Health Care Without Harm

CLEAN AIR

A DOSSIER ON AIR POLLUTION FOR HEALTH PROFESSIONALS

SEPTEMBER 2022

This dossier brings together crucial material regarding Air Pollution and Health from various scientific sources in an easy to read format for health professionals.

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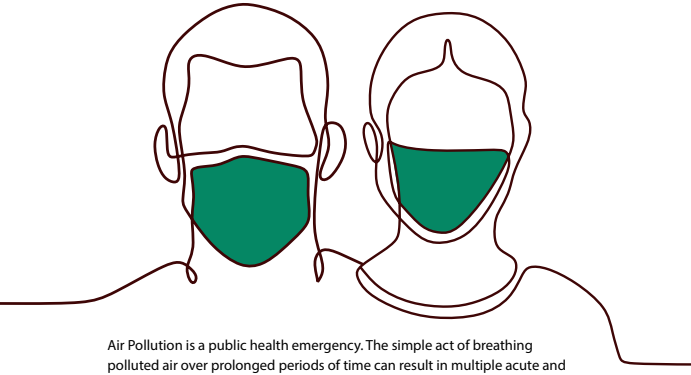


Air Pollution is a public health emergency. The simple act of breathing polluted air over prolonged periods of time can result in multiple acute and chronic health issues. Air pollution has been linked to over 7 million annual premature deaths across the world.

WHAT IS AIR POLLUTION

Air pollution occurs when gasses, dust particles, fumes, or smoke (or odor) enter the indoor and outdoor environment in a way that makes it harmful to humans, animals, or plants. Examples of pollutants of major public health concern include oxides of nitrogen and sulfur, carbon monoxide, ozone, methane, hydrocarbons, sand or dust particles, and volatile organic compounds that can evaporate and enter the environment.

Household combustion devices, motor vehicles, waste burning, industrial facilities, refineries, coal power plants, and forest fires are common sources of air pollution. According to data from the World Health Organization (WHO), almost all of the global population (99%) breathe air that exceeds WHO guideline limits and contains high levels of pollutants, with low- and middle-income countries suffering from the highest exposures.

Some of the same pollution that compromises respiratory health also drives climate change. For example, the burning of fossil fuels (coal, oil, and gas) for electricity, heat, or transportation is a major driver of climate change and the main source of air pollution. Recent research from Harvard University, in collaboration with the University of Birmingham, the University of Leicester, and University College London, found that "more than 8 million people died in 2018 from fossil fuel pollution, significantly higher than previous research suggested—meaning that air pollution from burning fossil fuels like coal and diesel was responsible for about 1 in 5 deaths worldwide."

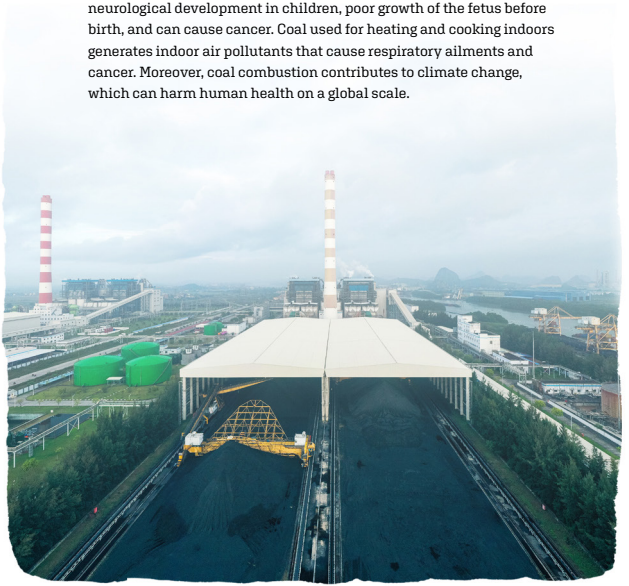
It is not only the deaths from air pollution that is a concern. Air pollution causes daily disruptions in people's lives from allergies, cold, cough, irritation of the eyes, nose, and throat, headaches, dizziness, fatigue, drive absenteeism from work and school, impaired productivity, and lead to mental health issues.

COAL POWER

A major source of air pollution

Access to electricity has a positive effect on the health and well-being of people worldwide. However, the use of coal to generate energy has negative health consequences. There is evidence of coal's impact on human health during every stage of its use for electricity generation – from mining to post- combustion disposal. In particular, coal combustion has been well-studied, with compelling evidence of widespread health effects on the population. When coal is burned, it produces air-borne pollutants of particulate matter, sulfur dioxide, oxides of nitrogen, carbon dioxide, mercury, arsenic, chromium, nickel, manganese, other heavy metals, acid gases (HCL, HF), hydrocarbons (PAHs), and varying levels of uranium and thorium in flyash.

