



## What is air pollution?

There are many different types of air pollutants from a wide range of sources. The pollutants of greatest importance to health are the gases and particles that have been found to contribute to cardiovascular and respiratory disease. These pollutants are often lumped together under the term smog.

## How does air pollution affect my health and the health of my family?

Depending on the length of time you are exposed, your health status, your genetic background and the concentration of pollutants, air pollution can have a negative effect on your heart and lungs. It can:

- Make it harder to breathe
- Irritate your lungs and airways
- Worsen chronic diseases such as heart disease, chronic bronchitis, emphysema and asthma

Each individual reacts differently to air pollution. Children, the elderly and those with diabetes, heart or lung disease are most sensitive to the adverse health effects of air pollution.

Negative health effects increase as air pollution worsens. Studies have shown that even modest increases in air pollution can cause small but measurable increases in emergency room visits, hospital admissions and death. Small increases in air pollution over a short period of time can increase symptoms of pre-existing illness among those at risk.

## How do I know if I am at risk?

**People with diabetes, lung disease** (such as chronic bronchitis, asthma, emphysema, lung cancer) **or heart disease** (such as angina, a history of heart attacks, congestive heart failure, arrhythmia or irregular heartbeat) are more sensitive to air pollution

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**Seniors** are at higher risk because of weakening of the heart, lungs and immune system and increased likelihood of health problems such as heart and lung disease.

**Children** are also more vulnerable to air pollution: they have less-developed respiratory and defense systems. Because of their size, they inhale more air per kilogram of body weight than adults. Children also spend more time outdoors being physically active, which can increase their exposure to air pollution.

**People participating in sports or strenuous work outdoors** breathe more deeply and rapidly, allowing more air pollution to enter their lungs. They may experience symptoms like eye, nose or throat irritation, cough or difficulty breathing when air pollution levels are high.

### What can I do to protect my health and the health of my family? How can I find out about the health risks posed by air pollution in my community?

You can better protect yourself and those in your care by understanding how air pollution affects your health, and by checking the *Air Quality Health Index* on a regular basis to find out what the health risks from air pollution are in your community.

To check the *Air Quality Health Index* reading for your community and learn more about how air pollution can affect your health, [www.ec.gc.ca/cas-aqhi](http://www.ec.gc.ca/cas-aqhi) or select the location of interest on the map of Canada on [www.weatheroffice.gc.ca](http://www.weatheroffice.gc.ca).

We can protect our health from the negative health effects of air pollution by appropriately changing our behaviour to reduce our exposure to air pollutants when air quality deteriorates.

Canadians can assess whether they are at greater risk based on their age, health status and level of outdoor physical activity, and whether or not they are experiencing symptoms.

When the *Air Quality Health Index* reading rises, they can decide whether they need to:

- Reduce or reschedule outdoor physical activities
- Monitor possible symptoms, such as difficulty breathing, coughing or irritated eyes
- Follow a doctor's advice to manage existing conditions such as heart or lung disease

They can also use the index as a reminder of the need to take action to reduce air pollution.

### What is the *Air Quality Health Index* (AQHI)?

The *Air Quality Health Index* is a scale designed to help you understand what the quality of the air around you means to your health. It is a new tool developed by health and environmental professionals to communicate the health risk posed by air pollution.

It is designed to help you make decisions to protect your health and the environment by:

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- Limiting short-term exposure to air pollution
- Adjusting your activity during episodes of increased air pollution and encouraging physical activity on days when the index is lower
- Reducing your personal contribution to air pollution

The index provides specific advice for people who are especially vulnerable to the effects of air pollution as well as the general public.

### **What can the AQHI tell me about the health risks I may experience due to the current local air quality? What are its limitations in this regard?**

The *Air Quality Health Index* provides a number from 1 to 10+ to indicate the level of health risk associated with local air quality. Occasionally, when the amount of air pollution is abnormally high, the number may exceed 10.

The higher the number, the greater the health risk and our need to take precautions.

The index describes the level of health risk associated with this number as 'low', 'moderate', 'high' or 'very high', and suggests steps we can take to reduce our exposure.

It also forecasts local air quality for today and tomorrow and provides associated health advice. .

The index does not, measure the effects of odour, pollen, dust, heat or humidity on your health.

You can refer to the *Air Quality Health Index* (at [www.ec.gc.ca/cas-aqhi](http://www.ec.gc.ca/cas-aqhi) or [www.weatheroffice.ec.gc.ca](http://www.weatheroffice.ec.gc.ca)) to check the quality of outdoor air in your community before heading off to work or play. And you can use the forecasts to plan your activities, whether over the next hour or the next day.

