Physical Health Impacts of Wildfire
Where there is Wildfire Smoke there is Particulate Matter (PM2.5)
5 min

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LA Fires

Jan 7 - Wildfires erupted

Killed at least 29 people, including some who died trying to prevent the fires from engulfing their homes.

The Fires **destroyed thousands of structures**.

Palisades Fire

The Palisades Fire erupted first in the morning of Jan. 7 **and started as a brush fire.**

The blaze grew to **~24K acres** before it was declared 100% contained.

Cal Fire: The fire damaged or destroyed **~7K** structures.

Eaton Fire

The Eaton Fire ignited hours after the Palisades

Involved **~15K acres** before it was 100% contained

Cal Fire**: ~11K structures** were damaged or destroyed in the blaze.

Damage from the fires

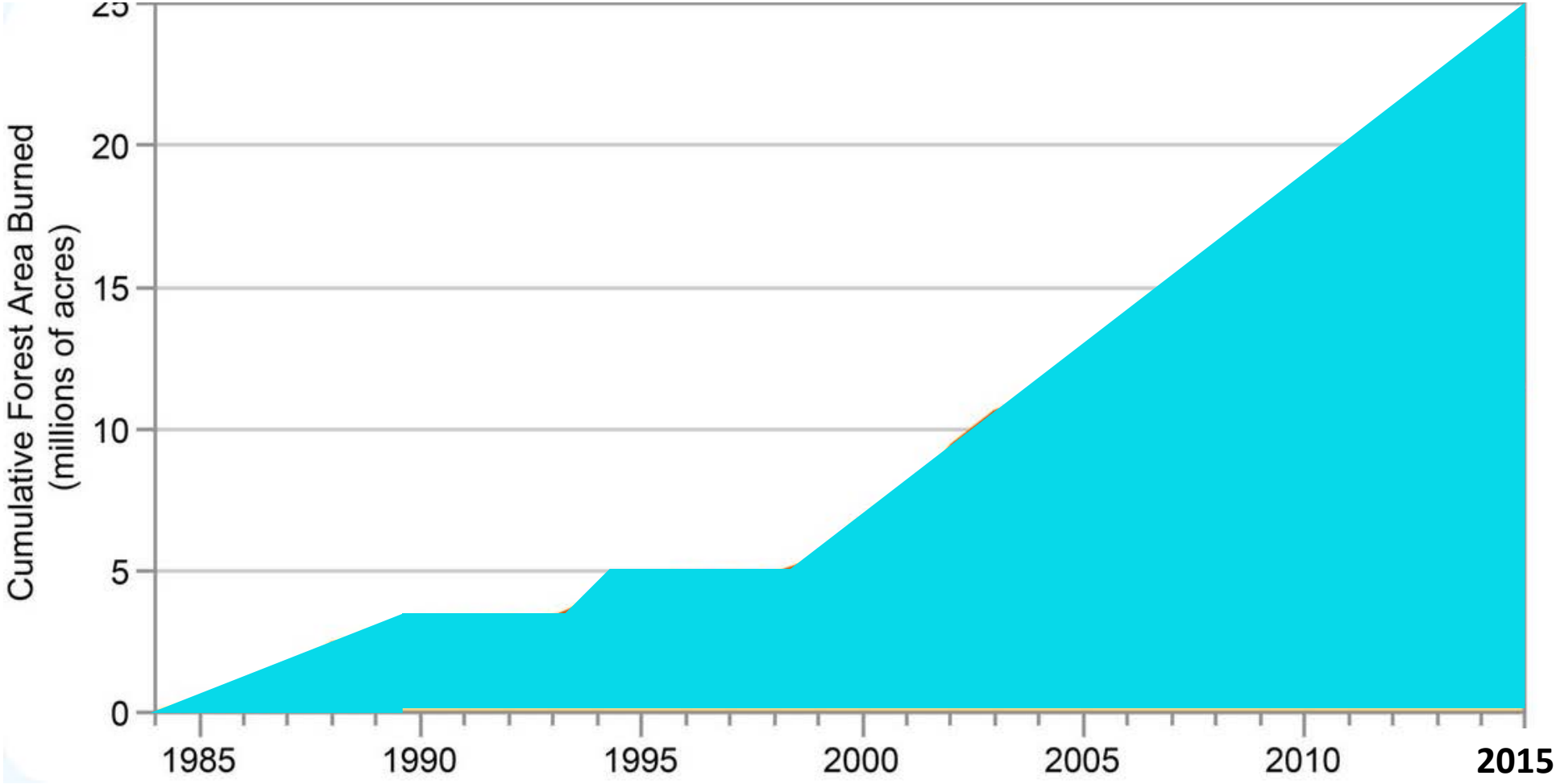
Estimates:

The insured losses >$20 billion

Total economic losses >$50 billion

Increasing Numbers of Wildfires in California

Since the 1980s, the size and intensity of wildfires in California have notably increased. **15/20 (75%) of the largest wildfires** in California history **have occurred since 2000**, and ten of the most costly and destructive fires to life and property in the state have occurred since 2015”



Hydro-climate Whiplash

That Spark
(human, power line pole, lightning)

Wet extremes
Vegetation growth

Dry extremes
Accelerated Vegetation drying & dying

Wet extremes
Vegetation growth

Dry extremes
Accelerated Vegetation drying

Wet extremes
Vegetation growth

Dry extremes
Accelerated Vegetation drying

Poor Air Quality

Check the Air Quality

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Air Quality Index (AQI) Scale and Color Legend

AQI	Air Pollution Level	Health Implications	Cautionary Statement (for PM2.5)
0 - 50	Good	Air quality is considered satisfactory, and air pollution poses little or no risk	None
51 -100	Moderate	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.	Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.
101-150	Unhealthy for Sensitive Groups	**Members of sensitive groups** may experience health effects. The general public is not likely to be affected.	Active children and adults, and people with respiratory disease, such as asthma, **should limit prolonged outdoor exertion**.
151-200	Unhealthy	**Everyone** may begin to experience health effects; members of sensitive groups may experience more serious health effects	Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, **should limit prolonged outdoor exertion**
201-300	Very Unhealthy	**Health warnings** of emergency conditions. The entire population is more likely to be affected.	Active children and adults, and people with respiratory disease, such as asthma, **should avoid all outdoor exertion**; everyone else, especially children, should limit outdoor exertion.
300+	Hazardous	**Health alert:** everyone may experience more serious health effects	Everyone should **avoid all outdoor exertion**

Five major pollutants:

