

# Clean Air, Healthy Children

## An Agenda for Action

### Protecting children from seven deadly sources of air pollution



Children's  
Environmental Health  
Collaborative

**Every child has the right to clean air.** But every day, hundreds of millions of children, mainly in low-and middle-income countries, have no choice but to breathe air laced with dangerous pollutants. Because children are uniquely vulnerable to the damaging health effects of air pollution, many die, get ill or bear lifelong consequences from exposure.

**We can change this reality.** We can stop children from dying or developing debilitating illnesses by confronting seven deadly sources of air pollution now. These seven sources are found in children's homes, and are also generated by traffic hotspots, waste burning, industry, wildfires, sand and dust storms and secondhand smoke. Most of these sources of air pollution are also contributing to, or are worsened by, climate change; another deadly threat for children.

**Prioritizing our children means taking bold and decisive action to eliminate these seven deadly sources of air pollution, without delay.** When exposure is unavoidable, it is our duty to minimize the risks that children face.

It is time to put children's health at the forefront of every decision, including on climate action. Their future depends on it.





## Introduction

**Children are uniquely vulnerable to air pollution – pollution that is both contributing to and being made worse by climate change. Every child’s death from causes linked to air pollution is preventable. Together, this is a problem we can solve.**

No child should die, suffer illness or bear lifelong consequences from air pollution. Because their bodies and brains are still developing, air pollution can have a severe impact on children’s health and even puts their lives at risk. The damage starts in the womb, as some air pollutants can cross the placenta to reach the fetus, and its effects can last a lifetime. Evidence shows that air pollution contributes to adverse birth outcomes, child deaths, cancer, damaged lung function and asthma. It can also increase the risk of neurological disorders and childhood obesity. It can prevent children from developing to their full potential and have dire consequences on well-being and lifelong productivity.

Globally, air pollution is linked to more than 700,000 deaths of children under-five each year.<sup>1</sup> This means around 2,000 children under-five die from breathing polluted air every single day. Air pollution is also linked to 34 per cent, or one in three, preterm births. Affected babies who survive their preterm births may face developmental delays, disabilities and health consequences throughout their life.<sup>2</sup>

The world has woken up to the fact that we must find ways to reduce pollution if we are to combat climate change and protect biodiversity. Debates and negotiations centred around a just energy transition are driving change. But the silence has been deafening when it comes to the plight of hundreds of millions of children, the majority of whom live in low- and middle-income countries, who are developing health conditions or dying from diseases linked to air pollution.

To support the vision of clean air for all children, in 2023 the United Nations Committee on the Rights of the Child outlined [the obligations of UN member states](#) in relation to the climate emergency, the collapse of biodiversity and pervasive pollution. It noted that the best interests of children should be at the forefront of all environmental decisions, including in relation to laws, regulations, policies, standards, guidelines, plans, strategies, budgets, international agreements and the provision of development assistance. Climate action today must centre on the impact of climate change on child health and well-being and the need to protect children’s health and their futures. Acting later will be too late.



## Action is most urgently needed in low- and middle-income countries where children bear the heaviest burden from air pollution

Every child deserves to grow up in a world where the air they breathe is safe. Sadly, children under-five in sub-Saharan Africa are 100 times more likely to die from air pollution than their counterparts in high-income countries. In sub-Saharan Africa, air pollution also accounts for 30 per cent of all deaths among babies who die in their first month of life. In some African and Asian countries, nearly one in every three deaths in children under-five caused by lower respiratory infection is linked to air pollution.

## The effects of air pollution are costing the world

In 2019, illness and death linked to air pollution, including for children, cost the world US\$8.1 trillion.<sup>3</sup> Yet the world is turning a blind eye to the tragic cost for children and families. The early years, starting in pregnancy, are the best time to invest in a child's health. We know that preventing children from breathing polluted air is cheaper than treating the illnesses it causes.

## A world where children can breathe clean air is possible – but we must act now

We can stop hundreds of millions of children from dying or developing debilitating illnesses by confronting seven deadly sources of air pollution now. Prioritizing our children means taking bold and decisive action to eliminate these sources of air pollution. When exposure is unavoidable, it is our duty to minimize the risks that children face.

