

Health

Emergency and Disaster Risk Management Framework



World Health
Organization

Health Emergency and Disaster Risk Management Framework



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Organization

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FOREWORD



Emergencies and disasters take a profound toll on people's health, often well after the headlines fade.

Every year, over 170 million people will be affected by conflict, and another 190 million by disasters; yet the full impact on people's health is far greater than this. Some will be large national, regional or even global crises, from cyclones and drought to major outbreaks. Others will be more localized, like traffic collisions and fires, but can still be devastating in their collective costs to human life.

Too often these events set back development – sometimes for decades – and jeopardize universal health coverage along with other development agendas of a country. They shatter the aspirations of children and adults, and the communities they live in or call home. They can overwhelm health systems and decimate the economies that fund them.

Reducing these impacts is one of our most pressing priorities. It will be central to achieving the triple billion goals of the World Health Organization (WHO): for universal health coverage, for health security, and health for all.

This Health Emergency and Disaster Risk Management (EDRM) Framework is a substantial response to this challenge. It emphasizes the critical importance of prevention, preparedness and readiness, together with response and recovery, to save lives and

protect health. It outlines the need to work together – because EDRM is never the work of one sector or agency alone. It shows how the whole health system can and must be fundamental in all of these efforts.

The Framework also details the clear need for communities to be in the driving seat. While emergencies affect everyone, they disproportionately affect those who are the most vulnerable. The needs and rights of the poorest, as well as women, children, people with disabilities, older persons, migrants, refugees and displaced persons, and people with chronic diseases must be at the centre of our work.

WHO is fully committed to working with Member States and partners to ensure that the Framework is implemented effectively.

This document is the result of extensive consultations and inputs from Member States and partners, as well as WHO colleagues across offices and programmes around the world. I would like to thank each and every one of those who have contributed to its development.

Moreover, I encourage everyone to use this Framework: you should be able to see yourself and your role in these pages. Not all emergencies can be predicted, but they can be prepared for. Let us act together to reduce the risks they pose before, during and after emergencies, and achieve a safer, healthier world for all.

Dr Tedros Adhanom Ghebreyesus

Director-General
World Health Organization

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The Health EDRM Framework is the culmination of a process of face-to-face and virtual consultations among WHO and experts from Member States and partner organizations who have contributed to the development, review and revision of the document. It is derived from the good practices and achievements in many related fields such as humanitarian action, multisectoral disaster risk management, and all-hazards emergency preparedness and response, including for epidemics, health systems strengthening and community-centred primary health care. The Framework has drawn inspiration from World Health Assembly and regional committee resolutions, regional strategies, national policies, international and national standards and guidelines, the United Nations Sustainable Development Goals, the Sendai Framework for Disaster Risk Reduction 2015–2030, the Paris Agreement on Climate Change, guidance on implementing the International Health Regulations (2005), and activities of the WHO Thematic Platform for Health EDRM and its associated Research Network.

The extensive process of developing this document was based on the evidence gained from WHO's work

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ABBREVIATIONS

CADRI	Capacity for Disaster Reduction Initiative
EDRM	emergency and disaster risk management
GOARN	Global Outbreak Alert and Response Network
GPW	General Programme of Work (WHO)
IASC	Inter-Agency Standing Committee
IFRC	International Federation of Red Cross and Red Crescent Societies
IHR	International Health Regulations
JMP	Joint Monitoring Programme (WHO/UNICEF)
NDMA	National Disaster Management Agency
NGO	nongovernmental organization
SDGs	United Nations Sustainable Development Goals
SOP	standard operating procedure
UHC	universal health coverage
UN	United Nations
UNDP	United Nations Development Programme
UNDRR	United Nations Office for Disaster Risk Reduction
UNICEF	United Nations Children's Fund
WHE	WHO Health Emergencies Programme
WHO	World Health Organization

EXECUTIVE SUMMARY

All communities are at risk of emergencies and disasters including those associated with infectious disease outbreaks, conflicts, and natural, technological and other hazards. The health, economic, political and societal consequences of these events can be devastating. Climate change, unplanned urbanization, population growth and displacement, antimicrobial resistance and state fragility are contributing to the increasing frequency, severity and impacts of many types of hazardous events that may lead to emergencies and disasters without effective risk management.

Reducing the health risks and consequences of emergencies is vital to local, national and global health security and to build the resilience of communities, countries and health systems. Sound risk management is essential to safeguard development and implementation of the Sustainable Development Goals (SDGs), including the pathway to universal health coverage (UHC), the Sendai Framework for Disaster Risk Reduction 2015–2030 (Sendai Framework), International Health Regulations (IHR) (2005), Paris Agreement on Climate Change (Paris Agreement) and other related global, regional and national frameworks.

While countries have strengthened capacities to reduce the health risks and consequences of emergencies and disasters through the implementation of multi-hazard disaster risk management, the IHR (2005), and health system strengthening, many communities remain highly vulnerable to a wide range of hazardous events. Fragmented approaches to different types of hazards, including over-emphasis on reacting to, instead of preventing events and preparing properly to be ready for response, and gaps in coordination across the entire health system, and between health and other sectors, have hindered the ability of communities and countries to achieve optimal development outcomes including for public health.

