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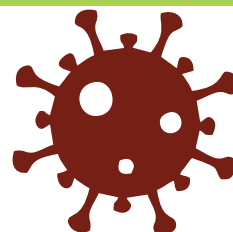**Communities in Pandemic Preparedness & Response**

ACT

COMMUNITY GUIDE ON PANDEMIC PREPAREDNESS AND RESPONSE (PPR) AND CLIMATE JUSTICE

Introduction

At the WHO's World Health Assembly in 2024, member states adopted a dedicated resolution on Climate Change and Health. The resolution clearly identified climate change as a major and imminent threat to public health.

The resolution, which was supported overwhelmingly by member states, is a resounding call to action, and recognises that radical action is necessary to safeguard environmental sustainability and public health.

This guide explores the intersectionality between climate change, health, pandemic preparedness and response (PPR) and the impact of climate change and PPR on health outcomes. It sets out the links between climate change and increased zoonotic spillover events. It also explains how changes to our natural systems, including degradation of the environment and biodiversity loss, can contribute to the emergence of new pathogens.

Finally, it looks at opportunities for communities, civil society organisations and community led monitoring partners in relation to PPR and climate justice, including the role of community led monitoring and surveillance systems that incorporate environment and climate data to predict disease outbreaks

What is climate change?

The Intergovernmental Panel on Climate Change (IPCC), which is the United Nations body responsible for assessing the science related to climate change, defines climate change as "a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer." In other words, climate change refers to changes in the climate or average weather and the variability of weather conditions over time.

For key concepts, terms and definitions related to climate change, see the IPCC's glossary at https://www.ipcc.ch/sr15/chapter/glossary.
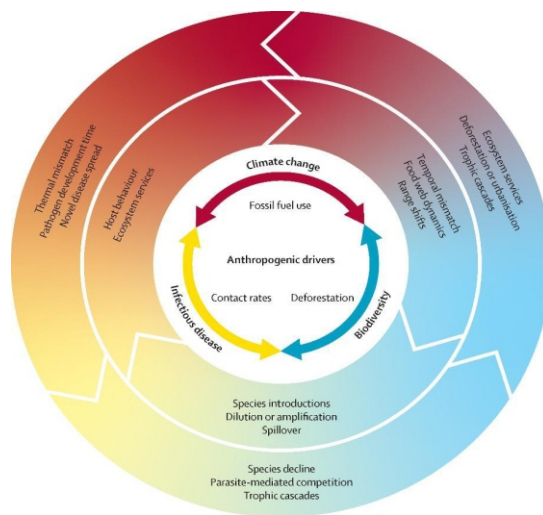
What is causing climate change?

Climate change can be caused by natural factors but there is broad agreement that human activities, especially the widespread use of coal, oil and gas are causing the extreme changes in the climate that we are seeing today. Rising temperatures, changes in rainfall, and extreme weather events are all examples of climate change..

How is climate change linked to human health and pandemics?

Climate change is changing ecosystems around the world, and, because wellfunctioning ecosystems are essential to human health, climate change poses a fundamental threat to human health.[3] Properly functioning ecosystems provide clean air, fresh water, medicines and food security, and help to limit infectious diseases and stabilise the climate.[4] The changes to our ecosystems that are caused by climate change are giving rise to biodiversity loss and an increase in infectious diseases.[5]

Source: Interconnecting global threats: climate change, biodiversity loss, and infectious

diseases, April 2024. Pfenning-Butterworth, Alaina et al. The Lancet Planetary Health, Volume 8, Issue 4, 270 – 283.

Some specific ways in which climate change and pandemics are linked are:

1. **Climate change is disrupting habitats and causing zoonotic spillover**. Rising temperatures and extreme weather conditions are forcing some animal species to migrate to new areas in search of food, water and more suitable conditions. This often brings them into closer contact with human populations. When humans and wildlife come into closer proximity, the likelihood of diseases jumping from animals to humans (zoonotic disease) increases.[6]

2. **Climate change is driving the movement of disease vectors.** Because disease vectors such as mosquitoes, ticks and flies are influenced by changes in the climate, climate change is impacting on the abundance and distribution of vectors. This, in turn, is giving rise to new risks of infectious diseases and increased transmission of the diseases that these vectors carry.[7] As an example, the severe flooding in Pakistan in 2022 resulted in huge collections of stagnant water and the perfect conditions for malaria-carrying mosquitoes to breed. The swarms of mosquitoes that resulted from this flooding caused the worst outbreak of malaria in Pakistan since 1973.[8]