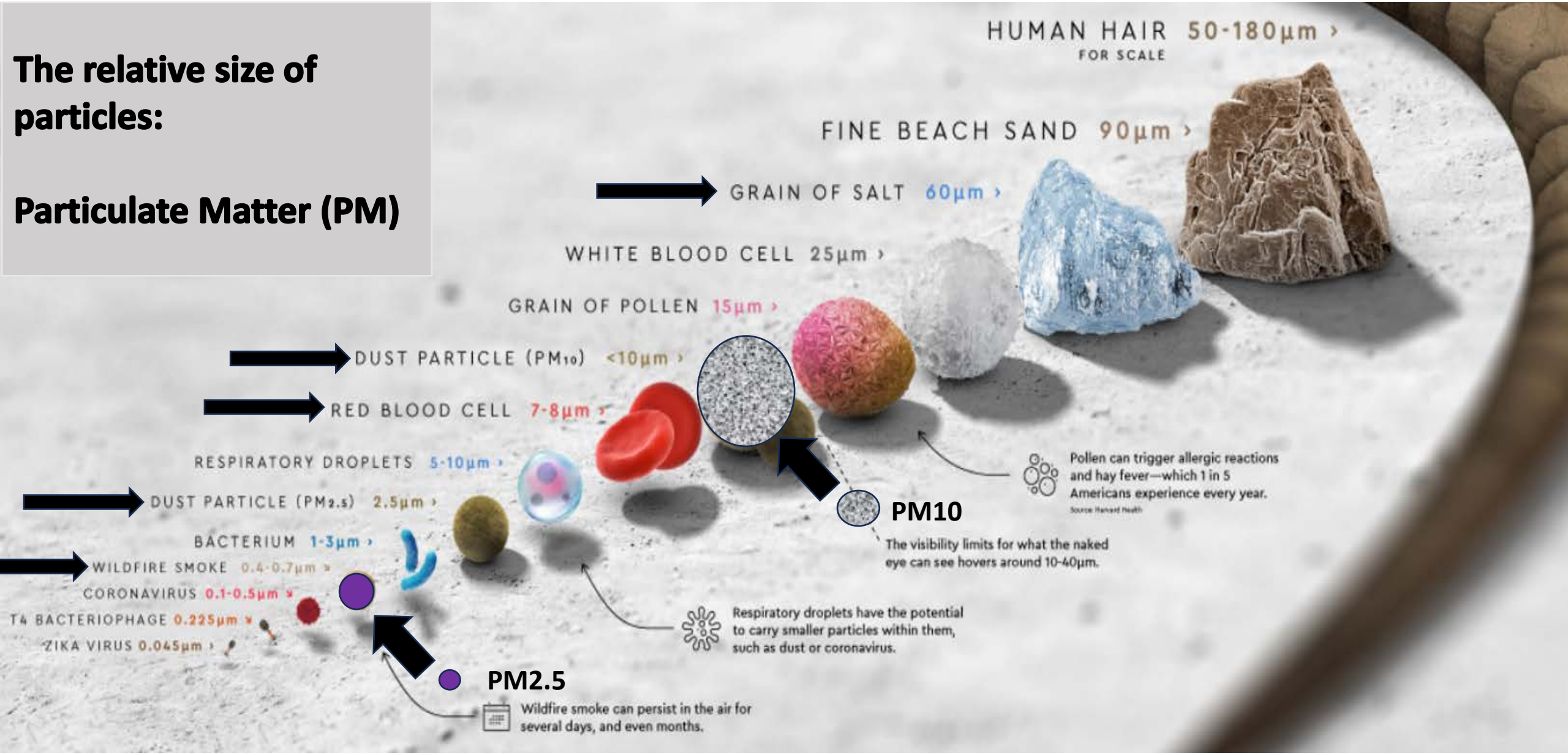
EPA establishes an AQI for five major air pollutants regulated by the Clean Air Act. Each of these pollutants has a national air quality standard set by EPA to protect public health:

- **ground-level ozone**
- **particle pollution** (also known as particulate matter, including PM2.5 and PM10)
- **carbon monoxide**
- **sulfur dioxide**
- **nitrogen dioxide**

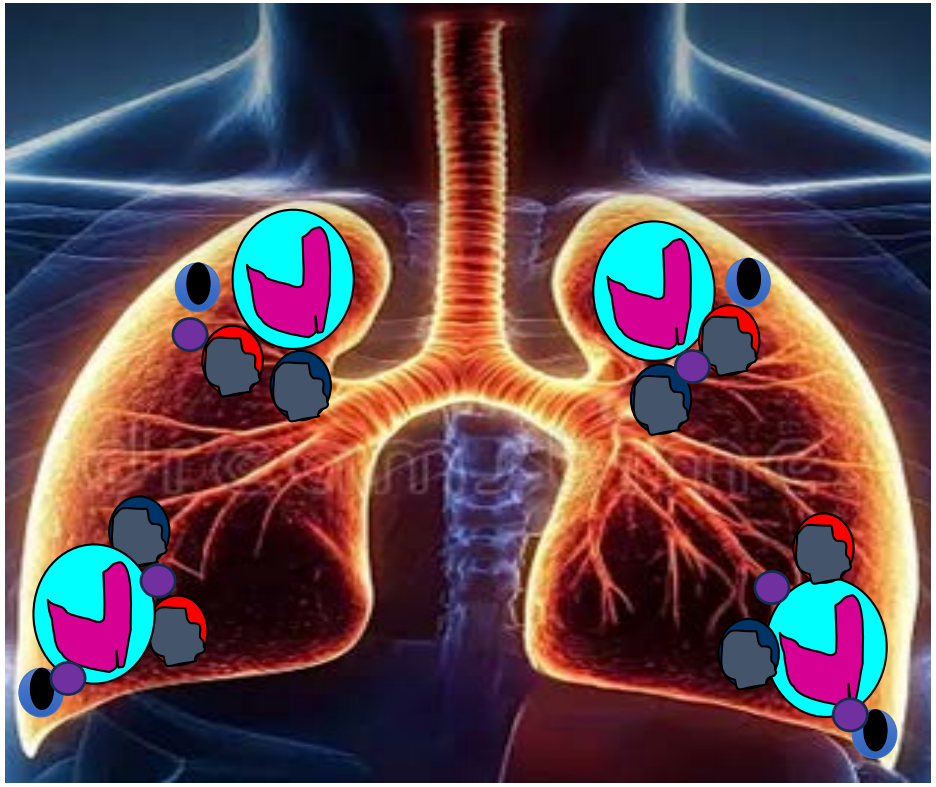
Particulate Matter (PM)

