

An aerial satellite-style map of the Americas, showing North and South America in green and brown, surrounded by blue oceans. The map is overlaid with a grid of semi-transparent squares in various shades of blue and green.

THE ESSENTIAL ENVIRONMENTAL PUBLIC HEALTH FUNCTIONS

A framework to implement the Agenda for the
Americas on Health, Environment, and Climate
Change 2021–2030

PAHO



Pan American
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Organization



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Americas

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Washington, D.C., 2022

THE ESSENTIAL ENVIRONMENTAL PUBLIC HEALTH FUNCTIONS. A FRAMEWORK TO IMPLEMENT THE AGENDA FOR THE AMERICAS ON HEALTH, ENVIRONMENT, AND CLIMATE CHANGE 2021-2030

PAHO/CDE/CE/22-0003

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PREFACE

The public health sector plays a key leadership and facilitation role in efforts to protect the public from harmful effects of environmental hazards. Working with other government sectors and nongovernmental entities, public health professionals have helped advance environmental public health in the Region of the Americas (the Region) toward achievement by 2030 of Sustainable Development Goal 3: Good health and well-being.

However, the health of people in many communities continues to be negatively impacted by unsafe air and water, inadequate sanitation, exposure to toxic substances, and the adverse impacts of climate change. Some individuals and populations are particularly vulnerable to environmental threats to health due to a combination of environmental, social, cultural, and political factors that contribute to health inequities. Effectively and efficiently addressing environmental determinants of health by the public health sector and other responsible entities involves a range of activities. These include generation of data and conduct of health and environmental assessments, development and implementation of policies to reduce harmful environmental exposures and promote environmental sustainability, and allocation of sufficient human, financial, and technical resources.

It is with these issues in mind that the Pan American Health Organization (PAHO) developed this document, which presents a conceptual framework and description of essential environmental public health functions (EEPHFs). The EEPHF framework was adapted from, and is aligned with, PAHO's *The Essential Public Health Functions in the Americas: A Renewal for the 21st Century: Conceptual Framework and Description*. The framework supports the objectives and spirit of the 2030 Agenda for Sustainable Development by providing a guide that PAHO Member States can use to plan, implement, promote, and evaluate integrated environmental public health policies through intra- and intersectoral strengthening at various levels of policy-making.

This document, *The Essential Environmental Public Health Functions*, was developed to assist governments in implementing the Agenda for the Americas on Health, Environment, and Climate Change 2021–2030 (the Agenda), published in 2021. The Agenda provides strategic guidance for reducing the burden of disease and inequity in health attributable to environment-related impacts in the Region. Its objective is to strengthen the capacity of health actors to address environmental determinants of health, with a focus on air quality; chemical safety; climate change; water, sanitation, and hygiene; and their related behaviors. Emphasis is placed on protecting populations living in conditions of vulnerability. Adaptable to the context and needs of Member States, *The Essential Environmental Public Health Functions* will be complemented by a specific tool developed to support governments in assessing and improving the performance of environmental public health programs and institutions.

ABBREVIATIONS AND ACRONYMS

Agenda	Agenda for the Americas on Health, Environment, and Climate Change 2021–2030
COVID-19	coronavirus disease 2019
EEPHF	Essential Environmental Public Health Functions
EPHF	Essential Public Health Functions
LAC	Latin America and the Caribbean
PAHO	Pan American Health Organization
PM₁₀	inhalable particles, with diameters that are generally 10 micrometers and smaller
PM_{2.5}	fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller
Region	Region of the Americas
SDG	Sustainable Development Goal
UN	United Nations
WASH	water, sanitation, and hygiene
WHO	World Health Organization

ACKNOWLEDGMENTS

The Essential Environmental Public Health Functions: A framework to implement the Agenda for the Americas on Health, Environment, and Climate Change 2021–2030 represents the work and contributions from several experts within and outside the Pan American Health Organization (PAHO). Lead authors and editors of the publication are Marcelo Korc, Chief, PAHO Climate Change and Environmental Determinants of Health Unit; Fred Hauchman, Chair, PAHO Climate Change and Environmental Determinants of Health Technical Advisory Group (TAG); and Ernesto Bascolo, Regional Advisor on Governance, Leadership, Policy and Planning for the Health Services and Access Unit. PAHO appreciates the invaluable contributions from the members of the PAHO TAG: Yamileth Astorga Espeleta, Carlos Corvalan, Judy Daniel, Jacobo Finkelman, Guilherme Franco Netto, Amalia Margarita Laborde García, and Carmen del Pilar Tello Espinoza. PAHO is also grateful to the following authors: Ana Boischio, Daniel Buss, Juan Jose Castillo, Jonathan Drewry, Sally Edwards, Henry Hernandez, Anwar Mendez, Laura Romero, Patricia Segurado, and Agnes Soares. Lastly, PAHO extends its gratitude to the National Center for Environmental Health at the United States Centers for Disease Control and Prevention for reviewing and agreeing with the content of the document.

1. ABOUT THE FRAMEWORK

Throughout Latin America and the Caribbean (LAC), environmental public health professionals promote public health and foster healthy communities by leading and facilitating efforts to address environmental determinants of health. Their broad responsibilities include activities such as conducting assessments of environmental hazards and other determinants of health, responding to environmental emergencies, and supporting development of health-protective policies and programs to reduce harmful environmental exposures. This typically involves coordinating with government entities at the national, subnational, and/or local levels, within and outside of the health sector (e.g., environment, housing, transportation, and energy). It also involves bringing stakeholders into the process, facilitating cooperation with nongovernmental organizations, the private sector, academia, and the public. Effective and timely communication with all of these partners is essential.

