

A lightning flash talk: 4 studies on climate change in 12 minutes

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1

Objectives



- Discuss four papers which looked at the impact of climate change on human health
- Articles will be briefly overviewed
- Goal is to have not only information but a story to tell

2

1. Impact of Wildfires on Emergency Departments



Published: 2022

Who: several southern and western US states (n=16), Australia (n=3)

When: 1991-2018

What: indicates particulate matter (PM) is principally linked to adverse respiratory and cardiovascular outcomes. Observable trends in the literature principally included a significant increase in respiratory presentations, primarily with a lag of one to two days from the initial event. Respiratory and cardiovascular studies that stratified results by age indicated individuals under five, over 65, or those with pre-existing conditions formed the majority of ED presentations.

Skinner, R., Luther, M., Hertelendy, A. J., Khorram-Manesh, A., Sørensen, J., Goniewicz, K., & Ranse, J. (2022). A Literature Review on the Impact of Wildfires on Emergency Departments: Enhancing Disaster Preparedness. *Prehospital and disaster medicine*, 37(5), 657–664.

3

1. Impact of Wildfires on Emergency Departments

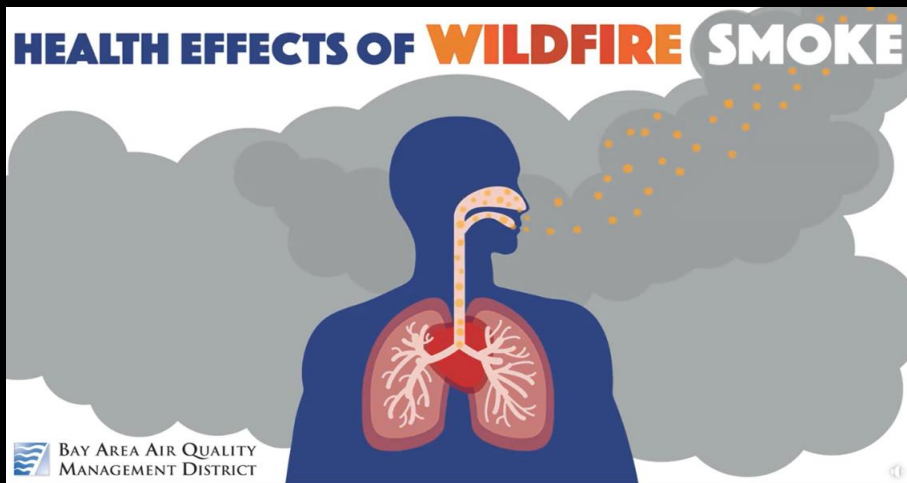


Takeaway: A greater prevalence of women and children were observed in EDs following a wildfire event and a lag time was sometimes observed between the start of the event and significant increases in ED presentations. The primary presenting complaint secondary to wildfires at EDs across all studies was respiratory, and often this was from individuals with little or no previous history of the disease. Conversely, those more aware of their medical condition (predominantly chronic respiratory conditions) were able to self-medicate and adequately prepare for the event, assuming key messaging was promulgated in a timely manner.

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4

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5

2. Particulate Air Pollution and Incident of Dementia in the US



Published: 2023

Who: 27 857 US participants (mean [SD] age, 61 [10] years; 15 747 [56.5%] female) of the Health and Retirement Study

How: Compared the 10-year mean total $PM_{2.5}$ and $PM_{2.5}$ from 9 emission sources at participant residences

Zhang, B., Weuve, J., Langa, K. M., D'Souza, J., Szpiro, A., Faul, J., ... & Adar, S. D. (2023). Comparison of particulate air pollution from different emission sources and incident dementia in the US. *JAMA Internal Medicine*.

6

2. Particulate Air Pollution and Incident of Dementia in the US



What: Higher concentrations of total $PM_{2.5}$ were associated with greater rates of incident dementia (HR, 1.08; 95% CI, 1.01-1.17)

- strongest associations for agriculture, traffic, coal combustion, and wildfires (HR, 1.05; 95% CI, 1.02-1.08)
- wildfires release other components that are likely to be highly toxic
- Long-range smoke from wildfires frequently impacts the same downwind locations, resulting in wildfire smoke becoming a more long-term presence

Zhang, B., Weuve, J., Langa, K. M., D'Souza, J., Szpiro, A., Faul, J., ... & Adar, S. D. (2023). Comparison of particulate air pollution from different emission sources and incident dementia in the US. *JAMA Internal Medicine*.

7

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<https://www.nytimes.com/2023/06/14/us/wildfire-smoke-minnesota.html>
<https://kffhealthnews.org/news/stalked-by-the-fear-that-dementia-is-stalking-you/>

8

3. Social and ecological determinants of mental health for children and youth



Published: 2021

Who: perspectives from Canadian children (0–14) and youth (15–24)

How: Literature review with thematic analysis of 58 articles

- What are the direct and indirect impacts of climate change on children/youth’s mental health in Canada?
- What are children/youth’s perceptions or views of climate change and how do they impact their mental health and wellbeing?
- In what ways can taking action on climate change through community projects strengthen and build resilience?

Gislason, M. K., Kennedy, A. M., & Witham, S. M. (2021). The interplay between social and ecological determinants of mental health for children and youth in the climate crisis. *International journal of environmental research and public health*, 18(9), 4573.

