Environment and Climate Change Canada
Environnement et Changement climatique Canada

POPULATION EXPOSURE TO OUTDOOR AIR POLLUTANTS

CANADIAN ENVIRONMENTAL SUSTAINABILITY INDICATORS

Canada

Suggested citation for this document: Environment and Climate Change Canada (2026) Canadian Environmental Sustainability Indicators: Population exposure to outdoor air pollutants. Consulted on *Month day, year.*
Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/population-exposure-outdoor-air-pollutants.html.

Cat. No.: En4-144/91-2026E-PDF
ISBN: 978-0-660-97807-9
Project code: EC25115

Environment and Climate Change Canada
Public Inquiries Centre
Place Vincent Massey Building
351 Saint-Joseph Boulevard
Gatineau QC K1A 0H3
Toll Free: 1-800-668-6767
Email: enviroinfo@ec.gc.ca

Aussi disponible en français

CANADIAN ENVIRONMENTAL SUSTAINABILITY INDICATORS

POPULATION EXPOSURE TO OUTDOOR AIR POLLUTANTS

February 2026

Table of contents

List of Figures

List of Tables

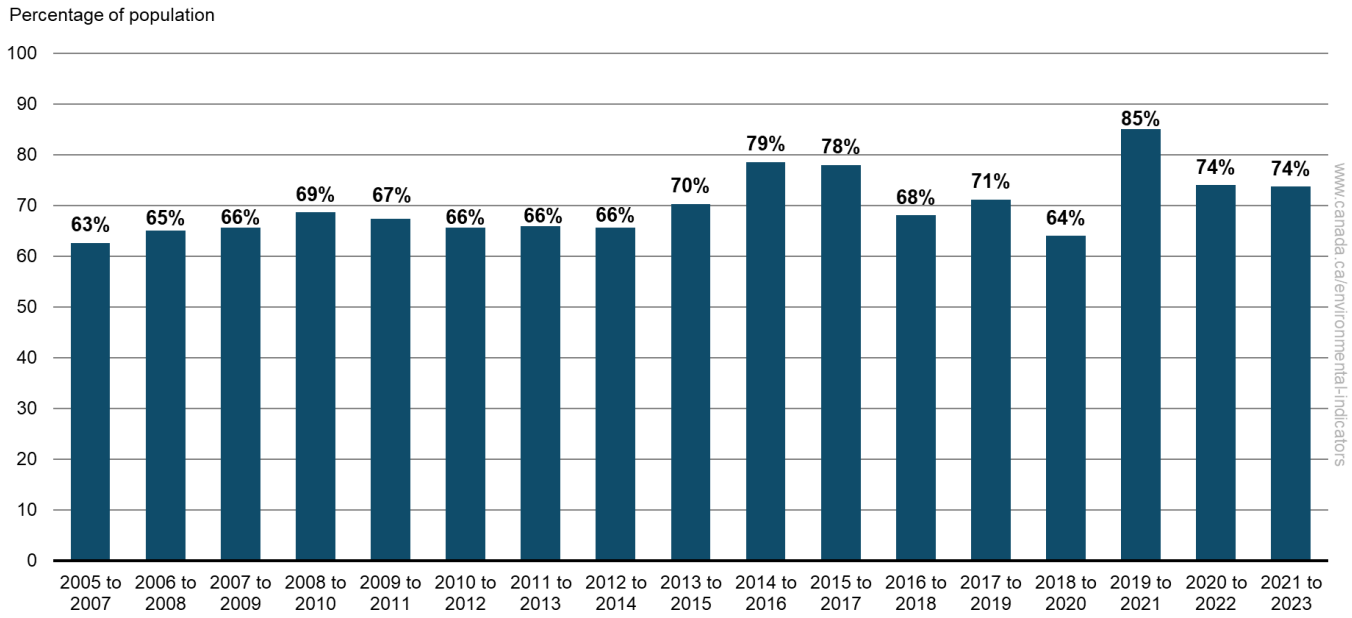
Population exposure to outdoor air pollutants

Exposure to air pollutants contributes to health issues such as asthma, cardiovascular diseases and other illnesses, and to premature mortality. The Canadian Ambient Air Quality Standards (CAAQS, the standards) are health- and environment-based objectives for pollutant concentrations in outdoor air.[1] The CAAQS are designed to further protect human health and the environment and to drive continuous improvement of air quality across Canada. This indicator tracks the percentage of the population living in Canadian regions where concentrations of outdoor air pollutants were less than or equal to all of the 2020 standards.[2] [3]

Key results

- In the most recent reporting period (2021 to 2023), 74% of the Canadian population lived in areas where outdoor concentrations of air pollutants were less than or equal to the standards
  - This result is the same as for the previous reporting period (2020 to 2022)
  - This result is largely due to ground-level ozone standard exceedances in southern Ontario, and to the widespread impact of the 2022 and 2023 wildfires that caused fine particulate matter standards to be exceeded, particularly in the Prairies and British Columbia[4]

Figure 1. Percentage of the Canadian population living in areas where outdoor concentrations of air pollutants were less than or equal to the 2020 Canadian Ambient Air Quality Standards, Canada, 2005 to 2023



Data for Figure 1

[1] Health effects can occur even at low levels, including those below the 2020 CAAQS. Canada's Air Quality Management System includes an Air Zone Management Framework to support air quality management in provinces and territories. This framework includes 4 colour-coded management levels, which are associated with a suite of monitoring, reporting and management actions that become progressively more rigorous as air pollutant concentrations approach or exceed the CAAQS.

[2] The indicator uses the 2020 CAAQS as the basis for comparison. Provinces and territories are responsible for reporting on achievement of the Canadian Ambient Air Quality Standards. For information on the Canadian Ambient Air Quality Standards, refer to the Canadian Council of Ministers of the Environment State of the Air website.

[3] This indicator assumes that populations not covered by monitoring stations are below the standards. For more information, please refer to the Caveats and limitations section.

[4] Results may fluctuate significantly from year-to-year due to extreme events such as wildfires.

Note: Except for the annual standards for nitrogen dioxide and sulphur dioxide, the 2020 Canadian Ambient Air Quality Standards use 3-year average concentrations. For this reason, the bar chart portrays percentage values over 3-year periods. For nitrogen dioxide and sulphur dioxide, the annual standard is calculated using concentrations from the latest year of the reporting period. For example, the 2023 annual concentrations were used for the 2021 to 2023 reporting period.
Source: Environment and Climate Change Canada (2025) Air Quality Research Division. Health Canada (2025) Air Quality Risk Assessment Division.

The indicator uses a total of 7 standards[5] related to 4 air pollutants (fine particulate matter, ground-level ozone, nitrogen dioxide, and sulphur dioxide). All 7 of these standards must be met in a given geographical area to be considered to have air pollutant concentrations that are less than or equal to the standards.

During the 2021 to 2023 reporting period, a total of 66 communities experienced exceedances of one or more standards. British Columbia, Alberta, and Ontario recorded the highest number of communities with exceedances, at 17, 16 and 15 communities, respectively. Prince Edward Island, Nova Scotia, Yukon and Nunavut had no communities with exceedances of the standards. These provincial and territorial differences may be influenced by the number and placement of monitoring stations.[6] For detailed information on geographical areas where exceedances were observed, please refer to Table B2.

Over the 2021 to 2023 reporting period, exceedances of the 8-hour ozone standard affected the largest percentage of the Canadian population, at 15%. Of the 19 communities exceeding the ozone standard, 15 are in southern Ontario, where air quality is influenced by the flow of air pollutants from the United States as well as local and regional emissions from transportation and industrial sources.

Despite the unprecedented impacts of the 2023 wildfires across the country, the proportion of the population living in areas exceeding the standards for the 2021 to 2023 reporting period remained unchanged at 74% compared to the 2020 to 2022 reporting period. Although a higher number of communities were affected (66 in this period compared to 43 in the previous period), this was offset by populous urban areas such as Toronto (Ontario), as well as in cities such as Oshawa (Ontario) and Abbotsford (British Columbia) that did not exceed the 2020 CAAQS. Consequently, the proportion of the population impacted by the exceedances remained unchanged.