The relative size of particles:

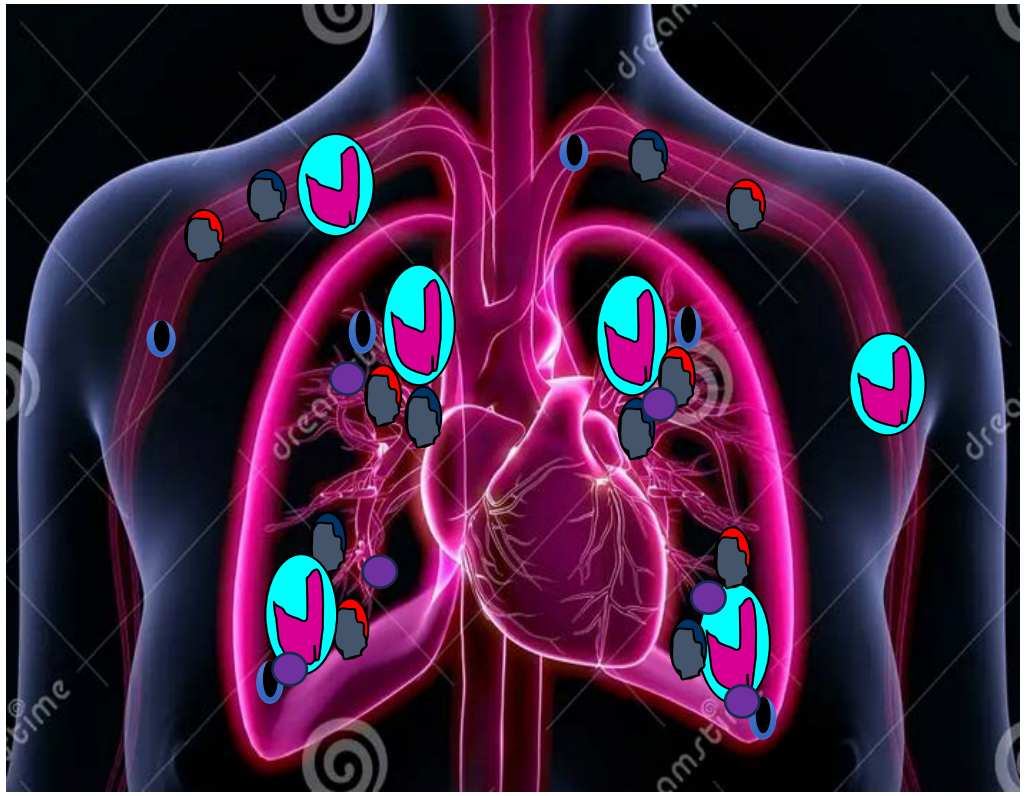
Particulate Matter (PM)



