

What is Air Pollution?

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- Air pollution is the contamination of the indoor or outdoor air by a range of gasses and solids that modify its natural characteristics. Key health-harmful pollutants include particulate matter (PM_{2.5} and PM₁₀)¹, carbon monoxide (CO), ozone (O₃), black carbon (BC), sulfur dioxide and nitrogen oxides (NO_x).
- Air pollution is often not visible to the naked eye as the size of the pollutants are smaller than the human eye can detect. They can become visible in some situations for example in the form of sooty smoke from the open burning of crop residues or other waste, as well as from burning wood, coal, petrol and diesel fuels for cooking and heating, transport or power production. The fact that you cannot see the air pollution does not mean that it does not exist.

What are the most health harmful air pollutants?

- WHO has air quality guidelines for air pollutants which are regarded as the most harmful to health. These include ozone, oxides of nitrogen, sulfur dioxide, and carbon monoxide, as well as fine particulate matter. Fine particulate matter (PM_{2.5}) is the key indicator used in making health estimates of air pollution impacts and is most commonly measured or monitored by governments around the

world to protect citizens against the adverse impacts of air pollutants.

What are the main health impacts of particulate matter?

- The health impacts of particulate matter depend on the level of exposure (frequently expressed in ug/m³) and the duration of exposure (which can be either short term e.g. 8 or 24 hours or long term e.g. annual) Individual sensitivity to the health impacts of particulate matter can vary.
- Short-term exposure to particulate matter (or PM) is likely to cause acute health reactions such as irritation to the eyes, nose, and throat, coughing, wheezing and increased frequency of acute lower respiratory infections, deep in your lungs.
- More prolonged and continued exposure to either high or lower levels of air pollution can also lead to an increased risk of respiratory infections, exacerbation of asthma, bronchitis or serious chronic effects including reduced lung function, ischaemic heart disease, stroke, lung cancer and premature death. Such symptoms are a particular concern in rural and peri-urban settings where use of wood, agricultural waste and animal dung is used for cooking, heating and lighting and exposure levels can be high and prolonged over long periods of time.

¹ Particulate less than 2.5 micrometers and 10 micrometers respectively

What are the factors affecting a normally healthy person's vulnerability to air pollution?

People are more vulnerable to having adverse health reactions to air pollution in the following situations:

- **Particularly high concentrations of particulate matter.** A number of factors, including increased burning of fuel for winter, burning of agricultural crop residues, as well as particular weather patterns can all combine to create air pollution peaks. High concentrations of particulate matter are more often found in winter-time when the temperature and wind affect the build-up of air pollution and its persistence locally. Normally, when air gets colder, a layer of warm air traps a layer of cold air nearer the ground. This acts like a lid over a cloud of smog and stops it from rising and drifting away.
- **Close proximity of activities generating high levels of pollution** including:
 - Heavy traffic on roads, vehicles not complying to pollution norms;
 - Thermal (coal-based) power plants and other factories emitting polluting smoke;
 - Uncontrolled construction or demolition sites;
 - Use of biomass fuel for domestic energy needs such as cooking;
 - Bursting fire crackers;

- Burning waste from houses, hospitals, electronic waste, crop residues, etc.

What additional factors can affect a person's vulnerability?

- **Age of person exposed:** Children, especially under-five, and older people are particularly vulnerable.
- **Health status of person exposed.** People, with pre-existing diseases such as asthma and other respiratory disease, cardiovascular diseases, are at greater risk of health effects.
- **Pregnant women.** Evidence has shown that pregnancy increases vulnerability to the effects of particulate exposure with potential effects to the unborn child such as low and pre-term birth weight.
- **Low socioeconomic status.** Persons with low socioeconomic status with a pre-existing disease, poor nutritional status and poor housing conditions, including where household combustion of solid fuels takes place for cooking, heating or lighting. People living on the street and in poor housing are particularly vulnerable.
- **Occupational exposures:** Construction workers, traffic police, road sweepers and those working outdoors and in highly polluted settings.
- **Smoking of tobacco products** and exposure to second-hand smoke