

AIR AND NOISE POLLUTION

What is Air and Noise Pollution?

While increased levels of carbon dioxide accelerate climate change, other air pollutants can worsen our air quality. Nitrogen oxides (NO_x), sulphur dioxide (SO₂), carbon monoxide (CO), fine particulate matter (PM_{2.5}) and ground level ozone (O₃) are the most common air pollutants in cities. Vehicles are the largest source of nitrogen oxides but these air pollutants are also emitted from residential furnaces, industrial processes, and electricity-generating stations that are run on coal and natural gas.

Contaminants in outdoor air come from many additional sources, including other transportation sources (e.g., planes, marine traffic), industrial emissions, wildfires, wood smoke from fireplaces, and dust from construction and agriculture.

At the same time, cars, trucks, construction machinery and airplanes emit noise that can affect the health of urban residents.

How does air and noise pollution affect health?

Urban design that prioritizes car travel instead of active transportation is common in North American cities and has led to negative health outcomes for residents.

In the early twentieth century, as cars became a mass consumer product, urban planning moved away from designing cities for walking, bicycling and other forms of sustainable transportation and moved towards designing spaces for cars.¹

Today, car ownership has grown to one billion, and is expected to double by the end of this decade,² and the health and environmental costs of car-centred city design are clear. Along with increasing urbanization³ and population growth,⁴ enabling more car ridership in our cities has led to less physical activity, greater rates of obesity⁵ and worsening traffic-related air quality⁶ and more noise.

Air pollution presents a significant risk to the health and well-being of people across Canada. Health Canada estimates⁷ that it causes more than 15,300 early deaths, 2.7 million asthma symptom days and 35 million acute respiratory symptom days per year, costing the health care system \$120 billion annually. As well, health issues directly related to air pollution⁸ in Canada result in 620,000 doctor visits, 92,000 emergency department visits, and 11,000 hospital admissions. At a global level, ambient PM_{2.5} air pollution is the fifth most common cause of death,⁹ resulting in 4.2 million deaths per year and representing 7% of deaths worldwide.

Short-term exposure to PM_{2.5}, sulphur dioxide and nitrogen dioxide has been associated with the exacerbation of asthma, pneumonia, and bronchitis, resulting in more emergency department visits and hospitalizations.¹⁰ Long-term exposure to air pollutants has been clearly linked¹¹ to premature deaths from cardiovascular disease, strokes, lung cancer and chronic obstructive pulmonary disease (COPD), as well as respiratory problems, impaired lung function, slower lung function growth in children and adolescents,¹² cardiovascular problems, and some cancers. It has also been associated with many other negative health impacts including bladder cancer, childhood leukemia, reduced cognitive function, dementia, and adverse pregnancy outcomes.¹³

Exposure to noise pollution, meanwhile, is associated with its own health hazards. The main health risk with excessive noise is hearing loss, but has also been linked to cardiovascular impacts such as high blood pressure, attention and memory loss, sleep disturbance, depression, decreased quality of life, chronic obstructive pulmonary disease, pneumonia and diabetes.

Reducing air and noise pollution can improve air quality, lessen their health burden, and mitigate the effects of climate change, including the effects on physical and mental health.

AIR AND NOISE POLLUTION (CONT'D)

Who is affected?

In large cities, exposure to air pollution tends to be greater among lower socioeconomic status neighbourhoods. This is because they often live closer to emitting sources. For example, children of lower socioeconomic status are more likely to live in homes that are closer to vehicle traffic,¹⁴ industrial facilities, and also have higher exposures to PM2.5 and nitrogen dioxide.

While Canada has made impressive progress in improving air quality, even when Canadian air quality standards are met, people are still being exposed to air pollutants at levels that negatively affect health. And it's the most vulnerable populations that bear the brunt of the burden of air pollution.¹⁵ Those with existing chronic conditions, such as asthma, heart, and cardiovascular issues, as well as older adults and young children, and people who spend a lot of time in or close to traffic, such as taxi drivers, police officers, people with long commutes, still face negative health consequences because of poor air quality.

Those with a lower socioeconomic status can experience higher levels of noise pollution, putting them at greater risk of its health impacts. In Montreal,¹⁶ socioeconomic status has been observed to be associated with increased exposure to environmental noise. Toronto, meanwhile, has seen similar patterns. Areas with the lowest incomes in the city were 11 times more likely¹⁷ to have 50% of its residents exposed to excessive noise.

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