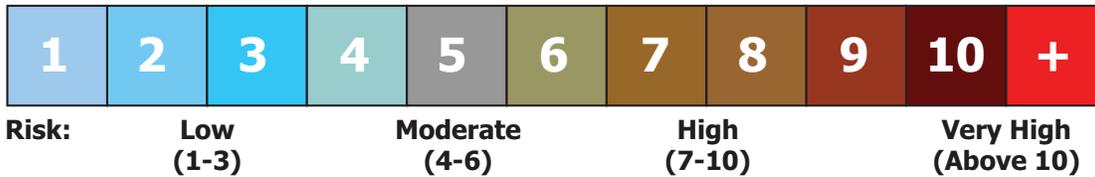
Seniors, parents of children with asthma, and people suffering from diabetes, heart or lung disease, can use the index to assess the immediate risk air pollution poses to your health and take steps to lessen that risk.

Even if you're relatively healthy, fit and active, you can consult the index to decide when and how much to exercise or work outdoors.

# The Air Quality Health Index: Frequently Asked Questions

## Air Quality Health Index

### Toronto



#### Current

Observed at  
9:00 AM EDT  
Wednesday 2 May 2007



- At-risk population:**
- Enjoy your usual outdoor activities.
  - [Find out if you are at-risk.](#)
- General population:**
- Ideal air quality for outdoor activities.

#### Forecast Maximums

Issued 6:00 AM EDT Wednesday 2 May 2007



#### Who is at risk?

People with heart and lung conditions are most affected by air pollution.

To find out if you are at risk, consult [the health guide](#), your physician or [your local health authority](#).

Visit the [national AQHI Web site](#) to learn more about the AQHI

#### Did you know...?

Riding your bike, walking or rollerblading to work is healthy for you and keeps the air clean.

# The Air Quality Health Index: Frequently Asked Questions

## How should I respond to AQHI information about health risks?

Health Risk	Air Quality Health Index	Health Messages	
		At Risk Population*	General Population
Low Risk	1 - 3	<b>Enjoy</b> your usual outdoor activities.	<b>Ideal</b> air quality for outdoor activities.
Moderate Risk	4 - 6	<b>Consider</b> reducing or rescheduling strenuous activities outdoors if you are experiencing symptoms.	<b>No need to modify</b> your usual outdoor activities unless you experience symptoms such as coughing and throat irritation.
High Risk	7 - 10	<b>Reduce or reschedule</b> strenuous activities outdoors. Children and the elderly should also take it easy.	<b>Consider</b> reducing or rescheduling strenuous activities outdoors if you experience symptoms such as coughing and throat irritation.
Very High Risk	Above 10	<b>Avoid</b> strenuous activities outdoors. Children and the elderly should also avoid outdoor physical exertion.	<b>Reduce or reschedule</b> strenuous activities outdoors, especially if you experience symptoms such as coughing and throat irritation.

\*Unsure if you are at risk? Consult this health guide to help you determine if you are at risk from air pollution. People with heart or breathing problems are at greater risk. Follow your doctor's usual advice about exercising and managing your condition.

## How is the *Air Quality Health Index* presented?

The *Air Quality Health Index* is a scale that lists a number from 1 to 10+ to indicate the level of health risk associated with air quality.

Scientists created the index by estimating the daily change in mortality risk for ten cities from 1998-2000 and plotting it on a 10 point scale.

The higher the number, the greater the risk and the need to take precautions.

## What is the scale for the *Air Quality Health Index*?

The *Air Quality Health Index* is measured on a scale ranging from 1 to 10+:

- 1-3 = 'Low' health risk
- 4-6 = 'Moderate' health risk
- 7-10 = 'High' health risk
- Above 10 = 'Very high' health risk

### How is the AQHI calculated?

The AQHI is designed as a guide to the relative risk presented by common air pollutants which are known to harm human health. Three specific pollutants have been chosen as indicators of the overall mixture:

1. **Ground-level Ozone (O<sub>3</sub>)**, is formed by photo-chemical reactions in the atmosphere. It can be a major component of smog during the summer, especially during hot sunny weather, but is generally low in the wintertime. Ozone can be transported long distances within a polluted air mass and can be responsible for large regional air pollution episodes.
2. **Particulate Matter**, is a mixture of tiny airborne particles that can be inhaled deep into the lungs. These particles can either be emitted directly by vehicles, industrial facilities or natural sources like forest fires, or formed indirectly as a result of chemical reactions among other pollutants. Particulate matter can reflect both local air pollution sources or widespread air pollution episodes.
3. **Nitrogen Dioxide (NO<sub>2</sub>)**, is released by motor vehicle emissions and power plants that rely on fossil fuels. It contributes to the formation of the other two pollutants. Nitrogen dioxide is often elevated in the vicinity of high traffic roadways and other local sources.

