World Health Organization

Executive Board
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Updated road map for an enhanced global response to the adverse health effects of air pollution

Report by the Director-General

Background

1. Following the establishment of the first Road map for an enhanced global response to the adverse health impacts of air pollution[1] in response to resolution WHA68.8 (2015), this draft road map updates the previous version and proposes a voluntary target to address the health impacts of air pollution[2] from 2025 to 2030. It aligns with WHO's Fourteenth General Programme of Work (GPW 14) by including actions proposed to meet the GPW 14 call for promoting low-carbon societies and a primary healthcare approach to tackling the critical environmental determinants of health and mitigating climate change. From March to July 2024, the WHO Secretariat met with Member States via briefings and consultations to report on implementing the first Road map and gather feedback.

Target and timeline for draft road map implementation

2. The overall target of this draft road map is for countries to achieve a 50% reduction in the population-attributable fraction of mortality from anthropogenic sources of air pollution by 2040, relative to 2015 baseline values.[3]

3. Acknowledging countries' different baselines and contexts, the target proposed for the draft road map is relative in order to ensure that countries progress towards clean air.

4. All actions highlighted should be immediately initiated and integrated into policy and programmatic decision-making processes by 2030. Progress towards this target should be reviewed and updated in 2030 to align with new global development agreements and climate goals.

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[1] See document WHA69/18 and decision WHA69(11) (2016).

[2] See WHO Air pollution data portal (accessed 2 October 2024).

[3] Those countries already achieving WHO guideline interim target 4 (IT-4) should continue making progress towards the WHO guidelines value, as the 50% target may not be attainable in this time frame.

Collective action and international cooperation to address air pollution and protect public health

5. Air pollution does not respect national, municipal or jurisdictional boundaries. Hence, protecting health from air pollution requires cooperation between countries, cities and regions. This poses a significant challenge to policy-making and implementation to improve air quality, but it also presents an opportunity for cooperative action.

6. Air quality is intricately connected to other environmental health risks such as climate change, noise, toxic chemicals and inadequate or no access to green spaces and to clean household energy. It is part of "the triple planetary crisis" of climate change, pollution and biodiversity loss. Implementing policies and interventions to improve air quality can achieve multiple benefits for public health and the environment.

7. Air pollution is a leading environmental risk factor for poor health, which systemically impacts the human body and increases the risks of communicable and noncommunicable disease (NCDs). As much as 85% of air pollution-related deaths can be attributed to NCD outcomes,[4] including ischaemic heart disease, stroke, chronic obstructive pulmonary disease and lung cancer. Breathing polluted air in outdoor and indoor environments is also a significant risk factor for children's health that impacts development throughout the life course. Other health outcomes linked to air pollution include adverse pregnancy outcomes (low birth weight), neurocognitive development, asthma and other cancers.[5]

8. Reducing air pollution is vital to protect the health of vulnerable populations such as pregnant women, infants and children. Integrating air pollution control actions into broader public health prevention and development strategies and health systems planning is a meaningful way to ensure that air pollution remains a priority for the health sector, with the appropriate allocation of financial and human resources.

Air quality and health actions contribute to the global development agenda

9. Recent global developments offer synergies for the implementation of resolution WHA68.8, including the Political declaration of the third high-level meeting of the General Assembly on the prevention and control of non-communicable diseases;[6] Human Rights Council and United Nations General Assembly resolutions on the right to a clean, healthy, and sustainable environment; the United Nations Environment Assembly resolution on promoting regional cooperation on air pollution to improve air quality globally;[7] the Pact for the Future;[8] and the commitments of regional forums and ministerial conferences on environment and health as well as the current revisions of the protocol under the Convention on Long Range Transboundary Air Pollution.

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[4] SDG indicator 3.9.1: mortality attributed to air pollution. Geneva: World Health Organization; 2024 (accessed 2 October 2024).

[5] Integrated Science Assessment (ISA) for Particulate Matter (Final Report, Dec 2019). Washington, DC: United States Environmental Protection Agency, 2019 (accessed 26 October 2024).

[6] Document A/RES/73/2.

[7] Document UNEP/EA.6/Res.10.

