Lessons from the London Smog: A Brief Report and Reflection on the 2023 Wildfire Events Affecting the Northeastern United States

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Introduction

During the London Smog of 1952, a catastrophic air pollution event, London's air was saturated with sulfur dioxide (SO2), particulate matter (PM2.5), and alarmingly high concentrations of carbon monoxide (CO), peaking at an estimated 300 ppm.[1,2,3] This led to significant morbidity, including severe cardiopulmonary illness and skin "redness" and "blistering."[1,2,3] Recent acute pollution events in North America highlight the persistent threat of air pollution to human health.[4] This study aims to examine the impact of air pollution intensified by recent wildfires and resulting downward spread of airborne pollutants to the northeastern United States (U.S.) on the burden of skin and airway disease in Boston. Arising from incomplete combustion in wildfires, CO has atmospheric longevity that provides utility when analyzing pollutant transport.[5]

Methods

Boston CO levels recorded by the Environmental Protection Agency (EPA)[6] during the Canadian wildfires were correlated with clinic visits for dermatitis and asthma exacerbations at the Mass General Brigham (MGB) hospital system, located 300 miles from the fires. This data was compared with data from the corresponding months in 2020-2022 for historical control.

Results

A peak in CO levels was associated with dermatitis and asthma exacerbation visits during the summer of 2023, highlighting the role of acute air pollution events on skin and respiratory disease (Fig 1).

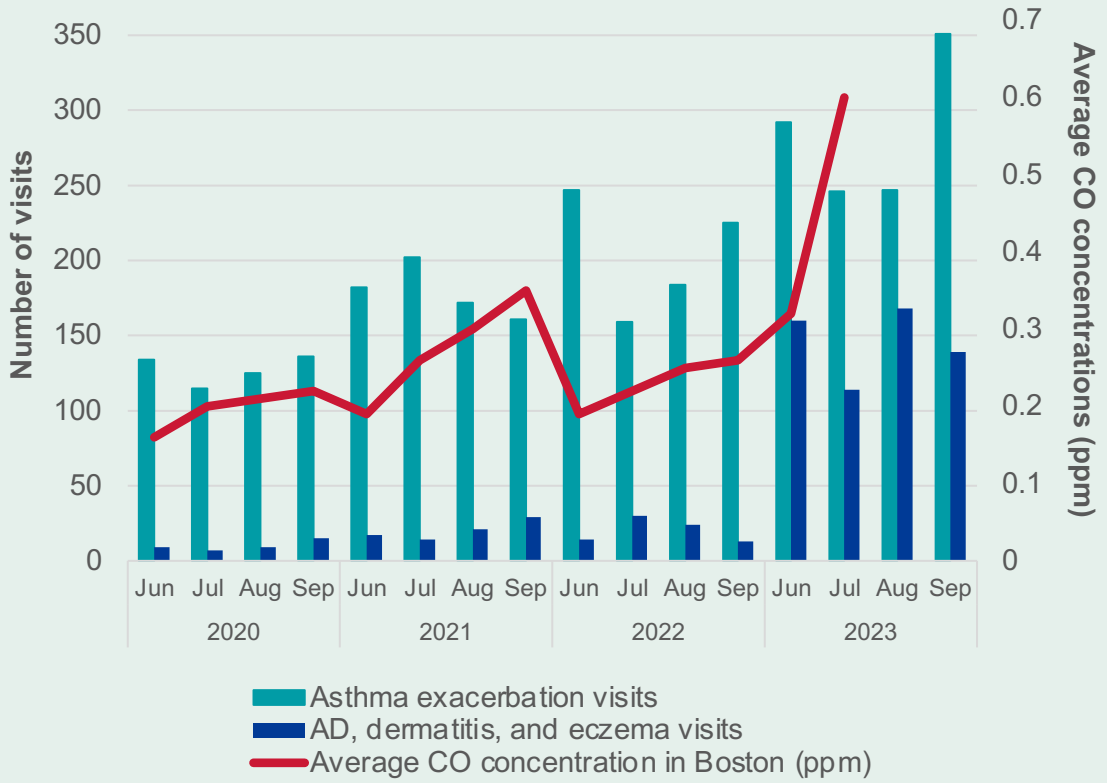

Figure 1. Clinic visits for atopic dermatitis (AD), dermatitis, eczema, and asthma exacerbations during the months of June through September in the years 2020 through 2023.[a] Average carbon monoxide (CO) concentrations in Boston are recorded by the U.S. Environmental Protection Agency. [a]Data collected with assistance of staff from MGH Information Systems

Discussion & Conclusion

In 1956, the Clean Air Act was introduced in Britain to promote smokeless zones, which led to gradual improvements in air quality.[7] Similarly, the U.S. Clean Air Act of 1963, enforced by the EPA, led to significant reductions in SO_2 (a contributor to PM2.5 levels) as well as CO emissions,[8,9] yet air pollution continues to pose a threat, particularly to the health of low-income, geriatric, and pediatric populations.[10,11,12] Despite the United Nations' caution on the need to learn from increasing wildfires, recent policy shifts propose a 40% reduction in EPA funding.[13,14] It is imperative that public health and governmental agencies collaborate to enhance air purification policies and initiatives, aiming to mitigate the burden of poor air quality on skin and respiratory diseases, especially in vulnerable communities.

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