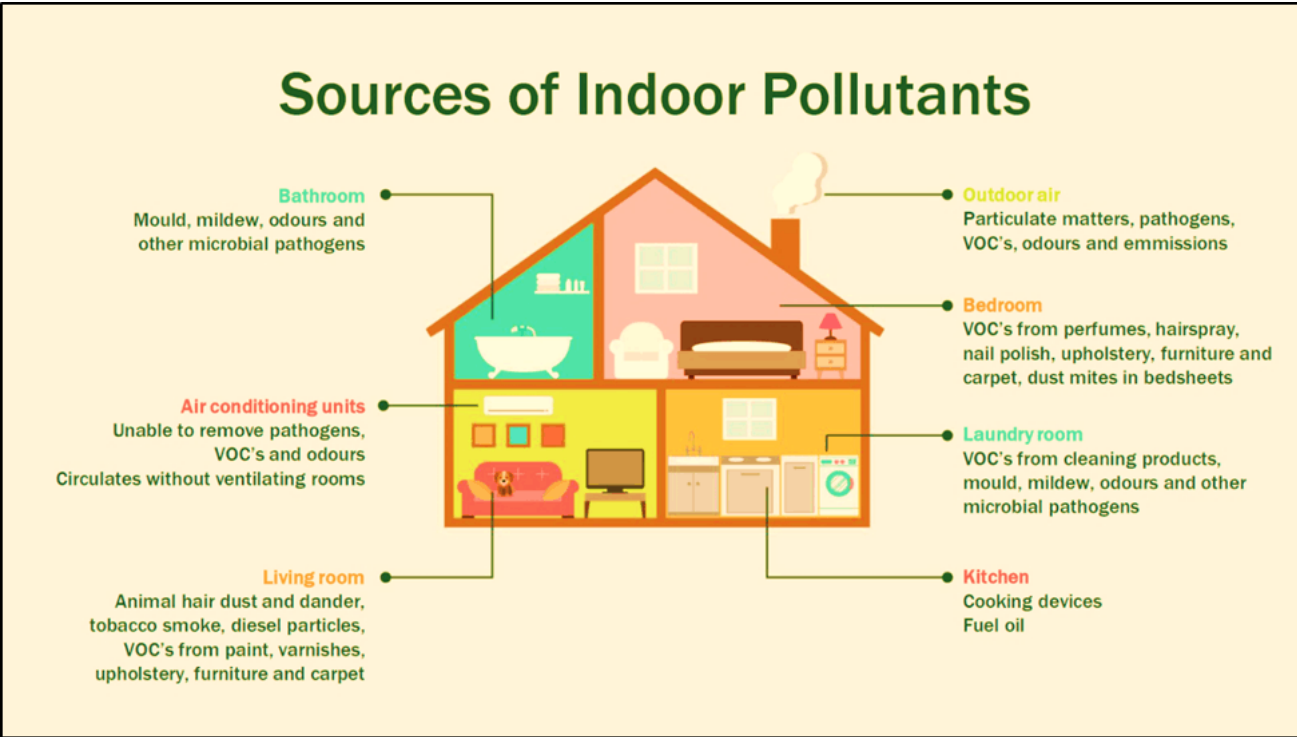


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Indoor and Outdoor Pollutants: Pollutants, Hazards, Symptoms, Sources, Health Effects

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- Indoor Pollution means the chemical, biological and physical contamination of indoor air.
- Some of the common indoor air pollutants are Asbestos, Biological Pollutants, Carbon Monoxide (CO) , Formaldehyde/Pressed Wood Products , Indoor Particulate Matter, Lead (Pb) , Nitrogen Dioxide (NO2) , Pesticides, Radon (Rn) , Environmental Tobacco Smoke, Stoves, Heaters, Fireplaces and Chimneys, Volatile Organic Compounds (VOCs) .



Pollutants, Sources and Health Hazards

| POLLUTANTS | SOURCES | HEALTH HAZARDS |
|------------|---------|----------------|
| | | |

| POLLUTANTS | SOURCES | HEALTH HAZARDS |
|--|---|--|
| Asbestos | Weathering on asbestos containing materials, windblown soil, hazardous waste sites etc. | Asbestosis (a lung disease resulting from the inhalation of asbestos particles) |
| Carbon Monoxide | Furnaces or boilers, Motor Vehicles, Fireplaces, both gas and wood burning etc. | Headache, dizziness, vomiting, and nausea etc. |
| Biological Pollutants | Bacteria, viruses, animal dander and cat saliva etc. | Sneezing, watery eyes, coughing, lethargy, shortness of breath etc. |
| Formaldehyde | Furnitures and Wooden Products | Cancer, skin irritation, coughing, wheezing etc. |
| Lead | Paint, Dust, cosmetics, Children's jewelry and toys, Workplace and hobbies et, folk medicines (medicine using herbal and other remedies) etc. | Anemia, weakness, and kidney and brain damage, damage baby's nervous system. |
| Nitrogen Dioxide NO ₂ | Combustion of Fossil Fuels such as coal, gas and oil, refining of petrol and metals, welding and using explosives etc. | Lung infections, wheezing, coughing, colds, flu and bronchitis etc. |
| Pesticides | Exposure in households, on gardens and lawns, in schools, agriculture, lice removal shampoos etc. | Acute Health Effects such as stinging eyes, rashes, blisters, blindness, nausea, dizziness, diarrhea and death etc. |
| Volatile Organic Compounds (VOCs) . | Burning of fuels such as gas, wood and kerosene, Tobacco Products, personal care products such as perfume and hair spray, cleaning agents, dry cleaning fluid, paints, lacquers, varnishes etc. | Throat irritation, headaches, loss of coordination, nausea; and damage to the liver, kidney, and central nervous system etc. |
| Table Supporting: Pollutants, Sources and Health Hazards | | |