[8] Document A/RES/79/1.

10. In resolution WHA77.14 (2024) on climate change and health, the Health Assembly highlighted the need to lower greenhouse gas emissions and requested the development of a WHO action plan on climate change and health that is coherent with the United Nations Framework Convention on Climate Change and the Paris Agreement. Reductions in air pollution emissions through accelerating the transition to clean energy and zero emission technologies will also reduce greenhouse gas emissions.

11. Interlinkages within the Sustainable Development Goals framework provide a rationale for the health sector to tackle air pollution to effectively contribute to achieving targets related to a healthy environment (target 3.9), NCDs (target 3.4) and child mortality (target 3.2), as well as other Goals. For example, reductions in air pollution disease burden will arise from the achievement of Sustainable Development Goals targets related to sustainable cities and communities (Goal 11), access to clean household energy solutions for cooking, heating and lighting (Goal 7) and combating climate change (Goal 13). Such synergies can be used to apply existing mechanisms for financing climate mitigation to implement air quality management programmes and leverage the multiple benefits of air pollution reductions, ultimately leading to health benefits.

12. Three air pollution-related Sustainable Development Goals indicators are being reported in WHO databases and benefit from ongoing international cooperation with partners such as the World Meteorological Organization, the World Bank, the International Energy Agency, the International Renewable Energy Agency and the United Nations Statistics Division.

A health sector response to air pollution

13. This draft road map is intended to provide guidance to and enable the health sector, including health protection authorities, to take a leading role in tackling the health risks of air pollution. Such a role would include providing health evidence to inform policy and programmatic decision-making in the health and other sectors; monitoring and making information on health risks from air pollution publicly available; advocating for clean air; and providing advice to patients and the community at large, particularly the most vulnerable and susceptible, on measures that can be taken to protect their health from communicable diseases and NCDs that can be caused, triggered or aggravated by air pollution.

14. Effective engagement of the health sector with other relevant sectors (environment, energy, transport, waste management, land use, agriculture) and with public and private stakeholders, including civil society organizations, will ensure public health and equity concerns are integrated into decision-making, evaluation processes, and national, regional and local policies and treaties. Putting health at the centre of policies ensures multiple benefits for climate, environment, poverty reduction, gender equality and sustainable development, utilizing a One Health approach, as appropriate.

15. The vision, rationale and mechanisms for how the health sector can enhance the global response to air pollution are described below. The framework and actions needed to strengthen the health sector's response to air pollution health risks are provided in the Annex to this report.

The draft road map is organized into four categories:

(a) **Knowledge and evidence:** building, synthesizing and disseminating evidence and knowledge relating to the impacts of air pollution on health, the effectiveness of policies to reduce them and interventions to address air pollution and its sources, and synergies with

climate change mitigation, including by identifying knowledge gaps, promoting innovation and research, evaluating cost-effectiveness and undertaking cost–benefit analyses of sectoral interventions;

(b) **Measuring progress:** enhancing systems, structures and processes needed to support monitoring and reporting on health impacts associated with air pollution and its sources and fulfilling the requirements of the resolution, while contributing to monitoring progress towards the Sustainable Development Goals, in particular targets 3.9, 7.1 and 11.6, and other current global initiatives and targets;

(c) **Institutional capacity-strengthening:** building the capacity of the health sector to understand, analyse and influence policy and decision-making processes related to air pollution and health, as well as to provide advice and guidance to patients and the community at large on air pollution as a health risk; and

(d) **Global leadership and coordination:** leveraging health sector leadership and coordinated action to enable an appropriate and adequate response to the public health risks of air pollution and the lack of clean energy access and ensure synergies with other global processes.

Knowledge and evidence

16. Knowledge and evidence on air pollution and health risks have grown substantially over the past two decades. To minimize health risks from air pollution, ensure a healthy environment and reduce health inequities, governments need to be equipped with strong evidence of the existing health impacts of air pollution.

17. The 2021 WHO air quality guidelines provide guidance on the air pollutant levels needed to minimize health risk of exposure. Further work is required to translate such evidence into policy and regulatory actions, for which the health sector plays a crucial role. For example, it should engage with the relevant institutions in countries or cities to help ensure that national or local air quality standards are designed for public health protection.

