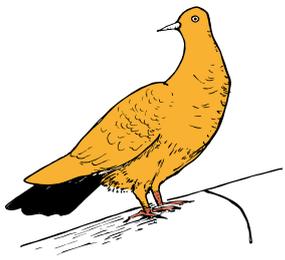


# Air quality It's time to act!





## Air quality: It's time to act!

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Panama City, Republic of Panama, 2021

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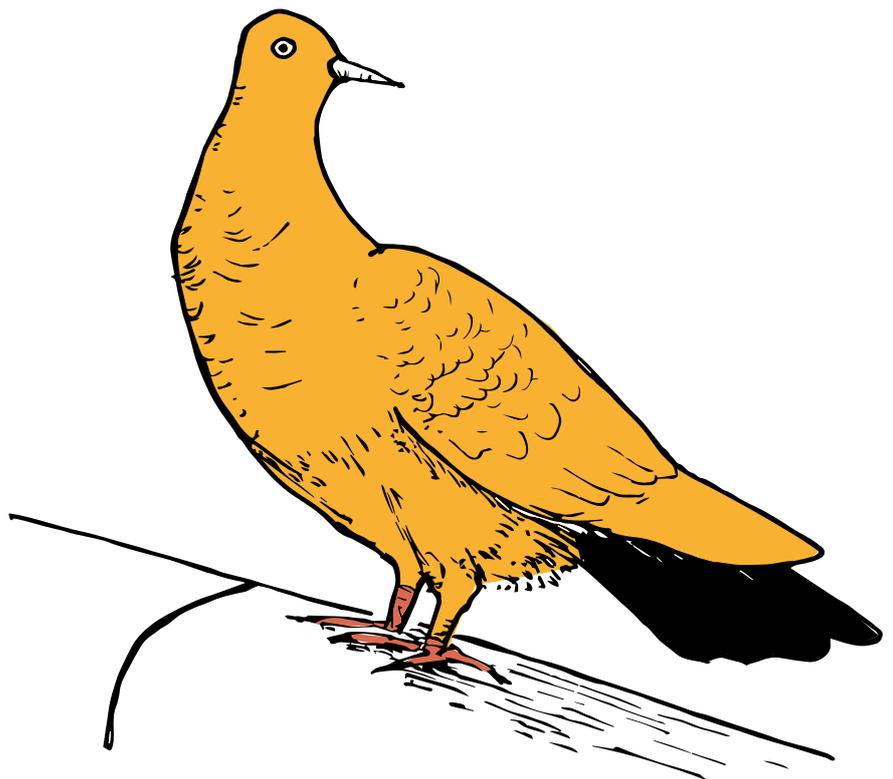
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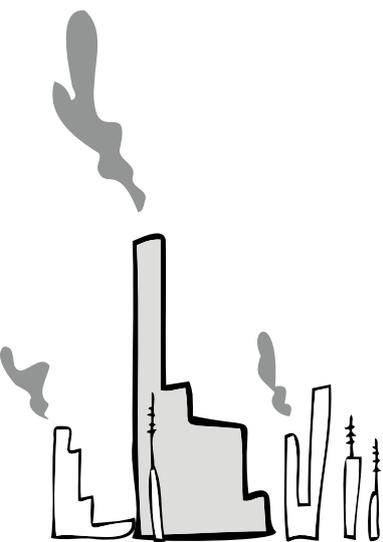


# Air quality

## It's time to act!

Key concepts and citizen experiences to understand air quality and take action for clean air.

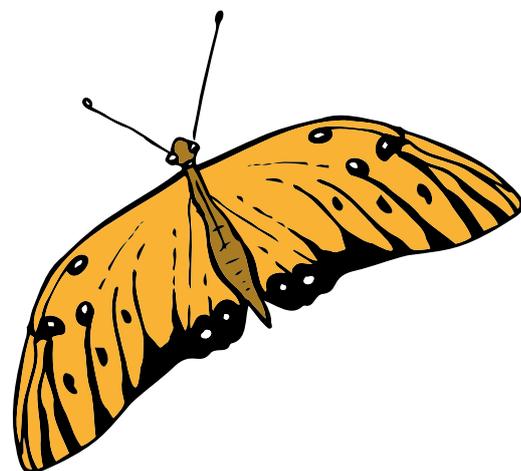
unicef  | for every child



# Foreword

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“We, as young people, are agents of change in different sections of society. We are not being left behind in **climate action**: our voices are being increasingly heard and we are demanding the right to **participate fully**. In fact, our participation is a right that should be central to the formulation of public policy.”



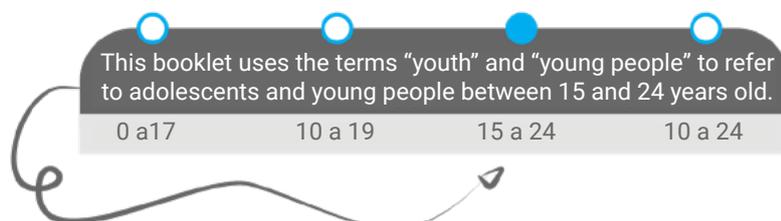
The **Toolkit for Young Climate Activists in Latin America and the Caribbean** was created by young people who, like you, are concerned about our planet’s situation and who, as activists, have faced many challenges when advocating and taking action.

Our goal is to share clear, concise, easily understandable information that describes the course of global, regional, and national climate action, in order to prepare you for **full and informed participation**.

The booklets are interrelated and are designed so that you can read them in succession and progressively deepen your knowledge of each of the topics. You can also consult them independently, according to your needs.

The **Air quality: It’s time to act!** booklet is the first booklet published as part of a thematic series on climate and environmental action that young people consider necessary in Latin America and the Caribbean. These booklets contain basic information to help you understand climate action. You can read them in succession and progressively deepen your knowledge of each of the topics.

The **Air quality: It’s time to act!** booklet contains essential information to help you understand air quality and the state of air quality both around the world and in the region. This understanding will help you take action for clean air.



# Acknowledgements

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The toolkit was written by Alejandro Daly, a young air quality activist and UNICEF consultant from Colombia / Venezuela and Sara Cognuck González, a young climate activist and UNICEF consultant. All content was co-created with young activists from 6 countries in Latin America and the Caribbean.

And finally, we appreciate the support of the UNICEF team: Amy Wickham, Emilia Numer, Hanoch Barlevi, Paulette Wade and Zoraya El Raiss for their guidance and advice, that has helped make this booklet a reality.

We especially thanks to Andrés Porras (Young leader), Astry Chávez (Red de Promotores de ODS and UNO.CINCO), Brenda Gutierrez (Red de Agentes Climáticos), Daniela Pellón (Aires Nuevos para la Primera Infancia), Ilana Cruz, Ismaela Magliotoo (UNO. CINCO), Kimberly Quinterio (Jóvenes and Cambio Climático), Lilibeth Villamizar (El Derecho a No Obedecer Cúcuta), María Daniela Castillo (George Washington University and Red Nacional Ciudadana por la Calidad del Aire) and Santiago Aldana (MeCAB), young activists who were excited about the project and always ready with constructive contributions to improve this booklet.



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# Acronyms and abbreviations

In the context of air quality and climate action, it is common to use acronyms in English even when we are communicating in Spanish. At other times, the Spanish version of an acronym is used. Here you will find a list of the acronyms used in this document, with the English and Spanish versions and the meaning in both languages.

<b>OMS/WHO</b>	Organización Mundial de la Salud	World Health Organization
<b>NU/UN</b>	Naciones Unidas	United Nations
<b>OPS/PAHO</b>	Organización Panamericana de la Salud	Pan American Health Organization
<b>PIB/GDP</b>	Producto Interno Bruto	Gross Domestic Product
<b>MP/PM</b>	Material particulado	Particulate matter
<b>MP2,5/PM2,5</b>	Material particulado de 2,5 micras	Particulate matter less than 2,5 microns
<b>MP10/PM10</b>	Material particulado de 10 micras	Particulate matter less than 10 microns
<b>µm</b>	Micras	Micrometres
<b>O3</b>	Ozono	Ozone
<b>SO2</b>	Dióxido de azufre	Sulfur dioxide
<b>CO</b>	Monóxido de carbono	Carbon monoxide
<b>NO2</b>	Dióxido de nitrógeno	Nitrogen dioxide
<b>CH4</b>	Metano	Methane
<b>HFC</b>	Hidrofluorocarbonos	Hydrofluorocarbons
<b>BC</b>	Carbono negro	Black carbon
<b>COV/VOC</b>	Compuestos orgánicos volátiles	Volatile organic compounds
<b>ICA/AQI</b>	Índice de contaminación del aire	Air quality index
<b>GEI/GHG</b>	Gases de efecto invernadero	Greenhouse gases

# Introduction

This booklet provides key information for understanding and exploring the main concepts relating to air quality, in particular the causes, effects and impacts of air pollution and the actions in favour of clean air that you can take as a young person or adolescent.

Many of the concepts that we are going to cover correspond to guidelines provided by the World Health Organization (WHO), which have been rewritten in simpler language. Other concepts are taken from official documents of the United Nations and other organizations. You can always consult the main source documents for more details or additional information about the concepts in this booklet.



Let's start by getting to know the state of air quality around the world, with a specific focus on Latin America and the Caribbean. We will cover some basic concepts that will allow us to understand the problems surrounding air pollution and identify ways to act.



Later, we will discuss the relationship between air quality and climate change and look at their commonalities and differences.



Next, we will learn about the effects of air pollution on our health and some tools we can use to measure it. We will look in more depth at air quality management and the actors involved, as well as essential approaches for understanding air pollution.



Finally, we will propose concrete actions to inspire you to take action for clean air.

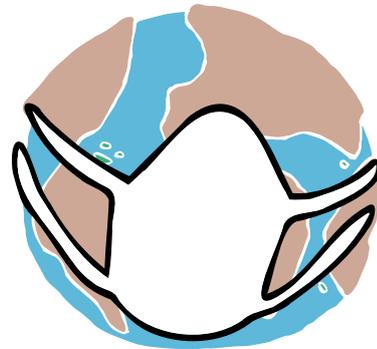
At the end of the booklet, you will find an alphabetical index to consult if you want to know more about a particular concept.

# Air quality around the world



In this section we will look at the state of air quality around the world. This will give us a picture of the situation we are facing and what we want to change.

We begin by presenting some important facts that will help us understand the problem.



Over ninety per cent of the world's population lives in places where air pollution levels exceed the maximum exposure limits recommended by WHO to avoid serious consequences for human health<sup>1</sup>.

Throughout the world, 600,000 children under the age of 5 years die from air pollution every year. In other words, among children under 5 years of age, 1 in 10 deaths is caused by air pollution.

Nearly 7 million premature deaths across the world were attributable to air pollution in 2016. Of these deaths, 91 per cent occurred in low- and middle-income countries<sup>2</sup>.



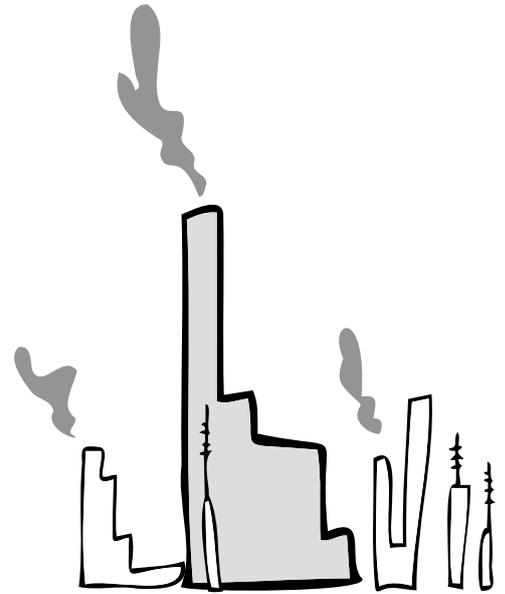
At the global level, we can see that air pollution has decreased in recent decades. In 1990, air pollution caused the deaths of more than 100 people per 100,000 population, while in 2017, the figure was about 60 people per 100,000 population<sup>5</sup>. This decrease is a result of multiple global efforts to reduce and control air pollution<sup>6</sup>. However, air pollution increased by 8 per cent between 2008 and 2013<sup>7</sup>. According to some estimates, the number of child deaths due to pollution in cities could rise by 50 per cent by 2050, as this pollution has a harmful effect on children's health and development.

Worldwide, 93 per cent of children under 15 years of age breathe polluted air, which affects their health and quality of life<sup>3</sup>.

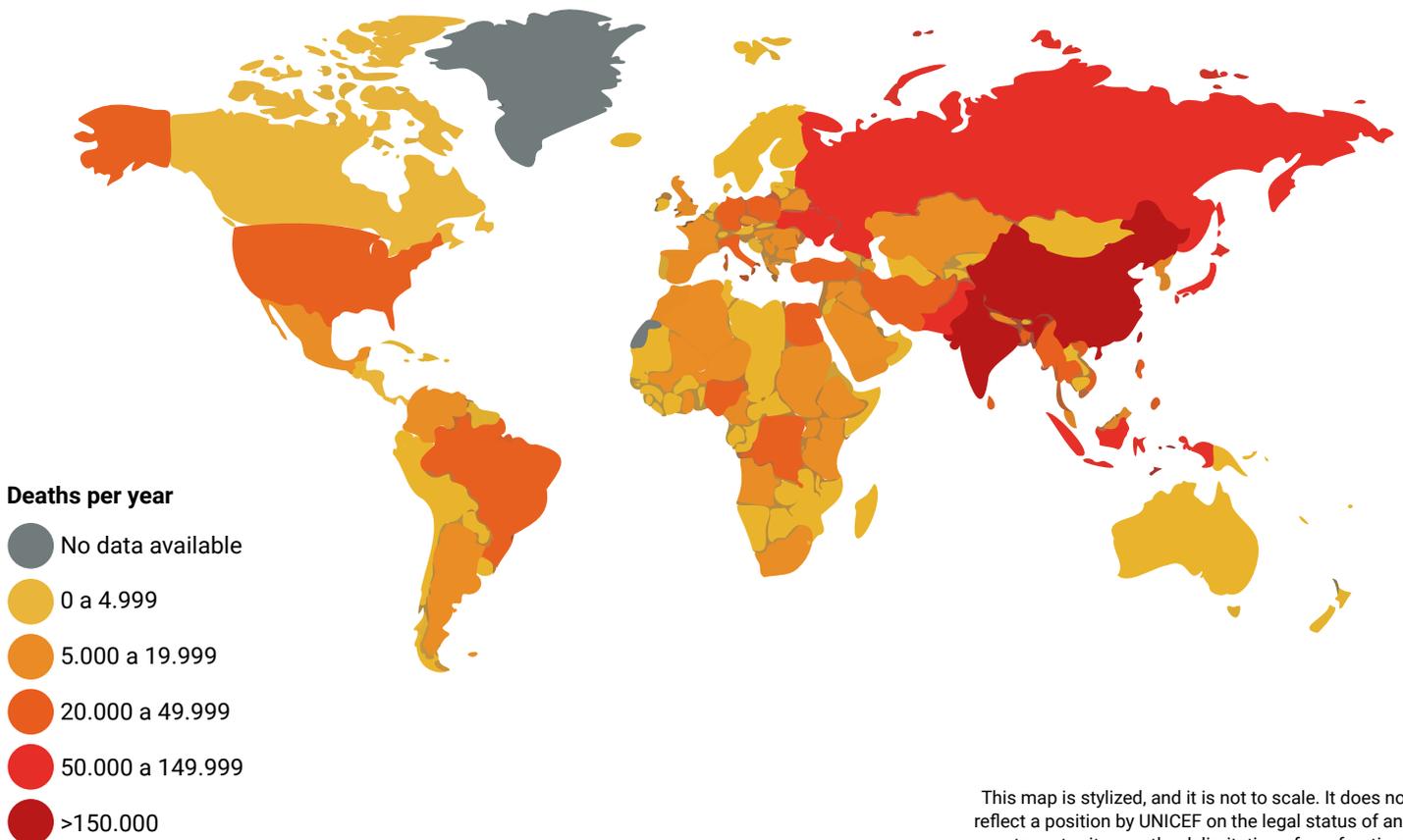
Worldwide, 1 billion children under the age of 15 are exposed to high levels of air pollution in their homes, mainly due to the use of firewood or coal for cooking and heating<sup>4</sup>.

## So, what is the state of air quality around the world?

This map shows the number of deaths attributable to air pollution worldwide in 2016. The colours get darker as the numbers get higher: from less than 5,000 deaths per year, numbers rise to more than 150,000 deaths per year. The places where no data is available are shown in grey.



Deaths attributable to air pollution



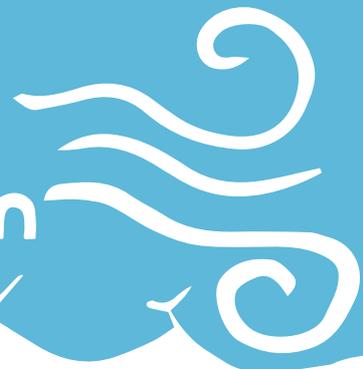
**Deaths per year**

- No data available
- 0 a 4.999
- 5.000 a 19.999
- 20.000 a 49.999
- 50.000 a 149.999
- >150.000

This map is stylized, and it is not to scale. It does not reflect a position by UNICEF on the legal status of any country or territory or the delimitation of any frontiers.

Source: World Health Organization, 'Ambient (outdoor) air pollution', WHO, 2018, <[www.who.int/news-room/fact-sheets/detail/ambient-\(outdoor\)-air-quality-and-health](http://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health)>, accessed 26 June 2021.