Long-term results by pollutant

- **Ground-level ozone (8-hour):** Between the 2005 to 2007 and 2021 to 2023 reporting periods, exceedances of the 8-hour ozone standard affected the largest proportion of the population in most reporting years. However, the proportion of the population living in areas with CAAQS exceedances decreased significantly from 34% for the 2005 to 2007 reference period to 15% for the 2021 to 2023 period.[7]
- **Fine particulate matter – $PM_{2.5}$ (annual):** The proportion of the population living in areas with CAAQS exceedances for annual $PM_{2.5}$ has fluctuated over time, with lower proportions between 2014-2016 and 2020-2022. For the 2021 to 2023 reporting period the proportion increased, with 14% of the population living in areas exceeding the 2020 standards, largely due to the significant influence of wildfire smoke on air quality. Exceedances during this period were recorded in major urban centres such as Hamilton and Windsor (Ontario), Regina (Saskatchewan), Edmonton and Calgary (Alberta), and Kelowna (British Columbia).
- **Fine particulate matter – $PM_{2.5}$ (24-hour):** Throughout the reporting periods, the proportion of exceedances of the 24-hour standard for $PM_{2.5}$ varied. The high proportion of population affected by exceedances in the reporting periods from 2016 to 2018 (13%), 2017 to 2019 (12%), and 2018 to 2020 (20%) can be attributed to the influence of smoke from large wildfires in the western United States and in northern and western Canada. The proportion of population affected by exceedances was 15% in the 2021 to 2023 period, largely due to the severe 2023 wildfire period, which affected large areas of the country. The impacts of the wildfire smoke on communities such as Regina (Saskatchewan), Calgary, Edmonton and Red Deer (Alberta), and Winnipeg (Manitoba) played a significant role in the increase in the percentage between the periods.

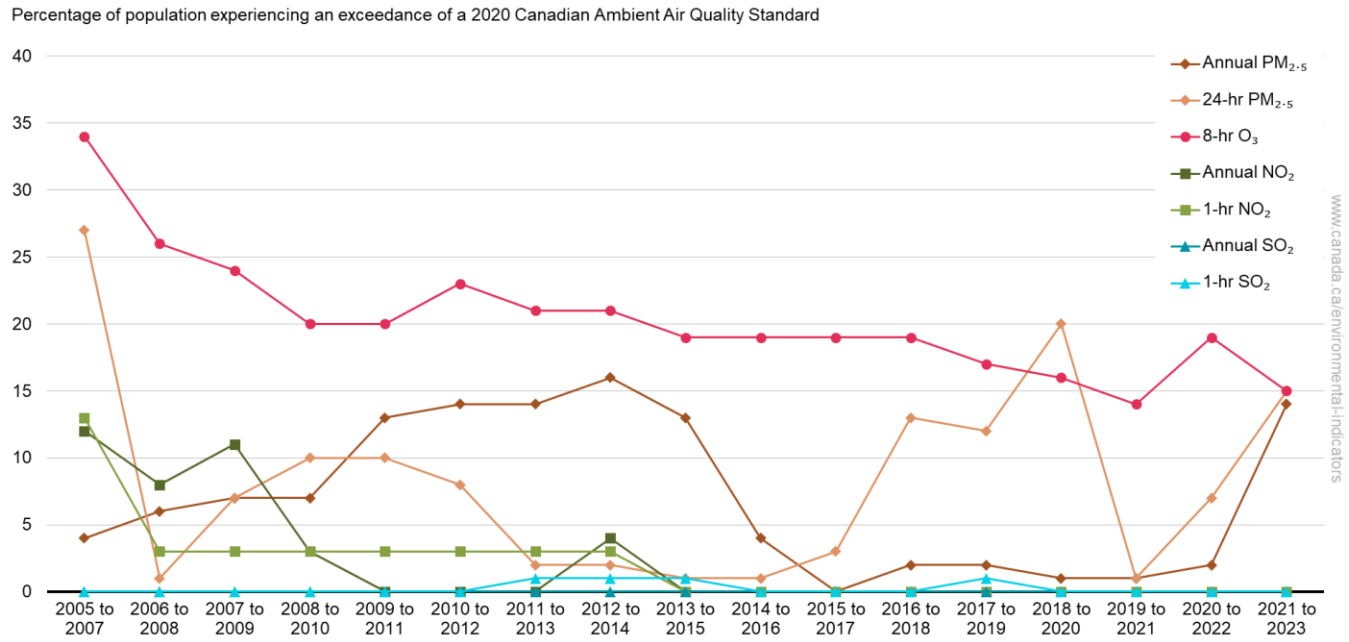
[5] The indicator uses the following 2020 Canadian Ambient Air Quality Standards: a 24-hour standard and an annual standard for fine particulate matter, an 8-hour standard for ground-level ozone, a 1-hour standard and an annual standard for nitrogen dioxide and a 1-hour standard and an annual standard for sulphur dioxide.

[6] More information on the spatial coverage of the monitoring stations can be found in the Caveats and limitations section.

[7] Ground-level ozone is not emitted directly into the air. It is a pollutant that forms in the air through chemical reactions mainly between nitrogen oxides (NO_X) and volatile organic compounds (VOCs) in the presence of sunlight.

- **Nitrogen dioxide – NO_2 (1-hour and annual):** Between the 2005 to 2007 and 2021 to 2023 reporting periods, the proportion of the population living in areas exceeding one of the standards for NO_2 decreased from 13% to 0%.
- **Sulphur dioxide – SO_2 (1-hour and annual):** Between the 2005 to 2007 and 2021 to 2023 reporting periods, exceedances of the standards for SO_2 had minimal influence on the indicator. For the 2021 to 2023 reporting period, exceedances of the 1-hour standard were recorded for 2 communities each in Quebec and New Brunswick, and 1 community each in Ontario, Saskatchewan and British Columbia; these exceedances amounted to 0.3% of the Canadian population. An exceedance of the annual standard was also recorded in 1 community in Quebec. Despite a comparatively low influence on the overall indicator, exceedances of SO_2 standards (specifically the 1-hour standard) remains a concern in some communities near SO_2-emitting facilities because of the potential negative impacts of the pollutant on the environment and on human health.

Figure 2. Percentage of the Canadian population living in areas where outdoor concentrations of air pollutants were exceeding the 2020 Canadian Ambient Air Quality Standards by pollutant, Canada, 2005 to 2023



Data for Figure 2

Note: Except for the annual standards for nitrogen dioxide and sulphur dioxide, the 2020 Canadian Ambient Air Quality Standards use 3-year average concentrations. For this reason, the chart portrays percentage values over 3-year periods. For nitrogen dioxide and sulphur dioxide, the annual standard is calculated using concentrations from the latest year of the reporting period. For example, the 2023 annual concentrations were used for the 2021 to 2023 reporting period.
Source: Environment and Climate Change Canada (2025) Air Quality Research Division. Health Canada (2025) Air Quality Risk Assessment Division.

The population can be exposed to concentrations exceeding the 2020 CAAQS for multiple air pollutants at the same time. Of the 66 communities experiencing CAAQS exceedances in the 2021 to 2023 reporting period, 31 exceeded more than 1 standard. These communities were located in Northwest Territories (1), Quebec (2), Ontario (2), Saskatchewan (5), Alberta (10), and British Columbia (11). Therefore, summing up the percentages of population for all pollutants for a given reporting period may differ from the results provided in Figure 1.

