



COMMENTARY

STRENGTHENING HEALTH SYSTEMS FOR CLIMATE ADAPTATION AND HEALTH SECURITY: KEY CONSIDERATIONS FOR POLICY AND PROGRAMMING

Elizabeth Lugten and Neetu Hariharan

Keywords: Climate change, Health system strengthening, Climate adaptation

INTRODUCTION

HEALTH SYSTEMS are the foundation for individual- and community-level resilience. The services they provide are often regarded as a first line of defense in preventing adverse health outcomes and protecting all global citizens by serving as a critical structure that provides accessible, affordable, accountable, and reliable healthcare and public health services. The context in which healthcare and public health services are delivered and consumed must also adapt to meet immediate and future challenges. The 2021 *Lancet* Countdown report¹ described climate change as the largest global health threat of the 21st century, further underscoring that climate change is a public health emergency while also recognizing the opportunities that exist to redefine our perspectives and approaches at this critical juncture. Yet practitioners often disregard the breadth and severity of impacts that climate change can have on the performance and sustainability of a health system and its ability to ensure health security. Better integration of climate information in health system planning is essential to ensure that health systems remain resilient to adequately serve their

populations while reducing health security risks. In this editorial, we suggest policy and programming priorities for health system practitioners, which will enable them to apply a climate lens and an integrated approach to foster resilient primary healthcare and health security.

CLIMATE IMPACTS ON HEALTH SYSTEMS AFFECTING HEALTH SECURITY

The impacts of climate change and variability threaten the sustainability of health system performance and development goals through increased pressure from rising heat, extreme weather events, changes in precipitation patterns, shifts in duration and prevalence of diseases, and increased potential for the emergence of novel diseases.^{1,2} Between 2030 and 2050, climate change is expected to cause approximately 250,000 additional deaths per year from malnutrition, malaria, diarrhea, and heat stress.³ The World Bank predicts internal climate migrants may total 216 million by 2050.⁴ Intensified and frequent extreme weather events can halt or hinder access to, availability, and quality of care for patients and providers, which can result

Elizabeth Lugten, MPH, and Neetu Hariharan, MPH, are Health Systems Technical Advisors and Credence Management Solutions Contractors, Office of Health Systems, Global Health Bureau, US Agency for International Development, Washington, DC.

© Elizabeth Lugten and Neetu Hariharan, 2022; Published by Mary Ann Liebert, Inc. This Open Access article is distributed under the terms of the Creative Commons Attribution Noncommercial License (<http://creativecommons.org/licenses/by-nc/4.0/>) which permits any noncommercial use, distribution, and reproduction in any medium, provided the original author(s) and the source are credited.

in substantial resource losses (ie, financial, human, material) for health systems. Forest fires can lead to facility destruction or extended closure for cleanup.⁵ The 2020 *Lancet* Countdown report noted “an increase in the number of days people were exposed to a very high or extremely high risk of wildfire between 2001-[20]04 and 2016-[20]19 in 114 countries... Correspondingly, 67% of global cities surveyed expected climate change to seriously compromise their public health assets and infrastructure.”⁶ In extreme cases, entire populations will need to move from climate-vulnerable areas due to destruction or changes in viable livelihoods. The Internal Displacement Monitoring Centre calculated that disasters (eg, droughts, floods, cyclones, earthquakes, hurricanes) triggered over 60% (5.9 million people) of the internal displacements recorded worldwide in 2021.⁷ New or worsening mental health conditions in affected communities are impacted due to the stress of the event and recovery.

