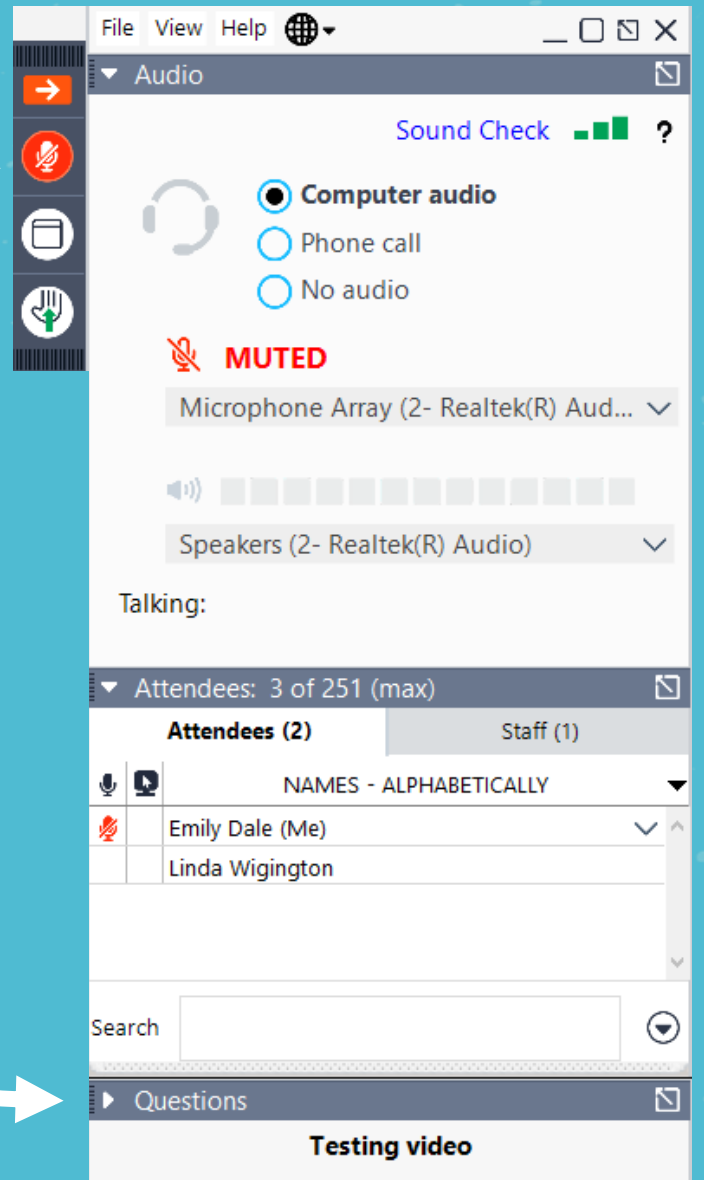
Low Cost Monitoring Project (LCMP)
Cohort 65:
Health Impacts & Questions

7:00 PM Monday, October 6, 2025

NOON Tuesday, October 7, 2025

The Virtual Classroom

- Open or close the control panel (upper right hand corner of screen)
- Feel free to keep your mics on unless your background is noisy
- Questions can be placed in the “Questions” tab
- Both links & comments will appear in the “Questions” tab



This Meeting is Being Recorded

LCMP Team



Linda Wigington
Team Leader
Waynesburg, PA
724-986-0793
lwigington1@outlook.com



Rob Busher
Program Coordinator
Portland, Maine
412-437-8454
robb@rocis.org



Samantha Totoni, PhD
Public Health Fellow
Pittsburgh, PA
217-390-1842
skc35@pitt.edu

Elly Helgen
SWPA Project Coordinator
Bethel Park, PA
520-419-1109
elisha.helgen@gmail.com



Jessica Kester
Air Quality Education Coordinator
Blue Knob, PA
814-937-7365
Jessicalkester@gmail.com



Your Name

Location

Send Elly an email if you want to do a short presentation of your data/experience.

01

Introduction

Cohort 65

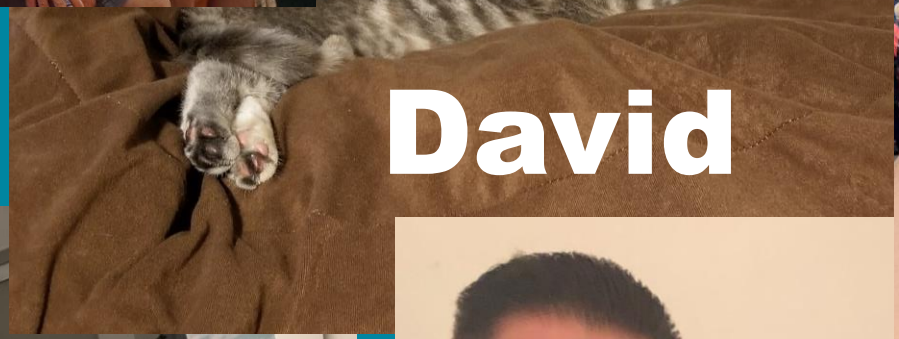




Nikki







David



Erika



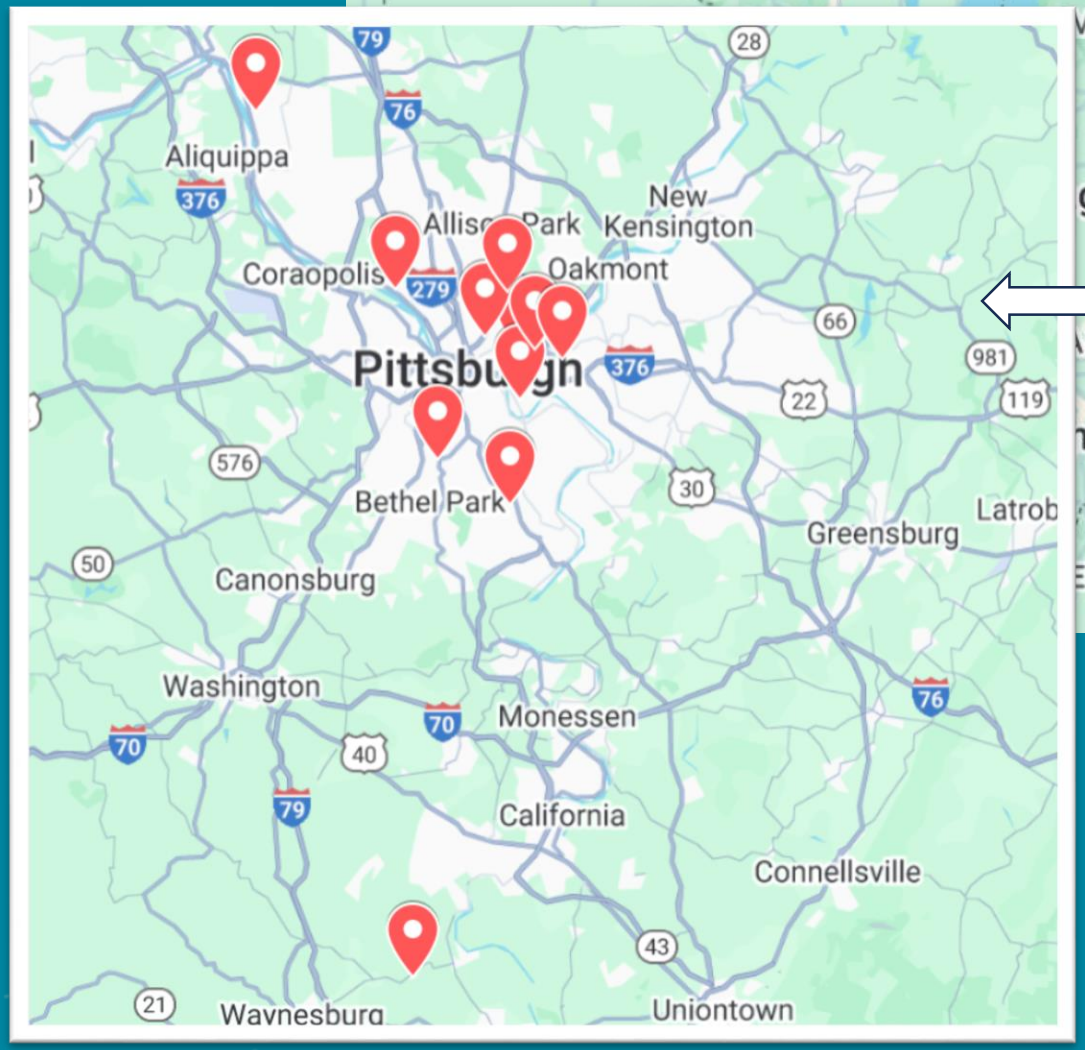
Becky



Gladys



Kathy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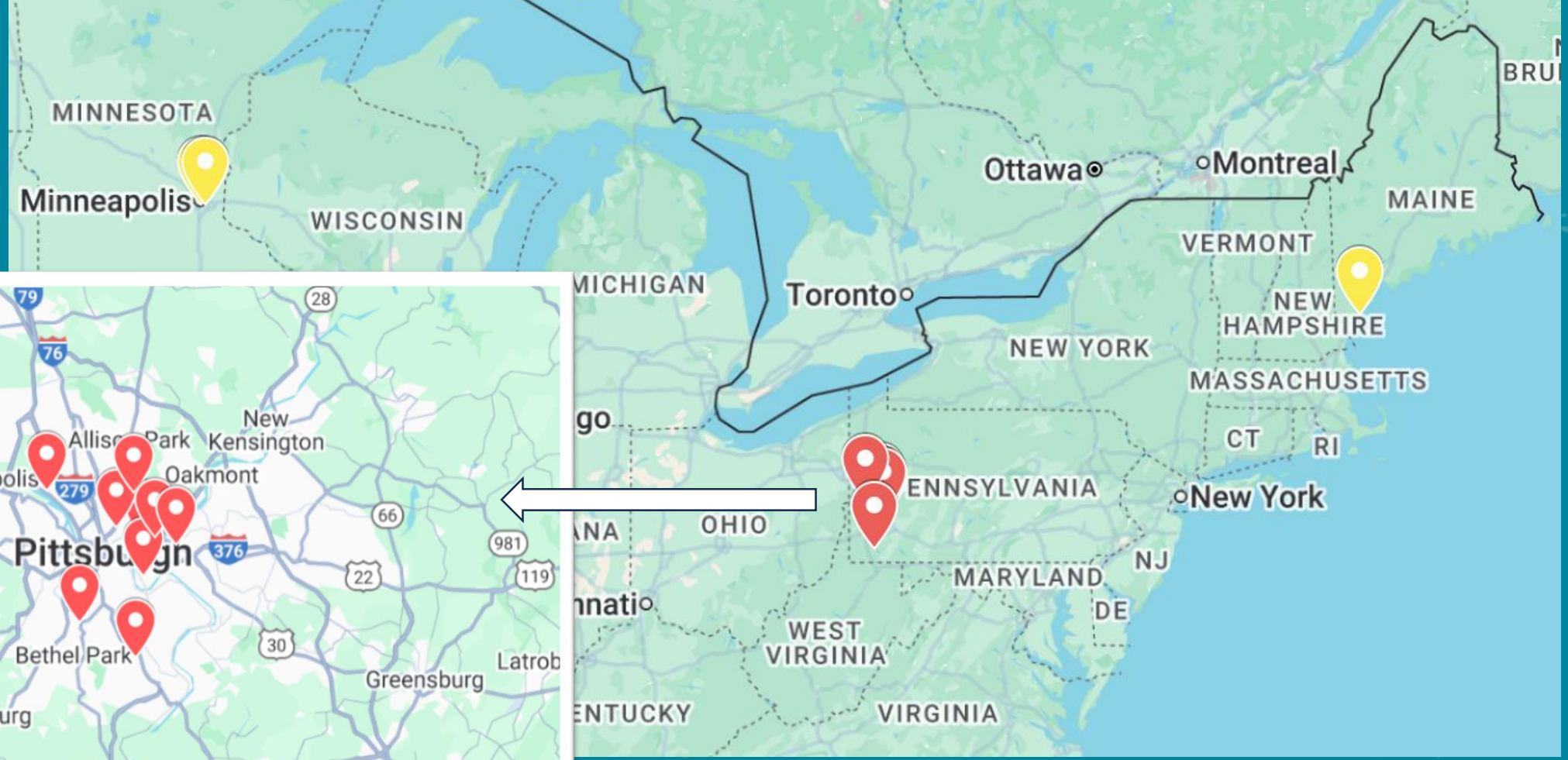
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Cohort 65

Meeting Topics

Address questions about health impacts:

- In the News
- In Pittsburgh
- Environmental Racism and Health Disparities
- Health Impacts Early and Late in Life
- Can air quality impact joint pain?
- Sensitivity to particle pollution
- Candles and Essential oils
- How much do short-term spikes affect air quality overall?
- Radon exposure and cancer, Why are there such drastic radon swings
- VOCs + Particles
- Degredation
- Air Quality Advocacy Opportunities

02

Take-Home Message reinforced by this presentation

Goal = particles as low as possible

No “safe” level of air pollution has been identified.

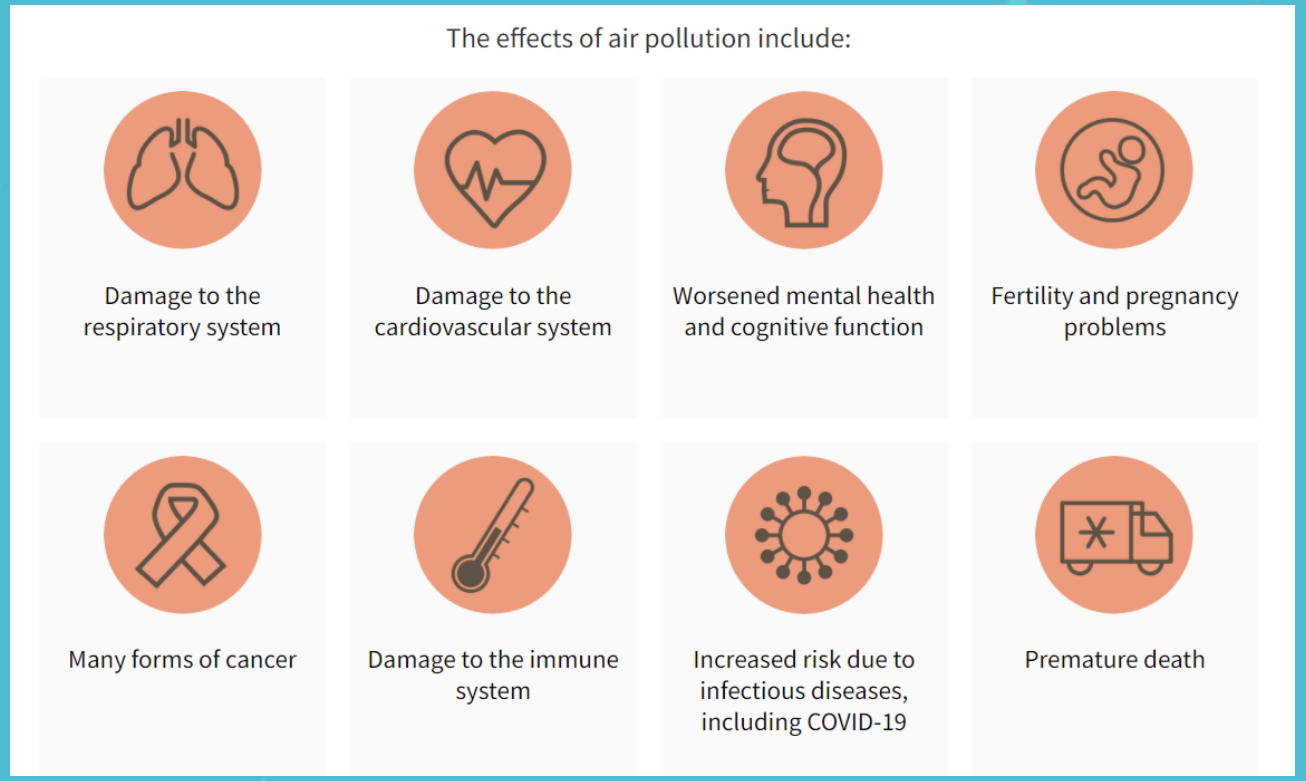
03



“The best evidence shows that having less of all types of particles in the air leads to better health and longer lives.”

Particle Pollution | American Lung Association

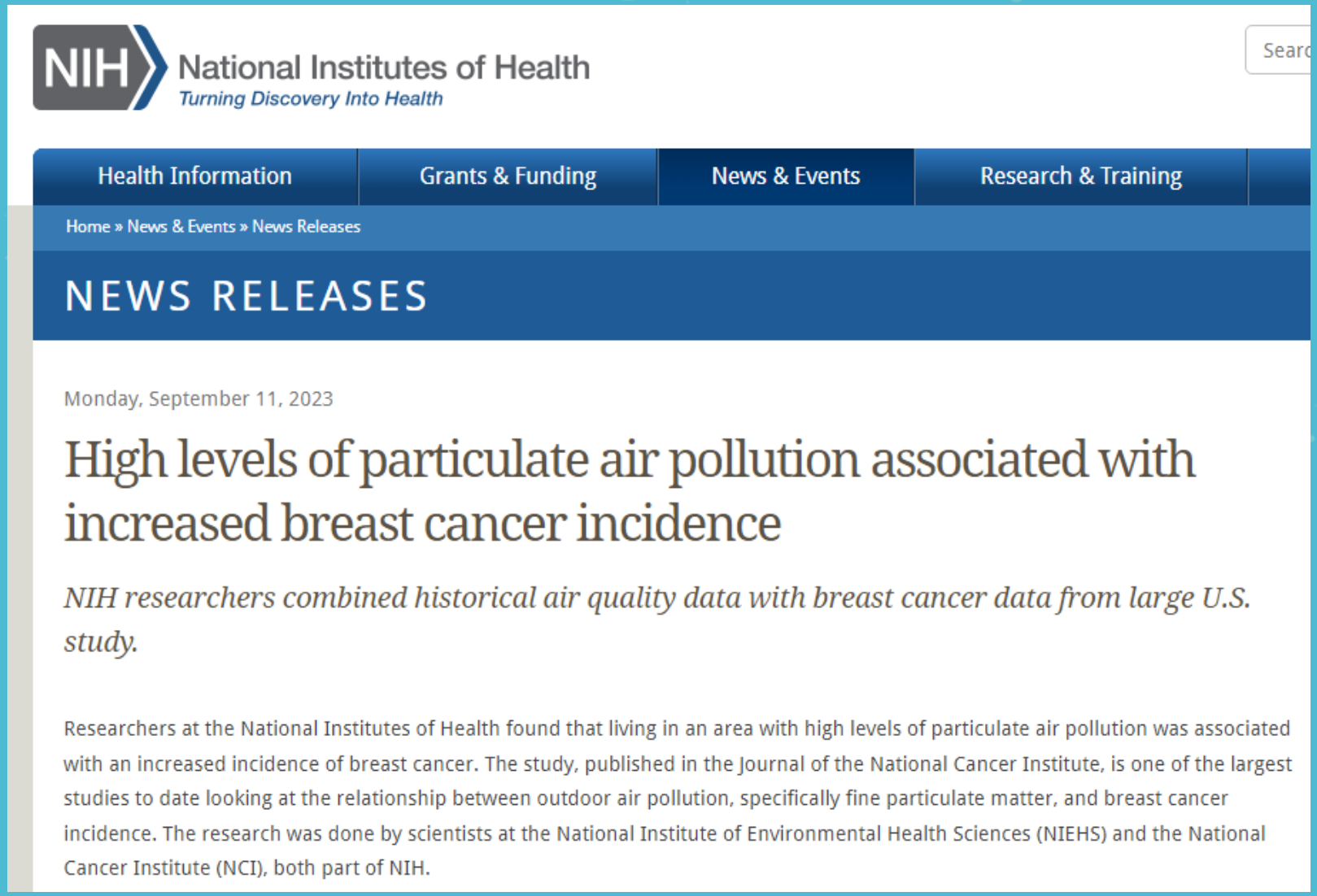
Reminder:



The pollution in America's air causes hundreds of thousands of premature deaths every year and contributes to health problems ranging from asthma to dementia.