Air pollution produced by coal combustion in power plants can affect the respiratory and cardiovascular systems and cause abnormal neurological development in children, poor growth of the fetus before birth, and can cause cancer. Coal used for heating and cooking indoors generates indoor air pollutants that cause respiratory ailments and cancer. Moreover, coal combustion contributes to climate change, which can harm human health on a global scale.



PEATLAND FIRES

A major source of haze in the Southeast Asian region

Forest and peatland fires, which occur annually in Indonesia, affect the entire Southeast Asian region and result in extensive environmental destruction and threats to livelihoods. The entire region can experience higher outdoor air pollution levels during haze episodes. Most importantly, smoke-born damages resulting from haze are detrimental to the environment and have irreversible long-term impacts on human health. Peat smoke represents a significant concern due to its adverse health effects, notably respiratory diseases and symptoms. Indonesia's forest and peatland fires are estimated to cause approximately 110,000 premature deaths annually. For example, in 2015, 69 million people in Southeast Asia were exposed to unhealthy air for nearly two months, with overall economic damage assessed at US$16 billion. During this episode, the Indonesian government reported over 500,000 additional cases of respiratory illness. Experts estimated that the increased air pollution exposure caused more than 100,000 deaths across the region.

Effects of Peat Smoke on Health

The fine particles released from peat fires pose the most significant risk to human health. When these particles get into the eyes and lungs, symptoms of irritation such as coughing, wheezing and sore eyes are commonly experienced. These symptoms will become less pronounced as smoke levels decrease and eventually cease. The symptoms are more severe at higher levels and may affect regular activity. In asthmatics, the irritation of the lungs caused by particles released from peat fires may trigger a severe asthma attack. Elevated levels of particulate matter are also known to aggravate pre-existing chronic respiratory and cardiac conditions, increasing the risk of severe health outcomes in affected individuals.

> *This is a health emergency and as a mother, I refuse to accept that my child will be forced to grow up with the possibility of serious breathing disorders and other illnesses caused by air pollution. We need doctors to speak out in no uncertain terms about the dangers to health and we need solutions that will be accessible to all sections of society.*
>
> *Nina Subramani*
> *Warrior Moms - Chennai*

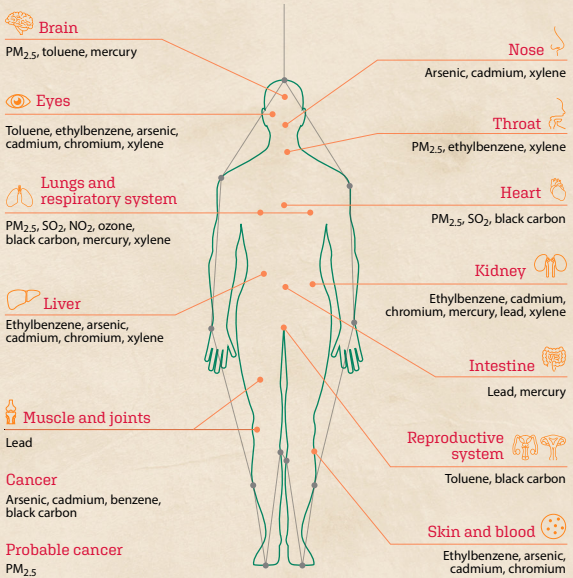
OIL & GAS

Facilities and air pollution

Petroleum refineries are a major source of commonly found air pollutants: Particulate matter (PM), Nitrogen oxides (NO_X), Carbon monoxide (CO), Hydrogen sulfide (H_2S), Sulfur dioxide (SO_2), and hazardous and toxic air pollutants, as well as Volatile Organic Compounds such as BTEX compounds (benzene, toluene, ethylbenzene, and xylene). The combination of volatile organic compounds and oxides of nitrogen also contributes to ground-level ozone formation. These gasses can wreak havoc on communities that live near the production, transmission, and storage of fossil fuels. Some of the chemicals released are known or suspected cancer-causing agents, responsible for developmental and reproductive problems. They may also aggravate certain respiratory conditions such as childhood asthma.

Stack or vent emissions are often identified as the most significant sources of emissions in a refinery. However, fugitive emissions from storage tanks, cooling tanks, pipe connectors, valves, equipment leaks, flanges, pumps, compressors, pressure release devices, transfer of raw materials, etc. can violate the ambient air quality standards and even exceed the stack emissions. Pollution control agencies often do not monitor fugitive emissions.

HEALTH IMPACTS OF AIR POLLUTION



1 PARTICULATE MATTER 2.5 ($PM_{2.5}$)

There is a robust association between several adverse health effects and ambient air particulate matter levels. Very small (fine) particles exert disproportionately more adverse health effects than larger particles.