The intertwined relationships between environment, climate change and variability, human health, and health systems are further exemplified by climate-sensitive diseases. Malaria, dengue, and many foodborne and waterborne diseases are rising at an alarming rate and expanding in geographic range due to changes in seasonality, increasing temperature and precipitation, deforestation, and air pollution. Endemic infectious diseases and novel disease outbreaks will likely worsen as shifts in climate create favorable conditions for disease vectors or pathogens to proliferate, leading to a backslide in health gains.¹ Multiple climate hazards can occur simultaneously, while nonclimatic risks also interact, which compounds the overall risk for all sectors.⁸ These risks will be accompanied by increased stress on the health system due to a growing need for care related to the negative health impacts of air pollution, heat stress, and poor nutrition outcomes, especially on vulnerable populations such as pregnant women, newborns, children, those with underlying health conditions, older adults, and those who are socially excluded in low-and-middle income countries. Vulnerable populations are often at greater risk due to weaker immune systems and lack of access to affordable and high-quality care.⁹

If climate change continues to be ignored by health system practitioners, health systems globally can face enormous strains, exposing longstanding gaps in public health and further exacerbating chronic inequities. This is currently being seen during the COVID-19 pandemic, which has exposed how vulnerable health systems are. Many health systems are already stressed by a high incidence of non-communicable and infectious diseases, an inability to provide high-quality primary and specialty services, and escalating costs. The World Health Organization (WHO) surveyed 129 countries to measure the extent of COVID-19 health service disruptions and noted that over 50% of countries experienced disruptions in primary care, community-level care, and rehabilitative services and 38% experienced disruptions in emergency, critical, and operative care.¹⁰ These disruptions resulted in substantial near-term increased mortality for

COVID-19 cases and indirect health impacts (eg, backlog in care for noncommunicable disease). WHO calculated COVID-19 direct and indirect deaths and found an excess mortality of 14.91 million people between January 2020 and December 2021.¹¹ These disruptions occurred due to the lack of healthcare resources and to policies that reduced services (33% of countries) and decreased care seeking (25% of countries).¹⁰ The enduring economic impacts of the pandemic continue to undermine access to equitable and quality essential healthcare and public health services, placing further strain on human and financial resources in the health sector.¹²

A siloed approach between health systems strengthening, health security, and vertical disease programs can be seen during health system shock events such as COVID-19. Such a fragmented approach can slow response and recovery, especially at the subnational level, given the health system’s vital role in mobilizing emergency response, providing primary healthcare services, and engaging with the community.¹³ As countries work to ensure COVID-19 vaccine readiness, procurement, and distribution, while also responding to health system challenges that became transparent or worsened through the pandemic, their efforts may be less effective or even hindered by system-level constraints. These constraints include regulations that are slow to adapt, lack of integration of public health functions and primary care services at the subnational level, supply chain challenges, ineffective decisionmaking processes, administrative and management challenges in hospitals, ongoing health workforce constraints, and ineffective intramultisectoral collaboration and global coordination—all of which create opportunities for further fragmentation. Lessons learned from COVID-19 continue to highlight the importance of ensuring strong and resilient health systems by integrating health security while ensuring access to essential services. As the effects of climate change and variability become more substantial at both individual and population levels, health systems need to better integrate climate risk management to ensure that shocks and stressors are addressed to prevent losses in development and health gains.

STRENGTHENING HEALTH SYSTEMS TO TACKLE THE CLIMATE CRISIS AND ENSURE HEALTH SECURITY

The Sixth Intergovernmental Panel on Climate Change report remarked that “future human vulnerability will continue to concentrate where the capacities of local, municipal and national governments, communities and the private sector are least able to provide infrastructures and basic services.”⁸ Addressing current gaps and improving health system performance without considering the effects of climate change and variability is simply not enough to prepare a health system to tackle the effects of the climate crisis and ensure health security. Health systems should take steps to understand how climate change and variability will affect their ability to

finance, manage, and protect population and individual health; evaluate the effectiveness of their interventions and systems under diverse climatic conditions and mediated impacts; and identify opportunities to enhance institutional iterative risk management capacity across all levels.¹⁴ This requires a strategic approach and is dependent on the commitment of the health system to work across sectors, fostering multisectoral and community engagement to achieve shared objectives that enhance access to essential services and public health functions. Timely, context-specific, and crosscutting investments in health systems must leverage and improve existing capacities and institutionalize risk management capacity across public and private institutions and community structures, while exploring short- and long-term opportunities to strengthen resilience.