9

3. Social and ecological determinants of mental health for children and youth



Takeaway:

- children/youth are currently experiencing considerable mental health issues for their age group, and are “feeling less in control of their lives than at any point in recent history”
- Furthermore, a majority of youth ages 10- to 12-years old experience feelings of fear, helplessness, worry, sadness, anger, and anxiety due to climate change
- children/youth are increasingly engaging in risk reduction, community climate adaptation, and mitigation initiatives, and policy discussions

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10



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"Greta Thunberg Effect"

Gislason, M. K., Kennedy, A. M., & Witham, S. M. (2021). The interplay between social and ecological determinants of mental health for children and youth in the climate crisis. *International journal of environmental research and public health*, 18(9), 4573.

11



4. The impact of the COVID-19 lockdown on global air quality

Published: 2022

Who: worldwide (focuses on India, China, Brazil, and USA)

How: Literature review of reported pollution levels pre and during COVID-19

- studies included different cities, residential areas, commercial areas, tourist spots, industrial areas, mining sites, highways, and roads

Saha, L., Kumar, A., Kumar, S., Korstad, J., Srivastava, S., & Baudh, K. (2022). The impact of the COVID-19 lockdown on global air quality: A review. *Environmental Sustainability*, 5(1), 5-23.

12

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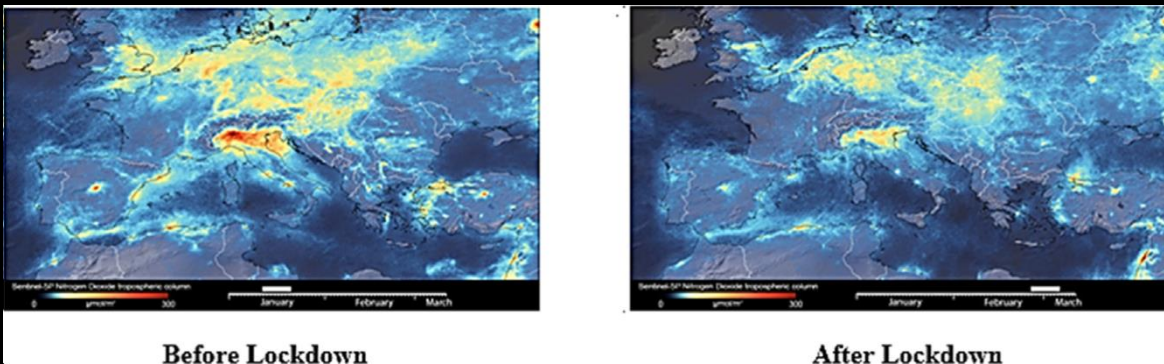
Takeaway:

- Global environmental pollution levels significantly improved, particularly the level of major air contaminants like NO₂, SO₂, CO, PM (PM_{2.5} and PM₁₀)
 - Environmental pollution decreased up to 30%
- Reduced major air contaminants prevented severe COVID-19 cases due to decreased lung and breathing complications

Saha, L., Kumar, A., Kumar, S., Korstad, J., Srivastava, S., & Baudh, K. (2022). The impact of the COVID-19 lockdown on global air quality: A review. *Environmental Sustainability*, 5(1), 5-23.

13

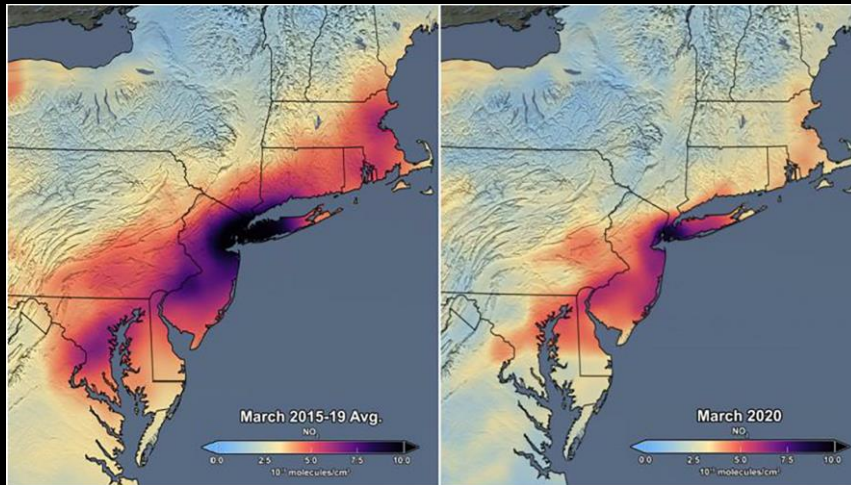
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Muhammad, S., Long, X., & Salman, M. (2020). COVID-19 pandemic and environmental pollution: A blessing in disguise?. *Science of the total environment*, 728, 138820.

14

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15

Take Home Points



- Climate disasters like wildfires, increasing in frequency due to changing climate, exacerbate current health problems and increase healthcare utilization
- Air pollutants, created by wildfires, may also increase the risk of long term illness such as dementia
- Climate disasters is causing psychological stress for children/youth who feel a lack of control and increased hopelessness for the planet
- With drastic changes, such as decreased transportation in COVID-19 lockdown, it's not too late to make a difference

16