The World Health Organization (WHO) and studies in the Journal of the American Medical Association, Environmental Health Perspectives, and the New England Journal of Medicine have all concluded that any level of air pollution causes measurable health impacts.

Some health effects of particulate air pollution are newly emerging:



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NEWS RELEASES

Monday, September 11, 2023

High levels of particulate air pollution associated with increased breast cancer incidence

NIH researchers combined historical air quality data with breast cancer data from large U.S. study.

Researchers at the National Institutes of Health found that living in an area with high levels of particulate air pollution was associated with an increased incidence of breast cancer. The study, published in the Journal of the National Cancer Institute, is one of the largest studies to date looking at the relationship between outdoor air pollution, specifically fine particulate matter, and breast cancer incidence. The research was done by scientists at the National Institute of Environmental Health Sciences (NIEHS) and the National Cancer Institute (NCI), both part of NIH.

But there is strong consensus about others!

Review > Circulation. 2020 Dec 8;142(23):e411-e431. doi: 10.1161/CIR.0000000000000931. Epub 2020 Nov 5.

Personal-Level Protective Actions Against Particulate Matter Air Pollution Exposure: A Scientific Statement From the American Heart Association

Sanjay Rajagopalan, Michael Brauer, Aruni Bhatnagar, Deepak L Bhatt, Jeffrey R Brook, Wei Huang, Thomas Münzel, David Newby, Jeffrey Siegel, Robert D Brook;
American Heart Association Council on Lifestyle and Cardiometabolic Health; Council on Arteriosclerosis, Thrombosis and Vascular Biology; Council on Clinical Cardiology; Council on Cardiovascular and Stroke Nursing; and Stroke Council

PMID: 33150789 DOI: 10.1161/CIR.0000000000000931
Free article

Regarding the leading cause of death in the US:

"…Unequivocal evidence of the causal role of fine particulate matter air pollution in cardiovascular disease has emerged..."

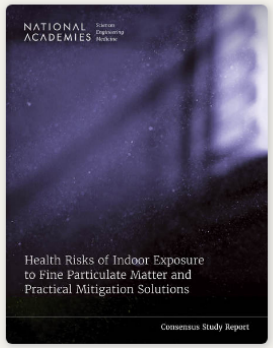
https://pubmed.ncbi.nlm.nih.gov/33150789/

January 2024 National Academies of Science, Engineering, and Medicine Consensus Report

NATIONAL ACADEMIES Sciences Engineering Medicine

NAP HOME BROWS

Consensus Study Report



VIEW LARGER COVER

Health Risks of Indoor Exposure to Fine Particulate Matter and Practical Mitigation Solutions

(2024)

Download Free PDF | Read Free Online | Buy Paperback: $26.00 | Buy Ebook: $20.99

Epub, Kindle, MobiPocket
What is an Ebook?

Schools, workplaces, businesses, and even homes are places where someone could be subjected to particulate matter (PM) – a mixture of solid particles and liquid droplets found in the air. PM is a ubiquitous pollutant comprising a complex and ever-changing combination of chemicals, dust, and biologic materials such as allergens. Of special concern is fine particulate matter (PM2.5), PM with a diameter of 2.5 microns (<0.0001 inch) or smaller. Fine PM is small enough to penetrate deep into the respiratory system, and the smallest fraction of it, ultrafine

[Health Risks of Indoor Exposure to Fine Particulate Matter and Practical Mitigation Solutions | The National Academies Press]

Health Risks of Indoor Exposure to Fine Particulate Matter and Practical Mitigation Solutions

(2024)

Particulate matter (PM) found indoors originates from both outdoor and indoor sources:

- Because outdoor PM2.5 infiltrates and persists indoors, most of human exposure to PM of outdoor origin is likely to take place indoors.
- **In fact, indoor exposure to PM2.5 of outdoor origin has been estimated to account for perhaps 40–60 percent of the mortality burden of PM2.5 exposure in the United States.**

Health Risks of Indoor Exposure to Fine Particulate Matter and Practical Mitigation Solutions

(2024)

Overwhelming evidence exists that exposure to PM2.5 of outdoor origin is associated with a range of adverse health effects:

- Cardiovascular
- Pulmonary
- Neurological and psychiatric
- Endocrine disorders
- Poor birth outcomes, with the burden of these effects falling more heavily on underserved and marginalized communities.

Health Risks of Indoor Exposure to Fine Particulate Matter and Practical Mitigation Solutions | The National Academies Press



Conclusions

- There is strong evidence that exposure to indoor $PM_{2.5}$ has adverse effects on the *respiratory* and *cardiovascular* systems and likely other organ systems
- Evidence for a role of indoor $PM_{2.5}$ in neurologic, metabolic, and reproductive outcomes is less well developed but emerging
- Reducing $PM_{2.5}$ exposure would have a significant public health benefit

31:57
vimeo

Goal = particles as low as possible

"The best evidence shows that having less of all types of particles in the air leads to better health and longer lives."

Particle Pollution | American Lung Association

No "safe" level of air pollution has been identified.

News

04



Past few months:

The Guardian

Air pollution reduces people's ability to focus on everyday tasks, study finds



[Air pollution reduces people's ability to focus on everyday tasks, study finds | Air pollution | The Guardian]

UNICEF

The silent killer: over 100 daily deaths of children under five linked to air pollution in East Asia and the Pacific



[The silent killer: over 100 daily deaths of children under five linked to air pollution in East Asia and the Pacific]

Virginia Tech

Researchers detect microplastics in exhaled air of bottlenose dolphins



[Researchers detect microplastics in exhaled air of bottlenose dolphins | Virginia Tech News | Virginia Tech]

Past few months:

abc NEWS Video Live Shows Shop

These are the biggest 'anti-environment' policies enacted in Trump's 1st 100 days, according to experts

Trump entered his second term with a slew of plans that impact the environment.

By Julia Jacobo
April 29, 2025, 5:20 PM



The PEMEX Deer Park oil refinery, April 8, 2025, in Deer Park, Texas
Ronaldo Schemidt/AFP via Getty Images

- **Attempt to boost fossil fuel production**
- **EPA deregulation**

"Several of the environmental freedoms Americans experience today – clean air, clean water and clean rain among them – could soon be in jeopardy from the Environmental Protection Agency's deregulation plans, according to experts.

On March 12, the EPA announced it was taking part in the "biggest deregulatory action in U.S. history." The move includes rolling back emission regulations on coal, oil and gas production and reevaluating government findings that determined that greenhouse gas emissions heat the planet and are a threat to public health, EPA Administrator Lee Zeldin said."

- **Federal firings and slashing of budgets, programs**

These are the biggest 'anti-environment' policies enacted in Trump's 1st 100 days, according to experts - ABC News

Past few weeks:

Drop in Air Pollution Drove a Surge in Warming, Study Finds

Sulfur dioxide pollution has substantially improved in China, but it also associated with the formation of sulfates, tiny particles that block the sunlight, with a cooling effect.

> Researchers described the drop in pollution as an "unmasking" that revealed the true extent of warming. "We will see an acceleration of warming while the unmasking takes place," said coauthor Laura Wilcox of the University of Reading in the U.K. But, she said, an "acceleration in warming due to reductions in air pollution is also likely to be short-lived."

Drop in Air Pollution Drove a Surge in Warming, Study Finds - Yale E360

National Institutes of Health (NIH) | (.gov)

NIH study links particulate air pollution to increased mutations in lung cancers among nonsmokers



“This suggests that secondhand smoke may have a lower overall ability to cause genetic mutations, known as mutagenicity, compared to air pollution.”

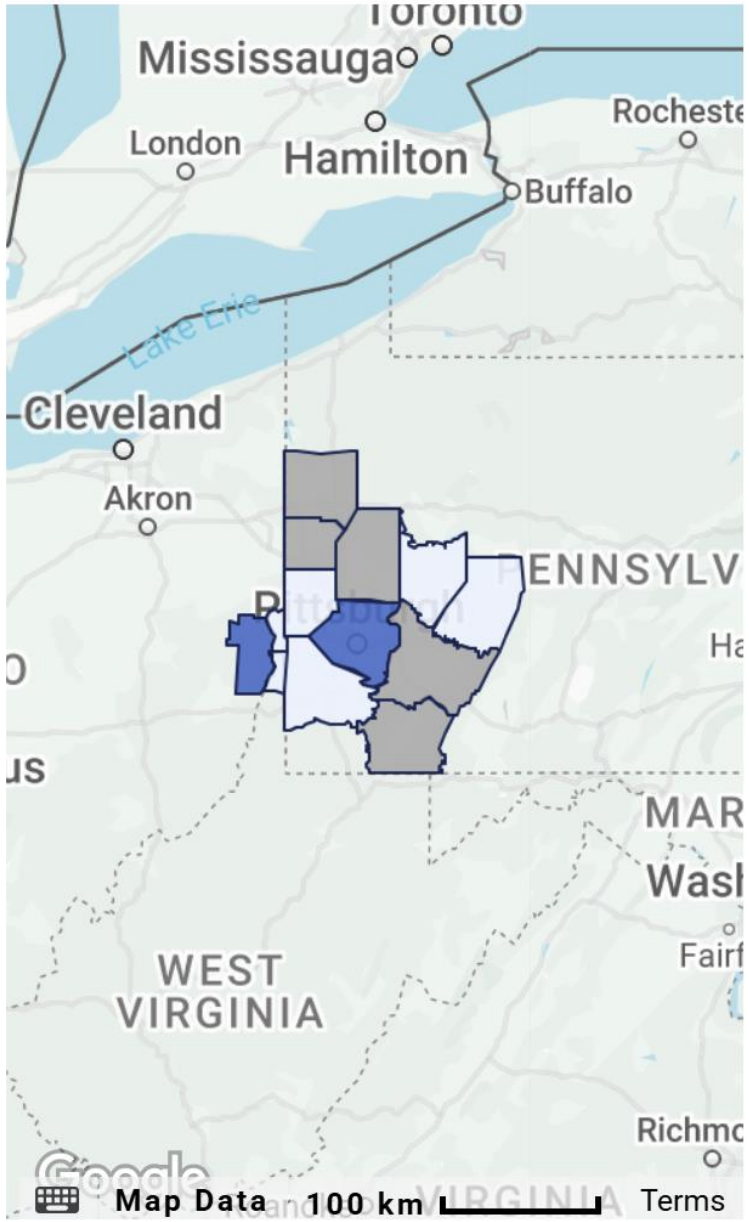
In Pittsburgh

05



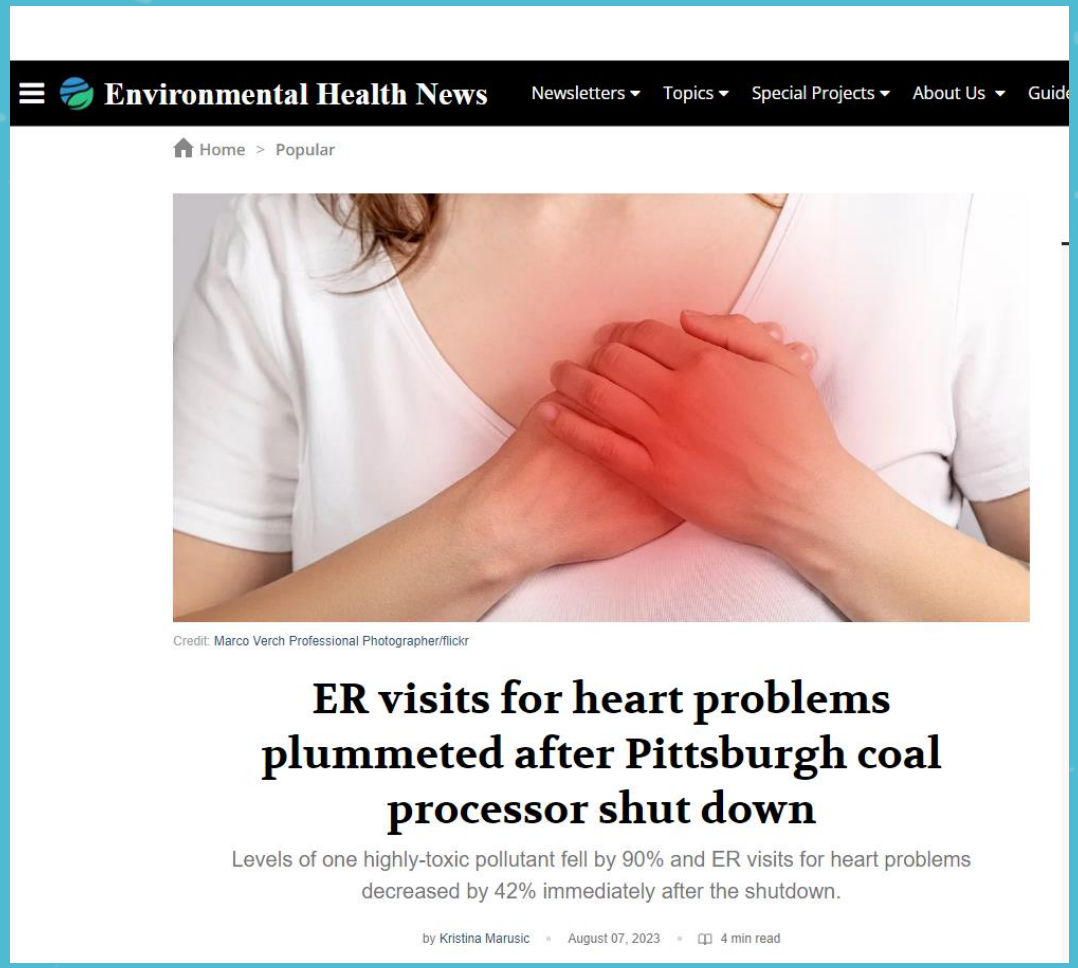
New Report Finds Pittsburgh Metro Area Residents Are Breathing Some of the Most Polluted Air in the Country; Area 16th Worst in Nation for Daily Particle Pollution & 12th Worst for Year-Round

American Lung Association's 26th Annual "State of the Air" report highlights air quality in Pittsburgh-Weirton-Steubenville, PA-OH-WV metro area and across the nation



Pass | Fail | DNC/INC

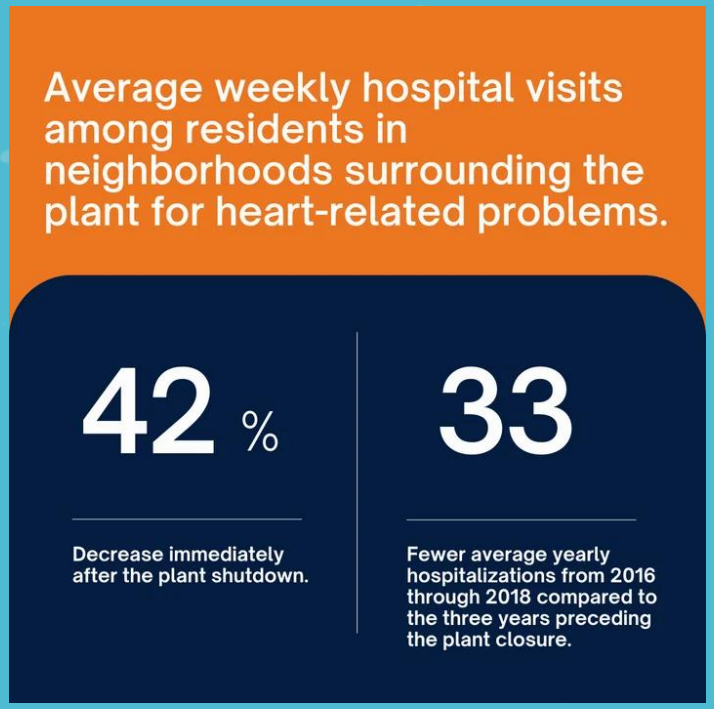
Pittsburgh-Weirton-Steubenville, PA-OH-WV | American Lung Association



“Closing this plant and eliminating its pollution really had a dramatic health benefit on the communities living nearby.”

[ER visits for heart problems plummeted after Pittsburgh coal processor shut down - EHN]

The Shenango Coke Works, located on Pittsburgh’s Neville Island, closed in January 2016.



- The study also found that average daily levels of sulfur dioxide, a byproduct of cokemaking linked to respiratory and heart problems, fell by 90% at government air-monitoring stations near the plant .
- Arsenic in particulate matter, another toxic byproduct emitted from the plant, fell by 66% at the monitors near the plant.

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THE ALLEGHENY FRONT

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United States Steel Corp. Edgar Thomson Plant in Braddock, Pennsylvania, U.S. Photo: Justin Merriman / Bloomberg via Getty Images

STUDY: PITTSBURGH KIDS NEAR POLLUTING SITES HAVE HIGHER ASTHMA RATES

REID FRAZIER × NOVEMBER 10, 2020

ENVIRONMENTAL JUSTICE | HAZARDOUS TO YOUR HEALTH | HEALTH | POLLUTION

JOURNAL OF ASTHMA
https://doi.org/10.1080/02770903.2020.1840584

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Check for updates

Asthma prevalence and control among schoolchildren residing near outdoor air pollution sites

Deborah A. Gentile, MD[a], Tricia Morphew, MS[b], Jennifer Elliott, PharmD[c], Albert A. Presto, PhD[d], and David P. Skoner, MD[e]

[a]Division of Clinical Research, Allergy and Asthma Wellness Centers, Butler, PA, USA; [b]Morphew Consulting LLC, Bothell, WA, USA; [c]School of Pharmacy, Duquesne University, Pittsburgh, PA, USA; [d]Center for Atmospheric Particle Studies, Department of Mechanical Engineering, Carnegie Mellon University, Pittsburgh, PA, USA; [e]Division of Pediatric Allergy/Immunology, West Virginia University, Morgantown, WV, USA

ABSTRACT

Introduction: Outdoor air pollution (OAP) contributes to poor asthma outcomes and remains a public health concern in Pittsburgh. The purpose of this study was to determine the prevalence of childhood asthma and its rate of control among Pittsburgh schoolchildren residing near OAP sites.

Methods: Participants were recruited from schools near OAP sites. Asthma prevalence and control were assessed using a validated survey. Demographics and socioeconomic status were collected by survey, BMI was calculated, secondhand smoke (SHS) exposure was assessed by salivary cotinine levels, and OAP was assessed by mobile platform monitoring. Multivariate analysis adjusted for confounders.