About the indicator

What the indicator measures

This indicator tracks the percentage of the population living in Canadian regions where concentrations of outdoor air pollutants from all sources were less than or equal to the 2020 Canadian Ambient Air Quality Standards (CAAQS, the standards).[8] The indicator uses the following 2020 CAAQS (see Table 1 for more details):

- fine particulate matter ($PM_{2.5}$): 24-hour and annual
- ground-level ozone (ozone): 8-hour
- nitrogen dioxide (NO_2): 1-hour and annual
- sulphur dioxide (SO_2): 1-hour and annual

Why this indicator is important

Human health impacts

Canadians are exposed to air pollutants on a daily basis, and this exposure is associated with acute and chronic adverse health effects. Exposure to some air pollutants, even at low levels, has been linked to increased heart and respiratory problems, leading to more hospitalizations, emergency room visits, and premature deaths. The Government of Canada estimates that, in 2018, air pollution was responsible for 47 premature deaths per 100,000 Canadians, with a total of 17,400 premature deaths per year.[9]

Most CAAQS pollutants ($PM_{2.5}$, ozone, and NO_2) are considered to be non-threshold pollutants. This means that they have no known safe levels of exposure and can cause adverse health effects even at low concentrations.[9] As such, while the larger proportion of the Canadian population meeting the CAAQS is expected to experience lower health risks compared with populations exposed to higher concentrations, some level of risk still remains. Health risk increases incrementally with exposure, even at low levels, and may also be influenced by other factors such as underlying health conditions.

Exposure to $PM_{2.5}$ can negatively impact the heart and lungs and can lead to health issues such as asthma symptoms, chronic bronchitis, heart disease, and may contribute to the development of lung cancer.

Exposure to ozone can cause throat irritation, coughing, shortness of breath, and reduced lung function and can aggravate existing conditions such as asthma. Over time, exposure to ozone may lead to development of asthma, reduced lung function, and other lung conditions.

Exposure to SO_2 and NO_2 can irritate the lungs, reduce lung function, and aggravate respiratory conditions, especially in people with asthma. Long-term exposure to NO_2 may contribute to the development of allergies and asthma.

Improved air quality reduces rates of cardiac events in adults, allergies, and asthma exacerbation in children, thus reducing hospital visits and loss of school and work days.[9]

Environmental impacts

All of the CAAQS pollutants also have adverse environmental impacts. NO_2 contributes to the formation of ground-level ozone and $PM_{2.5}$. NO_2 also contributes to acid deposition ("acid rain") and eutrophication (excessive nutrients in a body of water leading to algal blooms and low oxygen that impact the water habitat). Similarly, SO_2 is a major contributor to acid deposition and contributes to the formation of $PM_{2.5}$ and smog. Direct exposure to SO_2 can also harm plants, potentially decreasing their growth and yields. Ground-level ozone and $PM_{2.5}$ are key components of smog, which can also contribute to reduced visibility. When deposited into the environment, $PM_{2.5}$ can also damage vegetation and human-made structures. Ground-level ozone can also impact vegetation, decrease the productivity of some crops, and may contribute to forest decline. It can also damage synthetic

[8] This indicator assumes that populations not covered by monitoring stations are below the standards. For more information, please refer to the Caveats and limitations section.

[9] Health Canada (2024) Health Impacts of Air Pollution in Canada in 2018 – 2024 Report. Retrieved on November 4, 2025.

materials and textiles, cause cracks in rubber, accelerate fading of dyes, and speed deterioration of some paints and coatings.

Economic impacts

Air pollution also has significant impacts on the economy. Health Canada estimates that the total economic cost of exposure to air pollution in Canada in 2018 was $146 billion (based on 2020 currency) when all health impacts were combined.[10] Globally, it was estimated that the cost of $PM_{2.5}$ ambient air pollution on health is $6.43 trillion, equivalent to 4.8 percent of global gross domestic product.[11] This was due to effects such as strain on the healthcare system, decreases in productivity (for example, from lost work days), as well as pollution damages in key economic sectors. Poor air quality also has economic consequences for agriculture and forests. For example, the impacts of ozone on agriculture costs Canadian farmers millions of dollars in lost production each year. Reduced visibility due to air pollution also impacts well-being and the associated socio-economic cost was estimated to be $438 million in 2015.[12]

Related initiatives

This indicator tracks progress on the 2022 to 2026 Federal Sustainable Development Strategy, supporting the target: "Increase the percentage of the population across Canada living in areas where air pollutant concentrations are less than or equal to the Canadian Ambient Air Quality Standards from 60%[13] in 2005 to 85% in 2030". The most recent data available shows that, between the baseline reporting period (2005 to 2007) and the current reporting period (2021 to 2023), the percentage of Canadians living in areas where outdoor concentrations of air pollutants were less than or equal to the 2020 Canadian Ambient Air Quality Standards increased from 63% to 74%.

In addition, the indicator contributes to the Sustainable Development Goals of the 2030 Agenda for Sustainable Development. It is linked to Goal 3, Good Health and Well-being and Target 3.9, "By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination" and Goal 11, Sustainable Cities and Communities and Target 11.6, "By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management."

Related indicators

The Air health trends indicator provides an overview of the change in health risk over time associated with short-term exposure to air pollution in Canada.

The Air quality indicators track ambient concentrations of $PM_{2.5}$, O_3, SO_2, NO_2, and volatile organic compounds (VOCs) at the national and regional level and at local monitoring stations.

The Human exposure to harmful substances indicators track the concentrations of 4 substances (mercury, lead, cadmium, and bisphenol A) in Canadians.

The Air pollutant emissions indicators track emissions from human activities of 6 key air pollutants: sulphur oxides (SO_X), nitrogen oxides (NO_X), volatile organic compounds (VOCs), ammonia (NH_3), carbon monoxide (CO) and fine particulate matter ($PM_{2.5}$). Black carbon, which is a component of $PM_{2.5}$, is also reported. For each air pollutant, data are provided at the national, provincial/territorial, and facility level and by major sources.

---

[10] Health Canada (2024) Health Impacts of Air Pollution in Canada in 2018 – 2024 Report. Retrieved on November 4, 2025.

[11] World Bank Group (2021) The Global Health Cost of $PM_{2.5}$ Air Pollution: A Case for Action Beyond 2021. Retrieved on December 15, 2025.

[12] International Institute for Sustainable Development (2017) Costs of Pollution in Canada. Retrieved on December 15, 2025.

[13] The 2005 baseline of 60% presented in the 2022 to 2026 Federal Sustainable Development Strategy is informed by the estimated value for the 2005 to 2007 reporting period from the indicator released in 2021.

Data sources and methods

Data sources

The indicator is calculated from data on concentrations of air pollutants and population statistics.

The air pollutant concentration data were taken from Environment and Climate Change Canada's Canada-wide Air Quality Database. The population data were retrieved from Statistics Canada's demographic statistics.

More information

Air pollution concentration data

The Canada-wide Air Quality Database contains data collected through the National Air Pollution Surveillance Program (NAPS), which is a collaboration between Environment and Climate Change Canada, and provincial, territorial and regional government networks.

Population data for people exposed to $PM_{2.5}$, ozone and NO_2

Population estimates for the reporting periods from 2005-2007 to 2013-2015 are based on the 2011 Standard Geographical Classification and were retrieved from:

- Statistics Canada. Table 17-10-0078-01 Annual demographic estimates by census metropolitan area, age and sex, based on the Standard Geographical Classification (SGC) 2011, inactive
- Statistics Canada. Table 17-10-0084-01 Annual demographic estimates by census division, age and sex, based on the Standard Geographical Classification (SGC) 2011, inactive

Population estimates for the reporting periods from 2014-2016 to 2019-2021 are based on the 2016 Standard Geographical Classification and were retrieved from:

- Statistics Canada. Table 17-10-0135-01 Population estimates, July 1, by census metropolitan area and census agglomeration, 2016 boundaries, inactive
- Statistics Canada. Table 17-10-0139-01 Population estimates, July 1, by census division, 2016 boundaries, inactive
- Statistics Canada. Table 17-10-0142-01 Population estimates, July 1, by census subdivision, 2016 boundaries, inactive

Population estimates for the reporting periods 2020-2022 and 2021-2023 are based on the 2021 Standard Geographical Classification and were retrieved from:

- Statistics Canada. Table 17-10-0148-01 Population estimates, July 1, by census metropolitan area and census agglomeration, 2021 boundaries
- Statistics Canada. Table 17-10-0152-01 Population estimates, July 1, by census division, 2021 boundaries
- Statistics Canada. Table 17-10-0155-01 Population estimates, July 1, by census subdivision, 2021 boundaries

Population data for people exposed to SO_2

The population within the 2 kilometre (km) boundary of a SO_2 monitoring station was estimated using Statistics Canada's dissemination block data, only available on Census of Population years, by accessing Statistics Canada's GeoSuite website.