All three can have serious, combined effects on human health—from illness to hospitalization to premature death—even as a result of short-term exposure. Significantly, all of these pollutants appear to threaten human health, even at low levels of exposure, especially among those with pre-existing health problems.

In the development of the Air Quality Health Index, a formula that combined these three pollutants were found to be the best indicator of the health risk of the combined impact of the mix of pollutants in the air.

### Why aren't sulphur dioxide and carbon monoxide captured in the Air Quality Health Index?

Sulphur dioxide and carbon monoxide were dropped from the AQHI, because they were not associated with additional health risk once the effects of ozone, nitrogen dioxide and particulate matter were taken into account.

### What's the difference between the air quality index I am used to and the Air Quality Health Index? Won't people get the existing air quality index and the *Air Quality Health Index* mixed up?

The *Air Quality Health Index* is an entirely new approach to communicating about air quality that differs from more familiar air quality indices which all follow an approach developed in the 1970s. All previous air quality indices have reported air quality in term of air quality objectives for

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different pollutants and address each pollutant separately. The *Air Quality Health Index* presents the immediate health risk of the combined effects of air pollution (smog) mixture.

The air quality objectives or standards that old air quality index uses in its calculations are based on a variety of factors including effects on human health, vegetation, and consideration of the technical and economic achievability of the objectives as air quality management goals. The *Air Quality Health Index* is a personal health protection tool for individual Canadians, especially those most at risk: children, seniors, and people with diabetes, heart and lung disease. It does not attempt to consider any issues other than the day to day health impact of air pollution.

The old index is usually presented in a way that implies a safe level of air pollution below a specified threshold. The *Air Quality Health Index* reflects scientific evidence that negative health effects can occur even at low levels of exposure.

The old air quality index is not the same across the country as provincial and municipal governments have adopted different air quality standards as a basis for the index in their jurisdiction. The *Air Quality Health Index* has been developed through a national process and is designed to apply across the country.

The old air quality index usually has values in the range of 10 -60, with poor air quality designated as values above 50. The *Air Quality Health Index* is on a 1-10 scale and three categories “low moderate and high risk” within this range. For this reason confusion is unlikely.

### Why do we need a new index?

The principle underpinning the development of the *Air Quality Health Index* is that Canadians deserve the best possible information on air quality so they can act in ways to protect themselves and those in their care.

### What difference will the *Air Quality Health Index* make in the lives of Canadians?

It will help Canadians better understand how to protect their health from the adverse effects of air pollution on a daily, or even hourly, basis, just like the UV Index helps Canadians protect themselves from the harmful effects of too much sun.

This means that senior citizens, parents of children with asthma, and people suffering from diabetes, heart or lung disease now have an effective tool to help them assess the health risks posed by the levels of air pollution where they live, and take action to protect their health and the health of those under their care.

This also means that average Canadians can check the quality of outdoor air before heading off to work or play, whether over the next hour or the next day.

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### What will the *Air Quality Health Index* look like?

The health-based index will be much easier to understand because it:

- Illustrates the level of risk with a number and colour scale from 1 to 10+
- Labels health risk levels as “low”, “moderate”, “high” or “very high”
- Forecasts local air quality for today and tomorrow
- Suggests actions we can take to reduce our health risks
- Talks about how we can reduce air pollution
- Encourages physical activity as appropriate based on personal susceptibility and index reading

### Will it look the same across the country?

The *Air Quality Health Index* will use the same formula across the country and will appear with the same format across the country on the Environment Canada Weatheroffice website.

### When will all of this happen? Why don't you just launch the new *Air Quality Health Index* right away?

Health Canada and Environment Canada are supporting provinces, municipalities and non-government organizations as they begin to implement and communicate this new personal health-protection tool. Provinces carry out most of the air quality monitoring in Canada and their agreement and participation is essential to the implementation of the index.

The federal development phase of the *Air Quality Health Index* is complete, and implementation has begun. In the Spring of 2008 British Columbia moved to full implementation in 14 locations and the pilot was expanded to six more municipalities in the Greater Toronto Area. The *Air Quality Health Index* will expand to Saint John this summer and to other locations within the next two to three years.