The US Agency for International Development (USAID) Health System Strengthening Vision 2030 “recognizes that integrated, systems-based approaches for strengthening health systems are now more critical than ever,” as demonstrated by global challenges such as COVID-19 and climate change, and asserts that “health systems are resilient when they are able to adjust resources, policy, and focus to varying degrees to respond to [longstanding and emerging] challenges.”¹⁵ USAID supports countries by strengthening their capacity to absorb, adapt to, and transform if necessary to ensure available, accessible, affordable, and reliable healthcare and public health services to the communities they serve every day, not just during times of shocks. Such resilience must be built for an effective response to ongoing health demands; acute, time-bound events; and longer-term destabilizing dynamics. USAID focuses on achieving key health system outcomes through an integrated, whole-of-society approach, with attention on local context when developing health system programs. This means engaging traditional public and private health stakeholders as well as stakeholders from sectors that impact health (eg, water, sanitation, and hygiene; agriculture; and environment), while ensuring representation from faith-based organizations, communities, and local organizations to monitor, anticipate, manage, and adapt to health risks to ensure more responsive health services and better health outcomes, especially for vulnerable populations.

PRIORITIES FOR POLICY AND PROGRAMMING

Ongoing health systems work at the country level can be strengthened to improve resilience and sustainability by adding a climate and health security lens when adapting existing or developing new activities. The 3 priorities outlined in the following sections should be considered to better develop or support flexible systems that can adapt to system stressors. Conducting climate risk and health system assessments and WHO Joint External Evaluations¹⁶ to understand the breadth and depth of health system challenges within the local country context prior to developing activities will help determine the appropriate approaches to achieve short- and long-term objectives.

Operationalize Climate and Health Plans

The 2020 *Lancet* Countdown report estimated that 50% of 101 countries surveyed developed national health and climate change strategies or plans.⁶ However, only 9% of countries with these plans have adequate financing to implement them. Levels of domestic and external financing were already insufficient to meet United Nations Sustainable Development Goals¹⁷ spending needs prior to the COVID-19 crisis and the cost of providing services are increasing. Countries are experiencing substantial reductions in financing available for the health sector due to reductions in external private finance, remittances, and domestic resources resulting from the lack of economic activity. The Organisation for Economic Co-operation and Development reported private finance inflows to developing economies were estimated to drop by US\$700 billion in 2020.¹⁸ While global climate funds exist (eg, Global Environment Facility, the Adaptation Fund, the Green Climate Fund, or donors), funding remains limited for issues related to the health sector. Climate risk management is essential across all levels of government, with national strategy linked to subnational and local coordination, implementation, and delivery. Development partners can support countries to coordinate and ensure equitable and sustainable financing strategies with a focus on mobilizing domestic resources and private capital, establish strong management and flexible processes and systems to enable quick response to climate emergencies that negatively impact health system performance, and provide support to multisectoral cooperation and coordination in climate mitigation and adaptation for health. By recognizing the health implications of national climate policies and promoting activities that maximize health benefits, countries can avoid negative health effects, and realize associated health savings as a result.

Leverage Routine Information, Climate Services, and Surveillance Data

Using information from routine data sources, climate services, and surveillance can support informed decision-making that better optimizes resources (including financial, human, and medical products and commodities) and strengthens resilience. By integrating climate services, various health information systems (eg, human resources, supply chain management, logistics) and surveillance data, health systems can better prepare for shifts in disease range and incidence. For example, access to and use of integrated health and climate data would allow health system actors to alert communities and healthcare providers of potential climate hazards such as extreme heat waves or flooding, and trigger redistribution of health workers and supplies for emergency response or provide timely and comprehensive

evidence for informed policy and decisionmaking. The *Lancet* Countdown reports noted that 86 national meteorological and hydrological services of WHO member states provided climate services to the health sector,¹ with 77% reporting being highly engaged with their corresponding health service.⁶ While the level of climate data integration and collaboration is still limited, it does underscore the opportunity for multisectoral collaboration to support an adaptation approach to climate change and health that is integrated. Greater investment in countries' routine health information systems and other relevant sources is still needed, including support to national and subnational actors to provide and effectively use quality data for decisionmaking.

