WHO strategic approach on air quality, energy access and health

World Health Organization

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A child gazes up at a bright sky filled with white clouds.
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Acknowledgements

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The SAG provides expert guidance and advises WHO on programmatic issues related to ambient and household air pollution and health. The SAG also advises on emerging research questions and needs related to the implementation of the road map and global strategy addressing air pollution and health.

Abbreviations and acronyms

AAP	ambient air pollution
APHT	Air Pollution and Health Training (WHO toolkit)
BAR-HAP	Benefits of Action to Reduce Household Air Pollution tool
BenMap	Environmental Benefit Mapping and Analysis Program
CHEST	Clean Household Energy Solutions Toolkit
CLIMAQ-H	Climate Change Mitigation, Air Quality and Health tool
CLRTAP	Convention on Long-Range Transboundary Air Pollution
COPD	chronic obstructive pulmonary disease
CSO	civil society organization
DIMAQ	Data Integration Model for Air Quality
EMAPAC	Estimating the Morbidity from Air Pollution and its Economic Costs
GAPH-TAG	Global Air Pollution and Health Technical Advisory Group
GEMM	Global Environmental Measurement and Monitoring Initiative
HAP	household air pollution
HEART	Household Energy Assessment Rapid Tool
HEAT	Health Economic Assessment Tool
HEPA	Health and Energy Platform of Action
HIA	health impact assessment
HOMES	Household Multiple Emission Sources model
HRA	health risk assessment
iSThAT	Integrated Sustainable Transport and Health Assessment Tool
LMICs	low- and middle-income countries
LPG	liquified petroleum gas
NAAQS	national ambient air quality standards
NCD	noncommunicable disease
NGO	nongovernmental organization
PM	particulate matter
SAG	Scientific Advisory Group
SDG	Sustainable Development Goal
UHC	universal health coverage
UHI	Urban Health Initiative
UN	United Nations
WHA	World Health Assembly
WHO	World Health Organization

WHO strategic approach on air quality, energy access and hea

Overall objective: Protect public he
to improve air quality and ensure acces

	Strategic pillar 1: Knowledge, evidence and measuring progress	Strategic pillar 2: Institutional capa building and tec
Statement	**Provide the evidence base and collect data to inform policies and programmes** *"What we know, what we don't know and where we are"*	**Develop tools and res application in countri into policies and actio** *"How best to do it"*
Actions	• Synthesize evidence to inform policy development • Develop normative guidance and implement recommendations • Establish baseline and measure progress	• Inform the developr frameworks • Planning and imple • Train and educate h
Outputs	• Publicly available databases • Technical reports of analyses • Knowledge synthesis • Norms and guidelines • Reports and tracking progress • Methods and protocols	• Health workforce cu • Tools and calculator • Methods for evaluat monitoring • Guidance for policy mechanisms and pr
Outcome	**The evidence base on air pollution and lack of energy access is comprehensive, up to date and available to inform decision-making, and monitor progress**	**Country stakeholders knowledge, skills and and air quality to imp actions in policies and**

alth – for healthier populations and universal health coverage

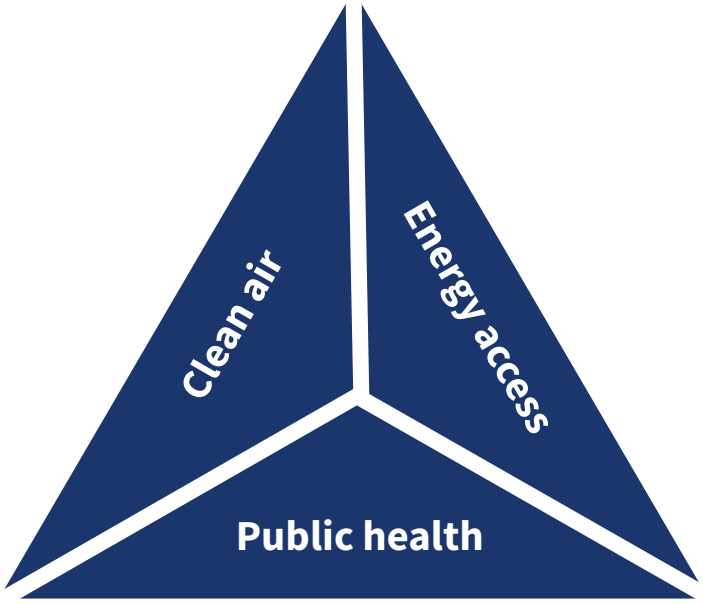
alth through evidence-based actions
ss to clean, sustainable energy solutions

acity hnical support	**Strategic pillar 3: Leadership and coordination**
ources, and support their es, to translate the evidence ons	**Promote health leadership and facilitate multi-sectoral coordination to accelerate action** *"Lead and steer"*
ment of regulatory mentation of interventions ealth and other sectors	• Convene interdisciplinary expert groups • Promote cross-sectoral and interagency collaboration • Leverage health argument for scaling up actions
rricula and training rs for situational assessment ion of interventions and development, regulatory ogramme implementation	• WHO-led expert working groups • Political commitment via WHO-led high-level coalitions and country engagement • Multi-partner initiatives and collaborative efforts • Joint technical activities with non-communicable diseases, maternal and child health, water and sanitation, and climate change agendas • Science communication and advocacy products
are equipped with capacity on energy access lement evidence-based d health care delivery	**Health, air quality and energy access is recognized and systematically integrated into the global development agenda to drive sectoral planning and actions**

Background – a global environmental health crisis

Air pollution is the greatest environmental risk to public health, through the life course. Unsustainable consumption, inefficient household energy, transport, waste burning, poor land-use planning, industrial pollution and power generation in communities all contribute to toxic air pollution – disproportionately affecting the poorest and most vulnerable populations. Some 7 million deaths are attributed to exposure to air pollution each year from diseases including heart disease, stroke, chronic obstructive disease (COPD), lung cancer and pneumonia *(1)*. Besides years of living with laboured breathing, punctuated by asthma attacks, or clouded by cataracts, a growing body of evidence suggests important links between air pollution exposure and other health outcomes like low birth weight, diabetes, cognitive impairment and even mental health *(2)*.

With around 2.1 billion people cooking using polluting fuels and technologies and 1 billion people served by health care facilities without reliable electricity worldwide, the lack of access to clean, sustainable energy impedes progress towards healthier populations, universal health coverage (UHC) and emergency preparedness *(3,4)*. The preventable health burden from air pollution and lack of energy access has substantial economic impacts, straining both national and household budgets with costs to health systems and disease management, loss of income and lower productivity. This leads to further inequities and negative impacts to well-being and livelihoods. Ultimately, air pollution and lack of clean, sustainable energy access are important contributors to climate change.



Vision: clean air and energy access for healthier populations and universal health coverage

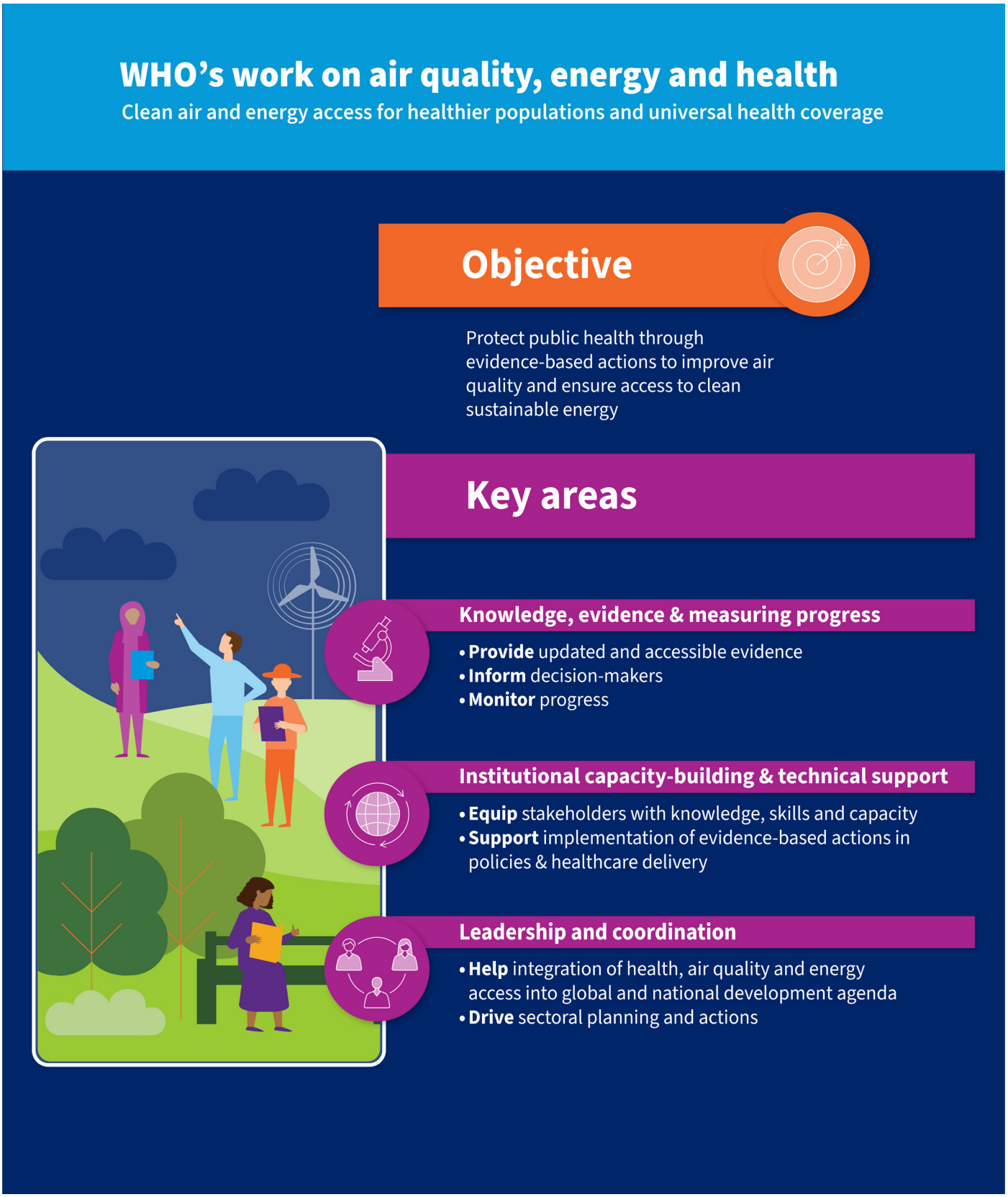
The overall objective of the strategic approach is:

Protect public health through evidence-based actions to improve air quality and ensure access to clean, sustainable energy solutions.

WHO's response

WHO, as the coordinating authority on international health, supports countries in protecting public health through evidence-based policies and actions. Considering the significant health burden and the multiple potential benefits of interventions, the WHO Air Quality, Energy and Health Unit aims to support countries by providing evidence, building institutional capacity and leveraging the "health argument" to convene sectors to tackle air pollution and accelerate energy access.