# Air quality in Latin America and the Caribbean



With this context in mind, we will now look more closely at the state of air quality in our region. Here are some facts on the subject:

-  **Air pollution is the leading environmental risk to public health in the Americas** (Latin America and the Caribbean, the United States and Canada)<sup>8</sup>.
-  In Latin America and the Caribbean, 138.000 people die each year from air pollution<sup>9,10</sup>.
-  Young people, particularly children, are especially vulnerable. More than 130 million children in Latin America and the Caribbean live in cities where outdoor air pollution exceeds WHO air quality guidelines<sup>11</sup>.
-  More than 30 million children in Latin America and the Caribbean live in households where firewood or coal is used for cooking and heating.

Unfortunately, not all countries have taken appropriate action to deal with this situation. By 2016, only 77 cities in 17 countries in Latin America and the Caribbean had a system to measure air quality or an institute responsible for it. It has therefore been very difficult to obtain up-to-date data to implement efficient and effective evidence-based local solutions<sup>12, 13</sup>.



Here, we look at air pollution and related deaths per million people in [four countries in Latin America and the Caribbean](#). We selected the four countries in the region with the highest number of deaths per million people. In Annex 1 you can find this data for the different countries of Latin America and the Caribbean.

Country	Deaths (per million people)
Argentina	663
Peru	517
Brazil	489
Chile	449

Both in Latin America and the Caribbean and at the global level, air pollution is one of the main problems faced by children and youth.

# What is air pollution?



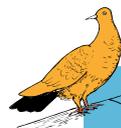
We have seen that the air quality is not good, both globally and in our region. It is a problem that needs to be addressed urgently. To mobilize for clean air, it is important to understand what we mean when we talk about air pollution. In this section we will discuss the types of pollution, the sources of emissions and the main pollutants.



The earth is surrounded by a gaseous layer called the **atmosphere**, which is composed almost entirely of nitrogen and oxygen, along with a number of trace gases such as argon, helium and the greenhouse gases (GHGs). In addition, the atmosphere contains water vapour, clouds and aerosols.

Greenhouse gases are the gaseous component of the atmosphere; they may be natural or anthropogenic (originating in human activity). GHGs absorb and emit radiation, which causes the greenhouse effect. The primary GHGs are water vapour, carbon dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), methane (CH<sub>4</sub>) and ozone (O<sub>3</sub>). There are also other anthropogenic GHGs, such as halocarbons<sup>14</sup>.

Aerosols are tiny particles, suspended in the atmosphere, that come from a variety of natural and anthropogenic sources. In the atmosphere, gaseous water vapour attaches itself to these tiny aerosol particles and, as a result, cloud droplets form.



What we call "air" is the mixture of gases that make up the atmosphere.

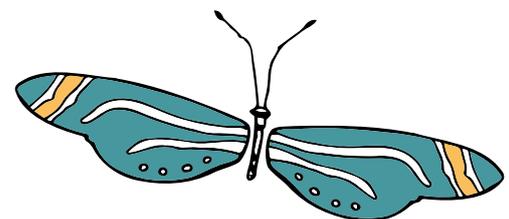
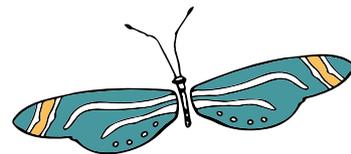
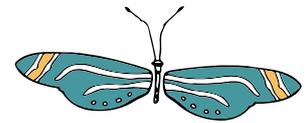
So, what is air pollution?

Generally, air is invisible, but, when it is very polluted, we can see a greyish haze. Air pollution refers to the presence of particles, gases or matter in the air that can reduce the air quality and generate risks or cause damage or serious nuisance to people and other living beings.

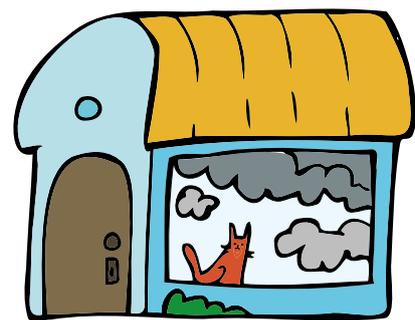
# Types of pollution



Air pollution is the result of multiple pollutants. These may be of **natural origin**, such as volcanic eruptions or sandstorms. They can also be **caused by the actions of people**, for example, when people burn waste (for example, agricultural residues, animal manure and kerosene) or fossil fuels (coal, charcoal, wood) to heat a space, cook or dispose of rubbish.

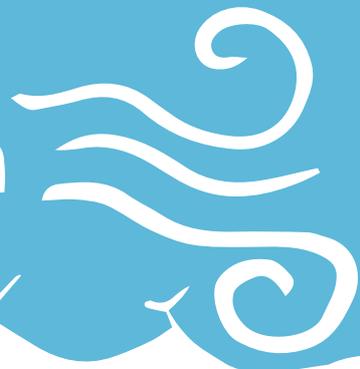


These pollutants can cause two types of pollution: **household pollution**, which is pollution that occurs in enclosed spaces, and **ambient air pollution**, which is pollution that occurs outdoors.



Fossil fuels are energy sources that are generated when plant and animal matter biodegrades. Their combustion generates GHGs. For example, oil, coal and natural gas are fossil fuels.

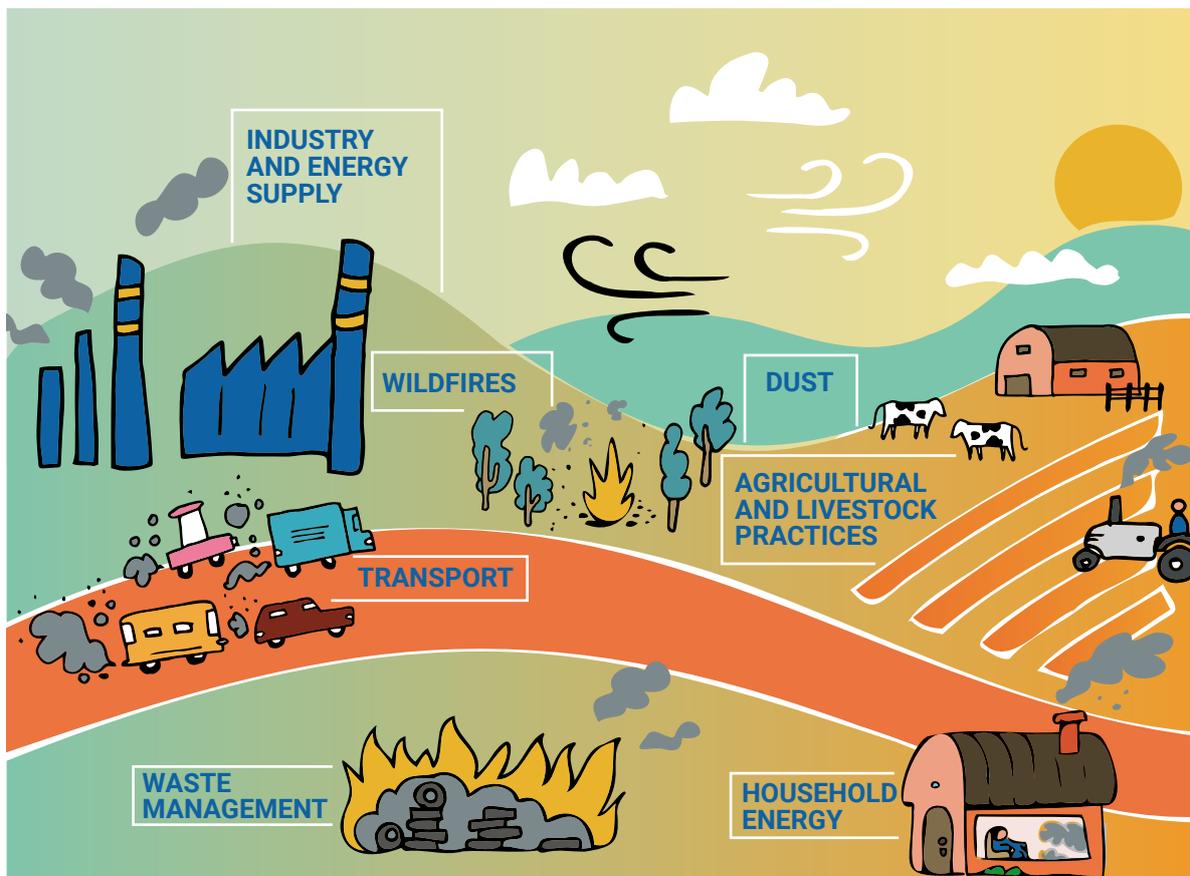
# Sources of air pollution



The main source of air pollution is the emissions produced by burning fossil fuels for transport, industrial processes or energy production, agricultural and livestock activities, burning forests and solid waste, and as a result of household energy use. The next figure shows some of these sources and how they interact with each other in urban and rural areas.

## Which are the sources of air pollution?

Air pollution affects urban and rural areas and is caused by multiple factors:



Countries cannot tackle air pollution on their own.  
It is a global problem that we must fight together.

Below, there are more details about these major sources of pollution.

### Industry

Industrial pollution is caused by factories and industry, such as brick kilns, manufacturing companies or power generators, releasing pollutants into the air. Although the source of this type of pollution is fixed, the pollutants released are then spread by wind and weather conditions.

### Transport

Transport can be by air, sea or land. Land transport may be individual (motorcycles, private cars, etc.), public (buses, articulated vehicles, taxis, trains, etc.) or cargo (trucks, tractors, heavy vehicles, etc.). Each of these modes of transport, except for electric vehicles, emits different pollutants: they all burn a type of fossil fuel (gasoline, gas, etc.) and, as a result, pollute the air with their emissions. In cities, in general, cargo transport and private vehicles are the biggest contributors to air pollution from the transport sector<sup>15</sup>.

### Livestock

This type of pollution mainly comes from the emission of methane and other GHGs, including CO<sub>2</sub>, into the atmosphere during the digestion process of some animals like cows and other ruminants.

### Agricultural practices

These produce pollution when there is an excessive and uncontrolled use of chemical and synthetic products (aerosols or pesticides, among others) that are harmful in the medium- and long-term to the health of the soil and to water and air quality<sup>16</sup>. These chemicals generate different types of pollutants that are released into the atmosphere. This type of pollution is also caused by the inappropriate use of practices that contribute to deforestation. For example, in many countries in Latin America and the Caribbean, the practice of agricultural burning is commonly used to clear land for replanting and to expand the agricultural boundary. As a result of these practices, about 50 per cent of methane in Latin America and the Caribbean originates in agriculture.

### Wildfires

Wildfires are powerful combustion processes that consume different types of vegetation of different sizes and in different states in a given geographical area. These fires can originate naturally or be caused by human action, in particular by poor agricultural practices or deforestation. Wildfires release different pollutants into the atmosphere as trees, grass and other elements of the forest burn. These emissions affect air quality and can travel for thousands of miles. For example, air quality in several cities in Colombia and Venezuela has been affected by air currents carrying pollutants generated by forest fires in the Amazon<sup>17</sup>.

### Dust

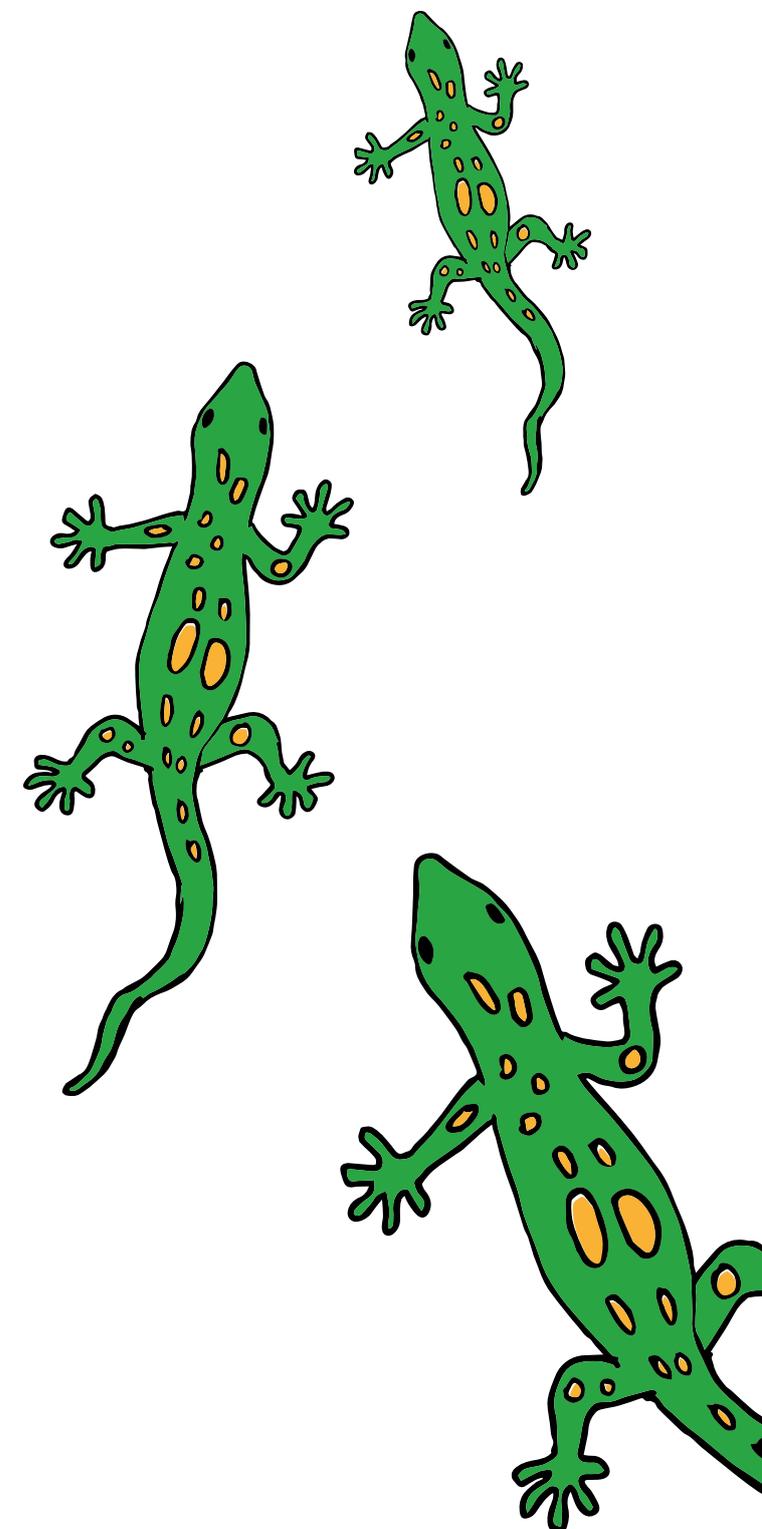
When we talk about natural dust, we are referring to a mixture of solid particles suspended in the atmosphere due to the action of the wind on arid or desert surfaces. The particles that form dust are very small, meaning they can travel anything from a few metres to thousands of kilometres, from their point of origin<sup>18</sup>. For example, every year, particulate matter from the Sahara Desert reaches Latin America and the Caribbean, affecting the air quality<sup>19</sup>.

### Household energy

Household energy is energy used for heating, cooling, or cooking activities. It can be generated by burning different fuels, using firewood or from other materials<sup>20</sup>. In many cases, these fuels and the use of inefficient technologies for cooking produce high levels of household air pollution as they release elements that are harmful to health into enclosed spaces<sup>21</sup>.

### Waste management

Waste management is a global problem. In low-income countries, more than 90 per cent of waste is dumped or burned in the open, disproportionately affecting the air breathed by the people living nearby (usually people in situations that make them vulnerable). Moreover, inadequate waste management is driving the transmission of disease and the burning of waste is contributing to an increase in respiratory problems<sup>22</sup>.



As the COVID-19 pandemic has forced people to stay indoors, more people have been affected by high levels of household pollution due to greater exposure to certain pollutants (for example, through increased use of firewood or coal for cooking and heating).

# Main pollutants



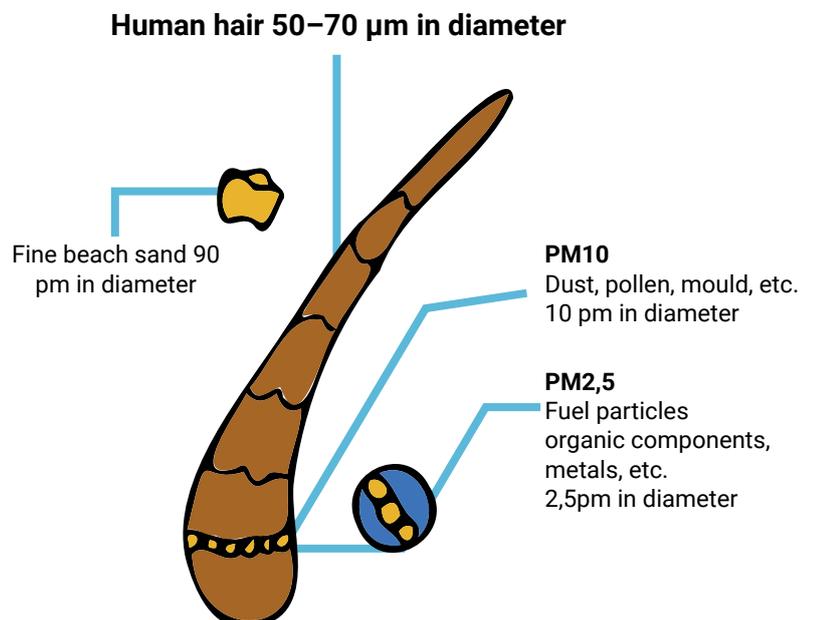
Now that we know the basic facts about air pollution, let's take a closer look at the main pollutants, their origins and the effect they have on our health. This information will allow us to think about main pollutants in our community. Identifying these pollutants will be key for guiding citizen mobilization actions.



