Air quality and health

Promoting sustainable transport, clean energy, waste management and urban planning can improve air quality and health, as well as contribute to the Sustainable Development Goals for Health (3), Energy (7) and Cities (11).

The global public health emergency

Air pollution is a global public health emergency. Ninety-one per cent of the world's population lives in places where air quality exceeds WHO limits. About seven million deaths[1] – one in eight deaths worldwide – is due to air pollution-related diseases. Air pollution is one of the largest causes of the four top noncommunicable diseases – stroke, lung cancer, chronic respiratory disease and heart disease – accounting for between a quarter and over one third and one quarter of those deaths. Air pollution is also responsible for more than 50% of childhood pneumonia deaths.

Major impacts on health, development and climate

- Fine particulate matter (PM) is one of the most health-damaging air pollutants also classified as carcinogen. Fine PM penetrates through the lungs into the bloodstream causing both respiratory and cardiovascular impacts.
- Ambient (outdoor) air pollution caused 4.2 million deaths (2016), mainly from transport, waste burning, agriculture, building energy use, industry, power production and forest fires.
- Household air pollution causes about 3.8 million deaths annually (2016), mainly due to smoke from inefficient cookstove technologies and fuels, e.g. biomass, coal, and kerosene.

- About half of the world still cooks over smoky stoves using biomass, coal, charcoal, dung or agricultural residues.
- Everyone's health is affected by air pollution, but low- and middle-income countries as well as poor and marginalized groups in high-income countries are at greater risk. Children, older people, and people with respiratory or heart diseases also are more vulnerable.
- Air pollutants such as methane and black carbon are powerful short-lived climate pollutants (SLCPs) that contribute to climate change. Black carbon, a component of PM, is one of the largest contributors to global warming after CO_2.
- WHO monitors three air pollution–related SDG indicators:
  - 3.9.1   Air pollution-related mortality
  - 7.1.2   Access to clean energy in homes
  - 11.6.2 Air quality in cities.

New opportunities – the time is right

In 2015, WHO Member States unanimously adopted a resolution recognizing air pollution as a global health risk and committing to action in four areas: building the knowledge base; monitoring and reporting; institutional capacity strengthening and global leadership and coordination. Other recent developments include:

- Technology – more cities are monitoring air quality and low-cost personal sensors also are becoming commonplace. Even so, air quality monitoring networks in developing regions, particularly Africa, still require significant development.

Global ambient air pollution, WHO guideline values (annual mean), PM$_{2.5}$: 10 µg/m^3, PM$_{10}$: 20 µg/m^3

Annual mean ambient PM$_{2.5}$ (µg/m^3)

World Health Organization
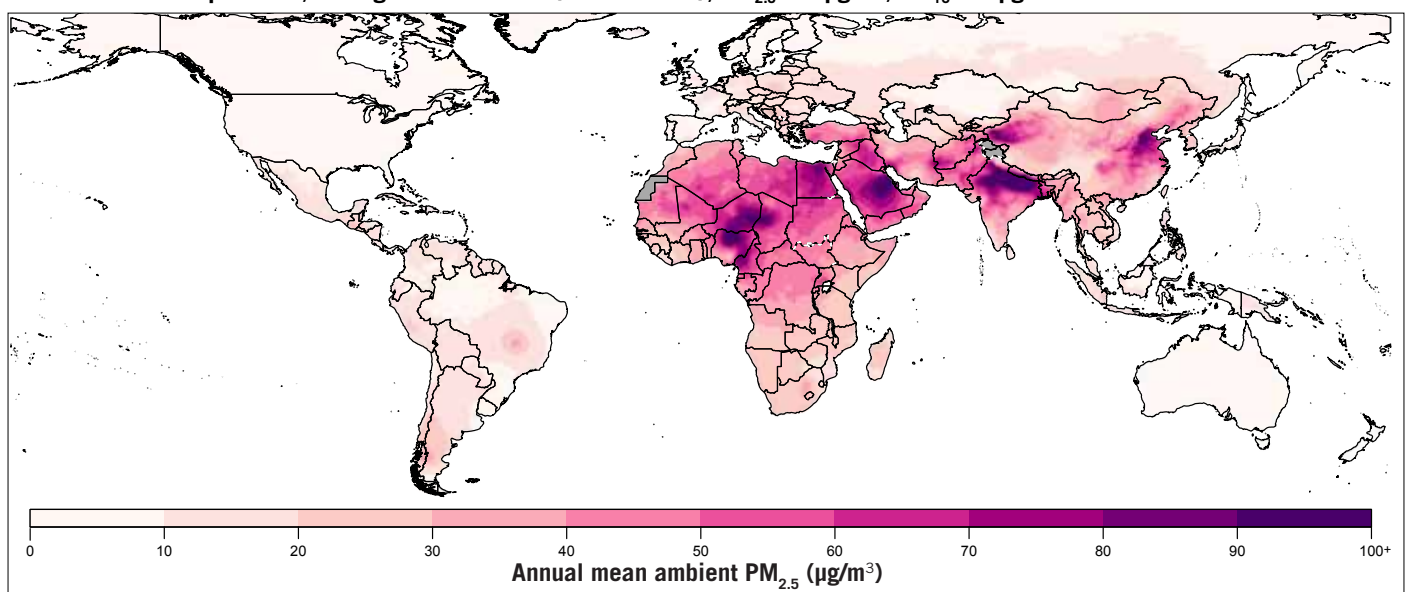
- Public awareness – increased awareness of air pollution's health and climate impacts has mobilized public opinion.
- Policy action – reducing air pollution is a key objective of initiatives such as the Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants (CCAC), and increasingly, for urban leaders. For example, Madrid, Paris, Athens and Mexico City recently committed to phase out diesel cars and vans by 2025.