Recognizing the gravity and urgency of the problem, all Member States approved resolution WHA68.8: Health and the environment: addressing the health impact of air pollution *(5)* at the World Health Assembly (WHA) in 2015, complemented by a roadmap for action the following year *(6)*. This outlined the role of countries, and commits ministries of health to tackle the health impacts of air pollution and energy access, ultimately leading to healthier populations, UHC and emergency preparedness. The resolution and implementation of the roadmap were further informed by the WHO Global Strategy on Health, Environment and Climate Change *(7)* in 2019 and have served as a foundation of the air quality, energy and health strategic approach at WHO. Air pollution is also recognized by the United Nations (UN) General Assembly as one of the five top risk factors for noncommunicable diseases (NCDs) *(8)*.



Vision of the WHO Strategic approach on air quality, energy access and health

A multi stakeholder approach

Actions to improve air quality and ensure energy access require the engagement and coordination of multiple sectors including health, environment, energy, transport and waste. Putting health at the centre of policies ensures multiple benefits for the climate, local environment, poverty reduction and sustainable development. This strategic approach positions the health sector to actively contribute to and support policies to tackle air pollution, ensure access to clean and sustainable energy and leverage the health arguments. It requires active participation and contributions from a variety of stakeholders.

Countries have a leading role to ensure health is considered in all policies. The primary aim of the Strategy is to support countries in meeting this responsibility through direct engagement and active support for the actions articulated in this strategy. WHO's representation at the international, regional and country level, with its network of WHO collaborating centres, affords it a strategic advantage to bring actors together.

Other UN agencies and programmes provide technical resources and support in tackling air pollution and energy access and hence are well-positioned to facilitate international cooperation and harmonize the actions of countries and other stakeholders. The formulation and implementation of health policies and programmes require engagement with experts from academia and research institutions, as well as a wide range of civil society actors working at global and local levels. Nongovernmental organization (NGOs), philanthropic organizations, medical societies and other organizations have a critical role in advocating and influencing local, regional and global policies and programmes, as well as taking action on the ground.

Strategic framework approach and action areas

Building on these efforts, this document the *WHO strategic approach on air quality, energy access and health – for healthier populations* (hereafter referred to as the "Strategy") elaborates a framework and related actions for 2023–2030 to strengthen WHO's efforts to protect populations from health risks. The Strategy identifies concrete lines of actions where the health sector has either a lead or important supporting role in promoting health in all policies and ensuring access to quality health services. The actions are organized into three cross-cutting areas:

- **Knowledge, evidence and measuring progress**
- **Institutional capacity building and technical support**
- **Leadership and coordination.**

Member States and subnational entities are typically responsible for the implementation and monitoring of policies to promote air quality and energy access for health. Successful policies and solid governance depend on coordinated action between a variety of stakeholders and sectors. The Strategy articulates the role of the health sector, and WHO's mandate to support the sector. Cooperation with other UN agencies and non-state actors is essential and has been integrated into this strategy to ensure synergies and maximize impact on the ground. The action areas are interlinked and articulate opportunities for countries with different contexts and needs, with the health sector playing a convening role to drive action.

Strategic pillar 1: Knowledge, evidence and measuring progress

Provide the evidence base and collect data to inform policies and programmes

"What we know, what we don't know and where we are."

Outputs

Publicly available databases
Technical reports of analysis
Knowledge synthesis
Norms and guidelines
Reports on tracking progress
Methods and protocols

Outcome

The evidence base on air pollution and lack of energy access is comprehensive, up to date and available to inform decision-making and monitor progress

Actions

Synthesize evidence to inform policy

WHO synthesizes current evidence and identifies research gaps and priorities to strengthen knowledge and better inform policies by:

- **Compiling emerging evidence** related to health effects from exposure to air pollution and its different sources
- Integrating expert guidance and new evidence and methods in **health impact assessments (HIAs)**
- **Reviewing policies** to determine their effectiveness and to evaluate alternatives
- Developing methodologies to estimate the **burden of disease**
- Compiling information on the **health effects** of ambient and household air pollution
- Identifying **emerging health and other risks**
- Developing methodologies for **techno-economic assessment** for health care facilities
- **Identifying and setting research priorities** based on current gaps and country needs on the health risks from air pollution and inadequate energy access

Develop normative guidance and recommendations

WHO develops evidence-based guidance supporting effective interventions to protect health from air pollution by:

- Defining **normative recommendations** on the health risks from exposure to different pollutants based on robust synthesis of available evidence
- **Disseminating normative recommendations and guidelines** (see Annex 1. and 2.)
- Providing guidance for **implementation of WHO guidelines**
- Developing **good practice statements from the WHO guidelines** on sand and dust storms, ultrafine particles and black carbon
- Elaborating guidance on **good practice statements and cost-effective interventions** including for energy access, land-use planning (e.g. green spaces), transport, efficient waste management, industry and health care facility electrification to mitigate air pollution exposure and health risks
- Developing methods and protocols for **epidemiological monitoring**
- Providing public health guidance to **reduce personal exposure to air pollution**

Establish baselines and measure progress

WHO monitors indicators and trends of exposure and health impacts from air pollution and lack of energy access by:

- Guiding and defining **indicators to measure** progress in air quality and energy access
- Ensuring **transparent and efficient data collection** processes for the defined indicators
- Regularly maintaining and updating **WHO databases** on health risks from air pollution and energy access, including databases on exposure and burden of disease, and repositories of policies and interventions
- Serving as custodial agency for **SDG indicators** 3.9.1, 7.1.2, 11.6.2
- Providing **robust and harmonized estimates** of air pollution exposure and access to energy for all Member States to plan and monitor related actions
- Engaging with Member States and relevant partners to enhance **WHO models of exposure and health impacts**

Strategic pillar 2: Institutional capacity building and technical support

Develop tools and resources, and support their application in countries, to translate the evidence into policies and actions

"How best to do it."

Outputs

- Health workforce curricula and training
- Tools and calculators for situational assessment
- Methods for evaluation of interventions and monitoring
- Guidance for policy development, regulatory mechanisms and programme implementation

Outcome

Country stakeholders are equipped with knowledge, skills and capacity on air quality and energy access to implement evidence-based actions in policies and health care delivery

Actions

Inform the development of regulatory frameworks

WHO develops tools and guidance to ensure countries have the capacity to design the scientific and technical content of policies and programmes; and provides direct technical support for:

- **Health-based standards for air quality**, based on WHO guidelines
- National **policy and regulatory frameworks** to address the health impacts of air pollution
- National and regional **monitoring systems** to estimate air pollution exposure, lack of clean energy, and attributable burden of disease
- Regional- and global-level **agreements on air quality**
- **Standards for cookstoves** and other household energy devices
- **Electrification of health care facilities**

Planning and implementation of interventions

WHO translates the technical and scientific evidence into implementable policies by providing guidance and tools for:

- **Quantification of health-related risks of air pollution** (see Annex 2.)
- **Estimation of health-damaging emissions** for different interventions (see Annex 2.)
- Selecting **cost-effective interventions** to reduce cooking-related household air pollution and increase access to clean, sustainable energy (see Annex 2.)
- The **policy development process** including to map stakeholders and conduct situational analyses and apply tools to develop national action plans to tackle air quality (see Annex 2.)
- The **integration of health considerations across policies and sectors**
- Piloting projects in polluted areas in selected human settlements to **explore relevant approaches to implement policy changes** (see Annex 2.)

Train and educate health and other sectors

WHO develops and supports the dissemination of training resources for clinical, public health and other stakeholders by:

- **Training health care professionals** to better understand the health risks of air pollution exposure and the lack of access to modern energy services, as well as safe and effective interventions to minimize health risks
- Promoting the **incorporation of air pollution as a risk into clinical practice**, advising patients and vulnerable individuals on personal measures to mitigate health risks from air pollution
- Fostering the integration of training on air pollution as a health risk factor into health professional development **curricula and continuous professional education**
- Providing information, tools and guidance on **the role of the health sector** in addressing health impacts of air pollution and communicating the risks
- **Informing stakeholders from other sectors** about the health risks of different policies and interventions
- Building the capacity for **monitoring SDG indicators**
- Facilitating open **trainings and capacity building for countries**

Strategic pillar 3: Leadership and coordination

Promote health leadership and facilitate multisectoral coordination

"Lead and steer."

Outputs

- WHO-led expert working groups
- Political commitment via WHO-led high-level coalitions and country engagement
- Multi-partner initiatives and collaborative efforts
- Joint technical activities with NCD, maternal and child health, water and sanitation and climate change agendas
- Science communication and advocacy products

Outcome

Health, air quality and energy access is recognized and systematically integrated into the global development agenda to drive sectoral planning and actions

Actions

Convene interdisciplinary expert groups

Leverage WHO mandate to convene and facilitate independent and interdisciplinary expertise by:

- Establishing and providing **coordination and secretariat functions** to the Scientific Advisory Group, Health and Energy Platform of Action (HEPA) and Global Air Pollution and Health Technical Advisory Group (GAPH-TAG)
- Mobilizing **ad hoc expert consultations** to answer specific and emerging questions

Promote cross-sectoral and interagency collaboration

WHO facilitates and leads intersectoral initiatives to drive actions by:

- Promoting **regional and international cooperation to tackle transboundary air pollution**, such as the Convention on Long-Range Transboundary Air Pollution (CLRTAP)
- Ensuring health impacts from air pollution are **integrated into policies and programmes in different sectors** including energy, transport, environmental management, housing, land-use planning
- Serving as a **health advocate and expert** in intersectoral discussions and decisions impacting air quality and energy access
- Serving as the **health lead in political and technical interagency and multistakeholder efforts** focused on improving air quality, mitigating climate change and accelerating energy access
- Supporting facilitation of **concerted action by health and other ministries** at the global and regional level to address the health impacts of air pollution

Leverage "health argument" for scaling up actions

WHO amplifies the health argument for action on the health impacts air pollution and energy access by:

- Steering **initiatives and campaigns** to build awareness about the health risks of air pollution, and showcasing successful actions in communities (e.g. BreatheLife)
- **Convening high-level leaders** to raise awareness, advocate and commit to public health improvement through actions on air pollution and energy access, e.g. High-Level Coalition on Health and Energy
- Empowering health and other sectors by **providing information resources, advocacy and communications materials** (e.g. policy briefs, flyers, videos, web resources) for use by countries and other partners

References

(1) WHO Air pollution data portal. Global Health Observatory. Geneva: World Health Organization; 2024 (https://www.who.int/data/gho/data/themes/air-pollution).

(2) Schraufnagel DE, Balmes JR, Cowl CT, De Matteis S, Jung SH, Mortimer K et al. Air pollution and noncommunicable diseases: a review by the Forum of International Respiratory Societies' Environmental Committee. Part 2: air pollution and organ systems. Chest. 2019;155(2):417-426 (https://pubmed.ncbi.nlm.nih.gov/30419237/).

(3) Tracking SDG 7: the energy progress report. Washington: International Bank for Reconstruction and Development/The World Bank; 2024 (https://trackingsdg7.esmap.org/data/files/download-documents/sdg7-report2024-0611-v9-highresforweb.pdf).

(4) Energizing health: accelerating electricity access in health-care facilities. Geneva: World Health Organization; 2023 (https://iris.who.int/handle/10665/365588). Licence: CC BY-NC-SA 3.0 IGO.

(5) Resolution WHA68.8: Health and the environment: addressing the health impact of air pollution. Geneva: World Health Organization; 2015 (https://iris.who.int/handle/10665/253237).