## Particulate Matter (PM)

PM is the complex mixture of solid and liquid particles that are suspended in the air. PM is a good indicator of air quality, as it is the air pollutant with the greatest capacity to affect human health. It is therefore one of the most widely used indicators of air pollution in the world. Particles can be of different sizes and are measured in microns ( $\mu\text{m}$ ) in diameter. The most harmful to humans are PM10 (with a diameter of less than  $10\ \mu\text{m}$ ) and PM2.5 (with a diameter of less than  $2.5\ \mu\text{m}$ ).

A grain of sand measures approximately  $90\ \mu\text{m}$ , while a hair is between  $50$  and  $70\ \mu\text{m}$ . PM10 (dust, pollen, mould, etc.) is  $10\ \mu\text{m}$  in diameter, and PM2.5 (fuel particles, metal particles, etc.) is  $2.5\ \mu\text{m}$  in diameter. Imagine how small these particles are!



# Particulate matter (PM10 and PM2,5)

## Definition and origin

PM is the complex mixture of solid and liquid particles that are suspended in the air<sup>23</sup>.

Particles up to 10 µm in diameter (PM10) enter our airways and can settle in the lungs, where they can cause serious illnesses.

Particles of 2,5 µm in diameter (PM2,5) are considered the most harmful because their size means they can enter our bloodstream and can even reach the brain.

The main source of PM10 and PM2,5 emissions is combustion processes, in particular the combustion of coal and other fossil fuels.<sup>15</sup> This occurs, for example, in automobile engines, power plants and in the industrial sector.

## Effects

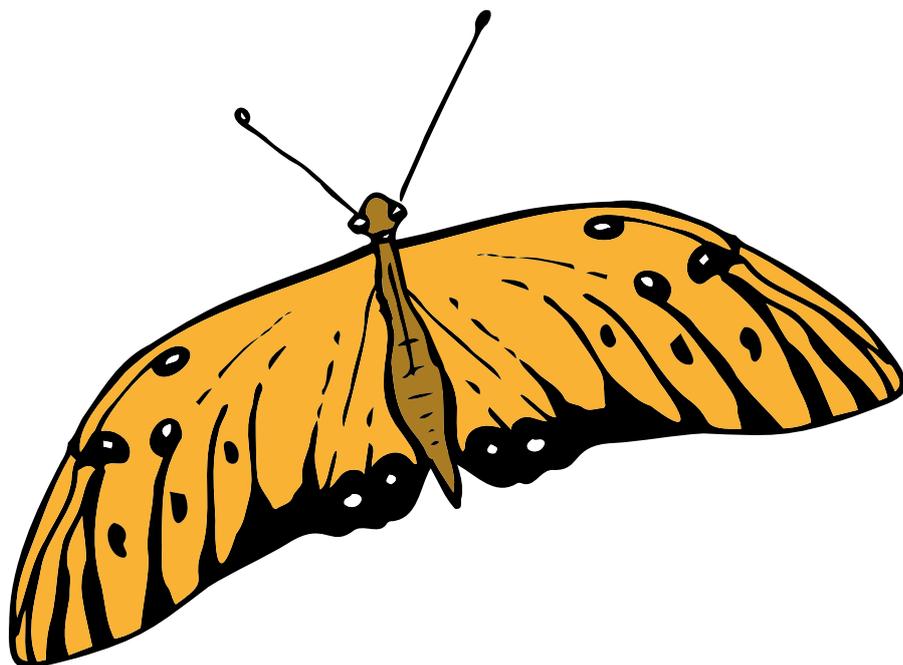
Exposure to these particles can affect both the lungs and the heart<sup>24</sup>.

Exposure can also cause the following adverse effects:

- premature death in people with heart or lung disease
- non-fatal heart attacks
- irregular heartbeats
- aggravated asthma
- reduced lung function
- increased respiratory symptoms, such as irritation of the airways, cough or shortness of breath.

Exposure to particle pollution mostly affects people with heart or lung disease, children and the elderly.

As PM2,5 is much more dangerous than PM10, the measurement and regulation of these smaller particles must be prioritized.



## Ozone (O<sub>3</sub>)

### Definition and origin

Ozone is a gas that forms both in the upper layer of the atmosphere (the stratosphere) and in the lower layer (the troposphere). In the stratosphere, ozone protects life on earth from harmful ultraviolet (UV) radiation from the sun. In the lower layer, however, it is an air pollutant that is harmful to human health and ecosystems.

It is also a major component of urban haze and the third leading cause of global warming, after methane and carbon dioxide. It remains in the atmosphere for anything from a few hours to several days.

Ozone is considered a secondary pollutant as it is not emitted directly but is produced by the reaction between sunlight and pollutants, such as those from vehicle or industry emissions. As a result, the highest ozone levels are recorded during periods of sunny weather<sup>25</sup>.

### Effects

Excessive ozone in the air can cause breathing problems, trigger asthma, reduce lung function and cause lung disease<sup>26</sup>. Recent studies have linked both brief and prolonged ozone exposure to premature death, heart attacks, strokes and possible reproductive and developmental disorders.

Ozone also reduces crop yields and the quality and productivity of plants.

## Sulfur dioxide (SO<sub>2</sub>)

### Definition and origin

SO<sub>2</sub> is a colourless gas with a strong smell. It is produced from the burning of fossil fuels (such as coal and diesel) and the smelting of mineral ores that contain sulfur<sup>27</sup>. This includes the fuels used for domestic heating, power generation and motor vehicles. There are also natural sources of SO<sub>2</sub>, such as volcanoes and geothermal activity.

### Effects

SO<sub>2</sub> can affect the respiratory system and the functions of the lungs, as well as causing eye irritation. Inflammation of the respiratory tract causes coughing, asthma and chronic bronchitis. It also makes people more prone to respiratory tract infections.

## Carbon monoxide (CO)

### Definition and origin

CO is an odourless, colourless gas that can cause death. It is produced when fuels like natural gas, propane gas, gasoline, oil, kerosene, wood or coal are burned<sup>28</sup>.

### Effects

Early signs of exposure to low concentrations of CO include mild headaches and shortness of breath during moderate exercise. Continued exposure can produce flu-like symptoms, including severe headaches, dizziness, tiredness, nausea, confusion, irritability and confused thinking, impaired memory and coordination.

When a person inhales CO, the toxic gas enters the bloodstream and prevents oxygen from entering the body, which can cause tissue damage and lead to death<sup>29</sup>.

## Nitrogen dioxide (NO<sub>2</sub>)

### Definition and origin

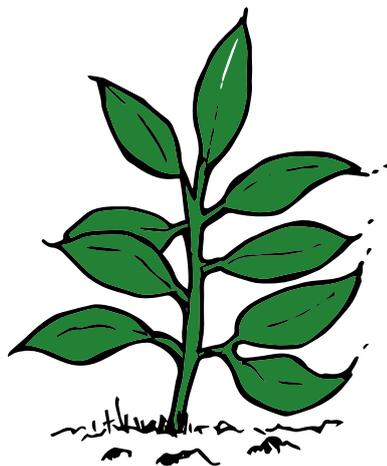
NO<sub>2</sub> is the main source of nitrate aerosols, which account for a large proportion of PM<sub>2,5</sub> and, in the presence of ultraviolet light, of ozone.

The main sources of anthropogenic NO<sub>2</sub> emissions are combustion processes (heating, power generation and engines in vehicles and ships).

### Effects

In high concentrations for short periods of time, it is a toxic gas that causes significant inflammation of the airways.

Similarly, symptoms of bronchitis in asthmatic children increase following prolonged exposure to NO<sub>2</sub>. Reduced lung function development is also linked to high concentrations of NO<sub>2</sub><sup>30</sup>.



## ☁ Volatile Organic Compounds (VOCs)

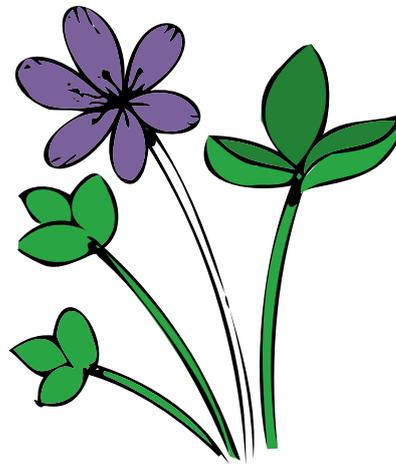
### Definition and origin

VOCs are emitted as gases from certain solids or liquids<sup>31</sup>. These have a high vapour pressure and low water solubility. Many VOCs are chemicals used in the manufacture of paints, pharmaceuticals and refrigerants. Examples of VOCs include paints and lacquers, cleaning supplies, pesticides, building materials and furniture, office equipment such as copiers and printers, craft materials including glues and adhesives, permanent markers and photographic solutions.

Concentrations of many VOCs are consistently higher indoors (up to 10 times higher) than outdoors.

### Effects

VOCs can have short- and long-term adverse effects on a person's health. They can cause breathing problems, eye and throat irritation, dizziness, etc. They can also cause psychiatric effects (irritability, difficulty concentrating, etc.). Moreover, in the long-term, they can damage the kidney, liver or central nervous system, or even have carcinogenic effects<sup>32</sup>.



## ☁ Methane (CH<sub>4</sub>)

### Definition and origin

CH<sub>4</sub> is a potent greenhouse gas that remains in the atmosphere for approximately 12 years. It has a direct influence on the climate and is known to play an important role in the creation of ozone.

In Latin America and the Caribbean, methane mainly originates from three sectors: agriculture (about 50 per cent); coal, oil and gas production and distribution (about 40 per cent); and waste management (about 10 per cent).

### Effects

High levels of methane can reduce the amount of oxygen breathed from the air<sup>33</sup>. This can result in mood changes, slurred speech, vision problems, memory loss, nausea, vomiting, facial flushing and headache. In severe cases, there may be changes in breathing and heart rate, balance problems, numbness and unconsciousness.

## Hydrofluorocarbons (HFC)

### Definition and origin

HFC are a group of industrial chemicals primarily used in refrigeration and air-conditioning systems, insulating foams and aerosol propellants but also to a lesser extent as solvents and for fire protection. They remain in the atmosphere for between 15 and 29 years.

### Effects

Inhaling HFC can cause problems such as respiratory distress, kidney and liver disease, headache, seizures and even disturb heart rhythms. In extreme cases, it can lead to suffocation and death<sup>34</sup>.

Skin contact with HFC can cause irritation or dermatitis, while ingestion can cause nausea, vomiting, diarrhoea and other digestive problems.

## Black carbon

### Definition and origin

Black carbon is a particle with the potential to contribute significantly to global warming. It remains in the atmosphere for up to two weeks<sup>35</sup>. Black carbon and other emissions produced by the combustion process contribute to the formation of particulate matter (PM<sub>2,5</sub>).

Black carbon is formed by the incomplete combustion of fossil fuels and biofuels. Transport and household burning of solid fuels for cooking and heating are responsible for three quarters of black carbon emissions in Latin America and the Caribbean.

Latin America and the Caribbean is responsible for less than 10 per cent of total global anthropogenic emissions of black carbon, excluding those from forest and savannah fires<sup>36</sup>. More than 60 per cent of black carbon emissions in the region originate in Brazil and Mexico.

### Effects

Black carbon has been linked to a variety of health impacts including premature death in adults with heart or lung disease, strokes, heart attacks, chronic respiratory diseases such as bronchitis, aggravated asthma and other cardiorespiratory symptoms.



Carbon monoxide, sulfur dioxide, ozone, methane, fluorocarbons and black carbon are also known as short-lived climate pollutants. They are categorized as “short-lived” because they remain in the atmosphere for a relatively short time, from a few days to a few decades. In contrast, carbon dioxide (CO<sub>2</sub>) can remain in the atmosphere for centuries. Nonetheless, short-lived climate pollutants contribute to climate change, degrade air quality and have serious impacts on the food security and health of the world’s most vulnerable populations.

# Effects of air pollution

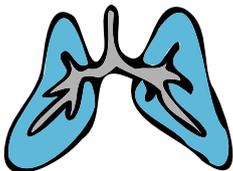
We have looked at air pollution and its causes and learned about one of the main problems facing society around the world. Next, we will learn about the effects of air pollution on humans and nature and analyse its consequences for our development.

Exposure to air pollution has been linked to a range of health problems and illnesses, often fatal. Air pollution is associated with:



## 1. Cardiovascular diseases.

These are diseases that affect the heart and blood vessels, such as atherosclerosis, heart attack, blood clots, ischaemia, stroke and fatal heart failure.



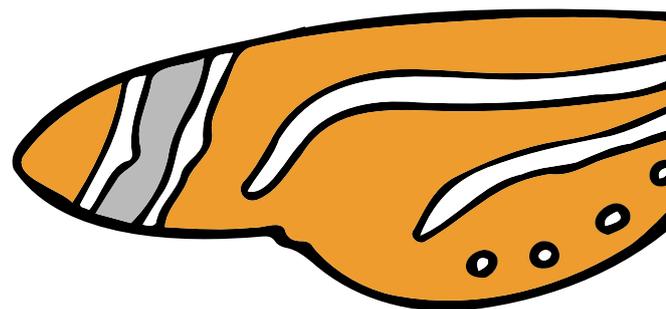
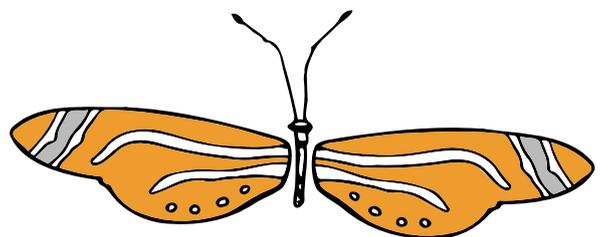
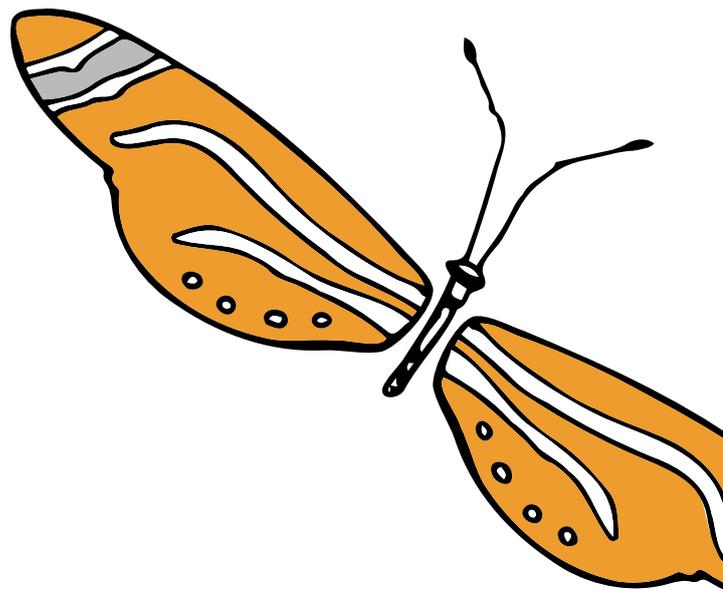
## 2. Respiratory diseases.

These are diseases that affect the airways, such as asthma, chronic obstructive pulmonary disease, respiratory infections and lung cancer.



## 3. Air pollution can reduce cognitive functions,

have a negative effect on our intelligence and impair our ability to learn and memorize. It can also increase levels of depression and anxiety.



Air pollution also has a major impact on children. In this context, children cannot be thought of as small adults. Their anatomical, cognitive, immunological, physiological, psychological and social characteristics make them more sensitive than adults to illness and pollution.

The next figure shows two factors that are very important when we talk about the effects of air pollution. The bottom part shows the effects on our health, including sexual, reproductive, respiratory, cognitive and cardiovascular health, as well as on morbidity. The top shows the effects in terms of our social and economic development. The horizontal axis shows the different stages of a person's life cycle: before birth, childhood, adolescence and adulthood.

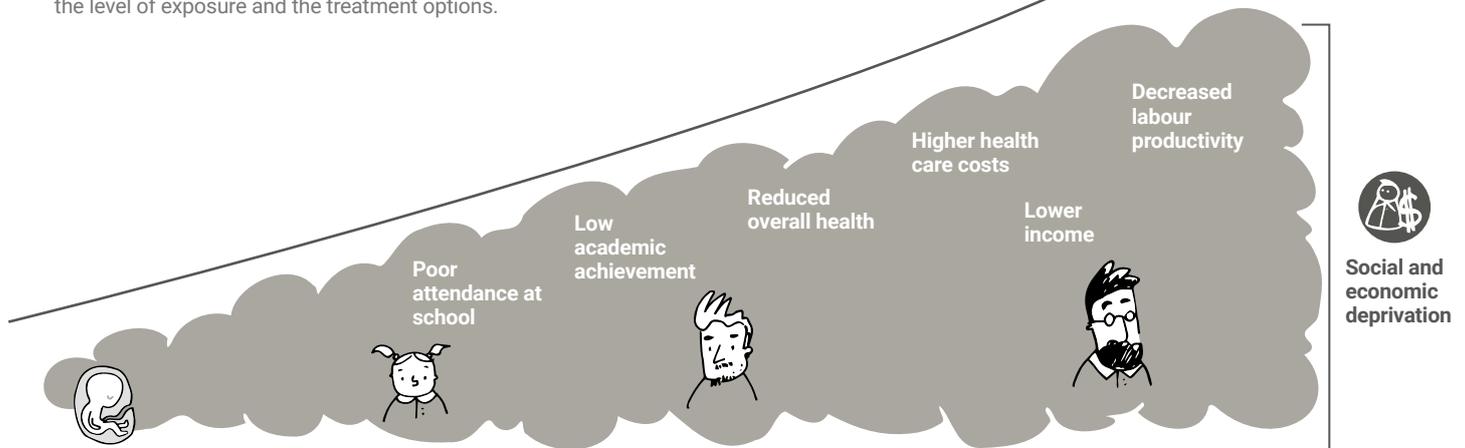


### EFFECTS OF AIR POLLUTION THROUGHOUT THE LIFE CYCLE

The cumulative effects of air pollution can cause socioeconomic deprivation that exacerbates poverty and inequality.

