers have also indicated that particulate matter pollution “disproportionately and systematically affect(s) people of color in the United States”.<sup>8</sup> One analysis looking at nine causes of death, of which only one (dementia) is neurological, showed that non-Hispanic black and African American individuals and those who have a lower socioeconomic status have a higher burden of death from  $\text{PM}_{2.5}$ .<sup>9</sup> The vast majority of all estimated deaths occurred at  $\text{PM}_{2.5}$  levels below 12  $\mu\text{g}/\text{m}^3$ , the current EPA standard. Many deaths were still estimated below the 8  $\mu\text{g}/\text{m}^3$  standard, the lowest proposed EPA standard.

We urge the EPA to use the most protective standards for the proposed  $\text{PM}_{2.5}$  rule. Strengthening the standards would contribute to safeguarding neurological health, contribute to reducing risk, and enhance efforts to reach EPA environmental justice goals so that historically and currently marginalized communities are not left further behind.

Sincerely,

The Michael J. Fox Foundation for Parkinson’s Research  
Alliance of Nurses for Healthy Environments  
American Academy of Neurology  
American Parkinson Disease Association  
American Psychological Association  
Brian Grant Foundation  
Central California Asthma Collaborative  
Climate for Health/ecoAmerica  
Climate Psychiatry Alliance  
CurePSP  
Dallas Area Parkinson Society  
Davis Phinney Foundation  
Friends of Parkinson's  
Hawai'i Parkinson Association  
Houston Area Parkinson Society  
League of Conservation Voters  
Lewy Body Dementia Association  
Michigan Parkinson Foundation  
Moms Clean Air Force  
Northeast Ohio Black Health Coalition  
Northwest Parkinson's Foundation  
Oregon Environmental Council  
Parkinson & Movement Disorder Alliance  
Parkinson Association of Alabama  
Parkinson Association of Central Florida  
Parkinson Association of Northern California  
Parkinson Association of the Carolinas

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<sup>6</sup> <https://www.epa.gov/criteria-air-pollutants/naaqs-table>

<sup>7</sup> <https://www.epa.gov/system/files/documents/2023-01/PM%20NAAQS%202022%20-%20Standards%20-%20Fact%20Sheet.pdf>

<sup>8</sup> Christopher W. Tessum et al., “ $\text{PM}_{2.5}$  Polluters Disproportionately and Systemically Affect People of Color in the United States,” *Science Advances* 7, no. 18 (April 30, 2021): eabf4491, <https://doi.org/10.1126/sciadv.abf4491>.

<sup>9</sup> Bowe et al., “Burden of Cause-Specific Mortality Associated With  $\text{PM}_{2.5}$  Air Pollution in the United States.”

Parkinson Association of the Rockies  
Parkinson's Foundation  
Parkinson's Resources of Oregon  
PD Avengers  
Power for Parkinson's  
Power Over Parkinson's  
The Parkinson Alliance  
Wisconsin Parkinson Association  
Woodsmoke Free PDX