18. The health sector is critical in providing evidence and guidance in designing and implementing solutions to achieve air quality targets or standards. The health sector can guide other sectors by utilizing methods and tools such as health impact assessments and economic analyses to evaluate policy options and support the roll-out of cost-effective solutions.

19. The health sector is well positioned to set a research agenda to generate critical evidence for improving air quality and protecting public health. Knowledge gaps should continue to be identified and research strategies promoted to strengthen the evidence, for example by expanding health research into air pollution’s impacts on a broader range of organ systems and related diseases such as metabolic impacts (for example, diabetes) or impacts on neurological systems (for example, dementia); advancing evidence on the complexity of air pollutants considering different substances (such as volatile organic compounds, polycyclic aromatic hydrocarbons and “forever chemicals”) along with the classical air pollutants, such as ground-level ozone and particulate matter; and harmonizing control measures for indoor air pollution and infectious disease prevention. The research agenda should consider the differing needs of countries and help health professionals to provide enhanced and targeted guidance to patients and within the community at local, national and global levels.

20. Research into priority areas include the health impacts of air pollution from different sources (for example, fossil fuel combustion versus biomass burning); health risks from components of particulate matter (for example, desert dust, black carbon and sulfates); health risks in the indoor environment (such as radon, other indoor chemicals) and links between household and ambient air pollution will also further support the health sector's ability to guide decision-making.

Measuring progress

21. Assessing health trends associated with exposure to air pollution and its sources are critical to effectively managing air quality for public health protection.

22. To evaluate the effectiveness of policy and technological interventions for public health protection from air pollution exposure, governments are encouraged to establish a baseline level(s) using official well calibrated ground-level monitoring systems, followed by routine monitoring and reporting of change in air quality and atmospheric composition.

23. Direct monitoring of air quality levels typically falls outside the mandate of the health sector; however, the health sector is well positioned to advocate for, provide guidance on and engage with data-collection efforts and methods for official health monitoring. This includes promoting mapping of air pollution sources and levels by the socioeconomic status of neighbourhoods and other well-being factors to better inform and evaluate policies that can lead to the most significant health benefits and reduce inequities.[9]

24. The health sector plays a critical role in enhancing data collection on the health impacts of air pollution, particularly for populations in situations of vulnerability. Public health surveillance systems can integrate metrics such as individual exposure levels, hospital admissions during pollution peaks and questions on air pollution exposure in tools like WHO's STEPwise approach to NCD risk factor surveillance and World Health Survey Plus and other surveillance efforts. While advanced monitoring methods such as IoT-enabled systems and big data analytics offer insights, WHO remains dedicated to supporting countries in building sustainable air quality monitoring systems and improving health data collection. Paired with reliable exposure metrics, these data enable effective policy evaluation and targeted health interventions to address health inequities driven by air pollution.

25. By partnering with environmental, meteorological or other relevant entities charged with monitoring air quality to routinely communicate data openly (for example, via regularly updated online platforms) on air pollution and its sources, the health sector can better inform the public about air quality health risks and means to minimize their exposure.

Institutional capacity-strengthening

26. Institutional capacity-strengthening is needed to support health professionals (clinicians, nurses, community health workers, public health officers and health policy-makers) in advising patients and the community at large about the health risks of air pollution, serving as advocates for public health protection from air pollution, as well as engaging in cross-sectoral decision-making.

[9] Overview of methods to assess population exposure to ambient air pollution. Geneva: World Health Organization; 2023 (accessed 7 January 2025).

27. To do so, the health sector needs sustained investment in the education and training of healthcare workers (including medical practitioners, nurses and community health workers) to understand health risks from air pollution, give guidance in managing disease related to air pollution, and provide recommendations on ways to reduce short- and long-term exposures to the public and susceptible and vulnerable individuals, including children, pregnant women, older people, people living with pre-existing conditions and people who lack adequate housing and access to essential services.

