NORTHEAST
BUSINESS GROUP ON HEALTH

MONDAYS WITH DR MARK & DR MICHAEL

Monday, June 30, 2025 | 1:00 – 2:00PM

TOPIC #47

Heat, Haze, and Health: Keeping Employees Safe as Temperatures Rise

HP2030 HEALTHY PEOPLE 2030 CHAMPION


Heat, Haze, and Health: Keeping Employees Safe as Temperatures Rise
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Leading Causes of Death

RANK	CAUSE	APPROX. ANNUAL DEATHS
1	*Heart disease*	~700,000
2	*Cancer*	~600,000
3	*Chronic lower respiratory diseases*	~150,000
4	*Accidents (unintentional injuries)*	~200,000
5	*Stroke*	~160,000
…	*Air pollution-related*	**100,000–200,000**
…	*Heat-related*	~2,000

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https://www.cdc.gov/nchs/fastats/leading-causes-of-death.htm

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Days >90 ^{0}F

Long-term increase:

Both the frequency and intensity of 90°F+ days have risen over time.

Increasing variability:

Compared with pre-1950 averages (~10-20 days), recent summers regularly hit 20–30 days, with occasional spikes above 35–37 days.

Health relevance:

More frequent extreme heat raises risks of heat-related illness, strains public health systems, and expands vulnerability windows.

Effects of Heat

Mild to Moderate

- Dehydration: dry mouth, thirst, dark urine
- Heat rash (prickly heat): skin irritation due to sweating
- Heat cramps: muscle pain or spasms (usually in legs, arms, or abdomen)
- Fatigue, dizziness, headache,
- Nausea or vomiting