(6) Health and the environment: draft road map for an enhanced global response to the adverse health effects of air pollution. Sixty-ninth World Health Assembly, Geneva, 23–28 May 2016. Geneva: World Health Organization; 2016 (https://iris.who.int/handle/10665/250653).

(7) WHO global strategy on health, environment and climate change: the transformation needed to improve lives and wellbeing sustainably through healthy environments. Geneva: World Health Organization; 2020 (https://iris.who.int/handle/10665/331959). Licence: CC BY-NC-SA 3.0 IGO.

(8) A/RES/73/2. Political Declaration of the 3rd High-Level Meeting of the General Assembly on the Prevention and Control of Non-Communicable Diseases. New York: United Nations General Assembly; 2018 (https://digitallibrary.un.org/record/1645265?ln=en&v=pdf).

Woman using a clean cookstove in a kitchen, illustrating safe and healthy cooking practices.
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Annex 1. Overview of WHO air quality guidelines

What are WHO air quality guidelines?

WHO air quality guidelines are a series of WHO publications that provide evidence-based, normative recommendations for protecting public health from the adverse effects of air pollution. WHO guidelines take into account the latest body of evidence on the health impacts of different air pollutants, and they are a key step in the global response to improve public health by eliminating or reducing exposure to hazardous air pollutants and by guiding national and local authorities in their risk management decisions.

Scientists and experts worldwide have produced the recommendations based on a robust and comprehensive review of the scientific literature and rigorously defined methodologies.

WHO Global air quality guidelines (global update 2021)

These guidelines provide evidence-informed recommendations in the form of air quality guideline levels, including an indication of the shape of the concentration–response function in relation to critical health outcomes, for $PM_{2.5}$, PM_{10}, ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide for relevant averaging times.

Interim targets are presented to guide reduction efforts towards the ultimate and timely achievement of the air quality guideline levels for countries that substantially exceed these levels.

Qualitative statements on good practices for the management of certain types of PM (i.e. black carbon or elemental carbon, ultrafine particles and particles originating from sand and dust storms) for which the available information is insufficient to derive air quality guideline levels but which indicate risk.

WHO Guidelines for indoor air quality: household fuel combustion (2014)

These guidelines aim to help public health policy-makers, as well as specialists working on energy and resource issues, to understand and implement the best approaches to reducing household air pollution. This extensive scientific assessment identifies which energy systems can be considered clean for health in the home, and specifies the levels of emissions that pose health risks. The guidelines also include recommendations against the use of unprocessed coal as a household fuel, and against the use of kerosene as a household fuel, in the light of health and safety risks. Another recommendation addresses the need for policies that prioritize substantial health benefits during the transition from the use of solid, polluting fuels to clean fuels and technologies, especially in low-income and rural households.

WHO Guidelines for indoor air quality: selected pollutants (2010)

These guidelines address a number of chemicals commonly present in indoor air (i.e. benzene, carbon monoxide, formaldehyde, naphthalene, nitrogen dioxide, polycyclic aromatic hydrocarbons, radon, trichloroethylene and tetrachloroethylene) often found indoors in concentrations of health concern. The guidelines are targeted at public health professionals involved in preventing health risks from environmental exposures, as well as specialists and authorities involved in the design and use of buildings, indoor materials and products.

WHO Guidelines for indoor air quality: dampness and mould (2009)

These guidelines address microbial pollution (building moisture and biological agents) that is a key element of indoor air pollution. It is caused by hundreds of species of bacteria and fungi, in particular, filamentous fungi (mould), growing indoors when sufficient moisture is available. The most important effects are increased prevalence of respiratory symptoms, allergies and asthma as well as perturbation of the immunological system. The guidelines also summarize the available information on the conditions that determine the presence of mould and measures to control its growth indoors. The most important means for avoiding adverse health effects is the prevention of persistent dampness and microbial growth on interior surfaces and in building structures.

How are WHO air quality guidelines implemented?

All guidelines provide a scientific basis for legally enforceable standards. The implementation of the guidelines offers several opportunities to take policy decisions to set priorities for action – knowing the health risk assessment of air pollution. They provide concentration–response relationships useful to health/environmental impact assessment practitioners to estimate the expected health effects under various scenarios. Researchers and academics also benefit from the guidelines because of the indication of critical data gaps that need to be filled in the future through a structured research agenda.

Implementation of the guidelines on air quality involves actions on:

- existing and operating air pollution monitoring systems;
- public access to air quality data;
- legally binding, globally harmonized air quality standards;
- air quality management systems;
- developing and applying tools to assist with planning and evaluating policies to support effective actions; and
- fostering capacity building, in particular for the health sector, and including content related to the guidelines in curricula for a variety of medical professionals and scientists.

Additionally, the guidelines support:

- consideration of the opportunities for synergy between climate policies and health, including financing;
- governments and other agencies developing and implementing policy on climate change mitigation;
- action on household energy and carry out relevant assessments to maximize health and climate gains;
- changing household energy practices through direct interactions between the public and health services; and
- encouraging intersectoral collaboration necessary for ensuring access to healthy levels of air quality for everyone.

Key ressources

WHO Global air quality guidelines (https://iris.who.int/handle/10665/345329).

WHO Guidelines for indoor air pollution: household fuel combustion (https://iris.who.int/handle/10665/141496).

WHO Guidelines for indoor air quality: selected pollutants (https://iris.who.int/handle/10665/260127).

WHO Guidelines for indoor air quality: dampness and mould (https://iris.who.int/handle/10665/164348).

WHO Clean Household Energy Solutions Toolkit (https://www.who.int/tools/clean-household-energy-solutions-toolkit).

Annex 2. Index of databases and repositories

Name	Category	Main topic	Type	Starting year	What is in there?
WHO Ambient Air Quality Database	Database	Ambient air pollution (AAP)	Real-world/ Census data	2011	Published version: annual mean of $PM_{2.5}$, PM_{10} and NO_2 at city level Non-published background version: annual mean of $PM_{2.5}$, PM_{10} and NO_2 at station level
Modelled estimates of particulate matter air pollution (Data Integration Model for Air Quality [DIMAQ] results)	Database	AAP	Modelled estimates	2014	Published version: gridded concentration
Database on Source Apportionment Studies for Particulate Matter	Repository	AAP	Epidemiological repository		Published version: 520 shares of source apportionment (sea salt, traffic, domestic fuel burning, natural sources, industry and other) from 230 studies
Air Quality Standards Database	Database	AAP	Other	2018	Published version: air quality standards based on the six WHO Global air quality guidelines pollutants
Global Household Air Pollution Measurements database	Database	Household air pollution (HAP)	Other	2003	Published version: 196 studies analysis through over 150 dimensions and divided in over 1290 measurements
Household Energy Database (Exposure)	Database	HAP	Real-world/ Census data		Published version: available upon request Non-published background version: share of different fuels and technologies for cooking, heating and lighting fuels, based on nationally representative data from surveys. It also contains information on stove type, time spent collecting fuel and incidence of acute lower respiratory infection

Description
WHO has been routinely collecting ground measurements of annual mean concentrations of two key pollutants. This database is critical to the modelling activities of WHO on exposure to air pollution and subsequently quantifying the number of premature deaths and associated diseases. With over 6000 cities/human settlement in 117 countries, it is the largest official database (with high-quality data). More disaggregated data are regularly requested by partners in academia and research organizations. The last update (5th) was published in 2022.
Assessing air pollution levels across the global in a consistent way is essential but such levels cannot be measured directly everywhere. WHO's current model provides the ability to predict air pollution levels across the world. It uses data from the WHO Ambient Air Quality Database and satellite population grid and topographic information via a complex mathematical model that covers the entire planet. The last update was published in 2018.
For reducing health impacts from air pollution, it is important to know what sources (e.g. transportation, power generation) contribute to human exposure, and by how much. The source apportionment database is a systematic collection of available source apportionment studies on PM from cities all over the world. It gathers over 520 shares of source apportionment (sea salt, traffic, domestic fuel burning, natural sources, industry and other) from across the world, from 230 studies. This database was developed in cooperation with the Joint Research Centre of the European Commission in Ispra, Italy. It is based on a 2015 paper published in Atmospheric Environment. The last update (2nd) was published in 2015.
WHO developed the ambient air quality guidelines at levels considered to be safe or of acceptable risk for human health. These guidelines are meant to support governments in defining national standards. Tracking such standards is important to assess differences and promote science-based standards. This database was developed in cooperation with Swiss Tropical and Public Health Institute. The first update was published in 2018.
A repository of methods and results from studies reporting household air pollution measurements. This database currently contains measurements from 196 studies from 43 countries between 1968 and 2016. This database is useful for understanding the range of household and outdoor air pollution measurements that have been taken in a country or region. The last update (5th) was published in 2018.
The database contains nationally representative data from surveys and censuses on cooking, heating and lighting fuels. It serves to estimates with models the use of clean versus polluting fuels and technologies, which allow to estimates the exposure for household air pollution and down the line calculate its burden of disease.

Name	Category	Main topic	Type	Starting year	What is in there?
Cooking fuels and technologies	Database	HAP	Modelled estimates		Published version: global, regional and country level for six specific fuel categories: electricity, gaseous fuels (including LPG, natural gas and biogas), kerosene, biomass (unprocessed biomass includes wood, crop residues and dung), charcoal and coal, for urban, rural and total, and 170 countries, with data dating back to 1960
WHO Air Pollution Data Portal	Database	Both	Other		Various datasets and time series
Integrating health in urban and territorial planning: directory	Repository	Urban health	Other	2022	Published version: 100+ open access resources tools
WHO Household Energy Policy Repository	Repository	HAP	Other	2021	Over 120 clean household energy policies or policy statement and more than 30 independent evaluations
Database on Electrification of Health-care Facilities	Database	Health care facility electrification	Other	2023	Summary statistics and estimates
Health Effects from Liquid and Gaseous Fuels Database	Database	HAP	Other	2022	Liquid and gaseous fuels used for household energy

Description
The database contains nationally representative data from surveys and censuses on cooking, heating and lighting fuels. It serves to estimate, with models, the use of clean versus polluting fuels and technologies, which facilitate production of exposure to household air pollution estimates and calculate burden of disease.
The portal provides statistics related to the burden of disease and mortality related to air pollution, both ambient and indoor. This includes data for SDG indicators such as mortality from air pollution and access to clean energy. These indicators enable countries and the world to assess the gap between the current state of affairs and global and regional targets. Most indicators rely on models developed by WHO with academic partners and feeds with other WHO databases.
The directory is an online repository of more than 100 open access resources and tools that provide information on the importance of planning and designing urban areas from a health perspective, as well as concrete guidance on how to achieve this. It includes resources that describe the importance of considering health in urban and territorial planning, tools that quantify the health and socioeconomic impact of planning and designing urban areas from a health perspective, the description of successful initiatives, or training materials on urban planning and health, among others. It also includes resources in different languages – including all the WHO official languages (Arabic, Chinese, English, French, Russian and Spanish) – and from different geographical regions. The directory builds from the resources included in the Integrating health in urban and territorial planning: a sourcebook (by WHO and UN-Habitat) and Supporting a healthy planet, healthy people and health equity through urban and territorial planning (Grant M et al., 2022).
WHO, in partnership with the Stockholm Environment Institute, developed a Household Energy Policy Repository (“the Repository”) to serve as an online clearing house for national, regional and local policies, regulations and legislation affecting household energy use. The Repository summarizes policies targeting cooking, heating and lighting using clean fuels and technologies including electricity, LPG, biogas, solar thermal and photovoltaic, ethanol, as well as other options like biomass pellets. The Repository currently includes information on over 120 clean household energy policies or policy statements from more than 30 countries and the European Union, representing all WHO regions. There are also links to more than 30 independent evaluations that assess the impacts of specific policies.
The database includes summary statistics from national health care facility assessments, surveys and reports on the percentage of facilities reporting no access to any electricity, unreliable access and reliable access to electricity. The data are disaggregated by health care facility attributes, when available, including facility type (hospital versus non-hospital) and geographic location (urban versus rural).
This database was developed through a systematic review of scientific literature and includes a full range of liquid and gaseous fuels used for household energy and associated air pollutants and potential health effects (including symptoms and diagnoses from exposure to household air pollution and burns and poisoning from use of the fuels). The database contains studies conducted between 1980 and 2020, with searches conducted in January 2021. The review protocol was registered with PROSPERO (CRD42021227092).