**Note:** These infographics are for illustrative purposes only. The impacts of air pollution on children vary considerably depending on the context, the level of exposure and the treatment options.

Increased risk of: poverty, inequality, premature death



Before birth	Childhood	Adolescence	Adulthood
Low birth weight			
Preterm birth			
Stillbirth			
	Airway inflammation		
	Cough, shortness of breath		
	Pneumonia and asthma		
			COPD and Lung cancer
Developmental delay			
			Cardiovascular disease
			Hypertension
		Type 2 diabetes	
	Reduced immune response		

As the figure shows, air pollution affects all stages of the life cycle, although the period before birth and early childhood are particularly vulnerable phases. Before childbirth, a pregnant person's exposure to pollutants can affect the health of the fetus and lead to conditions or illnesses that can last a lifetime. Significant exposure to air pollution during pregnancy can even result in babies being born early (preterm birth) or delays in the development of the brain. Women and other pregnant people are also at increased risk of heart or respiratory disease when exposed to pollutants.



Air pollutants inhaled during pregnancy can cross the placenta and affect the developing brain of the fetus. An adverse environment during embryonic development can lead to premature birth, result in low birth weight and increase the risk of developing lifelong illness. An adverse environment during the first 1,000 days of life can also increase this risk of lasting illness.



If the air is polluted, children absorb more pollutants than adults. Children living in polluted environments can experience a reduction in lung capacity of up to 20 per cent. The effect is similar to growing up exposed to second-hand cigarette smoke at home<sup>37</sup>.



Children are at a unique stage of physiological development in which their lungs are still growing. They breathe faster and take in more air with each breath than adults do.

Moreover, as can be seen in the upper section of the figure, air pollution also directly affects social and economic development. Air pollution can lead to various illnesses and problems during childhood that affect physiological, cognitive and emotional development, causing children to perform worse at school and even lowering their attendance, limiting how much they learn.

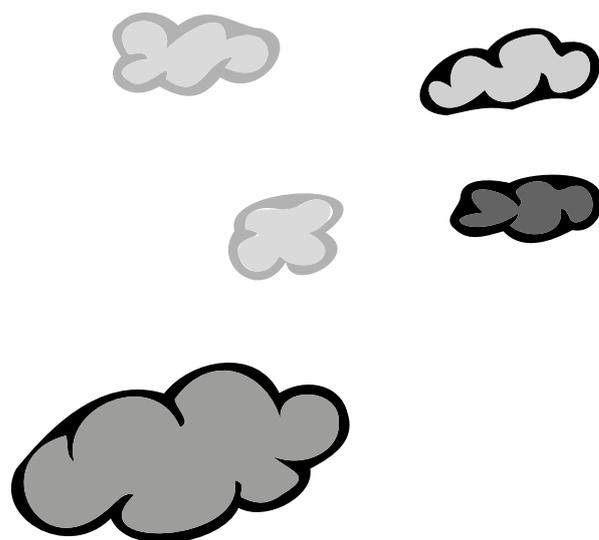
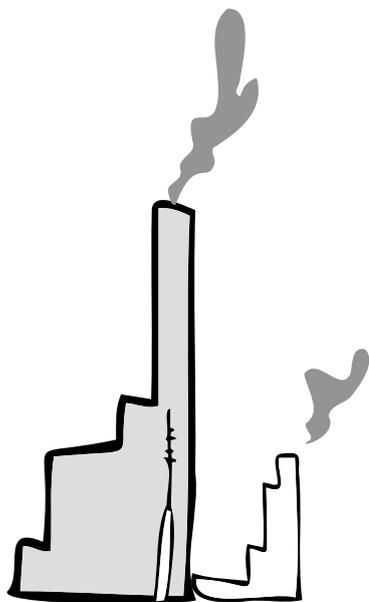
Moreover, as people's health deteriorates, their health expenses increase, affecting the family economy. States also face rising costs to fund the health system. At the same time, the productive capacity of adults is reduced, which limits their chances of finding employment. All this means that, in the long term, the risk that these people and their families live in conditions of poverty and inequity will increase. In many cases this combination of factors will lead to premature death.

# Measuring air pollution

This section deals with how air pollution is measured. We explain some key concepts about what is measured and the different classifications that are available.

Air pollution is measured using standards established at the international level. WHO has defined thresholds for exposure to air pollution, specifically for exposure to particulate matter<sup>38</sup>. This initiative has made it possible to standardize and guide the development of public policies to combat air pollution in different countries. The defined limits for exposure to PM<sub>2,5</sub> and PM<sub>10</sub> are\* :

- **PM 2,5:** 10 µg/m<sup>3</sup>, annual mean, and 25 µg/m<sup>3</sup>, 24-hour mean.
- **PM 10:** 20 µg/m<sup>3</sup>, annual mean, and 50 µg/m<sup>3</sup>, 24-hour mean.



For example, in cities such as Bogotá, Colombia, before the COVID-19 pandemic, the standard mean for PM<sub>2,5</sub> on a normal day was 13.9 µg/m<sup>3</sup>, while for PM<sub>10</sub> it was 39.07 µg/m<sup>3</sup>. However, according to reports from the Bogotá Environment Secretariat, on the city's 'car-free day' in 2020, there was a 10 per cent reduction in PM<sub>10</sub> and a 2 per cent reduction in PM<sub>2,5</sub>, reducing the risks linked to daily exposure. We can suffer negative effects from pollution, regardless of whether we are exposed to it for a short or long period of time<sup>39, 40, 41</sup>.

\* Air quality measurements are typically reported in terms of daily or annual mean concentrations of particulate matter per cubic metre (m<sup>3</sup>) of air volume. Routine air quality measurements describe PM concentrations in terms of micrograms per cubic metre (µg/m<sup>3</sup>).

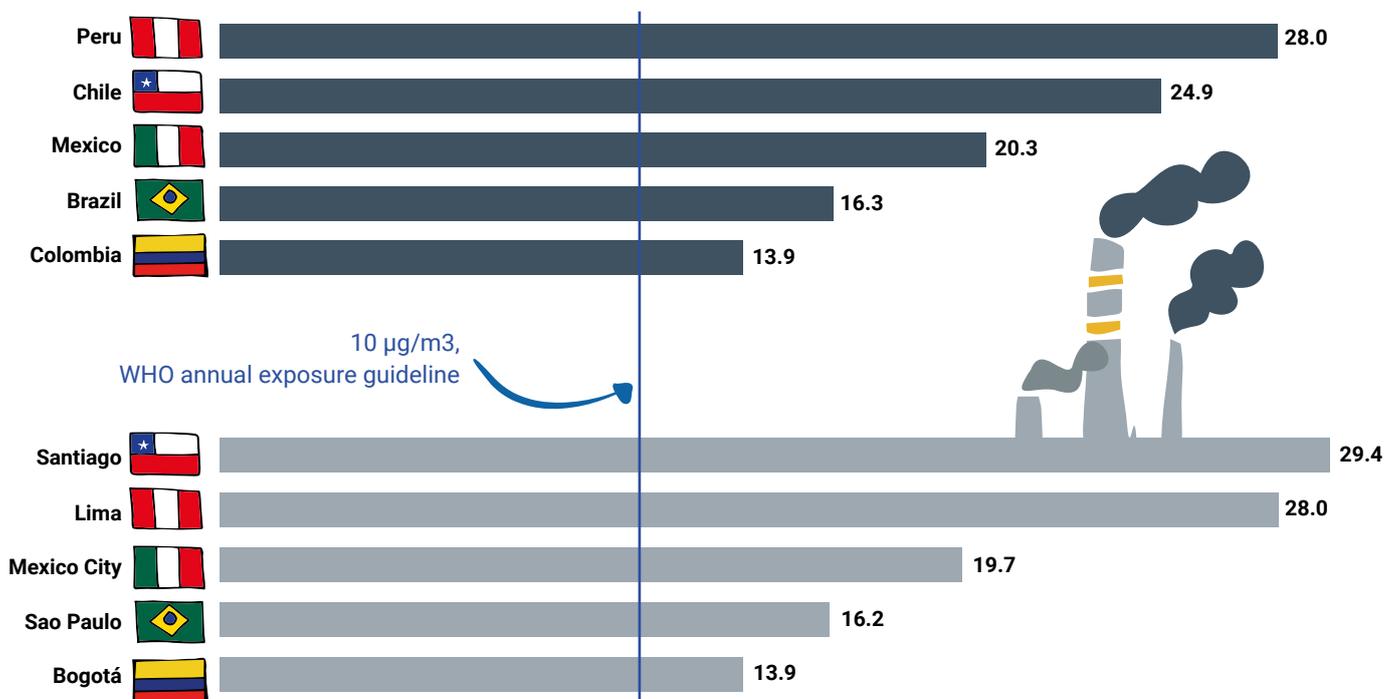
We are now going to look at the PM<sub>2,5</sub> levels for 2018 in some countries in Latin America and the Caribbean. A study shows that in 2018, Peru and Chile were among the countries with the highest levels of air pollution in the world. These two countries were ranked twenty-first and twenty-sixth in the world, respectively. Of the cities included in this study, Santiago de Chile was the most polluted capital city in Latin America and the Caribbean, followed by Lima and, in third place, Mexico City<sup>42</sup>.



The next figure shows levels of air pollution in Latin America. You can use the blue line, which represents the limits defined by WHO, as a reference. Many countries and cities exceed these limits, which means that urgent action is needed to improve air quality. At the end of this document, you will find a list of PM<sub>2,5</sub> pollution levels in the countries and capital cities of Latin America and the Caribbean.

### Air pollution in Latin America

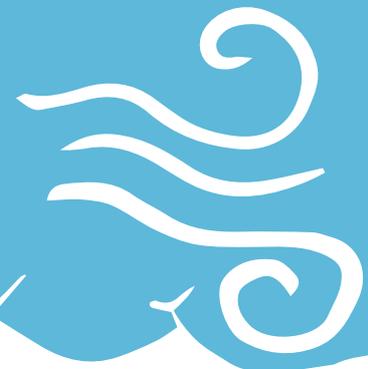
Latin American countries and cities with the highest concentration of particulate matter in the air\*



\*Particles equal to or less than 2.5 microns per cubic meter (PM 2.5 µg/m<sup>3</sup>).

Source: Pasquali Marina, '¿Dónde en América Latina está el aire más contaminado?', Statista, 2019, <<https://es.statista.com/grafico/18721/paises-y-ciudades-con-mayor-contaminacion-del-aire-enlatinoamerica/>>, accessed 13 June 2021.

# How do we measure air pollution?

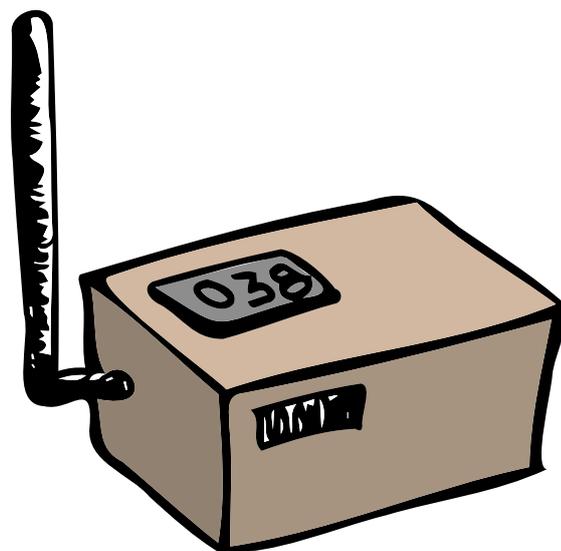


Several cities around the world have begun installing air quality sensors to measure how polluted the air is.

There are different types of sensors: fixed (that must be kept still when measuring air quality) and **mobile** (that can measure air quality even when moving). They can be large monitoring stations or low-cost sensors that you can set up yourself.

There are also satellite sensors: for example, the United States National Aeronautics and Space Administration, better known as NASA, has a fleet of satellites that observe our planet's oceans, biosphere and atmosphere. Several of these satellites have instruments that observe air pollutants around the world.

You can learn more about them [here](#).



Mobile air quality sensors



All these sensors report data that can be classified according to the Air Quality Index so we can determine the amount particulate matter in the air we breathe. If the Air Quality Index is high, it means there is more particulate matter in the air. For each level of pollution there is an associated colour that allows you to quickly understand the meaning of the values. At the local level, cities may use a different scale; however, the Air Quality Index is a good starting point for understanding the state of air quality.

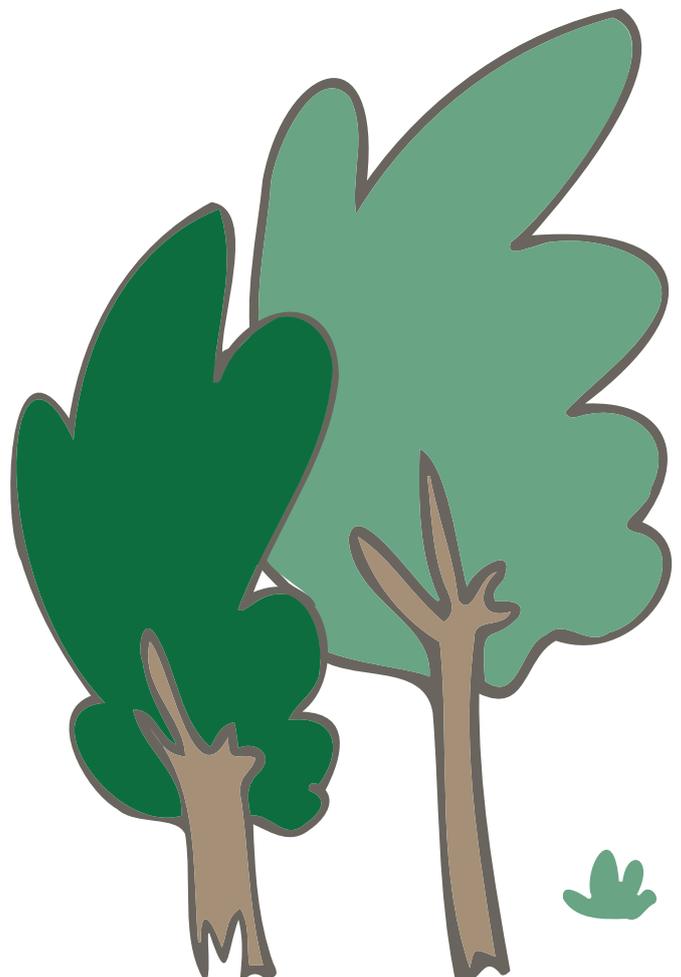
The levels are as follows:

Air Quality Index	Colour	What does it mean?
0-50		Air quality is good
51-100		Air quality is moderate
101-150		The air is harmful to the health of children, the elderly, pregnant people and sick people
151-200		The air is harmful to everyone's health
201-300		The air is very harmful to everyone's health
301-500		The air is hazardous to everyone's health

The Air Quality Index allows us to check, in a quick and visual manner, the state of air quality in our city. In fact, in several cities in Latin America and the Caribbean, people are in the habit of checking the Air Quality Index before going out to do physical activity in public spaces.



Measuring air pollution allows us to learn more about possible solutions and to take concrete actions to breathe cleaner air. If you want to find out about the state of air quality in your community, take a look at the UNICEF country [dashboard](#).



# Air quality management



Now that you understand air quality and air pollution, its causes and effects, let's look at air quality management, including the actors, their roles and the essential approaches we should promote.

The question often arises of who is responsible for improving air quality and how it links to other issues, such as climate change and poverty. In this section, we are going to cover some important information that you'll need to answer these questions and to participate meaningfully in air quality management.

Air quality management can be defined as **shared responsibility across different actors in society** with a view to improving air quality<sup>43</sup>. It works on the principle of creating synergy between all the social actors that have an impact on air pollution at the local level.

Air quality management is based on **citizen participation**. This means generating an open discussion, to which people can contribute in order to improve air quality and secure a healthy environment for all.



The right to a healthy environment is enshrined in the constitutions of at least 100 countries around the world. This commitment includes our right to breathe clean air, access to clean water, healthy food, a stable climate, thriving biodiversity and healthy ecosystems.

Many decision-making processes take place at the national level or the subnational level (at the level of a country's territorial divisions), especially when these involve creating programmes, public policies and regulations. Climate action, including action on air, is one example of a process that takes place at these levels.

Actors from various levels and subject areas are involved in the dialogue and negotiation processes on air quality, regardless of the decision maker's level of authority.



These national and subnational decision-making spaces are opportunities for public participation, which our youth organizations can take advantage of.



# Social actors and their roles in decision-making



Participation in environmental and climate decision-making processes is a human right and a child's right under the [Convention on the Rights of the Child](#). All people, including adolescents, youth and the organizations that represent them, have the right to participate in climate decision-making processes, including on air quality, and the state has a duty to ensure that this right can be exercised.



For more information, see the Climate Toolkit, entitled [What is climate governance?](#)

The following list of actors helps us understand who is involved in decisions about the quality of the air we breathe.



## Public sector

The public sector includes public institutions, ministries and other entities representing national, subnational or other state powers, as well as state-owned enterprises. These actors are responsible for developing public policies and regulations and for decision-making at the national and subnational levels. They include ministries of environment, transport, mining and energy. It is also important to recognize the role of local governments as the level of public administration closest to citizens. Their role is to make decisions that can be implemented locally and that align with climate action and air action, including with the objectives of international agreements such as the Paris Agreement.



To learn more about the Paris Agreement, [click here](#).



## Civil society

Civil society is made up of various types of organizations that represent the people, who have the right to participate in decision-making processes on the climate and air quality.