Population estimates for the reporting periods 2005-2007 to 2013-2015 are based on the Statistics Canada's 2011 Census of Population data.

Population estimates for the reporting periods 2014-2016 to 2019-2021 are based on the Statistics Canada's 2016 Census of Population data.

Population estimates for the reporting periods 2020-2022 and 2021-2023 are based on the Statistics Canada's 2021 Census of Population data.

Canadian Ambient Air Quality Standards

In October 2012, the ministers of the Environment of all provinces and territories, except Quebec,[14] agreed to begin implementing the Air Quality Management System. This system provides a comprehensive, cross-Canada framework for collaborative action to further protect human health and the environment through continuous improvement of air quality. Under the system, the Canadian Ambient Air Quality Standards (CAAQS) are drivers for air quality improvement across the country. The CAAQS are health- and environment-based air quality objectives for pollutant concentrations in outdoor air. Together with the management levels,[15] the CAAQS act as a benchmark to support continuous improvement of air quality. The standards are not "pollute-up-to levels". The Air Quality Management System encourages governments to take action to continuously improve air quality, including at concentrations below the standards, considering that some pollutants can affect human health even at low levels.

Under the *Canadian Environmental Protection Act, 1999*, the 2020 CAAQS were established for:

- fine particulate matter and ozone
- sulphur dioxide
- nitrogen dioxide

CAAQS for fine particulate matter and ozone were first established for 2015 and then replaced with the more stringent 2020 standards. CAAQS for nitrogen dioxide and sulphur dioxide were first established for 2020. New, more stringent CAAQS have also been established for ozone, nitrogen dioxide and sulphur dioxide for 2025 and for fine particulate matter for 2030. For consistency, the indicator uses the 2020 CAAQS numerical values. For more information on the other numerical values, refer to the Canadian Ambient Air Quality Standards.

Table 1. Canadian Ambient Air Quality Standards for 2020

Pollutant	Averaging time	2020 Standard (numerical value)	Statistical form
Fine particulate matter	24-hour (calendar day)	27 µg/m^3	The 3-year average of the annual 98th percentile of the daily 24-hour average concentrations
Fine particulate matter	Annual (calendar year)	8.8 µg/m^3	The 3-year average of the annual average of the daily 24-hour average concentrations
Ozone	8-hour	62 ppb	The 3-year average of the annual 4th-highest of the daily maximum 8-hour average concentrations
Nitrogen dioxide	1-hour	60 ppb	The 3-year average of the annual 98th percentile of the daily maximum 1-hour average concentrations
Nitrogen dioxide	Annual (calendar year)	17.0 ppb	The arithmetic average over a single calendar year of all 1-hour average concentrations
Sulphur dioxide	1-hour	70 ppb	The 3-year average of the annual 99th percentile of the daily maximum 1-hour average concentrations
Sulphur dioxide	Annual (calendar year)	5.0 ppb	The arithmetic average over a single calendar year of all 1-hour average concentrations

Note: Units: µg/m^3 = micrograms per cubic metre, ppb = parts per billion.

[14] Although Quebec supports the general objectives of the Air Quality Management System, it will not implement the system since it includes federal industrial emission requirements that duplicate Quebec's regulations. However, Quebec is collaborating with jurisdictions on developing other elements of the system, notably air zones and airsheds.

[15] Management levels refer to the air zone management framework. More information can be found in the Canadian Council of Ministers of the Environment's Guidance document on air zone management (PDF; 225 kB).

Methods

The indicator is calculated by comparing the average pollutant concentration for each geographical area with the respective 2020 Canadian Ambient Air Quality Standards (CAAQS, the standards). The total population of all geographical areas where the average concentrations for all pollutants are less than or equal to the respective standards are compared to the national population. For geographical areas where there is no monitoring station, it is assumed that the concentrations are less than or equal to the 2020 standards.

More information

Data completeness criteria

Concentration values at monitoring stations are considered to be "valid" and are used in the calculation of the indicator if they meet the related data completeness criteria specified in Table 2.

Table 2. Monitoring station data completeness criteria used in the calculation of the indicator

Pollutant	Averaging time	Data completeness and calculation criteria
Fine particulate matter	24-hour (calendar day)	• A daily 24-hour average concentration was considered valid if at least 75% (18 hours) of the 1-hour concentrations were available on a given day • A 98th percentile of the daily average concentration was considered valid if at least 75% of the daily average concentrations were available for the year and at least 60% of the daily average concentrations were available in each quarter [A] of a calendar year • A station was also included in the 98th percentile if the daily average concentration exceeded the 24-hour standard of 27 micrograms per cubic metre (µg/m^3), and had at least 75% of the daily average concentrations available for the year • For the 3-year average, at least 2 of the 3 years were needed
Fine particulate matter	Annual (calendar year)	• A daily 24-hour average concentration was considered valid if at least 75% (18 hours) of the 1-hour concentrations were available on a given day • An annual average concentration was considered valid if at least 75% of the daily average concentrations were available for the year and at least 60% of the daily average concentrations were available in each quarter[A] of a calendar year • For the 3-year average, at least 2 of the 3 years were needed
Ozone	8-hour	• Rolling (or moving) 8-hour average concentrations were calculated for each hour of the day from the 1-hour average concentrations, resulting in up to 24 8-hour average concentrations per day • To be valid a rolling 8-hour average concentration must have at least 6 1-hour average concentrations • A daily maximum 8-hour average concentration was considered valid if at least 75% (18) of the 8-hour rolling average concentrations were available in the day or if the daily maximum 8-hour average concentration exceeded the 8-hour standard of 62 parts per billion (ppb) • The annual 4th-highest daily maximum 8-hour average concentration was considered valid if there were at least 75% of all daily maximum 8-hour average concentrations in the period from April 1 to September 30 • A station was also included if the annual 4th-highest daily maximum 8-hour average concentration exceeded the 8-hour standard of 62 ppb, even if the above data completeness criteria were not satisfied • For the 3-year average, at least 2 of the 3 years were needed

Pollutant	Averaging time	Data completeness and calculation criteria
Nitrogen dioxide	1-hour	• The daily maximum 1-hour average concentration was considered valid if at least 75% (18) of the hourly concentrations were available on a given day or if the daily maximum 1-hour average concentration exceeded the 1-hour standard of 60 ppb • The 98th percentile of the daily maximum 1-hour average concentrations was considered valid if at least 75% of the daily maximum 1-hour average concentrations for the year were available and at least 60% were available in each quarter [A] • A station was also included if it exceeded the 1-hour standard of 60 ppb, even if the above data completeness criteria were not satisfied • For the 3-year average, at least 2 of the 3 years were needed
Nitrogen dioxide	Annual (calendar year)	• An annual average concentration was considered valid if at least 75% of all the 1-hour average concentrations were available for the year and at least 60% were available in each quarter [A] • The annual average concentration was also considered valid if it exceeded the annual standard of 17.0 ppb, and at least 50% of the NO_2 1-hour values are available in each calendar quarter [A]
Sulphur dioxide	1-hour	• The daily maximum 1-hour average concentration was considered valid if at least 75% (18 hours) of the hourly concentrations were available on a given day or if the daily maximum 1-hour average concentration exceeded the 1-hour standard of 70 ppb • The annual 99th percentile of the daily maximum 1-hour average concentrations was considered valid if at least 75% of all the daily maximum 1-hour average concentrations for the year were available and at least 60% were available in each quarter [A] • A station was also included if it exceeded the 1-hour standard of 70 ppb, even if the above data completeness criteria were not satisfied • For the 3-year average, at least 2 of the 3 years were needed
Sulphur dioxide	Annual (calendar year)	• An annual average concentration was considered valid if at least 75% of all the 1-hour average concentrations were available for the year and at least 60% were available in each quarter [A] • A station was also included if the annual average concentration exceeded the annual standard of 5.0 ppb, and at least 50% of the SO_2 1-hour values are available in each calendar quarter [A]

Note: [A] The calendar quarters are as follows: quarter 1 from January 1 to March 31; quarter 2 from April 1 to June 30; quarter 3 from July 1 to September 30 and quarter 4 from October 1 to December 31.