Annex 3. Lines of action

Line of action 1: Driving change – WHO global leadership on air pollution and energy access

Relevance

Ensuring clean air and energy access requires a collective voice and cooperation. WHO promotes a multidisciplinary approach and fosters partnerships to synthesize the science in a robust and independent way following the highest technical standards. By mobilizing resources, convening partners and promoting action by health and other sectors, WHO has raised the political ambition to improve health by addressing air pollution and energy access. As the lead global health agency, WHO is well placed to engage with ministries of health in disseminating the health evidence on air pollution and energy access, and leverage the health argument to drive concerted action on the ground – at local, national and global levels (see Fig. A1).

Yet, health is not always considered in development decisions and public action in general, leading to conflicting agendas. WHO, as the custodial agency for several Sustainable Development Goals (SDGs), can enable the global community to increase impact in countries across sectors.

Key facts

- Close to a quarter of total deaths are preventable by modifying the environment; among these deaths, air pollution accounts for the largest proportion *(1)*.
- Very limited financial resources are allocated to tackling air pollution and its health impacts. This is despite the resulting large health costs (estimated by the World Bank at US$ 8.1 trillion annually) *(2)*.
- WHO estimates that close to 1 billion people in low- and middle-income countries (LMICs) are served by health care facilities without reliable electricity access or with no electricity access at all *(3)*.

Opportunities

With 99% of the world's population breathing polluted air, with billions lacking access to clean energy in homes and health care facilities, and considering the importance of reducing air pollution to protect our fragile climate, there is no time to wait to take action to protect the health of people and our planet. Therefore, as the world begins to take stock of the progress towards the SDGs, and sets the post-2030 agenda, integrating health, air pollution and climate mitigation targets across policy areas is an important opportunity to drive "health-wise" sustainable development. With WHO's technical mandate and ability to position the health sector to play a more active role in policy-making within and outside the health sector, WHO is looking to use the trusted voice of health practitioners and leverage the health argument to promote air pollution, energy access and climate mitigation actions to protect public health.

WHO response

WHO has a number of ongoing leadership and coordination activities aimed at bringing together governments, agencies, technical experts and civil society organizations (CSOs), among others, to promote multisectoral and interagency collaboration for evidence-based action. The following examples evidence WHO's work in this area.

BreatheLife: Since 2016, WHO has used its global convening and advocacy role to mobilize Member States and municipalities to foster public actions through strong communications campaigns, workshops on health risk communications and providing technical support for advocacy and awareness raising.

Global air pollution and health conference: In 2018, WHO held the first global conference on air pollution and health, bringing together almost 1000 people representing governments, academia, CSOs, UN partners and others, to learn about the health risks of air pollution and the evidence around how to tackle this in the community, at home and at national level.

Health and Energy Platform of Action (HEPA): Co-convened with the UN Development Programme, UN Department of Economic and Social Affairs and the World Bank and WHO, HEPA brings together over 20 organizations and country representatives working on health and energy access to share expertise and resources, identify synergies and coordinate efforts on the ground to accelerate access to clean cooking and health care facility electrification. With focused thematic working groups, HEPA meets regularly with UN agencies, CSOs and experts to build political and financial commitment and strengthen the capacity of the health and energy sectors to work together to ensure universal access to clean and sustainable energy to protect health.

High-Level Coalition on Health and Energy: This coalition was convened by the WHO Director-General and comprises government and institutional leaders. It aims to strengthen cooperation between the health and energy sectors, increase political momentum, spur investment, mobilize public support and drive practical solutions.

Global Air Pollution and Health Technical Advisory Group (GAPH-TAG): Shaping the research agenda and coordinating efforts to advance knowledge and understanding on air quality and its impact on health are critical to advancing evidence-based decision-making. Consisting of around 80 global experts, GAPH-TAG meets regularly via expert working groups to outline key research priorities. WHO provides the secretariat and coordination functions of GAPH-TAG. In addition, WHO works with research centres and the health community as a whole to promote research to address needs and fill gaps relevant to Member States.

WHO collaborating centres: WHO established and engages closely with research and national agencies through WHO collaborating centres to support a vast range of technical activities related to air pollution, energy access and climate mitigation.

UN interagency engagements: WHO serves as the health focal point in a number of UN interagency tasks forces such as UN Energy; SDG 7 Technical Advisory Group; Climate and Clean Air Coalition; UN Interagency Task Force on NCDs; Health, Environment and Climate Change Coalition; Global Strategy for Women's, Children's and Adolescents' Health; and the UN Coalition on Combating Sand and Dust Storms.

SDG 3, 7 and 11 monitoring: WHO serves as the custodial agency for air pollution-related indicators (for SDGs 3, 7 and 11) – actively participating in efforts to monitor them.

Fig. A1. WHO global leadership on air pollution and energy access

Scientific Advisory Group on Air Pollution, Energy and Health

Health and Energy Platform of Action – Thematic working groups (clean cooking and health care facilities)

Global Air Pollution and Health – Technical Advisory Group

SDG 7 Technical Advisory Group

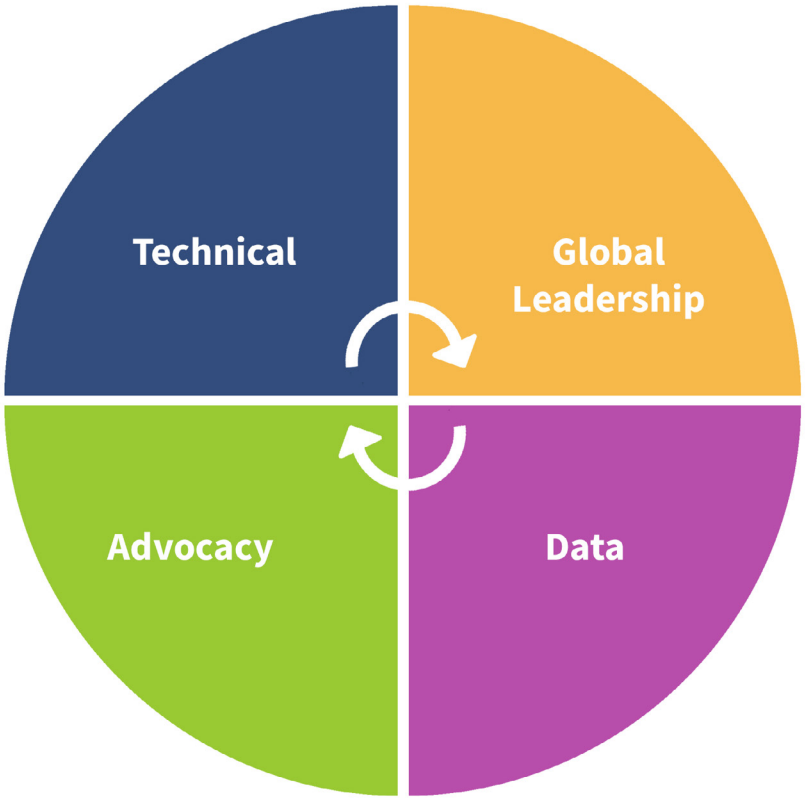
High-level Coalition on Health and Energy

UN Energy

Climate and Clean Air Coalition

UN Coalition on Combating Sand and Dust Storms

UN Interagency Task Force on NCDs



World Health Statistics

WHO Global Programme Work 13 Monitoring

BreatheLife

Health and Energy Platform of Action

High-Level Coalition on Health and Energy

SDG 3: Mortality of air pollution

SDG 7: Access to clean energy (in households and health care facilities)

SDG 11: Air quality in cities

Next steps

Moving forward, WHO will continue to champion clean air and energy for public health by bringing together the evidence, strengthening partnerships across sectors and provide the knowledge and tools for evidence-based action.

Working together: WHO will strive to further strengthen cooperation politically and technically between different stakeholders in serving as the secretariat for or contributing to cooperative platforms and partnerships internal and external to the health sector, such as HEPA. Through further engaging with ministers, mayors and other champions, WHO aims to raise the political profile and ambition for bringing clean air and energy to all. For example, GAPH-TAG and HEPA convene researchers and technical experts to advance evidence for policy and implementation on the ground.

Talking clean air and energy access for health: WHO is looking to further strengthen the health voice on air pollution, energy access and climate linkages through its advocacy work via HEPA, BreatheLife and other communication channels. It is enhancing its outreach via web, social media and other outlets to disseminate knowledge, and working with journalists to disseminate information.

Driving change: A key focus of WHO's programme is continuing to support communities of all sizes to build the capacity to implement WHO air quality guidelines. Similar to the Clean Household Energy Solutions Toolkit (CHEST), WHO is developing a set of tools to design and evaluate air pollution technological and policy interventions to scale up action in countries. For health care facility electrification, similar efforts are under way to develop tools for selecting and implementing health care facility electrification systems as well ensure proper usage and maintenance.

Monitoring progress: WHO will continue in its custodial role in monitoring health-related indicators beyond SDG 3 (Health) including energy access and air quality in cities and serve as a strong advocate and data source to monitor public health impacts of air pollution and energy access as part of the post-2030 agenda, while at the same time further strengthen countries' capacities to track their own progress.

Sharing solutions: Building upon the success of the First WHO Global Conference on Air Pollution and Health in 2018, WHO is now making plans for a second global conference on air pollution and energy access focused on healthy solutions. This second conference is scheduled for the March 2025 and aims to share new evidence, drive commitments by countries and other stakeholders, endorse a road map to tackle air pollution, and accelerate energy access to protect public health.

Resources

WHO Air Quality, Energy and Health Programme
(https://www.who.int/teams/environment-climate-change-and-health/air-quality-and-health).

BreatheLife
(https://breathelife2030.org).

Line of action 2: Building the case for action on air pollution health risk reduction

Relevance

Air pollution is one of the leading risks for NCDs. In 2018, in response the global NCD epidemic, the UN General Assembly recognized air pollution as one of five key risk factors and called on countries to scale up action to tackle air pollution. Unlike the other four NCD risk factors (tobacco use, salt intake, alcohol consumption and physical activity), all of which are largely linked to behaviours and actions taken by the individual, tackling air pollution requires concerted policy action by different economic sectors and stakeholders at community, country, regional and international scale.

Policies and investments in actions like cleaner transport and power generation, energy-efficient housing and municipal waste management, among others, can reduce key sources of air pollution. However, the cost and health impact of each of these interventions individually or in combination will differ based on characteristics of the specific location.