The solutions exist. It is time to put children's health at the forefront of every decision, including on climate action.

The following brief explains what governments, caregivers,\* the health sector, the private sector and civil society organizations need to do to end preventable child deaths and illness linked to seven deadly sources of air pollution.

## Children are not little adults – they are uniquely vulnerable to air pollution

During pregnancy, maternal exposure to air pollution can impair fetal growth and development. Children under-five are particularly at risk of dying from illnesses linked to air pollution. Newborns and infants are the most vulnerable. If children exposed to air pollution survive, they are more likely to have developmental issues, respiratory and cardiovascular conditions, cancer and other chronic diseases later in life.

\* Defined here as parents, guardians and others responsible for children's daily welfare, such as health workers, teachers and nursery workers.



# Air pollution damage starts in the womb with health effects that can last a lifetime



**Children are not little adults. They have unique vulnerabilities.**



**Air pollution impacts developing bodies and brains.**



**Health impacts.**

## Pregnancy

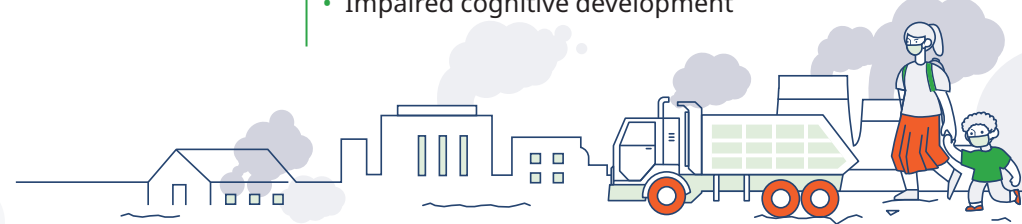
- A pregnant woman inhales more air per minute than a non-pregnant woman
- Some pollutants can cross the placenta and reach the fetus; these include air pollution resulting from the use of inefficient, polluting fuels and technologies and/or from secondhand smoke
- Maternal changes due to air pollution exposure, such as inflammation and oxidative stress, indirectly affect the fetus
- Negative impacts on development of respiratory, cardiovascular, immune, endocrine and nervous systems
- **Maternal health:** Gestational diabetes, pre-eclampsia, gestational hypertension and postpartum depression
- **Adverse birth outcomes:** Low birth weight, miscarriage, preterm birth and stillbirth
- **Impacts on lifelong child health:** Congenital heart defects, pneumonia in first year of life, neurodevelopmental disorders, stunting, development of asthma, eczema and allergic disease and high blood pressure

## Infancy and childhood

- Inhale more air per kilogram of body weight and absorb more pollutants relative to adults
- Ineffectively filter pollutants in nasal passages
- Lack ability to control exposure, both indoors and outdoors
- Live closer to the ground, so may breathe in more ground-level pollution
- Lungs, brain and other organs still developing
- Inflammation in children's smaller airways causes proportionally more blockage and resistance to air flow
- Pneumonia
- Upper respiratory tract infections
- Ear infections
- Asthma, allergies and eczema
- Altered growth (stunting and obesity)
- High blood pressure
- Childhood leukemia
- Impaired cognitive development, including autism spectrum disorders

## Adolescence

- May spend time outside playing sports, walking to school in high-pollution areas and other activities
- Lack control over location of organized sport activities, which may be located near areas of high pollution
- Lung function development continues in girls until late teens and in boys until early 20s
- Upper respiratory tract infections
- Asthma and allergies
- High blood pressure
- Obesity
- Impaired cognitive development





# Seven deadly sources of air pollution for children

Seven sources of air pollution are most linked to child death and illness. These sources of air pollution are major sources of PM<sub>2.5</sub>, the most consistent and accurate predictor of poor health outcomes across all age groups, and they also contain other harmful pollutants.