These organizations contribute to decision-making processes with comments, opinions and proposals based on their local, ancestral, traditional, technical and scientific knowledge and experience. By giving voice to the realities experienced by citizens and to their interests, rights and opinions, civil society organizations contextualize discussions and thus influence decision-making processes. Civil society also generates actions at the local level that help to improve the living conditions of communities, particularly through disseminating key information and reducing exposure to major pollutants. Organizations for children and young people are also part of civil society and have the same right to participate.



## Media

The media is a key ally for raising awareness, disseminating information and changing behaviour. It is important to note that there are different types of media. Media organizations can be international, national, local or community-based, and can take different forms (television, radio, print and digital). The media plays a key role in how people learn about air pollution and climate change. The behaviour of the media can help determine whether a society is aware of the reality, effects, causes and consequences of environmental pollution.



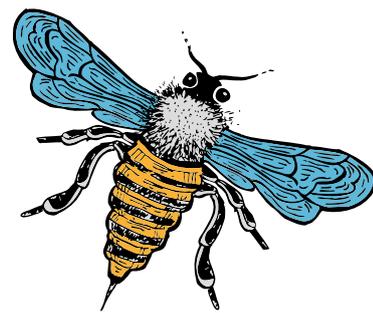
## Private sector

The private sector – as opposed to the public sector – is the part of the economy that seeks to generate profit through its activities and is not controlled by the state. It is one of the most polluting sectors, meaning the action it takes to reduce its emissions plays an important role in improving air quality. Measures that should be prioritized include changing production patterns to be more sustainable and environmentally friendly, modifying energy matrices and developing more sustainable and fairer distribution and marketing systems. Because of its responsibility for emissions and its potential to create technology that reduces pollutants, the private sector plays an essential role in action for air quality.



## Academia

This sector provides knowledge and research to enable informed decisions to be made based on scientific evidence. It also generates essential resources and provides spaces to strengthen education by creating new opportunities, building capacities and promoting the understanding of the changes needed, making the process more effective and efficient.



# International cooperation instruments

The international instruments, treaties and other commitments that states make to ensure cleaner air are a key part of air quality management. The different social actors play an important role in monitoring the implementation of these commitments.

Here are some of the main international cooperation instruments for our clean air movement.



1979

## Geneva Convention on Long-Range Transboundary Air Pollution

- Establishes a system that allows governments to work together to protect health and the environment from air pollution that is liable to affect several countries.
- [51 ratifications](#)

1985

## Vienna Convention for the Protection of the Ozone Layer

- The first international instrument that seeks to protect human health and the environment from adverse effects resulting from changes to the ozone layer that surrounds the planet.
- [196 signatories](#)

1987

## Montreal Protocol

- A protocol that sits under the Vienna Convention for the Protection of the Ozone Layer. Its purpose is to control the global production and consumption of ozone-depleting substances and aims to eliminate them entirely. Its implementation initially focused on chemicals with the greatest potential to affect the ozone layer.
- [197 ratifications](#)

1989

## Convention on the Rights of the Child

- Lists all the rights of children. These are the economic, social, cultural, civil and political rights of all children. Implementing the Convention is the duty of governments. The document also defines the obligations and responsibilities of other actors, such as parents, teachers, health professionals, researchers and children themselves. One of the articles of this convention concerns the protection of children's health specifically mentions the dangers and risks of environmental pollution.
- [195 ratifications](#)

1992

### United Nations Framework Convention on Climate Change

- Seeks to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous interference with the climate system. It establishes a general framework for intergovernmental efforts to tackle the challenges created by climate change.
- [195 signatories](#)

1992

### Kyoto Protocol

- Establishes binding greenhouse gas emission reduction targets for industrialized countries and recognizes that they are primarily responsible for the high levels of emissions currently in the atmosphere.
- [192 signatories](#)

2001

### Stockholm Convention on Persistent Organic Pollutants

- Aims to protect human health and the environment from persistent organic pollutants. The Convention requires its parties to take measures to eliminate or reduce the production, use, import, export and release of persistent organic pollutants into the environment. It includes provisions for public information, awareness and education, and participation in the development of implementation plans.
- [184 ratifications](#)

2015

### Paris Agreement

- The central objective of the Paris Agreement is to strengthen the global response to the threat of climate change. The agreement also aims to increase the ability of countries to adapt to the impacts of climate change and to ensure that funding flows are consistent with a low level of GHG emissions and a climate-resilient pathway.
- [195 signatories](#)



In 2015, a group of academics published a paper that showed that the ozone layer had recovered or at least that the rate of erosion in Antarctica had slowed down. In it, the authors showed that, without the Vienna Convention, the hole in the ozone layer would have grown by 40 per cent in 2013, with a greater loss in subpolar latitudes. Although these instruments may seem remote, when correctly applied they can guide the actions of the different actors to protect the environment and combat air pollution<sup>44,45</sup>. It is extremely important that, as we mobilize for clean air, we are familiar with these instruments and we ensure their provisions are respected. This is a good example of how is possible to change the course of history!

*See the [Paris Agreement for young people](#) for more information.*



# Essential approaches to air quality management



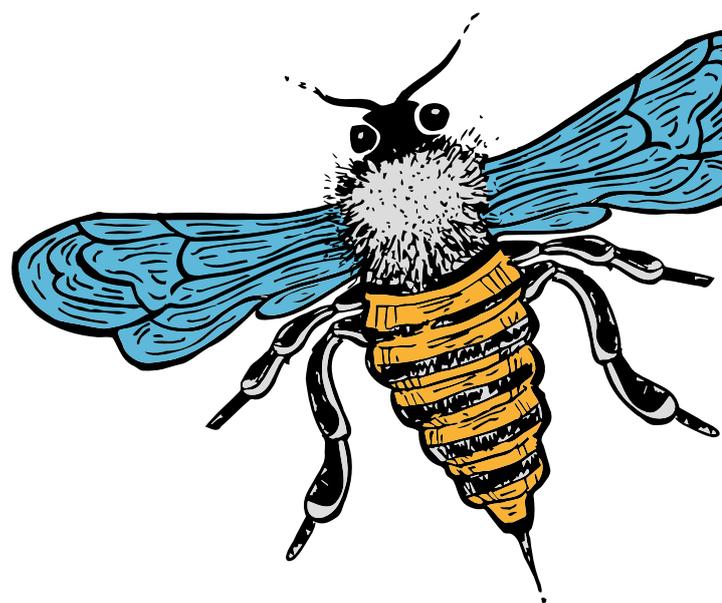
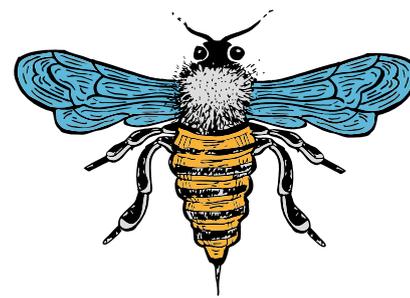
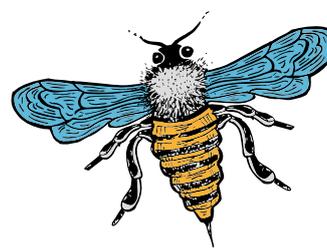
Now you are familiar with the main actors and the various existing instruments of international cooperation, we will take a closer look at air quality management in the light of different key issues. We will explore two essential approaches, emphasizing the different effects that air quality has on different groups. Our aim is to show you how the conversation about air quality is linked to debates about rights and environmental and social justice.



It is important to understand that air pollution does not affect all people equally. Some people suffer disproportionately from its effects and should be prioritized when taking action to improve air quality.

## 1 Human rights and children's rights approach

Action on air quality should consider an approach that prioritizes the rights of children and women and other pregnant people, due to their greater vulnerability to the impacts of air pollution. Today, air pollution – both household and ambient – is one of the leading causes of illness among children<sup>46</sup>. The development of illness and stunting also has consequences for school attendance rates and educational performance and is detrimental to overall health. When children's developmental capacities are limited, health costs are higher and productivity in the workplace is lower, affecting families' income. In the long term, these effects will increase the risk of poverty, inequality and premature death.



Air pollution (household and ambient) is considered a key factor in the **deaths of around 600,000 children under the age of 5 years each year worldwide**<sup>47</sup>. Every day, it threatens the present and future of millions of children around the world. This means that environmental pollution threatens human rights and children's rights: the right to education, the right to health and a healthy environment, and even the right to life.



The right to clean air is a human right. If we can't breathe clean air, we can't live a full and healthy life. This is why environmental pollution is one of the most pressing environmental challenges of our time and one that prevents us from fully enjoying our rights.

It is important that actions to improve air quality take into account the rights of children under the [Convention on the Rights of the Child](#), in particular Article 24.

## 2 Environmental, social, gender and intergenerational justice approach

Everyone can be exposed to air pollution. However, the major differences between population groups and geographic locations influence people's experience of environmental issues. These differences must be recognized when taking action for clean air.

## Environmental justice

Like other environmental issues, air pollution must be understood within the framework of environmental justice. Environmental injustice refers to the unfair distribution of environmental burdens or negative consequences of pollution (air, water or soil). These burdens or consequences are typically borne by vulnerable and disadvantaged populations. All around the world, there are communities living in places where there tend to be more pollutants.

Unfortunately, these communities often receive fewer resources from the state, leaving them exposed to a disproportionate amount of pollutants and without protection. It is important to note that environmental justice also seeks to ensure fair treatment for all people and to generate spaces in which everyone can participate meaningfully on issues related to environmental policies, regardless of their ethnicity, colour, origin, culture, education, disability or financial position<sup>48</sup>. This means it is essential that you include environmental justice as a fundamental concept when you mobilize for clean air.



When mobilizing for clean air, ask yourself: are the people most affected by this issue actually participating in this space?



## Social justice

Air pollution disproportionately affects poor people and communities. The vast majority of illnesses and premature deaths caused by air pollution affect people in low- and middle-income countries.

On the one hand, poverty forces people to use polluting fuels and devices for cooking and heating. These people are often less able to manage waste because poorer neighbourhoods or communities often lack adequate waste collection systems, so they are forced to burn rubbish, plastics, rubber and electronic devices, generating highly toxic chemicals that remain suspended in the air. Similarly, poorer households are also much less likely to have the resources to adequately ventilate, filter and cool air.

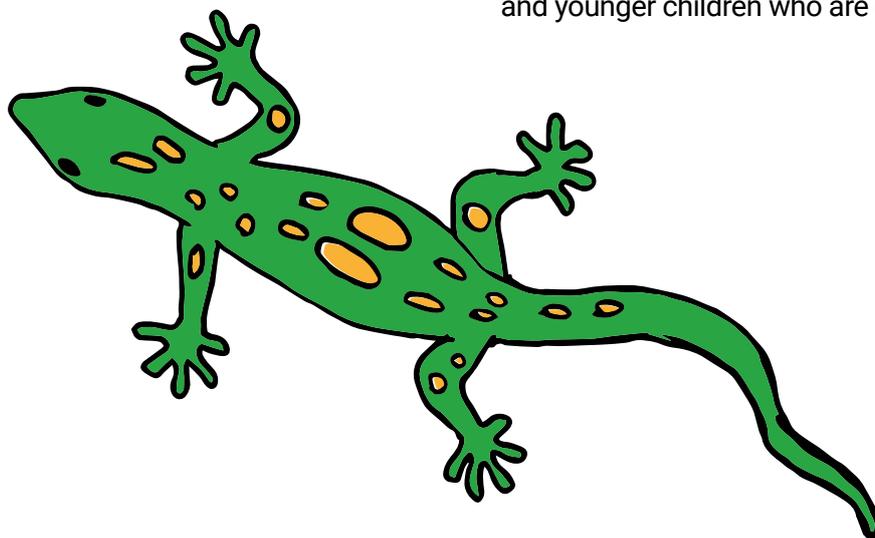
On the other hand, as mentioned above, people living in poverty may live in areas more affected by air pollution. Major sources of outdoor air pollution, including power plants, factories, brick kilns, incinerators and busy roads, tend to be closer to low-income areas. As a result, children from low-income families are more exposed to air pollutants, which also affects their resilience.

These situations are injustices that could be avoided if all people had access to the same opportunities and their fundamental human rights were guaranteed. This makes it imperative to understand air pollution is also a social justice issue. Social justice is based on equality of opportunity, human rights and equity. It is essential to ensure that every person can develop their full potential and that we can live in a peaceful society<sup>49</sup>. The lack of social justice means that the future prospects of children in different parts of the world are totally different.

## Gender justice

Gender also influences the impact of air pollution. Physiological factors, such as the reproductive cycle of women, as well as socially constructed norms such as the greater burden of care that falls on women and girls, mean that women and girls suffer more from the effects of air pollution than men.

For example, burning firewood to cook food generates a polluted environment in the space used for cooking and this has harmful effects on the health of those who breathe that air. Given the social division of labour, this particularly affects women and girls, who are much more exposed to these indoor toxic fumes, as well as the babies and younger children who are often in their care<sup>50</sup>.



Women's bodies also function as bioaccumulators of toxins. This means they absorb material from their surroundings more efficiently than it can be eliminated. This makes women particularly vulnerable to the effects of environmental deterioration, which can lead to changes in the menstrual cycle, fertility and reproductive risks, polycystic ovaries, early puberty, congenital malformations, obesity, fibromyalgia, chronic fatigue syndrome, multiple chemical sensitivity and changes in thyroid function<sup>51</sup>.

It is therefore extremely important that actions are based on a gender-based approach. Such an approach allows us to assess the different implications that a situation (in this case, air pollution) has on men and women. We must also ensure that these implications, as well as the concerns and experiences of women and men, are incorporated into proposals developed on the issue, paying special attention to women's vulnerability to air pollution<sup>52</sup>.

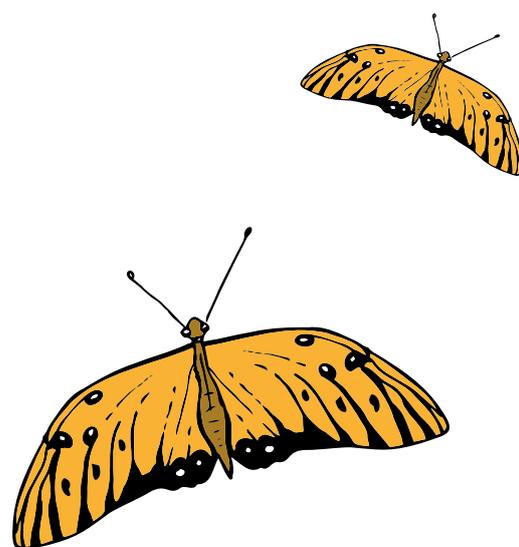
In this context, it is worth mentioning the concept of gender justice. Gender justice seeks to reduce the existing inequalities and inequities between men and women that increase the vulnerability of women in various situations, such as exposure to air pollution. Gender justice focuses on the needs, experiences and leadership of those most affected by discrimination and oppression. It therefore takes into account other elements that increase women's vulnerability (for example, recognizing differences between an adult woman and a girl)<sup>53, 54</sup>.

### Intergenerational justice

In the long term, the different levels of exposure of different population groups can be linked to inequities in development and have lasting effects on the quality of life of these individuals, as well as future generations.

Intergenerational justice means that new generations have the same opportunities to meet their needs as previous generations. When mobilizing for clean air, it is essential to consider the needs of present and future generations and to understand, in particular, that air pollution affects people in a negative way even before they are born, during the gestation period.

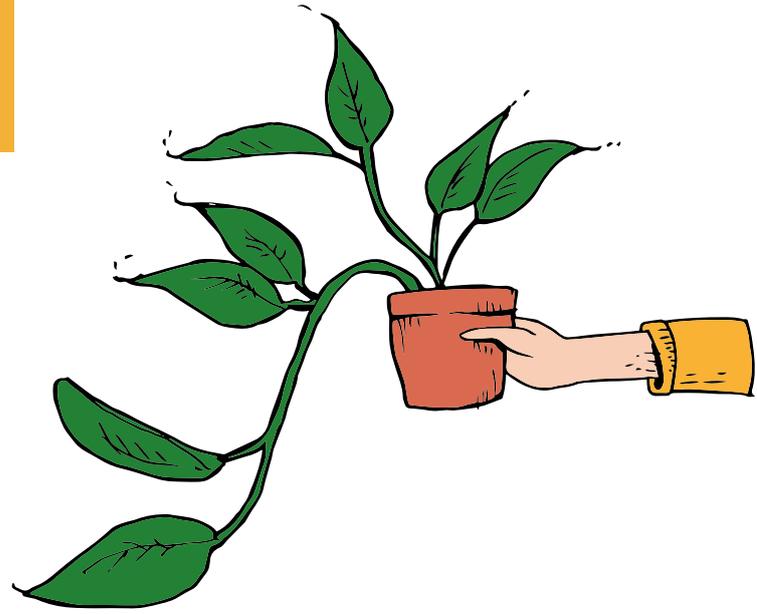
Action to curb and reverse air pollution must take into account the different perspectives of present and future generations. It is therefore necessary that children and adolescents are included and participate in these processes. Actions must also seek to reduce the impact of air pollution on new and future generations and ensure that they have the opportunity to develop fully.



# Air quality in the Sustainable Development Goals

When we discuss reducing poverty and promoting development, it is essential to talk about the United Nations Sustainable Development Goals (SDGs).

In September 2015, the United Nations General Assembly adopted the 2030 Agenda for Sustainable Development. This agenda contains 17 integrated goals with specific targets to be achieved by 2030. It includes issues such as eradicating poverty, climate action, education, gender equality, environmental protection and the design of our cities. To achieve these goals, everyone must do their part: governments, the private sector, civil society and people like you, leaving no one behind.



