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## Elevating the Importance of Environmental Public Health and Partnership With Healthcare Professionals

**Editor's Note:** The National Environmental Health Association strives to provide up-to-date and relevant information on environmental health and to build partnerships in the profession. In pursuit of these goals, we have partnered with the Office of Research and Development (ORD) within the U.S. Environmental Protection Agency (U.S. EPA) to publish two columns a year in the *Journal*. ORD is the scientific research arm of U.S. EPA. ORD conducts the research for U.S. EPA that provides the foundation for credible decision making to safeguard human health and ecosystems from environmental pollutants.

In these columns, authors from ORD will share insights and information about the research being conducted on pressing environmental health issues. The conclusions in these columns are those of the author(s) and do not necessarily represent the official position of U.S. EPA.

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### Making the Connection With Healthcare Partners

Professionals working in environmental public health, healthcare, and healthcare systems benefit from building partnerships and fostering cross-sector and cross-disciplinary dialogue, creating robust networks that facilitate cooperation and coordination. These networks improve the delivery and effectiveness of environmental health, public health, and healthcare services over time, rather than being limited to reactionary responses during health crises (Deener et al., 2021). The COVID-19 pan-

dem and the recent intrusion of wildfire smoke from Canada that inundated Eastern and Central U.S. underscore the need for such robust cross-disciplinary networks.

In recent years, the U.S. has seen many emerging environmental public health incidents, including the increased severity of wildfires and exposure to wildfire smoke, drought, excessive heat, and chemical exposures. Environmental public health professionals are often on the front lines of discovering and addressing these environmental health concerns, including the identification of those individuals at highest risk from a

specific environmental exposure. Healthcare providers, healthcare system leaders, and clinical case managers address clinical diseases, however, at the individual level and have the platform to provide patients with relevant health information and prevention strategies. Connecting these two fields—the understanding of an environmental public health issue and how it impacts individual health—and fostering cross-disciplinary dialogue could advance public health protection and improve personalized healthcare.

### Developing Impactful Training and Resources for Clinicians

Understanding this need to connect environmental health sciences with healthcare-related audiences, the U.S. Environmental Protection Agency (U.S. EPA) and Centers for Disease Control and Prevention (CDC) partnered to develop the following accredited courses: Particle Pollution and Your Patients' Health (U.S. EPA, 2023a; Figure 1) and Wildfire Smoke and Your Patients' Health (US EPA, 2023b). These courses enable physicians, nurses, and healthcare educators to educate themselves on the health risks and people most at risk for airborne environmental exposures. Continuing education credits are also available for completing the courses.

More recently, U.S. EPA, CDC, and the U.S. Department of Health and Human Services established the Million Hearts Climate Change and Cardiovascular Disease Collaborative. The collaborative provides a venue for healthcare practitioners to deepen their understanding of the threats of climate change and air pollution to heart and vascular

FIGURE 1

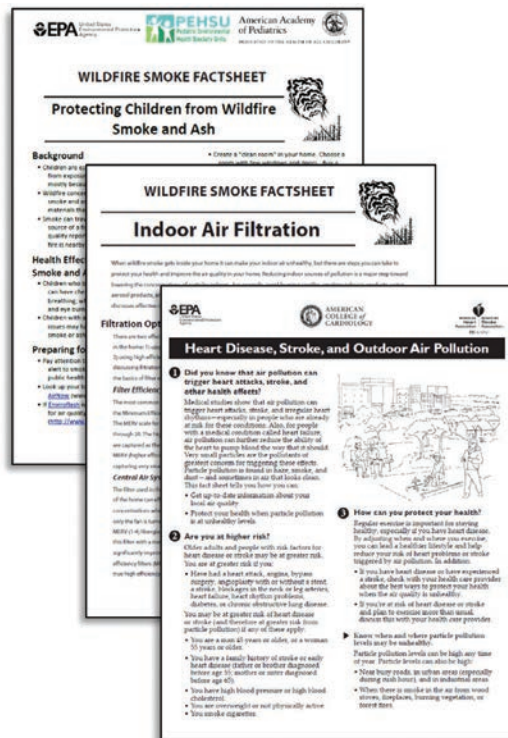
### Collaborative Course for Clinicians on Particle Pollution and Patient Health From the U.S. Environmental Protection Agency and the Centers for Disease Control and Prevention



Learn more about the course at [www.epa.gov/pmcourse/learn-about-particle-pollution-and-your-patients-health-course](http://www.epa.gov/pmcourse/learn-about-particle-pollution-and-your-patients-health-course).