3. Climate change is causing a loss of biodiversity. The loss of biodiversity because of climate change (such as the extinction of animal species or disruption of an ecosystem) can have complex effects on disease dynamics. Thriving ecosystems are essential to human health and often act as a buffer, limiting the spread of pathogens by reducing interactions between humans and disease-carrying animals.9

4. Climate change impacts on healthcare service delivery and facilities. Climate change, and the increasing frequency of extreme weather events can destroy health facilities and create resource shortages (including a shortage of clean water) that make it harder for health systems to respond to emerging outbreaks. In turn, this can allow infectious diseases to spread more quickly and to have a more devastating impact. For example, more than 300 health facilities were destroyed or flooded in Malawi, Madagascar and Mozambique because of Cyclone Freddy in 2023.10 The cyclone's destruction increased public health risks, including a surge in the spread of cholera, malaria, malnutrition, COVID-19, and other vaccine-treatable diseases.11

As climate change continues to worsen, it is expected that the frequency and intensity of pandemics will increase, especially in vulnerable regions. Populations most likely to experience negative climate change effects are those in low-income and middle-income countries, including those in small island states or coastal communities, Indigenous groups, and those in precarious economic situations. Addressing the interconnected challenges of climate change and pandemic preparedness requires global collaboration.

What is the impact of water scarcity on infectious diseases?

As the earth becomes warmer, heatwaves, heavy rainfall and droughts will start to become more severe and more frequent. Scientists predict that the extremes will get worse and that the water cycle will become more and more variable. In other words, while some areas will get drier, others will get wetter.[12] Access to clean water is essential for preventing a wide range of illnesses, maintaining hygiene, and ensuring proper sanitation. Here are three ways in which water scarcity impacts on public health.

1. Increased risk of waterborne diseases. When water becomes scarce, people may start to rely on unsafe water sources, which may be contaminated with pathogens that cause waterborne illnesses. An example of this is cholera, a diarrheal waterborne disease that is closely linked to water scarcity. The cholera outbreak in Haiti, which began in October 2010, is a tragic example of how a lack of clean water and poor sanitation can lead to a widespread cholera epidemic. Cholera, which had been previously eradicated in Haiti, spread rapidly in the wake of an earthquake because of the combination of contaminated water sources (rivers and streams), lack of sanitation and inadequate access to safe drinking water for displaced populations.

2. Poor hygiene and sanitation. Access to clean water is critical for maintaining basic hygiene, such as handwashing, bathing, and cleaning food. When water is scarce, people become less likely to practice these essential hygiene measures and this can lead to the increased transmission of respiratory infections (e.g., pneumonia, influenza) and diseases that are transmitted via contact with contaminated surfaces (e.g., enteric diseases).

3. Disruption of healthcare services. Without sufficient water, healthcare facilities may struggle to keep medical equipment clean, implement proper infection control and maintain hygiene in medical facilities. All of this can exacerbate the spread of hospital-acquired infections and other communicable diseases.

What health challenges does climate change pose?

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Climate change poses numerous health challenges that affect populations worldwide, both directly and indirectly.

Climate change and human health and wellbeing: Risks and responses

| CLIMATE HAZARDS, VULNERABILITY AND EXPOSURE		IMPACT AND RISKS	SOLUTIONS SPACE AND CLIMATE RESILIENT DEVELOPMENT PATHWAYS	
Vulnerability and upstream determinants of health outcomes	Exposure pathway	Example health outcomes	Health System Solution Space	Climate Resilient Development Pathways
Environmental factors Air pollution Biodiversity loss Deforestation Desertification Land degradation Land-use change Water pollution	Social factors	Physical and mental health risks, displacement, forced migration, other context-specific risks	Environmentally sustainable and resilient technologies and infrastructure	Fully implementing climate-resilient health systems Achieving universal healthcare coverage Achieving net zero Greenhouse Gas Emissions from healthcare systems and services Achieving the Sustainable Development Goals Adopting mitigation policies and technologies with significant health co-benefits
	Vector distribution and ecology	Chikungunya, dengue, hantavirus, Lyme disease, malaria, Rift Valley, West Nile, Zika	Health information systems (includes integrated risk monitoring and early warning and response systems, vulnerability, capacity, and adaptation assessments, health component of national adaptation plans, health and climate research)	
Socioeconomic factors Growing inequity Demographic change Economic growth Migration and (im)mobility Urbanization Science and tech investment	Nutrient dense diets and food safety	Malnutrition, salmonella, foodborne diseases	Service delivery (includes climate-smart health programs, management of environmental determinants of health, disaster risk reduction)	
	Water quality and quantity	Diarrheal diseases, campylobacteria infections, cholera, cryptosporidiosis, algal blooms	Collaborations with other sectors, agencies, and civil society	
	Air quality	Exacerbated respiratory diseases, allergies, cardiovascular disease	Leadership and governance Coherent policies and strategies Sufficient health workforce	
Susceptibility Political commitment Social infrastructure Socioeconomic conditions Population health status Individual factors	Heat stress	Heat-related illness and death, adverse pregnancy outcomes, lost worker productivity	Health authorities Strenghtening health delivery and system resilience Leveraging climate change specific funding streams	
	Extreme weather events	Injuries, fatalities, mental health effects		