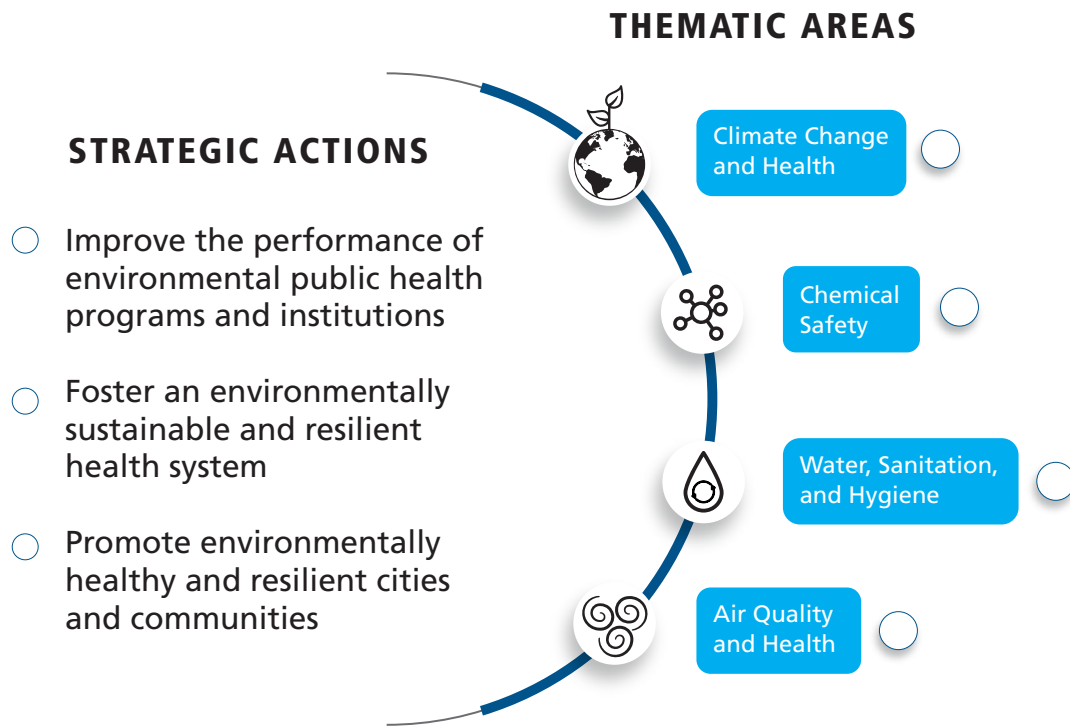
The ability of the public health sector to effectively and efficiently carry out these responsibilities is central to the successful implementation of the Agenda for the Americas on Health, Environment, and Climate Change:

2021–2030 (the Agenda), launched in 2021 by the Pan American Health Organization (PAHO) (1). The Agenda is aligned with the WHO Global Strategy on Health, Environment and Climate Change (2) and provides a roadmap for protecting the health of people in communities across LAC. Its goal is “to reduce the burden of disease and inequity in health attributable to environment-related impacts in the Region, with emphasis on air quality; chemical safety; climate change-related impacts; water, sanitation, and hygiene (WASH); and their related behaviors.” The Agenda describes three mutually reinforcing Strategic Lines of Action, with an emphasis on reducing inequities in health across the Region (Figure 1): (1) strengthening the performance of environmental public health programs and institutions; (2) fostering an environmentally resilient and sustainable health system; and (3) promoting environmentally healthy and resilient cities and communities. The Objectives and Indicators for each Strategic Line of Action are shown in the Annex.

A framework for essential environmental public health functions (EEPHFs) is presented herein to assist governments in implementing the Agenda’s strategic actions. The framework can help strengthen the planning, implementation, promotion, and evaluation of policies and programs that impact environmental public health. It can inform the allocation of human and financial resources needed to support the public health sector in this important role. Civil society and communities can use the EEPHF framework to better understand and advocate for actions to move the Region toward achievement by 2030 of Sustainable Development Goal 3: Ensure healthy lives and promote well-being for all at all ages.

Environmental public health is the branch of public health that addresses global, regional, national, and subnational environmental factors that influence human health (1).

Figure 1. The Agenda for the Americas on Health, Environment, and Climate Change 2021–2030



Section 2 reviews the essential public health functions (EPHFs) and PAHO’s recently updated EPHF framework (3) from which the proposed EEPHF framework was adapted. Section 3 describes the EEPHF framework and its 11 functions. Section 4 discusses monitoring and evaluation of these functions in order to assess their status and identify where additional actions are needed to meet the Objectives of each Strategic Line of Action of the Agenda.

2. ESSENTIAL PUBLIC HEALTH FUNCTIONS

In the 1990s, following the publication of the Institute of Medicine’s influential report, *The Future of Public Health* (4), organizations and governments around the world began establishing formal frameworks that describe the public health functions or services considered necessary for protecting the health of the public (3, 5). More recently, a growing appreciation has emerged for an expanded view of public health with a greater focus on health equity and a more explicit recognition of the impact of social, economic, and political factors on health. In 2020, PAHO updated its original EPHF framework published in 2002 (6) in response to this need for a broader consideration of public health practice in the 21st century (3, 7).¹

The updated EPHF framework, shown in Figure 2, includes 11 functions that fall into four integrated stages of the policy cycle: Assessment, Policy Development, Allocation of Resources, and Access. The integrated nature of the policy cycle stages is intended to promote a more consistent, coordinated, and broad institutional approach to public health protection and promotion in which all relevant actors are engaged (3). The policy cycle is non-linear, and some aspects of each stage may overlap. The Assessment stage informs the Policy Development stage; the Allocation of Resources stage addresses the critical need for sufficient and sustained resources to carry out the functions in the other stages in the cycle. The Access stage operationalizes all of the interventions necessary to provide access to services that protect both individual and collective public health (3).