- 1. NO POVERTY
- 2. ZERO HUNGER
- 3. GOOD HEALTH AND WELL-BEING
- 4. QUALITY EDUCATION
- 5. GENDER EQUALITY
- 6. CLEAN WATER AND SANITATION
- 7. AFFORDABLE AND CLEAN ENERGY
- 8. DECENT WORK AND ECONOMIC GROWTH
- 9. INDUSTRY, INNOVATION AND INFRASTRUCTURE
- 10. REDUCED INEQUALITY
- 11. SUSTAINABLE CITIES AND COMMUNITIES
- 12. RESPONSIBLE CONSUMPTION AND PRODUCTION
- 13. CLIMATE ACTION
- 14. LIFE BELOW WATER
- 15. LIFE ON LAND
- 16. PEACE AND JUSTICE STRONG INSTITUTIONS
- 17. PARTNERSHIPS TO ACHIEVE THE GOAL

Improving air quality contributes to the entire 2030 Agenda, as it has an impact on good health and well-being, education, poverty eradication, decent work and the reduction of inequalities, among other issues. In addition, access to clean and affordable energy, which is key to enabling sustainable economic development, would protect the lives of millions of people who are affected by the use of fossil fuels for cooking and heating their homes<sup>55</sup>.

Similarly, policies that make cities sustainable can improve air quality. We should remember that actions to improve air quality, such as the transition to cleaner alternatives for transport, cooking and energy, also help us to tackle climate change<sup>56</sup>. Every step we take to beat air pollution brings us closer to achieving the SDGs.

*For more information, see the [United Nations Agenda for Sustainable Development](#).*

The principal references to air pollution in the 2030 Agenda appear in the following targets:



### 3. Good Health and Well-being

3.9 Substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.



### 7. Affordable and Clean Energy

7.1 Ensure universal access to affordable, reliable and modern energy services.



### 11. Sustainable Cities and Communities

11.6 Reduce the adverse environmental impact associated with inhabitants of cities, including by paying special attention to air quality and the management of municipal and other wastes.



### 13. Climate Action

13.2 Integrate climate change measures into national policies, strategies and planning.

As we have seen, air quality governance poses complex problems and requires the implementation of combined strategies to meet different objectives, as is the case with the SDGs.



# Relationship between climate change and air pollution

Climate change and air quality are closely related, but **they are not the same thing**. In this section we'll explain some commonalities and differences between air quality and climate change that will allow you to develop your climate activism in your community.

Climate change is the global climate variation of the earth. It can be caused by natural or anthropogenic processes. **Current** climate change is due to global warming, which is caused by the increase in GHG emissions as a result of human activities. One such activity is the burning of fossil fuels by the energy sector, which includes transport, power generation, construction and infrastructure.

*See the [Climate Glossary for Young People](#) for more information.*

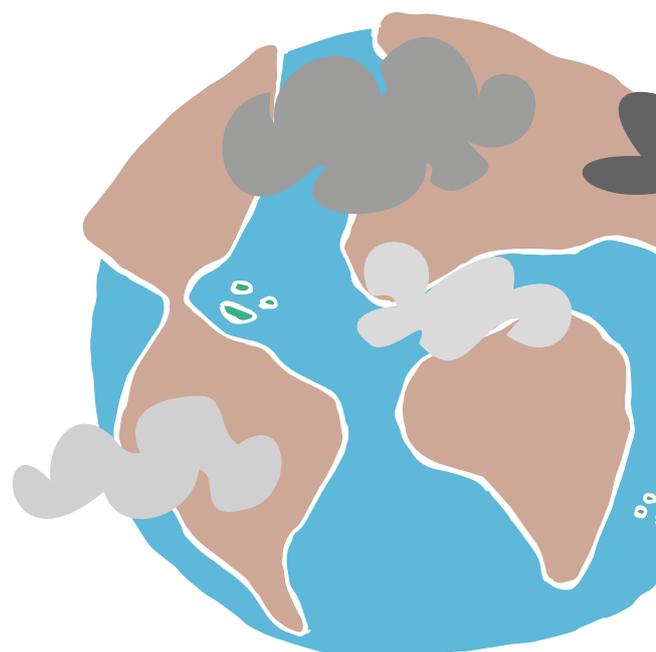
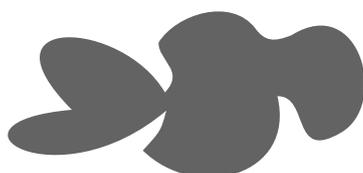
We will highlight three important relationships between climate change and air pollution:



The serious impact on society: both climate change and air pollution intensify inequalities and have negative effects on the health and development of people in general and children in particular.



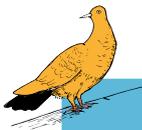
Climate change increases air pollution<sup>57</sup>. For example, heat waves combined with drought conditions can trigger intense forest fires that cause high levels of air pollution due to the burning of forests and hazardous chemicals, such as fossil fuels and plastics.



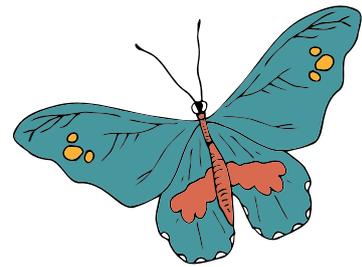


Air pollution and climate change have a common origin and can therefore have common solutions. Burning fossil fuels produces GHG emissions, which drive climate change. At the same time, pollutants, such as short-lived climate pollutants, are released, causing air pollution. Short-lived climate pollutants are responsible for more than 30 per cent of global warming<sup>58</sup>.

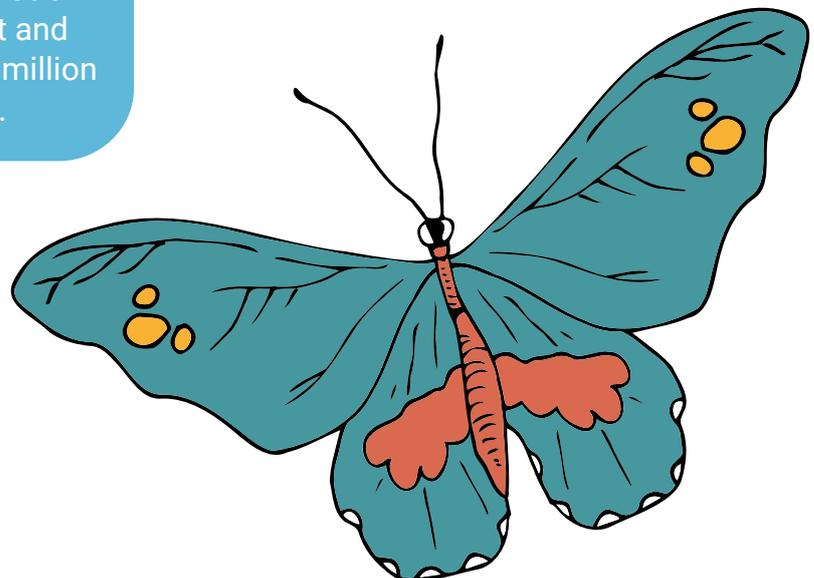
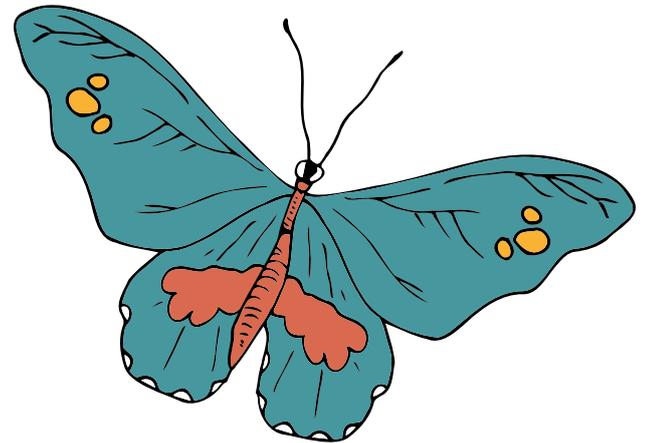
Effective control of short-lived climate pollutants could result in significant, near-term progress in the fight against climate change, allowing us more time to implement long-term solutions. It would also lead to improved air quality, fewer premature deaths from heart and respiratory diseases and increased crop yields.



In Latin America and the Caribbean, the implementation of measures to reduce emissions of black carbon, methane and hydrofluorocarbons by 2050 could reduce warming in the region by up to 0.9°C, reduce the mortality rate from air pollution by more than 20 per cent and prevent the loss of up to 4 million tons of staple crops.



Remember that (SCLPs) make reference to Short-Lived Climate Pollutants.



Although these phenomena are worsening, they have a common solution: **the just energy transition**. This is defined as the set of principles, processes and practices that develop economic and political power to transition from an extractive to a regenerative economy. This means moving to integrated cycles of production and consumption that have a lower environmental and social impact, and the end of burning fossil fuels.



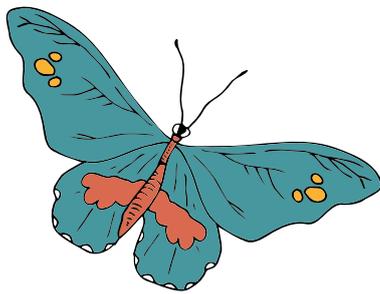
*Read more about the just transition in the [Climate Glossary for Young People](#).*

As the United Nations Secretary-General António Guterres has said, it is important that air quality management measures recognize the twofold opportunity at hand: to reduce pollution and mitigate climate change.

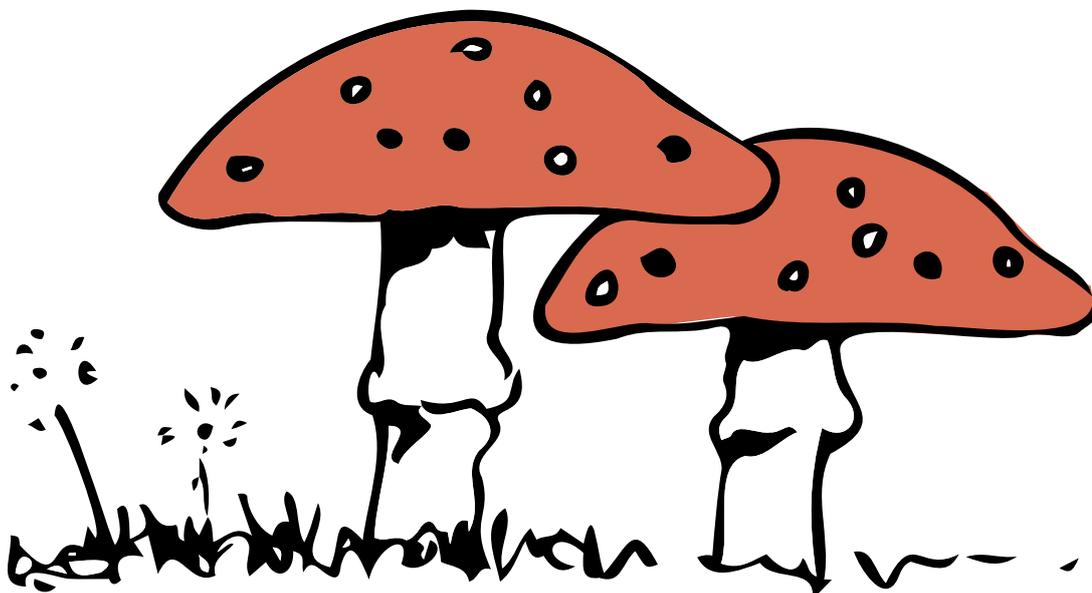


Mitigation actions involve reducing sources of GHG emissions or increasing carbon sinks (natural areas, systems, processes and even animals that absorb GHGs).

*See the [Climate Glossary for Young People](#) for more information*



For example, meeting the targets set by the Paris Agreement could save around 1 million lives a year, just by reducing air pollution. We have a lot of work ahead of us but it is possible to improve our environment and our health.



# Time to act: actions for clean air

Now that you have a better understanding of the state of air quality in Latin America and the Caribbean and around the world, as well as the effects of air pollution and key elements of air quality management, we will look at practical examples of steps you can take to mobilize for clean air.

This section is divided into five main actions: reducing air pollution; preventing and reducing exposure; monitoring and surveillance; education and awareness; participation, advocacy and policy improvement. Before you begin to mobilize, it is important to make sure that any action you take will not risk your safety.

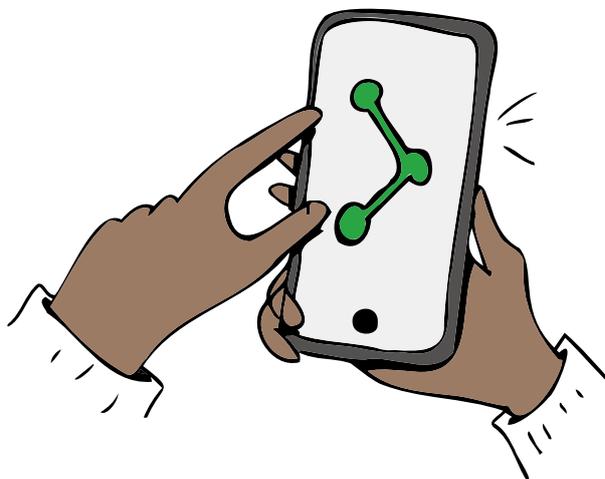


You'll find some tips in the booklet *Prepare to Take Action!*

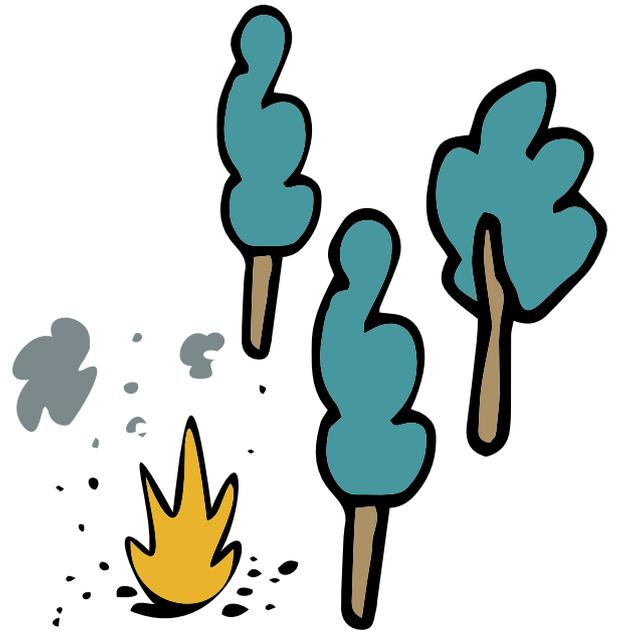
## Acciones concretas para actuar por un aire puro en América Latina y el Caribe

### Reducing air pollution

- ➔ **Know your carbon footprint and find out how you can reduce it.** The carbon footprint is an indicator that helps us to understand how much GHG we emit directly or indirectly as individuals. To mitigate your carbon footprint, you can use public transport, recycle, promote the use of renewable energy and make the planet a cleaner place. There are different calculators to measure our carbon footprint in the world, [here is an example](#) so you can see clearly what your footprint is.

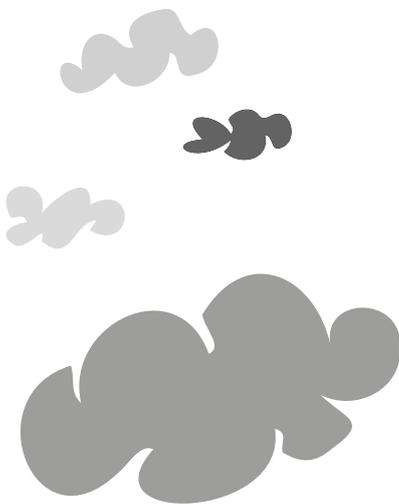


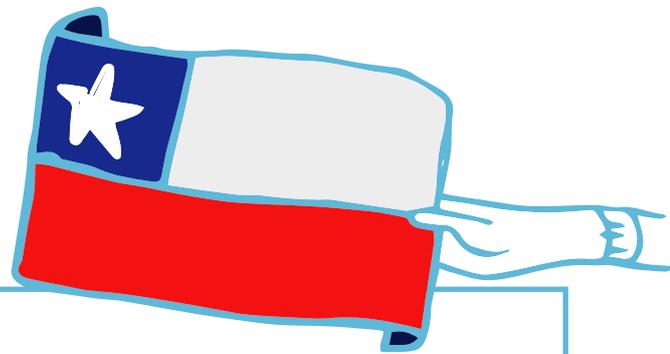
- ▶ **If you are travelling short distances, use a bicycle or try to walk.** For long distances, try to use public transport and, if you have no choice but to travel in a private motorized vehicle, share it with other people. If more people use different forms of sustainable transport, we will generate less pollutants.
- ▶ **Don't have bonfires or use open fires.** Forest fires can start with a small fire and cause serious damage to nature and to the health of people living in the surrounding area.
- ▶ **Be aware of your consumption.** It is important to find out about the impact that a product or brand has on air quality before buying. Having information will give you the tools to decide whether you want to avoid consuming or reduce your consumption of items that cause air pollution and environmental degradation. For example, consuming local products reduces the impact of transporting the products we buy. We should also avoid unnecessary single-use plastics, such as fruit trays packaged in plastic, that generate indestructible waste (which in many places is burned or thrown away, thus polluting the air or water sources, among other impacts). We can also avoid products linked to deforestation, such as meat or palm oil.



### Preventing and reducing exposure to air pollution

- ▶ **Make informed decisions to protect yourself from air pollution.** Remember to check, on a daily basis, the air quality information published by the environmental authorities of your town or city, or the Air Quality Index (which we looked at earlier) to reduce your exposure to air pollution. If pollution levels are very high, it is best to avoid outdoor activities such as playing, exercising or going for a walk.
- ▶ **Reduce the exposure of children and pregnant people to air pollution.** This may involve behavioural change in your home, neighbourhood or community, for example, in relation to cooking practices, burning of household waste and nutritional habits. When children have a healthy diet, they are more protected from air pollutants.
- ▶ **Identify mechanisms for reporting pollution hotspots in your country or community.** It is important that you know how to report pollution and that you know how to do so anonymously to ensure your safety. In some countries you need a photograph or video as evidence, but it is important that you do not expose yourself or put your life at risk to obtain this evidence. You can ask the authorities in your community or country for help.