Multiple socio-economic and environmental factors interact with climate risks to shape human health and wellbeing.
Achieving climate resilient development requires leveraging opportunities in the solution space within health systems and across other sectors.

Uganda's Health National Adaptation Plan

In August 2024, the Ugandan Ministry of Health collaboratively developed a Health-National Adaptation Plan (H-NAP) to guide climate change adaption by the health sector. The H-NAP is intended to address the significant threats that climate change poses to public health in Uganda and to enhance the resilience of the Ugandan health sector against climate related impacts.

The H-NAP outlines strategic interventions that are aligned with the World Health Organisations' framework. The H-NAP proposes short term and long terms interventions across the ten components of the WHO's framework for building climate-resilient health systems, including establishing climate-smart governance structures, enhancing health workforce training, integrating climate information into health programmes and promoting innovative partnerships for resource mobilization.

Ultimately, the H-NAP aims to build a climate resilient health system in Uganda by addressing the multifaceted impacts of climate change on health. The plan acknowledges that its success lies in strong collaboration among governments ministries, health agencies, civil society organisations and the private sector.

How can we build the resilience of health systems to combat climate related impacts?

The WHO defines health system resilience as "the ability of all actors and functions related to health to collectively mitigate, prepare, respond and recover from disruptive events with public health implications, while maintaining the provision of essential functions and services and using experiences to adapt and transform the system for improvement."[14]

Climate resilience can be built in two main ways:

i. **reducing climate-related health risks.** We need to ensure that our health systems can respond to and be protected from the health impacts from climate change. This includes preparing for and responding to current and future hazards, exposures, and vulnerabilities.

ii. developing specific health system capacities (such as the capacity to recognize, monitor, anticipate, communicate, and prepare for changing climate-related health risks) and integrating climate perspectives into health policy and operations.[15]

Climate resilient health systems are health systems which are capable of anticipating, responding to, coping with, recovering from, and adapting to climate-related shocks and stress, to bring about sustained improvements in population health, despite an unstable climate. To read more on the importance of climate resilient health systems, and steps countries can take to ensure that their national systems are climate resilient, see the WHO's Operational framework for building climate resilient and low carbon health systems.[16]

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Cameroon

In Cameroon, the Mbororo pastoralists have for years made use of a wide array of practices and traditional knowledge systems to predict environmental changes. The rotational grazing system adopted by Mbororo pastoralists has helped to reduce pressure on resources and curb rangeland degradation. Increasingly, the Indigenous knowledge of the Mbororo is being used to complement conventional scientific knowledge related to climate change assessment, adaption and mitigation.
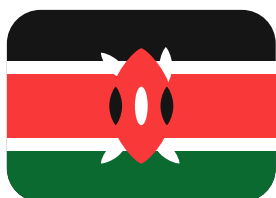
Kenya

The Ogiek People's Land and Climate Monitoring in Kenya undertook community led action in relation to the issue of deforestation, land rights violations and biodiversity loss. This involved developing a forest monitoring system to track illegal logging and climate impacts using traditional ecological knowledge alongside GIS mapping and drones to document forest destruction. The data collected from this action supported a landmark ruling by the African Court on Human and Peoples Rights affirming land right in 2017.