Results: In 1202 Pittsburgh elementary school students surveyed, 50.9% were female, average age was 8.5 years (SD = 1.9), 52.2% were African American and 60.6% had public health insurance. SHS exposure was relatively high at 33.9%, 17.1% of students were obese, and 70% had exposure to particulate matter ($PM_{2.5}$) greater than the World Health Organization standard of 10 $\mu g/m^3$. Overall prevalence of asthma was 22.5% with $PM_{2.5}$, nitric oxide (NO_x), sulfur (S), and zinc (Zn) significantly related to odds of asthma. Among the 270 children previously diagnosed with asthma, 59.3% were not well controlled with $PM_{2.5}$, black carbon, and silicon (Si) significantly related to odds of uncontrolled asthma.

Conclusions: These results demonstrate that asthma prevalence and poor disease control are significantly elevated in Pittsburgh schoolchildren exposed to high levels of OAP. Future efforts need to focus on primary prevention of asthma by reducing exposure to OAP in at risk populations.

Abbreviations: AAFA: Asthma and Allergy Foundation of America; ACHD: Allegheny County Health Department; BC: black carbon; BMI: body mass index; CDC: Centers for Disease Control; Cr: chromium; EPA: Environmental Protection Agency; Fe: iron; K: potassium; LUR: land use regression; NO_x: nitrogen oxides; OAP: outdoor air pollution; $PM_{2.5}$: particulate matter less than 2.5 microns in diameter; S: sulfur; Si: Silica; WHO: World Health Organization; Zn: zinc

ARTICLE HISTORY
Received 21 April 2020
Revised 5 October 2020
Accepted 18 October 2020

KEYWORDS
Epidemiology; pediatrics; morbidity and mortality

- Monitored air pollution levels near the schools and found a correlation between high levels of PM & asthma rates.
- Children in these schools had a 22.5% asthma rate, nearly triple the nationwide average of 8.3 percent. Allegheny County's overall child asthma rate is 11%.

Environmental Racism and Health Disparities

06



PITTSBURGH: HEALTH DISPARITIES

- In Pittsburgh miscarriages and stillbirth are 2 times more likely among Black women.
- Pittsburgh babies born to Black mothers are three times more likely to be under 3.3 lbs than babies born to mothers of other races.
- In Pittsburgh more Black residents die of CVD than 98% of similar cities.
- Pittsburgh's Black maternal mortality rate is higher than Black mortality rates in 97 % of similar cities.

https://www.socialwork.pitt.edu/sites/default/files/pittsburghs_inequality_across_gender_and_race_07_19_20_compressed.pdf



Jun 12, 2020

Environmental injustice in Pittsburgh: Poor, minority neighborhoods see higher rates of deaths from air pollution

"Systemic racism is not limited to one system."

Kristina Marusic

Research | Open Access | Published: 16 March 2020

A risk-based model to assess environmental justice and coronary heart disease burden from traffic-related air pollutants

James P. Fabisiak, Erica M. Jackson, LuAnn L. Brink & Albert A. Presto

Environmental Health **19**, Article number: 34 (2020) | Cite this article

1747 Accesses | **1** Citations | **14** Altmetric | Metrics

- Environmental Justice tracts (> 20% poverty and/or > 30% non-white):
  - Upto 25 times more likely to have the highest exposures of black carbon and NO_2



People walk in a city park near the Kern River oil fields in Bakersfield, California. Photograph: Mike Blake/Reuters

America's dirty divide

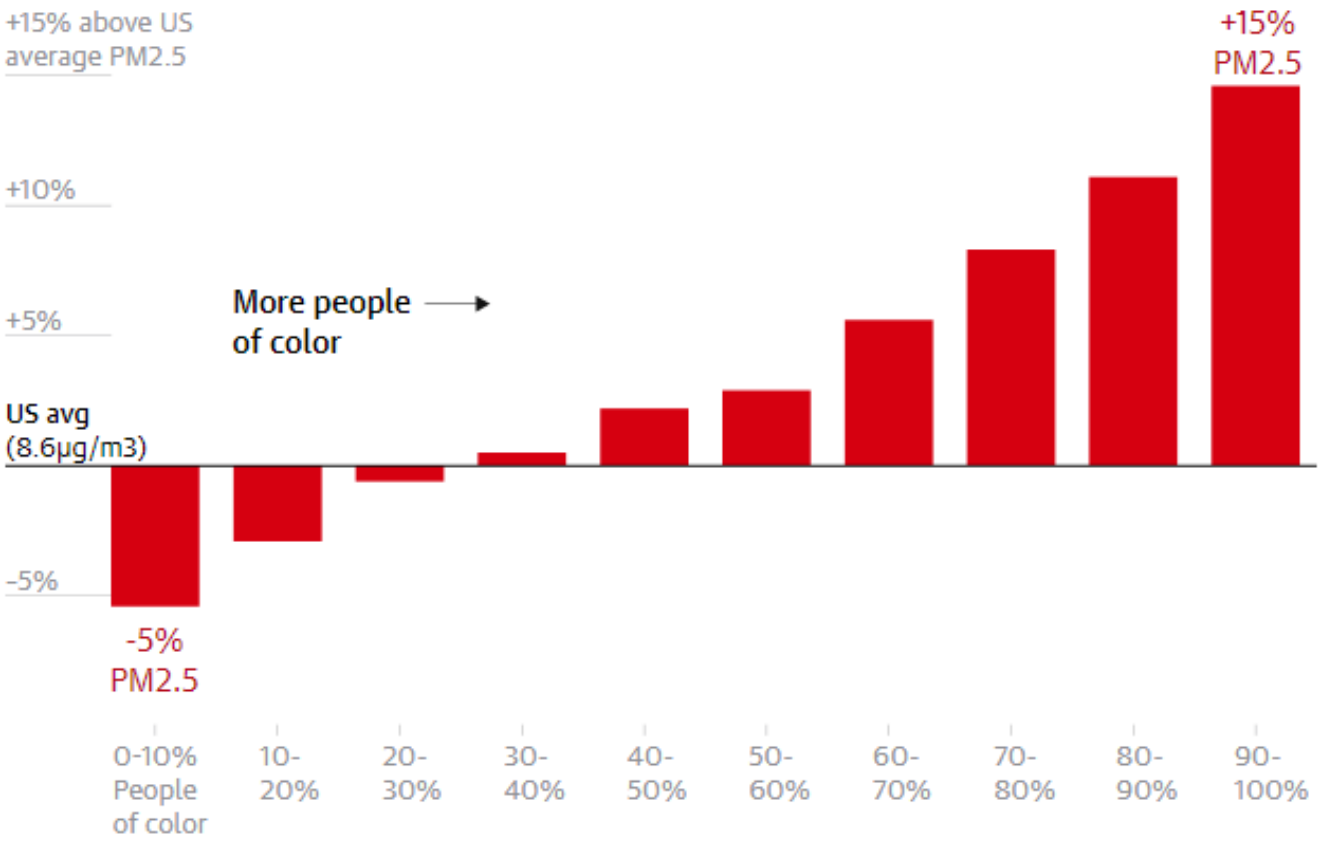
US neighborhoods with more people of color suffer worse air pollution

Exclusive: Cutting-edge analysis of fine particulate levels by area reveals shocking disparities: 'The underlying variable that is most predictive is systemic racism'

by Erin McCormick and graphics by Andrew Witherspoon

Air pollution is worse in census tracts with higher shares of people of color

Below, census tracts are grouped into tiers, from lowest share of people of color to highest. Here's how the median PM2.5 levels for each tier compares to the US average in our dataset.



Guardian graphic. Sources: Center for Air, Climate and Energy Solutions, Census Bureau. Note: Census tracts' share of people of color is defined as the share of the population that is not non-Hispanic white.

Climate and Environment

Deadly air pollutant ‘disproportionately and systematically’ harms Americans of color, study finds

Black, Latino and Asian Americans face higher levels of exposure to fine particulate matter from traffic, construction and other sources

By **Juliet Eilperin** and **Darryl Fears**

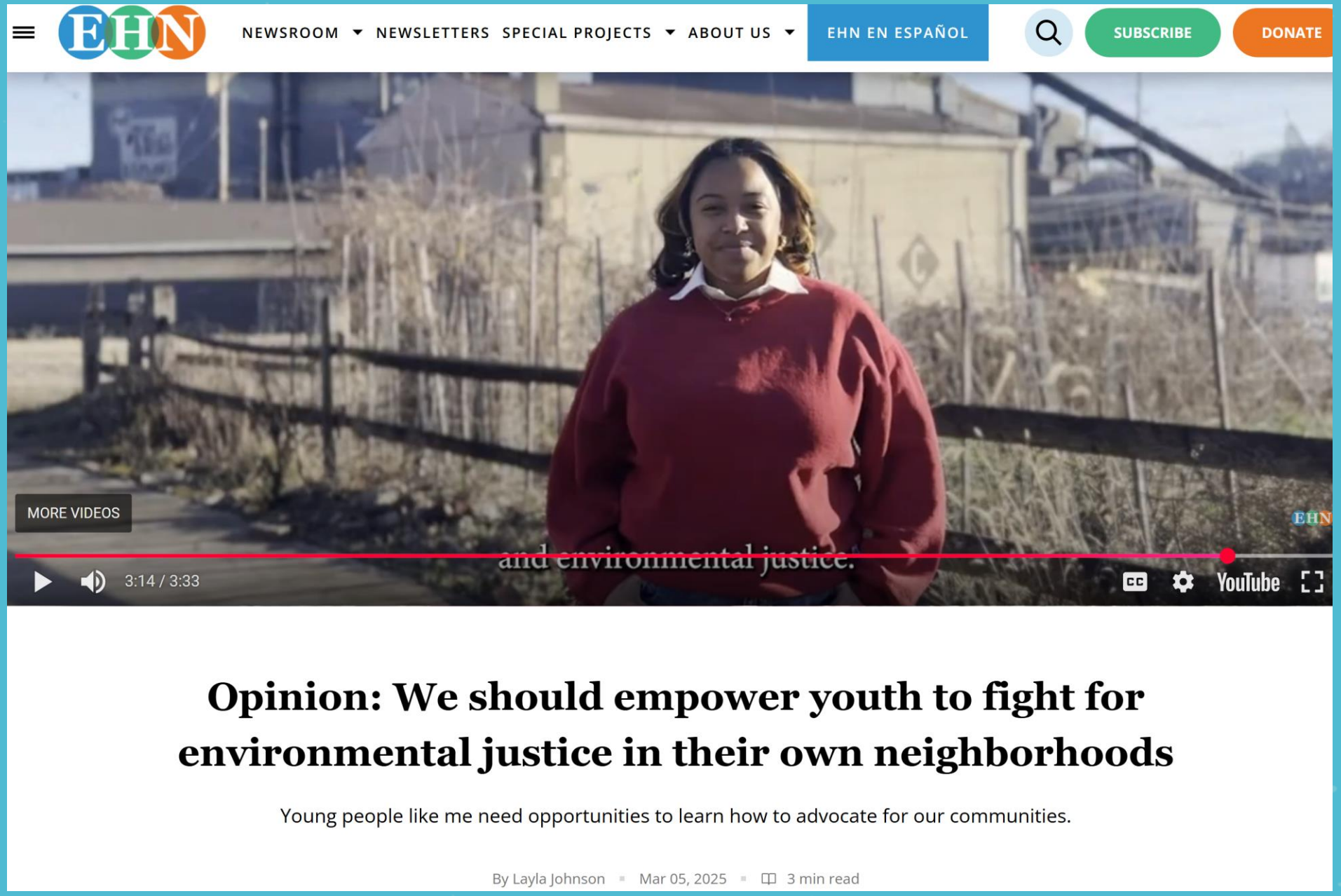
Add to list

April 28, 2021 at 2:00 p.m. EDT



Interstate 15 carries heavy traffic between Southern California and Las Vegas. (David McNew/Getty Images)

The study found that Black people are exposed to 21 percent more fine-particle pollution compared to average Americans, while exposure was 18 percent greater for Asian Americans and 11 percent more for Hispanics. White Americans, by contrast, have 8 percent less pollution exposure than the average.

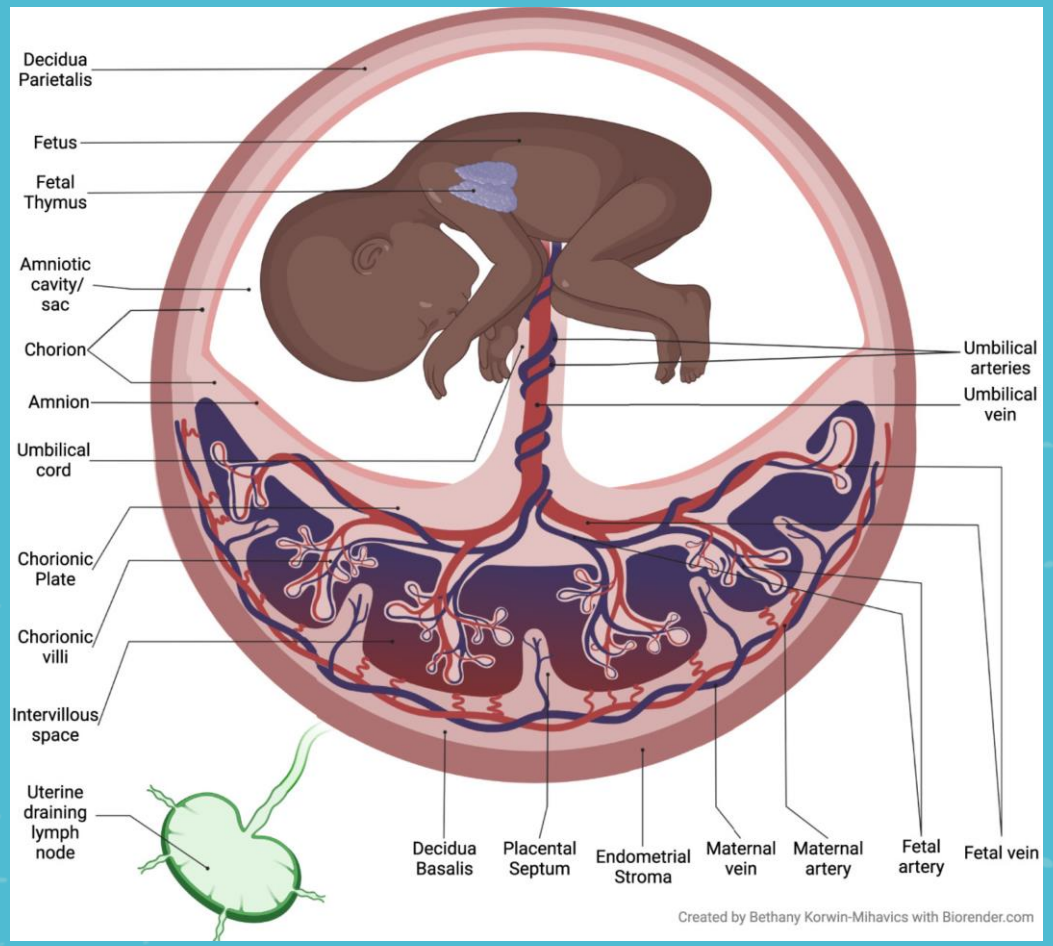


[Opinion: We should empower youth to fight for environmental justice in their own neighborhoods - EHN]

Examples: Health Impacts Across the Lifespan

07

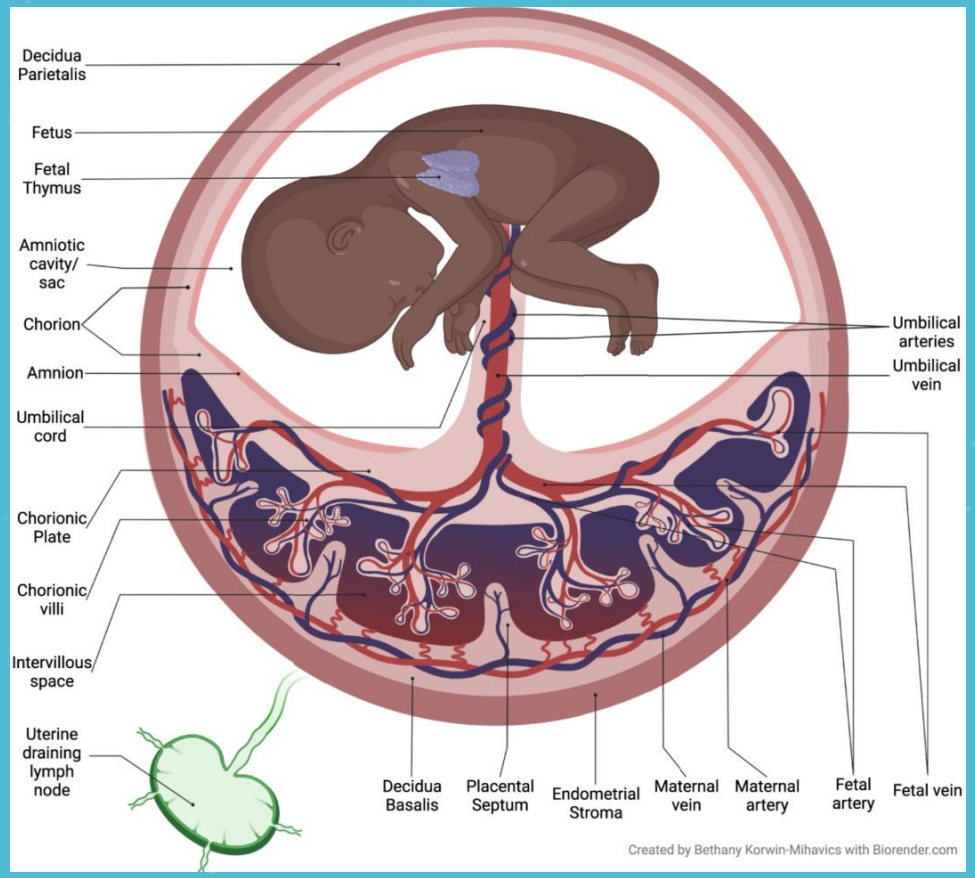
Early in life



The placenta:

- Organ responsible for nourishing and protecting a fetus during pregnancy.
- Performs lots of functions to support fetal development
- Forms a selective barrier between maternal and fetal circulations.
- Direct fetal contact with harmful substances is largely determined by the ability of the material to cross the placenta
- In utero exposure to environmental agents is a critical driver of diseases manifesting in childhood and adulthood

Black Carbon Particles DO cross the Placental Blood Barrier



nature communications

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Article | Open Access | Published: 17 September 2019

Ambient black carbon particles reach the fetal side of human placenta

Hannelore Bové, Eva Bongaerts, Eli Slenders, Esmée M. Bijnens, Nelly D. Saenen, Wilfried Gyselaers, Peter Van Eyken, Michelle Plusquin, Maarten B. J. Roeffaers, Marcel Ameloot & Tim S. Nawrot ✉

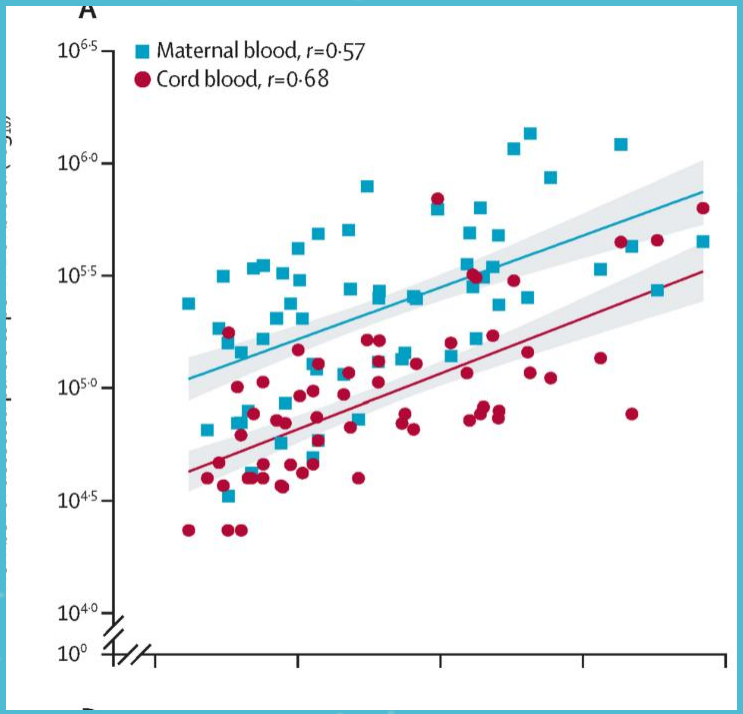
Nature Communications **10**, Article number: 3866 (2019) | Cite this article

ARTICLES · Volume 6, Issue 10, E804-E811, October 2022 · *Open Access* Download Full Issue

Maternal exposure to ambient black carbon particles and their presence in maternal and fetal circulation and organs: an analysis of two independent population-based observational studies

Eva Bongaerts, MSc [a] · Laetitia L Lecante, PhD [c] · Hannelore Bové, PhD [a] · Prof Maarten B J Roeffaers, PhD [d] · Prof Marcel Ameloot, PhD [b] · Prof Paul A Fowler, PhD [c] · et al. Show more

Affiliations & Notes Article Info



"In summary, our study provides compelling evidence for the presence of black carbon particles originating from ambient air pollution in the fetal circulation system during gestation.