### Preventing exposure to air pollution in my city

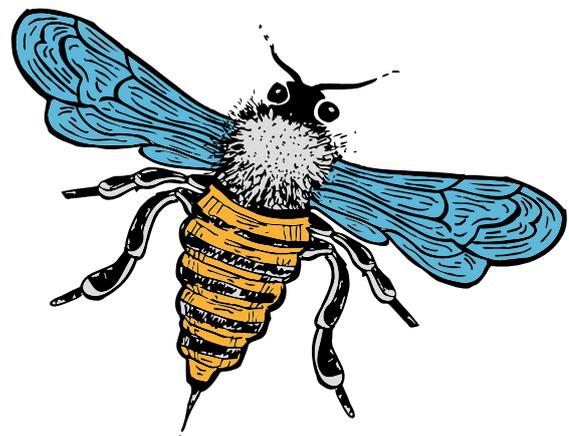
Hi, I'm Daniela Pellón and I'm from Coyhaique, a city in the southern part of Chile that has the highest rates of air pollution in Latin America and where more than 90 per cent of the population uses firewood as an energy source in their homes. In winter, poor air quality increases respiratory illnesses and prevents people from doing physical activity, which has increased rates of obesity in my city.

Through my work in the nursery and the Aiken Yemel kindergarten, I have been able to participate in the New Air for Early Childhood project, which involved installing an air quality monitor that measures the outdoor air that children breathe in the city in real time. We can all access this information through an application on our mobile phones and it has allowed us to plan better.

We have also been able to implement an action plan to achieve strategic objectives for environmental education and awareness. We call the plan For Air that Smells of Life, and it includes:

- awareness-raising workshops for families and the community, run by the New Air project with the support of the Coyhaique municipality.
- daily air quality alerts on the municipality's website to maximize the amount of time that children can exercise
- promotion in social networks of the AirVisual app for measuring air quality
- educational logos for cars in the city with the slogan 'If you stop the engine, keep it turned off for air that smells of life'.

Over the coming months, we hope to increase actions at the local level and evaluate the results of the measures taken. I am very excited to see how, through concrete actions, we are showing people the effects of air pollution on children, from a remote region in the southernmost country in the world.



## Air quality monitoring and surveillance

➔ **Regularly monitor air quality in indoor and outdoor spaces.** Data is very important for strengthening our activism for clean air. It allows us to discover and describe reality, meaning we can equip ourselves with arguments to advocate for change. How can we use data?

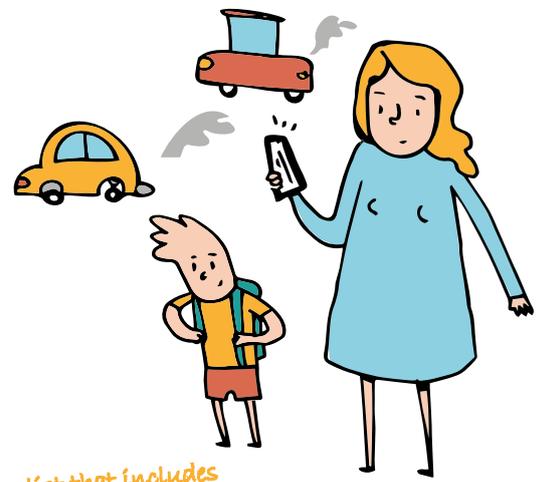
- **Research the data and information that are available:** There is a lot of data available today that you can use to understand air quality at a local, national or regional level.

For example, you can find data and information in the following places:

- > The Air Quality Index data portal.
- > Open data portals in your country or city, for example, cities such as [Medellín](#), [Mexico City](#) and [Santiago de Chile](#) have data portals.
- > Official reports generated by your government on environmental and air quality issues.
- > Climate and Clean Air Coalition.
- > World Health Organization (WHO).
- > World Bank data.
- > Google Scholar or other recognized sites – search for relevant research.

- **Ask for data:** after a while, people realize that the data being published is insufficient and that they need more. In some Latin American and Caribbean countries there is a right of access to public information, which allows us to request data. However, remember that we want to process those data (extract statistics, draw graphs, etc.), so we need the data in an open format ([discover the principles of open data](#)). Consequently, an important part of our role as activists who use data is to ask environmental authorities to publish open data.

*You can read this example from [Medellín](#) on how to request air quality data.*



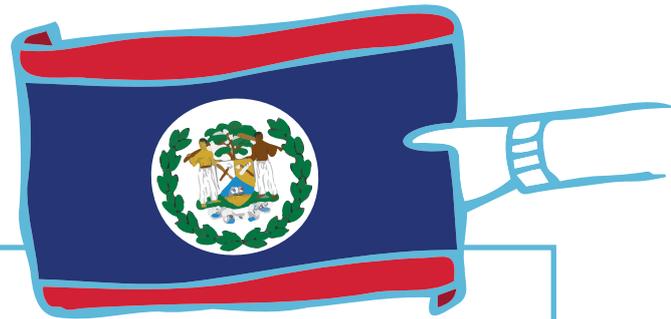
*You can consult the list that includes data on pollution levels and deaths per million inhabitants attributable to air pollution in Latin American and Caribbean countries.*

- **Create the data:** if there is no public data on the air quality of our community or territory, and if the environmental authorities are not monitoring air quality, then we can create data ourselves! By placing low-cost sensors in our homes, schools, neighbourhoods, health centres, etc., we can create data on the air quality of our environment.
- **Disseminate the data:** obtaining data, processing it and disseminating it in user-friendly formats is a very important step in our work as air activists. Mobilizing for clean air often involves learning and sharing these discoveries with the world.

- ➔ **Involve other young people in air quality monitoring and surveillance.** You can bring together groups of young people with similar interests and create a team of young people monitoring air quality.



It is important to monitor air quality in places where children are present, such as schools, health centres, playgrounds and kindergartens. If possible, involve students or the schools themselves in these monitoring exercises.

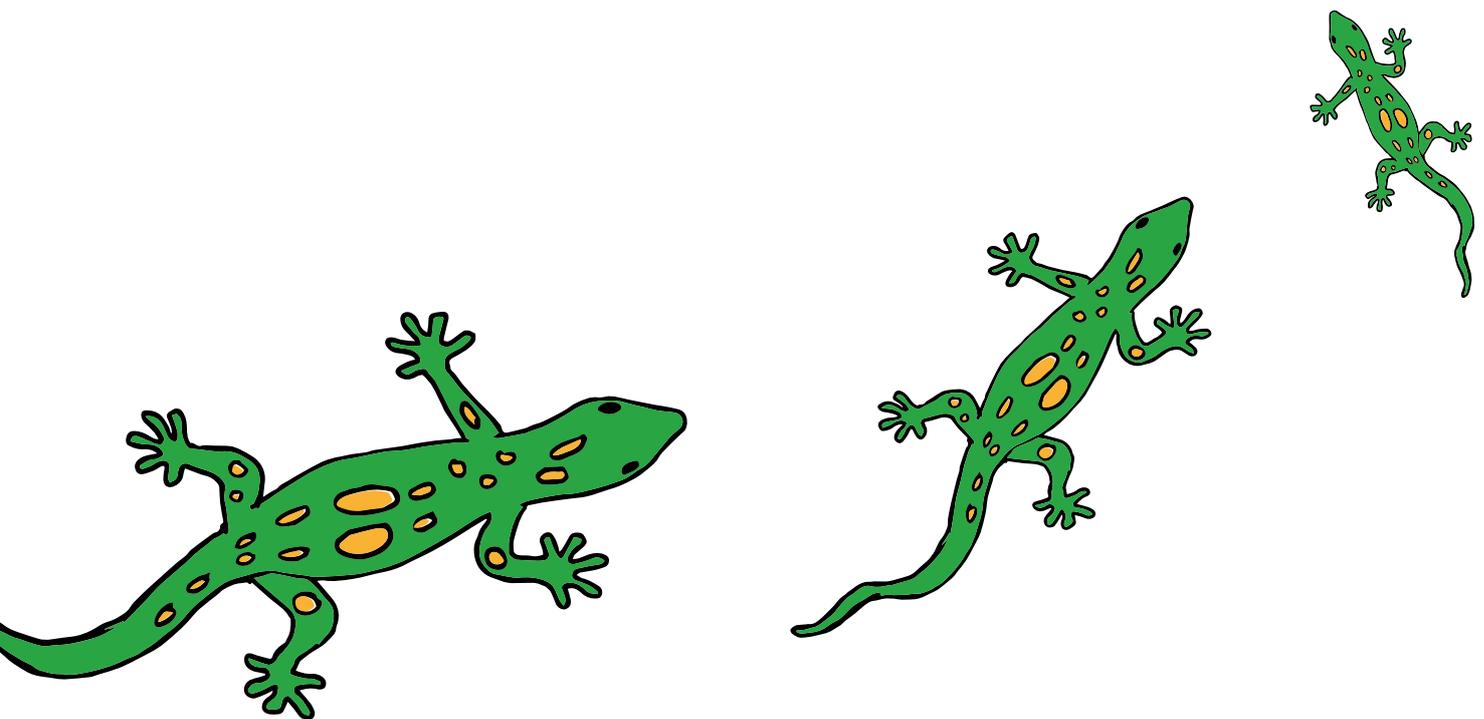


### Monitor home air quality to make informed decisions

My name is Ilana Cruz, and I am from Belize. The action I took part was the Air Quality Champions. This action aim to test out the air quality within our homes. We were given small monitors/sensors devices. These monitors were great in detecting air quality in different areas within the house whether it was in the kitchen, the bathroom or any rooms.

I had to keep an eye on these monitors, so I had to place them in different areas of my house, for at least a day and then record the air quality results. I had to face several challenges. In the kitchen, the smokes and emissions from the flames contributed to the very low air quality in that room.

The results of this experiment were very useful. It showed the air quality in every room and which room held the worst air quality and which room held the best air quality in my home. It allowed me to know which room I should stay less and which one I most likely to spend more time in. This allowed us to figure out which room we can pay attention in order to ensure better air quality.



## Education and awareness-raising

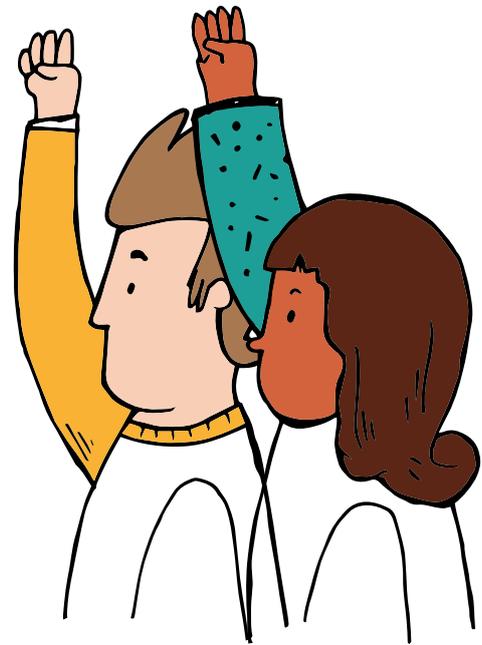
### ▶ **Share the knowledge with those close to you.**

You can tell your family, friends, classmates, or people in your community what you are learning about air quality and the risks of air pollution. Everyone can work together to find solutions that will help protect them from pollutants that are harmful to their health and contribute to improving air quality.

### ▶ **Express yourself.** Share information on social networks about air pollution and invite people to take action to combat it. You can also share your thoughts on air pollution by submitting an article to [Voices of Youth](#).

### ▶ **Start a movement to raise awareness of your cause** or to ask the authorities in your community or country to take stronger action to help combat air pollution. Here are some examples of mobilizing actions that you may find useful:

- **Awareness-raising on public transport.** Get on a bus or other form of public transport and tell commuters about air pollution using data that is real and impactful. You could bring some printouts to show them pictures.
- **Prove it.** Leave a medium-sized cotton ball on your street. Check the colour of the cotton ball after one day. Share images of the cotton ball on social media and invite people in your community to watch the experiment and talk about it.
- **Organize and/or participate in tree planting days in your city.** Trees help us filter out some pollutants and provide a barrier to reduce exposure. It is very important to protect the trees in your community or country.



### ▶ **Promote conversations that provide information about air pollution and/or that help to develop a citizens' agenda for the air in your city.** Here we share with you some citizen conversation methodologies that may be useful to you:

- **[Lunes de Ciudad \[City Mondays\]](#):** Events to which you invite experts, citizens and/or government officials to talk about a topic of interest, exchanging different perspectives on the same topic.
- **[Thematic café](#):** A set of strategies to popularize different topics of interest and the concerns of a community, group or institution by sharing knowledge and experiences.
- **[Let's get together to meet each other](#):** This methodology seeks to understand the differences between people who think differently and find points in common from which to build collaborative work ideas.
- **[World Café](#):** This system allows you to discuss a particular topic in small conversation groups that rotate as the workshop progresses. Participants contribute different perspectives on the topic of debate, creating different networks, proposals and solutions are created as the groups exchange ideas.



### Taking action for clean air in my city by raising awareness

My name is Lilibeth Villamizar. I live in the border city of Cúcuta, in the department of Norte de Santander, in Colombia. I am the Cúcuta Coordinator of El Derecho a No Obedecer [The Right to Disobey], a project set up by Corporación Otraparte. In February 2020 I joined the National Citizen Network for Air Quality in Cúcuta as a liaison officer.

I'd like to tell you about my experience acting for clean air:

- We collaboratively promoted the #DíasDelAire [Days for Air] campaign in several cities in Colombia, with the aim of putting the importance of improving the quality of the air we breathe on the public agenda.
- From Cúcuta, we promoted various spaces for conversation called #JuntémonosParaEncontrarnos [Let's Get Together to Meet Each Other] in the city's green public spaces. The intention was to map and build cooperation networks involving the various prominent activists, social organizations, teachers, media and public institutions that had joined this active citizenship initiative.
- This effort in Cúcuta gave rise to a working group called the Environmental Cooperation Network, which has 85 members and was created jointly by all the actors and sectors of society that participated in #DíasDelAire. The objectives of the network are to promote environmental education, generate collaborative work agendas and drive citizen mobilization on environmental issues and climate action in Cúcuta.
- To respond to the environmental situation generated by the poor air quality in Cúcuta, we promoted the hashtag #SOSCúcutaSeAsfixia [SOS Cúcuta Is Choking], which helped us bring attention to this issue at the local, departmental and national level, with the hashtag becoming the foremost trend on social networks nationwide.

Thanks to all of our work, we have won a seat to represent civil society at the round table on air quality in Norte de Santander. We hope to use that space to continue acting for education and awareness in response to air pollution.

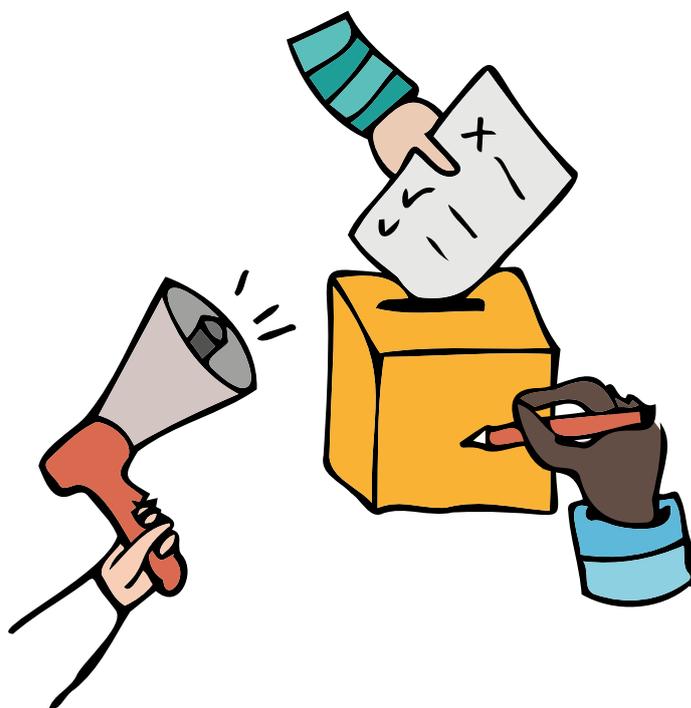
## Participation, advocacy and improving public policy on air quality

➔ **Identify the appropriate authority in your community or country.** In recent years, countries have established national competent authorities for air quality (usually the Ministry of Environment). There are also local authorities (municipal or departmental/state) that have a task force on air quality and air pollution. Once you identify them, you can begin to establish official channels of communication.

You can read more tips in the booklet *Prepare to Take Action!*

➔ **Participate in different local, national and international decision-making spaces related to air pollution.** It is important to identify the spaces for participation relating to air pollution. You can also learn about existing mechanisms for participation, such as public consultations, sectoral meetings and dialogues. You can advocate for spaces for youth and adolescents who represent groups that have historically been discriminated against, such as indigenous people or people of African descent, people with disabilities, migrants, rural populations and children.

➔ **Advocate for reducing air pollution and preventing childhood exposure to pollutants.** It is important that regulations to improve air quality and monitoring systems are developed and implemented in your country and community. It is also vital that there is recognition of the important role environmental protection plays in ensuring our well-being as a society, in particular for children and pregnant people. In your advocacy efforts, try to raise awareness about the importance of public policies focused on the following issues: reducing the burning of fossil fuels; investing in renewable energy sources; ensuring access to quality and affordable cooking devices and fuels, as well as cleaner heating and cooling systems; developing better strategies to reduce emissions; designing more people-friendly



cities and urban spaces; and improving regulations related to burning waste. To do this, you can organize and direct citizen monitoring processes, working with other young people, collectives, civil society organizations and representatives of local academia.