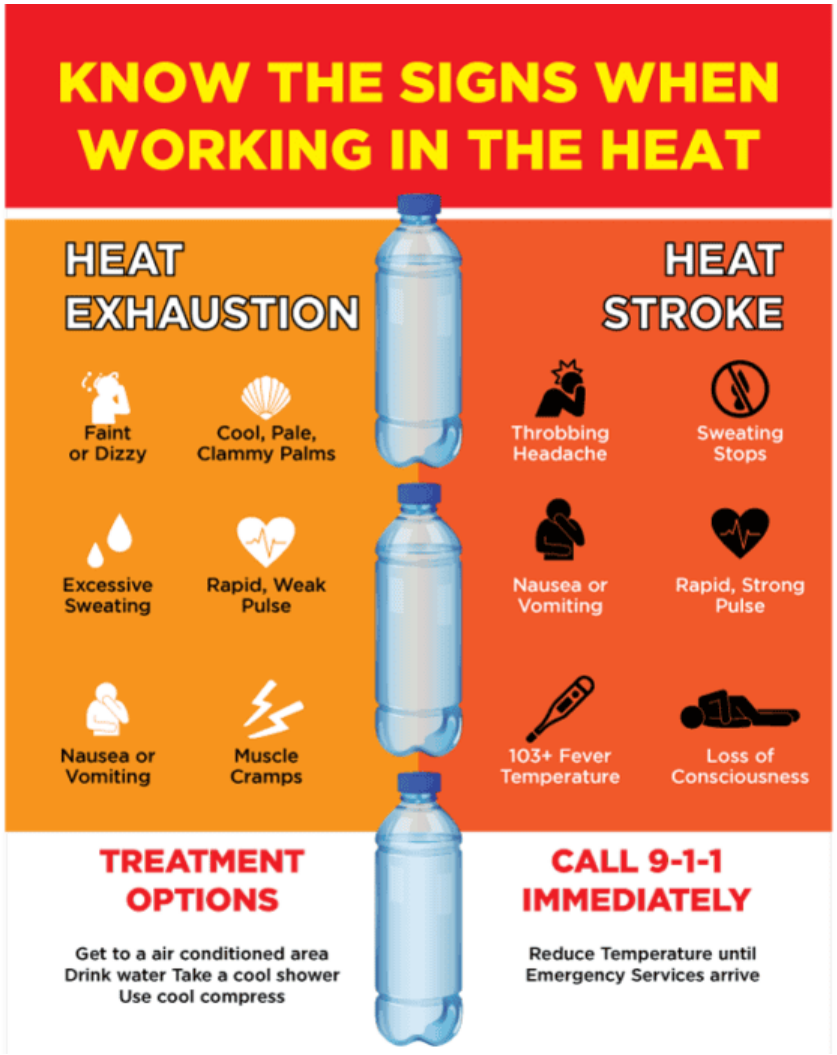
Severe Heat-Related Illnesses

Heat Exhaustion - Warning stage—can progress to heat stroke if untreated

- Symptoms: heavy sweating, weakness, confusion, rapid pulse, nausea, clammy skin
- Treatment: move to a cooler place, hydrate, rest

Heat Stroke (Medical Emergency)Body temperature ≥ 104°F (40°C)

- Symptoms: confusion, fainting, seizures, hot/dry or damp skin, no sweating, rapid heartbeat. Can lead to: organ failure, permanent brain damage, death
- Treatment: Requires immediate cooling and emergency medical attention


KNOW THE SIGNS WHEN WORKING IN THE HEAT
HEAT EXHAUSTION
Faint or Dizzy
Cool, Pale, Clammy Palms
Excessive Sweating
Rapid, Weak Pulse
Nausea or Vomiting
Muscle Cramps
HEAT STROKE
Throbbing Headache
Sweating Stops
Nausea or Vomiting
Rapid, Strong Pulse
103+ Fever Temperature
Loss of Consciousness
TREATMENT OPTIONS
Get to a air conditioned area
Drink water Take a cool shower
Use cool compress
CALL 9-1-1 IMMEDIATELY
Reduce Temperature until Emergency Services arrive

Chronic & Indirect Health Effects

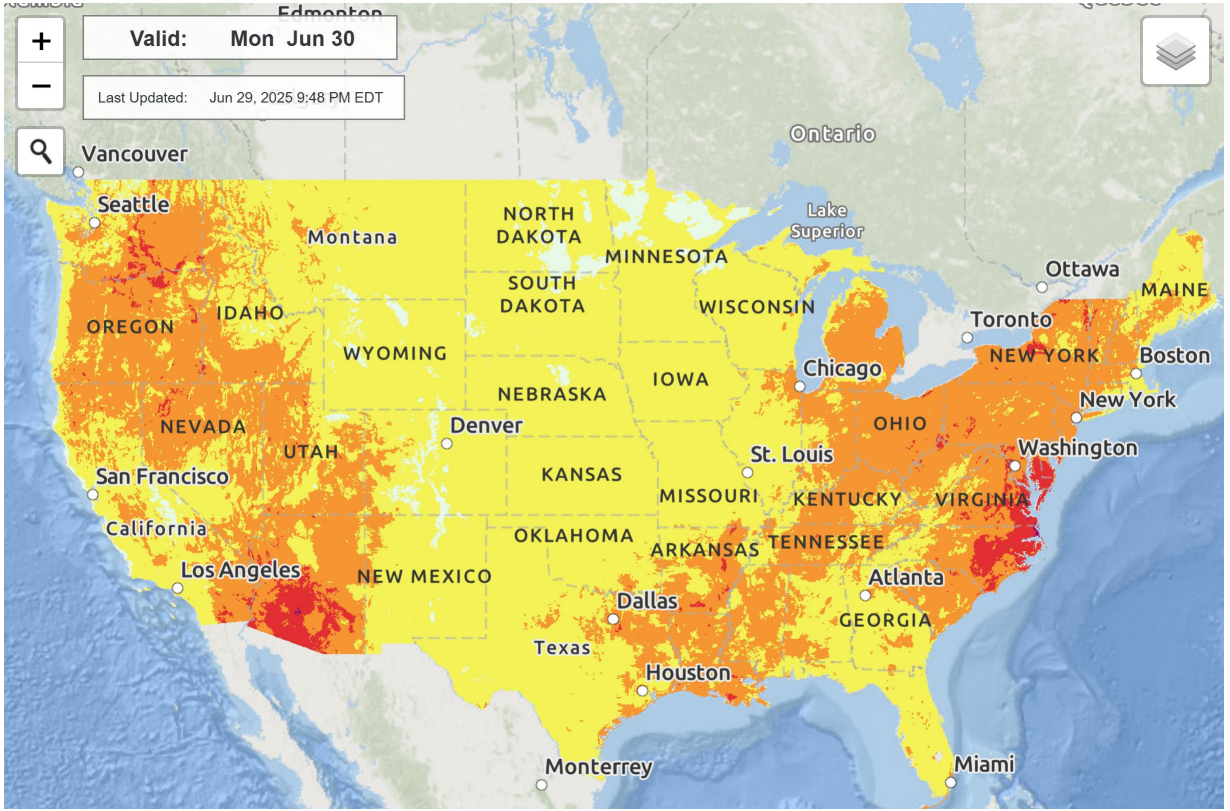
Heat also worsens existing health conditions:

- **Cardiovascular strain**: increases heart attack risk, especially in older adults
- **Respiratory issues**: worsens asthma and COPD, especially during hot, humid, or ozone-heavy days
- **Kidney stress/failure**: especially in outdoor workers or those who are dehydrated
- **Mental health effects**: heat is associated with irritability, aggression, anxiety, sleep disturbances, and increased suicide risk

Who's Most at Risk

- Older adults (65+)
- Infants and young children
- Outdoor workers and workers in high heat environments
- People with chronic diseases (heart, lung, kidney)
- People taking medications that impair heat regulation (e.g., diuretics, beta-blockers, antipsychotics)
- Pregnant employees
- Equity lens: employees in lower-income neighborhoods or shared housing may lack cooling/filtration

Category	Risk of Heat-Related Impacts
Green 0	Little to no risk from expected heat.
Yellow 1	Minor - This level of heat affects primarily those individuals extremely sensitive to heat, especially when outdoors without effective cooling and/or adequate hydration.
Orange 2	Moderate - This level of heat affects most individuals sensitive to heat, especially those without effective cooling and/or adequate hydration. Impacts possible in some health systems and in heat-sensitive industries.
Red 3	Major - This level of heat affects anyone without effective cooling and/or adequate hydration. Impacts likely in some health systems, heat-sensitive industries and infrastructure.
Magenta 4	Extreme - This level of rare and/or long-duration extreme heat with little to no overnight relief affects anyone without effective cooling and/or adequate hydration. Impacts likely in most health systems, heat-sensitive industries and infrastructure.



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https://www.wpc.ncep.noaa.gov/heatrisk/