We provide direct evidence that fetal organ exposure to these particulates occurs during the most susceptible period of life—in utero—and show that human fetuses have a black carbon load **before they even take their first breath."**

JAMA Network | Open

Original Investigation | Environmental Health

Association of Air Pollution and Heat Exposure With Preterm Birth, Low Birth Weight, and Stillbirth in the US

A Systematic Review

Bruce Bekkar, MD; Susan Pacheco, MD; Rupa Basu, PhD; Nathaniel DeNicola, MD, MSHP

Abstract

IMPORTANCE Knowledge of whether serious adverse pregnancy outcomes are associated with increasingly widespread effects of climate change in the US would be crucial for the obstetrical medical community and for women and families across the country.

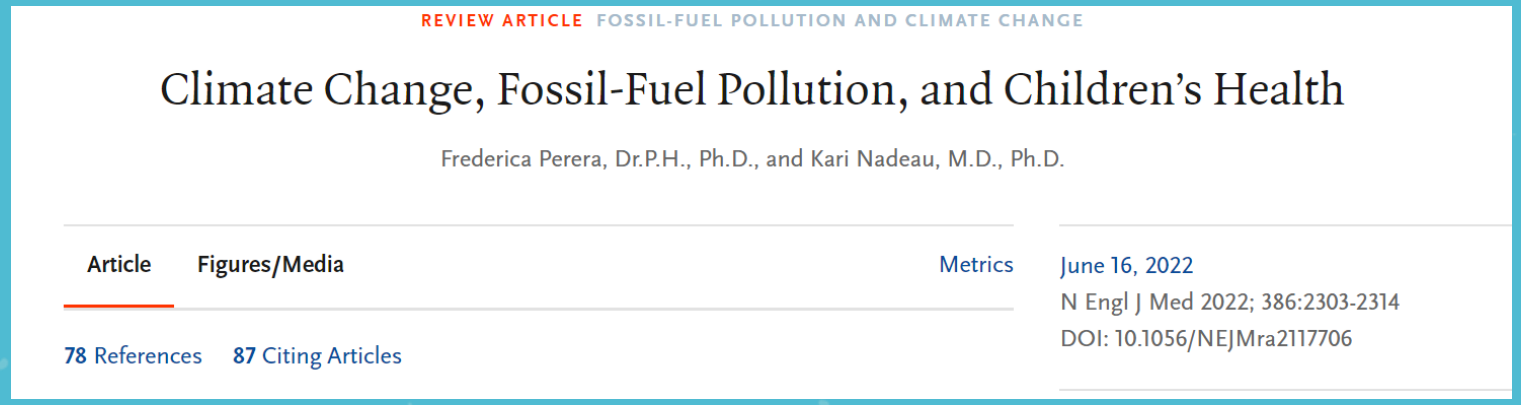
OBJECTIVE To investigate prenatal exposure to fine particulate matter ($PM_{2.5}$), ozone, and heat, and the association of these factors with preterm birth, low birth weight, and stillbirth.

Findings In this systematic review of 57 of 68 studies including a total of 32 798 152 births, there was a statistically significant association between heat, ozone, or fine particulate matter and adverse pregnancy outcomes. Heterogeneous studies from across the US revealed positive findings in each analysis of exposure and outcome.



"Our findings here suggest that exacerbation of air pollution and heat exposure related to climate change may be significantly associated with risk to pregnancy outcomes in the U.S."

Nathaniel DeNicola, MD – assistant professor of obstetrics and gynecology at the George Washington University School of Medicine and Health Science



REVIEW ARTICLE FOSSIL-FUEL POLLUTION AND CLIMATE CHANGE

Climate Change, Fossil-Fuel Pollution, and Children's Health

Frederica Perera, Dr.P.H., Ph.D., and Kari Nadeau, M.D., Ph.D.

Article Figures/Media Metrics

78 References 87 Citing Articles

June 16, 2022
N Engl J Med 2022; 386:2303-2314
DOI: 10.1056/NEJMra2117706

- Both air pollution and climate change are already taking a major toll on the physical and mental health of children.
    - Example: Synergistic effect of heat and air pollution on the incidence of hospitalization for childhood asthma.
- All children are at risk, but the greatest burden falls on those who are socially and economically disadvantaged.

Climate Change, Fossil-Fuel Pollution, and Children's Health | NEJM

Goal = particles as low as possible

No “safe” level of air pollution has been identified.

Goal = particles as low as possible

"The best evidence shows that having less of all types of particles in the air leads to better health and longer lives."

Particle Pollution | American Lung Association

No "safe" level of air pollution has been identified.

Examples: Health Impacts Across the Lifespan

08

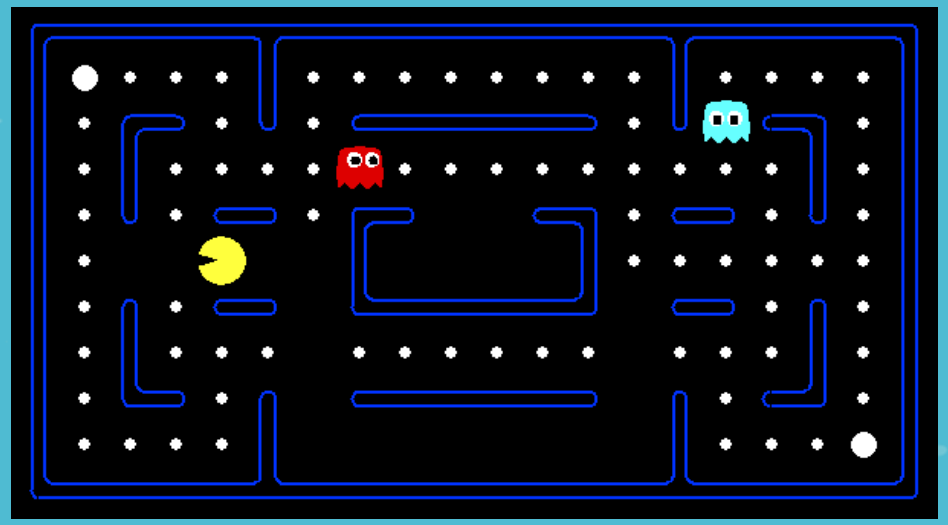
Late in life

Transl Psychiatry. 2017 Jan; 7(1): e1022.
Published online 2017 Jan 31. doi: 10.1038/tp.2016.280
PMCID: PMC5299391
PMID: 28140404

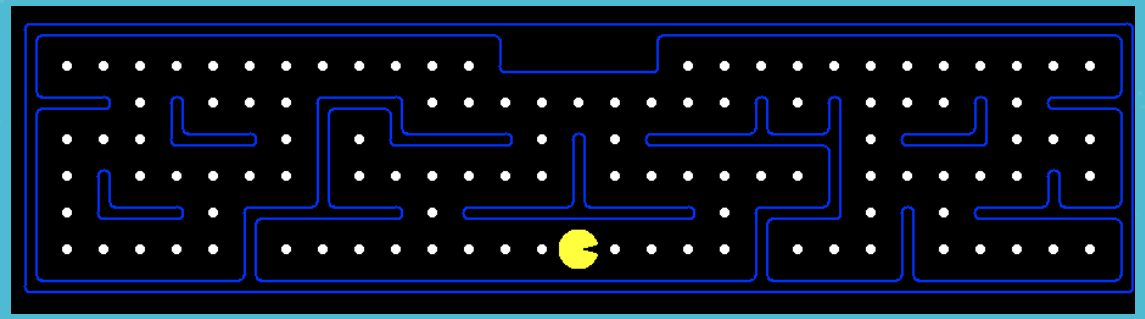
Particulate air pollutants, APOE alleles and their contributions to cognitive impairment in older women and to amyloidogenesis in experimental models

M Cacciottolo,[1] X Wang,[2] I Driscoll,[3] N Woodward,[1] A Saffari,[4] J Reyes,[5] M L Serre,[5] W Vizuete,[5] C Sioutas,[4] T E Morgan,[1] M Gatz,[6,7] H C Chui,[7,8] S A Shumaker,[9] S M Resnick,[10] M A Espeland,[11] C E Finch,[1,7,*] and J C Chen[2,7,*]

AKA:
Particulate Matter & Pacman in our brains



Beta-amyloid is sticky compound that accumulates in the brain, disrupting communication between brain cells and eventually killing them.





PM – interferes with this process



Apolipoprotein E (**APOE**) is a protein that influences the probability of *beta-amyloid aggregation.*

There are three types of the APOE gene, called alleles: APOE2, E3 and E4.



E2 – very efficient at clearing Beta-amyloid

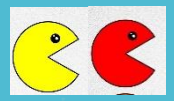


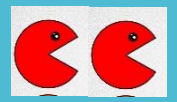
E3 – ok at clearing Beta-amyloid



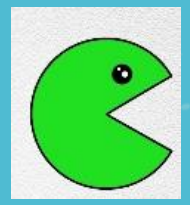
E4– Not efficient at clearing Beta-amyloid

We inherit these in team of 2: 

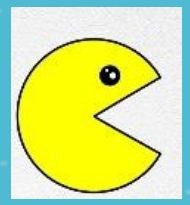
Having  can increase your risk for Alzheimer's by 2 to 3 times;

 increases risk by 12 times

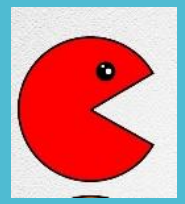
Worldwide Frequency:



8.4%



77.9%

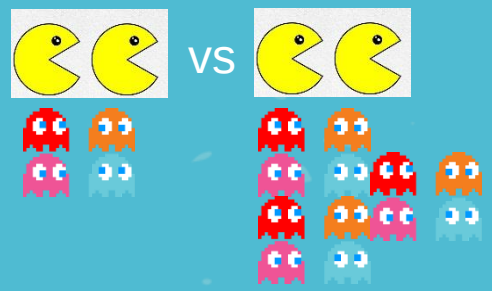


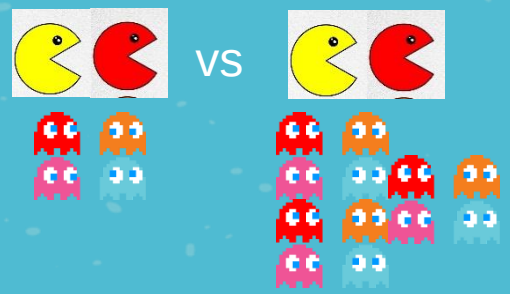
13.7%; 40% in patients with AD

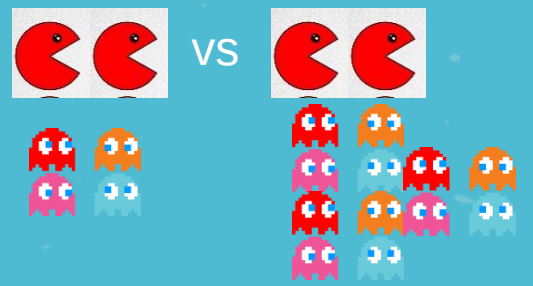
Participants from the Women's Health Initiative Memory Study (WHIMS). Community-dwelling (>95% in urban areas) across 48 states, aged 65 to 79 years, and free of dementia when enrolled, 1995–1999

Annual screening of cognitive function

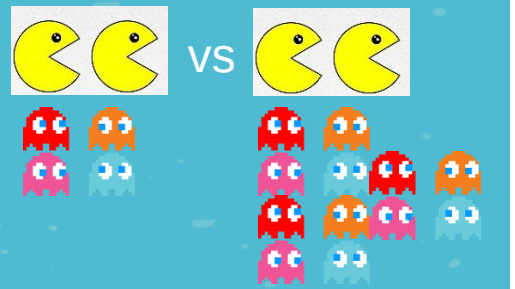
Researchers looked at:



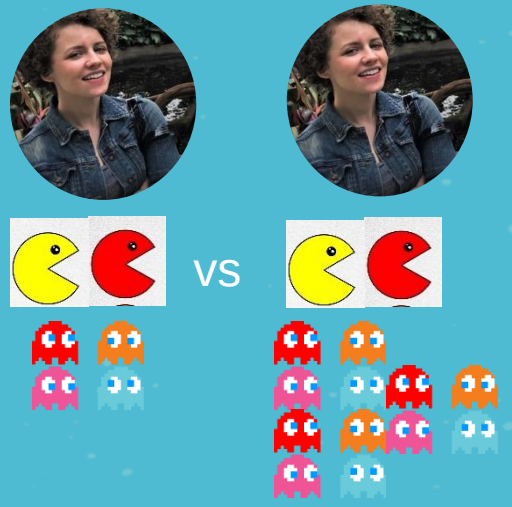




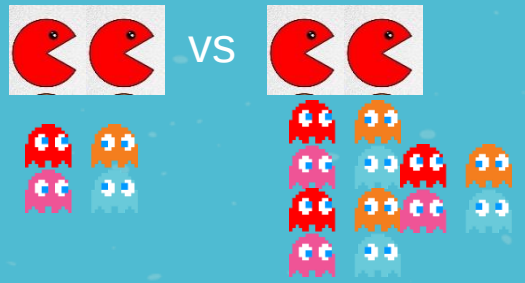
For Women Residing at Locations with low $PM_{2.5}$ vs High $PM_{2.5}$ (1999-2010)



68% increase in hazard for all-cause dementia



91% increase in hazard for all-cause dementia



295% increase in hazard for all-cause dementia

“the first evidence that neurodegenerative effects of airborne PM may involve gene-environment interactions with APOE ε4...”

May 2023 study – younger people, similar results

Air pollution may increase risk of dementia, complicated by genetics

Date: May 2, 2023

Source: University of California - San Diego

Summary: Researchers describe how exposure to ambient air pollution, such as car exhaust and power plant emissions -- is associated with a measurably greater risk of developing dementia over time.



THE LANCET COMMISSIONS | VOLUME 396, ISSUE 10248, P413-446, AUGUST 08, 2020

Dementia prevention, intervention, and care: 2020 report of the *Lancet* Commission

Prof Gill Livingston, MD • Jonathan Huntley, PhD • Andrew Sommerlad, PhD • Prof David Ames, MD • Prof Clive Ballard, MD • Prof Sube Banerjee, MD • et al. Show all authors

Published: July 30, 2020 • DOI: https://doi.org/10.1016/S0140-6736(20)30367-6 • Check for updates

Report placed ambient air pollution as a greater risk for Alzheimer's and related dementias than diabetes, physical activity, hypertension, alcohol consumption and obesity.

Dementia prevention, intervention, and care: 2020 report of the Lancet Commission.*Lancet.* 2020; **396**: 413-446

Goal = particles as low as possible

"The best evidence shows that having less of all types of particles in the air leads to better health and longer lives."

Particle Pollution | American Lung Association

No "safe" level of air pollution has been identified.

Joint Pain

09

ROCIS

The musculoskeletal system comprises bone, cartilage, muscles, tendons, and joints, which collectively serve to protect and support the human body.



human anatomy model showcasing muscular system for educational purposes Stock Illustration | Adobe Stock

Journal of Hazardous Materials
Volume 466, 15 March 2024, 133658



Long-term ambient air pollution and the risk of musculoskeletal diseases: A prospective cohort study

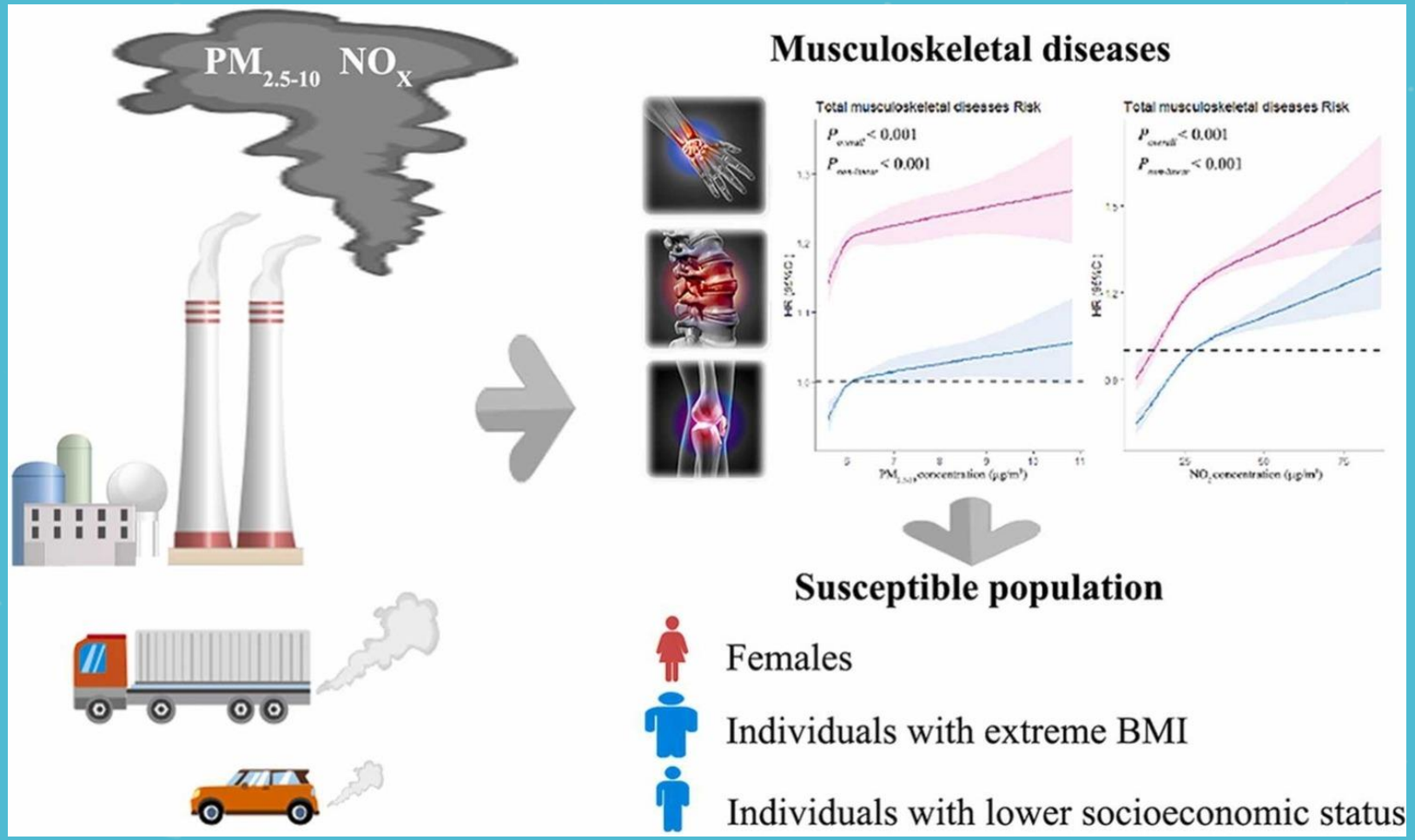
Bolun Cheng [a b c], Chuyu Pan [a b c], Qingqing Cai [a b c], Li Liu [a b c], Shiqiang Cheng [a b c], Xuena Yang [a b c], Peilin Meng [a b c], Wenming Wei [a b c], Dan He [a b c], Huan Liu [a b c], Yumeng Jia [a b c], Yan Wen [a b c], Peng Xu [d] ✉, Feng Zhang [a b c] ✉

Research indicates that exposure to air pollutants can induce low-level systemic inflammation, contributing to the development of musculoskeletal diseases.