28. Few curricula and guidelines for healthcare workers include information on air pollution as a health risk. Greater recognition and inclusion of air pollution as a health risk for diseases such as heart disease, stroke and pneumonia in health worker education and training better equips health professionals to recognize health threats posed by air pollution.

29. The WHO Secretariat has developed an air pollution and health training toolkit for health workers, including an online training course via the WHO Academy. Efforts are continuing to disseminate these training materials widely, working with governments, medical and health associations, patient groups and academic institutions to facilitate training in different countries and regions.

30. Recognizing the substantial NCD and child health burden attributed to air pollution exposure, it is essential to integrate air pollution control actions into NCD prevention and control services, maternal and child health strategies, health education and clinical guidelines.

31. Addressing the broader determinants of health, including air pollution, as part of a primary healthcare approach is an inclusive, equitable and cost-effective way to protect public health. Strengthening the health sector's capacity to engage in multisectoral decision-making by providing knowledge and tools to identify, evaluate and implement solutions to reduce health-damaging emissions in polluting sectors is critical for protecting population health. This includes working with local and national governments to develop mechanisms for implementing WHO air quality guidelines. For example, to ensure clean air from the clean energy transition, health professionals and those working in the energy, environment and other relevant sectors should use existing tools to map stakeholders and policies; evaluate and compare the health, climate and economic benefits of policy and technological interventions; give guidance on the establishment of health-based technology standards; and support the engagement of health professionals with the general public, patients and other sectors on the health benefits of air pollution reductions and clean energy access.

Global leadership and coordination

32. Health professionals are a trusted voice. Convening stakeholders, promoting cooperation and advocating for joint policy and programmatic actions on air pollution to protect health are leadership roles that the health sector is uniquely placed to play.

33. With the growing environmental health burden posed by the "triple planetary crisis", the demands for health sector leadership on air pollution continue to increase. Governments are encouraged to ensure that health ministries and related institutions are adequately resourced and staffed with trained and qualified personnel to routinely advise and use public health evidence to contribute to and influence decision-making in other sectors, such as energy, industry, transport, land-use and waste management.

34. Considering the transboundary nature of air pollution, health professionals should engage with decision-makers at the local, national, regional and international levels so that health benefits from clean air are integrated into policies and programmes at different levels of government. This includes cooperative efforts in monitoring air pollution exposure and health impacts and ensuring coherency in actions on the ground. Enhancing collaboration within different sectors that affect vulnerable communities (for example, outdoor workers), paired with established policy-tracking mechanisms, will help to ensure an effective approach to delivering air pollution reductions from sectoral interventions. Cooperative agreements addressing air pollution and other environmental impacts from sources such as maritime shipping and aviation could be enhanced by using health evidence for action on air pollution.

35. Strategic communication on the health impacts of air pollution is vital to promote the integration of air pollution into broader disease prevention and development strategies. Effective communication about health and health equity risks associated with air pollution and the health benefits expected from multisectoral actions to mitigate air pollution is critical to promoting clean air for health. Expanding efforts to advocate for clean air for public health protection by highlighting reductions in air pollution as a way to mitigate climate change, raising community awareness of health risks using economical air quality sensors and citizen science, measures to minimize exposure and evidence-based solutions with multiple benefits will further advance action.

36. The health sector's calls to reduce air pollution align with efforts to protect the environment, minimize biodiversity loss, mitigate climate change, accelerate clean energy access and advance sustainable development. The health sector is well positioned to engage and influence such initiatives to consider health gains by providing knowledge, guidance and tools to quantify and compare the health costs and benefits of related interventions, including climate. For example, as countries that are party to the Paris Agreement prepare their long-term low greenhouse gas emissions development strategies or, as appropriate, subsequent nationally determined contributions under the Paris Agreement, consideration of actions on reducing health-damaging air pollutants such as ground-level ozone that are also greenhouse gases can help to promote significant wins for both climate and health.

WHO Secretariat support for draft road map implementation

37. The WHO Secretariat supported the implementation of the previous Road map by providing countries with updated normative guidance;[10] routinely monitoring air quality, energy access and health impacts; strengthening strategic engagement and knowledge exchange with experts; convening stakeholders from the health and other sectors to advance policy; supporting political and technical engagement on air quality, energy access and health stakeholders; and strengthening communication efforts with countries, cities and partners. Many of these Secretariat activities are continuing and will support the implementation of this updated draft road map.

