

Rajagopalan S, Brauer B, Bhatnagar A, Bhatt DL, Brook JR, Huang W, Münzel T, Newby D, Siegel JA, Brook RD. 2020. Personal-level protective actions against particulate matter air pollution exposure: A scientific statement from the American heart association. *Circulation*, 142(23), e411-431. DOI: [10.1161/CIR.0000000000000931](https://doi.org/10.1161/CIR.0000000000000931)

Abstract

Since the publication of the last American Heart Association scientific statement on air pollution and cardiovascular disease in 2010, unequivocal evidence of the causal role of fine particulate matter air pollution (PM_{2.5}, or particulate matter ≤2.5 μm in diameter) in cardiovascular disease has emerged. There is a compelling case to provide the public with practical personalized approaches to reduce the health effects of PM_{2.5}. Such interventions would be applicable not only to individuals in heavily polluted countries, high-risk or susceptible individuals living in cleaner environments, and microenvironments with higher pollution exposures, but also to those traveling to locations with high levels of PM_{2.5}. The overarching motivation for this document is to summarize the current evidence supporting personal-level strategies to prevent the adverse cardiovascular effects of PM_{2.5}, guide the use of the most proven/viable approaches, obviate the use of ineffective measures, and avoid unwarranted interventions. The significance of this statement relates not only to the global importance of PM_{2.5}, but also to its focus on the most tested interventions and viable approaches directed at particulate matter air pollution. The writing group sought to provide expert consensus opinions on personal-level measures recognizing the current uncertainty and limited evidence base for many interventions. In doing so, the writing group acknowledges that its intent is to assist other agencies charged with protecting public health, without minimizing the personal choice considerations of an individual who may decide to use these interventions in the face of ongoing air pollution exposure.

Keywords

- Air pollution, cardiovascular disease, environment, particulate matter, public health

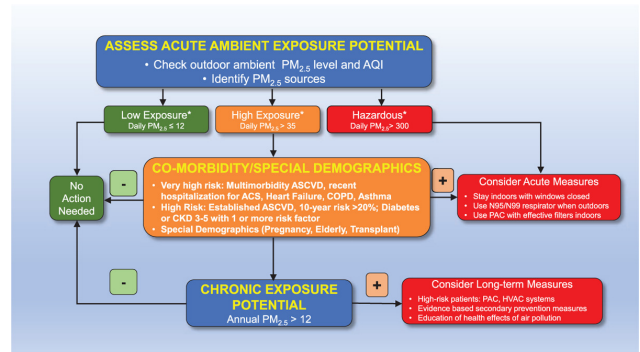


Figure 1. Potential clinical approach to determine if personal-level interventions are needed. *Represents daily PM_{2.5} levels. Given the fact that indices like the Air Quality Index (AQI) and Air Quality Health Index may be influenced by other pollutants, PM_{2.5} values are used in this suggested approach. The threshold values of 12 and 300 μg/m³ represent daily averages and correspond to the corresponding AQI limit of 50 and 450, respectively. The value of 35 μg/m³ corresponds to the daily National Ambient Air Quality Standards limit for PM_{2.5}. ACS indicates acute coronary syndrome; ASCVD, atherosclerotic cardiovascular disease; CKD, chronic kidney disease; COPD, chronic obstructive pulmonary disease; HVAC, heating ventilation and air conditioning; PAC, portable air cleaner; and PM_{2.5}, fine particulate matter, defined as particles <2.5 μm in diameter.

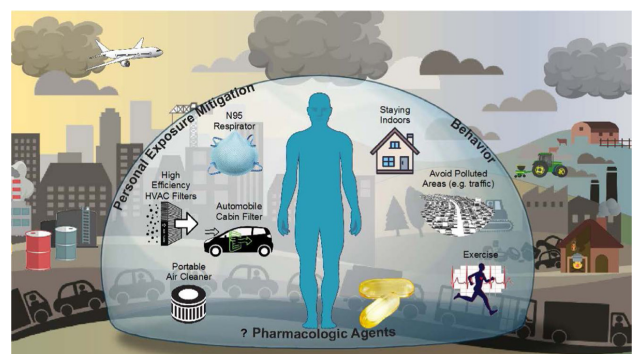


Figure 2. Individual exposure mitigation strategies. Personal exposure reduction, behavioral pharmacologic approaches are highlighted.