PM2.5 - Inflammation

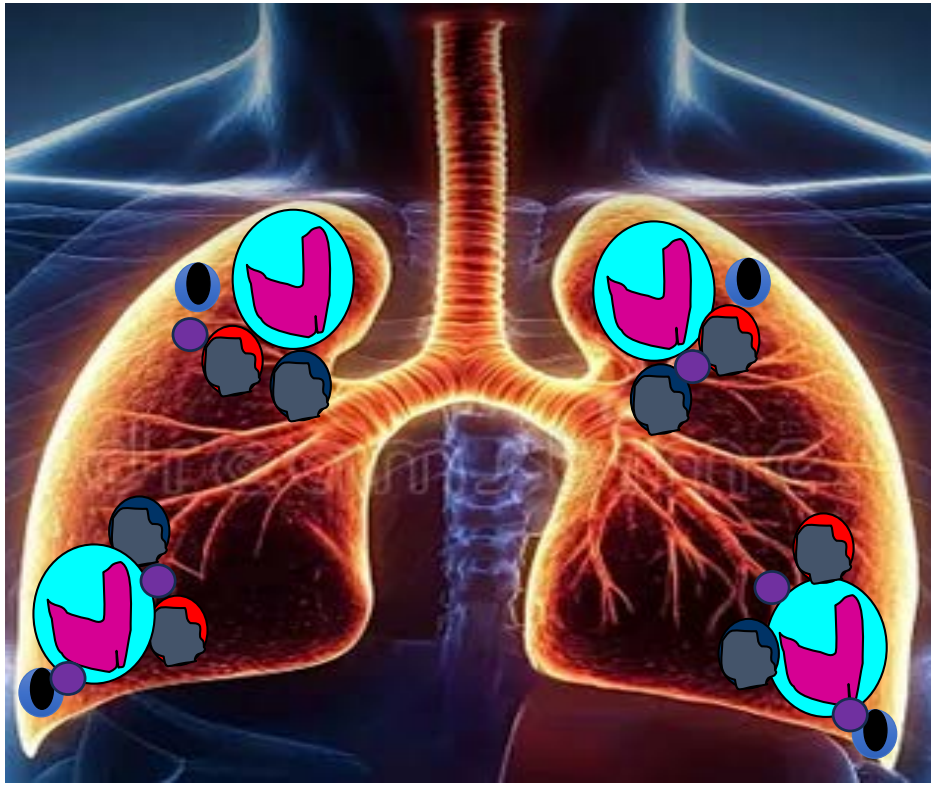


Compartmentalized to the lung
Makes Asthma, Chronic Obstructive Pulmonary Disease (COPD), Interstitial Lung Disease (ILD), Lung Transplants decompensate



Non - Compartmentalized to the systemic circulation: (brain – anxiety, depression & PTSD), carotids (strokes), heart (arrythmias, heart failure), coronaries (MI), pregnancy (preterm labor)

PM2.5 - Inflammation



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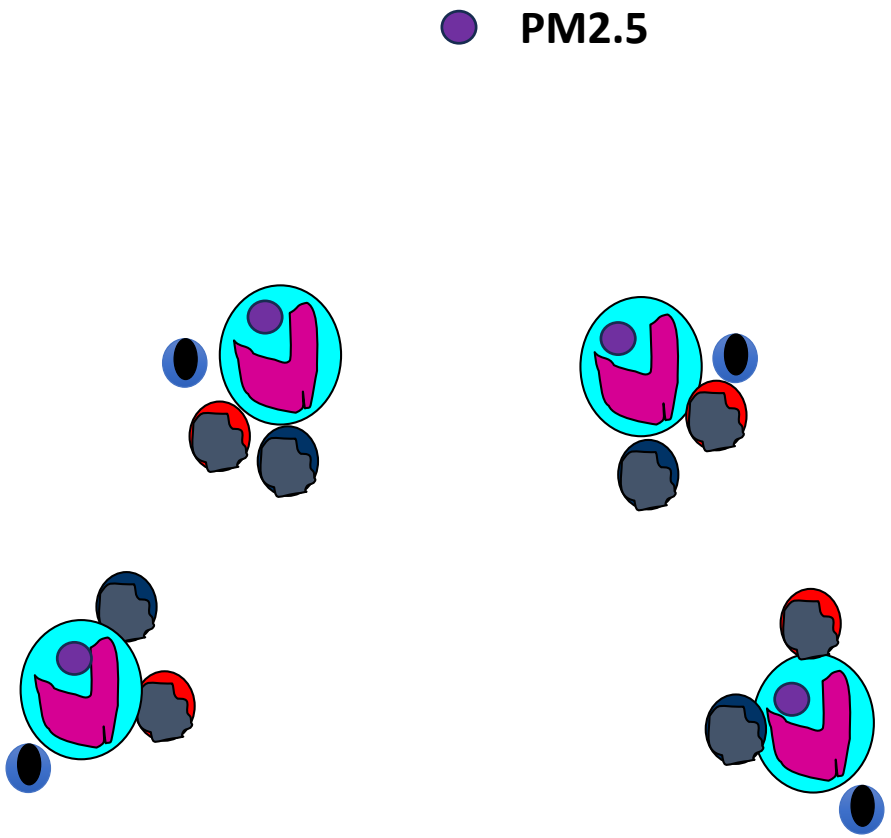
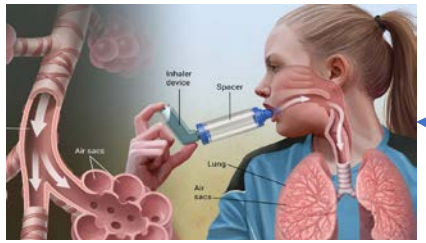