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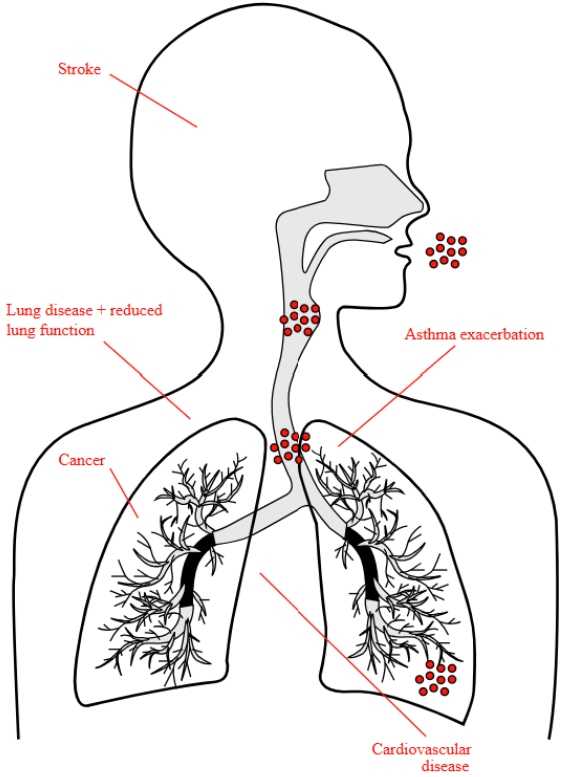
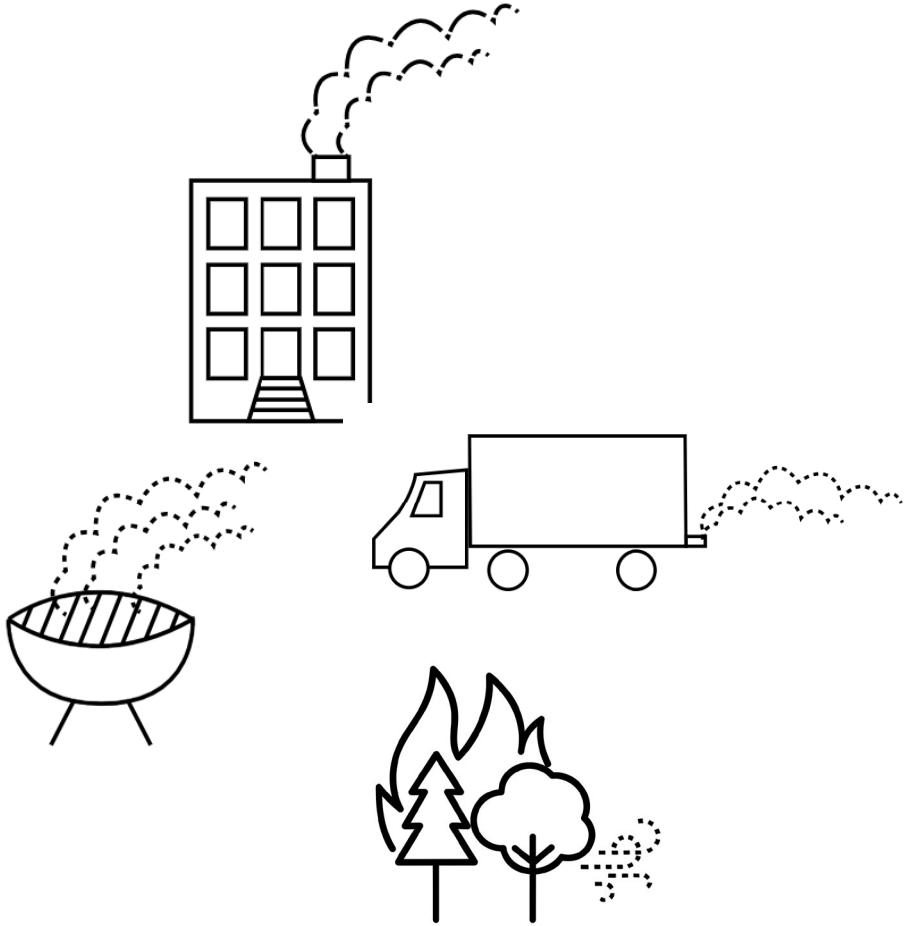
Air Quality

US AQI Level		PM2.5 ($\mu g/m^3$)	Health Recommendation (for 24 hour exposure)
WHO PM2.5 ($\mu g/m^3$) Recommended Guidelines as of 2024: **0-5.0**			
Good	0-50	0-9.0	Air quality is satisfactory and poses little or no risk.
Moderate	51-100	9.1-35.4	Sensitive individuals should avoid outdoor activity as they may experience respiratory symptoms.
Unhealthy for Sensitive Groups	101-150	35.5-55.4	General public and sensitive individuals in particular are at risk to experience irritation and respiratory problems.
Unhealthy	151-200	55.5-125.4	Increased likelihood of adverse effects and aggravation to the heart and lungs among general public.
Very Unhealthy	201-300	125.5-225.4	General public will be noticeably affected. Sensitive groups should restrict outdoor activities.
Hazardous	301+	225.5+	General public at high risk of experiencing strong irritations and adverse health effects. Should avoid outdoor activities.