Several studies have investigated the association between air pollution and musculoskeletal diseases such as rheumatoid arthritis and osteoporosis.

Although findings from these studies have been inconsistent, they generally support the detrimental effects of air pollution on musculoskeletal health.

Long-term ambient air pollution and the risk of musculoskeletal diseases: A prospective cohort study - ScienceDirect



Long-term ambient air pollution and the risk of musculoskeletal diseases: A prospective cohort study - ScienceDirect

Symptoms – can they go away?

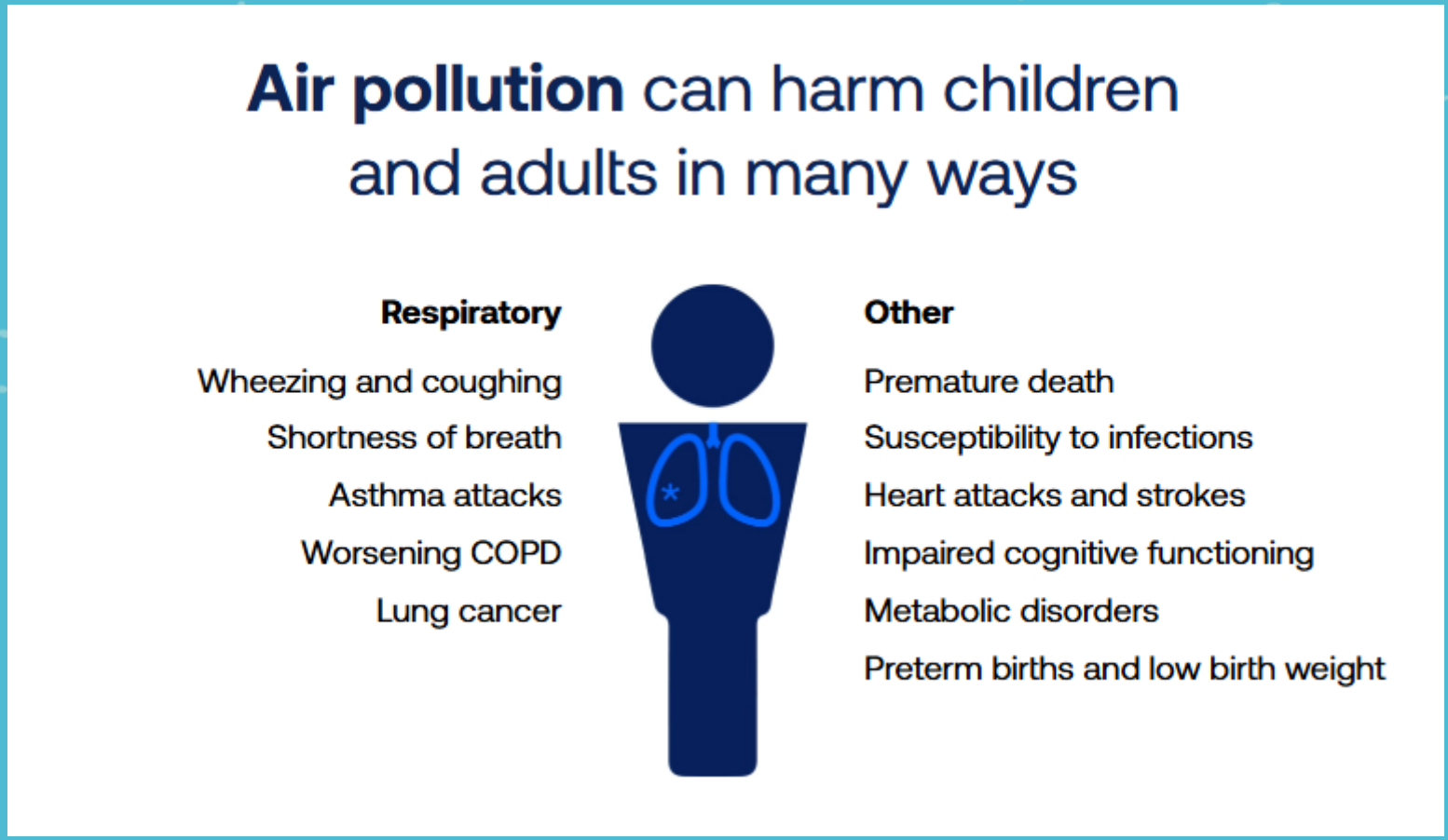
10



https://www.epa.gov/report-environment/indoor-air-quality

Symptoms associated with indoor air pollutants include:

- Irritation of the eyes, nose, and throat.
- Headaches, dizziness, and fatigue.



https://www.lung.org/blog/air-pollutions-top-10-health-risks

https://www.lung.org/research/sota/health-risks

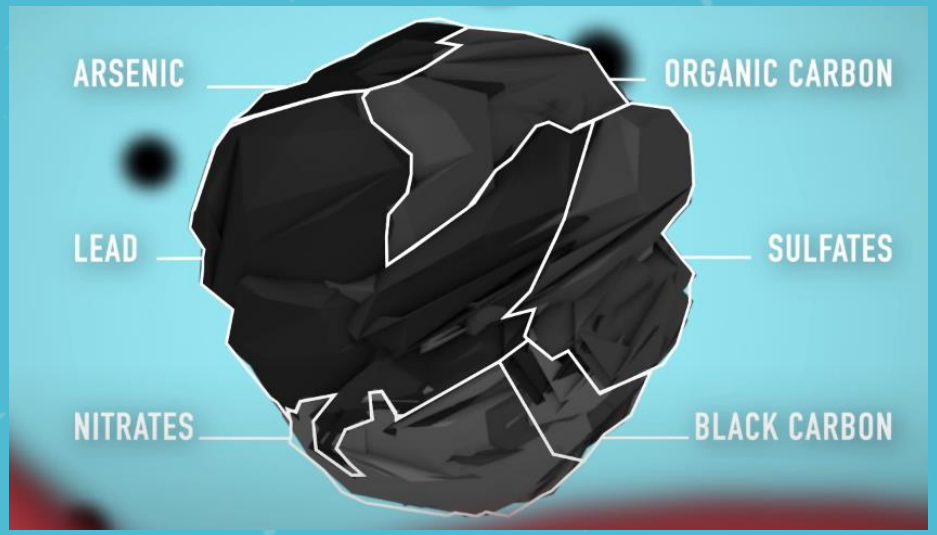
This is complicated!

- For example, can differ depending on factors like age and exposure
- Some studies suggest that it's possible for our bodies to adapt to air pollution to some extent, and it's possible that symptoms might subside.

BUT - the **body's** sensitivity persists. **The health risks persist.**

Reducing exposure to particle pollution is the most effective strategy to safeguard your health.

Particle composition:
$PM_{2.5}$ is very diverse – a single particle can be a complex mixture.



WHO: Breathe Life - How air pollution impacts your body - YouTube

Liu, Zixuan, et al. "Characterization of blood protein adsorption on PM2. 5 and its implications on cellular uptake and cytotoxicity of PM2. 5." *Journal of Hazardous Materials* 414 (2021): 125499.



Jan 02, 2019

Cancer in Pittsburgh: Prevention lags as pollution persists

"Genetics loads the gun but the environment pulls the trigger."

Kristina Marusic

In addition to being in the top 2 percent of U.S. counties for cancer risk from air pollution, Allegheny County is also in the top 1 percent for cancer risk specifically from large industrial sources.

Goal = particles as low as possible

"The best evidence shows that having less of all types of particles in the air leads to better health and longer lives."

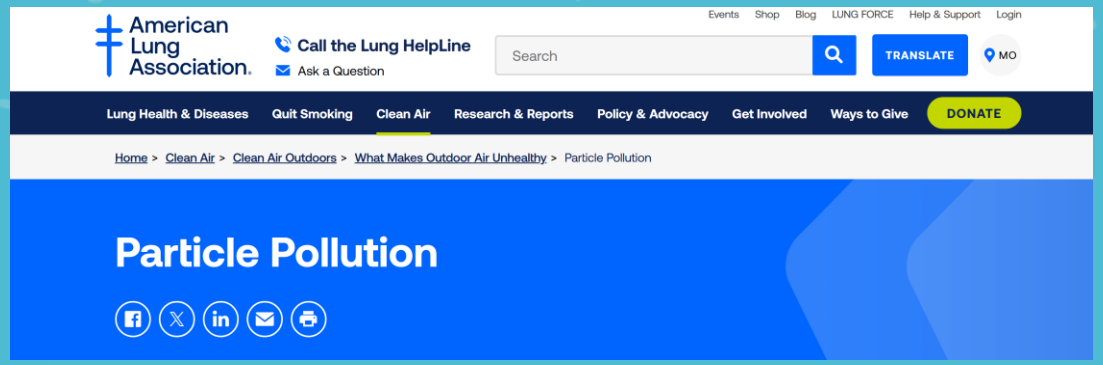
Particle Pollution | American Lung Association

No "safe" level of air pollution has been identified.

Short-term spikes

11

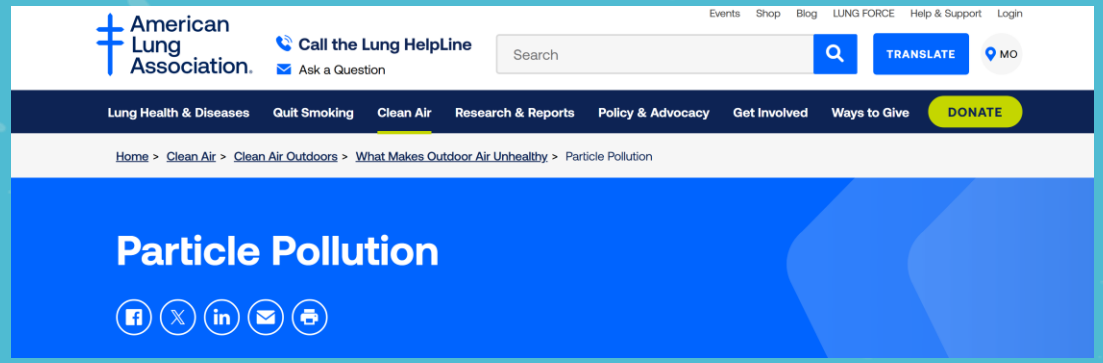




(Primary focus on outdoors! Research has not caught up with ROCIS yet in terms of investigating different indoor exposure scenarios)

- Short-term exposure, such as from peaks or spikes in particle pollution that lasts from hours to days, can kill.
- Premature deaths from breathing in these particles can occur on the very day that particle levels are high, or within one to two months afterward.
- These premature deaths would not have occurred if the air were cleaner.

Particle Pollution | American Lung Association



Extensive research has linked short-term increases in particle pollution to:

- increased mortality in infants
- increased hospital admissions for cardiovascular disease, including heart attacks and ischemic heart disease
- increased hospital admissions and emergency department visits for COPD

Particle Pollution | American Lung Association

Radon risk and spikes

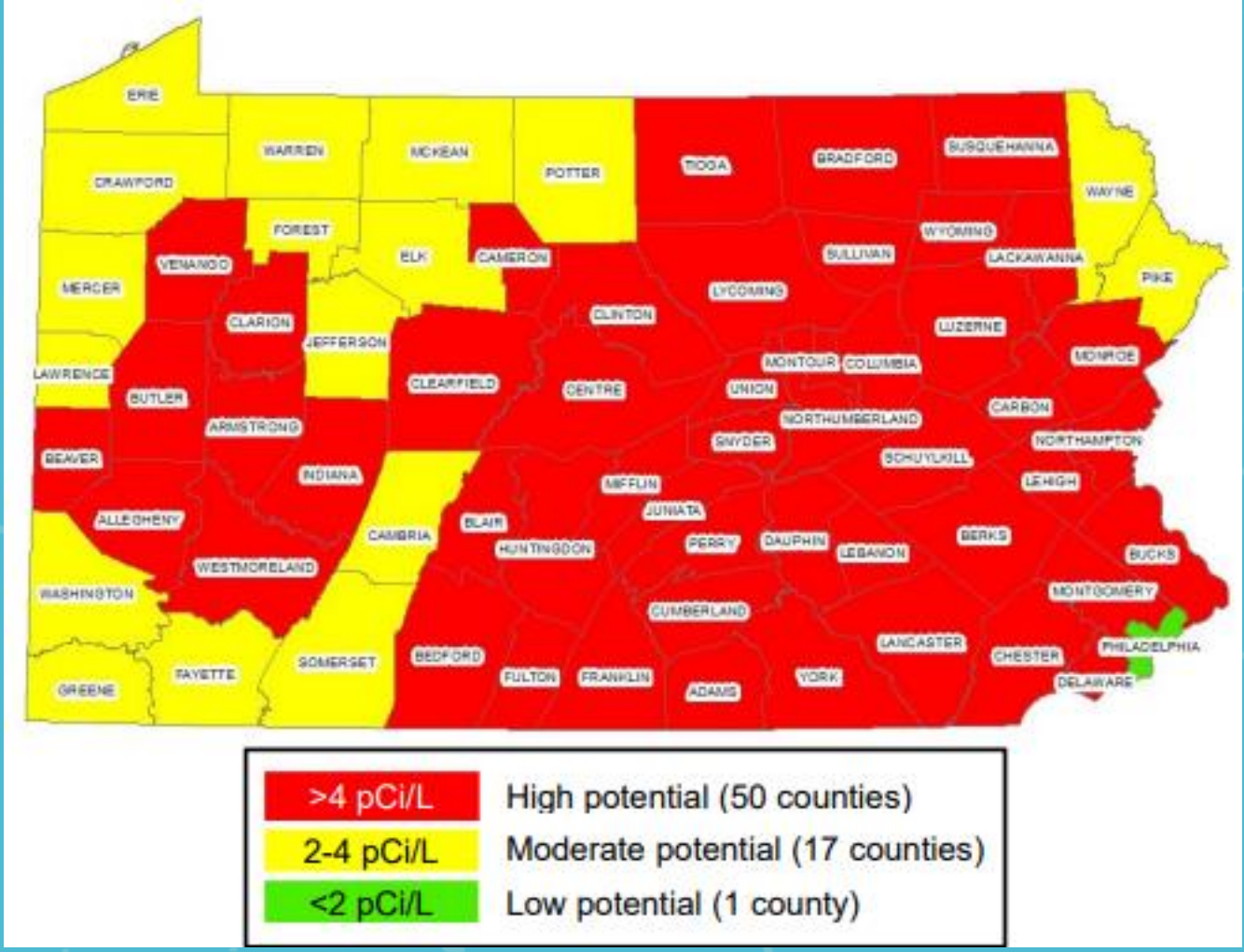
12

Radon Exposure & Health

- Greatest exposure occurs indoors
  - Tight and/or insufficiently ventilated structures are especially at risk
- Increased risk of lung cancer; small-cell lung carcinoma
  - #1 cause of lung cancer in non-smokers
- 50% lung cancer risk increase at EPA level of 4pCi/L
- Synergistic risk effect in smokers
- Further research needed re incidence of childhood and non-lung cancers



Radon in Pennsylvania



40% of homes tested in Allegheny County have radon levels above 4.0 pCi/L

The State of Our Health: A Statewide Health Assessment of Pennsylvania, March 2022

https://www.health.pa.gov/topics/Documents/Health%20Planning/SHAUpdateReport2022.pdf

Radon Risk if You Have Never Smoked

Note: If you are a former smoker, your risk may be higher.

* Lifetime risk of lung cancer deaths from EPA Assessment of Risks from Radon in Homes (EPA 402-R-03-003).

** Comparison data calculated using the Centers for Disease Control and Prevention's 1999-2001 National Center for Injury Prevention and Control Reports.

https://www.epa.gov/radon/health-risk-radon

Radon Level	If 1,000 people who never smoked were exposed to this level over a lifetime*...
20 pCi/L	About 36 people could get lung cancer
10 pCi/L	About 18 people could get lung cancer
8 pCi/L	About 15 people could get lung cancer
4 pCi/L	About 7 people could get lung cancer
2 pCi/L	About 4 person could get lung cancer
1.3 pCi/L	About 2 people could get lung cancer
0.4 pCi/L	

Estimates may be ~10-25% too high?