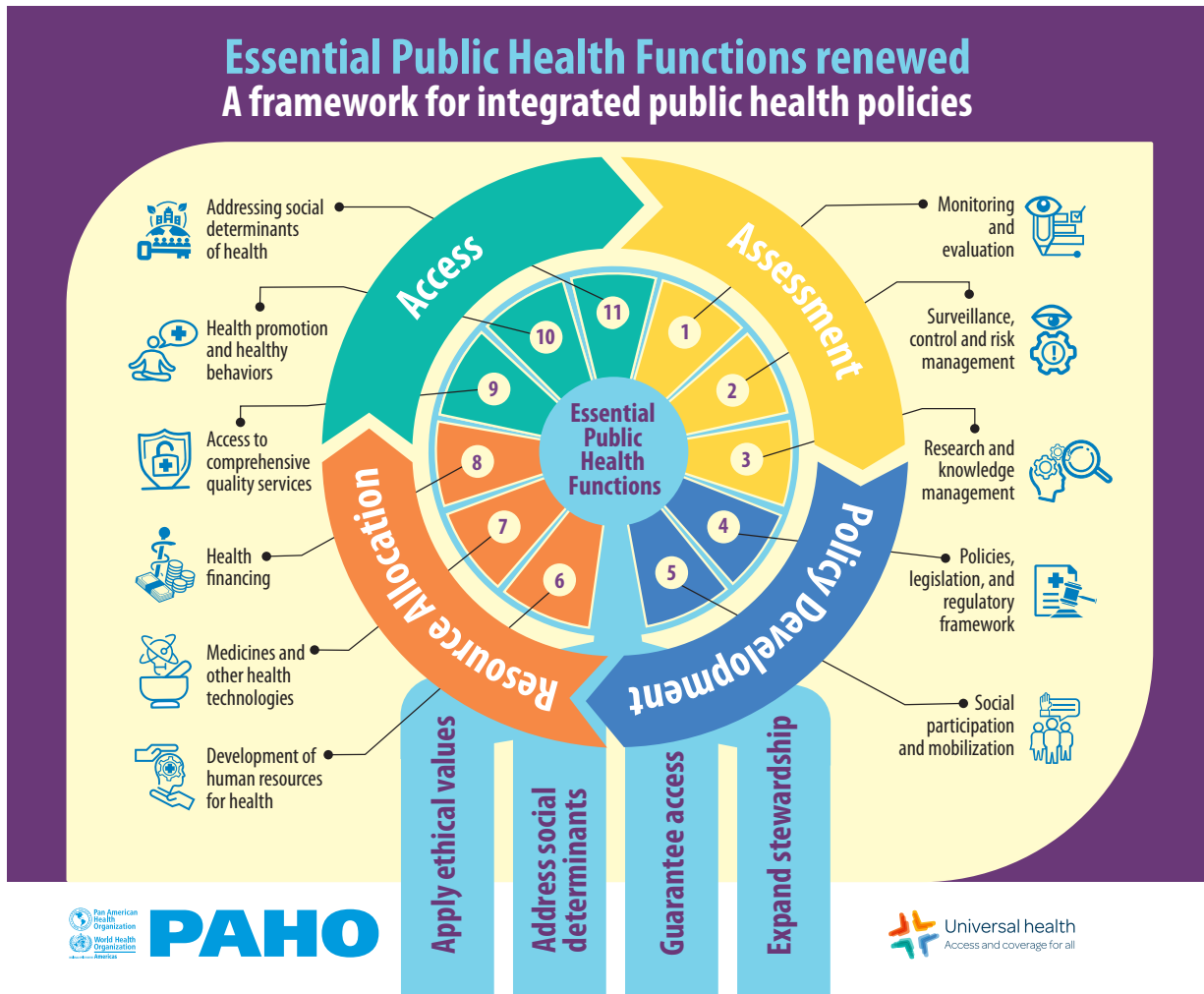
The framework is supported by four pillars that reflect the broadened scope of public health (3):

- 1) Apply ethical values of public health to address health inequities and their causes.
- 2) Address the social, economic, cultural, and political conditions that determine the health of populations.
- 3) Guarantee universal access to comprehensive, integrated, individual, and collective public health services.
- 4) Expand the stewardship role of the health authorities to address public health challenges.

Commitment of governmental entities at the national, subnational, and local levels to adopt the updated EPHF framework, with adherence to these four pillars, is essential for achieving the goal of health for all people in all communities.

¹ The U.S. Centers for Disease Control and Prevention, along with experts from public health organizations across the United States of America, recently updated their essential public health services framework for similar reasons (8).

Figure 2. PAHO Essential Public Health Functions Framework



Source: Pan American Health Organization [Internet]. Washington, DC: PAHO; 2021 [cited 2022 Jan 7]. Essential public health functions. Available from: <https://www.paho.org/en/topics/essential-public-health-functions>

3. ESSENTIAL ENVIRONMENTAL PUBLIC HEALTH FUNCTIONS

The EEPHF framework was adapted from the EPHF framework to describe functions of the public health sector that are essential for addressing environmental determinants of health throughout the Americas. As shown in Table 1, the EEPHF framework includes the same policy cycle stages and pillars as the EPHF framework. EPHF 10 is highly relevant because it includes environmental public health as one of its key components. Each EEPHF aligns with its corresponding EPHF, all of which are relevant to environmental public health. Strengthening the EEPHFs is a key element for stewardship and governance in environmental public health.² The EEPHF framework helps identify the responsibilities of health actors within and outside the health sector as well as governance structures needed to develop and monitor policies. Full operationalization of the EEPHF framework requires efficient and effective governance structures to design, implement, monitor, and evaluate policies and programs. Given the inter-programmatic, cross-sectoral, and multidisciplinary nature of environmental determinants of health, these structures should include legitimate and institutionalized mechanisms of coordination, communication, and collaboration among actors within and outside the health sector.

² In 2017, PAHO defined stewardship as “the capacity of health authorities to lead and support joint action, which allows the creation, strengthening, or changes to governance structures in the health system.” Governance, in turn, was defined as “the institutional arrangements that regulate the actors and critical resources that influence conditions of coverage and access to health services” (3).

Table 1. The essential environmental public health functions: adapted from and aligned with the essential public health functions

POLICY CYCLE STAGE	ESSENTIAL PUBLIC HEALTH FUNCTIONS ³	ESSENTIAL ENVIRONMENTAL PUBLIC HEALTH FUNCTIONS
Assessment	1. Monitoring and evaluation of health and well-being, equity, social determinants of health, and health system performance	1. Monitoring and evaluation of health and well-being, equity, and social determinants of health to determine their impact on environmental public health
	2. Public health surveillance, control and management of health risks and emergencies	2. Environmental health surveillance of environmental hazards, exposures, health risks, and risk management measures
	3. Promotion and management of health research and knowledge	3. Promotion and management of environmental health research and knowledge
Policy development	4. Development and implementation of health policies and promotion of legislation that protects the health of the population	4. Development and implementation of environmental health policies and promotion of legislation that protects the environmental health of the population
	5. Social participation and social mobilization, inclusion of strategic actors, and transparency	5. Social participation and social mobilization to promote communication and action on environmental determinants of health
Allocation of resources	6. Development of human resources for health	6. Development of human resources for environmental public health
	7. Ensuring access to and rational use of quality, safe, and effective essential medicines and other health technologies	7. Use and management of essential medicines and health technologies in an environmentally safe and sustainable manner to protect public health
	8. Efficient and equitable health financing	8. Efficient and equitable environmental public health financing
Access	9. Equitable access to comprehensive, quality health services	9. Equitable access to health care facilities that are climate resilient and environmentally sustainable
	10. Equitable access to interventions that seek to promote health, reduce risk factors, and promote healthy behavior	10. Equitable access to environmental public health interventions that promote health, reduce risk factors, and promote healthy behaviors
	11. Management and promotion of interventions on the social determinants of health	11. Including the environmental public health dimension in the management and promotion of interventions on social determinants of health
Pillars: Apply ethical values; Address social determinants; Guarantee access; Expand stewardship		

³ The essential public health functions are described in PAHO (3).