1. Household air pollution



4. Industrial air pollution



2. Traffic-related air pollution



5. Wildfire and landscape fire smoke



3. Waste-related air pollution



6. Sand and dust storms



7. Secondhand smoke

# 1. Household air pollution

**Household air pollution is primarily produced from the combustion of biomass, coal and charcoal in inefficient stoves or open hearths for cooking and heating, and it is exacerbated by poor ventilation. In addition, the burning of kerosene in lamps, and the burning of incense and candles, can add to air pollution in the home.**

Household air pollution can contain many different pollutants, including particulate matter, black carbon, polycyclic aromatic hydrocarbons, volatile organic compounds, methane, nitrogen oxides, sulfur dioxide, carbon monoxide, dioxins and heavy metals. In poorly ventilated homes, indoor smoke can have levels of fine particles that are 100 times higher than acceptable.

Household air pollution is associated with 70 per cent of all deaths linked to air pollution in children under-five.<sup>4</sup> It is also linked to adverse birth outcomes and a range of lifelong illnesses, including asthma, lower respiratory infections, anaemia, stunted growth, chronic infections, developmental delays and poor sleep.

Even though more people than ever have access to cleaner cooking and heating, just under half of the world's population still relies on devices that pollute children's homes, especially in Africa, South Asia, Central Asia and Eastern Europe. Without accelerated action, 1.9 billion people will still rely on old polluting fuels and technologies to cook their meals in 2030. This will cost the world US\$2.4 trillion a year due to the impacts on health and the climate.<sup>5</sup>





## 2. Traffic-related air pollution



**Emissions from transportation contribute to poor air quality, including smog and climate change. In dense traffic hotspots, this has a huge impact on children's health and welfare. Parts of Latin America, Asia and Africa, and some high-income regions, are most affected.**

Traffic-related primary pollutants known to impact health include highly breathable fine and ultrafine particles, diesel exhaust particles and gases, nitrogen dioxide, carbon monoxide, heavy metals, and volatile organic compounds like benzene and polycyclic aromatic hydrocarbons. Some traffic-related pollutants are known carcinogens.

Traffic pollution is associated with the development and exacerbation of asthma; the most common chronic disease among children.<sup>6</sup> It can also cause poor lung development, and emerging evidence links it to autism, delayed cognitive development, childhood obesity and childhood leukaemia. Children who are repeatedly exposed to traffic pollution are at greater risk of developing cancer and cardiovascular disease later in life.

Unless action is taken, traffic pollution will continue to take its toll on children's health. Yet, despite the fallout for people's health and the planet, demand for transport is increasing. Globally, the number of vehicles is set to rise three- to four-fold in the next few decades, meaning more traffic hotspots are likely to form. Most of this growth is happening in developing countries. The availability of low-emission and electric vehicles, public transport infrastructure and active mobility is not keeping pace with this growth.



### 3. Waste-related air pollution

**Half of the world's waste is not being properly managed. The burning of household and industrial waste, including agricultural waste, as well as poorly managed waste and recycling sites exposes children to a wide range of toxic chemicals and metals.**

Agricultural waste burning is the biggest source of black carbon, a microscopic pollutant that penetrates deep into the lungs and bloodstream. The burning of improperly managed domestic waste, including plastic, can release a cocktail of toxic gases, heavy metals, dioxins, furans and particulate matter into the atmosphere. Additionally, landfills and open dumps emit methane as the organic waste in them decomposes. Methane is also a precursor to tropospheric ozone, another powerful climate forcer and air pollutant, which harms people's health.<sup>7</sup> Waste decomposition can also release volatile organic compounds and other gases into the air. Improper e-waste recycling can release particulate matter and noxious gases. Children who live near or work at waste-related air pollution sites are particularly at risk.

Waste-related air pollution can alter neurological development and cognitive function, the immune system, lung and thyroid function, hormone production and development, and the eyes, nose and throat. It also increases children's risk of developing chronic diseases later in life, such as diabetes and cancer.<sup>8</sup> The damage to children's health is significant, but it can be prevented.





