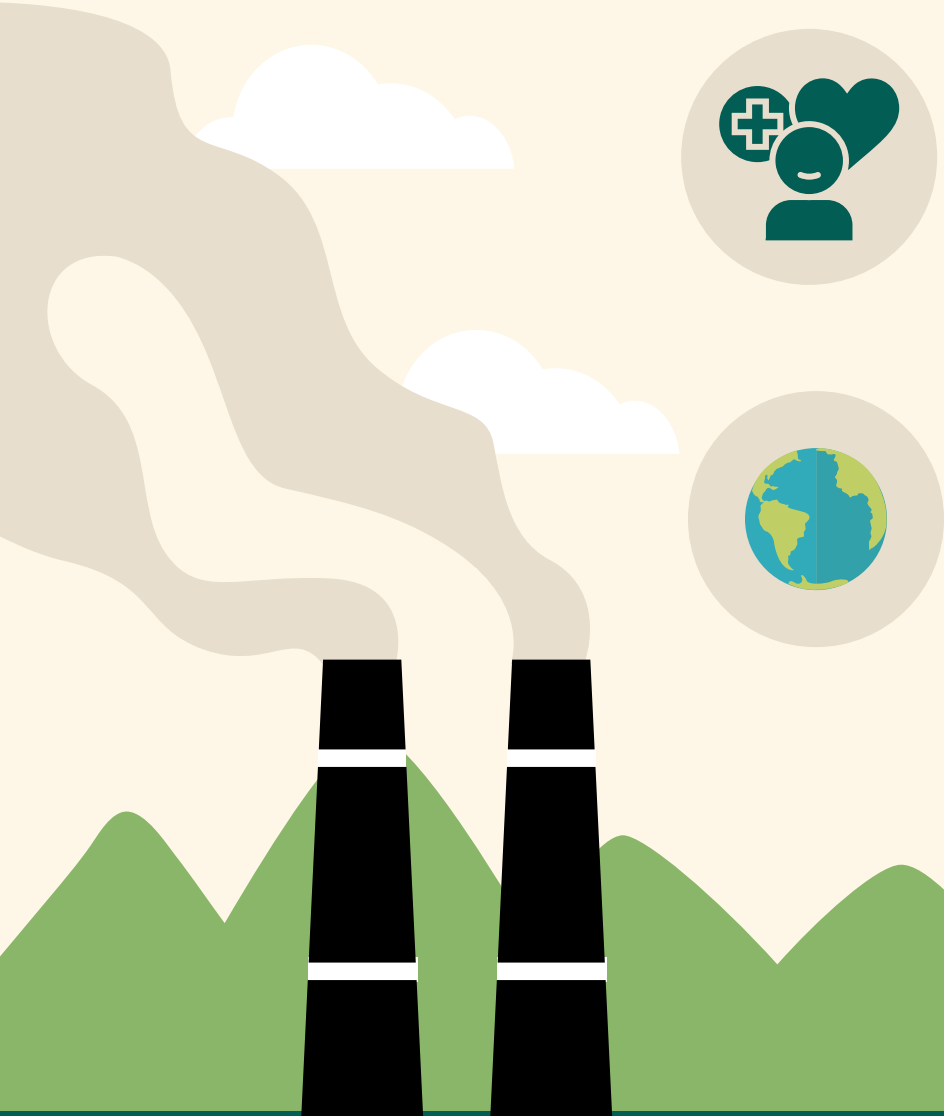
AIR POLLUTION

What is air pollution and how does it affect human health?

Air pollution is the contamination of the air with any substance that alters its natural properties. There are many different sources of air pollution including motor vehicles, energy for household cooking and heating, industrial facilities, and waste incineration.



Pollutants pose harm to public health

Air pollution threatens Earth's climate

Criteria Air Pollutants

The EPA has established National Air Quality Standards for 6 Criteria Air Pollutants

1

Ozone

Ozone is most likely to reach unhealthy levels on warm, sunny days because it forms through chemical reactions in the presence of sunlight and heat.

2

Particulate Matter

These particles include dust , dirt , and smoke from sources such as construction sites and fires. Other particles form in chemical reactions of pollutants from vehicles and industries.

3

Lead

The amount of lead in the air has substantially decreased since leaded gasoline was phased out. Today, lead emissions mostly come from metal processing.

4

Nitrogen Dioxide

The largest source of nitrogen dioxide in our air is motor vehicle emissions. Gas burning appliances also produce nitrogen dioxide, leading to indoor air pollution.