PM2.5





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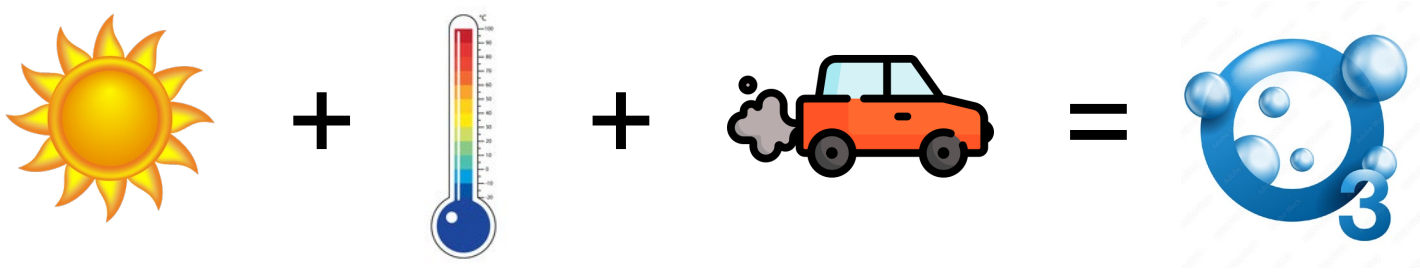
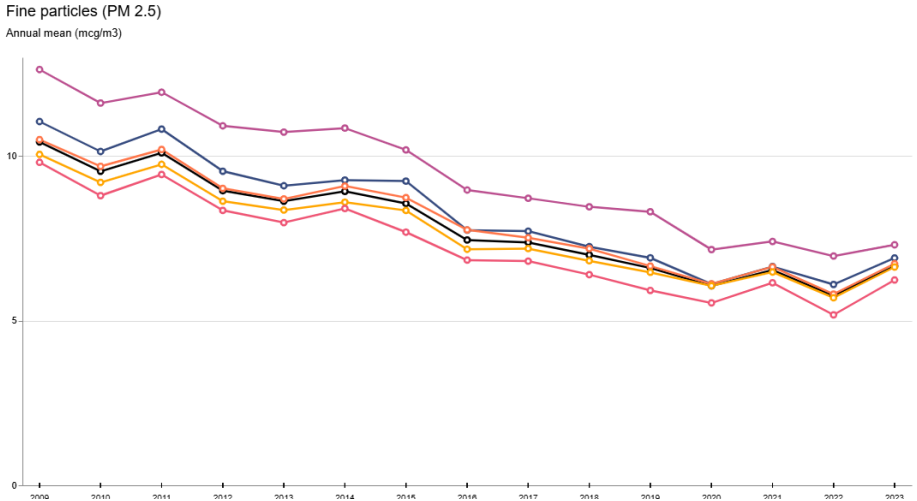
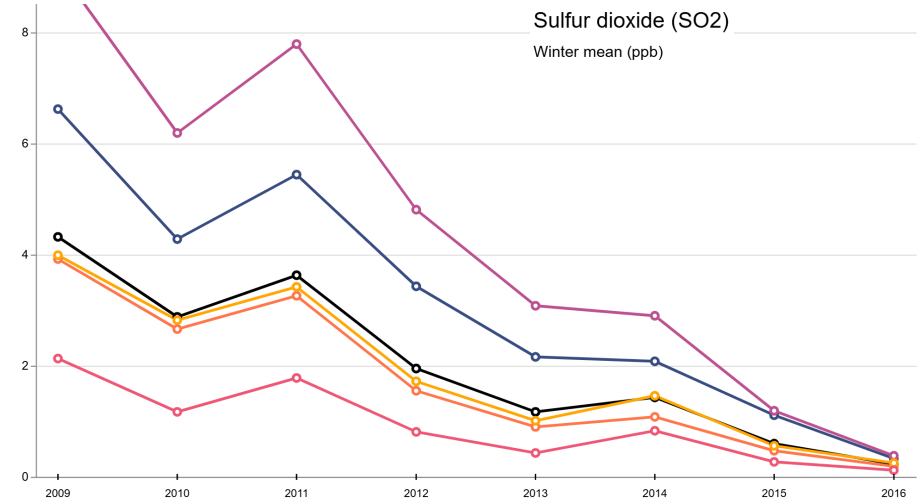
Formation of Ground-Level Ozone (Smog)

