# The solution space for climate adaptation is underdeveloped or lacks implementation at scale in most areas.

#### Status of climate adaptation solutions, illustrative

Limited solutions exist
Solutions exist but not at scale
Solutions increasingly deployed at scale<sup>1</sup>

Solutions required explicitly at the climate-health nexus

#### Climate hazards and other exposure pathways

Adaptation type	Adaptation	Heat	Wildfires	Storms	Floods	Air quality	Water quality and quantity	Food security and safety	Vector distribution and ecology
Development of medical products and technology for climate-related diseases (including preventative and therapeutics)	Develop new vaccines and point-of-care testing for existing diseases						•	•	•
	Develop rapid-response procedures that can be quickly adapted to help develop vaccines and diagnostics against the next disease (eg, remote clinical trials)								
	Develop products and tools for air quality improvement (eg, biofilters)								
	Develop products and tools for water and sanitation management (eg, water filters)						•		
	Develop products for food security and safety (eg, rehydration, microbiome intervention)							•	
	Develop products and tools for vector control programs (eg, mosquito nets)								•
	Develop treatments against climate-related illnesses (eg, antimalaria drugs, oral rehydration therapy)	٠	•	•	•	•	•	•	•
	Develop solutions to treat mental health issues related to climate risks								
	Develop digital and Internet of Things solutions to prevent climate-induced health emergen- cies (eg, drones against dengue spread)								
	Develop medical products that are less vulnerable to climate hazards (eg, heat-resistant drugs)								
	Develop products and tools for heat-related illness (eg, geriatric solutions)								

<sup>1</sup>However, may not be reaching all populations (eg, those in remote or conflict areas). The solution space draws on an extensive literature review, including calls for innovations in the climate change and climate health space (for example, Grand Challenges Canada's Stars in Global Health program, Health Innovation Exchange's Climate Health Innovation Equity Fund call for applications, and PATH's Climate x Health challenge) and established literature (eg, from Inter-American Development Bank, Intergovernmental Panel on Climate Change, WHO, and World Economic Forum), as well as more than 20 calls with experts.

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## Climate hazards and other exposure pathways

Adaptation type	Adaptation	Heat	Wildfires	Storms	Floods	Air quality	Water quality and quantity	Food security and safety	Vector distributior and ecology
Climate-related information sharing and awareness	Conduct public-awareness campaigns to educate communities around climate risks and adaptation measures (eg, risk commu- nication, management of misinformation)								
	Develop guidance and standards around climate risks and adaptation measures								
	Support behavioral interventions that empower populations to address and adapt to health risks related to climate change								
Climate-related surge	Provide access to cooling stations								
and emergency capacity	Provide access to emergency shelters								
	Provide distribution centers for food and water						•	•	
	Set up field hospitals or mobile medical units that can augment existing healthcare capacity during emergencies and reach remote areas	٠	•	•	•	•	•	•	•
	Set up emergency clinical-care pathways (eg, emergency patient flows such as patient triage and isolation)	٠	•	•	•	•	•	•	•
	Enable health emergency response simulations to help develop, assess, and test functional capabilities of emergency systems, procedures, and mechanisms (eg, tabletop exercises or functional or field exercises)	٠	•	•	•	•	•	•	•
	Build comprehensive emergency management plans	٠	•	•	•	•	•	•	•
	Deploy special health emergency alert and response teams that are interoperable and rapidly deployable	٠	•	•	•	•	•	•	•

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Climate-related surge and emergency capacity (continued)	Increase number and flexibility of healthcare workforce to reallocate workers in case of emergencies	٠	•	•	•	•	•	•	•
	Leverage digital and Internet of Things solutions to respond to climate-induced health emergencies (eg, location-tracking tools)								
Climate-related	Leverage meteorological EWS	•							
surveillance and Early Warning Systems (EWS)	Leverage wildfire detection systems		•						
	Leverage storm EWS			•					
	Leverage flood EWS				•				
	Leverage air quality monitoring					•			
	Leverage on-the-ground solutions to monitor epidemiological data (eg, genomic- surveillance networks)						•	•	•
	Leverage water quality monitoring						•		
	Leverage food safety monitoring							•	
	Implement local community-driven early identification of risks and disaster forecasts (eg, community-owned early-warning systems)								
	Develop algorithms and use AI to predict health emergencies based on climate and health/social indicators (eg, social determi- nants, climate data, biodiversity)								
	Develop long-term modeling tools on climate-induced risks to health system								

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Climate-related surveillance and Early Warning Systems (EWS)	Develop data transparency and information- tracing systems (eg, track and trace)	٠	•	•	•	•	•	•	•
(continued)	Develop interoperability and communication systems across ecosystem for better information sharing (eg, standardized protocols and data exchange formats for electronic health records)	٠	•	•	•	•	•	•	•
Climate-resilient healthcare building, equipment and IT	Expand healthcare infrastructure to address climate-driven increases in healthcare demand (eg, additional unit to hospital)								
infrastructure	Relocate healthcare buildings that are built on high-risk sites								
	Increase laboratory capacity for pathogen and genomic surveillance					•	•	•	•
	Increase energy resilience of healthcare infrastructure (eg, solar roofs, generators)								
	Make healthcare infrastructure more heat resistant (eg, insulation, heat-resistant building material)								
	Increase resilience of healthcare infrastructure against extreme weather events (eg, elevate buildings)								
	Ensure ventilation to prevent airborne infections					•			
	Improve waste, water, and sanitation management of healthcare facilities (eg, clean drinking water, WASH facilities)						•	•	•
	Implement digital-health solutions such as telemedicine	٠	•	•	•	•	•	•	•

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Climate-resilient healthcare supply chains	Improve resilience of transport routes (eg, underground tunnels)								
	Increase climate resilience of supply chains for treatments (eg, battery-powered portable refrigerators)								
	Diversify supply sources to mitigate climate shocks								
	Increase data transparency and real-time information on healthcare supply chain, including digital supply networks	•	•	•	•	•	•	•	•
	Build and maintain strategic stockpiles of essential medical supplies and equipment (eg, vaccines, medical devices)	•	•	•	•	•	•	•	•
	Increase supply chain capacity during emergencies (eg, manufacturing capacities, local manufacturing)	•	•	•	•	•	•	•	•
Climate-informed healthcare workforce	Provide on-the-ground training for healthcare professionals to respond to climate-induced healthcare demand and emergencies (eg, heat stress, mental health)								
	Integrate courses on climate change and health into medical training programs								

Source: Eurostat, OECD, and WHO, "Classification of health care functions (ICHA-HC)," chapter 5 in A System of Health Accounts 2011: Revised edition, OECD Publishing, Mar 2017; Climate change: Science and solutions; Healthy planet, healthy people, Royal Society, 2021; Climate change and health: Vulnerability and adaption assessment, WHO, Oct 2021; ICD-11: International Classification of Diseases 11th revision, WHO, Feb 2022; Operational framework for building climate resilient and low carbon health systems, WHO, Nov 2023