5

Sulfur Dioxide

Fossil fuel burning at industrial facilities and power plants contribute the greatest amount of sulfur dioxide to our air.

6

Carbon Monoxide

Carbon monoxide is found in motor vehicle exhaust. It is also a common indoor air pollutant as it is produced from gas appliances.

Air Pollution & Climate Change

Many sources of air pollution emit greenhouse gases

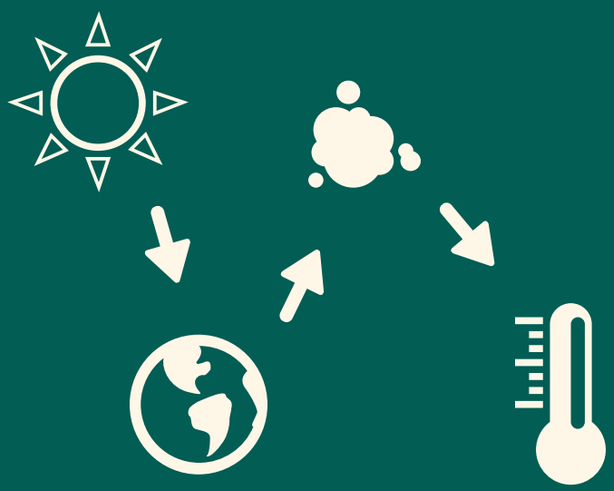
Transportation → carbon dioxide

Electricity → carbon dioxide

Industry → carbon dioxide

Agriculture → methane & nitrous oxide

Greenhouse gases contribute to climate change



Greenhouse gases are gases that trap heat in the atmosphere, warming the earth. The increased amount of greenhouse gases in the atmosphere due to human burning of fossil fuels is responsible for global warming.

Climate change harms Earth's ecosystems

Extreme weather events - heavy rain, hurricanes, flooding

Loss of habitat & species, decreased crop yields

Sea level rise, ocean acidification, decreased fresh water supply

Extreme heat, forest fires

Climate change threatens human health

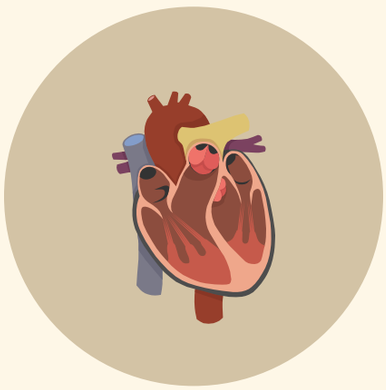
Climate change affects many aspects of health through its impacts on air, water, food, and shelter.

Air Pollution & Health

Air pollution is linked to a number of human health issues

Cardiovascular Problems:

- chest pain
- irregular heartbeat
- heart attacks
- premature death in individuals with heart and lung disease