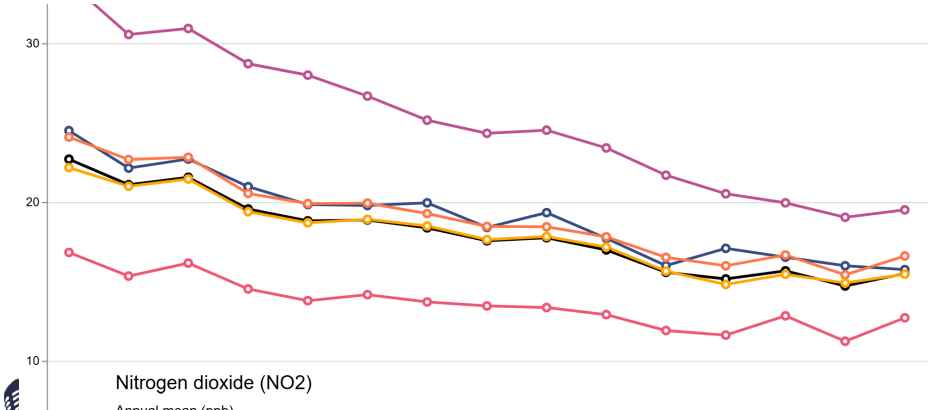


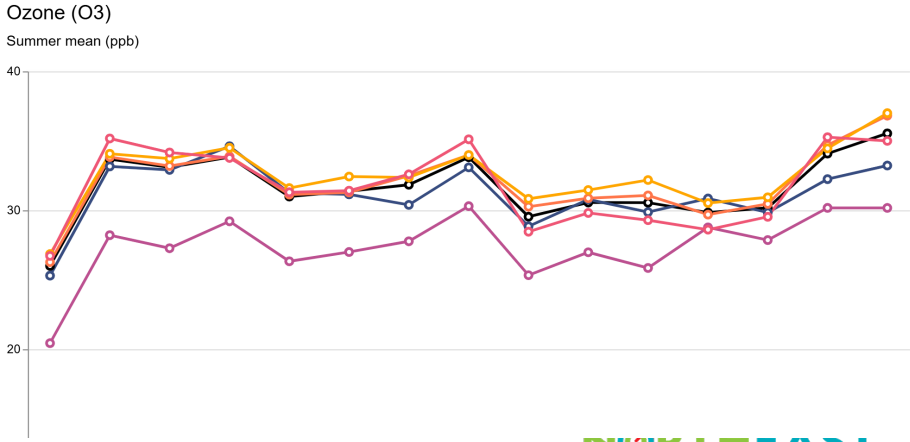
Sunlight **Heat** **Pollutants** **Ozone**

- On hot, sunny days, nitrogen oxides (NO_x) and volatile organic compounds (VOCs) from cars, power plants, and industry react in sunlight to form ground-level ozone.
- Ground-level ozone is a major component of photochemical smog and is harmful to lungs, especially for children, older adults, and people with asthma.
- “Sunlight acts like a chemical oven, cooking pollutants into ozone.









https://a816-dohbesp.nyc.gov/IndicatorPublic/data-explorer/air-quality/?id=2020#display=trend

Forest Fire Trends

Burned area nearly doubled

- Satellite data show forest fires now burn almost twice as much tree cover compared to 20 years ago

Season length and frequency increasing

- Climate change has led to longer wildfire seasons, more fires, and larger burn areas, driven by warmer springs, prolonged droughts, and dry vegetation

Sparse grassland but intense extreme fires

- Although grassland fires (70% of wildfires) have decreased, extreme wildfires are projected to rise by 14% by 2030, 30% by 2050, and 50% by century's end.

Rising emissions

- Global wildfires release 5–8 billion tonnes of CO_2 annually, and 2023–24 saw record fire emissions—8.6 billion t CO_2, a 16% spike above the previous two-decade average

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Smoke & Air Pollution Trends

PM2.5 spikes & ozone surges

- Wildfire smoke is now a leading cause of unhealthy air days in the U.S.; smoke-driven PM2.5 and ozone exceedances have reversed decades-long air quality improvements

Increased exposure across populations

- U.S. smoke-exposed population increased 27-fold from 2012–2022, and 1 in 4 unhealthy air days are now “smoke days”

Peak exposure in 2023–24

- 2023 saw the highest smoke-PM2.5 exposure since 2006—66% more than 2021 .