## 4. Industrial air pollution



**Among the most prominent industries affecting children's health are chemical manufacturing, oil refining operations, metals smelting, mining and extractives, energy generation and agriculture. Increasing urbanization and development has led to a massive growth of air polluting industries, and many businesses are failing to meet industrial emission limits set by governments in low- and middle-income countries.**

Chemical manufacturing releases volatile organic compounds, polycyclic aromatic hydrocarbons and heavy metals; oil refining operations release benzene, sulfur dioxide and nitrogen oxides; metal smelting and foundries release lead, mercury and arsenic, sulfur dioxide and other metals, and energy generation releases sulfur dioxide, nitrogen oxides and heavy metals. Agricultural air pollution comes from manure management, soil fertilizer emissions, rice cultivation, the digestive processes of livestock, and other agricultural practices.

Some subregions in Latin America and some areas in Europe are heavily exposed to industrial air pollution. Informal sectors can also cause industrial air pollution, such as the brick kiln industries in South Asia and Latin America.

Harm to children's health can vary depending on the types of industry causing the pollution, the emissions being generated and children's exposure. Health effects include adverse birth outcomes, developmental delays, respiratory diseases including pneumonia, and long-term health issues like childhood leukaemia and other cancers. These risks could be eliminated or greatly reduced if the right kind of collective action is taken to enforce industrial emission limits.



## 5. Wildfire and landscape fire smoke

**Across the world, landscape fires – including devastating wildfires – are surging in both size and frequency. This alarming trend is a consequence of the escalating climate crisis, which is ushering in hotter and drier conditions that provide an ideal breeding ground for these destructive fires.**

Wildfire particulate matter is composed of matter formed through the chemical reactions of carbon monoxide, particulate matter, nitrogen oxides, volatile organic compounds and polycyclic aromatic hydrocarbons, as well as the byproducts of any other materials that have been unintentionally burned.

The impact of wildfire smoke on children is profound and unsettling. Fine particulate matter (PM<sub>2.5</sub>) from wildfire smoke has been found to be up to 10 times more harmful to children's respiratory health compared to PM<sub>2.5</sub> from other sources, and particularly so for children aged 0–5 years.<sup>9</sup>

East Asia has the highest number of attributable deaths from wildfires of any region, and in sub-Saharan Africa wildfires are responsible for a large share of PM<sub>2.5</sub>. Wildfires are also a significant contributor to air pollution in southern Latin America.





## 6. Sand and dust storms



**Every year, an estimated 2 billion tonnes of sand and dust enter the atmosphere; equal in weight to 350 Great Pyramids of Giza.<sup>10</sup> Sand and dust storms are a major source of air pollution in West Asia and Africa. Sand and dust storms are also an issue in South America, India, the Middle East and East Asia.**

Sand and dust storms are a natural phenomenon, but they are being made worse by poor land and water management and climate change.<sup>11</sup> These storms contribute directly to air pollution by increasing particulate matter concentration. They are a growing problem for children's health, mainly due to the link between sand and dust storms and respiratory diseases. Inhalation of fine dust particles exposes children not only to hazardous fine mineral particulates, but also to harmful combinations of pollutants, spores, bacteria, fungi and potential allergens, which are carried along with mineral dusts.

Sand and dust storms can also increase the risk of infant death,<sup>12</sup> spread infectious diseases like meningitis, and cause or aggravate bronchitis, eye infections and skin irritations. They also increase the risk of developing lung disorders or cardiovascular disorders later in life. It is possible to stop children from suffering ill effects from sand and dust storms. More research is needed on the health effects of children's exposure to sand and dust storms.



## 7. Secondhand smoke

**Secondhand smoke refers to smoke released both by the burning end of a tobacco product or the air that a smoker exhales.<sup>13</sup> Particles in secondhand smoke range in size between PM<sub>2.5</sub> and PM<sub>10</sub>, and these fumes stay in the air for hours after tobacco is extinguished. When children breathe in this smoke it exposes them to nearly 7,000 different compounds, including many known carcinogens. Some of the toxic metals contained in secondhand smoke include arsenic, lead, chromium and cadmium.**

There is no safe level of exposure to secondhand smoke, and children are particularly at risk. Secondhand smoke damages children's health, even if they are only exposed for a short time. It can cause respiratory infections, ear infections, asthma, impaired heart function, diabetes and weight and height issues like stunting, wasting and obesity. In 2021, secondhand smoke was the eighth largest risk factor for deaths in children under-five and resulted in 39,000 preventable deaths among this age group.<sup>14</sup> Smoking during pregnancy harms fetal development. It also increases the risk of miscarriage. If children are exposed to secondhand smoke early in life, it increases their risk of developing non-communicable diseases later on.