38. To advance the knowledge and evidence base for action, WHO regularly consults with its Scientific Advisory Group and Global Air Pollution and Health Technical Advisory Group, seeking strategic oversight and expert support to synthesize evidence on source-specific exposure; health outcomes; sectoral policy guidance and interlinkages with climate change effects, such as desert dust, wildfires and heatwaves; and methodological aspects to evaluate and assess environmental

[10] WHO global air quality guidelines. Geneva: World Health Organization; 2021 (accessed 26 October 2024).

health research. Normative guidance, including air quality guidelines for outdoor and indoor air and support for their implementation, is provided and updated, as appropriate.

39. To support countries in measuring progress, WHO routinely monitors air quality and health impacts, updating relevant models and publicly available databases on air quality, energy access and health, and advancing reporting mechanisms for source-specific air pollution exposure (for example, fossil fuels). Such data are reported on the Global Health Observatory, feeding into Sustainable Development Goals custodial agency reporting and monitoring WHO's GPW 13 targets on healthier populations and GPW 14 targets on responding to climate change and addressing environmental determinants of health. It works within WHO, across United Nations entities and partners to coordinate and scale up the dissemination of data and evidence to policy-makers on air pollution levels, energy access and health impacts.

40. Technical support for institutional capacity-strengthening focuses on supporting the health sector in engaging with patients and local communities, policy-makers and the global community about the health risks and benefits of air pollution and related interventions. WHO advances resources and tools for the implementation of WHO air quality guidelines, including the development and dissemination of interactive tools and training to support the use of health impact assessments to evaluate the health, economic, social and climate costs of sectoral interventions, for example, AirQ+; Benefits of Action to Reduce Household Air Pollution (BAR-HAP); Clean Household Energy Solutions Toolkit (CHEST); and Climate Change Mitigation, Air Quality and Health (CLIMAQ-H). This support helps countries to identify best buys for NCD prevention, improving child health and well-being and mitigating climate change with health co-benefits. Considering the cross-sectoral nature of air quality management, tools are provided to support the health sector in engaging with technical counterparts in other government institutions, map stakeholders and policies, guide standard-setting and establish monitoring and evaluation frameworks.

41. To strengthen the knowledge and guidance of healthcare workers on air pollution and health risks, WHO works with the WHO Academy, health associations, academia, WHO collaborating centres and other non-State actors to scale up health sector training on air pollution.

42. To support the health sector to leadership, build the resilience of healthcare facilities in the face of climate change and ensure universal access to quality healthcare services, WHO provides guidance and supports the scale-up of clean and sustainable energy solutions in healthcare facilities.

43. To synergize country efforts to address air pollution, WHO convenes and works closely with other international and national agencies, WHO collaborating centres, academia and civil society organizations. It aims to build a mechanism for enhanced cooperation between United Nations entities to ensure coherence and maximize support to countries in tackling air pollution. It hosts platforms for political and technical collaboration between health and sectoral actors such as the Health and Energy Platform of Action, and contributes to UN-Energy and the work of the Climate and Clean Air Coalition.

44. Leveraging the convening power of the health sector, WHO hosted the first Global Conference on Air Pollution and Health at headquarters in 2018 and will organize a second conference in 2025. Both conferences represent important milestones in reviewing progress towards global goals such as the Sustainable Development Goals, providing an opportunity to discuss and agree on actions required to ensure an appropriate response to address the health impacts of air pollution, including actions related to monitoring, reporting, capacity-building,

reduction measures, policy experience and financing. The conferences provided Member States, United Nations entities and civil society organizations a unique platform to commit to clean air, accelerate energy access and improve public health as outcomes of good governance, institutional capacity-strengthening, engaging political leadership and financing solutions for clean air, energy access and health interventions across sectors.

45. As part of its strategic communication plan and in partnership with other United Nations entities and initiatives such as the Climate and Clean Air Coalition, WHO continues to support the BreatheLife campaign to advocate for clean air. WHO leverages the BreatheLife online platform and works with other United Nations entities to serve as a data and resource portal for critical stakeholders on clean air for health and will track commitments made at the forthcoming Second Global Conference on Air Pollution and Health.