Ensure Primary Healthcare and Health System Response Plans Are Context-Specific

Primary healthcare plays a key function in any health crisis response and serves as the first point of comprehensive and coordinated care, but climate-related stresses threaten key functions of primary healthcare such as facility readiness, human resources, and supply chains.¹⁹ In Indonesia, flooding has led to an increase in diarrhea, dengue fever, skin diseases, and leptospirosis. Community-led monitoring programs by the Municipal Health Office have helped in effectively responding to infectious disease outbreaks in Indonesia due to changing patterns of vectorborne and waterborne diseases by providing extra support for communities in need.²⁰ Tailored, integrated response plans to address these local challenges require input from the community, including participation of indigenous people, vulnerable communities, and marginalized populations to improve responsiveness, equity, and quality of healthcare. Community engagement provides an entry point contributing to social capital and resilience at the individual and community level. Strengthening primary healthcare and health system governance structures and increasing multisectoral coordination and collaboration with a specific focus on the local context will enable greater adaptability to address emerging challenges.

CONCLUSION

As climate change becomes more apparent while countries are still grappling with COVID-19 and its continued effects, it is clear that failing to prepare for and address strains on the health system will lead to long-term secondary impacts that make it harder for the system to recover and perform optimally. Investing in health systems strengthening is one way to mitigate the adverse effects of climate change and infectious disease threats on population and individual health. Health systems strengthening efforts should include climate and health security considerations by promoting and strengthening capacity for effective and

iterative risk management across all levels, fostering multisectoral and community engagement, and identifying short- and long-term actions and investments to increase system resilience. This involves encouraging policymakers and practitioners to identify opportunities to operationalize their climate and health plans down to the lowest levels; leverage routine information, climate services, and surveillance data to support informed decisionmaking to optimize resource use; and ensure primary healthcare and health system response plans are tailored to the local context and needs, which will allow for greater adaptability to address emerging challenges.

ACKNOWLEDGMENTS

Thank you to our colleagues, especially Martin Alilio, in the Office of Health Systems for their review and input throughout the process. Disclaimer: The views expressed in this article are those of the authors alone and do not represent the views of the United States Agency for International Development.

REFERENCES

1. Romanello M, McGushin A, Di Napoli C, et al. The 2021 report of the *Lancet* Countdown on health and climate change: code red for a healthy future. *Lancet*. 2021;398(10311):1619-1662. Published correction appears in *Lancet*. 2021;398(10317):2148.
2. Caminade C, McIntyre KM, Jones AE. Impact of recent and future climate change on vector-borne diseases. *Ann N Y Acad Sci*. 2019;1436(1):157-173.
3. World Health Organization. Climate change and health. Published October 30, 2021. Accessed July 11, 2022. <https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health>
4. Clement V, Rigaud KK, de Sherbinin A, et al. *Groundswell Part 2: Acting on Internal Climate Migration*. Washington, DC: World Bank; 2021. Accessed July 1, 2022. <https://openknowledge.worldbank.org/handle/10986/36248>
5. Chen A, Murthy V. How health systems are meeting the challenge of climate change. *Harvard Business Review*. Published September 18, 2019. Accessed July 11, 2022. <https://hbr.org/2019/09/how-health-systems-are-meeting-the-challenge-of-climate-change>
6. Watts N, Amann M, Arnell N, et al. The 2020 report of the *Lancet* Countdown on health and climate change: responding to converging crises. *Lancet*. 2021;397(10269):129-170.
7. Internal Displacement Monitoring Centre (IDMC), Norwegian Refugee Council. *GRID 2022: Children and Youth in Internal Displacement*. Geneva: IDMC; 2022. Accessed July 11, 2022. <https://www.internal-displacement.org/publications/2022-global-report-on-internal-displacement>
8. Intergovernmental Panel on Climate Change (IPCC). *Climate Change 2022: Impacts, Adaptation and Vulnerability – Summary for Policymakers*. Geneva: IPCC; 2022. Accessed July 11, 2022. https://report.ipcc.ch/ar6wg2/pdf/IPCC_AR6_WGII_SummaryForPolicymakers.pdf