According to the United States Environmental Protection Agency:

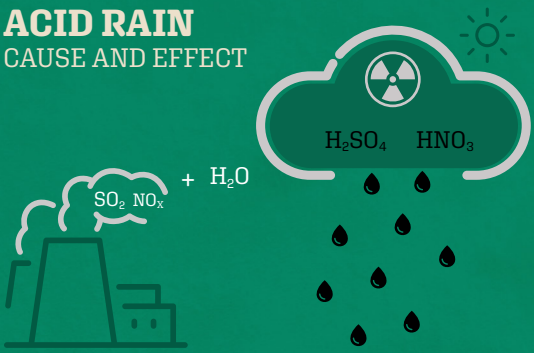
"Particles less than 10 micrometers in diameter (PM_{10}) pose a health concern because they can be inhaled into and accumulate in the respiratory system. Particles less than 2.5 micrometers in diameter ($PM_{2.5}$) are referred to as 'fine' particles and are believed to pose the largest health risks. Because of their small size (less than one-seventh the average width of a human hair), fine particles can lodge deeply into the lungs.

"Health studies have shown a significant association between exposure to fine particles and premature mortality. Other important effects include aggravation of respiratory and cardiovascular disease (as indicated by increased hospital admissions, emergency room visits, absence from school or work, and restricted activity days), lung disease, decreased lung function, asthma attacks, and certain cardiovascular problems such as heart attacks and cardiac arrhythmia. Individuals particularly sensitive to fine particle exposure include older adults, people with heart and lung disease, and children."

2 SULFUR DIOXIDE

Sulfur dioxide is produced when oil and coal containing sulfur burns. It can cause health issues, especially in people with existing heart or lung conditions. Sulfur dioxide irritates the respiratory tract and increases the risk of tract infections. It causes coughing and mucus secretion and aggravates conditions such as asthma and chronic bronchitis. Sulfur dioxide mixes with water to produce sulfuric acid (known as acid rain) which can impact urban infrastructure, forests, waterbodies, and aquatic life.

ACID RAIN
CAUSE AND EFFECT



Acid Rain is caused by emissions of Sulfur dioxide (SO_2) and Nitrogen oxide (NO_x), which react with water molecules in the atmosphere, producing Sulphuric acid (H_2SO_4) and Nitric acid (HNO_3).

Lowers pH level in waterways, killing marine organisms

Acid deposition has many harmful ecological effects when the pH of most aquatic systems falls below 6 and especially below 5

Damages to man-made structures like buildings and statues is evident with signs of corrosion and erosion

Forests have been impacted by acid rain. It makes trees vulnerable to diseases, extreme weather conditions and insects

Source: https://www.epa.gov/acidrain/effects-acid-rain

3 NITROGEN DIOXIDE

Nitrogen dioxide (NO_2) is one of a group of highly reactive gasses known as oxides of nitrogen or nitrogen oxides (NO_x). Other nitrogen oxides include nitrous acid and nitric acid. NO_2 is used as the indicator for the larger group of nitrogen oxides. NO_2 primarily gets in the air from the burning of fuel. NO_2 forms from emissions from cars, trucks and buses, power plants, and off-road equipment.

Breathing air with a high concentration of NO_2 can irritate airways in the human respiratory system. Such exposures over short periods can aggravate respiratory diseases, particularly asthma, leading to respiratory symptoms (such as coughing, wheezing, or difficulty breathing), hospital admissions, and visits to emergency rooms. Longer exposures to elevated concentrations of NO_2 may contribute to the development of asthma and potentially increase susceptibility to respiratory infections.

Nitrogen dioxide along with other NO_x reacts with other chemicals in the air to form both particulate matter and ozone. Both are also harmful when inhaled due to their effects on the respiratory system.

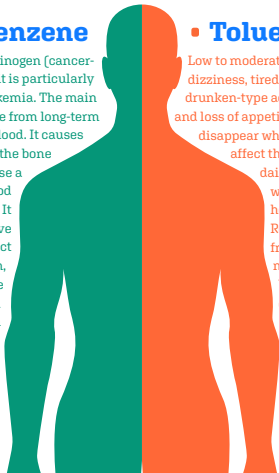
4 VOLATILE ORGANIC COMPOUNDS

Volatile organic compounds (VOCs) are chemicals that contain carbon and can quickly turn into vapors or gasses. These VOCs can be released by several products or items in everyday life. The simplest way to determine the presence of VOCs in the air is through their distinct odors.