The types and levels of air pollution vary considerably across countries, cities and regions due to factors such as local and regional polluting sources, geography, climatic conditions, available infrastructure and financial resources, but also political will. Further, air pollution interventions often require significant investment by governments and municipalities, often forcing countries to weigh the costs and benefits in comparison with other competing development priorities.

The 2030 Agenda for Sustainable Development and the drive for net zero emissions by 2050, paired with the demand to produce a set of “best buy” intervention options on air pollution, provide an opportune time for country action on air pollution. Currently, there is a paucity of tools and knowledge resources available for countries to identify and implement “health-wise” interventions to combat air pollution. Accordingly, there is an urgent need to provide governments and other stakeholders with robust evidence and a set of sound tools to evaluate and select air pollution interventions based on the overall health, economic, social and environment impacts.

Key facts

- 85% of air pollution-related deaths are caused by NCDs, including stroke, ischaemic heart disease, COPD and lung cancer *(4)*.
- Laboured breathing, impaired physical activity and the other disabilities are often overlooked burdens carrying heavy costs for the individual, households, health systems and the local economy *(5)*.
- US$ 8.1 trillion were attributed to air pollution due to loss of productivity and additional health care system costs in 2019 alone *(2)*.

WHO response

WHO is supporting countries identify cost-effective interventions to protect health from air pollution and build the business case for action by:

- Developing robust methods to systematically assess the health (morbidity and mortality), economic and other impacts of different policy and technological solutions for air pollution mitigation (e.g. Estimating the Morbidity from Air Pollution and its Economic Costs [EMAPEC]).
- Reviewing policy and technological interventions to inform the development of guidance for selecting, implementing and monitoring air quality interventions (e.g. Household Energy Policy Repository).
- Tracking policies for air pollution mitigation and pairing them with relevant evaluations, when available, to share lessons learned and encourage cross-country cooperation (e.g. Ghana Policy Tracking Report).
- Developing interactive tools allowing countries to quantify the health, social, environmental and economic costs and benefits of interventions (e.g. BAR-HAP) to support evidence-based decision-making.

Next steps

Air pollution intervention knowledge portal: WHO is defining a methodology to produce examples of air pollution interventions that could serve as "best buys" for protecting health from air pollution and support integrated planning. To do so, WHO is building a knowledge portal to better assess the impacts of policies, including expected air pollution reductions, health and climate impacts as well as monetary costs. The portal itself will:

- identify cost-effective intervention strategies based on common factors (e.g. by sources of emissions or pollutant);
- be searchable and facilitate exploration of interventions for a specific location or context based on characteristics or details such as sectors, emission source(s), demographics, geography, etc.;
- allow user inputs of interventions that achieved specific goals or targets for inclusion in the database;
- be regularly updated and maintained; and
- assess the level of evidence available for a particular type of air pollution intervention.

Using the information included in the portal, WHO will compile and synthesize the evidence to derive some overarching guidance on best practices on policy interventions for air pollution as well as provide interactive web-based tools and resources allowing users to select and evaluate the interventions best suited for their specific context or priorities. Such an interactive tool will help to quantify net costs and benefits of interventions in terms of health, government and individual expenditure, climate and other socioeconomic impacts.

Resources

EMAPEC (https://www.who.int/activities/estimating-the-morbidity-from-air-pollution-and-its-economic-costs).

CLIMAQ-H (https://www.who.int/europe/tools-and-toolkits/climate-change-mitigation--air-quality-and-health-(climaq-h)).

Household Energy Policy Repository (https://www.who.int/tools/household-energy-policy-repository).

BAR-HAP tool (https://www.who.int/tools/benefits-of-action-to-reduce-household-air-pollution-tool).

Tackling NCDs: 'best buys' and other recommended interventions for the prevention and control of non-communicable diseases (https://www.who.int/publications/i/item/WHO-NMH-NVI-17.9).

Line of action 3: Informing clean air policies via health impact assessment and other tools

Relevance

The world is waking up to the health and environmental threat of air pollution. With the recurring headline of 7 million deaths attributed to air pollution, largely due to chronic diseases like heart disease, stroke, COPD and lung cancer, the growing call for climate mitigation, as well as the latest WHO Global air quality guidelines, which show that even lower pollutant thresholds are required to protect public health, tackling air pollution can be seen as a means to beat the growing NCD epidemic, fight the climate crisis while paving a sustainable development pathway.

However, unlike some other public health risks, there is no single solution or "prescription" for tackling the health risks of air pollution. Policies in different economic sectors, like energy, transport, land use and waste management, produce health impacts by multiple direct and indirect routes, which each carry different costs and benefits for health, depending on their local context and geography. This leaves decision-makers having to answer tough questions as to which sector policies and technological solutions provide the greatest benefits for health and what the trade-offs are between options. Health impact assessment (HIA) can assist policy tracking, i.e. the development and application of systematic approaches to identifying and evaluating the planning, implementation and progress of a policy or intervention.

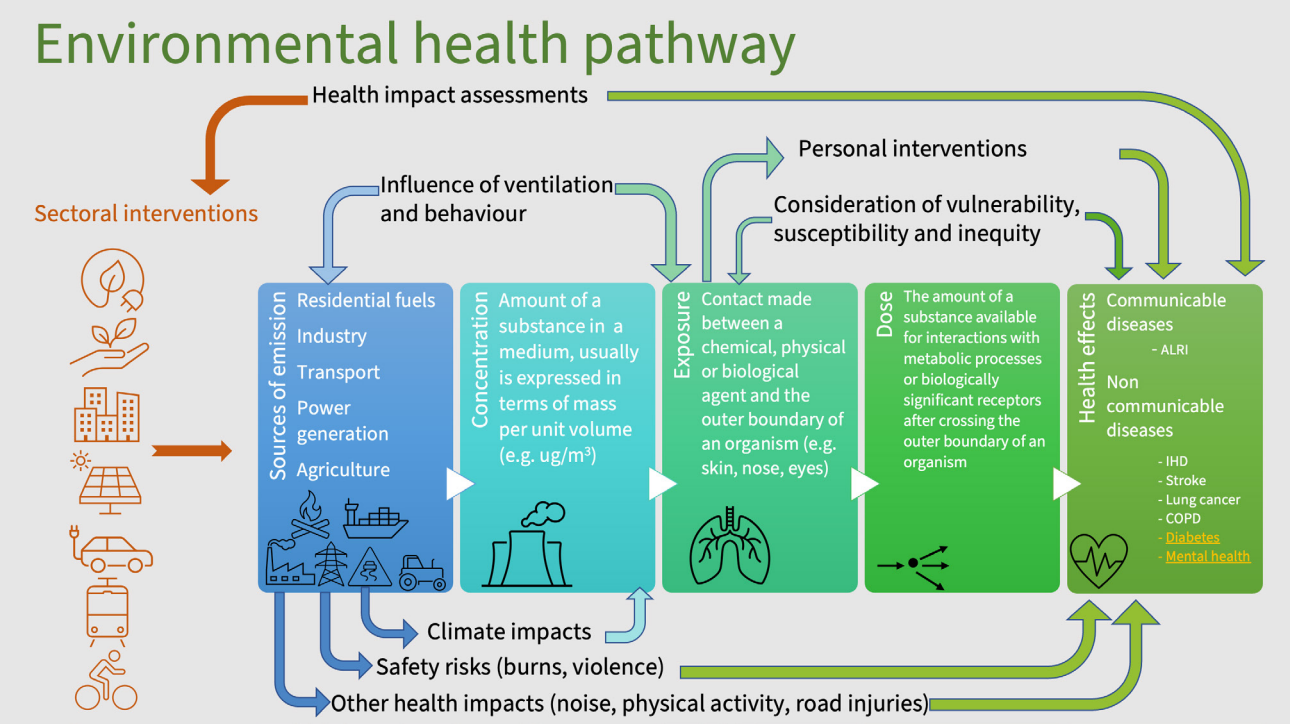
Key facts

- Health is at risk at even low levels of air pollution. Consequently, 99% of the world's population is exposed to air pollution *(6)*.
- Through the achievement of interim target one of the WHO Global air quality guidelines (35 µg/m^3), around 300 000 deaths would be saved worldwide annually *(7)*.
- Power generation, energy use in buildings, transport, agriculture and industry are the main anthropogenic sources of air pollution globally *(8)*.
- As of 2021, only 57 % of countries have legal requirements to monitor air quality and 31% of countries have still not adopted ambient air quality standards, even if there is a legal mandate *(9)*.
- Addressing air pollution can only be efficient if tackled at different geographical scales (urban, rural, national, regional, international) *(10)*.

Opportunities

Whether countries are working to develop or revise their national ambient air quality standards (NAAQS), identify climate mitigation strategies with health co-benefits, and/or implement actions on air pollution to tackle the growing epidemic of NCDs or childhood mortality, the health impacts of air pollution need to be an important factor in any decision-making. Tools like HIA serve as critical resources to inform and evaluate policy options. Co-benefits of air pollution reduction strategies clearly affect other health and development outcomes such as noise reduction, improved safety, promotion of physical activity, protection and overall well-being.

Fig. 2. Environmental pathway



WHO response

Health impact assessment: WHO is actively supporting decision-makers with tools such as HIA (see Box 1) to leverage the "health argument" in the policy and planning work of different sectors, including household energy and transport. Such tools support countries to quantify levels of exposure to air pollution and changes in mortality, morbidity and other impacts from different sectoral interventions (e.g. AirQ+ software tool).

Urban Health Initiative: WHO has developed increasingly sophisticated methods within pilot projects in the WHO UHI to address air pollution in urban settings. These assessments provide insights into multiple dimensions of the urban environment (transport, waste, household energy) and their impacts on health, which, however, are not always considered in the policy and decision-making process.

CHEST: WHO has also been a pioneer in tackling household air pollution caused by the use of polluting fuels and technologies for cooking – a significant source of ambient (outdoor) air pollution globally – developing a toolkit (CHEST, see Line of action 4). This toolkit guides users through a series of steps, from conducting situational assessment and stakeholder mapping on household energy to creating an action plan to using an evidence-based approach to select technological and policy solutions to protect health.

EMAPEC: This project provides expert technical and advisory support on the adverse health effects of air pollution and the morbidities it causes. This stream of technical work provides a methodology and tools to estimate economic costs of selected morbidity outcomes of exposure to air pollution within a population.

Next steps

Technical support: Provide technical support to countries, in collaboration with other UN agencies, to integrate public health evidence into air quality management plans and national air quality standards.

Suite of tools: Develop a suite of tools providing knowledge and resources to help countries understand and take actions at various stages of the environmental pathways for specific sectors (e.g. CHEST for household energy) containing the following six areas:

- situational assessment and stakeholder mapping
- identification of technological, policy and programmatic interventions
- guidance on standards and good practices
- monitoring and evaluation
- engaging the health community (see Line of Action 6)
- communication and awareness raising.

Specific activities regarding these tools to include:

- Regular support, update and expansion of WHO Regional Office for Europe tools such as AirQ+, CLIMAQ-H, Health Economic Assessment Tool (HEAT) for cycling and walking, and iSThAT, to the global context and align with other tools developed by other international agencies and regulatory bodies (e.g. United States Environmental protection Agency's Environmental Benefits Mapping and Analysis Program [BenMAP]).
- Develop the BAR-HAP tool for specific sectors (as was done for household energy).
- Provide trainings and capacity-building opportunities for the health and other sectors to apply the tools and understand how to use health risk assessment (HRA) in policy and programmatic planning.