Symptoms of Indoor Air Pollution

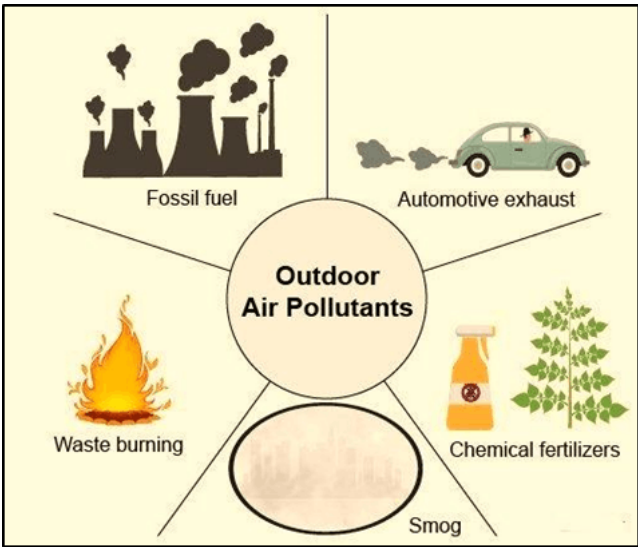
- Coughing
- Sneezing
- Watery eyes
- Dizziness
- Fatigue
- Headaches
- Upper respiratory congestion

Health Effects

- Indoor pollutants such as electric arcing, electronic air cleaners etc. can cause chest pain, coughing, throat irritation etc.
- The gas stoves, water heaters, cigarettes, gas fired dryers can cause a variety of pathological changes including the destruction to cilia lining.
- The combustion appliances can cause occupants to grow drowsy thereby getting headaches and shortness of breath.
- The air circulation of Air Conditioning infectious can transmit respiratory diseases.
- The aerosol sprays can cause eye irritation and respiratory illness like lung cancer.
- *PM2.5* Emission from the solid fuels used for cooking can damage the lungs.
- *Some* Other health effects include cataracts, low birth rate, lung cancer and chronic obstructive pulmonary disease (COPD) .

Outdoor Pollutants

- Outdoor Air Pollution takes place outside of the built environment.
- Some of the major outdoor pollutants include burning of fossil fuels (i.e.. the coal and petroleum used in energy production) noxious gases (sulfur dioxide, nitrogen oxides, carbon monoxide, chemical vapors, etc.)
- The Primary Outdoor air pollutants include *CO*, *CO₂*, *SO₂*, *NO*, *NO₂* etc.
- The Secondary Outdoor air pollutants include *SO₃*, *HNO₃*, *O₃* etc.



Breathing is the main route to outdoor air pollutants.

Pollutants, Sources and Health Hazards

| POLLUTANTS | SOURCES | HEALTH HAZARDS |
|----------------------------------|--|--|
| Sulphur Dioxide SO ₂ | Burning of fossil fuels such as coal, oil and natural gas, Volcanic eruptions etc. | Inhalation can cause death, harms respiratory system, nose and throat irritation, shortness of breath etc. |
| Carbon Dioxide CO ₂ | Ocean release and respiration, Cement production, deforestation, burning of fossil fuels like coal, oil and natural gas. | Headaches, dizziness, restlessness, increased heart rate, elevated blood pressure, coma etc. |
| Sulphur Trioxide SO ₃ | Volcanic gases and in the atmosphere near industrial plants, oil containing sulfur compounds etc. | Tooth erosion, respiratory tract irritation, skin and eye irritation etc. |
| Ozone O ₃ | Pollutants emitted by cars, power plants, industrial boilers, refineries, chemical plants. | Makes breathing difficult, Inflammation and damage the airways, Aggravate lung diseases such as asthma, emphysema, and chronic bronchitis etc. |
| HNO ₃ | Oranges, watermelon, mango, spinach, arugula, kale etc. | Corrosion of mucous membranes, death, permanent cornea damage etc. |
| Carbon Monoxide | Furnaces or boilers, Motor Vehicles, Fireplaces, both gas and wood burning etc. | Headache, dizziness, vomiting, and nausea etc. |

Table Supporting: Pollutants, Sources and Health Hazards

Major Sources of Outdoor Air Pollutants

- Motor Vehicles
- Forest Fires

- Industrial Processes
- Biomass Combustion

Health Effects of Outdoor Air Pollutants

- Outdoor pollutants may cause a proportionately greater obstruction of airflow in children.
- Ozone one of the most important outdoor air pollutants can cause Coughing, irritation of nose and throat, Worsening of asthma symptoms and people with preexisting heart or lung disease.
- The health effects from chronic ozone exposure increased prevalence of allergic rhinitis, asthma symptoms, and asthma.
- The health effects from acute PM Particulate Matter PM exposure can cause coughing and wheezing, decreased lung function, increased risk of lung cancer in non-smokers etc.
- SO_2 Can cause Coughing and wheezing, increased risk of lung cancer etc. The main sources of SO_2 Coal-burning power plants, Paper mills and Smelters.