Some common VOCs emitted from oil & gas facilities and their health impacts:

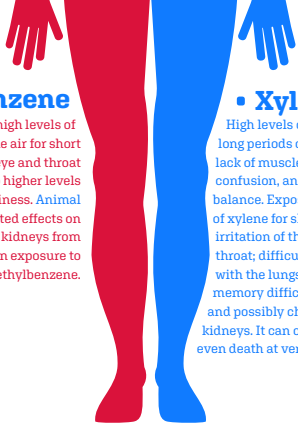
• Benzene

Benzene is a known carcinogen (cancer-causing chemical) and it is particularly known to cause leukemia. The main effect of benzene from long-term exposure is on the blood. It causes harmful effects on the bone marrow and can cause a decrease in red blood cells leading to anemia. It can also cause excessive bleeding and can affect the immune system, increasing the chance of infection. Prolonged exposure may result in blood disorders like leukemia, reproductive and developmental disorders, and other cancers.



• Toluene

Low to moderate levels can cause headaches, dizziness, tiredness, confusion, weakness, drunken-type actions, memory loss, nausea, and loss of appetite. These symptoms usually disappear when exposure stops. Toluene may affect the nervous system. Long-term daily exposure to toluene in the workplace may cause some hearing and color vision loss. Repeatedly breathing toluene from glue or paint thinners may permanently damage the brain. Exposure to high levels of toluene during pregnancy, such as those associated with solvent abuse, may lead to developmental effects, such as reduced mental abilities and growth in children.



• Ethylbenzene

Exposure to high levels of ethylbenzene in the air for short periods can cause eye and throat irritation. Exposure to higher levels can result in dizziness. Animal studies have reported effects on the blood, liver, and kidneys from chronic inhalation exposure to ethylbenzene.

• Xylene

High levels of exposure for short or long periods can cause headaches, lack of muscle coordination, dizziness, confusion, and changes in one's sense of balance. Exposure of people to high levels of xylene for short periods can also cause irritation of the skin, eyes, nose, and throat; difficulty in breathing; problems with the lungs; delayed reaction time; memory difficulties; stomach discomfort; and possibly changes in the liver and kidneys. It can cause unconsciousness and even death at very high levels.

5 HEAVY METALS IN COAL DUST

Trace amounts of toxic heavy metals and other chemicals are naturally infused into the mined coal. These substances are liberated when coal is burnt and ultimately concentrate either in the air, the bottom ash, or the fly ash. Along with an increased risk of cancer from toxic heavy metal exposure, coal dust and ash can affect human development, create lung, and heart problems, cause stomach ailments, and contribute to premature mortality.

Some common toxic heavy metals in coal emissions and their health impacts:

Typically, coal power emissions and coal ash consist of arsenic, lead, mercury, selenium, and hexavalent chromium, among other carcinogens and neurotoxins.

I always shivered to think as a mother I was packing cigarettes instead of lunch boxes in my children's school bags. The air our children breathe could be equal to smoking up to 20 cigarettes a day or even more. We may be breathing for life but this breathing is killing us & our children.

Bhavreen Kandhari
Warrior Moms, India

Arsenic (As)

Arsenic is a carcinogen in humans. It has been shown to cause skin and lung cancer. Many scientists believe there is no safe level of exposure to a carcinogen. Exposure to arsenic can cause weakness, poor appetite, nausea, vomiting, headache, muscle cramps, and even death. Eye contact can cause irritation, burns, and red, watery eyes. Inhaling arsenic can irritate the nose and throat causing coughing and wheezing. Chronic arsenic exposure has been associated with spontaneous abortions and stillbirths. There is limited evidence that arsenic is a teratogen in animals. Scientists believe that until further testing has been done, it should be treated as a possible teratogen in humans. Repeated skin contact can cause thickened skin and/or patchy areas of darkening and loss of pigment. Some persons may develop white lines on the nails. Long-term exposure can also cause an ulcer or hole in the "bone" (septum) dividing the inner nose, hoarseness, and sore eyes. Arsenic may damage the nervous system causing numbness, "pins and needles," and/or weakness in the hands and feet. Arsenic may damage the liver.

Chromium (Cr)

Contact can irritate and burn the skin and eyes with possible eye damage. Inhaling chromium can irritate the nose and throat causing coughing and wheezing. Exposure to chromium *fumes* can cause "*metal fume fever*." This is a flu-like illness with symptoms of metallic taste in the mouth, headache, fever and chills, aches, chest tightness, and cough. The symptoms may be delayed for several hours after exposure and usually last for a day or two. Inhaling chromium can cause a sore and/or a hole in the "bone" (septum) dividing the inner nose, sometimes with bleeding, discharge, and/or formation of a crust. Chromium may cause a skin allergy. If an allergy develops, very low future exposure can cause itching and a skin rash. Chromium may cause an asthma-like allergy. Future exposure can cause asthma attacks with shortness of breath, wheezing, coughing, and/or chest tightness. Prolonged skin contact can cause burns, blisters, and deep ulcers. Chromium may affect the liver and kidneys. Coal ash ponds are known to leach hexavalent chromium, a form of chromium that is extremely toxic at very low doses.