9. Singh N, Singh S, Mall RK. Urban ecology and human health: implications of urban heat island, air pollution and climate change nexus. In: Verma P, Singh P, Singh R, Raghubanshi AS, eds. *Urban Ecology: Emerging Patterns and Social-Ecological Systems*. Amsterdam: Elsevier; 2020:317-334.
10. World Health Organization (WHO). *Third Round of the Global Pulse Survey on Continuity of Essential Health Services During the COVID-19 Pandemic: November–December 2021. Interim Report*. Geneva: WHO; 2022. Accessed July 11, 2022. https://www.who.int/publications/i/item/WHO-2019-nCoV-EHS_continuity-survey-2022.1
11. World Health Organization. Global excess deaths associated with COVID-19, January 2020 - December 2021. Published May 2022. Accessed July 11, 2022. <https://www.who.int/data-stories/global-excess-deaths-associated-with-covid-19-january-2020-december-2021>
12. International Monetary Fund. Fault lines widen in the global recovery. Published July 2021. Accessed July 11, 2022. <https://www.imf.org/en/Publications/WEO/Issues/2021/07/27/world-economic-outlook-update-july-2021>
13. World Health Organization (WHO). *Fostering Resilience Through Integrated Health System Strengthening: Technical Meeting Report*. Geneva: WHO; 2021. Accessed July 11, 2022. <https://www.who.int/publications/i/item/9789240033313>
14. World Health Organization. Building climate-resilient health systems. Accessed July 15, 2022. <https://www.who.int/teams/environment-climate-change-and-health/climate-change-and-health/country-support/building-climate-resilient-health-systems>
15. United States Agency for International Development (USAID). Vision for health system strengthening 2030. Updated June 10, 2022. Accessed July 11, 2022. <https://www.usaid.gov/global-health/health-systems-innovation/health-systems/Vision-HSS-2030>
16. World Health Organization (WHO). Joint External Evaluation Tool. 3rd ed. Geneva: WHO; 2022. Accessed July 15, 2022. <https://www.who.int/publications/i/item/9789240051980>
17. United Nations Department of Economic and Social Affairs. Do you know all 17 SDGs? Accessed July 15, 2022. <https://sdgs.un.org/goals>
18. Organisation for Economic Co-operation and Development (OECD). The impact of the coronavirus (COVID-19) crisis on development finance. Published June 24, 2020. Accessed July 11, 2022. <https://www.oecd.org/coronavirus/policy-responses/the-impact-of-the-coronavirus-covid-19-crisis-on-development-finance-9de00b3b/>
19. Kadandale S, Marten R, Dalglis SL, Rajan D, Hipgrave DB. Primary health care and the climate crisis. *Bull World Health Organ*. 2020;98(11):818-820.
20. Dwinantoaji H, Widyasamratri H, Karmilah M, Kanbara S. Climate change adaptation strategies in primary health care. In: Djalante R, Bisri MBF, Shaw R, eds. *Integrated Research on Disaster Risks: Contributions From the IRDR Young Scientists Programme*. Cham: Springer Nature Switzerland AG; 2021:215-230.

Address correspondence to:

Elizabeth Lugten, MPH
Health Systems Technical Advisor
USAID

901 D Street, Suite 1040
Washington, DC 20024

Email: elugten@usaid.gov