



## Wildfire Smoke and the Air Quality Health Index (AQHI)

The Canadian Air Quality Health Index (AQHI) is designed to help people understand how air quality can affect their health, and how they can protect themselves when air quality is poor. It uses a scale of 1–10+ to indicate potential health risk and to recommend actions for reducing risk.



The AQHI is usually based on the combined levels of three different air pollutants: ground-level ozone (O<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>), and fine particulate matter (PM<sub>2.5</sub>).

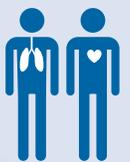
- Most PM<sub>2.5</sub> is created by burning fuels and materials, including forests. Some PM<sub>2.5</sub> is formed by chemical reactions in the air.
- NO<sub>2</sub> is another product of burning fuels. The most important source of NO<sub>2</sub> is motor vehicle exhaust.
- O<sub>3</sub> is formed in the air by the reaction of other air pollutants with sunlight. Ground-level O<sub>3</sub> is the main pollutant in urban smog.
- Levels of PM<sub>2.5</sub>, NO<sub>2</sub>, and O<sub>3</sub> used in the AQHI come from air quality monitoring stations run by government agencies.



Of all the pollutants in wildfire smoke, PM<sub>2.5</sub> poses the greatest risk to human health. In British Columbia, the AQHI has been changed to reflect this risk.

- The AQHI was originally developed to communicate about the health risks associated with changes in urban air pollution. Wildfire smoke causes much larger and faster changes in PM<sub>2.5</sub>.
- Every hour the AQHI in British Columbia is calculated two different ways, and the higher of the two values is reported:
  - Using levels of PM<sub>2.5</sub>, NO<sub>2</sub>, and O<sub>3</sub> together <https://u.nu/s08q>
  - Using the level of PM<sub>2.5</sub> alone (Table 1)
- This change to the AQHI was based on the respiratory health effects observed across British Columbia under smoky conditions.
- The current AQHI values <https://u.nu/p-3> and 1-hour PM<sub>2.5</sub> concentrations <https://u.nu/lamf> are reported in real time on the BC Air Quality website.

### PEOPLE AT HIGHER RISK



PEOPLE WITH CHRONIC LUNG/HEART DISEASE



PREGNANT WOMEN



INFANTS, YOUNG CHILDREN



OLDER ADULTS



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FOR MORE INFORMATION [bccdc.ca/wildfiresmoke](https://bccdc.ca/wildfiresmoke)

1-HOUR PM <sub>2.5</sub> ( $\mu\text{g}/\text{m}^3$ )	PROVINCIAL AQHI	AQHI RISK CATEGORY	HEALTH MESSAGE FOR PEOPLE AT HIGHER RISK	HEALTH MESSAGE FOR GENERAL POPULATION	ACTIONS TO REDUCE WILDFIRE SMOKE EXPOSURE
0 – 10	1	LOW	Enjoy your usual outdoor activities.	Ideal air quality for outdoor activities.	Normal air quality in British Columbia
11 – 20	2				
21 – 30	3				
31 – 40	4	MODERATE	Consider reducing or rescheduling strenuous activities outdoors if you experience symptoms.	No need to modify your usual outdoor activities unless you experience symptoms.	<ul style="list-style-type: none"> <li>Use a portable air cleaner to reduce smoke in your home</li> <li>Stay inside with doors and windows closed, but keep cool – being too hot is more risky than breathing smoke for most people</li> </ul>
41 – 50	5				
51 – 60	6				
61 – 70	7	HIGH	Reduce or reschedule strenuous activity outdoors.	Consider reducing or rescheduling strenuous activities outdoors if you experience symptoms.	<ul style="list-style-type: none"> <li>Visit places with cleaner and cooler air, such as libraries, community centres, and shopping malls</li> </ul>
71 – 80	8				
81 – 90	9				
91 – 100	10				
101+	10+	VERY HIGH	Avoid strenuous activity outdoors.	Reduce or reschedule strenuous activity outdoors, especially if you experience symptoms.	<ul style="list-style-type: none"> <li>If you cannot access cleaner air, consider using a well-fitted N95 respirator or relocating to an area with less smoke</li> </ul>

**TABLE 1:** Values of the provincial AQHI when it is calculated using the fine particulate matter (PM<sub>2.5</sub>) levels alone. PM<sub>2.5</sub> is measured in micrograms per cubic meter of air ( $\mu\text{g}/\text{m}^3$ ). The table shows messages provided by Health Canada, and actions recommended to reduce wildfire smoke exposure. People at higher risk or anyone experiencing symptoms should consider these actions at Moderate AQHI values, while others may not need them until High or Very High values are reached.

### The AQHI has a maximum value of 10+ based on the current health evidence.

- There is limited evidence on the health effects of air pollution at AQHI values over 10.
- For example, an AQHI of 7 is known to be **much healthier** than an AQHI of 3. However, it is not known whether an AQHI of 17 is much healthier than an AQHI of 13 because such high values are rare.
- Wildfire smoke is the main cause of 10+ AQHI values in British Columbia and elsewhere in Canada.
- Whenever the AQHI is 10+, the air quality is extremely poor. **Everyone should take action to protect their health.**

### The evidence-based AQHI was developed in Canada by federal and provincial partners.

- The best sources of information for British Columbia are the BC Air Quality website <https://u.nu/91n0>, the national AQHI smartphone app <https://u.nu/6ce1>, and the national WeatherCAN smartphone app <https://u.nu/an9l>.
- Do not rely on any values reported by other websites and smartphone applications.** These values may not be based on scientific evidence, and may not reflect the PM<sub>2.5</sub> concentrations measured in British Columbia.



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