The following section describes each EEPHF within the four integrated policy cycle stages. For detailed information about the EPHFs from which the environmental versions are adapted, see PAHO (3).

ASSESSMENT STAGE – EEPHF 1, 2, AND 3

This stage of the policy cycle includes three functions that involve the collection, analysis, management, and dissemination of information on the health impact of environmental threats, with an emphasis on populations in conditions of vulnerability. Health assessments developed from this information, along with information on the control of environmental health risks, help inform policy decisions to reduce the health burden attributed to environmental stressors and the social factors that contribute to health inequities and inequalities.

EEPHF 1. *Monitoring and evaluation of health and well-being, equity, and social determinants of health to determine their impact on environmental public health*

This function involves collection and analysis of data and information on the health status of the population, the social determinants of health⁴ that may contribute to environmental health inequalities and inequities, and the performance of health systems in handling environmental public health concerns in the populations served. Information is available from databases such as the PAHO Core Indicators Database⁵ and SDG 3 Data Portal.⁶ Published reports in the health and social science literature are an additional source of information. For some geographic areas and populations of interest, however, additional data collection is necessary to support more robust assessments.

As discussed in the EPHF report (3), monitoring and evaluation systems provide a convenient mechanism for compiling, managing, and sharing information. Although there has been progress in institutionalizing health sector information systems in some parts of the Region, information in these systems for assessing health equity (e.g., through household health surveys that include information on economic status or area of residence) is still limited in most countries of LAC (3). Nevertheless, environmental health professionals should work with others within and outside of the health sector to evaluate the available information related to this function, and whenever possible collect new data relevant to communities that are most likely to be impacted by poor air or water quality, inadequate sanitation, solid waste management concerns, exposure to toxic substances, or climate-related health impacts.

EEPHF 2. *Environmental health surveillance of environmental hazards, exposures, health risks, and risk management measures*

Environmental health surveillance is a type of public health surveillance that contributes to an understanding

⁴ The conditions in which people are born, grow, work, and play, including factors such as socioeconomics, education, and access to health care and housing.

⁵ PAHO Core Indicators Database: <https://www.paho.org/en/evidence-and-intelligence-action-health/core-indicators-database>

⁶ Evidence and Information for Action on the SDG-3 Targets: <https://www3.paho.org/ods3/en/home/>

of the environmental threat (i.e., chemical, physical, or biological), the characteristics of exposure (e.g., duration and frequency; natural, accidental, or deliberate; distributions across the population), the health effects (e.g., respiratory, cardiovascular, and gastrointestinal disease) and potential health risk in healthy and highly susceptible individuals, and the effectiveness of services or technologies to reduce or eliminate the risk to health. Disaggregation of surveillance data by population groups is valuable for determining differences in environmental exposures and health risks, and the social determinants of health that may be contributing factors.

Surveillance may be ongoing, periodic, or in response to an emergency event. Activities may involve monitoring or modeling levels of specific contaminants in the environment, conducting health surveys and risk assessments, and evaluating the effectiveness of risk management measures. Data from environmental health surveillance activities are essential for developing scientifically sound policies, programs, and priorities for equitably protecting the environmental health of the population. To be fully effective, the public health sector must have strong environmental health surveillance capabilities and the capacity to efficiently collect, analyze, and manage the flow of relevant data for assessments. Intersectoral cooperation on surveillance efforts and communication with relevant stakeholders are also very important.

The World Health Organization (WHO) and other United Nations organizations have developed guidance on health surveillance to assist policymakers with the development of norms and solutions for reducing health inequities and the health burden associated with environmental threats. Countries throughout LAC have adapted these recommendations to their own particular circumstances and priorities, based on a consideration of health and other factors (e.g., technological feasibility, costs, and institutional capacities). The Agenda (1) identifies the health surveillance data used to determine progress toward meeting relevant Sustainable Development Goals.⁷ For example, for Goal 11 on sustainable cities and communities, monitoring of PM_{2.5} and PM₁₀ in cities, at a minimum, is recommended.

Table 2 provides a list of recommended environmental health surveillance activities, adapted from the *Compendium of WHO and Other UN Guidance on Health and Environment* (9).

⁷ Includes Sustainable Development Goals 3, 6, 7, 11, 12, and 13.

Table 2. Environmental health surveillance activities

ENVIRONMENTAL ISSUE		ENVIRONMENTAL HEALTH SURVEILLANCE
Air quality		
Outdoor air		<p>Monitoring of the following pollutants</p> <ul style="list-style-type: none"> • PM_{2.5} and PM₁₀ (annual and 24-hour)* • Ozone (8-hour) • Nitrogen dioxide (annual and 24-hour) • Sulfur dioxide (24-hour) • Hazardous chemicals (e.g., volatile organic compounds) <p>Surveillance of emissions from sources of air pollution</p>
Indoor air	Household	<p>Monitoring of PM_{2.5} and carbon monoxide (vented and unvented)</p> <p>Assessment of the proportion of houses using clean fuels and technologies for cooking, heating, and lighting</p>
	Mold	<p>Regular professional building inspections and maintenance to prevent dampness and mold from occurring, and surveillance of buildings with dampness and mold to identify the root causes</p>
Water quality and sanitation		
Drinking water		<p>Routine water quality surveillance of households, schools, and health care facilities. Can include monitoring of physical, biological, chemical and radiological parameters</p> <p>Health surveillance to confirm safety of the drinking water</p> <p>Surveillance as a component of Water Safety Plans</p>
Sanitation		<p>Surveillance to target sanitation services to settings with high disease burden and support outbreak prevention efforts</p> <p>Surveillance and local risk assessments to prioritize improvements and manage system performance</p> <p>Surveillance as a component of Sanitation Safety Plans</p>
Recreational water		<p>Surveillance of:</p> <ul style="list-style-type: none"> • microbial quality of coastal and fresh recreational waters using indicator values for intestinal enterococci; • harmful algal blooms in freshwater using indicator values for cyanobacterial biomass and cyanotoxins; • other hazards (beach sand, chemicals, other microbial hazards, nuisance); • swimming pool physical and chemical parameters; • recreational water illnesses. <p>Surveillance as a component of Recreational Water Safety Plans</p>
Hygiene		<p>Surveillance of hand-washing facilities in public places (e.g., schools, health care facilities)</p>
Solid waste		
Hazardous chemicals		<p>Biomonitoring and environmental monitoring (e.g., of water, soil, air) of harmful waste exposure, and surveillance to determine exposure of target populations to harmful wastes</p>
E-waste		<p>Assessment and surveillance to identify e-waste streams and potential human exposures</p>