Radon-induced lung cancer deaths may be overestimated due to failure to account for confounding by exposure to diesel engine exhaust in BEIR VI miner studies - PMC

Radon Risk if You Have Never Smoked

Radon Level	If 1,000 people who never smoked were exposed to this level over a lifetime*...	X 100, - 25% per 100,000 people exposed
20 pCi/L	About 36 people could get lung cancer	27,000 people/100,000
10 pCi/L	About 18 people could get lung cancer	7,500 people/100,000
8 pCi/L	About 15 people could get lung cancer	600 people/100,00
4 pCi/L	About 7 people could get lung cancer	525 people/100,000
2 pCi/L	About 4 person could get lung cancer	300 people/100,000
1.3 pCi/L	About 2 people could get lung cancer	150 people/100,000
0.4 pCi/L		

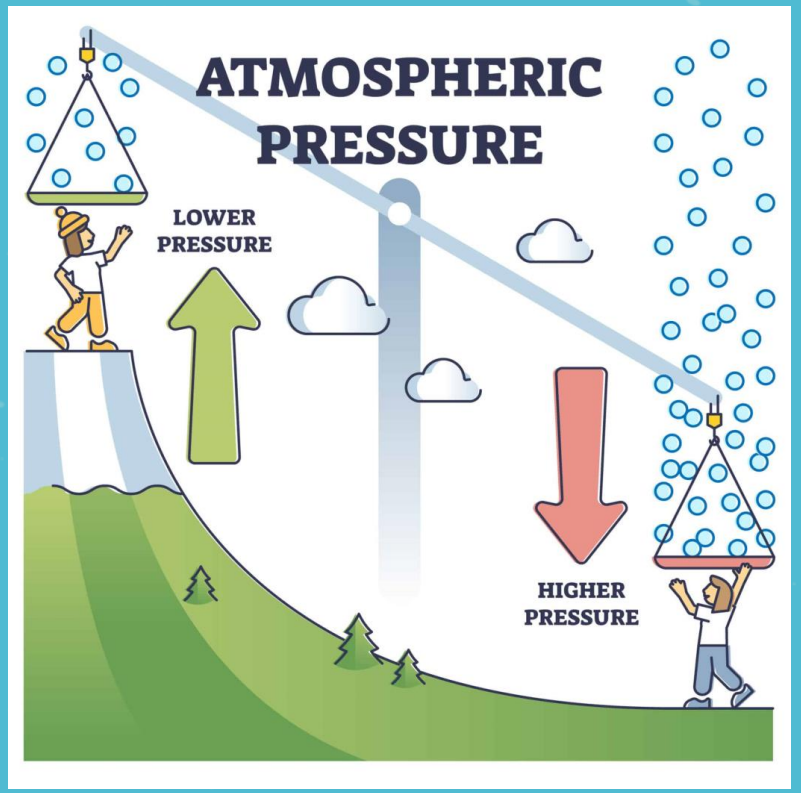
Estimates may be ~10-25% too high?

Consider: Population of Allegheny County is 1.2 million

Variation of indoor radon concentration can be influenced by the fluctuation of weather or environmental parameters:

- Temperature
- Pressure
- Humidity
- Ventilation condition
- Wind speed and direction

Example: Barometric Pressure



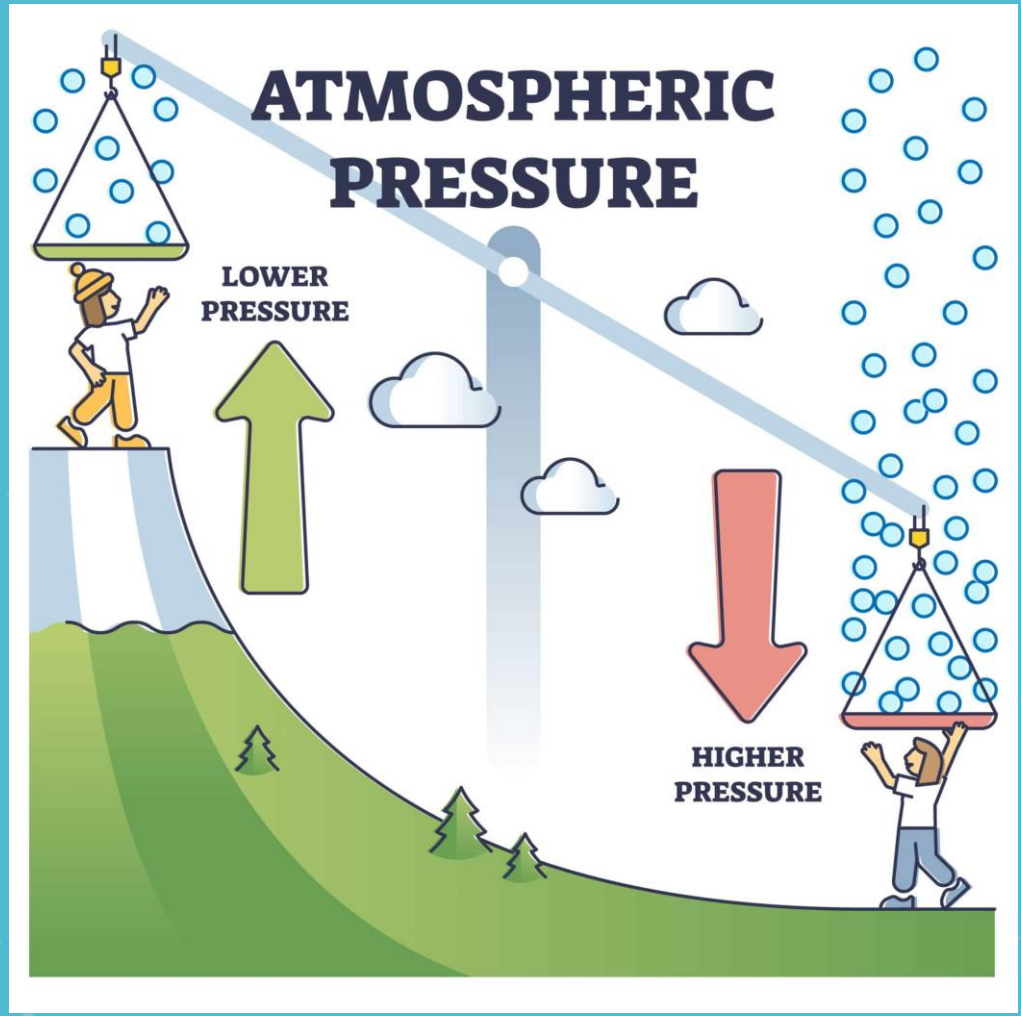
A Review of Studies on the Seasonal Variation of Indoor Radon-222 Concentration - PubMed

Air pressure is the weight of the column of air above you, and a barometer is a scale to measure it.

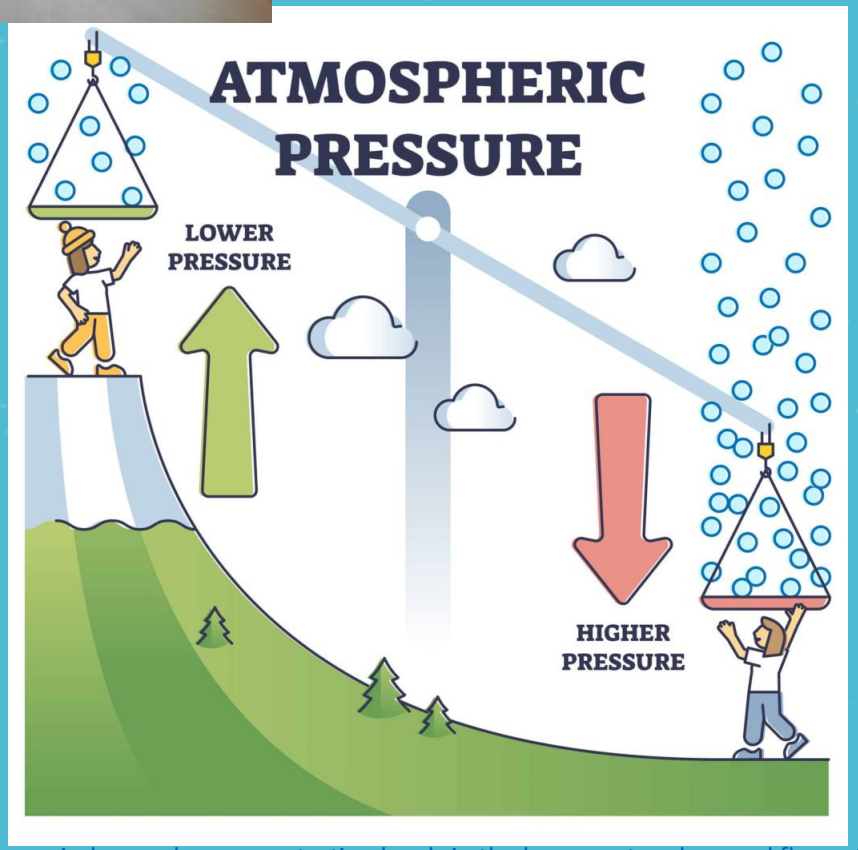
- Barometric pressure changes every day due to wind patterns, air temperatures, and the Earth's rotation.

- When these variables create a high-pressure system, the air presses closer to the Earth's surface

- In a low-pressure system, the air congregates higher up in the







The lower pressure outdoors can allow radon through vulnerable entry points.

This means indoor radon levels can spike during or after significant weather events associated with low barometric conditions.

Influence of environmental factors on indoor radon concentration levels in the basement and ground floor of a building – A case study

How the Weather Affects Home Radon Levels

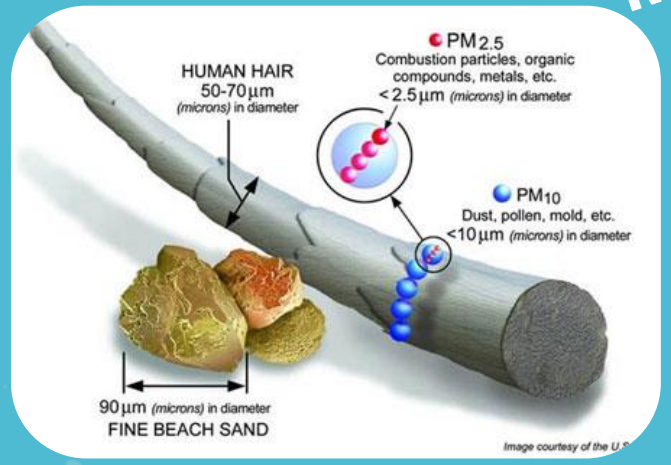
Candles

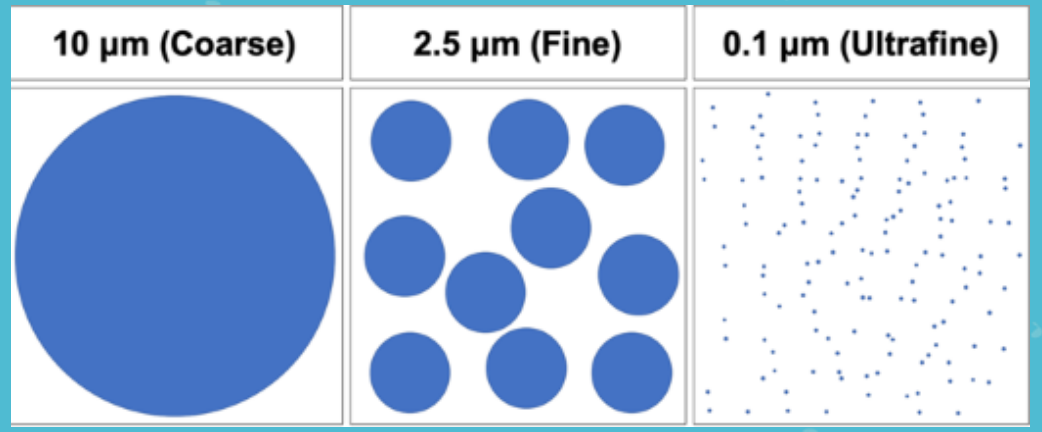
13

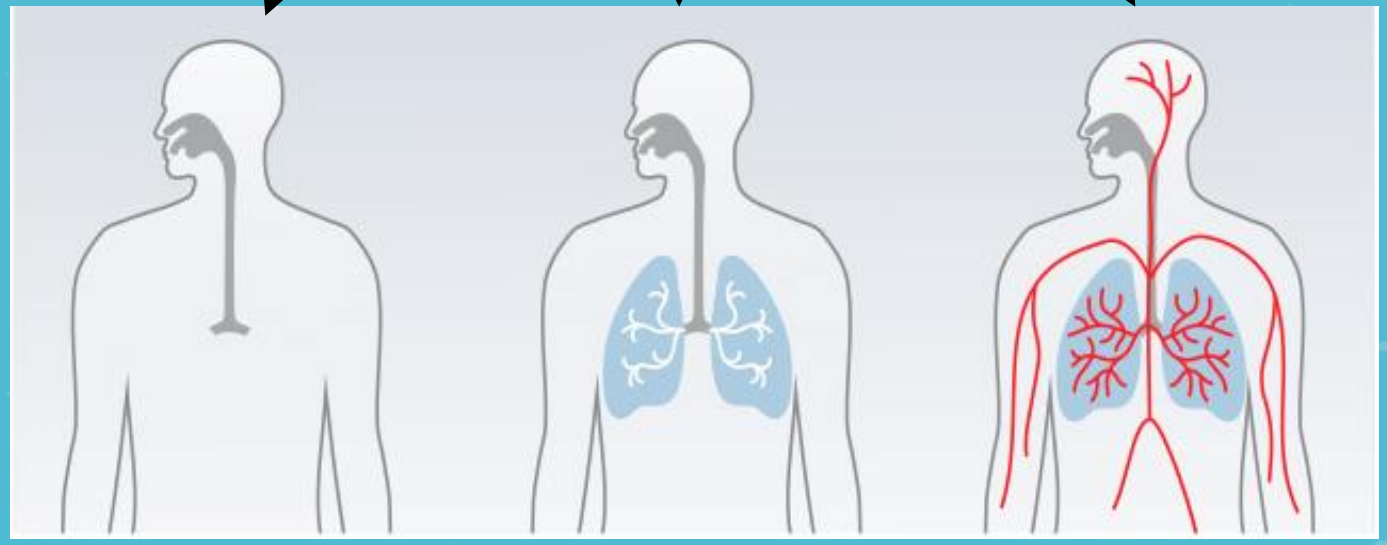


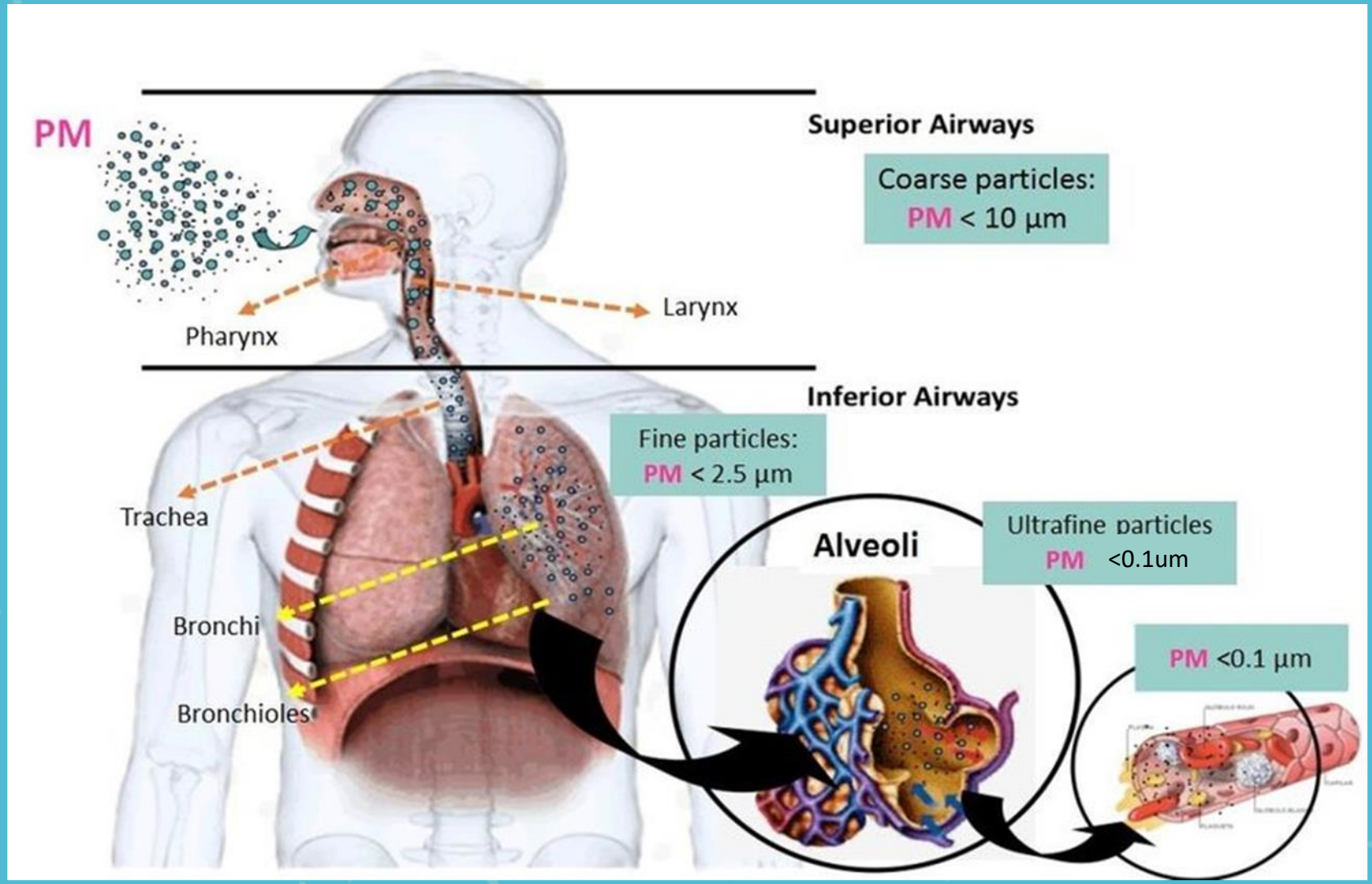
Reminder:

Particle Size Matters!









From Castelo, Fiorella Barraza. *Human exposure assessment related to oil activities in Ecuador: from the air quality monitoring to the study of metallic contaminants transfer in the soil-plant continuum*. Diss. 2017.

- Candles vary by type of wax (fuel), fragrance ingredients, amount of fragrance, type and composition of wick, colorants, and shape (e.g., filled container versus open pillar)

- Common waxes include paraffin, stearin, beeswax, soy, palm oil, and associated mixtures

- The National Candle Association estimates that more than 10,000 different candle scents are available in the United States

- Candle wicks are generally cotton and sometimes paper and vary by length, thickness, and the additives used as flame retardants (to control flame).



- Scented candles emit lots of different compounds, including but not limited to:
    - Volatile organic compounds (VOCs)
    - Semivolatile organic compounds (SVOCs)
    - Particulate matter (PM)
    - Polycyclic aromatic hydrocarbons (PAHs)



- Synthetic fragrances in scented candles can also contain phthalates that mimic and block hormones, even at very low levels.
    - During the fetal period exposure to phthalates can change the developing immune system and contribute to the development of asthma and allergies.

Although candles made from renewable sources are generally considered safer and more sustainable than those made from paraffin, it’s important to pay attention to environmental impact (e.g. palm oil) leading to deforestation and habitat destruction.



Beyond Aromatherapy: Illuminating the Underappreciated Risks Associated with Scented Candle Exposure | Environmental Science & Technology

Environment International
Volume 155, October 2021, 106590

Measurement and evaluation of gaseous and particulate emissions from burning scented and unscented candles

Tunga Salthammer [a], Jianwei Gu [a], Sebastian Wientzek [a], Rob Harrington [b], Stefan Thomann [c]

"The corresponding short-term and long-term concentrations for indoor air are safely met and, in many cases, are well below the established safety levels."

Particles

Soy-based candles had the highest emission rates across scented candles, and paraffin and palm-based candles had the lowest emission rates.