Lead (Pb)

Lead is a neurotoxin and is known to cause low IQ among children. Lead is a probable carcinogen in humans. There is some evidence that lead and *lead compounds* cause lung, stomach, brain, and kidney cancers in humans and they have been shown to cause kidney cancer in animals. Many scientists believe there is no safe level of exposure to a carcinogen. Lead may be a teratogen in humans since it is a teratogen in animals. It may decrease fertility in males and females and damage the developing fetus and the testes (male reproductive glands). Lead can cause eye irritation, headache, irritability, reduced memory, disturbed sleep, and mood and personality changes. Exposure can cause upset stomach, poor appetite, weakness, and fatigue. Repeated exposure to lead can cause *lead poisoning*. Symptoms include metallic taste, poor appetite, weight loss, colic, nausea, vomiting, and muscle cramps. Higher levels can cause muscle and joint pain, and weakness. High or repeated exposure may damage the nerves causing weakness, "pins and needles," and poor coordination in the arms and legs. Lead exposure increases the risk of high blood pressure. Lead may cause kidney and brain damage, and damage to the blood cells causing anemia. Repeated exposure causes Lead to accumulate in the body. It can take years for the body to get rid of excess Lead.

Mercury (Hg)

Coal ash is known to leach mercury; the nervous system is very sensitive to all forms of mercury. Methylmercury and metallic mercury vapors are more harmful than other forms because more mercury in these forms reaches the brain. Exposure to high levels of metallic, inorganic, or organic mercury can permanently damage the brain, kidneys, and developing fetus. Effects on brain functioning may result in irritability, shyness, tremors, changes in vision or hearing, and memory problems. Short-term exposure to high levels of metallic mercury vapors may cause effects including lung damage, nausea, vomiting, diarrhea, increases in blood pressure or heart rate, skin rashes, and eye irritation. Very young children are more sensitive to mercury than adults. Mercury in the mother's body passes to the fetus and may accumulate there, possibly causing damage to the developing nervous system. It can also pass to a nursing infant through breast milk. However, the benefits of breastfeeding may be greater than the possible adverse effects of mercury in breast milk. Mercury's harmful effects that may affect the fetus include brain damage, mental retardation, incoordination, blindness, seizures, and inability to speak. Children poisoned by mercury may develop problems in their nervous and digestive systems, and kidney damage.

Selenium (Se)

Selenium is considered a signature pollutant of coal power plants. Breathing selenium can irritate the nose, throat, and lungs causing coughing, wheezing, and/or shortness of breath. Contact can irritate and burn the skin and eyes. Selenium can cause nausea, vomiting, diarrhea, abdominal pain, and headache. There is limited evidence that selenium may decrease fertility in females. High or repeated exposure can cause a skin rash (dermatitis). Repeated exposure can cause a garlic odor on the breath, metallic taste, irritability, fatigue, increased dental cavities, loss of nails and hair, and mood change (depression).

Over 90 percent of kids worldwide are breathing toxic air. This is unacceptable and as parents, we will not stand for it. Fossil fuels are damaging our children's health and stealing their futures. Across the world parents from around the world are standing up and demanding change and no new fossil fuels for the sake of all children.