Box 1. Health impact assessment of air pollution

Health impact assessment (HIA) is a practical approach used to support decision-making based on the potential health effects of a policy, programme or project on a population, particularly for vulnerable or disadvantaged groups. The process can be applied in diverse economic sectors and uses quantitative, qualitative and participatory techniques. Recommendations are produced for decision-makers and stakeholders, aiming to maximize the proposal's positive health effects and minimize its adverse health effects.

Health impact assessment tools are models in which the health risks can be calculated for a situation at one moment – a difference between the current and future situations or between policy scenarios (i.e. health benefit or loss). This allows past implemented policies, programmes and interventions to be evaluated and to model the expected health benefits of possible future interventions. This is especially useful to create support for measures with high upfront costs and which may be considered "inconvenient" by the public, such as low emission zones, building restrictions or biomass burning restrictions.

Health impact assessment typically involves the screening, scoping, appraisal, reporting and monitoring of a policy or programme. Health risk assessment (HRA) is the scientific evaluation of potential adverse impacts to human health resulting from exposure to a particular hazard, e.g. air pollution. It aims to estimate the health risks of past, current or future exposure, and changes in exposure that may result from planned policies or interventions. Health risk assessment is conducted when a particular risk to the population is identified during the appraisal phase of HIA. In some countries and settings, HIA may be mandated for policy changes or major projects, or often HRA may be done as part of an environmental impact assessment.

While performing HIA, the following questions need to be addressed:

- How can local environmental monitoring support decision-making?
- What data are available?
- What are the health impacts of environmental action?
- What interventions are effectively reducing health impacts?

Resources

WHO Air quality and health: planning and evaluation tools (www.who.int/teams/environment-climate-change-and-health/air-quality-and-health/planning-and-evaluation-tools).

WHO Urban Health Initiative: guidance and tools (https://www.who.int/initiatives/urban-health-initiative/guidance-and-tools).

CHEST (https://www.who.int/tools/clean-household-energy-solutions-toolkit).

AirQ (https://www.who.int/europe/tools-and-toolkits/airq---software-tool-for-health-risk-assessment-of-air-pollution).

CLIMAQ-H (https://www.who.int/europe/tools-and-toolkits/climate-change-mitigation--air-quality-and-health-(climaq-h)).

HEAT (https://www.who.int/europe/tools-and-toolkits/health-economic-assessment-tool-for-walking-and-cycling).

iSThAT (https://www.who.int/europe/tools-and-toolkits/isthat--the-integrated-sustainable-transport-and-health-assessment-tool).

BenMAP (https://www.epa.gov/benmap).

BAR-HAP (https://www.who.int/tools/benefits-of-action-to-reduce-household-air-pollution-tool).

Line of action 4: Tackling household air pollution (CHEST)

Relevance

Preparing a hot meal, staying warm on a cold night or turning on a light in the evening – for many around the world such needs are met by a simple flick of a switch or turn of a dial. However, for around one-third of the global population, who mainly rely on polluting stoves and fuels, such basic tasks come with costs to health, well-being and the environment.

Household air pollution arising from the use of polluting stove and fuel combinations (e.g. open fire, simple woodstove, kerosene lamp) for cooking, heating and lighting is one of the most important global environmental health risks today in many LMICs.

Widespread use of polluting cookstoves causes some 3.2 million premature deaths, largely from NCDs such as stroke, ischaemic heart disease, COPD and lung cancer, as well as pneumonia. Fuelwood collection and stove preparation can take hours and puts women and children at greater risk of injury and violence.

Knowing the level of air pollution all over the world, or how many people are using clean cooking, or the latest number of deaths linked to air pollution are critical to enable public action. Such robust data are essential for countries and the global community, to establish a baseline, track progress, draw comparisons and advocate for actions. WHO's leadership in monitoring and reporting on air pollution and its health impacts builds on decades of compiling data on household energy for cooking and ambient air quality (Global Environmental Measurement and Monitoring Initiative [GEMM] Air and the WHO databases). These data have been informing policies for decades and fostered cooperation through joint endeavours.

Key facts

- The health and well-being of 2.3 billion people could be improved by replacing polluting stove and fuel combinations with clean sources of energy, like electricity, liquified petroleum gas (LPG), biogas and solar, at point of use *(11)*.
- Kerosene use in the home is one of the largest causes of childhood poisonings and, along with simple stoves, is also an important source of burns and scalds in LMICs. Women and children spend many hours a week collecting fuel and preparing inefficient cookstoves due to the lack of access to clean cooking options *(12)*.
- Universal access to clean cooking could cut some 50% of global black carbon emissions – a climate pollutant with more than 400 times the warming potential of carbon dioxide – attributed to residential biomass use *(13)*.
- Close to a 250 000 pneumonia deaths in children under the age of 5 are due to household air pollution, caused by a lack of clean cooking *(14)*.

SDG indicators provide a standardized way to track and report on the implementation of the SDGs and help countries monitor their progress towards achieving the goals. They serve as a tool for governments, organizations and individuals to hold themselves accountable and support transparency and accountability in reporting. Beyond good health and well-being, WHO is the custodial agency of the following air pollution and energy access indicators:

- SDG Indicator 3.9.1: Mortality rate attributable to household and ambient air pollution
- SDG Indicator 7.1.2: Percentage of population with primary reliance on clean fuels and technologies; progress towards universal access to affordable, reliable, sustainable and modern energy
- SDG Indicator 11.6.2: Concentrations of fine particulate matter ($PM_{2.5}$).

Around 40% of countries do not have the air pollution ground measurements needed to estimate exposure to air pollution. Energy use in households and health care facilities is not adequately included in national surveys and censuses to estimate health, climate and economic impacts. Data gathered by WHO are based on regular consultations with Member States and are publicly available.

Opportunities

Moving forward, WHO will continue to lead global monitoring efforts, and will work to disseminate broadly quantitative analysis of determinants of health related to air pollution and energy. Such health indicators can be leveraged to monitor progress towards the SDGs, and beyond the 2030 Agenda, for health, climate change and other sectors. The data collected can inform decision-making and guide policy action, and thus indicators can further raise awareness and drive action.

WHO response

WHO compiles and estimates a large range of data and maintains over 10 databases. Many of them are carried out in close collaboration with other UN agencies and academic partners.

Accelerating access to clean household energy can improve the health of the poorest populations and improve livelihoods and gender equity, while at the same time protecting our climate through the reduction in emissions and decreasing deforestation.

Acknowledging the large disease burden and equity impacts associated with household air pollution, in 2014 WHO produced the first normative guidance (WHO Guidelines for indoor air quality: household fuel combustion). These guidelines provide technical recommendations on the types of fuels and technologies used in the home considered clean and safe for health at the point of use, and provide suggestions for maximizing health benefits during the energy transition. The guidelines also provide good practice recommendations on the important synergies between household energy use and climate change mitigation. Investments in household energy solutions should be made based on understanding the country-specific options available and the actual health risks.

The CHEST modules and the accompanying *Clean household energy policy and programme planning guide* provide step-by-step guidance for mapping out current household energy use, related health impacts and key stakeholders and use an evidence-based approach to select technological and policy solutions. CHEST also supports the SDGs.

Box 2. Clean Household Energy Solutions Toolkit (CHEST)

The WHO Clean Household Energy Solutions Toolkit (CHEST) provides tools that countries and programmes can use to develop policy action plans for expanding clean household energy access and use. CHEST can be used by governments, policy-makers, researchers and programme implementers to help enact clean household energy interventions that can reduce household air pollution and improve health, the environment, livelihoods and the climate.

The *Clean household energy policy and programme planning guide* walks users through a series of steps using the tools and resources in CHEST to create an action plan for implementing and evaluating a clean household energy policy or programme. It describes how to use the tools within CHEST to identify, assess, compare and develop clean household energy policy and technology interventions tailored to specific country settings.

By using the guide, users create an action plan for developing, implementing and monitoring new policies and programmes or improving existing ones in order to accelerate the transition to clean household energy at scale. The action plan will list the specific steps and actors necessary for enacting a comprehensive policy to drive wider adoption and sustained use of clean household energy and ultimately improve public health outcomes.

CHEST modules

Module 1: Stakeholder mapping and situational assessment
Provides guidance on identifying key stakeholders and performing a rapid countrywide assessment of household energy use. Application of the module's tools will result in an evidence-based argument and potential paths forward for action in clean household energy.

Module 2: Identification of technological and policy interventions
Provides resources for comparing various options for clean household energy interventions. This module and its associated tools help users explore how different fuels, technologies and policy designs can impact health, environmental and other social and economic outcomes (e.g. time loss).

Module 3: Guidance on standards and testing
Includes resources to help planners develop national standards for stoves based on safety, performance, durability and other features.

Module 4: Monitoring and evaluation
Provides the tools and resources necessary to effectively monitor and track household energy use, adoption of clean fuels and technologies, and the impacts on health and livelihoods. This module offers guidance on how to collect quantitative and qualitative data on stove use, personal exposure to household air pollution and health impacts associated with reducing exposure. The tools can be used to assess the impact of interventions and help governments and planners determine the cost-effectiveness and sustainability of different solutions.

Module 5: Engaging the health community
Contains resources to empower the health sector to tackle household air pollution. The module provides health professionals with the tools to integrate household energy and household air pollution as a risk factor for disease and the knowledge to "prescribe" clean household energy solutions. It contains resources for the health sector to effectively communicate the health risks from household energy use, including to those working in other sectors.

Module 6: Communication and awareness raising
Provides communication materials to educate the public and professionals about the health and livelihood risks associated with household energy use and household air pollution. It highlights key networks and campaigns such as the WHO-hosted BreatheLife Network where specialized communication materials on the importance of scaling up clean household energy to protect health and the environment are available for countries to use.

Next steps

WHO will continue working with countries, providing CHEST training and tools, and offering support in their application to develop or adapt policies for clean household energy access. It will further refine tools and develop others based on country needs. It will also work with partners in the HEPA, UN Energy, SDG 7 TAG and other groups to share and incorporate the knowledge, tools and information resources into activities on the ground to achieve clean cooking to protect health.

Resources

CHEST (https://www.who.int/tools/clean-household-energy-solutions-toolkit).

Line of Action 5: Accelerating electrification of health care facilities

Relevance

Reliable energy, particularly electricity, is critical to quality health care delivery. Without reliable electricity in all health care facilities, UHC cannot be reached. Electricity is needed to power the most basic services – from lighting operating surgical theatres to ensuring a clean water supply. Reliable power is also crucial for medical equipment, for example, to safely manage childbirth or to ensure immunization as well as for undertaking most of the routine and emergency procedures.

Yet this aspect of health infrastructure is still neglected and urgently needs more action and attention by all – from governments to development partners and from philanthropic institutions to international organizations.

Key facts

WHO estimates that close to 1 billion people in LMICs are served by health care facilities without reliable electricity access or with no electricity access at all *(3)*.

In South Asian and sub-Saharan African LMICs, approximately 12% and 15% of health care facilities, respectively, have no access to electricity whatsoever *(3)*.