For a geographical area having only 1 monitoring station, the data completeness criteria of Table 2 are applied.

For a geographical area having more than 1 monitoring station, the data completeness criteria differ depending on the pollutant.

- For all pollutants but sulphur dioxide, the criteria of Table 2 are applied to the overall data available for all monitoring stations within the geographical area. In such a case, the averaged concentration of all monitoring stations can be reported for that particular geographical area even though each of the monitoring stations could have incomplete data.
- For sulphur dioxide, the criteria of Table 2 are applied to the data available for each station individually.

Geographical areas

Each air quality monitoring station is assigned to a geographical area. Only stations that are selected by provinces and territories for reporting on CAAQS achievement under the Air Quality Management System are used in the calculation of the indicator.

For fine particulate matter, ground-level ozone and nitrogen dioxide, the geographical areas are either a Statistics Canada census metropolitan area, census division or census subdivision. For each year from 2005 to 2023, population counts are allocated to each geographical area with at least 1 monitoring station.

For fine particulate matter and ground-level ozone, the population counts correspond to the average of the population for each of the 3 years of the reporting period.

For nitrogen dioxide and sulphur dioxide, the population counts for the annual standards are based on the latest year of the reporting period, while population counts for the 1-hour standards correspond to the 3-year average population.

Because concentrations of sulphur dioxide tend to be localized around point sources, the geographical area for the annual and 1-hour standard for sulphur dioxide was set to a 2 km radius around the monitoring station. Only population data within the 2 km boundary of the monitoring station were used. In this case, Statistics Canada's dissemination block data were used to calculate the population within the 2 km boundary of a station. Note that population data at the dissemination block level is only available on census years. The dissemination blocks data were obtained by accessing Statistics Canada's GeoSuite and downloading the respective datasets for 2011, 2016, and 2021. Refer to Table B.1 for a list of the geographic areas used to calculate the indicator.

Air pollutant concentrations by geographical area

For fine particulate matter, ground-level ozone and nitrogen dioxide, the following steps were used to assign a concentration value to each geographical area for each air pollutant and averaging time:

1. A daily concentration[16] value was calculated for each monitoring station within the geographical area using the data completeness and calculation criteria outlined in Table 2
2. An average of the daily concentration values from all monitoring stations within the geographical area was calculated
3. An annual concentration for the geographical area was then calculated using the data completeness and calculation criteria outlined in Table 2

For sulphur dioxide, the following steps were used to assign concentration values and associated population exposure for each geographical area and averaging time:

1. The annual concentration values for each individual station were calculated using the data completeness and calculation criteria outlined in Table 2. It represents the population exposure for a geographic area of 2 km around the station.
2. When 2 monitoring stations are within 4 km of each other, the population overlapping the geographical areas are assigned depending on the concentration levels and population counts, as follows:
    - If no exceedances are observed or if an exceedance is observed for both monitoring stations, the overlapping population is assigned to the geographical area with the lowest population count and removed from the other geographical area
    - If an exceedance is observed for one of the monitoring stations, the overlapping population is assigned to the geographical area with the exceedance and removed from the other geographical area

Comparison with the standards and total population below the standards

The concentration value for each pollutant was then compared to the respective standard to determine if the population in the geographical area was exposed to pollutant levels less than or equal to the corresponding standard. This comparison was done for each pollutant and for each standard.

- If the concentration value for the geographical area was less than or equal to the respective standard for all 7 CAAQS, the population count was recorded

[16] A daily concentration value represents a 24-hr average for $PM_{2.5}$, a daily maximum 8-hour value for ozone, and a daily maximum 1-hour value for NO_2.

- If at least 1 standard was exceeded, the population for the geographical area was set to 0

The population from all geographical areas with average concentrations less than or equal to all CAAQS were then added together. The sum was then divided by the total Canadian population (Canadian 3-year average population estimate) and multiplied by 100 to produce the percentage of the population that lives in an area where air pollutant concentrations were less than or equal to the standards. The general formula is as follows:

100 * (sum of the population at or below all CAAQS ÷ total population of Canada)

where the population at or below all CAAQS is the population of Canadians living in geographical areas where ambient concentrations of fine particulate matter, ozone, nitrogen dioxide, and sulphur dioxide are all less than or equal to their respective standard.

Caveats and limitations

From 2021 to 2023, approximately 65% of the population lived in areas covered by selected air quality monitoring stations that meet the data completeness criteria. This percentage has remained relatively stable, increasing from approximately 60% to 65% of the population over the reporting period of 2005 to 2023. Refer to Table B.1 for a list of geographical areas used in the calculation of the indicator. The indicator assumes that the remainder of the population lives in areas where outdoor concentrations of ozone, fine particulate matter, sulphur dioxide and nitrogen dioxide are less than or equal to their 2020 standards. This assumption results in an overestimation of populations being exposed to concentration below the 2020 standards. Furthermore, ground-level ozone concentrations are generally higher outside urban cores, where there may not be NAPS monitoring. For example, for a region such as Southwestern Ontario, it is likely that the entire region would be above the 2020 standards for ozone. Note that for SO_2, there is less coverage, with only 7 to 8% of the population living in areas within 2 km of a station monitoring SO_2 concentrations. The rest of the Canadian population was assumed to be exposed to SO_2 concentrations below the CAAQS.

Populations in rural and northern regions of the country have relatively less coverage, as monitoring stations tend to be situated near urban areas with high population density. This difference in spatial coverage is becoming increasingly important to consider with smoke affecting rural and northern communities in recent wildfire seasons. As these areas are typically not densely populated, the impact on the percentage of population experiencing exceedances may be small; however, the impacts on affected communities could be significant.

Each annual update includes one additional year of air pollution data, and the indicator presents the calculated result for the most recent 3-year period. Previous results are not recalculated and therefore do not capture any subsequent updates to historical data.

Due to the unpredictable variability in extreme environmental events such as wildfires, results may fluctuate significantly from one reporting period to another.

More information

This indicator is used to report the percentage of the Canadian population living in areas where outdoor concentrations of air pollutants were less than or equal to all of the 2020 Canadian Ambient Air Quality Standards (CAAQS, the standards). The indicator is not used for formally reporting the achievement status of the standards. Under the Air Quality Management System, reporting on achievement of the standards is a provincial and territorial responsibility.

The method used to calculate the indicator differs from that used to report on the achievement status of the CAAQS by provinces and territories under the Air Quality Management System. In particular, for the indicator, the average concentration from CAAQS monitoring stations in the geographical area is used to compare against the standard. However, for the purpose of reporting on CAAQS achievement, the determination is made on a per-station basis and all stations in a given geographical area (or, air zone) have to meet the standard to be considered as achieved. In addition, provinces and territories can remove days impacted by transboundary flow and exceptional events to assign their management levels. As a result, this indicator may consider average concentrations that are higher or lower than those reported by provinces and territories.

Populations not covered by monitoring stations were assumed to be below the standards. This results in some uncertainty regarding the estimated population below the standards; a sensitivity analysis indicated that this assumption does not result in a large error.

Some data collected at monitoring stations cannot be used in calculating the indicator because the data do not meet the data completeness criteria. The removal of this data can influence the number of geographical areas used per reporting period. Refer to Table B.1 for a list of geographical areas used in the indicator.