FIGURE 2

### Stand-Alone Fact Sheets for Protecting Populations and At-Risk Individuals From Wildfire and Wildfire Smoke



You can find these fact sheets and more at [www.airnow.gov/wildfire-guide-factsheets/](http://www.airnow.gov/wildfire-guide-factsheets/).

disease and the impact on healthcare systems (Million Hearts, 2023). These collaborations have reinforced the critical benefits offered by providing clinicians with easily accessible tools and accredited training resources to communicate patient health risks.

The key, too, is the provision of easy-to-use tools to healthcare providers that can be shared with patients at higher health risk to specific environmental exposures, like airborne particulate matter. These tools can help individuals monitor their environments and know when they might be at higher risk. Applications like the AirNow.gov website and its mobile app, as well as participatory science projects like the Smoke Sense App, are interactive tools that enable an individual to personalize their environmental search and geographic locations to learn what and how much of an air pollutant they are being exposed to (AirNow, 2023a, 2023b; U.S. EPA, 2023c).

Tailored fact sheets and DIY infographics are other tools healthcare professionals use to convey information to patients about exposures and strategies to promote health and prevent disease. The U.S. EPA *Wildfire Smoke: A Guide for Public Health Officials* offers stand-alone fact sheets on protecting at-risk populations, such as children, from wildfire smoke and ash, along with guidance on the correct use of face masks to prevent inhalation of smoke particles (U.S. EPA, 2021; Figure 2). Providing physicians with easy and cost-conscious DIY solutions can increase accessibility for at-risk populations to take action to reduce their exposure. For instance, U.S. EPA has developed DIY air cleaner information to help individuals reduce their indoor exposure to wildfire smoke (U.S. EPA, 2023d).

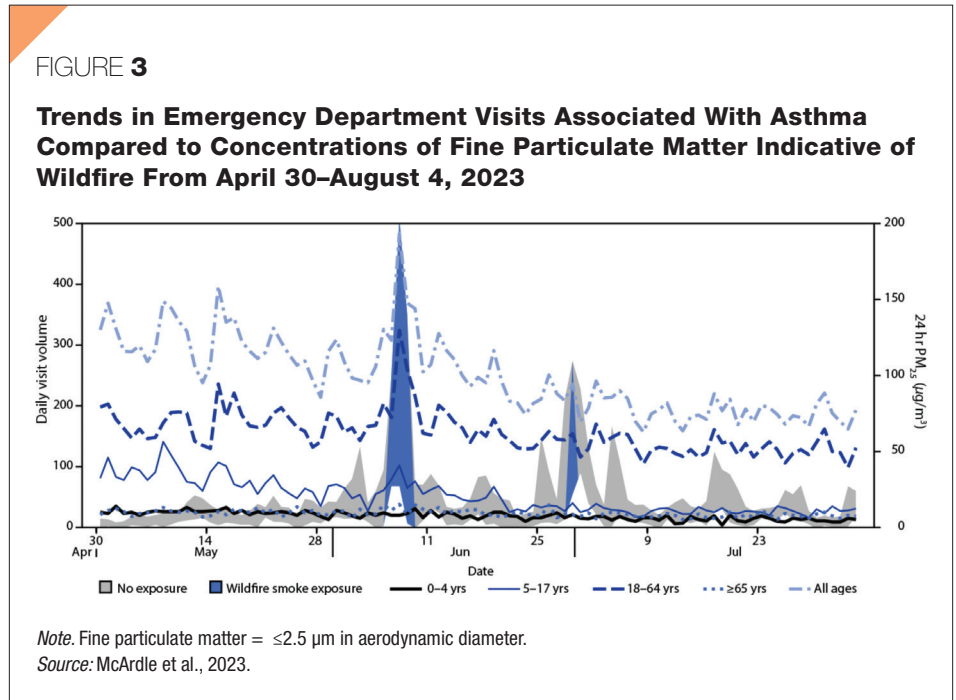
### Connecting Environmental Emerging Events to a Healthcare Setting: Wildfires

From April 30–August 4, 2023, smoke originating from wildfires in Canada affected some U.S. states unaccustomed to exposure to wildfire smoke. CDC analyzed daily numbers and percentages of emergency department visits associated with asthma on days with and without wildfire smoke to estimate the extent of wildfire smoke on increased asthma-associated visits. Emergency department visits for asthma were 17% higher than expected during 19 days of wildfire smoke (McArdle et al., 2023; Figure 3).