Rebecca Wynn
Our Kids Climate

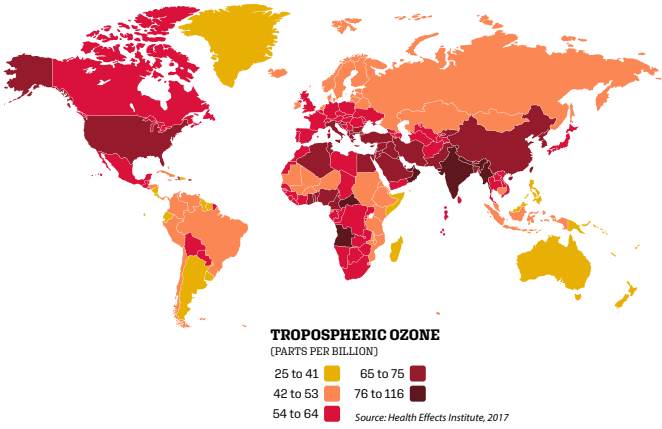
6 BLACK CARBON

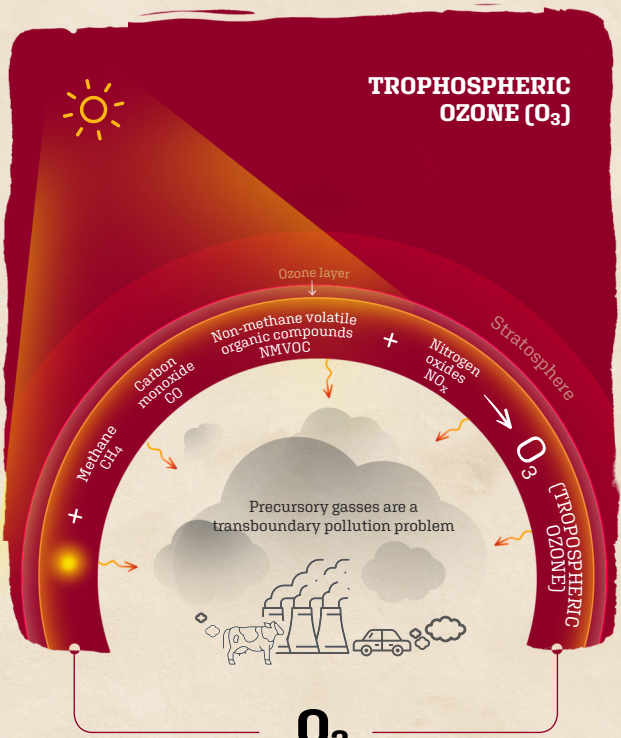
Black carbon is the sooty black material emitted from gas and diesel engines, coal-fired power plants, and other sources that burn fossil fuel. It comprises a significant portion of particulate matter or PM, which is an air pollutant. Black carbon is a global environmental problem that has negative implications for both human health and our climate. Inhalation of black carbon is associated with health problems including respiratory and cardiovascular disease, cancer, and even birth defects. And because of its ability to absorb light as heat, it also contributes to climate change. For example, as black carbon warms the air, rapid changes in patterns of rain and clouds can occur.

7 TROPOSPHERIC OZONE

Ozone can be "good" or "bad" for health and the environment, depending on where it is found in the atmosphere. Stratospheric ozone (found 32 kms above ground) is "good" because it protects living things from ultraviolet radiation from the sun. Ground-level ozone, also known as Tropospheric ozone, is "bad" because it is a greenhouse gas and air pollutant, which is harmful to human and ecosystem health. It can trigger a variety of health problems, particularly for children, the elderly, and people of all ages who have lung diseases such as asthma. It is also a major component of urban smog.

Ground-level ozone is not emitted directly into the air but is created by chemical reactions between oxides of nitrogen (NOx) and volatile organic compounds (VOC). This happens when pollutants emitted by cars, power plants, industrial boilers, oil & gas refineries, chemical plants, and other sources chemically react in the presence of sunlight.





O_3

is known as a 'secondary' pollutant because **it is not emitted directly**, but instead forms when precursor gasses react in the presence of sunlight

Warms the atmosphere

Damages plants and affects cultural production by reducing:

- health and productivity of crops
- plants ability to sequester carbon
- photosynthesis

O_3 pollution causes **over 150000 premature deaths every year, and millions more chronic diseases,** particularly in children and older adult

Source: Climate & Clean Air Coalition

8 METHANE AND HEALTH

Methane is a colorless, odorless, and highly flammable gas, which is the primary component of natural gas, biogas, and marsh gas. Depending on its origin it may be referred to as either of these. It is a powerful greenhouse gas emitted by human activities such as oil and gas production, waste landfills, and the raising of livestock, as well as by natural sources such as wetlands and volcanoes.

Methane is used for domestic cooking and heating, in energy generation, and in industry to refine petrochemicals and to produce plastics, fertilizers, anti-freeze, and fabrics.

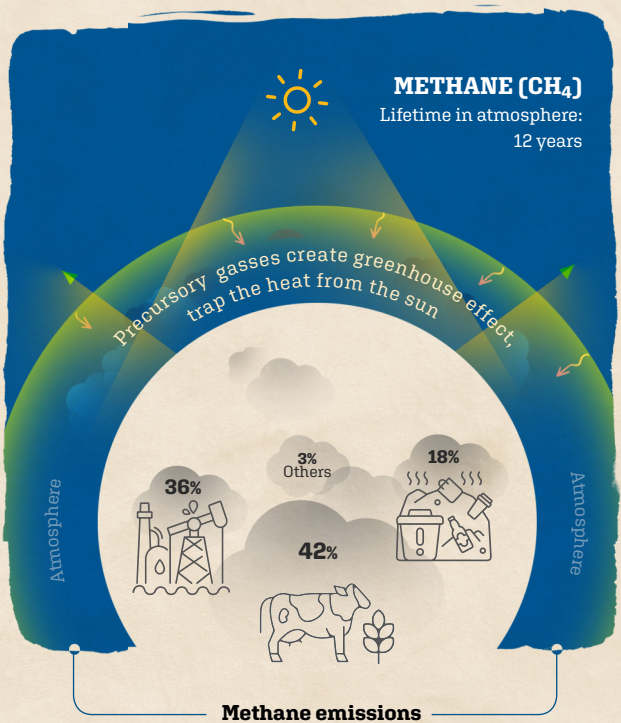
Methane is present in the atmosphere (and its levels are increasing); therefore, the public may be exposed to very low levels when breathing in the air. Low-level exposure to methane can also occur from the use of natural gas products or gas appliances in the home. Low-level exposure would not be expected to cause adverse health effects.