ENVIRONMENTAL ISSUE	ENVIRONMENTAL HEALTH SURVEILLANCE
Chemical safety	
Chemicals in air, drinking water, and soil	Surveillance to determine potential exposures and health burdens. Selected chemicals of concern include arsenic, asbestos, pesticides, dioxin and dioxin-like substances, mercury, and lead (particularly prenatal and children's exposures)
Chemical events	Assessment and surveillance for the prevention, detection, verification, and risk assessment of chemical events of national and international concern
Waste sites	<p>For prevention: Mapping of existing sites and potential hazardous contents</p> <p>For preparedness: Assessment and surveillance to provide information for databases on existing hazardous waste sites, contents of transportation, chemical information, health care resources, and emergency contact information</p> <p>For response: Assessment and surveillance to advise and alert health care facilities, collect human and environmental samples to register individuals exposed, and investigate during the incident</p> <p>For recovery: Assessment and surveillance to register exposed persons for follow-up and surveillance, and to conduct risk and health outcome assessments</p>
Health care facilities	
	<p>Assessment of the environmental health impact, sustainability, and climate-resilience of health care facilities, including water and sanitation services, energy emissions, waste management, and material use (e.g., mercury thermometers, radiation)</p> <p>Surveillance to detect antimicrobial-resistant strains of microorganisms in the environment</p>
Climate change	
	<p>Assessments and surveillance of extreme weather events, temperatures, water availability and quality, etc.</p> <p>Surveillance of climate-related disease</p> <p>Development of integrated monitoring systems allowing collection and analysis of data on environmental hazards, socioeconomic factors, and health outcomes</p>

Note: The following areas listed in WHO (9) are outside the scope of the Agenda (1): chemicals in food, radon in homes, ultraviolet radiation, electromagnetic fields, radiological emergencies, radioactivity in food, and vector control.

Source: Adapted from World Health Organization. Compendium of WHO and Other UN Guidance on Health and Environment. WHO/HEP/ECH/EHD/21.02 [Internet]. Geneva: WHO; 2021. Available from: <https://www.who.int/publications/i/item/WHO-HEP-ECH-EHD-21.02>

EEPHF 3. *Promotion and management of environmental health research and knowledge*

This function involves promotion and management of policy-relevant research and scientific knowledge to support policies that effectively and equitably prevent or respond to environmental threats to health. Research that leads to a better understanding of the nature and magnitude of environmental health risks can help set national priorities to address the most important environmental health concerns. Research can also lead to development of cost-effective and innovative solutions to environmental public health problems. Effective management of scientific knowledge, which includes processes and tools for creating, using, sharing, and maintaining information, is critical for ensuring that it is both accessible and understandable to scientists, policymakers, and the public.

New environmental health research may not be needed to address all environmental public health problems. In some instances, it may be sufficient to ensure that relevant available scientific information about the environmental health risks and solutions is available to decisionmakers and the public. However, a strong rationale exists for strengthening the capacity for research and knowledge management in LAC. Policy-relevant scientific information for characterizing and cost-effectively controlling environmental threats is often limited. Research to fill key data gaps and develop sustainable and affordable solutions, particularly for those in conditions of vulnerability, is essential for the development of scientifically sound and implementable environmental health policies (1, 2). PAHO (10) identified four principles to guide the conduct of policy-relevant health research and the generation of scientific knowledge: impact, quality, inclusiveness, and communication and accessibility.

POLICY DEVELOPMENT STAGE – EEPHF 4 AND 5

This stage includes two EEPHFs that focus on development of strong environmental health policies that provide equitable protection of the population from health risks posed by environmental threats. For this to be successful, certain conditions and capabilities must exist within the public health sector and other public entities involved in developing environmental public health policies, legislation, and programs, as well as within civil society⁸ and communities that participate in the process.

EEPHF 4. *Development and implementation of environmental health policies and promotion of legislation that protects the environmental health of the population*

The development of evidence-based environmental public health policies and legislation, adapted to the context and priorities of individual countries, reflects the commitment of governments to protect the health of the public against environmental threats. Public sectors other than health (e.g., transportation, environment, and energy) commonly have the primary responsibility for developing and implementing policies to address air quality, WASH, chemical safety, and climate change. The intersectoral nature of policies that have an environmental health component highlights the importance of the active engagement of the public health sector in working with its partners during all stages of policy development and implementation. This involves advocating for and assisting in development of policies and legislation to reduce the environmental health burden equitably across the population, contributing expertise in public health, environmental science, and risk assessment, participating in the decision-making process, and facilitating communication with all stakeholders. Periodic evaluations of the success of intersectoral policies in achieving environmental public health goals is an essential component of this function.

There must be sufficient capacity and capability within the environmental public health sector to support this broad set of responsibilities. Staff must be technically and politically skilled, in addition to having the ability to communicate well with all actors involved, including the public.

The Agenda provides a framework for policies and strategies to reduce the health burden and inequity in

⁸ PAHO defines civil society as “groups outside the government created to promote public health and the general good.”

<https://www.paho.org/salud-en-las-americanas-2017/pv-civil.html>

health attributed to environment-related effects in the Region. Guidance on specific policies and actions for individual environmental areas can be found in WHO (11), as well as in the more detailed, area-specific WHO and United Nations agency publications cited therein. WHO (11) also identifies the sectors involved in planning and implementation, the level of implementation (e.g., national, community, health care), and the instruments (e.g., governance, regulation, assessment, and surveillance).

EEPHF 5. *Social participation and social mobilization to promote communication and action on environmental determinants of health*

The participation of civil society and communities in the development of policies and actions on environmental determinants of health has many benefits. An open, democratic process provides opportunities for the public to meet with government representatives to share health concerns and offer input on solutions. Community members can hear technical analyses conducted by experts from within and outside the government, and learn about policy options being developed. Social participation built on mutual trust and understanding, established early in the policy development process, can help legitimize and improve decisions made by the government. This can lead to more responsive policies that are better accepted and more easily implemented (3, 12).