Nigeria

The Niger Delta in Nigeria has for decades been severely impacted by oil spills, logging, and the spread of invasive nipa palms that have destroyed mangrove forests that are key to the community's local economy. To counter this, a local environmental and gender rights organization has invited women affected by oil spills and other threats to enrol in mangrove reforestation training and the initiative has since led to the planting of millions of mangrove trees across swamps. Anecdotal evidence suggests that the reforestation initiative has resulted in many benefits, including providing marine nurseries, habitat for shellfish, fish, shrimp and crabs, as well as certain fruits and medicinal remedies.
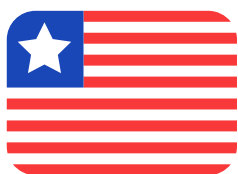
Liberia

In Liberia, the Global Centre for Adaptation, working with several community groups and NGOS, has conducted community data-collecting and profiling exercises in fifteen communities to identify key climate-related risks and hazards faced by local communities as well as locally owned plans to address these climate risks.

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Communities in Pandemic Preparedness & Response

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Sierra Leone

In March 2024, the Sierra Leone Coastal Resilience Project was launched to empower communities to plan for climate change and improve their livelihoods. This locally led adaptation project seeks to equip communities with the resources they need to adopt climate-resilient practices in farming, fishing, education, water use and ecosystem management.

Cambodia

In Cambodia, the Action for Khmer Aid Service Organization (AKAS) in collaboration with local communities and stakeholders, has implemented adaptation projects aimed at, among other things, rehabilitating irrigation canals to improve agricultural production and to drain floodwater out of the villages and rehabilitating a natural lake to improve fish resources for the community. The project not only led to better rice production but also promoted biodiversity by creating habitats that attracted various bird species back to the area.

Indonesia

In several coastal villages in Indonesia, which are severely impacted by tidal floods, Puspita Bahari is working to empower fisherwomen by developing solidarity among women in small-scale fisheries. The initiative is aimed at enhancing fisherwomen's confidence and capacity to address climate change.

Philippines

The Philippines is of the world's most vulnerable countries to climate disasters. Efforts to mitigate climate related health risks have included strategic studies on the Use of Climate Change Variables to Predict Dengue Cases. Health workers in the Philippines have also been trained on Mitigating the Health Effects of Climate Change. A key output in the health sector has been the adoption of the Administrative Order on Mainstreaming Climate Change in Health Programs by the DOH.

What is Climate Justice?

The IPCC defines climate justice as "justice that links development and human rights to achieve a human-centred approach to addressing climate change, safeguarding the rights of the most vulnerable people and sharing the burdens and benefits of climate change and its impacts equitably and fairly."

However, more than just a concept climate justice is also a movement, which recognises that climate change will not affect all people equally and demands that equity and human rights are at the core of decision making and action on climate change.

As UN Secretary-General António Guterres has said: "as is always the case, the poor and vulnerable are the first to suffer and the worst hit." It is expected that people living in low-income communities, people of colour, Indigenous people, people with disabilities, women and very old or very young people will be the most at risk of the consequences caused by climate change.

What is One Health?

Recognising that human, animal, and environmental health need to be addressed as a whole, and interdisciplinary collaboration and communication across human-animal-environmental health is required, the One Health approach has gained prominence. One Health is an integrated, unifying approach that balances and optimizes the health of people, animals and the environment. One Health is particularly important to prevent, predict, detect, and respond to global health threats such as pandemics.

To read more about One Health, see One Health Cases in the CABI Digital Library. This is a curated collection of practical, educational case studies demonstrating One Health in practice. The case studies stress the interconnections between humans, animals, plants, ecosystems, and their shared environment in a truly transdisciplinary way.

The Coordinating Office for Control of Trypanosomiasis in Uganda (COCTU): A One Health Best Practice Case
Human African Trypanosomiasis (HAT), the human form of sleeping sickness, dates as far back as the 20th century in Uganda. Control and prevention of the disease were not within reach until the country adopted an integrated approach that saw collaboration among a range of stakeholders. These efforts were coordinated by the Coordinating Office for Control of Trypanosomiasis in Uganda (COCTU). Using an integrated One Health approach that emphasised the balance between environmental, physical and socio-political factors that affect the interactions between the vector fly, the animal and human subject, COCTU efforts resulted in HAT cases being eliminated as a human health constraint by 2020 after 100 years (1920–2020) of control efforts. The collaborative efforts between different national sectors dealing with finances, policy regulations, human and animal health with no considerations for geographical or political boundaries make this case an excellent example of a successful One Health case study.