By staggering implementation, it will allow the index to be implemented in a way that is most beneficial to the province. This will include the development of communication tools and educating and informing the public about the tool and how to use it.

Evaluations of these initial projects will be done to ensure that the *Air Quality Health Index* is being implemented and used in an effective and efficient way.

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### **What's the federal role in implementing the Air Quality Health Index? What's the provincial/municipal role? Why don't you just have one federal Air Quality Health Index that's used across the country?**

Health Canada and Environment Canada have led the development of the *Air Quality Health Index* and continue to collaborate with government, health and environmental NGO partners on development of the Air Quality Health Index.

Health Canada is ensuring that its latest cutting-edge epidemiological research informs the creation of this new health-based index. Department officials are also providing the health information necessary to help Canadians better understand how to protect their health from the negative effects of air pollution.

Environment Canada is overseeing the technical development of the index and updating its capacity to provide *Air Quality Health Index* forecasts.

### **What's the difference between the American Index and the Canadian Air Quality Health Index? Why aren't they the same? Won't this be confusing for people who live close to the border and hear both versions being used?**

The American index is standards-based and emphasizes the impact of a single pollutant, much in the same way as provincial air quality indices have done up until now. The different jurisdictions have different standards and in addition the US uses different scales and categories.

Unlike the American index, the *Air Quality Health Index* looks at the combined effects of air pollutants on health, rather than emphasizing the impact of one pollutant over others.

Like the older Canadian AQIs the US AQI has a broad range, with the category "unhealthy for sensitive groups" beginning at a value of 101. This is unlikely to be confused with the AQHI's 1-10+ scale.

The United States Environmental Protection Agency and Canadian partners will work together to reduce confusion.

### **What are the real impacts of air pollution on human health? How many doctor/hospital visits and deaths can be directly attributed to air pollution?**

Air pollution exacerbates health conditions in people who already suffer from chronic conditions such as heart and lung disease, or makes those who are vulnerable to its effects—such as children and the elderly—more susceptible to illness.

Air pollution may also contribute to the development of new cases of heart and lung disease

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## The Air Quality Health Index: Frequently Asked Questions

The World Health Organization recently estimated that 800,000 deaths per year worldwide (1.4% of all deaths) could be attributed to urban outdoor air pollution.

In Canada, scientific evidence based on data from eight Canadian cities shows that 5,900 deaths can be linked to air pollution every year.

Research also shows that poor air quality sends thousands more Canadians to hospital each year.

### **Will the *Air Quality Health Index* be used to measure, manage and report on air quality over time? Can it be used as a tool for assessing accountability and progress relevant to clean air legislation and regulation?**

No. The *Air Quality Health Index* has been designed as a tool to help individual Canadians make choices that will protect their personal health and reduce their exposure to air pollution.

### **Isn't the *Air Quality Health Index* just another excuse for inaction on clean air?**

No, it isn't. On the contrary, the *Air Quality Health Index* empowers all of us—Canadian governments, advocates and citizens—to take action.

Environment Canada and its partners have developed this health-based forecasting system to communicate in simple, easy-to-understand terms how current weather conditions and levels of air pollution can affect our health.

With this information, each of us can then respond in a more timely and effective way to the quality of the air we breathe.

As governments, we are looking at ways to clean up our air and reduce the negative impacts pollution can have on our health.

For example, the Government of Canada has introduced a comprehensive regulatory framework to reduce by 50% by 2015 air pollution from industrial sources.

As advocates, we now have a tool that will help us increase public awareness and encourage community action to clean up our air.

As citizens, we can consult the *Air Quality Health Index* and decide for ourselves how to react, given local conditions and the status of our health.

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### **While it's great that the *Air Quality Health Index* informs people about air pollution and their health, shouldn't we focus on ways to reduce air pollution?**

The *Air Quality Health Index* will encourage Canadians to reduce personal and household emissions as well as promoting individual health.

Governments and advocates can use this new tool to engage the public in education programs that encourage them to reduce vehicle emissions and energy use.

Canadians can act in a number of ways to lighten their impact on the environment, from driving their cars less to conserving more energy at home

The AQHI will where possible link to federal, provincial and municipal action plans to reduce air pollution and greenhouse gases.

### **Why hasn't a local *Air Quality Health Index* been created for my community?**

One of the goals of the *Air Quality Health Index* is to provide Canadians with health risk information that would be consistent across the country. The air quality Index was developed based on the best available dataset of national air pollution measurements.

However, air quality data are not readily available in all areas of Canada: for example, the technical capacity to monitor air pollution is limited in rural areas.

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