Despite the evidence that designated smoking areas or rooms fail to protect health, 71 countries continue to use them in public indoor spaces.<sup>15</sup> Secondhand smoke is particularly an issue in East, Central and Southeast Asia, Northern Africa and the Middle East. But with the right collective action this can change.





# How to stop air pollution from harming children: An agenda for action

Now is the time to act to stop children from dying or falling ill from causes linked to air pollution.

This is a responsibility we all share. If we work collectively, we can ensure children breathe clean air and are protected from the damage that different sources of air pollution cause. The sources of air pollution to prioritize for action will depend on local context, altered climate characteristics, susceptibility to natural disasters, local capacities and other factors.

The recommended actions for governments and caregivers are organised by seven deadly sources of air pollution, while the actions for the private sector, the health sector and the civil society apply across all different sources of air pollution. Across the seven sources, protecting children from the harms of air pollution requires leadership, collaborative public-private action and effective policies, regulations, institutional capacities, community engagement and budgetary allocations.



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## 1. Household air pollution

### Governments can

- Scale-up the use of cleaner fuels (such as electric, liquefied petroleum gas, ethanol or biogas), low emission stoves and heating technologies (such as pellet stoves), utilizing the [WHO Clean Household Energy Solutions Toolkit \(CHEST\)](#).
- Provide economic incentives, such as subsidies, tax exemptions and microfinance schemes, to support entrepreneurs and households to move to, and sustainably use, cleaner fuels and technologies.
- Implement social and behavioural change strategies, including through health workers, to encourage families to use cleaner fuels and technologies, improve household practices and minimise risks for children and pregnant women.

### Caregivers can

- Switch to cleaner fuels and technologies to reduce household air pollution and minimize the use of products that contribute to household smoke, such as candles and incense.
- Improve ventilation (e.g., use smoke hoods, eaves spaces, windows; maintain stove and appliances), kitchen design (e.g., have the kitchen separate from the house; put the stove at waist height) and cooking techniques (e.g., dry fuel, use pot lids).
- Keep children and pregnant women away from polluting devices, such as cooking sources and open heating devices.



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## 2. Traffic-related air pollution

### Governments can

- Shift to lower-emission vehicles and fuels and implement mandatory inspections. Promote lower private vehicle use, and encourage active mobility, the use of public transport and cleaner modes of transport, including incentivizing the increased use of electric vehicles.<sup>16</sup>
- Introduce low-emission zones in areas where children live, learn and play (these are areas where vehicles that do not meet a minimum standard for emissions are restricted from entering).
- Implement air quality monitoring around traffic hotspots to support decision making.
- Adopt risk communication measures to improve public awareness of the unique vulnerabilities of children to air pollution and how to reduce these risks.

### Caregivers can

- Utilize air quality information and implement risk reduction measures. For example, avoid travelling with children during times of heavy traffic. If it is not possible, put well-fitting facemasks or certified respirators on children.\*\*
- If walking, running or cycling, travel on less busy roads. Keep children away from fumes generated by idling cars and school buses.
- Ensure children are not playing or doing strenuous sports or activities in locations near heavy traffic. Get children to stop these activities if they start coughing or develop other respiratory symptoms.
- Use public transport and avoid the use of personal vehicles. Turn engines off rather than idling them in places where children are present.<sup>17</sup>



## 3. Waste-related air pollution

### Governments can

- Ban open waste burning, including the burning of agricultural residue and waste.
- Legislate, enforce and make provisions for environmentally-sound management of waste, including waste prevention, waste reduction, waste separation, recycling and reuse, waste reprocessing, and the use of technologies to reduce waste-related air pollution.
- Implement social and behavioural change strategies to reduce household waste burning practices and engage agricultural workers to use no-burn alternatives.