Most countries in the Region have included provisions for public participation in the development of legislation and sector-specific laws to protect the environment and health (12). A number of the countries have ratified the 2018 *Regional Agreement on Access to Information, Public Participation and Justice in Environmental Matters in Latin America and the Caribbean* (Escazu Agreement).⁹ In recent decades, public movements and organizations in the Region that advocate for health have emerged (3). Although these developments are encouraging, meaningful public participation is often limited. This may be due to factors such as limited political will, limited information sharing, insufficient financial assistance for the participation of affected populations, late engagement of the public in the process, or poor organization of community groups (3, 12). The public health sector can help remove some of these barriers by advocating for and supporting government efforts to engage all interested parties, particularly populations in conditions of vulnerability, in the development of policies and actions in support of environmental public health.

ALLOCATION OF RESOURCES STAGE – EEPHF 6, 7, AND 8

This stage includes three functions that focus on the human and financial resource requirements for the provision of environmentally safe and sustainable solutions to environmental concerns in the community, including in health care facilities.

EEPHF 6. *Development of human resources for environmental public health*

A major factor in the ability of the public health sector to carry out its vital leadership and facilitation

⁹ The Agreement and the most recent list of signatories can be found at:

https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-18&chapter=27&clang=_en

role in reducing the health burden associated with environmental threats is the level of investment in its environmental health workforce. Human resource policies and plans should have sufficient resources for hiring, retaining, and training environmental health professionals with the requisite technical expertise and additional competencies necessary for the job. Due to the intersectoral nature and social dimensions of environmental health protection, environmental staff must be able to work, influence, and communicate effectively with all sectors, including the general public.

Academic and on-the-job training in environmental health is a vital component of strategies to build the capacity of the environmental public health sector in the Region. Environmental health professionals must also be trained in areas that prepare them for working in a multisectoral, policy-oriented workplace. A recent study of undergraduate programs in medicine and other health disciplines at 161 universities in LAC found that most offer courses in public health and epidemiology (13). However, a relatively small number of these universities include courses on environmental health and climate change in their curricula. To meet the complex challenges posed by environmental threats to health, there is an urgent need to strengthen the pipeline of students in LAC who are pursuing a career in environmental public health, and to provide career opportunities for these graduates.

EPPHF 7. *Use and management of essential medicines and health technologies in an environmentally safe and sustainable manner to protect public health*

This EPPHF, along with EPPHF 9 (discussed below), focuses on actions to enhance the capacity of the health sector to protect public health and the environment in a resilient and sustainable manner. EPPHF 7 involves optimizing the use of resources and taking appropriate steps to ensure that environmental safety and sustainability are key considerations in the procurement, rational use, and management of therapeutic tools (i.e., essential medicines and health technologies) of health systems. This can be achieved through development and implementation of appropriate policies for each of these considerations, and monitoring practices to evaluate whether they are meeting their intended goals.

A number of specific actions can be taken to ensure environmental safety and sustainability of health systems with regard to essential medicines and health technologies (11). In accordance with the 2017 Minamata Convention on Mercury,¹⁰ phasing out mercury-containing thermometers and blood pressure devices, and phasing down the use of dental amalgam, protect human health and the environment from the adverse effects of mercury. Policies should provide for the adequate treatment and/or disposal of medical wastes, which can include microbial pathogens, hazardous chemicals, radioactive waste, pharmaceuticals, discarded needles and other sharps, and hospital waste with plastic material (which can release harmful dioxins and furans if improperly incinerated). Medical facilities can help address the growing public health concern of antimicrobial resistance through effective treatment and disposal of biological wastes (14). Procurement practices should prioritize acquisition of new health technologies that are not only more effective but are safe for patients, health facility workers, and the environment.

¹⁰ Minamata Convention on Mercury: <https://www.mercuryconvention.org/en>

EPPHF 8. *Efficient and equitable environmental public health financing*

The ability of the EPPHF framework to advance environmental public health equitably in the Region requires a sufficient and sustained level of strategically planned, equitably targeted financing to meet the public health challenges posed by current and emerging environmental threats. EPPHF 8 focuses on financing, which is dependent upon efficient and equitable resourcing of the public health sector, as well as of the other sectors that are responsible for policies and programs that impact environmental public health.

Information about sources and levels of financing of environmental public health programs in LAC is not readily available. Budgets for government programs generally involve a process in which the priorities of all national programs are considered. In addition to competing priorities across government programs, there are competing priorities within the health sector overall (e.g., funding health services versus public health) and within the public health sector itself (e.g., funding food safety versus environmental health). Funding decisions must also be made regarding support for current versus emerging environmental health concerns. Financing of the public health sector supports hiring, retaining, and training of environmental health staff and the functions they perform (e.g., environmental health surveillance, policy development). Resources for environmental monitoring and development of policies that address environmental determinants of health, or for policies affecting the social determinants of health, are allocated to other sectors (e.g., environment, transport, social services). Financing from public and private international sources (e.g., Green Climate Fund, European Union, The Bill & Melinda Gates Foundation) supports global and national environmental health priorities, with resources going to governmental and nongovernmental entities from the national level down to the local level.

It is important that financing strategies for environmental public health are developed and implemented in such a way as to promote coordination, collaboration, and communication between the entities involved in policies and programs affecting environmental public health. Funding strategies should include support for the essential functions of hiring, retaining, and training environmental public health staff; developing policy-relevant environmental data; collecting, analyzing, and using relevant information on health inequities; strengthening the climate resilience and environmental sustainability of health care services; and effectively engaging communities to promote knowledge and action on environmental determinants of health (3).

ACCESS STAGE – EPPHF 9, 10, AND 11

The fourth stage of the policy cycle includes functions with actions to assure access to climate-resistant and environmentally sustainable health services, and to public health services that equitably address environmental health concerns. At this stage in the policy cycle, providing access means that these actions are fully and effectively operationalized, particularly at the local level where environmental health threats pose a risk to members of the community, and where the risks are mitigated or eliminated.

EPPHF 9. *Equitable access to health care facilities that are climate resilient and environmentally sustainable*

This function, which is closely linked to EPPHF 7, involves actions to strengthen the climate resilience and environmental sustainability of health care facilities by optimizing use and safety of resources, and minimizing release of waste into the environment. According to WHO (11), there are four main requirements for this to

happen, each of which has implications for protecting environmental public health:

- 1) A skilled health workforce that is adequate in number with good working conditions and capable of responding to environmental challenges;
- 2) Sustainable and safe management of water, sanitation, hygiene, and health care waste services;
- 3) Sustainable energy sources;
- 4) Appropriate infrastructure, technologies, products, and processes, including operations for the efficient functioning of a health care facility.