Occupational exposure to methane may occur in the workplace where it is extracted, produced, or used. Exposure to high levels of methane can reduce the amount of oxygen breathed from the air. 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. If exposure to methane is large or continues for a longer period, it can result in death.

Methane is a key precursor gas of the harmful air pollutant, tropospheric ozone. Globally, increased methane emissions are responsible for half of the observed rise in tropospheric ozone levels. While low-level methane does not cause direct harm to human health or crop production, ozone is responsible for about 1 million premature respiratory deaths globally. Methane is responsible for about half of these deaths.

Methane is a short-lived climate pollutant with an atmospheric lifetime of around 12 years. While its lifetime in the atmosphere is much shorter than carbon dioxide (CO_2), it is much more efficient at trapping radiation. Per unit of mass, the impact of methane on climate change over 20 years is 86 times greater than CO_2; over a 100-year period, it is 28 times greater. Data from the Intergovernmental Panel on Climate Change suggests that more than half of the warming we experience over the next two decades due to current emissions will be from the continued release of methane and other short-lived pollutants into the atmosphere.

Climate change has many widespread impacts, including an increased risk of harm to public health from extreme weather events such as stronger hurricanes, droughts, and heat waves. Additionally, warmer weather extends the lives and ranges of mosquitos and ticks, expanding their ability to spread vector-borne diseases such as Lyme disease, dengue, zika, and chikungunya.



Methane emissions caused by human activities are one of the most significant drivers of climate change. Methane is also the main precursor of tropospheric ozone, a powerful greenhouse gas and pollutant.

Responsible for 40% of warming since the industrial revolution

86x
times more powerful than CO_2 over a 20-year period

Causes roughly **50% of the 1+ millions deaths** due to ozone air pollution

- **Respiratory diseases**
- **Heart disease**
- **Damaged airways and lung tissues**

Upto 15% annual yield losses of wheat, rice and maize

Source: Climate & Clean Air Coalition

WHO IS MOST AT RISK

While air pollution is a problem that affects everyone, some groups of people are more vulnerable than others. These groups are multiple and may be overlapping; they include **children, pregnant women and other pregnant people, fetus, elderly, people living in poverty, people with respiratory ailments (asthma and chronic bronchitis),** and **people with cardiovascular disease or diabetes**.

When ambient air quality standards are set, special attention must be paid to ensure that the established levels are stringent enough to protect these vulnerable populations and not only those who are fully grown and in good health. vulnerable populations and not only those who are fully grown and in good health.

HOW CAN HEALTH CARE PROFESSIONALS ADVOCATE FOR CLEAN AIR?

Health professionals are usually the most trusted voices in their communities. Country leadership looks to them for advice, families confide in them, and citizens want to adhere to what the country's leading medical professionals have to say about their health. When doctors, nurses, hospitals, and health systems take public stances on air pollution and climate change, it can reframe these issues as questions of public health and help move public opinion and policy. The voices of health workers are critical in promoting actions that address air pollution and its impacts on health. Health care professionals can make a big difference — with their patients, in their practices, and in their health care institutions.

Rx ON THE ISSUE OF AIR POLLUTION, HEALTH PROFESSIONALS CAN

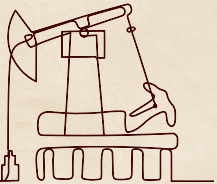
1. Highlight the health impacts of pollution and humanize the issue in the media, with the public and policymakers or with other colleagues and within professional medical associations.
2. Generate local health evidence from their clinics and communities on the health impacts of air pollution.
3. Provide health advisories for protecting their patients and the vulnerable population from the dangers of air pollution.
4. Highlight the health co-benefits of clean air and advocate for actions that promote clean air to their patients, communities, and policymakers.
5. Advocate for robust health adaptation and mitigation plans to combat the adverse health impacts of poor air quality, especially on the economically disadvantaged and marginalized populations.
6. Advocate for a just transition from dependence on fossil fuels to an economy that values health and is based on clean, renewable, healthy energy.