What are the opportunities for communities, civil society and community led monitoring partners in terms of advocacy, building community literacy and awareness related to PPPR, health and climate justice?
Communities, civil society organizations (CSOs), and community-led monitoring partners have a critical role to play in advocating for climate justice and enhancing PPR. Their involvement is especially important in ensuring that marginalized and vulnerable populations, including Indigenous communities, are not left behind and that responses to climate change and health crises are equitable, inclusive, and sustainable. In the context of Indigenous communities, where people rely heavily on Indigenous knowledge, climate change resilience and knowledge of how to adapt to the changing environment will be critical for the survival of Indigenous communities that are under the threat of climate change. Equally, Indigenous knowledge is being used effectively in climate change adaptation and mitigation endeavours, such as in rural Ghana where communities have been actively involved in growing bamboo as a means to capture carbon gas emissions. Where this is the case, Indigenous knowledge should be integrated into national climate policy frameworks.

What is One Health?

Civil society and community led monitoring groups can help to raise awareness about the impacts and risks of climate change, advocate for policy changes, build local capacity, and ensure that climate action and health responses are equitable, inclusive, and effective. Importantly, they can also take the lead in collecting real-time data on climate impacts and health outcomes in their local contexts, i.e. community led monitoring and early warning systems. Community led monitoring has been shown to be effective in:

- Monitoring outbreaks and the spread of climate-related diseases (e.g., vector-borne diseases, cholera).
- Tracking climate vulnerabilities, such as food and water scarcity, air pollution, and the frequency of extreme weather events, to support early warning systems.
- Providing data that is critical for advocacy, enabling communities to show how climate change is affecting their health, livelihoods, and overall well-being, and to demand greater action from policymakers.

These local observations can complement national and international data, enabling more responsive and targeted interventions.

The CARE Climate Justice Centre, an organisation working to build resilience and tackle the causes and consequences of climate change, uses an innovative approach called Another opportunity for communities to work on health and climate justice is in Participatory Scenario Planning in its work to empower communities to become more climate resilient. CARE explains that: Participatory Scenario Planning (PSP) is an "approach that empowers communities and local governments to use seasonal forecasts to develop climate-resilient plans." In PSP workshops, local actors, including community health workers, join meteorological services to share and interpret seasonal forecasts alongside local knowledge. Together, they develop scenario-based advisories that translate forecasts into actionable information for community and health service planning. This method can be adapted to address the challenges posed by climate change on diseases like HIV, TB, and malaria. This collaborative approach ensures that communities can anticipate and respond to climate-related health challenges, such as shifts in disease transmission patterns due to changing rainfall seasons or extreme weather events.

In Kenya, where the Adaptation Learning Programme (ALP) has facilitated PSP since 2011, the approach has enabled communities to better prepare for droughts and floods, leading to improved livestock health and agricultural productivity.

Applying PSP to combat HIV, TB, and malaria could involve ensuring the storage of essential medicines in flood-prone areas and enhancing surveillance and response systems for vector-borne diseases during peak transmission periods.

Additionally, PSP can guide long-term health planning, such as establishing climate-resilient healthcare infrastructure and promoting sustainable practices that reduce disease risk. By integrating seasonal forecasts into health strategies, PSP fosters resilience and adaptability, ultimately improving health outcomes and reducing the impact of climate change on these critical diseases.

What can the global response to COVID19, particularly in relation to the engagement of communities, teach us about our response to PPR in the context of climate change?

The global response to COVID-19, particularly in relation to the engagement of communities, offers valuable lessons that can significantly shape how we approach pandemic preparedness and response (PPR) in the context of climate change. COVID-19 highlights the importance of a holistic approach to prevent, detect and respond to health threats. While COVID-19 presented unprecedented challenges, the way communities and civil society responded—both positively and with limitations—can inform more effective, equitable, and sustainable PPR strategies in a world increasingly shaped by climate-related risks. Here are some of the key lessons from COVID-19 for PPR in the context of climate change:

Lesson Learned	Notes	Going Forward
Community Engagement is Crucial for Effective Response	During the pandemic, community engagement varied greatly across regions. In some places, local leaders, community organizations, and grassroots networks played pivotal roles in educating the public, distributing protective equipment, and helping to implement health protocols. For instance, community health workers (CHWs) were instrumental in reaching remote and underserved populations with information and services, especially in places where the healthcare system was overwhelmed. Climate change impacts, such as extreme weather events, floods, and heatwaves, can disproportionately affect vulnerable populations. Just as we saw with COVID-19, community engagement is essential for effective climate adaptation and resilience-building. Local communities must be involved in disaster preparedness, climate adaptation planning, and health system strengthening. Slum Dwellers International (SDI) is working to ensure that climate interventions include organised urban poor communities – particularly women and youth – as lead designers, planners, and implementers of climate solutions. This advocacy is underpinned by the demonstrated power of community led approaches that SDI documented during the COVID-19 pandemic. The SDI Alliance in Ghana, for example, was critical in establishing community coordinating committees, community volunteers, and community sensitisation activities which resulted in the identification and preparation of measures to decrease risks and protect vulnerable groups, including older people and those with underlying health conditions.	We need to actively involve communities in designing and implementing PPR strategies to ensure they are context-specific, culturally sensitive, and reach those most in need. Empowering local leaders and groups—especially women, youth, Indigenous peoples, and marginalized communities—can strengthen both climate resilience and pandemic preparedness.

Lesson Learned	Notes	Going Forward
Addressing Inequities in Health and Resources	COVID-19 exposed and deepened existing social, economic, and health inequalities. Marginalized communities, people with underlying health conditions, the elderly, and people living in poverty faced disproportionately high risks. Access to vaccines, testing, and even basic healthcare services was unequal, with poorer regions and countries struggling to access necessary resources. Climate change also exacerbates inequalities. The poor, people living in informal settlements, marginalized ethnic groups, and those in areas prone to climate-related disasters are often most at risk from both the direct effects of climate change (like floods or heatwaves) and indirect health impacts (such as the spread of infectious diseases).	Future PPR and climate responses must prioritize equity by ensuring that vulnerable groups are not left behind. This includes equitable access to resources, healthcare, and climate adaptation funding. Investments in health infrastructure, social protection, and disaster preparedness in underserved areas will be crucial for addressing disparities in the face of both pandemics and climate change.
International Cooperation and Global Solidarity	The pandemic underscored the importance of global cooperation, both in terms of sharing vaccines and knowledge and in coordinating responses to mitigate the economic and health impacts of the pandemic. However, we also saw failures in global solidarity, with inequitable vaccine distribution, especially in low-income countries, leading to calls for reform of international cooperation mechanisms. Climate change, like COVID-19, is a global challenge that requires international cooperation. Climate change impacts transcend borders, and the global response to climate-related health threats needs to be coordinated and just. The sharing of climate adaptation technology, funding for vulnerable regions, and equitable access to climate-resilient health systems will be critical.	To ensure a coordinated global response to both climate change and health crises, countries must commit to global solidarity. This includes increased climate financing for vulnerable regions, stronger international cooperation in research and innovation, and ensuring that climate adaptation measures and health system strengthening are equitable and inclusive.

Have you heard about the HEPR Framework?

In the three years post the COVID-19 pandemic's onset, the WHO collaborated with Member States and partners to assess global response strengths and weaknesses, and the Health Emergency Prevention, Preparedness, Response, and Resilience (HEPR) framework. After reviewing over 300 recommendations, the WHO released the HEPR strategic framework in 2023. This framework aims to strengthen national, regional, and global capacities at the intersection of health security, primary health care, and health promotion. HEPR calls for progress to be made across five intersecting subsystems (the 5 C's) of:

> (i) collaborative surveillance;
> (ii) community protection;
> (iii) safe and scalable clinical care; and
> (iv) access to medical countermeasures, and
> (v) emergency coordination.

Each of the five C's encompasses the core capacities required under the WHO's International Health Regulations and complements the One Health approach that underpins zoonotic disease prevention and a whole-of-society approach to HEPR. While the five C's are a significant first step towards building a HEPR system, work to refine the five C's is ongoing and the WHO is accelerating its work with partners to support national efforts to strengthen capacities across the five C's. [30]

The community protection subsystem of the HEPR strategic framework has three objectives. It:

> (i) recognises that delivering community protection needs an approach that strengthens community resilience, draws on local strengths and assets, centres civil society involvement and participation, and promotes co-design and co-delivery of programmes, policies, and interventions;
>
> (ii) defines key population and environmental interventions for managing the health impacts of emergency events, including those to prevent zoonotic spill over, vector control, public health and social measures, Water, Sanitation and Hygiene (WASH), and vaccination; and
>
> (iii) highlights the comprehensive, whole of-government, multisectoral and multi-partnership approach that is needed at local, national, and global levels. [31]

Annex: Additional Information

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