## **Fullscript** National Association of Environmental Medicine



## Air pollution

Air pollution is a mixture of particles and gases that can infiltrate indoor and outdoor environments, pollute the atmosphere, degrade ecosystems, and result in negative health outcomes. Currently, the environmental protection agency (EPA) has identified 187 toxic air pollutants.

## Adverse health effects of air pollutants

Exposure to toxic air pollutants at high enough concentrations and for long periods of time may increase the risk of cancer or other harmful health outcomes, including reproductive, immune, neurological, developmental, and respiratory health problems. The following health effects or conditions may be associated with exposure to air pollutants:

- Allergies
- Asthma
- Cancer
- Cardiovascular disease
- Neurodegenerative conditions (e.g., Alzheimer's disease, Parkinson's disease)
- Chronic obstructive pulmonary disease (COPD)
- Eye, nose, and throat irritations
- Reduced fertility
- Reduced lung function



# How are people exposed to harmful air pollutants?

People can be exposed to harmful air pollutants by breathing in contaminated air. Air pollution can come from natural sources (e.g., forest fires, volcanoes) or human sources (e.g., activities that depend on carbon-based fuels like transportation, oil, and gas production, and certain products such as paints or solvents).

## **Common toxic air pollutants**

The table below includes descriptions of common air-polluting chemicals or classes of air pollutants and their sources.

	Pollutant	Description	Sources
Air toxins	Ammonia	A toxic substance that comes from waste, fertilizers, and atmospheric sources	Coal-fired power plants Decomposition or breakdown of organic waste Fertilizers Forest fires
	Asbestos	Natural minerals that form fibers when they crystalize and can enter the air and be harmful to the body	Ceiling and floor tiles Home insulation Roofing shingles
	Formaldehyde	A flammable gas and VOC with a strong odor that can lead to skin, eye, nose, and throat irritation	Building materials (e.g., insulation, wall paper) Cigarette smoke Composite wood resins Fertilizers and pesticides Gas stoves Kerosene space heaters
	Metals	Naturally occuring, electropositive elements (e.g., lead, arsenic, cadmium)	Airports Firing ranges Landfills Junkyards Mines and smelters

Air toxins	Methyl chloride	A VOC commonly used in industrial, commercial, and consumer sectors	Adhesives Aerosol propellants Burning of wood, coal, or some plastics Cleaning products Degreasers Paint strippers Polystyrene insulation Sealants
	Pesticides	Substances used to prevent or eliminate pests and weeds	Atrazine, glyphosate (Roundup), 2,4-D
	Radon	A naturally occurring, odorless radioactive gas that's harmful to health	Emitted from the rocks and soil located underneath a home or other building
	Volatile organic compounds (VOCs)	Gases emitted from solids or liquids that encompass a variety of different pollutants	Adhesives Air fresheners Cleaning products Electronics Gas Furniture Kerosene Kids toys Paints Personal care products Sealants Smog Varnishes
Ozone and traffic gases	Benzene	A type of volatile organic compound (VOC). VOCs are gases emitted from solids or liquids that encompass a variety of different pollutants.	Natural gas dehydrators Steel manufacturing equipment Solvents Vehicle emissions

Ozone and traffic gases	Carbon monoxide (CO)	A colorless and odorless gas produced during combustion reactions	Barbecues Burning cigarettes Fireplaces Furnaces Gas lawn mowers Gas powered generators Gas water heaters Gas snow blowers Smog Wood and gas stoves Vehicles
	Nitrogen oxides	Non-flammable gases such as nitric oxide and nitrogen dioxide	Arc welding Burning of coal, oil, or natural gas Dynamite blasting Electroplating Engraving Manufacture of explosives Motor vehicles exhaust Production of lacquers, dyes, and other chemicals Smog
	Ozone	A gas with a pungent odor that exists at ground level and in the upper atmosphere	Air purifiers Chemical manufacturing industry Industrial waste treatment Smog Water purifiers
	Sulfur oxides	A family of gases formed from sulfur in a variety of raw materials that can be chemically transformed into sulfuric acid and sulphates	Base metal smelters Coal-fired power generators Cement plants Fossil-fueled electric power plants Natural gas plants Oil extraction from oil sands Petroleum refineries Pulp and paper mills Smog Transportation sources (e.g., ships, off- road diesel vehicles)