Climate resilient and environmentally sustainable health care facilities anticipate, respond to, cope with, recover from, and adapt to climate-related shocks and stresses. They minimize negative impacts on the environment and leverage opportunities to restore and improve it, bringing ongoing and sustained health care to their target population and protecting the health and well-being of future generations (11).

A starting point for identification and prioritization of appropriate interventions to improve climate resilience and environmental sustainability is to determine a health care facility's environmental footprint. The environmental footprint includes generation of waste, chemical contamination, water consumption, and emissions of greenhouse gases associated with the production, transport, and disposal of health care goods and services. These measures establish a baseline for monitoring progress toward more climate-resilient and environmentally sustainable health care facilities (11).

Actions such as training health care staff in chemical safety and medical waste management during routine and emergency situations, verifying compliance with national standards for drinking water and sanitation facilities, promoting energy conservation and implementing renewable energy strategies, procuring environmentally safe and energy efficient products, and providing access to hand-washing facilities and flush toilets for safe hygiene are among the many interventions that can be taken to move health care facilities toward a more climate-resilient and environmentally sustainable status. The occurrence of local environmental disasters and of global health crises such as COVID-19 is a reminder of the critical importance of health care facilities being prepared to effectively respond to disease outbreaks and emergencies that invariably arise. WHO (11) provides a comprehensive set of interventions to address each of the four requirements above.

EEPHF 10. *Equitable access to environmental public health interventions that promote health, reduce risk factors, and promote healthy behaviors*

This EEPHF represents the integration and effective operationalization of all of the functions in the framework. Assuring equitable access to environmental public health interventions that protect and promote health means that actions under the four stages of the policy cycle must be effectively implemented by the public health sector and others whose collaboration and cooperation are essential.

As discussed above, the public health sector and other entities throughout government at the national and subnational level provide leadership in the development of high-level policies and programs to protect environmental public health. The actual interventions to ensure the safety of drinking water, promote good hygiene, effectively manage hazardous waste, prepare for extreme weather events due to climate change,

and manage other environmental health hazards are all implemented at the local level. This highlights the importance of intersectoral partnerships involving the local community, of understanding the range of local factors that contribute to environmental health concerns, and of identifying the most appropriate local solutions to environmental health problems.

Unlike environmental public health concerns that can be specifically attributed to conditions such as unsafe water, poor sanitation, and exposure to toxic substances, some health concerns have a significant environmental dimension, but this may not be the primary contributing factor. Examples include arboviral diseases and neglected tropical diseases. For other health concerns (e.g., cardiovascular disease), the environment may be only one of a number of important risk factors. Ensuring equitable access to environmental public health interventions should therefore be an important consideration in prevention and control efforts for these types of public health concerns as well.

EEPHF 11. *Including the environmental public health dimension in the management and promotion of interventions on social determinants of health*

This function focuses on the role of the public health sector in promoting a consideration of environmental public health in actions to address structural socioeconomic factors that impact health and well-being. It is well established that conditions of daily life, such as economic status, education, employment, and living conditions, are important contributors to health inequalities, including but not limited to when environmental determinants are responsible for health concerns (15). As discussed under EEPHF 4, it is important for the public health sector in LAC to work in coordination with other sectors that have the lead responsibility for policies and programs that can impact environmental public health. The same is true for public health sector engagement with sectors that seek to improve socioeconomic conditions in populations that may be particularly vulnerable to health problems associated with poor air or water quality, inadequate sanitation and hygiene, hazardous chemicals, and the negative effects of climate change.

Cross-sectoral collaboration at all levels can result in a greater understanding of the influence of social and economic factors on environmental public health, leading to more effective policies and programs administered by these other sectors. Participation in development of intersectoral initiatives through governance structures that coordinate different government jurisdictions (e.g., finance, urban planning, housing, and social development) can strengthen the impact of social or economic interventions, which in turn can also improve environmental public health (3).

Challenges to meaningful cross-sectoral collaboration, however, may need to be overcome in parts of LAC. It may be necessary to instill in government authorities a greater recognition of the interrelated public health benefits of considering environmental public health in the development of socioeconomic policies and programs. A greater appreciation of the importance of establishing governance mechanisms to promote effective intersectoral collaboration and a shared responsibility and accountability across the sectors may also be needed.

4. MONITORING AND EVALUATION

As indicated in the Introduction, the EEPHF framework can be used to evaluate the ability of environmental public health programs to implement the Agenda. Monitoring and evaluating the status of each of the 11 functions in the context of the Agenda’s Strategic Lines of Action, Objectives, and Indicators can guide decisions concerning the functions that need to be strengthened to further reduce the health burden and health inequity attributable to environment-related impacts in the Region.

An assessment tool based on the EEPHF framework is being developed to facilitate the monitoring and evaluation process in the context of the Agenda’s Strategic Lines of Action (see Annex). The tool, which is being adapted from the PAHO tool to monitor and evaluate the EPHFs, will elicit relevant information about the status of each EEPHF through a series of questions, as shown in the examples below:

Table 3. Examples of selected EEPHFs and evaluation questions

ESSENTIAL ENVIRONMENTAL PUBLIC HEALTH FUNCTION	EVALUATION QUESTION
Strategic Line of Action 1: Improve the performance of environmental public health programs and institutions (Objective 1.1/Indicator 1.1.2)	
EEPHF 4. Development and implementation of environmental health policies and promotion of legislation that protects the environmental health of the population	<ul style="list-style-type: none"> Is there a national environmental public health policy, strategy, or plan? If so, does the national environmental public health policy, strategy, or plan define the roles and responsibilities of the entities involved in its implementation within and outside the health sector?
Strategic Line of Action 1: Improve the performance of environmental public health programs and institutions (Objective 1.3/Indicator 1.3.2)	
EEPHF 6. Development of human resources for environmental public health	<ul style="list-style-type: none"> Do the national public entities responsible for environmental public health have qualified and sufficient technical personnel to implement the health dimension of the plan for air quality? Water and sanitation? Chemical safety? Climate change?
Strategic Line of Action 2: Foster an environmentally sustainable and resilient health system (Objective 2.1, Indicator 2.1.2)	
EEPHF 9. Equitable access to health care facilities that are climate resilient and environmentally sustainable	<ul style="list-style-type: none"> Has a national environmental public health strategy/plan been implemented to improve the environmental footprint of the health sector related to water? Mercury? Hazardous waste?