PM2.5 get engulphed by white blood cells cause dysfunction and lead to increased risk of infections (influenza)

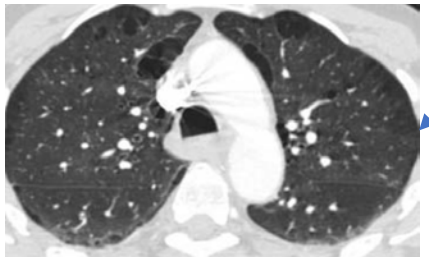
PM2.5 - Inflammation

Compartmentalized

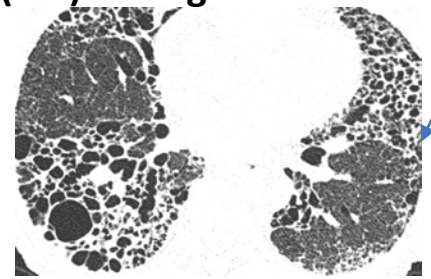
Asthma



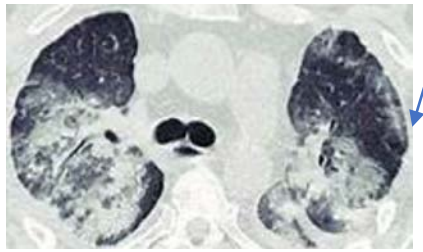
Chronic Obstructive Pulmonary Disease (COPD) & Emphysema



Interstitial Lung Disease (ILD) – Lung Fibrosis



Lung Transplant

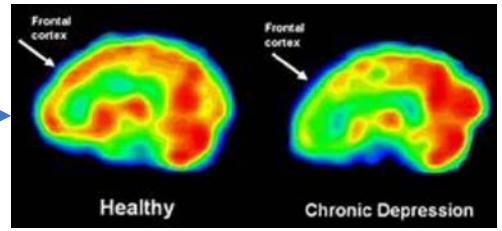


PM2.5

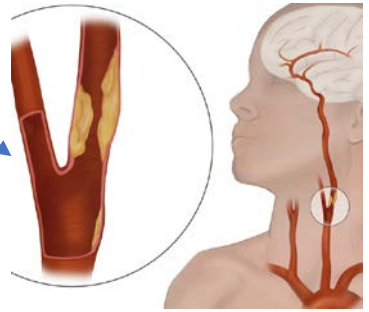
Influenza and other lung infections

Non - Compartmentalized

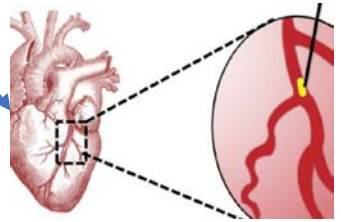
Depression & PTSD



Carotids (strokes)



Arrythmias & Coronaries (MI)



Pregnancy (preterm labor)

CA Wildfires are Detrimental to Our Health with Many Short and Long-Term Complications

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