WHO's response: and global leadership and coordination on air pollution and health

In line with the 2015 World Health Assembly resolution and a 2016 "Road Map" for enhanced action, WHO is providing global leadership and technical support to Member States as follows:

1. Global monitoring of SDG progress

The WHO databases on household energy and air quality are unique resources used by scientists, UN agencies, countries and others to monitor global progress towards clean air. They supply data to track progress on SDG 7.1.2 (access to clean fuels and technologies), as well as SDG 11.6.2 (improving air quality in urban areas). They are the basis for determining disease burden from air pollution for SDG 3.9.1. Ongoing improvements in modeling of air pollution exposures, pollutants (beyond $PM_{2.5}$) and disease outcomes, will further refine analyses.

2. WHO Air quality guidelines

WHO's guidelines are a basis for formulating national standards and policies.[2] These cover:

1. Ambient air quality: health relevant limits for pollutant concentrations indoors and outside.
2. Household fuel combustion: defines clean fuels and technologies, with reference to emissions targets for health-damaging pollutants.
3. Chemical indoor pollutants: limits for pollutants from indoor sources, such as building materials and furnishings.
4. Biological indoor air pollutants: indicators for mould and control measures.

3. Support to countries for evaluating new policies and interventions
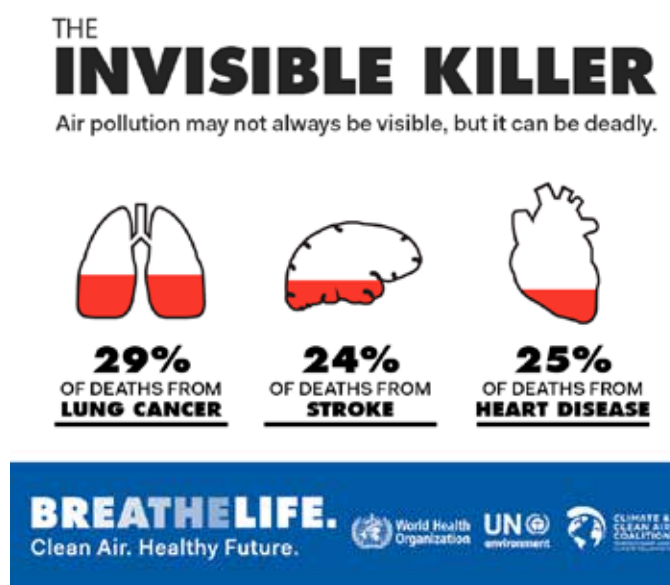
WHO has recently launched the AirQ+ software tool, which allows countries and cities to estimate locally deaths attributable to outdoor air pollution based on inputs such as: average ambient air pollution concentrations, population and population health data.[3]

Through the Urban Health Initiative, WHO is working with cities and national ministries of health to build capacity for evaluating and shaping strategies that reduce pollution from energy, transport, waste and other urban sectors in ways optimal to health. WHO is also working with Member States in the Americas, Africa and Asia to develop a clean household energy solution toolkit with resources for developing national policies and programmes for clean household energy.

4. Leadership

Global air quality and health platform – WHO, in collaboration with the World Meteorological Organization and UN Environment, convenes regular meetings with other intergovernmental agencies and academia, to harmonize data and methods for assessing air pollution's health burden, addressing research gaps and trends, such as use of new portable monitoring technologies.

BreatheLife campaign (www.breathelife2030.org) – A global campaign to raise awareness about the health risks of air pollution and its contribution to climate change in coordination with UN Environment and the Climate and Clean Air Coalition (CCAC). The campaign is building a network of *BreatheLife Cities* committed to reaching WHO Air quality guidelines, which already includes major cities and regions such as Jalisco State, Mexico; Mendel in, Colombia; and the Greater Manchester Region, United Kingdom.

THE
INVISIBLE KILLER
Air pollution may not always be visible, but it can be deadly.

29% OF DEATHS FROM **LUNG CANCER**

24% OF DEATHS FROM **STROKE**

25% OF DEATHS FROM **HEART DISEASE**

BREATHELIFE.
Clean Air. Healthy Future.
World Health Organization | UN environment | CLIMATE & CLEAN AIR COALITION

WHO – working at country level to:

- Increase national and city government commitments to attain WHO Air quality guidelines
- Conducting rapid situational assessment for clean household energy in Nepal, Peru, Ghana and Kenya.
- Assist with assessment of national and subnational disease burden from air pollution in 70 countries through online AirQ+ tool
- Assess air and health quality impacts of transport, household energy and waste interventions in Ghana and Nepal.

For more information:

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http://www.who.int/airpollution
www.breathelife2030.org

Endnotes:

1 Total estimated annual air pollution deaths of 7 million is somewhat less than the sum of deaths from indoor and outdoor air pollution, due to overlap in deaths from these two air pollution risk factors.
2 WHO air quality guidelines: www.who.int/airpollution/ambient
3 http://www.euro.who.int/en/health-topics/environment-and-health/air-quality/activities/airq-software-tool-for-health-risk-assessment-of-air-pollution