There is a sharp urban–rural divide: urban health care facilities often report more access to electricity and more reliable electricity than rural facilities in the same country *(3)*.

Opportunities

Today, several solutions exist to electrify health care facilities that were not available, or were too expensive, just a few years ago. For example, decentralized sustainable energy solutions based on solar photovoltaics are not only cost-effective and clean but rapidly deployable on site, without the need to wait for the arrival of the central grid. Additionally, onsite renewable energy systems dramatically increase climate resilience of health care facilities, making them independent from the diesel supply needed for generators, while reducing carbon and polluting emissions.

Technical solutions and enabling delivery models exist and have been demonstrated to be successful. It is essential to scale up investments and accelerate action to ensure reliable electricity to all health centres, including in remote and rural areas.

WHO response

WHO supports countries ensure a reliable supply of electricity for health care facilities by providing the knowledge and tools to:

- understand the energy access situation and energy needs of health care facilities in their country;
- build the institutional capacity to identify the most suitable energy solutions to meet their needs;
- build an enabling framework to accelerate health care facility electrification; and
- support high-level advocacy, coordination and mobilization of adequate resources for impact on the ground.

Data gathering, analysis and harmonization: Establishing baselines and measuring progress are essential steps to identify gaps and priority needs for the allocation of limited resources. Building on the WHO Database on Electrification of Health-care Facilities, developed in 2013, WHO collects and analyses data regarding the energy status of health infrastructures to measure progress on access to electricity as well as on access to reliable electricity, among other indicators.

Knowledge creation: WHO gathers lessons and good practices on electrification of health care facilities. It identifies and consolidates key insights on successful and innovative policies, regulations, financing instruments, delivery models and support measures with countries to identify priority actions to accelerate health care facility electrification. Guidance and support to countries is provided via direct technical assistance and through the dissemination of reports and best practices, like those included in *Energizing health: accelerating electricity access in health-care facilities.*

Technical support and capacity building for country action: WHO provides direct technical support to countries, through regional and country offices, on techno-economic analyses, including support for:

- energy needs assessments
- evaluation of different technical options
- assessment of economic and environmental benefits
- identification of the most suitable electrification and design approach
- preparation of technical documentation
- guidance on operation and maintenance.

WHO has joined with Gavi, the Vaccine Alliance and the UN Children's Fund to build on and expand the scope of the current Cold Chain Equipment Optimisation Platform. This new initiative, instead of providing solar energy only for the vaccine cold chain, aims at providing energy for all the needs of health care facilities.

WHO provides technical support to strengthen the professional capacity of health workers at different levels, from central governments to local health centres. This activity will increase the ability of the local health sector to design, implement and maintain health care electrification programmes. WHO will also work with local stakeholders to strengthen the capacity of health care facility staff to properly use the energy systems and undertake the basic maintenance.

Building the enabling environment: WHO facilitates multisector cooperation and coordinated action among health and energy stakeholders, to maximize impact and leverage on synergies on the ground. In this framework, WHO serves as a secretariat. The HEPA facilitates the activities of the High-Level Coalition on Health and Energy, convened by the WHO Director-General and plays a crucial role in multistakeholder platforms relevant for health and energy, such as the UN Climate Change Conferences of Parties, UN Energy and SDG 7 progress tracking.

Resources

Energizing health: accelerating electricity access in health-care facilities. WHO, 2023 (https://www.who.int/publications/i/item/9789240066960).

Access to modern energy services for health facilities in resource-constrained settings. WHO and World Bank, 2015 (https://iris.who.int/handle/10665/156847).

WHO Database on Electrification of Health-care Facilities (https://www.who.int/data/gho/data/themes/database-on-electrification-of-health-care-facilities).

Cold Chain Equipment Optimisation Platform (https://www.gavi.org/sites/default/files/support/guidelines-2023/Cold-chain-equipment-technology-guide.pdf).

Line of action 6: Training – building health workforce capacity

Relevance

Imagine you are a family doctor, and a young girl has been seeing you with frequent asthma attacks. Would you consider air pollution as a potential risk factor in your patient assessment? What questions would you ask to further explore this? Which tools might you use to better understand whether air pollution contributes to her symptoms? How would you advise her to reduce her risk?

Health workers are often not aware of the health impacts of air pollution. Yet, air pollution is a major environmental threat and one of the main causes of death among all risk factors, ranking just below high systolic blood pressure, tobacco smoking and high glucose. Globally, air pollution is responsible for around 7 million premature deaths per year due to ischaemic heart disease, stroke, COPD and lung cancer, but also from acute lower respiratory tract infections.

In all countries, reductions in the level of air pollution greatly improve public health. The international community recently recognized that the health workforce should play a more prominent role in the battle for clean air, as endorsed by ministries of health in WHA resolution 68.8: Health and the environment: addressing the health impact of air pollution *(15)*.

Key facts

- Air pollution is the only environmental risk factor that has been formally recognized as major risk factor for NCDs along with tobacco, alcohol consumption, unhealthy diet and physical inactivity. This represents a paradigm shift from individual risk factors to environmental risk factors for NCDs, which the health sector is currently ill-equipped to tackle *(16)*.
- At present clinical guidelines frequently do not address air pollution and health issues *(17)*.
- To date, issues around the health effects of air pollution are not sufficiently addressed in the curricula of health professionals, with only 12% of medical schools providing formal education on air pollution and health *(18)*.
- Less than 50% of World Heart Federation survey respondents felt they had access to any tools or information on air pollution and cardiovascular health *(19)*.
- Existing training programmes lack geographical diversity and are mainly based in high-income countries *(20)*.

Opportunities

The engagement of the health sector and the health community is pivotal. Thus, including air pollution as part of clinical and community-level practice, and engagement in boosting advocacy and political action for clean air, are important. This requires a strong effort by countries and key stakeholders willing to increase awareness and equip current and future health workers with knowledge and tools to tackle air pollution, communicate its risks and with advice on personal- and population-level interventions for risk reduction.

WHO response

Earlier efforts by WHO to build the capacity of the health sector on air pollution and health included collaboration with more than 50 international experts from government and academic institutions who developed and/or reviewed the training toolkit contents, ran country Air Pollution and Health Training (APHT) toolkit piloting workshops *(21)*, and joint collaborations with relevant non-state actors for implementation and dissemination of the toolkit components.

WHO Air Pollution and Health Training (APHT) toolkit: This is a set of materials designed to provide health workers with understanding on the health risks of air pollution, identify risk reduction measures and promote clean air solutions for individuals and communities. Using a train-the-trainers' approach, the APHT toolkit also helps facilitate the organization of in-person workshops, online courses and other learning opportunities. The APHT toolkit is composed of:

- 12+ training modules
- train-the-trainers manual
- case scenarios to develop a clinical approach to air pollution
- job aids and flipcharts for community engagement.

WHO online trainings: WHO offers a series of publicly available online courses on air pollution and health via WHO learning platforms – making the materials accessible to a broad audience and easily replicable.

Next steps

WHO will continue to build the capacity of the health workforce on air pollution and health via:

- Development of new training modules and tools for specific target audiences within the health workforce.
- On-the-ground country and regional workshops and trainings.
- Online self-paced and global interactive courses delivered through the OpenWHO platform and WHO Academy.
- Clinical tools for risk assessment to guide personal interventions.
- Enhanced clinical guidance through stakeholder consultation on air pollution and health.
- Advocacy to support air pollution being included or integrated as part of health education curricula

Resources

WHO Air pollution and health training kit (https://www.who.int/tools/air-pollution-and-health-training-toolkit-for-health-workers).

WHO Academy (https://www.who.int/about/who-academy).

WHO capacity building and training materials (https://www.who.int/activities/capacity-building-and-training-materials).

Line of action 7: Enabling health sector engagement via tools and resources for action on air pollution and energy access

Relevance

The health sector has an important role to play in addressing air pollution, whether it be "prescribing a breath of clean air" in clinical practice or serving as the health champion in local policy discussions around transport or energy access. The "health argument" is a strong lever for the health sector to drive action by governments and individuals.

Despite the large disease burden attributed to air pollution, and the strong evidence base linking air pollution to specific health outcomes, many health professionals report feeling ill-equipped and/or lacking the background and resources to effectively integrate air pollution as a risk factor into their clinical, policy or advocacy work for disease prevention and management. Unlike other disease risk factors, many of the causes of air pollution fall outside the responsibility of the health sector, causing health professionals to feel uncertain about their role in taking measures to reduce exposure to air pollution. Such challenges hinder the effective engagement of the health sector, a much-needed champion and leader in protecting health for 99% of the world's population.

To fully leverage the strength of the health argument, there is an urgent need to ensure that health professionals have the knowledge and tools at their disposal to effectively communicate, educate and protect the health of patients and populations from air pollution.

Key facts

- Four out of the five leading causes of death, namely stroke, ischaemic heart disease, COPD and acute lower respiratory infection, are attributable to air pollution *(6)*.
- Asthma is a commonly overlooked NCD directly related to air pollution, affecting both children and adults. In 2020, for the first time, the United Kingdom declared air pollution the cause of death of a 9-year-old girl who suffered regular asthma attacks *(22)*.
- Only 11% of medical schools include formal education around air pollution as a risk factor for disease *(18)*.
- There are few, if any, questions on household surveys aimed at assessing ambient air pollution as a risk factor for ill health *(23)*.
- Standardized intake surveys for patients and other diagnosis tools for clinicians lack any questions or assessment of air pollution as a risk factor for disease – a missed opportunity for early prevention *(24)*.

WHO response

WHO is supporting countries to identify cost-effective interventions to protect health from air pollution and build the business case for action by:

- Developing robust methods to systematically assess the health (morbidity and mortality), economic and other impacts of different policy and technological solutions for air pollution mitigation (e.g. EMAPEC).
- Reviewing policy and technological interventions to inform the development of guidance for selecting, implementing and monitoring air quality interventions (e.g. Household Energy Policy Repository).

- Tracking policies for air pollution mitigation and pairing them with relevant evaluations, when available, to share lessons learned and encourage cross-country cooperation (e.g. Ghana Policy Tracking Report).
- Developing interactive tools allowing countries to quantify the health, social, environmental and economic costs and benefits of interventions (e.g. BAR-HAP) to support evidence-based decision-making.

Next steps

WHO is leading a multistakeholder process to integrate health-related questions into national omnibus surveys, like Demographic Health Surveys and censuses, to assess health risks from household energy use, and on monitoring policy progress for action on NCDs via a household energy module in the *WHO STEPwise approach to NCD risk factor surveillance (STEPS)*.

Building on this know-how and experience with household air pollution along with the WHA mandate to strengthen the capacity of the health sector to tackle air pollution, WHO is currently working to better assess and monitor air pollution as a risk factor, develop tools to integrate air pollution in clinical and policy practice, and strengthen the voice of the health sector in communication around air pollution as a risk factor for ill-health (see Line of Action 6). Specific ongoing activities include:

- Clinical risk assessment screening tool for air pollution-related disease.
- STEP survey instrument module preparation on ambient air pollution to be adopted by countries in monitoring progress in tackling NCDs.
- Integration of questions assessing ambient air pollution exposure in household census and survey questions.
- Communication tools and evidence base messaging on air pollution and health risk (e.g. air quality and health indexes).
- Guidance on personal protection measures for air pollution (e.g. face masks, air purifiers) to support clinicians when advising patients and support public health department messaging.