The New York State Department of Environmental Conservation also conducted a more regional analysis of emergency department visits during a 2-week period in June where the air quality for particulate matter reached “unhealthy” and “very unhealthy” levels across the state. Their findings were that particulate matter in New York was highest on June 7, 2023, representing 590% to 1,229% increases across the state (except for the Adirondacks) and that emergency department visits associated with asthma increased statewide by 81.9% (Meek et al., 2023). Perhaps these high rates of asthma, particularly in the 18- to 64-year-old cohort, relate to the lack of personal experience with wildfire smoke in this population and the lack of knowledge of options available to reduce exposure.

The results from these emergency department analyses can help guide emergency response planning and public health communication strategies, especially in U.S. regions where wildfire smoke exposure was previously uncommon. These findings also suggest that clinicians can consider counseling patients about protective measures, including awareness of current and predicted air quality conditions, staying indoors, using air filtration, and using properly fitted N95 respirators when outdoors, especially among persons with asthma, COPD, heart and vascular disease, or children, older adults, and pregnant persons.

Having partnerships formally established and relevant resources available and communicated in advance of an environmental health crisis is essential to ensuring clinicians have the available information at their fingertips when needed. After the Canadian wildfires, U.S. EPA analyzed website traffic on specific sites that offered training and resources to public health professionals on exposure to wildfire smoke. It was found that access to the Wildfire Smoke and Your Patients’ Health course rose from 4,863 visits in May 2023 to 49,535 visits in June 2023, with approximately 18,000 views in one day when most of the wildfire smoke was impacting major U.S. cities. Furthermore, the Particle Pollution and Your Patients’ Health course rose from 6,884 visits in May 2023 to 46,136 visits in June 2023. Similarly, daily access to websites and informational materials rose substantially in June 2023, such as access to the U.S. EPA Smoke Ready Toolbox and the DIY air cleaner information documents,



which rose from approximately 150 views per day to over 1,500 views per day and 100 views per day to over 2,750 views per day, respectively. These data suggest that the availability of resources prior to an emerging event can enable clinicians to quickly access environmental information they were previously not well versed in and provide health-protective information to their patients.

**Future Opportunities**

While environmental public health practitioners continue to study the effects of environmental hazards adversely impacting human health and identifying the most at-risk populations, few at-risk patients are counseled by their healthcare professionals about the risks of short- and long-term exposure to ambient particulate matter (Mirabelli et al., 2018). Many reasons might explain the low rate of engagement between clinical providers and patients on the topic of environmental health risks. Inadequate time to counsel patients during brief encounters is a common explanation, even when a clinician knows an environmental risk. Another reason is the uncertainty of a benefit from an intervention, which is in part due to physicians depending on clinical data to inform disease prevention and exposure interventions.

While well-designed clinical studies have confirmed that personal interventions to

reduce exposure to ambient particulate matter improve surrogate biomarkers of cardiovascular risk, there is as yet no randomized clinical trial testing an intervention to lower long-term reductions in ambient particulate matter and measure clinical cardiovascular endpoints, such as the reduction in the rate of heart attack, stroke, arrhythmia, or heart failure (Rajagopalan et al., 2020). Randomized controlled trials of individual-level interventions to reduce particulate matter exposure are essential to establish evidence-based recommendations for approaches to improve health outcomes, especially among those individuals with a higher risk from exposure (Cascio & Ward-Caviness, 2023).

Until then, environmental health professionals can continue to develop, engage, and foster relationships with clinicians and allied healthcare professionals. They can also learn how their colleagues in the healthcare professions process information and relay interventions to their patients. Furthermore, environmental health professionals can proactively develop and communicate resources and tools that clinicians and patients can use during emerging environmental events that place many people at higher risk for adverse health outcomes. ✨

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