46. Continued technical support from WHO will be needed at global, regional and country levels, including in the areas of epidemiology, statistics/modelling, health impact assessment, health economics, institutional capacity-building, advocacy and research.

47. Evaluations of progress on implementing the draft road map will be undertaken. Reporting will focus on activities, revisions required, resources available to support implementation and progress towards achieving the overall goals and objectives of resolution WHA68.8, while WHO databases and related mechanisms will remain essential sources of information and will be strengthened by the implementation process.

Action by the Executive Board

48. The Executive Board is invited to note the report and to adopt the following draft decision:

> The Executive Board, having considered the report by the Director-General,[11]
>
> Decided to recommend to the Seventy-eighth World Health Assembly the adoption of the following decision:
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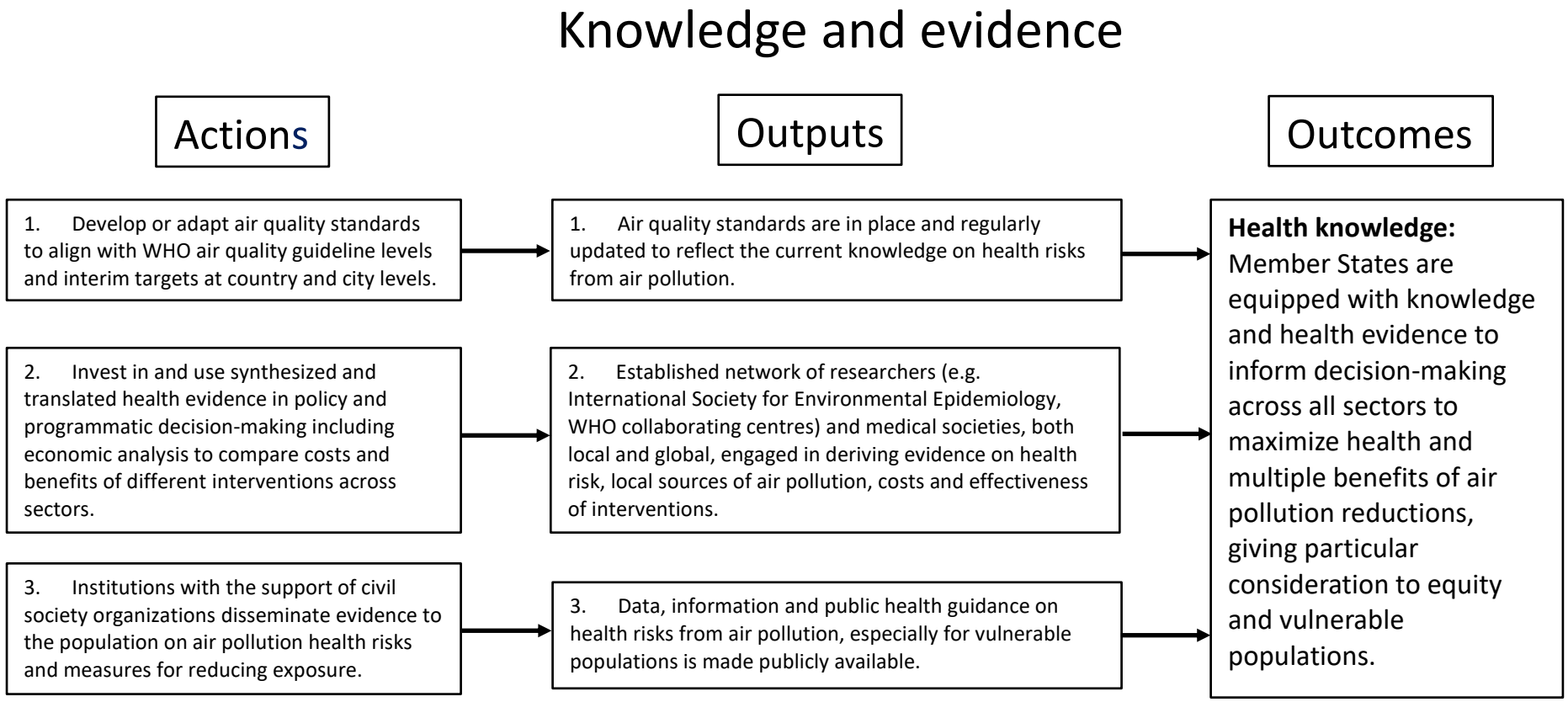
> > The Seventy-eighth World Health Assembly, having considered the report by the Director-General,
> >
> > Decided:
> >
> > (1) to adopt the Road map for an enhanced global response to the adverse health impacts of air pollution;
> >
> > (2) to request the Director-General to report on progress in its implementation to the Eighty-third World Health Assembly in 2030.