Resources

WHO capacity building and training materials (https://www.who.int/activities/capacity-building-and-training-materials).

WHO STEPwise approach to NCD risk factor surveillance (https://www.who.int/teams/noncommunicable-diseases/surveillance/systems-tools/steps).

Household energy survey (https://cdn.who.int/media/docs/default-source/ncds/ncd-surveillance/steps/steps-household-energy-use.pdf?sfvrsn=39689065_5).

Line of action 8: Addressing knowledge gaps on sand and dust storms and health

Relevance

Desert dust episodes contribute directly to air pollution by increasing particulate matter (PM) concentrations. In some regions this is an important (even main) source or air pollution. Desert dust episodes, or sand and dust storms, constitute a growing public health risk, mainly for respiratory diseases, and are an environmental concern in many areas of the world. Desert dust episodes also have an important transboundary component – important to take into account when addressing the issue at regional and international level.

It is a challenge for the health sector because of the difficulty in characterizing the exposure, being a global phenomenon while impacting specific areas, and the limited evidence on its long-term health effects. Exposure to dust can be defined in different ways, and there is much heterogeneity in its definition and use in epidemiological studies and regarding further policy action. Currently, government response is based on the knowledge of short-term health effects, limited early warning systems and the provision of information to vulnerable groups in real time, as well as the impact of emergency hospital admissions.

The health sector should also address the gaps in knowledge and response on the health impacts of desert dust in the longer term and continue strengthening collaboration with appropriate government entities to provide a timely and effective public health response.

Key facts

- Someone living in Barbados regularly breathes Sahara dust particles. Globally, some 2 billion people are exposed daily to particles transported by wind, including for thousands of kilometres – far from source areas *(25)*.
- Climate change contributes to desertification which in turn may increase the frequency and spread of sand and dust storms *(26)*.
- About a third of the earth's land surface (arid and semi-arid regions) is prone to emit airborne mineral dust *(26)*.
- In certain areas, desert dust can dominate the air pollution mix *(27)*.
- Evidence indicates that dust has immediate impacts on respiratory and cardiovascular diseases *(28)*.

WHO response

Sand and dust storms have gained attention and been put on the international agenda, with UN agencies joining forces to address the issues in a coordinated manner. WHO is studying the implications of the health impacts of desert dust on air quality.

WHO is advocating for addressing the issue of dust as an important risk to health. A good practice statement on desert dust and sand and dust storms was incorporated for the first time in the latest (2021) WHO Global air quality guidelines *(29)*.

With the support of dedicated expert groups, WHO is:

- Synthesizing evidence on the short- and long-term health impacts of desert dust.
- Providing guidance on harmonized exposure assessments of desert dust and monitoring of health effects.
- Evaluating the implementation of the current good practice statements as provided in the WHO Global air quality guidelines and strengthening future normative recommendations.

Next steps

WHO is collaborating closely with international organizations such as the World Meteorological Organization's Sand and Dust Storm Warning Advisory and Assessment System (forecasts) and leading the Working Group on Health of the UN Coalition to Combat Sand and Dust Storms to integrate health arguments and tools in action plans and developing training tools for the health and other sectors to share knowledge on the health impacts of desert dust and trigger the implementation of measures to protect health.

Resources

UN Coalition to Combat Sand and Dust Storms (https://www.unccd.int/land-and-life/sand-and-dust-storms/coalition).

Line of action 9: Defining, tracking and reporting data: health beyond SDG 3

Relevance

Knowing the level of air pollution all over the world, how many people are using clean cooking or the latest number of deaths linked to air pollution is critical to enable public action. Such robust data are essential for countries and the global community to establish a baseline, track progress, draw comparisons and advocate for action.

WHO's leadership in monitoring and reporting on air pollution and its health impacts builds on decades of compiling data on household energy for cooking and ambient air quality (GEMM Air and WHO databases). These data have been informing policies for decades and helping foster cooperation through joint endeavours.

Key facts

SDG indicators provide a standardized way to track and report on the implementation of the SDGs and help countries monitor their progress towards achieving the goals. They serve as a tool for governments, organizations and individuals to hold themselves accountable and support transparency and accountability in reporting.

- Beyond good health and well-being, WHO is the custodial agency of the following air pollution and energy access indicators *(30)*:
    - SDG Indicator 3.9.1: Mortality rate attributable to household and ambient air pollution
    - SDG Indicator 7.1.2: Percentage of population with primary reliance on clean fuels and technologies; progress towards universal access to affordable, reliable, sustainable and modern energy
    - SDG Indicator 11.6.2: Concentrations of fine particulate matter ($PM_{2.5}$).
- 40% of countries do not have the air pollution ground measurements available needed to estimate exposure to air pollution *(31)*.
- Energy use in households and health care facilities is not adequately included in national surveys and censuses to estimate health, climate and economic impacts *(32)*.
- Data gathered by WHO are based on regular consultations with Member States and are publicly available *(6)*.

Opportunities

Moving forward, WHO will continue to lead global monitoring efforts, and will work to broadly disseminate quantitative analysis of the determinants of health related to air pollution and energy. Such health indicators can be leveraged to monitor the progress toward SDGs, and even beyond the 2030 Agenda for health, climate change and other sectors. The data collected can inform decision-making and guide policy action, and these indicators can further raise awareness and drive action.

WHO response

WHO compiles, estimates and disseminates a large range of data and maintains over ten databases. Many reporting activities (see Table A) are done in close collaboration with other UN agencies and academic partners.

Table A. WHO's reporting activities regarding air pollution data

Data – from indicators to actions			
Design	**Collect**	**Estimate**	**Inform**
• Lead and cooperate with other UN agencies on SDG indicator methodology updates and reporting • Identify exposure and health data needs and gaps • Integrate air pollution into WHO and SDG portals • Advance estimations and data collection on gender and inequality	• Collect data from Member States, literature and publicly and trusted available data sources • Build capacity and refine tools for enhanced data collection in countries • Advance the collection of more comprehensive and standardized data and promote standardization	• Regularly update WHO databases • Produce regular estimates for the SDGs • Apply methods and models to improve data coverage and coherence • Consult with Member States regarding estimates and missing data	• Provide informative webinars and trainings on SDG indicators, methodologies and results • Regularly update WHO and SDG data portals to enhance dissemination and provide open access data • Provide better data visualization to present the data in an easily accessible and understandable format • Prepare and disseminate relevant reports, policy briefs and publications

Line of action 10: Delivering impactful communications and advocacy

Relevance

Communication is vital for implementing the Strategy, while informing the general population, policy-makers and the health workforce on the impacts of air pollution, lack of energy access and how to protect health. WHO presents health, climate and economic arguments to incentivize action and promotes evidence-based policies and programmes to reduce air pollution and accelerate energy access. Media engagement and tracking also provide useful insights for monitoring the progress of policies to address air pollution and energy access.

Key facts

- WHO has a high level of credibility, leveraged in many successful health communications campaigns.
- WHO has powerful channels, including its official website, social media channels and relationships with mass media, to communicate with multisector audiences. The global, regional and country levels of WHO, Member States and WHO partners form critical channels for communication and should be engaged to implement WHO strategies. This can be viewed both as a big funnel for health promotion, and a series of specialized channels to inform key decision-makers with tailored messages.
- Air pollution and lack of clean energy are increasingly recognized as a risk to health, for their impacts on climate change, and development challenges such as gender inequality, poverty and food insecurity. However, through the lens of the indicators tracked via this strategy, progress towards clean air and energy access with improved health outcomes has been slow and uneven.

Opportunities

WHO aims to support countries in implementing guidance on air quality, energy access and health, and to promote detailed messages that engage health workers, decision-makers in key sectors and sector stakeholders to reduce air pollution from specific sources, accelerate energy access and improve public health while mitigating climate change. While there is rarely a direct correlation between a single communications action or campaign and a particular policy outcome, WHO seeks to build awareness which opens opportunities for action, widens dialogue and creates a sense of political urgency. WHO is uniquely positioned to communicate health arguments to drive actions across sectors.

WHO strategic communications for air quality and energy access:

- Via the WHO website, increase the visibility of the health impacts of air pollution and energy access data and guidance. Translate evidence into easy-to-interpret and locally adaptable maps, graphics and visualizations integrated into communications products, e.g. BreatheLife air quality gauge *(33)*.
- Engage global, regional and country communications focal points, collaborating centres, researchers and influencers to reach “outcome-critical” stakeholders, promote local actions and measure progress *(34)*.
- Capacity building to implement air pollution, energy access and health framework for to achieve a single overarching communication outcome – the main message of the campaign *(34)*.
- Impactful campaigns and international conferences to communicate the impacts of air pollution and energy access on public health, and drive evidence-based solutions on the ground *(34)*.
- Communications tools that contextualize health risks to the general public, make risks more “visible and detectable locally”, reduce personal exposure and intensify the demand for action. WHO will conduct analytics to confirm the types of information health workers, decision-makers and media influencers are looking for regarding information on air pollution from WHO *(34)*.

WHO response

Communicating the evidence base: Regular news updates on the WHO website, newsletters, social media and other channels:

- Promote newsletters that communicate the latest evidence-based information on air quality, energy access and health to a targeted audience, including health workers, decision-makers and other stakeholders.
- In cooperation with partners, publish new evidence in peer-reviewed scientific journals and reports.
- Prepare joint topical reports with other UN agencies and partners to provide a state of the evidence and identify priorities for decision-makers working in different sectors to take action.
- Harmonize and disseminate public health messaging around air pollution and energy access throughout all levels of WHO and other programmes, e.g. maternal and child health and NCDs.

Developing communications channels to support capacity building: Data visualizations on the WHO website:

- Work with the WHO Global Health Observatory and ICT to develop cutting-edge, interactive data visualizations on the WHO website that engage a wide audience, support capacity building and provide practical information to countries.
- Produce data visualizations and integrate them on the WHO website.

Communications training modules: Develop resources, including health posters, for health and other sectors for integration into existing initiatives, guidance and tools such as:

- WHO Air Pollution and Health Training toolkit
- WHO Clean Household Energy Solutions Toolkit
- WHO Urban Health Initiative and BreatheLife campaign.

Working with and coordinating outreach with partners: Communication through existing networks:

- Support efforts to communicate air pollution and energy access through existing networks, such as HEPA, GAPH-TAG, Healthy Cities Network and C40.

Mass and social media analysis: Conduct analysis:

- Identify influencers, channels and audiences to reach health workers, key stakeholders and sensitive and vulnerable groups and develop targeted messaging and campaigns to engage them.

Interactive tools on the BreatheLife platform: Disseminate tools:

- Harness the BreatheLife platform for greater dissemination of tools, information resources and country examples to key stakeholders and the general public by integrating interactive clinical case scenarios as a resource for training, creating locally adaptable communications assets and infographics. Use geographical information systems to demonstrate actions and tools for policy tracking.

Conferences on air pollution, energy and health: Capitalize on opportunities at conferences:

- Promote conference activities and develop plans to promote internal and external communications during conferences. Host events and exhibits to promote awareness during conferences.

Leverage specific days or events throughout the year: Support risk and emergency communication:

- These include World Environment Day, World Health Day and the International Clean Air Day for Blue Skies.

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https://www.who.int/teams/environment-climate-change-and-health/air-quality-energy-and-health