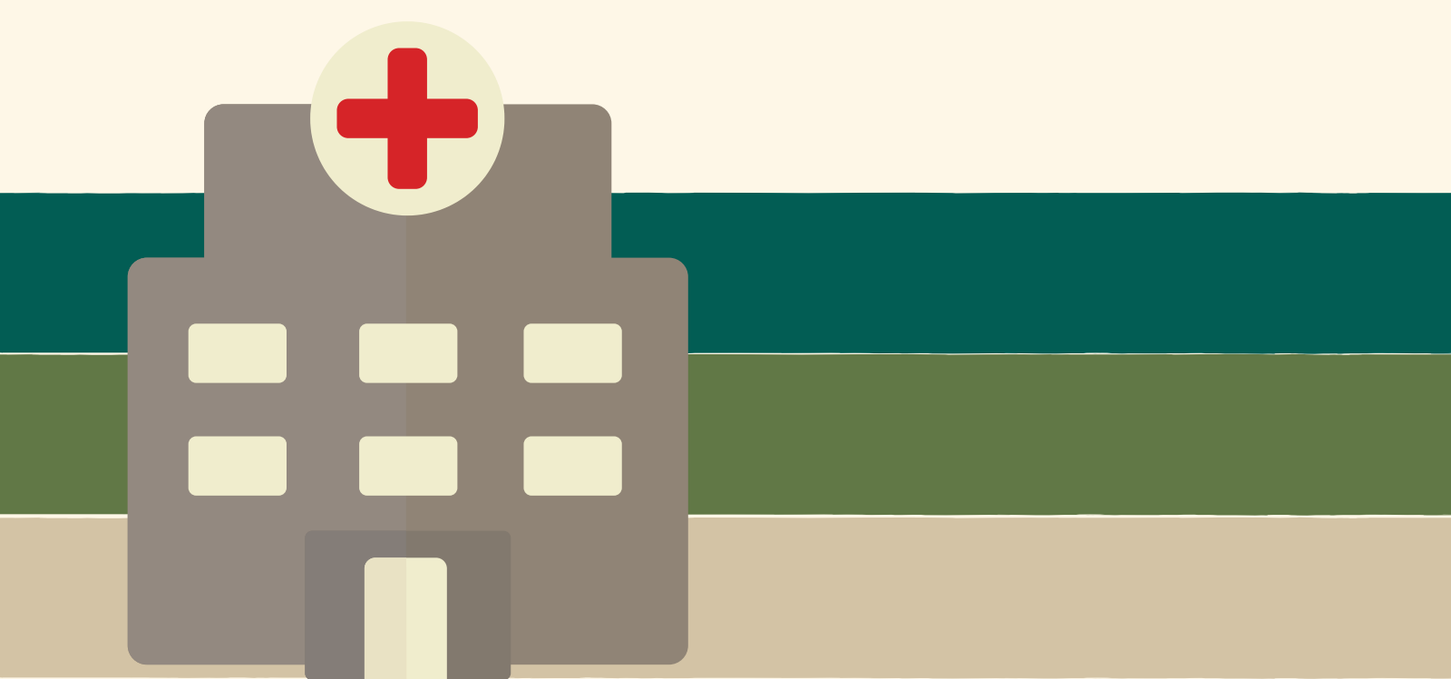


Respiratory Problems:

- coughing and difficulty breathing
- throat irritation and airway inflammation
- reduced lung function
- aggravated asthma
- lung cancer
- chronic obstructive pulmonary disease

Neurological Problems:

- stroke
- cognitive deficits and decline
- impaired cognitive development in children
- increased risk of dementia



Air Quality Inequity

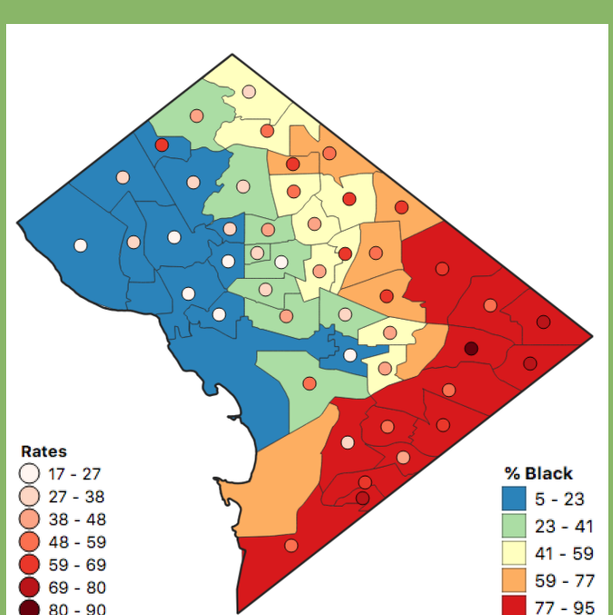
Exposure to air pollution is unequal.

Air quality tends to be poorer in communities with higher percentages of...

- people of color
- low-income households

Neighborhoods with predominately low-income and minority populations face burdens beyond air quality including...

- lack of access to green spaces
- limited healthcare access
- poor access to nutrition



This map shows the percentage of minority residents in D.C. neighborhoods with the dots indicating the rate of deaths related to air pollution per 100,000 residents

These communities are especially vulnerable to the effects of air pollution due to...

- greater exposure to harmful pollutants
- baseline health disparities which worsen the health impacts of air pollution

Populations with higher exposure to air pollution have higher rates of certain health problems such as...

- chronic obstructive pulmonary disease
- heart disease
- lung cancer
- stroke
- asthma-related emergency department visits
- all-cause mortality

Addressing Air Pollution

Air Quality Monitoring

- DC has 5 monitoring sites that collect data about air pollution in the city
- there is a need for more monitoring sites, especially in Wards 7 and 8
- the next-step should be to gather community level data so that local disparities in air quality may be revealed

Reduce Pollution

- releasing fewer pollutants improves air quality & combats global warming
- actions to reduce pollution:
  - home electrification = replace gas appliances with electric appliances
  - decrease vehicle emissions
    - use public transportation
    - carpool
    - walk or bike
    - shift to electric cars

Equity as a Guiding Principle in Policy

- prioritize disfavored communities in future efforts to improve air quality
- consider health risk disparities when writing air quality regulations
- avoid placement of freeways and polluting industries near vulnerable populations

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