Among candles without fragrances, palm and stearin-based candles had the highest emissions, and paraffin and **soy-based candles** had the lowest emissions.



Measurement and evaluation of gaseous and particulate emissions from burning scented and unscented candles - ScienceDirect

Environmental Science & Technology > Vol 57/Issue 41 > Article

Cite Share Jump to Expand

VIEWPOINT | October 4, 2023

Beyond Aromatherapy: Illuminating the Underappreciated Risks Associated with Scented Candle Exposure

Ajeet Singh*, Amisha Kumari, and Laveeza Fatima

Open PDF



“People should use scented candles with caution, especially in closed spaces, and should certainly refrain from using them around vulnerable groups, such as pregnant women, children, the elderly, and individuals with preexisting cardiopulmonary conditions.

Furthermore, as a responsible and environmentally conscious community, it is crucial to opt for safer alternatives to scented candles, such as beeswax or soy-based candles.”

Beyond Aromatherapy: Illuminating the Underappreciated Risks Associated with Scented Candle Exposure | Environmental Science & Technology

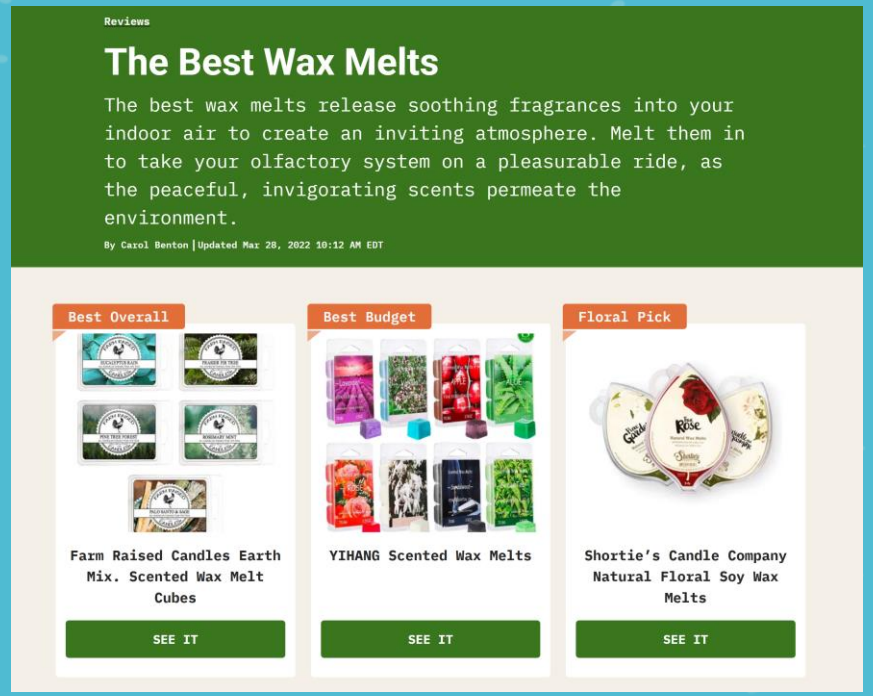
Environmental Science & Technology Letters > Vol 12/Issue 2 > Article

Open Access

OCCURRENCE, FATE, AND TRANSPORT OF CONTAMINANTS IN INDOOR AIR AND ATMOSPHERE | February 3, 2025

Flame-Free Candles Are Not Pollution-Free: Scented Wax Melts as a Significant Source of Atmospheric Nanoparticles

Satya S. Patra, Jinglin Jiang, Jianghui Liu, Gerhard Steiner, Nusrat Jung*, and Brandon E. Boor*



Flame-Free Candles Are Not Pollution-Free: Scented Wax Melts as a Significant Source of Atmospheric Nanoparticles | Environmental Science & Technology Letters

Goal = particles as low as possible

"The best evidence shows that having less of all types of particles in the air leads to better health and longer lives."

Particle Pollution | American Lung Association

No "safe" level of air pollution has been identified.

Essential Oils

14



American Lung Association.

Call the Lung HelpLine

Ask a Question

Shop Blog LUNG FORCE Help & Support Logi

TRANSLATE PA

Lung Health & Diseases | Quit Smoking | Clean Air | Research & Reports | Policy & Advocacy | Get Involved | DONATE

Each Breath

A Blog by the American Lung Association

Essential Oils: More Harmful Than Helpful?

Essential oils should be used with caution by individuals with respiratory conditions.



https://www.lung.org/blog/essential-oils-harmful-or-helpful

Safety Tips:

1. **Ask Your Healthcare Professional**: If you are considering using essential oils for specific health concerns, it is crucial to prioritize safety. Consult with your healthcare professionals to provide personalized advice based on your health history and individual needs.
2. **Proper dilution**: When using essential oils for inhalation it is important to dilute them properly. Avoid inhaling undiluted oils directly, as this can lead to irritation.
3. **Diffuser safely**: If using a diffuser, follow the manufacturer's instructions and ensure that the space is well ventilated. Prolonged exposure to high concentrations of essential oils is associated with negative heart issues and lung symptoms.
4. **Individual response varies**: People's responses to essential oils can vary and what works well for one person may cause irritation to another person. Pay attention to how your body reacts and adjust usage accordingly.
5. **Patch Testing**: Before using essential oils on the skin, perform a small patch test to check for any allergic reactions or skin sensitivities.
6. **Observe and Adjust**: Monitor how your body responds to essential oils. If you experience any adverse reactions, stop using it and seek guidance from your healthcare professional.

https://www.lung.org/blog/essential-oils-harmful-or-helpful

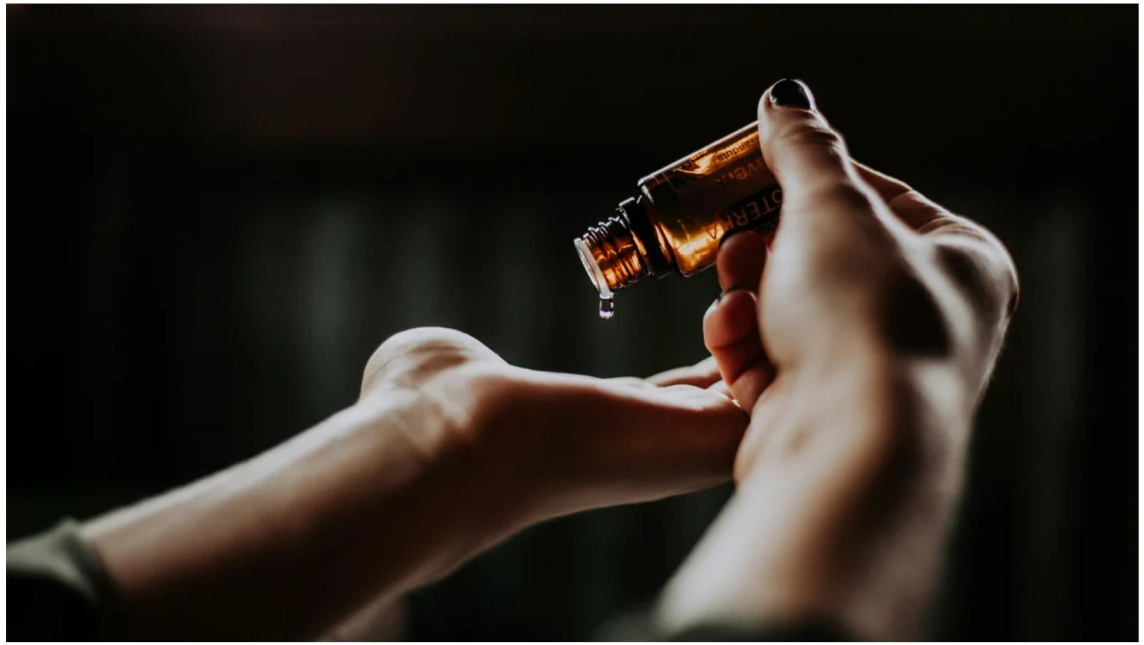


Photo by Christin Hume on Unsplash
Photo by Christin Hume on Unsplash

Phthalates detected in 11 popular brands of essential oils

The toxic chemicals were found in all 22 of the lavender and peppermint essential oils selected for testing, including several organic oils.

By EHN Editors ▪ Feb 13, 2025 ▪ 2 min read

Phthalates detected in 11 popular brands of essential oils - EHN

VOCs and particles: Even “harmless” particles can “turn bad”

15

ROCIS

Sources of Volatile Organic Compounds (VOCs)

Indoor Sources

Building materials:

- Paint, paint strippers
- Varnishes & finishes
- Caulks & sealants
- Adhesives
- Flooring, carpet, pressed wood products

Home & personal care products:

- Cleaners & disinfectants
- Furniture
- Pesticides
- Air fresheners
- Cosmetics & deodorants
- Fuel oil, gasoline

Activities:

- Tobacco smoke
- Dry-cleaned clothing
- Arts & crafts products: glues, permanent markers, etc.
- Wood burning stoves
- Office printers a copiers

Outdoor Sources

- Gasoline
- Diesel emissions
- Wood burning
- Oil / gas extraction & processing
- Industrial emissions

Volatile organic compounds, or VOCs are organic chemical compounds whose composition makes it possible for them to evaporate under normal indoor atmospheric conditions of temperature and pressure

Under sunlight, VOCs react with nitrogen oxides emitted mainly from vehicles, power plants and industrial activities to form ozone, which in turn helps the formation of fine particles.

Information on VOCs – Health Effects

From the Health Canada site: “Short-term exposure to high levels of some Volatile Organic Compounds (VOC) can cause:

- breathing problems
- irritation of the eyes, nose, throat
- headaches”

Long term exposure to VOCs can potentially cause neurological effects, leukemia, altered immune response, and cancer, depending upon the VOC and the dose

A brief example from:

Gaseous VOCs rapidly modify particulate matter and its biological effects – Part 2: Complex urban VOCs and model PM

S. Ebersviller[1], K . Lichtveld[1], K. G. Sexton[1], J. Zavala[1], Y.-H. Lin[1], I. Jaspers[1,2], and H. E. Jeffries[1]

[1]Environmental Sciences and Engineering, Gillings School of Global Public Health, The University of North Carolina at Chapel Hill, North Carolina, USA
[2]Center for Environmental Medicine and Lung Biology, Human Studies Facility, The University of North Carolina at Chapel Hill, North Carolina, USA

Correspondence to: S. Ebersviller (sebersviller@gmail.com)

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EXPERIMENT



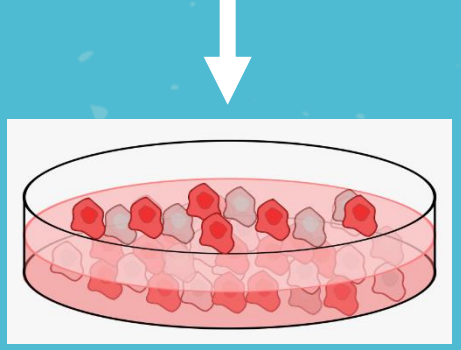
Non-toxic Particulate Matter



“Aged” VOCs

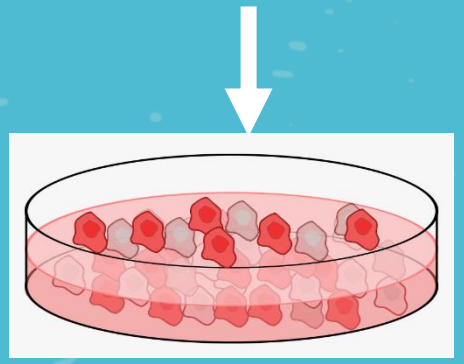


Non-toxic Particulate Matter



= No impact to cells

Respiratory Cells



= Negative impact to cells

Respiratory Cells

VOCs Modified the Effect that Particulate Matter had on Respiratory Cells

Resuspension

16



Indoor Surface Reservoirs – an important piece of the puzzle

We've talked about the resuspension of particles.

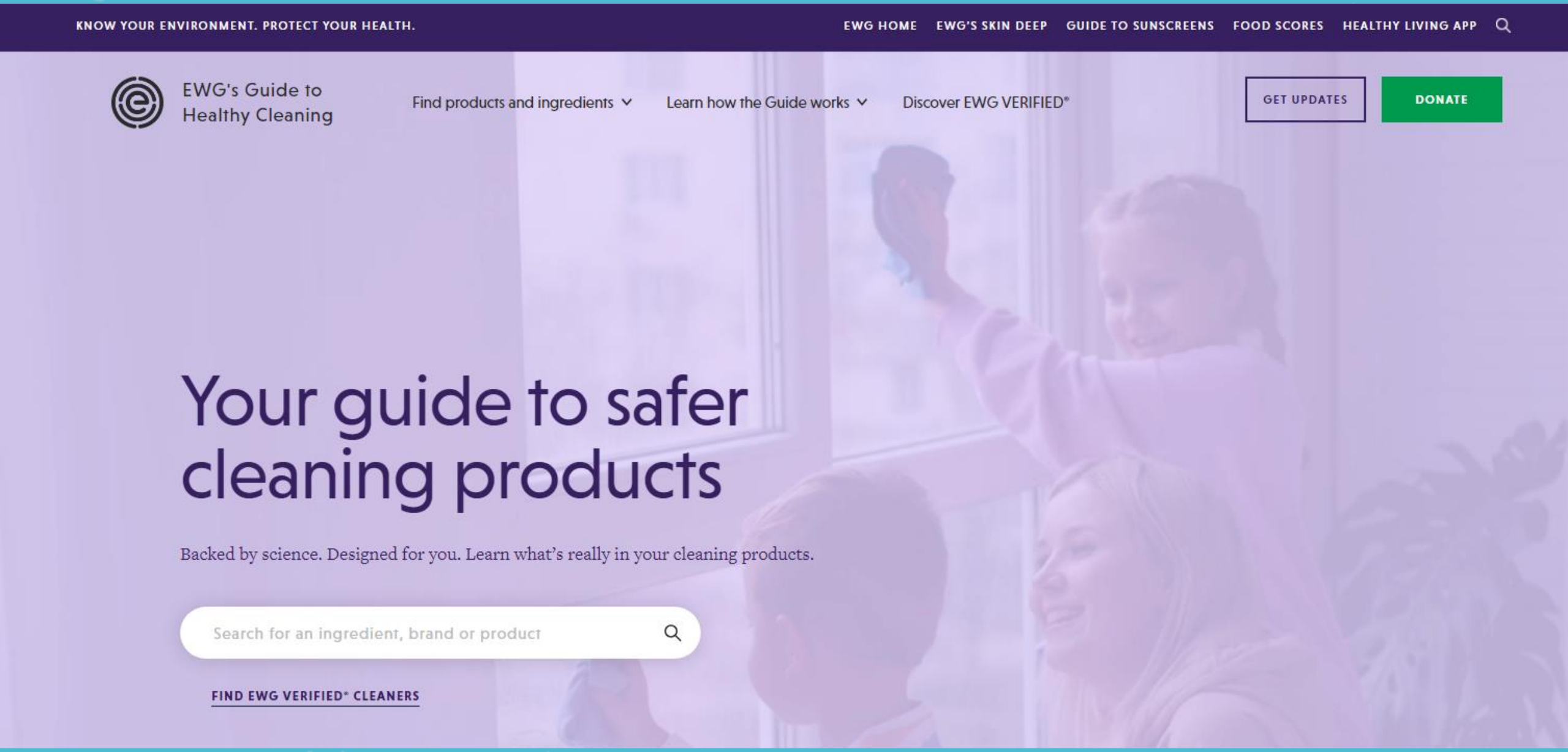


But pollutants including VOCs can also stick to indoor surfaces. This creates a new emission source from inside your own home.

Highlights importance of:

- Keeping air cleaners running 24/7
- Vacuuming/mopping/ cleaning surfaces

A review of indoor Gaseous organic compounds and human chemical Exposure: Insights from Real-time measurements - ScienceDirect



[EWG's Guide to Healthy Cleaning]

Air Quality Advocacy Opportunities

17

ROCIS

BREATHE PROJECT
The Air We Share

About Resources Tech Tools Take Action News & Events Sign U



Urge the Allegheny County Health Department to Protect Our Health!

Residents in Clairton and Mon Valley communities suffer serious respiratory and health problems due to air pollution coming from U.S. Steel's Mon Valley Works – one of the largest coking operations in the United States.

The voices of Mon Valley residents must be heard, especially with the pending sale of U.S. Steel to Nippon Steel. Residents in environmental justice communities deserve a seat at the table. In Clairton, nearly 40% of residents are Black and they live near the U.S. Steel Clairton Coke Works plant. Many are disproportionately affected by pollution and related illnesses, including asthma and cancer. Children living near the plant suffer from asthma rates that are nearly three times higher than the rest of the U.S. Championing environmental justice requires listening to residents whose health and quality of life are the most harmed by the coking operations.

Communities

Braddock | Clairton | East End - Squirrel Hill - Pittsburgh

LEARN MORE ABOUT THIS CAMPAIGN

Take Action - Breathe Project

BREATHE PROJECT

The Air We Share



ABOUT THE BREATHE COLLABORATIVE

The Breathe Collaborative is a coalition of citizens, environmental advocates, public health professionals and academics working to improve air quality, eliminate climate pollution and make our region a healthy and prosperous place to live. The Collaborative powers the Breathe Project through science-based work and a community outreach platform.

BREATHE COLLABORATIVE MEMBERS INCLUDE:

350 Pittsburgh
We envision a future where policies and actions at the local, state, federal and international levels will have ensured a stable climate that provides an opportunity for all people to achieve health, prosperity and fulfillment.

Allegheny County Clean Air Now
ACCAN was founded in 2014 to give voice to the residents living downwind from the GTE Energy's (Shenango Coke Plant on Neville Island and raise awareness of the impact of the plant's toxic pollution. Since Shenango shutdown in January 2015, ACCAN has focused on turning the plant site into a solar farm and supporting other communities in their fight for better air quality and improved health outcomes.

American Lung Association in Pennsylvania
The leading organization working to save lives by improving lung health and preventing lung disease through research, education and advocacy. The work of the ALA in Pennsylvania is focused on four strategic imperatives: to defeat lung cancer; to improve the air we breathe; to reduce the burden of lung disease on individuals and their families; and to eliminate tobacco use and tobacco-related diseases.

Beaver County Marcellus Awareness Community
As a 501(c)3 organization, we seek to inform the citizens of Western Pennsylvania, specifically those in Beaver County, about Marcellus Shale gas drilling, and to protect our natural environment by promoting and supporting sustainable energy alternatives to carbon-based energy sources.

Better Path Coalition
The Better Path Coalition is a statewide frontline- and grassroots-led coalition forging a path to a clean, renewable energy future for Pennsylvania and a government that puts the people's interests before those of the fossil fuel and petrochemical industries.

Blue Lens
Presents the work of Mark Dixon, Pittsburgh-based environmentalist, filmmaker, videographer, photographer, media consultant and public speaker.

Carnegie Mellon University Center for Atmospheric Particle Studies (CAPS)
We strive to be world leaders in science, engineering and policy covering the full role of fine particulate matter in the atmosphere.

Carnegie Mellon University CREATE Lab
The Community Robotics, Education and Technology Empowerment Lab (CREATELab) explores socially meaningful innovation through robotic technologies that empower a technologically fluent generation and educate citizens and scientists through affordable environmental sensing and documentation instruments, powerful visualization platforms and evidenced-based scientific data.