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ANNEX

STRATEGIC LINES OF ACTION, OBJECTIVES, AND INDICATORS IN THE PAHO AGENDA FOR THE AMERICAS ON HEALTH, ENVIRONMENT, AND CLIMATE CHANGE: 2021–2030

Strategic Line of Action 1: Improve the performance of environmental public health programs and institutions

Objective 1.1: Strengthen environmental public health programs and institutions, placing specific emphasis on air quality, chemical safety, climate change-related impacts, WASH, and their related behaviors, using a health equity lens.

Indicator

- 1.1.1 Number of countries and territories implementing the recommendations of the performance assessments of national environmental public health programs for specific thematic areas, using the essential public health functions framework.
- 1.1.2 Number of countries and territories implementing and monitoring national policies to achieve Sustainable Development Goal (SDG) targets that address environmental determinants of health, prioritizing those living in conditions of vulnerability.
- 1.1.3 Number of countries and territories that include SDG indicators that address environmental determinants of health disaggregated by subpopulation groups in conditions of vulnerability in national public health and/or environmental surveillance systems.

Objective 1.2: Enhance health sector collaboration with environment, water and sanitation, and other sectors using the Health in All Policies framework to address environmental determinants of health, placing emphasis on air quality, chemical safety, climate change-related impacts, WASH, and their related behaviors, and to advance health equity.

Indicator

- 1.2.1 Number of countries and territories with established formal mechanisms between the health national authority and environment, water and sanitation, and other national government entities to address environmental determinants of health, prioritizing those living in conditions of vulnerability.

Objective 1.3: Strengthen the technical capacity of the environmental public health workforce within and outside the health sector, placing specific emphasis on air quality, chemical safety, climate change-related impacts, WASH, and their related behaviors.

Indicator

- 1.3.1 Number of countries and territories implementing a national strategy for standardizing environmental public health professional qualifications, educational requirements, and credentialing.
- 1.3.2 Number of countries and territories with adequate full-time staff in the health sector trained in and assigned to environmental public health for specific thematic areas.

Strategic Line of Action 2: Foster an environmentally sustainable and resilient health system

Objective 2.1: Reduce the environmental footprint of a health system to further the creation of an environmentally sustainable and healthy environment, placing specific emphasis on air quality, chemical safety, climate change-related impacts, WASH, and their related behaviors.

Indicator

- 2.1.1 Number of countries and territories that have estimated the environmental footprint of health care facilities.
- 2.1.2 Number of countries and territories implementing a national strategy to reduce the environmental footprint of health care facilities.
- 2.1.3 Number of countries and territories that include sustainable procurement practices in their health systems.

Objective 2.2: Provide adequate environmental infrastructure and services in health care facilities that aim to increase the resilience of a health system, placing specific emphasis on air quality, chemical safety, climate change-related impacts, WASH, and their related behaviors and using a health equity lens.

Indicator

- 2.2.1 Number of countries and territories implementing a national strategy to promote adequate environmental infrastructure in health care facilities, prioritizing facilities accessed primarily by those living in conditions of vulnerability.
- 2.2.2 Number of countries and territories with early warning systems developed for climate sensitive health hazards to provide increased health sector resilience.

Strategic Line of Action 3: Promote environmentally healthy and resilient cities and communities

Objective 3.1: Integrate environmental public health in health protection and improvement programs within the health sector, using a health equity lens.

Indicator

- 3.1.1 Number of countries and territories that included the environmental public health dimension within specific national health protection and improvement strategies within the health sector implemented in cities and communities, prioritizing those living in conditions of vulnerability.

Objective 3.2: Integrate environmental public health in development programs using the Health in All Policies framework, with a health equity lens.

Indicator

3.2.1 Number of countries and territories that have included the environmental public health dimension within specific national development strategies implemented in cities and communities, using the Health in All Policies framework and prioritizing those living in conditions of vulnerability.

Objective 3.3: Strengthen environmental public health capacity for emergency and disaster response and early recovery.

Indicator

3.3.1 Number of countries and territories that have tested environmental public health plans and procedures for emergency and disaster response and early recovery, in coordination with the national incident or emergency response teams.

Note: For an explanation of how each Indicator is measured, see Annex 3 of the Agenda for the Americas on Health, Environment, and Climate Change 2021–2030, which is available from:

https://iris.paho.org/bitstream/handle/10665.2/54816/PAHOCDECE210004_eng.pdf?sequence=7&isAllowed=y

This publication presents a framework to implement the Agenda for the Americas on Health, Environment, and Climate Change 2021–2030 (the Agenda) that is structured around essential public health functions focused on environmental determinants of health. The Agenda is a call to action to the health sector to lead the charge to address environmental determinants of health in the Americas. The Pan American Health Organization (PAHO) will work with Member States to achieve its goal and objective to ensure healthy lives and promote well-being for all at all ages using a sustainable and equitable approach that places a priority on reducing health inequity.

The Agenda was developed under the umbrella of the WHO Global Strategy on Health, Environment, and Climate Change, and builds upon the commitments set forth in the Sustainable Health Agenda for the Americas 2018–2030 and the PAHO Strategic Plan 2020–2025. The Agenda was developed in consultation with the PAHO Climate Change and Environmental Determinants of Health Technical Advisory Group and through a consensus-driven decision-making process with Member States during the 2019–2020 period. Looking toward the achievement of Sustainable Development Goal 3, the Agenda focuses on: improving the performance of environmental public health programs and institutions; fostering environmentally resilient and sustainable health systems; and promoting environmentally healthy and resilient cities and communities. Its implementation will be context-specific, based on the needs and realities of the countries. It will benefit countries and territories by promoting good governance practices, strengthening the leadership and coordination roles of the health sector, fostering cross-sectoral action, focusing on primary prevention, and enhancing evidence and communication. It will facilitate access to human, technical, and financial resources necessary to address environmental determinants of health and ensure that the Region is fully engaged in global health, environment, and climate change processes and agreements.

The objective of the Agenda is to strengthen the capacity of health actors in the health and non-health sectors to address and adapt to environmental determinants of health, prioritizing populations living in conditions of vulnerability, in order to meet Outcome 18 of the PAHO Strategic Plan 2020–2025 directly and several other outcomes of the Plan indirectly.

To address and adapt to the challenges of environmental determinants of health in the Region, an integrated and evidence-informed approach within the health sector and across sectors will be needed—one enabled and supported by good governance practices, adequate management mechanisms, high-level political will, and adequate human, technical, technological, and financial resources.

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