

HEALTH AND AIR QUALITY

What you need to know



www.nb.lung.ca

Clean air is a basic public health requirement. Unfortunately, with urban and industrial growth come consequences like air pollution, which has detrimental effects on people and the environment. Research has shown that air pollution has both short and long-term effects on people's health and their public health system.

Poor air quality causes heart, lung and body circulation problems. It weakens the immune system and may result in early death. In addition, it has been associated with more visits to the doctor and the emergency room, frequent hospitalization and use of medication, and absence from work or school.

SOURCES OF AIR POLLUTION

The personal and financial costs of poor air quality are no doubt high. Important sources of air pollution in New Brunswick are the power plants, industries, large traffic corridors in the northern United States and Southern Canada. This 'transboundary' pollution is carried to NB on the westerly prevailing winds.

While there are other known pollutants in the air (see the "Fact File" feature box on the reverse side), particulate matter (PM) and ground-level ozone are the two that pose the greatest threat to people living in NB. Ozone is one of the components of smog, the haze that develops on warm, calm days.

Particulate matter is made up of very fine solid or liquid particles

that can float in the air and travel far distances. PM is a serious threat to lung health because it can be inhaled deeply into the lungs and damage lung tissue.

Ground-level ozone develops in the atmosphere on warm days. It is created from the chemical reaction between other air pollutants like nitrogen oxides and volatile organic compounds (materials which easily become vapours or gases) in the presence of sunlight. Ozone can cause inflammation of the airways. Long-term exposure to it can decrease lung function as well as trigger asthma, COPD and a host of other issues, especially for people with a heart condition.

Other sources of air pollution include:

- fuels burned for energy and home heating such as gas, oil, coal and wood
- exhaust from motor vehicles and machinery
- emissions from industrial manufacturing and processing plants
- burnt farming and forestry materials

HEALTH EFFECTS OF AIR POLLUTION

Current research indicates that even low levels of air pollution will impact people's health. PM_{2.5}, particles that are smaller than 1/8 the diameter of a strand of human hair, can inflame the airways that lead to the lungs, resulting in coughing and wheezing. These minute particles disrupt normal lung function, which may prompt the

use of medications, if not a visit to the emergency room or a hospital stay. For people with a preexisting heart condition, their heart rhythm may be affected and their chances of having a heart attack increase.

People with asthma and COPD are especially sensitive to ground-level ozone. Exposure to ozone can prompt asthma attacks or worsen one's COPD. It may also weaken lung development or decrease lung performance.

The amount of air pollution has a direct effect on people's health. Generally, the greater the concentration of pollution, the more harmful the effect. However, the length of exposure, individual levels of sensitivity and the type of activities in which one engages will also determine the effect of air pollution on a person's health.

While even a perfectly healthy individual may have difficulty breathing on days when air pollution is at a high level, the following are at a higher risk:

- people with a pre-existing heart or lung condition
- children
- the elderly

TIPS FOR PEOPLE SENSITIVE TO AIR POLLUTION

Know how sensitive you are to air pollution. If you develop asthma symptoms shortly after exposure (usually a day after you have been

outdoors), you are most likely sensitive.

Know when and where air pollution is at its highest level. Ozone is often worse on hot summer days, especially in the afternoons and early evenings. On the other hand, particulate matter can be bad at any time of the year, usually more so when the weather is calm because air pollution builds up. Fine particle levels may be particularly high during rush hour, near busy roads, around industrial sources or in places where there is smoke emission from wood stoves, fireplaces, or burning vegetation.

TIPS FOR EVERYONE ELSE

Plan activities when and where pollution levels are lower. Early morning is the best

time to exercise. When jogging and going for a walk, stay away from busy roads and industrial areas.

Check air quality and health index. On hot smoggy days when ozone levels are high, consider engaging in indoor activities instead. Avoid the outdoors when there are medical advisory alerts. Find local air quality forecasts and reports on local TV, radio, and newspapers.

Adjust your level of activity. Take it easy when air pollution levels are high, to reduce the amount of polluted air you breathe in. If and when possible, pursue a less intense activity like walking instead of jogging, and do it for a shorter period of time.

Learn to listen to your body. If you experience breathing difficulties, try changing your activity, moving to a different location or stopping what you're doing all together.

Talk to your health care provider. Find out if you need to take or carry with you any medication before heading outdoors. If you have asthma, follow your action plan.

FACT FILE: WHAT'S IN THE AIR WE BREATHE?

Here are the main elements found in the air and the essential facts about each one:

Particulate Matter (PM2.5)

- Tiny solid or liquid particles like dust, dirt, soot and smoke that are blown and stay suspended in the air

- Released by vehicles, factories, power plants and during construction and fires

- Can travel long distances when windblown

- Helps in smog formation and reduces visibility

- Other dangerous air pollutants may attach themselves to it, increasing its toxicity

- Can also form when such gases as sulphur dioxide, nitrogen oxides and various hydrocarbons react with each other

Ground-level Ozone (O3)

- Smog's main ingredient produced on warm sunny days when volatile organic compounds (VOCs) and nitrogen oxides (NOx) react
- Forms in the lower atmosphere called the troposphere

- Not to be confused with the ozone layer, which shields against ultraviolet rays

- Collects over urban/industrial areas that produce large amounts of VOCs and NOx

- Can travel up to several hundred kilometers downwind

- Periods of high ozone can last several days if a motionless air mass traps pollutants over a region

- Can irritate the eyes, nose and throat

- Long-term exposure may damage lungs or affect their normal lung functions

- Can lead to the development of asthma or worsen asthma and COPD

Nitrogen Oxides (NOx)

- Produced by burning of fuel

- Motor vehicles, industrial and electrical power plants and home heating are the primary sources of NOx emissions

- React with volatile organic compounds to

produce ozone

- Can irritate the eyes, nose and throat

Sulphur Oxides (SOx)

- Released when fuel containing sulphur is burned

- Come mainly from petroleum refineries, pulp and paper mills, electrical generating plants, smelter, and metal refineries

- Irritates the upper airways of respiratory tract and can lead to eye infection and shortness of breath

Carbon Monoxide (CO)

- An odourless, tasteless and colourless gas

- Produced by the incomplete burning of fuels, mainly from cars

- Interferes with the blood's ability to carry oxygen to the brain, heart, and other parts of the body

- Depending on the amount inhaled, can slow down reflexes and cause fatigue, headache, confusion, nausea and dizziness or even death by suffocation