[11] Document EB156/24.

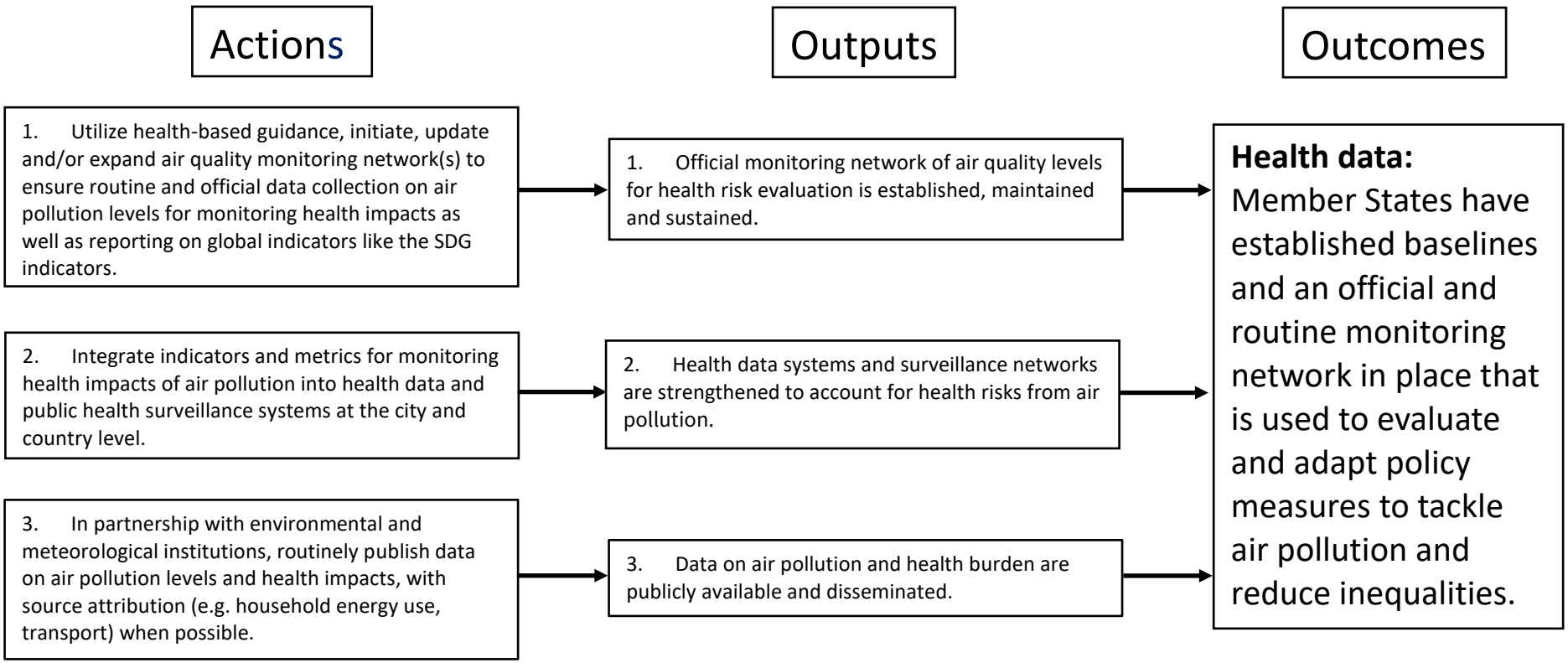
Annex

Road map for an enhanced global response to the adverse health effects of air pollution