➔ **Raise awareness among staff in health centres, schools and the media and encourage them to participate.** It is very important that people who work in health centres, schools and the media are aware of the effects of air pollution on human health, and in particular on children and pregnant people. Be sure to invite people who represent these actors to your conversations and clean air mobilizations.

➔ **Find and join citizen organizations that are already working to improve air quality.** Talk to them about their activities, proposals and objectives, and get involved.

*In the booklet Prepare to Take Action! we offer you some tips for mobilizing on social networks.*

→ **You can also mobilize on social media.**  
Here are some tips:

- Post on social media and add a short, symbolic hashtag.
- Find someone who can make photographic records and horizontal videos of places with high pollution in your city. You can take photos from viewpoints in your city or town (if there are any) on days with high pollution.
- If you want to make graphic materials about the situation in your city, you can use the tool [www.canva.com](http://www.canva.com).



This is a list of some international days related to air quality that we consider key milestones and that can help you to get the problem on the public agenda and mobilize for clean air. Your country or city may have additional days to celebrate air quality.

14 August: **Inter-American Air Quality Day**

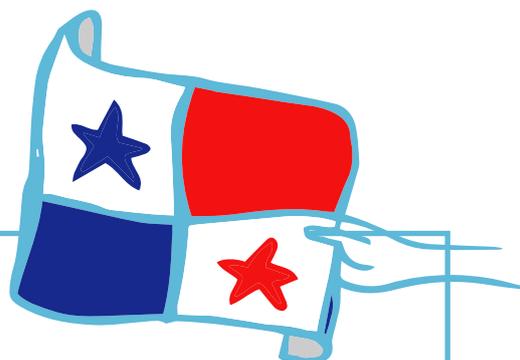
7 September: **International Day of Clean Air for Blue Skies**

Third Thursday in November: **World Pure Air Day**

### **Exerting influence for better public policies on electric mobility in Panama**

My name is Kimberly Quintero. I'm a member of the Panama Youth and Climate Change organization. We've been participating in the national processes on electric mobility in Panama through two bodies:

- The National Secretariat of Energy through the Subcommittee on Environmental Management. The Secretariat is committed to reducing greenhouse gas emissions from the transport sector. We had the opportunity to collaborate in several meetings to prepare a document on the Environmental Management of Electric Vehicles in Panama, which contains recommendations for the development of a comprehensive public policy regulating the environmental management of electric mobility through a detailed analysis of existing policies. A consensus had to be reached among all the actors involved and the low participation of young people taken into account to produce the final document.
- The National Assembly of Panama through the Communication and Transportation Commission. In this space, the main debate was on the articles of Draft Bill No. 162, which aims to reduce GHG emissions through the promotion and growth of electric mobility. During the discussions, opinions were exchanged, and recommendations were made, and we even had the right to vote on decisions on amendments to the articles discussed. We were able to research the topic, gather input from our members and develop discussion points. These meetings resulted in 13 amendments, 12 deletions and 14 new articles for the draft bill.



# Complementary resources

[¿Cómo se mide y cuál es la calidad del aire en América Latina y El Caribe?](#) [How is air quality measured and what is the state of air quality in Latin America and the Caribbean?] In this webinar, air quality experts offer different perspectives on how to measure air quality and on the challenges and opportunities of measuring for clean air. Available in Spanish.

[An inside look at how NASA measures air pollution](#): a training course designed for people interested in learning how to access and visualize NASA satellite imagery and finding out how satellites are used to measure air pollution. Available in English.

[BreatheLife](#): a joint campaign led by WHO, the United Nations Environment Programme (UNEP) and the Climate and Clean Air Coalition. Its objective is to mobilize cities and people to protect our health and the planet from the effects of air pollution. Available in English.

[C40 Cities Climate](#): C40 convenes networks that provide a range of services in support of cities' climate change, air quality, and public health efforts; C40 also coordinates technical assistance, research, and communications support to cities.

[Energising Development \(EnDev\)](#): EnDev promotes sustainable access to sustainable energy sources that meet the needs of the poor in 25 countries in Africa, Asia and Latin America. Available in English and Spanish.

[Global Clean Air Initiative](#): with this online community, you will learn how innovative technologies, scientific research and policies are supporting communities, governments and private sector leaders around the world to achieve cleaner air for all. Available in English.

[IQAir](#): one of the world's leading air quality measurement tools. It allows you to view average air pollution levels in different cities and countries around the world. Available in English and Spanish.

[Plataforma de Qualidade do Ar \[Air Quality Platform\]](#): this platform is an initiative of the Institute for Energy and the Environment, a Brazilian civil society organization, in partnership with the Brazilian state environmental agencies. It was developed to integrate and disseminate information on air quality in the country. Available in Portuguese. society organizations committed to improving air quality and protecting the climate through actions to reduce short-lived climate pollutants.

[Sustainable Energy for All](#): is an international organization that works in partnership with the United Nations and leaders in government, the private sector, financial institutions, civil society and philanthropies to drive faster action towards the achievement of Sustainable Development Goal 7 (SDG7).

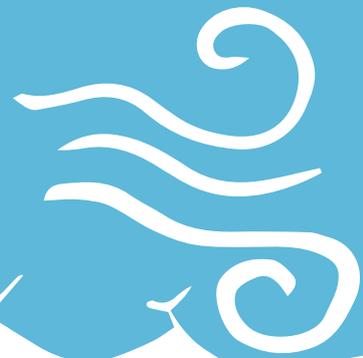
The [Clean Air Fund](#): is a philanthropic initiative with a mission to tackle air pollution around the world. They bring together funders, researchers, policy makers and campaigners to find and scale solutions that will provide clean air for all.

The [Clean Cooking Alliance](#): works with a global network of partners to make clean cooking accessible to the 3 billion people who live each day without it.

The [Climate and Clean Air Coalition](#): is a voluntary partnership of governments, intergovernmental organizations, businesses, scientific institutions and civil.

[WHO Clean Household Energy Solutions Toolkit \(CHEST\)](#): the toolkit is designed to help health sector professionals and policymakers implement the recommendations contained in the WHO guidelines on household air quality. Available in English and Spanish.

# Glossary



-  **Air pollution:** Air pollution refers to the presence of particles, gases or matter in the air that can reduce air quality and generate risks or cause damage or serious nuisance to people and other living beings.
-  **Air Quality Index:** An index that measures daily the quality of the air, on a scale from 0 to 500, and that indicates the degree of atmospheric pollution in a given location.
-  **Black carbon:** A particle with the potential to contribute significantly to global warming. It remains in the atmosphere for up to two weeks. Black carbon and other emissions produced by the combustion process contribute to the formation of particulate matter (PM2.5).
-  **Carbon footprint:** An indicator that helps us to understand the quantity of GHGs we emit directly or indirectly as individuals.
-  **Carbon monoxide (CO):** An odourless, colourless gas that can cause death. It is produced whenever any fuel, such as natural gas, propane gas, gasoline, oil, kerosene, wood or coal, is ignited.
-  **Chronic obstructive pulmonary disease:** A chronic inflammatory lung disease that causes obstructed airflow from the lungs.
-  **Environmental justice:** The discriminatory distribution of environmental burdens or negative consequences produced by pollution (air, water or soil). These burdens or consequences are typically borne by vulnerable and disadvantaged populations.
-  **Fossil fuels:** Energy sources that are generated when plant and animal matter biodegrade. Their combustion generates GHGs. For example, oil, coal and natural gas are fossil fuels.
-  **Gender justice:** Air pollution also has a gender-differentiated impact. Physiological factors, such as the reproductive cycle of women, as well as socially constructed norms such as the greater burden of care that falls on women and girls, mean that women and girls suffer more from the effects of air pollution than men.
-  **Greenhouse gases (GHGs):** Gases in the atmosphere that absorb and then re-emit infrared radiation (radiation with wavelengths longer than visible light) emitted by the earth's surface, the atmosphere and clouds. Water vapour, carbon dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), methane (CH<sub>4</sub>) and ozone (O<sub>3</sub>) are the main GHGs in the atmosphere.
-  **Household and ambient air pollution:** Household pollution happens indoors, while ambient air pollution happens outdoors.

-  **Hydrofluorocarbons (HFCs):** A group of industrial chemicals primarily used in refrigeration and air-conditioning systems, insulating foams and aerosol propellants, and to a lesser extent as solvents and for fire protection. They remain in the atmosphere for between 15 and 29 years.
-  **Intergenerational justice:** In the long term, the different levels of exposure of different population groups can be linked to inequities in development and have lasting effects on the quality of life of these individuals, as well as future generations. Intergenerational justice means that new generations have the same opportunities to meet their needs as previous generations.
-  **Methane (CH<sub>4</sub>):** A potent GHG that remains in the atmosphere for approximately 12 years. It has a direct influence on the climate and is known to play an important role in the creation of ozone.
-  **Micron:** A unit of length equal to one millionth of a metre.
-  **Nitrogen dioxide (NO<sub>2</sub>):** The main source of nitrate aerosols, which account for a large proportion of PM<sub>2.5</sub> and, in the presence of ultraviolet light, of ozone.
-  **Ozone (O<sub>3</sub>):** Ozone is a gas that forms both in the upper layer of the atmosphere (the stratosphere) and in the lower layer (the troposphere). In the stratosphere, ozone protects life on earth from harmful ultraviolet (UV) radiation from the sun. In the lower layer, however, it is an air pollutant that is harmful to human health and ecosystems.
-  **Particulate Matter (PM):** The complex mixture of solid and liquid particles suspended in the air. PM is a good indicator of air quality, as it is the air pollutant with the greatest capacity to affect human health.
-  **Short-lived climate pollutants:** Carbon monoxide, sulfur dioxide, ozone, methane, fluorocarbons and black carbon are also known as short-lived climate pollutants. They are categorized as “short-lived” because they remain in the atmosphere for a relatively short time, from a few days to a few decades. In contrast, carbon dioxide (CO<sub>2</sub>) can remain in the atmosphere for centuries.
-  **Social justice:** Air pollution disproportionately affects poor people and communities. The vast majority of illnesses and premature deaths caused by air pollution affect people in low- and middle-income countries.
-  **Sulfur dioxide (SO<sub>2</sub>):** A colourless gas with a strong smell. It is produced from the burning of fossil fuels (such as coal and diesel) and the smelting of mineral ores that contain sulfur.
-  **Sustainable Development Goals (SDGs):** The 2030 Agenda contains 17 integrated goals with specific targets to be achieved by 2030. It covers issues such as poverty eradication, climate action, education, gender equality, environmental protection and the design of our cities.
-  **Volatile organic compounds (VOCs):** VOCs are emitted as gases from certain solids or liquids. These have a high vapour pressure and low water solubility.

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# Annexes

## Annex 1. Deaths related to air pollution per million people in Latin America and the Caribbean.

This annex shows the number of deaths related to air pollution per million people in each country of Latin America and the Caribbean. Where no data is available, you will see the abbreviation N/A (not applicable).

Country	Deaths per million people
Antigua and Barbuda	N/A
Argentina	663
Bahamas	N/A
Barbados	493
Belize	417
Bolivia	721
Brazil	489
Colombia	413
Costa Rica	332
Cuba	890
Chile	449
Dominica	537
Ecuador	349
El Salvador	592
Grenada	N/A
Guatemala	720
Guyana	644
Haiti	1492
Honduras	839
Jamaica	615
Mexico	410
Nicaragua	430
Panama	399
Paraguay	577
Peru	517
Dominican Republic	544
Saint Kitts and Nevis	N/A
Saint Vincent and the Grenadines	576
Saint Lucia	N/A
Suriname	518
Trinidad and Tobago	453
Uruguay	718
Venezuela	N/A

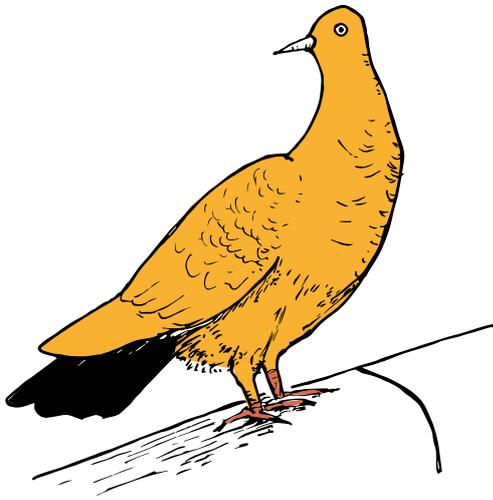
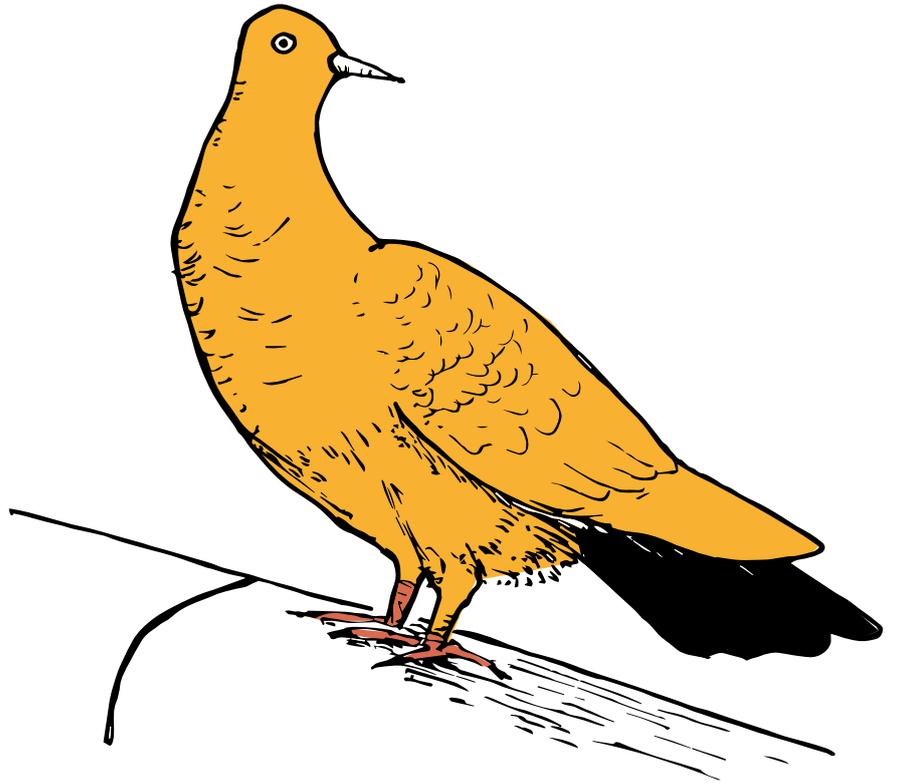
Source: Global Alliance on Health and Pollution, 'Pollution.org', <[www.pollution.org](http://www.pollution.org)>, accessed 30 May 2021.

## Annex 2. Particulate Matter (PM2.5) levels of the countries and their respective capitals in Latin America and the Caribbean.

This annex shows PM2.5 levels of the countries and their respective capitals in Latin America and the Caribbean. Where no data is available, you will see the abbreviation N/A (not applicable).

Country	PM2.5	Capital	PM2.5
<b>Antigua and Barbuda</b>	N/A	Saint John's	N/A
<b>Argentina</b>	14.2 µg/m <sup>3</sup>	Buenos Aires	14.2 µg/m <sup>3</sup>
<b>Bahamas</b>	N/A	Nassau	N/A
<b>Barbados</b>	N/A	Bridgetown	N/A
<b>Belize</b>	N/A	Belmopan	N/A
<b>Bolivia</b>	N/A	Sucre	N/A
<b>Brazil</b>	14.2 µg/m <sup>3</sup>	Brasilia	5.6 µg/m <sup>3</sup>
<b>Colombia</b>	15.6 µg/m <sup>3</sup>	Bogotá	14.3 µg/m <sup>3</sup>
<b>Costa Rica</b>	8.2 µg/m <sup>3</sup>	San José	N/A
<b>Cuba</b>	N/A	Havana	N/A
<b>Chile</b>	19.3 µg/m <sup>3</sup>	Santiago	23.6 µg/m <sup>3</sup>
<b>Dominica</b>	N/A	Roseau	N/A
<b>Ecuador</b>	7.6 µg/m <sup>3</sup>	Quito	7.6 µg/m <sup>3</sup>
<b>El Salvador</b>	N/A	San Salvador	N/A
<b>Grenada</b>	N/A	Saint George's	N/A
<b>Guatemala</b>	19.2 µg/m <sup>3</sup>	Guatemala City	13 µg/m <sup>3</sup>
<b>Guyana</b>	N/A	Georgetown	N/A
<b>Haiti</b>	N/A	Port-au-Prince	N/A
<b>Honduras</b>	N/A	Tegucigalpa	N/A
<b>Jamaica</b>	N/A	Kingston	N/A
<b>Mexico</b>	18.9 µg/m <sup>3</sup>	Mexico City	19.7 µg/m <sup>3</sup>
<b>Nicaragua</b>	N/A	Managua	N/A
<b>Panama</b>	N/A	Panama City	N/A
<b>Paraguay</b>	N/A	Asunción	N/A
<b>Peru</b>	17.9 µg/m <sup>3</sup>	Lima	18 µg/m <sup>3</sup>
<b>Dominican Republic</b>	N/A	Santo Domingo	N/A
<b>Saint Kitts and Nevis</b>	N/A	Basseterre	N/A
<b>Saint Vincent and the Grenadines</b>	N/A	Kingstown	N/A
<b>Saint Lucia</b>	N/A	Castries	N/A
<b>Suriname</b>	N/A	Paramaribo	N/A
<b>Trinidad and Tobago</b>	N/A	Port of Spain	N/A
<b>Uruguay</b>	N/A	Montevideo	N/A
<b>Venezuela</b>	N/A	Caracas	N/A

Source: Global Alliance on Health and Pollution, 'Pollution.org', <[www.pollution.org](http://www.pollution.org)>, accessed 30 May 2021.



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