The indicator uses the actual concentrations measured at monitoring stations. Some of these concentrations may have been influenced by pollutant sources in other countries and by smoke from wildfires both within and outside Canada.

Effect of changes in fine particulate matter measurement technologies

Some of the year-to-year variations in the $PM_{2.5}$ population exposure indicator before 2010 may be due, in part, to the introduction of newer monitoring technologies across the NAPS rather than to changes in actual ambient concentrations only. As such, trends in $PM_{2.5}$ concentrations before 2010 may not be a true reflection of the changes that have occurred over the time period concerned.

Resources

References

Canadian Council of Ministers of the Environment (2012) Guidance document on achievement determination for Canadian Ambient Air Quality Standards for fine particulate matter and ozone (PDF; 264 kB). Retrieved on November 4, 2025.

Canadian Council of Ministers of the Environment (2014) Air Quality Management System. Retrieved on November 4, 2025.

Canadian Council of Ministers of the Environment (2019) Guidance document on air zone management (PDF; 225 kB). Retrieved on November 4, 2025.

Canadian Council of Ministers of the Environment (2020) Guidance document on achievement determination for Canadian Ambient Air Quality Standards for nitrogen dioxide (PDF; 616 kB). Retrieved on November 4, 2025.

Canadian Council of Ministers of the Environment (2020) Guidance document on achievement determination for Canadian Ambient Air Quality Standards for sulphur dioxide (PDF; 586 kB). Retrieved on November 4, 2025.

Canadian Council of Ministers of the Environment (2025) State of the air. Retrieved on November 4, 2025.

Environment and Climate Change Canada (2022) National Air Pollution Surveillance Program. Retrieved on November 4, 2025.

Government of Canada (2023) Outdoor air pollution and health. Retrieved on December 4, 2025.

Health Canada (2016) Human health risk assessment for ambient nitrogen dioxide. Retrieved on November 4, 2025.

Health Canada (2016) Human health risk assessment for sulphur dioxide : analysis of ambient exposure to and health effects of sulphur dioxide in the Canadian population. Retrieved on November 4, 2025.

Health Canada (2022) Canadian health science assessment for fine particulate matter ($PM_{2.5}$). Retrieved on November 4, 2025.

Related information

Canadian Smog Science Assessment Highlights and Key Messages

Smog: causes and effects

Annexes

Annex A. Data table for the figure presented in this document

Table A.1. Data for Figure 1. Percentage of the Canadian population living in areas where outdoor concentrations of air pollutants were less than or equal to the 2020 Canadian Ambient Air Quality Standards, Canada, 2005 to 2023

Period	Proportion of the population where air pollutants were at or below the standards (percentage)
2005 to 2007	63
2006 to 2008	65
2007 to 2009	66
2008 to 2010	69
2009 to 2011	67
2010 to 2012	66
2011 to 2013	66
2012 to 2014	66
2013 to 2015	70
2014 to 2016	79
2015 to 2017	78
2016 to 2018	68
2017 to 2019	71
2018 to 2020	64
2019 to 2021	85
2020 to 2022	74
2021 to 2023	74

Note: Except for the annual standards for nitrogen dioxide and sulphur dioxide, the 2020 Canadian Ambient Air Quality Standards use 3-year average concentrations. For this reason, the table portrays percentage values over 3-year periods. For nitrogen dioxide and sulphur dioxide, the annual standard is calculated using concentrations from the latest year of the reporting period. For example, the 2023 annual concentrations were used for the 2021 to 2023 reporting period.
Source: Environment and Climate Change Canada (2025) Air Quality Research Division. Health Canada (2025) Air Quality Risk Assessment Division.

Table A.2. Data for Figure 2. Percentage of the Canadian population living in areas where outdoor concentrations of air pollutants were exceeding the 2020 Canadian Ambient Air Quality Standards by pollutant, Canada, 2005 to 2023

Period	Proportion of the population where air pollutants were exceeding the standards (percentage)						
	Annual $PM_{2.5}$	24-hour $PM_{2.5}$	8-hour O_3	Annual NO_2	1-hour NO_2	Annual SO_2	1-hour SO_2
2005 to 2007	4	27	34	12	13	0	0
2006 to 2008	6	1	26	8	3	0	0
2007 to 2009	7	7	24	11	3	0	0
2008 to 2010	7	10	20	3	3	0	0
2009 to 2011	13	10	20	0	3	0	0

Period	Proportion of the population where air pollutants were exceeding the standards (percentage)						
	Annual $PM_{2.5}$	24-hour $PM_{2.5}$	8-hour O_3	Annual NO_2	1-hour NO_2	Annual SO_2	1-hour SO_2
2010 to 2012	14	8	23	0	3	0	0
2011 to 2013	14	2	21	0	3	0	1
2012 to 2014	16	2	21	4	3	0	1
2013 to 2015	13	1	19	0	0	0	1
2014 to 2016	4	1	19	0	0	0	0
2015 to 2017	0	3	19	0	0	0	0
2016 to 2018	2	13	19	0	0	0	0
2017 to 2019	2	12	17	0	0	0	1
2018 to 2020	1	20	16	0	0	0	0
2019 to 2021	1	1	14	0	0	0	0
2020 to 2022	2	7	19	0	0	0	0
2021 to 2023	14	15	15	0	0	0	0

Note: Except for the annual standards for nitrogen dioxide and sulphur dioxide, the 2020 Canadian Ambient Air Quality Standards use 3-year average concentrations. For this reason, the table portrays percentage values over 3-year periods. For nitrogen dioxide and sulphur dioxide, the annual standard is calculated using concentrations from the latest year of the reporting period. For example, the 2023 annual concentrations were used for the 2021 to 2023 reporting period.
Source: Environment and Climate Change Canada (2025) Air Quality Research Division. Health Canada (2025) Air Quality Risk Assessment Division.

Annex B. Geographical areas used to calculate the indicator

Table B.1. Geographical areas used to calculate the indicator

Census subdivision, census metropolitan area or census division	Province or territory	Community	Reporting periods used
1	Newfoundland and Labrador	St. John's	2005-2007 to 2021-2023
1002005	Newfoundland and Labrador	Burin	2014-2016 to 2021-2023
1005018	Newfoundland and Labrador	Corner Brook	2005-2007 to 2021-2023
1006017	Newfoundland and Labrador	Grand Falls-Windsor	2005-2007 to 2021-2023
1009022	Newfoundland and Labrador	Port au Choix	2014-2016 to 2019-2021
1010032	Newfoundland and Labrador	Labrador City	2014-2016 to 2021-2023
1102075	Prince Edward Island	Charlottetown	2014-2016 to 2021-2023
1207001	Nova Scotia	Kings, Subd. A	2005-2007 to 2021-2023
1207012	Nova Scotia	Kentville	2018-2020 to 2021-2023
1209034	Nova Scotia	Halifax	2005-2007 to 2021-2023
1212004	Nova Scotia	Pictou	2005-2007 to 2021-2023
1215002	Nova Scotia	Port Hawkesbury	2005-2007 to 2021-2023
1217030	Nova Scotia	Cape Breton	2005-2007 to 2021-2023
310	New Brunswick	Saint John	2005-2007 to 2021-2023
1302026	New Brunswick	Saint Andrews	2005-2007 to 2021-2023
1307022	New Brunswick	Moncton	2005-2007 to 2021-2023
1310032	New Brunswick	Fredericton	2005-2007 to 2021-2023
1313027	New Brunswick	Edmundston	2016-2018 to 2021-2023
1315011	New Brunswick	Bathurst	2005-2007 to 2021-2023
2413045	Quebec	Auclair	2005-2007 to 2021-2023
2418040	Quebec	Notre-Dame-du-Rosaire	2018-2020 to 2021-2023
2420005	Quebec	Saint-Francois-de-l'Île-d'Orléans	2005-2007 to 2016-2018, 2018-2020
2423	Quebec	Québec	2005-2007 to 2021-2023
2425213	Quebec	Levis	2014-2016 to 2021-2023
2429020	Quebec	Saint-Hilaire-de-Dorset	2005-2007 to 2021-2023
2434058	Quebec	Deschambault-Grondines	2005-2007 to 2021-2023
2437067	Quebec	Trois-Rivières	2005-2007 to 2020-2022
2439025	Quebec	Tingwick	2005-2007 to 2021-2023
2441027	Quebec	La Patrie	2005-2007 to 2021-2023
2443027	Quebec	Sherbrooke	2005-2007 to 2021-2023
2450090	Quebec	Saint-Zéphirin-de-Courval	2005-2007 to 2021-2023
2451080	Quebec	Charette	2005-2007 to 2021-2023