### Caregivers can

- Practice waste separation and recycling, and properly dispose of waste. Do not burn waste.
- Avoid exposing children to areas with open burning.
- Close windows and ventilation gaps when indoors. Get children to wear well-fitting, child-sized face mask or certified respirators for brief periods if air pollution from waste burning cannot be avoided.<sup>18</sup>

\*\* Respirators are personal protective devices that cover the nose and mouth and reduce the inhalation of PM<sub>2.5</sub> and other particles. Respirators' efficiency depends on the rating they are given. Respirators that filter 95 per cent of airborne particles are called: N95 in the United States of America; KN95 in China; FFP2 in Europe. Respirators' packaging should be examined for certification or approval by a national or international authority. Children's surgical masks do not filter as well as respirators, but they are quite effective if you can make them fit properly. Using an ear-loop clip around a child's head can help tighten the mask on their face. Cloth masks are poor at filtering pollution.





## 4. Industrial air pollution

### Governments can

- Set and enforce industry emission standards and undertake measures to move polluting industries away from high-density residential areas where children live, learn and play.
- Transition to green and sustainable energy sources, and switch to low-emission applications of fertilizer or manure.
- Promote the optimization of industrial processes by using the best available techniques and equipment to reduce air pollution.

### Caregivers can

- Take precautions to avoid take-home exposures by wearing protective clothing at work, changing clothes and shoes before leaving work and keeping dirty work clothes and shoes separate from clean clothes. If it is not possible to change at work, take off your work shoes before entering the home, then change out of your work clothes and wash them immediately, separately from the family's clothes. Wash your hands or shower after arriving home.<sup>19</sup>
- Where possible, avoid areas with polluting industries, including agricultural areas where pesticides are applied.
- Get children to wear well-fitting, child-sized facemasks or certified respirators for brief periods if industrial pollution cannot be avoided.



## 5. Wildfire and landscape fire smoke

### Governments can

- Mitigate against the threat of wildfires by implementing prescribed burning, alternate forest management techniques and preventing invasive species like grass from spreading.<sup>20</sup>
- Devise an emergency preparedness and response plan for wildfires for health care facilities, schools and nurseries.
- Improve national preparedness and participate in international cooperation frameworks.

### Caregivers can

- Be alert to early warning signs; prepare an emergency kit and get an emergency evacuation plan ready in case a wildfire should break out. This kit should include well-fitting, child-sized facemasks or certified respirators. Show children in advance how to use the facemasks or respirators in the kit.
- Evacuate a building immediately during a wildfire if the building is at risk of catching fire. If you are not in immediate danger, keep children indoors with the doors and windows closed. If you have an air conditioner, run it with the fresh-air intake closed to keep outdoor smoke from getting indoors. Use a portable air cleaner and HEPA filter if available. Get children to drink water to stay hydrated. Avoid cooking using biomass and gas indoors.
- Take children to a health facility after a wildfire (once it is safe to do so) if they are experiencing any wildfire-related symptoms (e.g., cough, wheeze, chest pain, dizziness, difficulty breathing or burning nose, throat or eyes).



## 6. Sand and dust storms

### Governments can

- Implement early warning systems and dust forecasting programmes, and devise action plans to implement mitigation strategies and risk communication.
- Implement wind erosion control by carefully planning the expansion of green spaces.
- As a short-term measure after intense sand and dust storms, clean the streets in urban areas that are densely populated but have low rainfall, as this will prevent road traffic spreading the dust further.

### Caregivers can

- Be vigilant of early warnings of imminent sand and dust storms.
- Stay indoors, close windows and seal ventilation gaps. If you have an air conditioner, run it with the fresh-air intake closed to keep outdoor particles from getting indoors. Use a portable air cleaner and HEPA filter if available. Get children to drink water to stay hydrated. Avoid cooking using biomass and gas indoors.
- Get children to wear a well-fitting, child-sized facemask or certified respirator and eye goggles. Cover exposed skin if outside.



