Air Pollution

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Without urgent action, air pollution is estimated to cause 7 million deaths every year worldwide, with some estimates ranging to over 10 million.

Being one of the leading causes of NCD death, air pollution poses risks to our lives, planet and economies. Despite the grim picture, the international funding response for pollution prevention has been meagre. Learn more about its devastating impact and opportunities for successful policies.

Air pollution is the world's largest single environmental health risk, with over 90% of the global population living with unsafe levels of air pollution. It is estimated to cause at least 7 million deaths every year worldwide, with some estimates **[1] ranging much higher, and 80% of these deaths are due to NCDs.**

Fast facts

- 99% of the global population is living with unsafe levels of air pollution.
- Air pollution is estimated to cause 7 million deaths every year worldwide, with some estimates ranging to over 10 milion.
- 80% of deaths from air pollution are due to NCDs, primarily those affecting the heart and lungs. The other 20% are due to infectious diseases such as pneumonia.
- Beyond the heart and lungs, air pollution has negative effects on all of our bodies organs and functions, including an important effect on children's brains.
- Poorer countries and communities suffer most from air pollution, with more than 90% of pollution deaths taking place in LMICs.
- The economic losses due to air pollution are estimated to account for over 6% of global GDP, reaching higher

than 10% in some Asian countries where air pollution is most severe.

What is air pollution?

A human being breathes about 11,000 litres of air [2]every day. Apart from the oxygen (O2) and nitrogen (N2) we need to survive, air also contains pollutants including particulate matter, carbon monoxide, ozone, nitrogen dioxide and sulfur dioxide. These pollutants come from a wide range of sources: household cooking and heating fuels, motor vehicles, industrial facilities and forest fires are just a few. Particulate matter [3], mainly derived from burning fossil fuels, is the most harmful to human health.

In global health, air pollution fits into two main categories: Household air pollution (from indoor cooking and heating) and ambient air pollution (the contaminants in the air we breathe outside). About 3 billion people, particularly in developing countries, continue to rely on inefficient and polluting fuels for various purposes such as cooking, heating, and lighting, which means that household air pollution (HAP) remains a serious health threat despite a reduction in deaths over the past two decades. While deaths caused by HAP have fallen, those from ambient air pollution (AAP) have increased by 66% [4], driven by industrialisation, uncontrolled urbanisation, population growth, fossil fuel combustion, and an absence of adequate national or international chemical policy. Deaths from AAP are most drastically rising in south Asia, east Asia, and southeast Asia, while deaths from HAP are mainly occurring in low- and middle-income countries around the globe.

What are the health effects of air pollution?

Studies have found that air pollution accounted for 16% of all premature NCD deaths in 2016 [5], placing it alongside tobacco as the leading causes of NCD deaths. Other more recent research from Harvard University [1] found that 10.2 million people died prematurely in 2018 from fossil fuel pollution, specifically from fine particulate matter (PM2.5). This is significantly higher than previous research has suggested, and would mean that air pollution from burning fossil fuels alone was responsible for a quarter of all deaths worldwide.

Air pollution affects our lungs and heart most directly, and about 80% of deaths [6]from air pollution are attributed to NCDs affecting these organs. The remaining 20% are due to respiratory infections [7] such as pneumonia.

Air pollution is estimated to cause [3]:
29% of lung cancer deaths
43% of chronic obstructive pulmonary disease (COPD) deaths
25% of ischaemic heart disease deaths
24% of stroke deaths

But air pollution may prove even more deadly, as research discovers more about the linkages with our bodies and health. Beyond the lungs and heart, air pollution has been identified as a risk factor for endocrine disorders, obesity, gastrointestinal diseases, osteoporosis, skin diseases…the list goes on and on.

Effects of air pollution on our body

One important effect of air pollution is on our cognitive development and ability. It has been shown to affect children's brains [8], impairing their cognitive development, and has also been linked to impaired attention and poor school performance. And all those who live in areas affected by high levels of pollution - from young students to individuals of advanced age - are at higher risk of accelerated loss of cognitive ability [9].

It is important to note that poorer countries and communities suffer most from air pollution, with more than 90% of pollution deaths [10] taking place in LMICs. Those LMICs which are heavily industrialized or urbanized countries suffering most. In India for instance, fossil fuel pollution was responsible for the deaths of nearly 2.5 million people in 2018; representing over 30% of total deaths in India [1]among people over age 14.

Economic impacts of pollution

The 2017 Lancet Commission on Pollution and Health found that economic losses associated with all types of 2015 pollution were equal to 6.2% of world GDP [11], and 82% of these economic losses were attributed to air pollution. Other estimates range even higher. For instance a World Bank study showed that in 2019, the global economic losses attributable to household air pollution and ambient PM2·5 air pollution alone amounted to 6·1% of global economic output. The economic effects of air pollution are especially severe in regions of east Asia and the Pacific, where losses reach 9.3% of GDP, and south Asia, with losses of 10.3% of GDP.

The international funding response [11]for pollution prevention has been meagre. Only a small number of bilateral and multilateral agencies and organisations are promoting the health and pollution agenda, and those efforts receive very little support. And the situation does not seem to be changing. A 2019 study [12] of overseas development assistance (ODA) from bilateral and UN agencies allocated to reducing air pollution found that there was no overall upward trend. ODA contributions to all pollutants and chemicals amounted to just $860 million during the period 2016–18, which is inadequate for the size and scope of the problem. Private philanthropic funding for pollution control also remains scarce.

On the other hand, the International Monetary Fund has estimated that fossil fuels subsidies in 2020 totalled US$5.9 trillion or 6.8 percent of global GDP.

Few countries have been able to deal with this enormous public health problem through domestic measures. Although high-income countries have controlled their worst forms of pollution and linked pollution control to climate change mitigation, only a few low-income and middle-income countries have been able to make pollution a priority, devote resources to pollution control, or make progress.

As with other NCD risk factors, this higher and seemingly insurmountable level of air pollution makes it an issue of human rights and equality, as well as health.

A triple win: Policies for pollution, climate change and planetary and human health

We cannot separate our own health from the planet's. Reducing air and other types of pollution will greatly benefit both, and is a top priority for mitigating climate change. Especially in this context of inadequate funding for pollution reduction, governments must take what steps they can through effective policymaking. WHO highlights the following opportunities for successful policies [13] in diverse sectors to protect our health and planet from pollution:

- **Health**: Integrate air pollution into strategies to prevent NCDs;
- **Industry:** Clean technologies that reduce industrial smokestack emissions; improved management of urban and agricultural waste, including capture of methane gas emitted from waste sites as an alternative to incineration (for use as biogas);
- **Energy**: Ensuring access to affordable clean household energy solutions for cooking, heating and lighting;
- **Transport:** Shifting to clean modes of power generation; prioritizing rapid urban transit, walking and cycling networks in cities as well as railways for travel and transport between them; shifting to cleaner heavy-duty diesel vehicles and low-emissions vehicles and fuels, including fuels with reduced sulphur content;
- **Urban planning:** Improving the energy efficiency of buildings and making cities more green and compact, and thus more energy efficient;
- **Power generation:** Increased use of low-emissions fuels and renewable combustion-free power sources (like solar, wind or hydropower); co-generation of heat and power; and distributed energy generation (e.g. mini-grids and rooftop solar power generation);

- **Municipal and agricultural waste management:** Strategies for waste reduction, waste separation, recycling and reuse or waste reprocessing; as well as improved methods of biological waste management such as anaerobic waste digestion, are feasible, low cost alternatives to the open incineration of solid waste. Where incineration is unavoidable, then combustion technologies with strict emission controls are critical.

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