Census subdivision, census metropolitan area or census division	Province or territory	Community	Reporting periods used
2454090	Quebec	Saint-Simon	2005-2007 to 2021-2023
2456083	Quebec	Saint-Jean-sur-Richelieu	2005-2007 to 2021-2023
2458007	Quebec	Brossard	2005-2007 to 2021-2023
2458227	Quebec	Longueuil	2005-2007 to 2021-2023
2464008	Quebec	Terrebonne	2015-2017 to 2021-2023
2465005	Quebec	Laval	2005-2007 to 2021-2023
2466	Quebec	Montréal	2005-2007 to 2021-2023
2469070	Quebec	Saint-Anicet	2005-2007 to 2021-2023
2478047	Quebec	Saint-Faustin–Lac-Carré	2005-2007 to 2021-2023
2479097	Quebec	Ferme-Neuve	2005-2007 to 2021-2023
2481017	Quebec	Gatineau	2005-2007 to 2021-2023
2482035	Quebec	La Pêche	2005-2007 to 2021-2023
2486042	Quebec	Rouyn-Noranda	2005-2007 to 2021-2023
2489040	Quebec	Senneterre	2005-2007 to 2021-2023
2490027	Quebec	Lac-Édouard	2005-2007 to 2020-2022
2491050	Quebec	La Doré	2005-2007 to 2021-2023
2494068	Quebec	Saguenay	2005-2007 to 2021-2023
3506008	Ontario	Ottawa	2005-2007 to 2021-2023
3510010	Ontario	Kingston	2005-2007 to 2021-2023
3515014	Ontario	Peterborough	2005-2007 to 2021-2023
3518013	Ontario	Oshawa	2005-2007 to 2021-2023
3520005	Ontario	Toronto	2005-2007 to 2021-2023
3521005	Ontario	Mississauga	2005-2007 to 2021-2023
3521010	Ontario	Brampton	2005-2007 to 2021-2023
3523008	Ontario	Guelph	2005-2007 to 2021-2023
3524001	Ontario	Oakville	2005-2007 to 2021-2023
3524002	Ontario	Burlington	2005-2007 to 2021-2023
3524009	Ontario	Milton	2005-2007 to 2021-2023
3525005	Ontario	Hamilton	2005-2007 to 2021-2023
3526053	Ontario	St. Catharines	2005-2007 to 2021-2023
3529006	Ontario	Brantford	2005-2007 to 2021-2023
3530013	Ontario	Kitchener	2005-2007 to 2021-2023
3537039	Ontario	Windsor	2005-2007 to 2021-2023
3538030	Ontario	Sarnia	2005-2007 to 2021-2023
3539036	Ontario	London	2005-2007 to 2021-2023
3543042	Ontario	Barrie	2005-2007 to 2021-2023

Census subdivision, census metropolitan area or census division	Province or territory	Community	Reporting periods used
3553005	Ontario	Greater Sudbury	2005-2007 to 2021-2023
3557061	Ontario	Sault Ste. Marie	2005-2007 to 2021-2023
3558004	Ontario	Thunder Bay	2005-2007 to 2021-2023
4607062	Manitoba	Brandon	2005-2007 to 2021-2023
4621064	Manitoba	Flin Flon (Part)	2014-2016, 2016-2018 to 2018-2020, 2020-2022, 2021-2023
4622026	Manitoba	Thompson	2014-2016 to 2018-2020
602	Manitoba	Winnipeg	2005-2007 to 2021-2023
4701024	Saskatchewan	Estevan	2016-2018 to 2021-2023
4706027	Saskatchewan	Regina	2005-2007 to 2021-2023
4708004	Saskatchewan	Swift Current	2014-2016 to 2021-2023
4711066	Saskatchewan	Saskatoon	2005-2007 to 2021-2023
4715066	Saskatchewan	Prince Albert	2005-2007 to 2021-2023
4718070	Saskatchewan	Buffalo Narrows	2020-2022 to 2021-2023
4801006	Alberta	Medicine Hat	2005-2007 to 2021-2023
4802012	Alberta	Lethbridge	2005-2007 to 2021-2023
825	Alberta	Calgary	2005-2007 to 2021-2023
4808011	Alberta	Red Deer	2005-2007 to 2021-2023
4809002	Alberta	Clearwater County	2018-2020 to 2021-2023
4810058	Alberta	Lamont County	2005-2007 to 2021-2023
4811031	Alberta	Drayton Valley	2014-2016 to 2021-2023
4811032	Alberta	Brazeau County	2014-2016 to 2021-2023
835	Alberta	Edmonton	2005-2007 to 2021-2023
4812002	Alberta	Cold Lake	2005-2007 to 2021-2023
4812014	Alberta	St. Paul County No. 19	2005-2007 to 2021-2023
4813001	Alberta	Lac Ste. Anne County	2014-2016 to 2021-2023
4814003	Alberta	Yellowhead County	2005-2007 to 2021-2023
4814019	Alberta	Hinton	2005-2007 to 2021-2023
4814024	Alberta	Edson	2005-2007 to 2021-2023
860	Alberta	Wood Buffalo	2005-2007 to 2021-2023
4819006	Alberta	Grande Prairie County No. 1	2005-2007 to 2021-2023
4819012	Alberta	Grande Prairie	2005-2007 to 2021-2023
5903045	British Columbia	Castlegar	2014-2016 to 2021-2023
5905014	British Columbia	Trail	2021-2023
5905032	British Columbia	Grand Forks	2015-2017 to 2021-2023

Census subdivision, census metropolitan area or census division	Province or territory	Community	Reporting periods used
5909009	British Columbia	Hope	2005-2007 to 2021-2023
5909020	British Columbia	Chilliwack	2005-2007 to 2021-2023
932	British Columbia	Abbotsford	2005-2007 to 2021-2023
933	British Columbia	Vancouver	2005-2007 to 2021-2023
5909032	British Columbia	Kent	2014-2016 to 2021-2023
935	British Columbia	Victoria	2005-2007 to 2021-2023
5919008	British Columbia	North Cowichan	2014-2016 to 2021-2023
5919012	British Columbia	Duncan	2005-2007 to 2021-2023
5921007	British Columbia	Nanaimo	2005-2007 to 2021-2023
5923008	British Columbia	Port Alberni	2014-2016 to 2021-2023
5924034	British Columbia	Campbell River	2005-2007 to 2021-2023
5926010	British Columbia	Courtenay	2005-2007 to 2021-2023
5927008	British Columbia	Powell River	2014-2016 to 2020-2022
5929028	British Columbia	Sunshine Coast F	2014-2016 to 2021-2023
5931006	British Columbia	Squamish	2005-2007 to 2021-2023
5931020	British Columbia	Whistler	2005-2007 to 2021-2023
5933042	British Columbia	Kamloops	2005-2007 to 2021-2023
5935010	British Columbia	Kelowna	2005-2007 to 2021-2023
5937014	British Columbia	Vernon	2005-2007 to 2021-2023
5939007	British Columbia	Golden	2014-2016 to 2021-2023
5941009	British Columbia	Williams Lake	2005-2007 to 2021-2023
5941013	British Columbia	Quesnel	2005-2007 to 2021-2023
5949005	British Columbia	Kitimat	2014-2016 to 2021-2023
5949011	British Columbia	Terrace	2014-2016 to 2021-2023
5949803	British Columbia	Kitimat 2	2014-2016 to 2021-2023
5951007	British Columbia	Vanderhoof	2014-2016 to 2021-2023
5951022	British Columbia	Burns Lake	2014-2016 to 2021-2023
5951034	British Columbia	Houston	2014-2016 to 2021-2023
5951043	British Columbia	Smithers	2005-2007 to 2021-2023
5953023	British Columbia	Prince George	2005-2007 to 2021-2023
5955021	British Columbia	Peace River D	2020-2022 to 2021-2023
5955030	British Columbia	Taylor	2020-2022 to 2021-2023
5955034	British Columbia	Fort St. John	2014-2016 to 2021-2023
6001009	Yukon	Whitehorse	2005-2007 to 2021-2023
6101017	Northwest Territories	Inuvik	2005-2007 to 2021-2023
6102007	Northwest Territories	Norman Wells	2005-2007 to 2021-2023