Center for Coalfield Justice
We fight for coalfield communities through advocacy, education and organizing.

Center for Healthy Environments & Communities (CHEC), University of Pittsburgh
Our mission is to improve environmental health in Western Pennsylvania through community-based research to analyze the social, economic, political, policy, behavioral and geographical variables associated with environmental health issues, as well as the traditional physical-chemical aspects of local environmental health problems.

Civic Science for Environmental Futures Collaborative
A research lab at Arizona State University's School for the Future of Innovation in Society comprised of faculty, graduate and undergraduate researchers and community partners committed to working together to make sense of complex environmental issues through an understanding resource extraction, energy infrastructure and implications for human and environmental health. Through these collaborations, we explore how communities can engage with science and policy to shape a more just and equitable environmental future.

Clean Air Council
A member-supported environmental organization serving the Mid-Atlantic Region since 1967.
The Council is dedicated to protecting and defending everyone's right to breathe clean air and uses public education, community action, government oversight and enforcement of environmental laws 2to advocate for healthy air.

Clean Air Task Force
Clean Air Task Force is a nonprofit environmental organization with offices across the U.S. CATF works to help safeguard against the worst impacts of climate change by catalyzing the rapid global development and deployment of low-carbon energy and other climate-protecting technologies through research and analysis, public advocacy leadership and partnership with the private sector.

Clean Water Action
Founded during the campaign to pass the landmark Clean Water Act in 1972, Clean Water Action has worked to win strong health and environmental protections by bringing issue expertise, coalition-oriented thinking and people power to the table.

Climate Reality Pittsburgh & SWPA
Climate Reality Pittsburgh & SWPA is a community of concerned Southwestern Pennsylvania citizens and neighbors who are addressing the climate crisis in our region, challenging sources of climate change pollution and supporting efforts for a renewable energy future.

Communities First – Sewickley Valley
Communities First is a group committed to protecting the health, safety and environment in the Sewickley Valley. Our focus is on the impact the Shell ethane "cracker" plant and the expanding petrochemical/plastics industry will have on our communities. We are alerting, educating and mobilizing our residents to protect our quality of life.

Community Foundation for the Alleghenies
We work to empower all people to become philanthropists who have a permanent impact and leave a lasting legacy in our region. We envision an inclusive and engaged culture of philanthropy that grows an abundance of resources, achieving perpetual impact on a thriving region.

Community Partners in Asthma Care
Community Partners in Asthma Care is a non-profit whose mission is to provide allergy and asthma education and care in underserved communities.

East End Neighbors – Fight Pollution
East End Neighbors is a grassroots group of residents, living in and around Squirrel Hill, who advocate to redress the risks to public health due to air pollution in our region.

Environmental Health Project, Southwest Pennsylvania
A nonprofit public health organization that assists and supports residents of Southwestern Pennsylvania and beyond who believe their health has been, or could be, impacted by unconventional oil and gas development.

Environmental Integrity Project
A nonpartisan, nonprofit watchdog organization that advocates for effective enforcement of environmental laws. It is comprised of former EPA enforcement attorneys, public interest lawyers, analysts, investigators and community organizers working with local citizens.

Fair Shake Environmental Legal Services
Provides environmental legal services on a sliding scale for clients in the Appalachian basin.

Food & Water Watch
Food & Water Watch champions healthy food and clean water for all. We stand up to corporations that put profits before people and advocate for a democracy that improves people's lives and protects our environment.

FracTracker Alliance
A leading resource on oil and gas issues and trusted asset to the concerned public. FracTracker studies, maps and communicates the risks of oil and gas development to protect our planet and support the renewable energy transformation.

Freshwater Accountability Project
Our mission is to educate people about freshwater supplies by providing an online archive of studies and community information. Through education and factual information, people can work towards meaningful change at the local, state, and federal levels of government to ensure our water is protected, and thus, our future is preserved.

Group Against Smog and Pollution (GASP)
Group Against Smog and Pollution (GASP) is a non-profit citizens' group in Southwestern Pennsylvania working for a healthy, sustainable environment. Founded in 1968, GASP has been a diligent watchdog, educator, litigator, and policy-maker on many environmental issues, with a focus on air quality in the Pittsburgh region.

Lawrenceville Clean Air Now
Lawrenceville Clean Air Now (LCAN) is a community of people who live and work in the Lawrenceville neighborhood of Pittsburgh. Through community education and organizing, we aim to mobilize support for efforts to address local and county air pollution and protect public health.

Lowell Center for Sustainable Production at the University of Massachusetts
Uses rigorous science and innovative strategies to develop practical solutions that promote environmentally sound systems of production and consumption.

Marcellus Outreach Butler
We envision a Butler County powered by renewable energy, not fossil fuels. Our mission is to educate, advocate, and activate communities to ban fracking and its infrastructure and promote renewable energy.

Mom's Clean Air Force
Moms Clean Air Force is a community of moms and dads united against air pollution. We're a force for change that cannot be ignored on Capitol Hill. Keeping Our Kids Healthy.

Mountain Watershed Association
We work for the water and for people. We pursue on-the-ground restoration of past damage while also advocating on local, regional and national issues that impact our watershed.

Nine Mile Watershed Association
Nine Mile Run Watershed Association restores and protects its watershed ecosystem, while working regionally to support and implement resilient solutions for a healthy urban environment.

North Braddock Residents For Our Future
North Braddock Residents For Our Future is a grassroots group of residents organized to promote community health and clean air and fight unconventional gas drilling in our community.

Northside Leadership Conference
The Northside Leadership Conference is a coalition of Northside community-based organizations, committed to addressing mutual concerns through a united approach in order to promote and enhance the vitality, quality of life and image of Pittsburgh's Northside.

Ohio River Valley Institute
Helping the greater Ohio Valley region mark out a path toward shared prosperity, clean energy, and equitable civic structures.

PennEnvironment Research and Policy Center
A statewide, citizen-based environmental advocacy organization that believes there's something special about Pennsylvania worth protecting and preserving for future generations.

PennFuture
Serves as Pennsylvania's watchdog for clean air, pure water and a healthy climate. The statewide nonprofit is leading the transition to a clean energy economy in Pennsylvania, fighting big polluters with legal muscle, enforcing environmental laws and supporting legislative policy that protects public health. PennFuture is engaging and educating citizens about the realities of climate change and giving them the tools needed to influence lawmakers on the issues.

Physicians for Social Responsibility Pennsylvania
PSR mobilizes physicians and health professionals to contribute public health solutions for climate change and nuclear weapons abolition.

Plant Five For Life
Our first program aims to give trees to every child born in collaboration with our health care community, matching the trees to cities nearest each child's neighborhood in an effort to plan a vision of environmental equity with supportive health services that drive our work.

Protect Franklin Park
Protect Franklin Park is a non-partisan, community-based organization dedicated to protecting the environmental health and safety of Franklin Park Borough residents through information, action and advocacy.

Protect PT
A grassroots organization dedicated to ensuring that the safety, security and quality of life of residents in Penn Trafford and surrounding communities are protected from the harmful effects of unconventional natural gas development in Westmoreland and Allegheny Counties. Started in 2014, Protect PT strives to protect the constitutional rights of residents in our community in the wake of gas development using education, empowerment and engagement.

Rail Pollution Protection Pittsburgh
Rail Pollution Protection Pittsburgh (RPP) is a group of Pittsburgh residents committed to addressing the risk and negative impacts of rail proliferation where it conflicts with urban health, sustainability, and personal well-being.

Reimagine Appalachia
A 4-state coalition that is rolling out a blueprint to reimagine a 21st-century economy for the Ohio Valley that's good for workers, communities and the environment.

ROCIS (Reducing Outdoor Contaminants in Indoor Spaces)
We work to reduce the impact of exterior environmental pollution in southwestern Pennsylvania and to create healthy and energy efficient indoor environments where we live, work and learn.

Sierra Club Pennsylvania
We are the only member-led statewide environmental organization in Pennsylvania and we believe our open spaces, clean water and natural resources should be protected so that current and future generations may enjoy them.

St. Paul's Working for Justice
The Working for Justice Ministry clean air group endeavors to inform, educate and mobilize members of our congregation, and the broader community, in matters relating to justice. The dimensions of justice important to our ministry include environmental, social, economic, and political issues.

Sustainability Pioneers
Sustainability Pioneers is a web-based short video documentary series by Kirsi Jansa that showcases the new reality that is emerging as a response to climate change and highlights people and communities in the U.S. and in Europe taking bold steps to address climate crisis and lay a trail towards a more livable planet.

The Heinz Endowments
Based in Pittsburgh, where we use our region as a laboratory the development of solutions to challenges that are national in scope. Although the majority of our giving is concentrated within southwestern Pennsylvania, we work wherever necessary, including statewide and nationally, to fulfill our mission. That mission is to help our region become a just and equitable community in which all of its citizens thrive economically, ecologically, educationally, socially and culturally. We also seek to advance knowledge and practice in the field of philanthropy through strategies that focus on our priorities of Creativity, Learning and Sustainability.

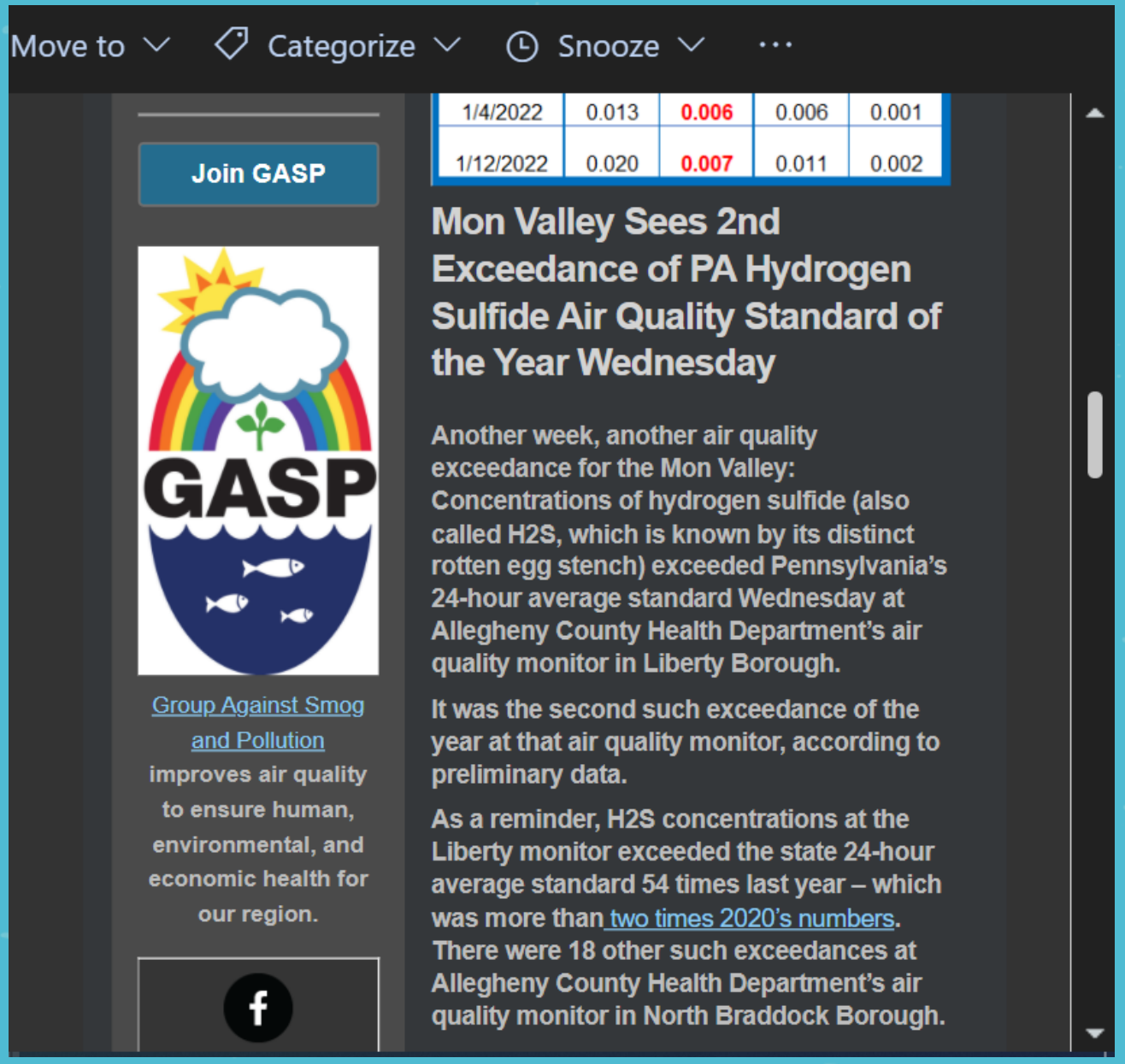
Thomas Merton Center EcoJustice Working Group
Holding, participating and encouraging actions in defense of life on Earth.

Uptown Partners of Pittsburgh
Uptown Partners of Pittsburgh is a community-based organization of residents, institutions, and business owners—working together to build a vibrant community.

UrbanKind Institute
To advance policies, practices, and programs that are kind to urban people and environments.

Valley Clean Air Now (VCAN)
Valley Clean Air Now (VCAN) seeks to fight for the residents of the Mon Valley who continue to suffer from severe health, economic, climate and environmental justice by galvanizing the community to take action through local politics, grassroots organizing, community building, education and community health initiatives.

Women for a Healthy Environment
Educates and empowers community members to act as ambassadors about environmental risks so that they can make healthy choices and advocate for change for a better tomorrow for all. At the core of WHE's work is protecting children from harmful exposures in the environment and creating healthy places for them to live, learn and play.



1/4/2022	0.013	0.006	0.006	0.001
1/12/2022	0.020	0.007	0.011	0.002

Mon Valley Sees 2nd Exceedance of PA Hydrogen Sulfide Air Quality Standard of the Year Wednesday

Another week, another air quality exceedance for the Mon Valley: Concentrations of hydrogen sulfide (also called H2S, which is known by its distinct rotten egg stench) exceeded Pennsylvania's 24-hour average standard Wednesday at Allegheny County Health Department's air quality monitor in Liberty Borough.

It was the second such exceedance of the year at that air quality monitor, according to preliminary data.

As a reminder, H2S concentrations at the Liberty monitor exceeded the state 24-hour average standard 54 times last year – which was more than two times 2020's numbers. There were 18 other such exceedances at Allegheny County Health Department's air quality monitor in North Braddock Borough.

Wrap-Up

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Schedule & Topics

75-minute Online Meetings

7 PM Mon. & Thurs., repeated noon Tues. & Fri.

Important Dates:

Oct. 11	Have data and logs uploaded.
Oct. 13	Kit Pick up

Meetings:

Oct. 9 or 10	**Wrap-up Meeting**

Meetings in orange are required

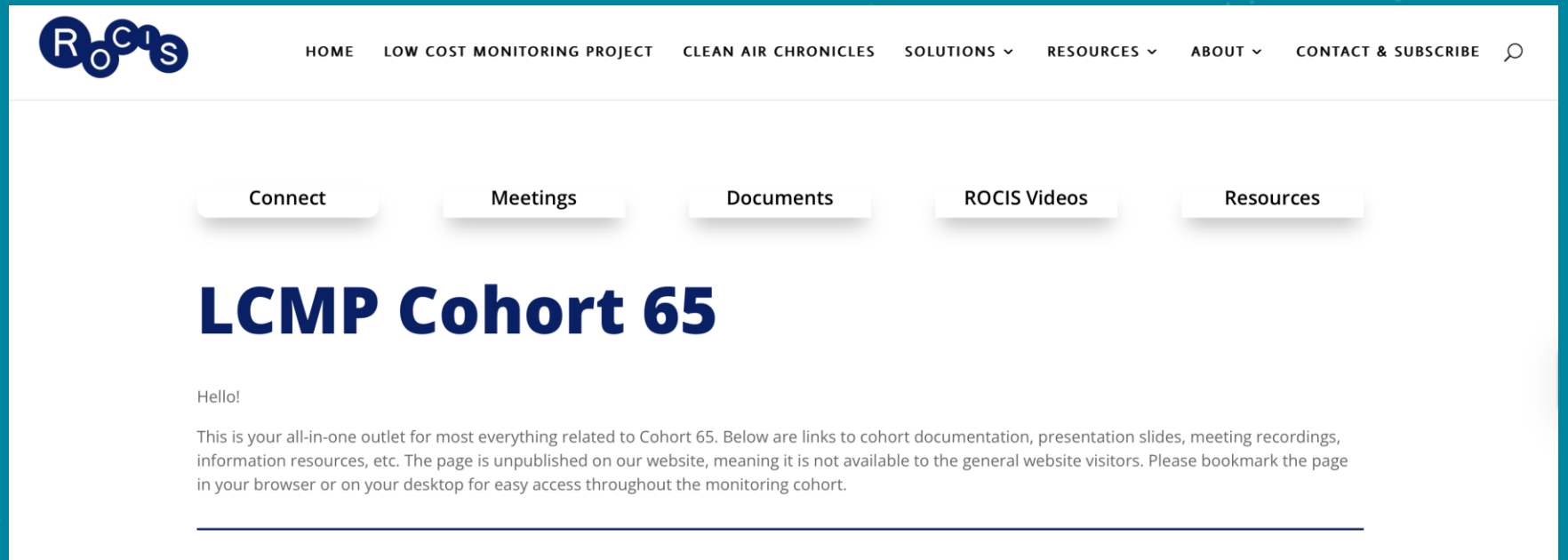
Accessing Cohort 65 Resources

- Limited Access Website page*
  - Handouts & forms
  - Slide decks from meetings
  - Links to recordings
  - Links to resources

Always hit refresh!

https://rocis.org/cohort-65/

***This link will also be in the follow-up e-mail!**



Need Help? Who to Contact

- **Coordination & Logistics:**
  - Elly Helgen - text: 520-419-1109 or elisha.helgen@gmail.com
- **Equipment issues:**
  - Linda Wigington - text: 724-986-0793 or lwigington1@outlook.com
  - Rob Busher - text: 412-437-8454 or robb@rocis.org (computer issues)
- **Interpretation of monitoring readings:**
  - Linda Wigington - text: 724-986-0793 or lwigington1@outlook.com
  - Rob Busher - text: 412-437-8454 or robb@rocis.org (computer issues)
- **Social Media Postings:**
  - Christine Benner Dixon - m.christine.benner@gmail.com

Thank you!

Thanks to Phil Johnson & The Heinz Endowments for support of the ROCIS initiative (Reducing Outdoor Contaminants in Indoor Spaces) and our 600+ LCMP participants.

QUESTIONS?



Linda Wigington
Team Leader
Waynesburg, PA
724-986-0793
lwigington1@outlook.com



Rob Busher
Program Coordinator
Portland, Maine
412-437-8454
robb@rocis.org



Samantha Totoni, PhD
Public Health Fellow
Pittsburgh, PA
217-390-1842
skc35@pitt.edu

Elly Helgen
SWPA Project Coordinator
Bethel Park, PA
520-419-1109
elisha.helgen@gmail.com



Jessica Kester
Air Quality Education Coordinator
Blue Knob, PA
814-937-7365
Jessicalkester@gmail.com