## 7. Secondhand smoke

### Governments can

- Ban smoking in all public indoor areas and all public areas in multiple-unit dwellings. Consider making outdoor or semi-outdoor areas and public places smoke-free (e.g., playgrounds and parks).
- Comprehensively implement the *WHO Framework Convention on Tobacco Control*.
- Raise awareness about the risks of exposure to secondhand tobacco smoke for children.
- Engage the community to encourage them to monitor compliance and report violations (e.g., by establishing a toll-free telephone complaint hotline).

### Caregivers can

- Spread awareness and report community violations.
- Ensure homes, schools, nurseries and health facilities are smoke-free by ensuring no tobacco products are used, including electronic cigarettes.







## Priority actions for the private sector

- Ensure compliance with environmental and health regulations by adopting cleaner technologies and practices, including in supply chains, and undertake due diligence throughout the supply chain to ensure children are protected.
- Take initiatives to publicly report on and reduce air pollution. Set ambitious targets with a clear action plan to reduce emissions, such as mapping air pollution footprints, investing and using clean technologies and raising awareness among employees and customers about air pollution.
- Partner with governments to support the scale-up and availability of clean and green technologies that minimize air pollution and meet the WHO's *Global Air Quality Guidelines*, invest in the development of new technologies and innovative solutions, and collect and share disaggregated data and evidence with the public sector that can close information gaps about air pollution and children's health.
- Create new business opportunities offering green technology and green services to consumers and offer financial products that provide incentives to adopt clean and green technologies and reduce air pollution.





## Priority actions for the health sector

- Assess children's history of exposure to air pollution, and counsel families on exclusive breastfeeding, nutrition, exercise, immunization and early screening to detect air pollution-related illnesses. Recommend actions to families that can reduce children's exposure to air pollution.
- In places with specific air pollution seasons, in advance of the season, strengthen the readiness of the health sector in terms of information, human and financial resources, diagnostics, medicine and equipment. This includes incorporating information on air pollution in health worker training courses alongside other major environmental risk factors for health. Health workers can build their knowledge and skills by completing the joint UNICEF-WHO online course [Introduction to Children's Environmental Health](#) and the WHO's [Air Pollution and Health Training Toolkit for Health Workers](#).
- Implement sound medical waste management practices and clean technologies (e.g., autoclave, microwave) to dispose medical and other hazardous waste, as well as end-of-life medical products.



## Priority actions for civil society

- Educate parents, caregivers, educators and communities on the dangers of air pollution, including how to reduce the impacts of air pollution on children's health.
- Gather evidence on air pollution and its effects on children; advocate for policy change and hold companies or entities that violate air quality regulations to account.
- Provide direct support to children and families affected by air pollution, such as health care services and financial assistance to cover expenses and resources like air purifiers and respirators.



# Engaging children and young people as agents of change on air pollution

Children are often the first to feel the harmful effects of air pollution, but they should not be treated like early warning systems. They may experience the impacts more acutely, from asthma to developmental issues, but they are also among the most powerful advocates for environmental justice. By equipping them with knowledge and tools, like UNICEF's [toolkit for young climate activists](#) that has a specific guide on air quality, we can empower the next generation to raise their voices and demand the cleaner, healthier air they deserve.

Children and young people's involvement can lead to increased awareness, innovative solutions and a shift in societal behaviours. For example, UNICEF's report [The use of innovative tools and approaches to engage children and young people as agents of change on air pollution](#) highlights the successful use of innovation in child-centred clean air programmes in UNICEF country offices in Belize, China, Mongolia and Serbia. This guide is designed to inspire children and young people to integrate new technologies and innovative approaches into air pollution projects. It provides a practical resource that offers insights into how innovative tools can gather air pollution data, foster youth advocacy and drive meaningful change.



## Priority actions for children and young people

- Collect, analyse and disseminate data; actively engage in air quality monitoring in homes, schools and playgrounds by using air quality tools, such as sensors and digital platforms.
- Raise awareness on the seven deadly sources of air pollution and take action to reduce your own and others' exposure to air pollution.
- Advocate for clean air policies with national and local governments.



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Published by UNICEF  
Programme Group  
New York

pubdoc@unicef.org  
www.unicef.org

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