Climate's footprint on emissions & exposure

- Anthropogenic climate change contributed ~49% of increased PM2.5 smoke in Western U.S. (1997–2020) and 33–82% of burned area in the West since 1992

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Health & Social Impacts

- Thousand lives lost
  - Wildfire smoke contributed to ~150,000 premature deaths in the U.S. (2006–2020), with ~50,000 premature deaths in California alone (2008–2018).
- Exposure linked to lung, heart, immune, reproductive issues, dementia, and epigenetic changes
- Acute and persistent effects
- Global indoor air pollution:
  - From 2003–2022, over 1 billion people worldwide experienced unhealthy indoor air due to wildfire smoke.
- Economic burden
  - Smoke-related health impacts cost the U.S. $160 billion between 2006–2020

What Employers Should Be Thinking About

- **Workplace Readiness**
  - Medical should work closely with Facilities Management, Environmental Engineers and Human Resources and vendors to develop a comprehensive response
  - May be useful to use the pandemic related TBAP- trigger based action plan- as a model for responding to heat and air quality issues. Develop response for your employees at each threat level
    - Facilities: Ensure buildings have adequate air filtration and temp controls in place
    - Medical: Create set of recommendations that reflect medical best practice, especially for vulnerable populations. Consider mask distribution
    - Environmental engineers: Assess impact of reducing fresh air intake
    - Human Resources: Understand populations at risk (e.g., who is vulnerable because of increased exposure or underlying medical conditions). Evaluate flexible work policies; prepare communications for affected populations
    - Vendors: Prepare response plan for vendor staff, aligning with client's policies

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What Employers Should Be Thinking About

- **Communication & Education**
  - Share AQI and heat alerts
  - Educate employees on symptoms and self-care
  - Provide tips for staying safe at home and during commutes
- **Workplace Readiness**
  - Ensure buildings have adequate air filtration and temperature control
  - Evaluate sick day/flexible work policies on bad air or extreme heat days
  - Consider providing portable fans, cooling breaks, or access to indoor spaces
- **Benefits & Support**
  - Promote relevant benefits: telehealth, EAP, chronic condition management, behavioral health
  - Encourage preventive care for at-risk populations
  - Offer hydration stations or healthy snacks that support heat resilience (e.g., electrolytes)

NYC and State Resources

- Hot Weather and Your Health - https://www.nyc.gov/site/doh/health/emergency-preparedness/emergencies-extreme-weather-heat.page
- Beat The Heat - https://www.nyc.gov/site/em/ready/extreme-heat.page
- NYC Outdoor Air Quality - https://www.nyc.gov/site/doh/health/health-topics/air-quality-air-pollution-protection.page
- NYSERDA – Protecting New Yorkers from Extreme Heat - https://www.nyserda.ny.gov/Featured-Stories/Protecting-New-Yorkers-from-Extreme-Heat

Federal Resources

- National Integrated Heat Health Information System – https://www.heat.gov/
- Low Income Home Energy Assistance Program (LIHEAP) - https://acf.gov/ocs/programs/liheap
- OSHA - Heat Illness Prevention - https://www.osha.gov/heat
- OSHA-NIOSH Heat Safety Tool App –
  - Apple Store - https://apps.apple.com/us/app/osha-niosh-heat-safety-tool/
  - Google Play - https://play.google.com/store/apps/details?id=erg.com.nioshheatindex&pli=1

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Questions

Upcoming NEBGH events:

- **July 14** – Mondays with Dr. Mark & Dr. Michael
- **July 16** – Back to Camp: Grown-Up Edition
- **September 18** – 2025 Pharmacy Benefits Conference
- **November 13** - The Cancer Care Continuum: Supporting Employees Throughout the Cancer Journey