WHO GUIDANCE FOR **CLIMATE-RESILIENT AND ENVIRONMENTALLY SUSTAINABLE** HEALTH CARE FACILITIES

Interventions listed below can be rated as follows:

	Indicates either low performance, or unavailable activity, or unable to complete.
	Indicates either medium performance, or activity in progress, or incomplete.
	Indicates either high performance, or completed activity, or achieved and tested.

*The complete **WHO guidance for climate resilient and environmentally sustainable health care facilities**, along with other intervention tables, are available in English, French and Spanish on the WHO website at who.int/publications/i/item/9789240012226.*

Infrastructure, technology and products interventions - climate resilience

Interventions on climate resilience

Adaptation of current systems and infrastructures: Building regulations implemented in the construction and retrofitting of health care facilities to ensure climate resilience and environmental sustainability.

*Infrastructure technologies and products – **climate resilience***

Interventions *(level of achievement)* **Low:** unavailable, unable **Medium:** in progress, incomplete **High:** completed, achieved	**Action level**			**Observations**
Established partnerships between the health care facility, community and local authorities to reduce climate vulnerability in the surrounding communities*	☐	☐	☐	
Assessed hazards that can put the health care facility's structural and non-structural elements in danger	☐	☐	☐	
Mapped exposure of health care facility to all types of hazards and risk of the events (such as biological, chemical, geological, hydrometeorological, technological, societal) *	☐	☐	☐	
Mapped the catchment area of the health care facility in terms of the geographical area and population for whom the health care facility would be expected to provide health care for extreme climate event emergencies and disasters*	☐	☐	☐	
Building is regularly inspected, both internally and externally, for signs of deterioration such as broken plaster, cracks or sinking structural	☐	☐	☐	

elements, and the causes determined				
Health care facility has sufficient natural ventilation with protection against disease vectors	☐	☐	☐	
Siting of new health care facilities follows assessments to avoid high-risk coastal areas, or areas that are prone to damage from hurricanes, windstorms, floods or water surges, including rising sea-levels associated with climate change*	☐	☐	☐	
Health care facilities built or retrofitted to cope with extreme weather events ensuring their resilience, safety and continuous operation*	☐	☐	☐	
Evaluated condition and safety of structural and non-structural elements of the health care facility, resulting from previous exposure to natural and other hazards*	☐	☐	☐	
New infrastructure construction considers a range of climate related risk scenarios, such as drought, flood, prolonged rainfall, storms, strong winds, heat waves and sea-level rise*	☐	☐	☐	
Construction and retrofitting of health care facilities follows expert's advice incorporating the topography, flood history and local climate*	☐	☐	☐	
Assessed health care facility structures and trees along the access routes that would impede traffic if they fell during a climate related emergency or a disaster*	☐	☐	☐	
Verified that health care facility exit and evacuation routes are clearly marked and free of obstacles to enable emergency evacuation*	☐	☐	☐	
Health care facility building is built with fire-resistant and non-toxic materials*	☐	☐	☐	
Assessed safety of the location of critical services and equipment in case of flood	☐	☐	☐	
Glass windows are laminated or otherwise protected to prevent threat from shattering during disasters	☐	☐	☐	
Glass walls, doors and windows resist basic wind speeds of 200-250 kph*	☐	☐	☐	
Windows have wind and sun protection devices and are leakproof	☐	☐	☐	
Power-operated doors can be opened manually to permit exit in the event of power failure	☐	☐	☐	
Electrical systems safely secured with backup arrangement to satisfy the facility's demand for	☐	☐	☐	

at least three days, at all times*				
Information and telecommunications systems safely secured with backup arrangement (via cloud, satellite) to satisfy the facility's demand, at all times*	☐	☐	☐	
Heating, ventilation and air conditioning systems safely secured with backup arrangement to satisfy the facility's demand for at least three days, at all times	☐	☐	☐	
Reflective white roofs on buildings installed to reduce heat impacts	☐	☐	☐	
Roofing materials completely and securely fastened, welded, riveted or cemented	☐	☐	☐	
Roof drainage system has adequate capacity and is properly maintained	☐	☐	☐	
Roof is leak-proof and insulated	☐	☐	☐	
Improved safety roofing designed to withstand wind velocity of 175-250 kph in high intensity tropical storm prone areas*	☐	☐	☐	
Water supply system has sufficient reserves, with backup arrangement, to satisfy the facility's demand for at least three days, at all times*	☐	☐	☐	
Sufficient resources allocated for mitigating and preventing climate change impacts of extreme weather events				
Equipment and supplies (furnishings, medical and laboratory equipment and supplies) safely secured in sufficient quantity and quality with backup arrangement to satisfy the facility's demand for at least three days, at all times*	☐	☐	☐	
Funding is available for newly planned improvements*	☐	☐	☐	

Promotion of new systems and technologies: Adopt new technologies and processes that can provide climate resilience, environmental sustainability and enhanced health service delivery.