A GLOBAL CALL FOR HEALTH CARE PROFESSIONALS ON THE FOSSIL FUEL NON-PROLIFERATION TREATY

The Healthy Climate Prescription letter that health professionals signed in the lead-up to COP26 called on nations to deliver a rapid and just transition away from fossil fuels. Now, there is an opportunity to get involved in an important initiative that supports that goal - an international treaty among governments committing to stop the expansion of fossil fuel projects and to phase out existing projects.

A global effort is underway to establish a Fossil Fuel Non-Proliferation Treaty, and the health community is ready to add their support to this call. Health organizations are joining academics, scientists, Nobel laureates, cities, faith leaders, and young people in endorsing the call for a treaty to stop fossil fuels with a new letter of support specifically from the health community.

Like the Framework Convention on Tobacco Control, the proposed Fossil Fuel Non-Proliferation Treaty would aim to be an evidence-based international agreement to control a category of substances well-known to be harmful to human health, in order to ensure the right of all people to the highest standard of health.



The letter for endorsement can be found at: https://fossilfueltreaty.org/health-letter

It breaks my heart that the health of many of our members' children is severely impacted by these fossil fuel pollutants. But what is even worse, is knowing that the climate impacts caused by these pollutants are setting up children everywhere for hardships like droughts, floods, bushfires, and famine that they shouldn't need to face. We need to end fossil fuels.

Leanne Brummell
Parents For Future Global

AIR POLLUTION: A REGIONAL PROBLEM THAT NEEDS REGIONAL SOLUTIONS

Air pollution knows no borders. Management of air pollution sources, particularly those which affect territories over thousands of kilometers, require high levels of coordination and cooperation among several institutions across states and countries. In other words, we need to evolve a new framework that focuses on reducing air pollution in an 'airshed', i.e., the entire area over which the pollutants disperse due to meteorological and geographical factors. The concept is very similar to a 'watershed', an area of land that drains all the streams and rainfall into a common outlet like a river.

In an airshed approach, institutions in different jurisdictions would need to coordinate reductions in air emissions from all sources including industry, energy, vehicular, and residential sources. Formal coordination mechanisms through working groups and advisory committees between local, regional, state, and central authorities can provide pathways to effective regulatory and scientific cooperation across jurisdictions and sectors. The key is also to build trust and dialogue to achieve compliance with regulations and respond to political demands.

WHAT SHOULD THE GOVERNMENTS DO?

National level:

- Invest in increasing air quality monitoring capacity and disclosing data to the public about the health impacts of the air quality in the form of health advisories.
- Urgently revise their existing air quality standards and align them with the WHO guidelines of 2021, putting public health at the center of the standard setting process.
- Invest in policies and mechanisms to ensure enforcement of its air quality standards.
- Set stringent emission standards for refineries, industries, transportation, etc.
- Have robust health adaptation and mitigation plans to combat the adverse health impacts of poor air quality.
- Commit to phasing out of fossil fuels and invest in low carbon and healthy sources of energy options.

Regional level:

- Recognize that air pollution knows no boundaries and that there is a need for urgent cross border collaboration.
- Set up mechanisms to ensure regional collaboration, exchange of information, data, policies, and action to strategically tackle the air pollution and health crisis.
- Commit to phasing out of fossil fuels and invest in low carbon and healthy sources of energy options.

Studies say that more than "8 million people died in 2018 due to pollution by fossil fuels, that is to say, that the burning of coal and diesel were responsible for approximately 1 in 5 deaths worldwide". We cannot keep waiting for a miracle to happen to expect the best. We need to make this happen. Let's fight for a better future, as humans, but still, as animals that we are, that depend on trees, air, and water to live.

Ana Maria Ancines
Parents For Future Global

Health Care Without Harm (HCWH) works to transform health care worldwide so that it reduces it environmental footprint, becomes a community anchor for sustainability and a leader in the global movement for environmental health and justice.

The Health Care Without Harm Global Network is composed of regional offices in Europe, South East Asia, and the United States; a Latin America regional team and a global secretariat. Strategic partner organizations represent us in Australia, Brazil, China, India, Nepal and South Africa.

Health Care Without Harm and its partners also lead Global Green and Healthy Hospitals, a worldwide network of hospitals and health systems with more than 1,500 members in 75 countries, representing the interests of over 60,000 hospitals and health centers.

We also work in partnership with international organizations, including the World Health Organization (WHO), United Nations Development Program (UNDP), International Federation of Medical Students Associations (IFMSA), Global Climate and Health Alliance (GCHA), and World Federation of Public Health Associations (WFPHA).

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