Particulate matter	Mold	A common biological contaminant that can develop in damp environments with poor ventilation	Leaking roof or pipes Prolonged dampness caused by flooding Sewage backup Standing water Water-damaged materials Wet surfaces
	Biological contaminants	Microorganisms that can infiltrate indoor and outdoor environments	Animal dander Bacteria Cat saliva Dust mites Pollen Mold Mildew Smog Viruses
	Black carbon	Black particulate matter emitted from fossil fuel sources as a result of incomplete combustion reactions	Gas and diesel engines Fossil fuel burning plants (e.g., gas, oil, and coal) Wildfires
	Tobacco smoke	A toxic air pollutant that contains harmful chemicals	Chewing tobacco Smoking cigarettes or cigars Secondhand smoke from cigarettes
	Vaping	A device that heats a liquid, wax, or herb into a vapor that contains chemicals; the vaping liquid often contains nicotine and/or is flavored.	E-liquids for vaping/e-cigarettes



## Tips to reduce exposure

- Check the <u>Air Quality Health Index</u> in your area.
- Reduce the amount of plastics in your home as these off-gas for years. Avoid any stain-resistant furniture or carpeting as it likely contains per-and polyfluoroalkyl substances (PFAS), referred to as "Forever Chemicals," which are readily absorbed in the lungs.
- Make sure your gas stoves have proper ventilation leading to outside your home and are monitored for CO2 levels.
- If outdoor air quality is poor, stay indoors and keep windows closed as much as possible. Use an air purifier and a MERV 13+ furnace filter in your home, and if you have central air, run your fan or A/C on recirculate. If you have to go outdoors, wear a mask to help prevent inhaling pollutants.
- Consult a licensed mold remediation professional if you find mold on walls, ceilings, or floors. Cleaning the mold with soap and water is not sufficient.
- Consider non-motorized means of transportation (e.g., biking, walking, skateboarding) to reduce fuel emissions. However, avoid exercising outdoors if the air quality index is over the EPA limit of over 100; exposure to poor air quality may have effects on health, including cardiovascular function.
- Ensure you are properly trained and use the proper personal protective equipment if you work with hazardous materials.
- Ensure indoor materials are kept dry in order to prevent mold.
- Avoid vaping tobacco or other substances. Vaping releases metals and solvents that become airborne and enter the sinuses and lungs.
- Do not use plug-in air fresheners or scented candles, especially if you have asthma or other breathing problems or have children who are more vulnerable to solvent or phthalate exposure.

- Use personal care products and cleaning products that are free from synthetic fragrances.
- Vacuum and mop floors to reduce biological contaminants.
- Wear a respirator mask to protect yourself from VOCs and ensure proper ventilation.
- Use an app to help you evaluate cleaning and personal care products for ingredient safety.
- Consider switching to natural power sources such as solar and wind energy.

#### Did you know?

Radon exposure is the second leading cause of lung cancer in adults. Measuring radon in indoor spaces can be done using radon sensors purchased from hardware stores. If you live in the northeastern United States or in the Rocky Mountains, your risk for exposure to radon is higher, and a standard radon sensor may not be adequate. If radon levels are high in your area, contact a radon evaluation specialist to have your home radon levels evaluated.



## **Helpful resources**

The following resources provide educational content that allow consumers to make informed decisions about their health, as well as information about the risks associated with <u>environmental toxins</u> and how to identify them:

- Environmental Working Group
- David Suzuki Foundation

- <u>National Air Toxics Assessment</u>
- Toxics Release Inventory

## Helpful apps

The following apps are helpful for checking product labels for toxic ingredients in cleaning and personal care products or for measuring outdoor air quality in your area:

Identifying toxic ingredients:

- Detox Me
- EWG's Healthy Living App

- Air quality:
- <u>AirVisual</u>
- Plume Air Report



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