*Infrastructure, technologies and products – **climate resilience***

Interventions *(level of achievement)* **Low:** unavailable, unable **Medium:** in progress, incomplete **High:** completed, achieved	**Action level**			**Observations**
National and local early warning system developed for early action to respond to extreme weather events*	☐	☐	☐	

Health care facility obtains alert information from early warning systems for extreme weather events to ensure prompt action*	☐	☐	☐	
Plans in place for operating and maintaining critical systems in emergencies and disasters	☐	☐	☐	
Climate hazard vulnerability analysis is prepared and regularly updated (including the impacts of extreme weather risks on infrastructure)*	☐	☐	☐	
Mapped the intensity and probability of extreme weather events across the health care facility (present and future)*	☐	☐	☐	
Identified and mapped the health care facility's vulnerabilities and risks to climate-related impacts, emergencies and disasters	☐	☐	☐	
Identified capacities and resources available within the health care facility to cope with any climate related emergency and disaster	☐	☐	☐	
Health workers trained to respond to new infectious diseases threats emerging from climate related events or environmentally related, including post-disaster case management and proper infection prevention and control	☐	☐	☐	
Strengthening health information systems with climate information to provide information for early health interventions*	☐	☐	☐	
Ensured that a mechanism exists for the prompt maintenance and repair of equipment required for essential services*	☐	☐	☐	
Building design responsive to assessment of local hazards*	☐	☐	☐	
Devices and equipment installed for monitoring indoor temperatures, cooling existing buildings and spaces, blocking direct sun, increasing air flow in case of extreme heat	☐	☐	☐	
Reliable and sustainable primary and backup communication systems (such as satellite phones, mobile devices, landlines, Internet connections, pagers, two-way radios, unlisted numbers) available including access to an updated contact list for emergency operation*	☐	☐	☐	
Established mechanisms to identify and incorporate new risks to food supply from climate related impacts*	☐	☐	☐	

Health care facility uses proven smart materials and applications, sensors, low power electronics and similar health care appropriate technology (such as telemedicine, remote sensing systems)*	☐	☐	☐	

Sustainability of health care facility operations: Adopt and procure low environmental impact technologies, processes and products to enhance climate resilience and environmental sustainability.

*Infrastructure, technologies and products – **climate resilience***

Interventions *(level of achievement)* **Low:** unavailable, unable **Medium:** in progress, incomplete **High:** completed, achieved	**Action level**			**Observations**
Climate related hazards (current and potential) are classified as high (indicating a high probability of hazards taking place or high-magnitude hazards, or both), medium (a high probability of moderate hazards) and low (a low probability or hazards of low magnitude)*	☐	☐	☐	
Sufficient emergency room surge capacity available to manage climate-related emergencies and disasters (such as extreme heat events)	☐	☐	☐	
Disaster risk reduction plan to protect essential services is known and understood by all staff	☐	☐	☐	
A health care facility's health emergency plan available for preparedness and response with a clear budget line	☐	☐	☐	
Actions implemented to improve work productivity and financial returns that would otherwise be lost from climate-sensitive health impacts	☐	☐	☐	
Medicines available to cover surge demand to ensure that the health care facilities can sustain the provision of essential and specialized services in an emergency or disaster*	☐	☐	☐	
Stockpiled essential supplies and pharmaceuticals in accordance with national guidelines ensuring timely use to avoid loss due to expiration*	☐	☐	☐	
Access to antibiotics, antiparasitic and antiviral drugs available for use in acute outbreaks of vector--or water-borne diseases made worse by climate change	☐	☐	☐	
Estimated the consumption of essential supplies and pharmaceuticals (such as amount used per week) using the most likely extreme weather	☐	☐	☐	

event scenarios				
Updated inventory of all equipment developed and maintained monthly, including a shortage alert and delivery mechanism	☐	☐	☐	
Emergency standard operating procedures for extreme weather events includes how and where the health care facility would be evacuated, what disaster recovery steps would be taken to restore some level of services, and how to locate family members and staff who are off duty at the time*	☐	☐	☐	
Climate related disaster plans regularly updated, and workforce regularly trained on how to implement it	☐	☐	☐	
Anticipate the impact of the most likely disaster events on the supply of water, food and energy*	☐	☐	☐	
A centralized emergency transportation system in place for shifting critically ill patients in case of emergencies or disaster*	☐	☐	☐	
Patient medical records are safely stored particularly in flood-prone areas	☐	☐	☐	
Established protocols for the health care facility's food service to respond and recover from an extreme weather event (such as emergency menus) and food-borne outbreaks (sanitation, disinfection, isolation)*	☐	☐	☐	
Secure access to essential backup food sources via multiple agreements with different vendors and through cooperative agreements with other health care facilities*	☐	☐	☐	
Food resources monitored during emergencies to ensure adequate supplies throughout the duration of the event ensuring protocols are in place to guide the rationing of limited food supplies*	☐	☐	☐	
Food service staff adopts proper sanitary food handling and storage	☐	☐	☐	
Identified space within the health care facility for the storage and stockpiling of additional supplies, taking ease of access, security, temperature, ventilation, light exposure, and humidity level into consideration	☐	☐	☐	
Safe access to critical backup supplies and resources are available (for medical equipment, laboratory and treatment supplies, personal protective equipment, technical experts, alternative energy supplies)	☐	☐	☐	

Established contingency agreements (such as memoranda of understanding, mutual aid agreements) with vendors to ensure the procurement and prompt delivery of equipment, supplies and other resources in times of shortage*	☐	☐	☐	
Verified measures taken to protect critical supplies such as emergency power, medicines and patients' records, in case of flood	☐	☐	☐	
Appropriate backup arrangements available for essential lifelines, including water, power and oxygen*	☐	☐	☐	
Generator's housing or powerhouse protected from extreme weather events and movable if required	☐	☐	☐	
Emergency generator with capacity to meet priority health care facility demands available	☐	☐	☐	
Ensured uninterrupted cold chain for essential items requiring refrigeration*	☐	☐	☐	
Vaccine refrigerators with adequate holdover times available to keep vaccines cool during prolonged periods of power outages	☐	☐	☐	
Adequate supplies for safe water available (such as chlorine, filters or other water treatment technology, rapid water testing kit, water quality monitoring record sheets)	☐	☐	☐	
Identified alternative water sources to keep health care facility operational at all times (such as deep well, local water utility, mobile water storage tank)*	☐	☐	☐	
Mechanisms in place to notify health care facility staff, patients and visitors of air pollution advisories and warnings*	☐	☐	☐	

* Actions that need the support of local or national governments, or of other sectors