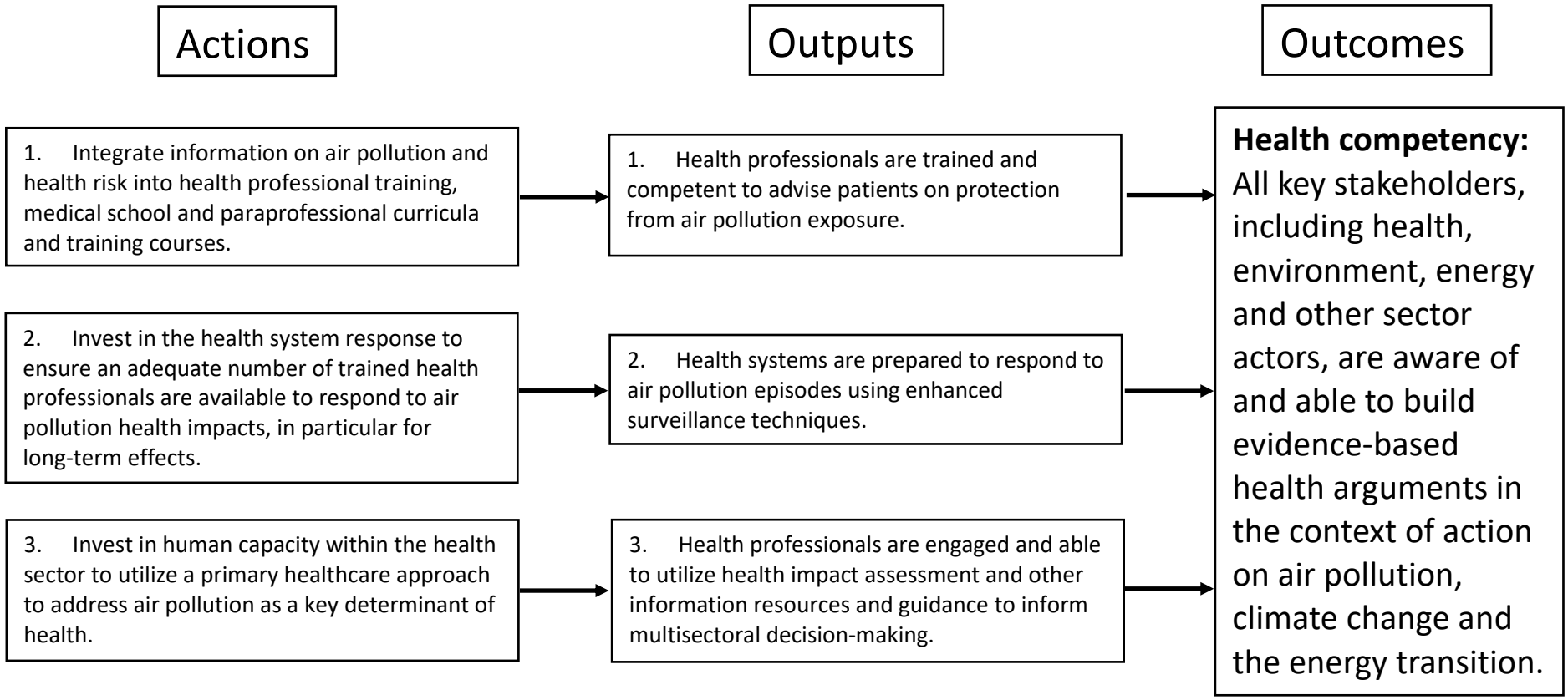
The road map for the period 2025–2030 is represented in the figures below, which depict the sequence of actions, output and proposed outcomes of this road map as a guide to governments, particularly health sector institutions and authorities. Figures 1–4 focus on the four relevant activities: expanding the knowledge and evidence base, monitoring and reporting, institutional capacity strengthening and global leadership and coordination.



Measuring progress



Institutional capacity strengthening



Global leadership and coordination