Census subdivision, census metropolitan area or census division	Province or territory	Community	Reporting periods used
6105001	Northwest Territories	Fort Smith	2014-2016 to 2021-2023
6106023	Northwest Territories	Yellowknife	2005-2007 to 2021-2023
6204003	Nunavut	Iqaluit	2015-2017 to 2018-2020

Table B.2. Geographical areas with exceedances from the standards for the 2021-2023 reporting period

Province or territory	Community	Standard exceeded
Newfoundland and Labrador	Labrador City	8-hour standard for ozone
New Brunswick	Saint John	1-hour standard for SO_2
New Brunswick	Edmundston	1-hour standard for SO_2
Quebec	Terrebonne	Annual standard for $PM_{2.5}$
Quebec	Ferme-Neuve	24-hour standard for $PM_{2.5}$
Quebec	La Peche	24-hour standard for $PM_{2.5}$
Quebec	Rouyn-Noranda	Annual standard for $PM_{2.5}$
Quebec		24-hour standard for $PM_{2.5}$
Quebec		1-hour standard for SO_2
Quebec	Senneterre	24-hour standard for $PM_{2.5}$
Quebec	Saguenay	Annual standard for SO_2
		1-hour standard for SO_2
Ontario	Brampton	8-hour standard for ozone
Ontario	Brantford	8-hour standard for ozone
Ontario	Burlington	8-hour standard for ozone
Ontario	Guelph	8-hour standard for ozone
Ontario	Hamilton	Annual standard for $PM_{2.5}$
		8-hour standard for ozone
		1-hour standard for SO_2
Ontario	Kingston	8-hour standard for ozone
Ontario	Kitchener	8-hour standard for ozone
Ontario	London	8-hour standard for ozone
Ontario	Milton	8-hour standard for ozone
Ontario	Mississauga	8-hour standard for ozone
Ontario	Oakville	8-hour standard for ozone
Ontario	Peterborough	8-hour standard for ozone
Ontario	Sarnia	8-hour standard for ozone
Ontario	St. Catharines	8-hour standard for ozone
Ontario	Windsor	Annual standard for $PM_{2.5}$

Province or territory	Community	Standard exceeded
		8-hour standard for ozone
Manitoba	Winnipeg	24-hour standard for $PM_{2.5}$
Saskatchewan	Buffalo Narrow	Annual standard for $PM_{2.5}$
		24-hour standard for $PM_{2.5}$
Saskatchewan	Estevan	Annual standard for $PM_{2.5}$
		24-hour standard for $PM_{2.5}$
		1-hour standard for SO_2
Saskatchewan	Prince Albert	Annual standard for $PM_{2.5}$
		24-hour standard for $PM_{2.5}$
Saskatchewan	Regina	Annual standard for $PM_{2.5}$
		24-hour standard for $PM_{2.5}$
Saskatchewan	Saskatoon	Annual standard for $PM_{2.5}$
		24-hour standard for $PM_{2.5}$
Saskatchewan	Swift Current	24-hour standard for $PM_{2.5}$
Alberta	Calgary	Annual standard for $PM_{2.5}$
		24-hour standard for $PM_{2.5}$
		8-hour standard for ozone
Alberta	Clearwater County	24-hour standard for $PM_{2.5}$
Alberta	Cold Lake	Annual standard for $PM_{2.5}$
Alberta		24-hour standard for $PM_{2.5}$
Alberta	Drayton Valley	Annual standard for $PM_{2.5}$
Alberta		24-hour standard for $PM_{2.5}$
Alberta		8-hour standard for ozone
Alberta	Edmonton	Annual standard for $PM_{2.5}$
Alberta		24-hour standard for $PM_{2.5}$
Alberta	Edson	24-hour standard for $PM_{2.5}$
Alberta	Grande Prairie	Annual standard for $PM_{2.5}$
Alberta		24-hour standard for $PM_{2.5}$
Alberta	Grande Prairie County No. 1	Annual standard for $PM_{2.5}$
Alberta		24-hour standard for $PM_{2.5}$
Alberta	Hinton	Annual standard for $PM_{2.5}$
Alberta		24-hour standard for $PM_{2.5}$
Alberta	Lac Ste. Anne County	24-hour standard for $PM_{2.5}$
Alberta	Lethbridge	24-hour standard for $PM_{2.5}$
Alberta	Medicine Hat	24-hour standard for $PM_{2.5}$
Alberta		8-hour standard for ozone
Alberta	Red Deer	Annual standard for $PM_{2.5}$

Province or territory	Community	Standard exceeded
Alberta		24-hour standard for $PM_{2.5}$
Alberta	St. Paul County No. 19	24-hour standard for $PM_{2.5}$
Alberta	Wood Buffalo	Annual standard for $PM_{2.5}$
Alberta		24-hour standard for $PM_{2.5}$
Alberta	Yellowhead County	24-hour standard for $PM_{2.5}$
British Columbia	Burns Lake	Annual standard for $PM_{2.5}$
		24-hour standard for $PM_{2.5}$
British Columbia	Castlegar	Annual standard for $PM_{2.5}$
		24-hour standard for $PM_{2.5}$
British Columbia	Chilliwack	24-hour standard for $PM_{2.5}$
British Columbia	Fort St. John	Annual standard for $PM_{2.5}$
		24-hour standard for $PM_{2.5}$
British Columbia	Golden	Annual standard for $PM_{2.5}$
		24-hour standard for $PM_{2.5}$
British Columbia	Grand Forks	Annual standard for $PM_{2.5}$
		24-hour standard for $PM_{2.5}$
British Columbia	Hope	24-hour standard for $PM_{2.5}$
British Columbia	Houston	24-hour standard for $PM_{2.5}$
British Columbia	Kamloops	Annual standard for $PM_{2.5}$
		24-hour standard for $PM_{2.5}$
British Columbia	Kelowna	Annual standard for $PM_{2.5}$
		24-hour standard for $PM_{2.5}$
British Columbia	Kent	24-hour standard for $PM_{2.5}$
British Columbia	Prince George	Annual standard for $PM_{2.5}$
		24-hour standard for $PM_{2.5}$
British Columbia	Quesnel	Annual standard for $PM_{2.5}$
		24-hour standard for $PM_{2.5}$
British Columbia	Trail	1-hour standard for SO_2
British Columbia	Vanderhoof	Annual standard for $PM_{2.5}$
		24-hour standard for $PM_{2.5}$
British Columbia	Vernon	Annual standard for $PM_{2.5}$
		24-hour standard for $PM_{2.5}$
British Columbia	Williams Lake	24-hour standard for $PM_{2.5}$
Northwest Territories	Fort Smith	24-hour standard for $PM_{2.5}$
Northwest Territories	Yellowknife	Annual standard for $PM_{2.5}$
		24-hour standard for $PM_{2.5}$

Additional information can be obtained at:

Environment and Climate Change Canada
Public Inquiries Centre
Place Vincent Massey Building
351 Saint-Joseph Boulevard
Gatineau QC K1A 0H3
Toll Free: 1-800-668-6767
Email: enviroinfo@ec.gc.ca