Large-scale events due to natural and technological hazards in the Caribbean, Japan, Mozambique and Nepal, disease outbreaks in the Democratic Republic of the Congo, Republic of Korea and Saudi Arabia, and protracted crises in many countries have highlighted that no country is immune from emergencies and disasters. While these events may have the greatest impact, the cumulative effect of smaller-scale events also has a significant impact on communities worldwide. All of these events demonstrate the public health imperative to scale up risk-informed actions to reduce hazards, exposures and vulnerabilities, and build capacities to protect public health from emergencies and disasters.

In order to address current and emerging risks to public health and the need for effective utilization and management of resources, the conceptual frame or paradigm of “health emergency and disaster risk management” (Health EDRM) has been developed to consolidate contemporary approaches and practice.

The Health EDRM Framework provides a common language and a comprehensive approach that can be adapted and applied by all actors in health and other sectors who are working to reduce health risks and consequences of emergencies and disasters. The Framework also focuses on improving health outcomes and well-being for communities at risk in different contexts, including in fragile, low- and high-resource settings.

Health EDRM emphasizes assessing, communicating and reducing risks across the continuum of prevention, preparedness, readiness, response and recovery, and building the resilience of communities, countries and health systems. Drawing on the expertise and field experience of many experts who contributed to the development of this Framework, Health EDRM is

derived from the disciplines of risk management, emergency management, epidemic preparedness and response, and health systems strengthening. It is fully consistent with and helps to align policies and actions for health security, disaster risk reduction, humanitarian action, climate change and sustainable development. Effective implementation of Health EDRM is therefore critical to achieve UHC in all country contexts.

The **vision** of Health EDRM is the “highest possible standard of health and well-being for all people who are at risk of emergencies, and stronger community and country resilience, health security, universal health coverage and sustainable development”. The **expected outcome** of Health EDRM is that “countries and communities have stronger capacities and systems across health and other sectors resulting in the reduction of the health risks and consequences associated with all types of emergencies and disasters”.

Health EDRM is founded on the following set of core principles and approaches that guide policy and practice:

- ▼ risk-based approach;
- ▼ comprehensive emergency management (across prevention, preparedness, readiness, response and recovery);
- ▼ all-hazards approach;
- ▼ inclusive, people- and community-centred approach;
- ▼ multisectoral and multidisciplinary collaboration;
- ▼ whole-of-health system-based;
- ▼ ethical considerations.

Health EDRM comprises a set of functions and components that are drawn from multisectoral emergency and disaster management, capacities for implementing the IHR (2005), health system building blocks, and good practices from regions, countries and communities. The Framework focuses mainly on the health sector, noting the need for collaboration with many other sectors that make substantial contributions to reducing health risks and consequences.

Health EDRM functions are organized under the following components.

- ▼ **POLICIES, STRATEGIES AND LEGISLATION:** Defines the structures, roles and responsibilities of governments and other actors for Health EDRM; includes strategies for strengthening Health EDRM capacities.
- ▼ **PLANNING AND COORDINATION:** Emphasizes effective coordination mechanisms for planning and operations for Health EDRM.
- ▼ **HUMAN RESOURCES:** Includes planning for staffing, education and training across the spectrum of Health EDRM capacities at all levels, and the occupational health and safety of personnel.
- ▼ **FINANCIAL RESOURCES:** Supports implementation of Health EDRM activities, capacity development and contingency funding for emergency response and recovery.
- ▼ **INFORMATION AND KNOWLEDGE MANAGEMENT:** Includes risk assessment, surveillance, early warning, information management, technical guidance and research.
- ▼ **RISK COMMUNICATIONS:** Recognizes that communicating effectively is critical for health and other sectors, government authorities, the media, and the general public.
- ▼ **HEALTH INFRASTRUCTURE AND LOGISTICS:** Focuses on safe, sustainable, secure and prepared health facilities, critical infrastructure (e.g. water, power), and logistics and supply systems to support Health EDRM.
- ▼ **HEALTH AND RELATED SERVICES:** Recognizes the wide range of health-care services and related measures for Health EDRM.

- ▼ **COMMUNITY CAPACITIES FOR HEALTH EDRM:** Focuses on strengthening local health workforce capacities and inclusive community-centred planning and action.
- ▼ **MONITORING AND EVALUATION:** Includes processes to monitor progress towards meeting Health EDRM objectives, including monitoring risks and capacities and evaluating the implementation of strategies, related programmes and activities.

The success of Health EDRM relies on joint planning and action by ministries of health and other government ministries, the national disaster management agency, the private sector, communities and community-based organizations, assisted by the international community. At the core of effective Health EDRM are efforts to strengthen a country's health system with a strong emphasis on community participation and action to build resilience and establish the foundation for effective prevention, preparedness, response and recovery from all types of hazardous events including emergencies and disasters.

All countries require multidisciplinary and multisectoral policies, strategies and related programmes to reduce health risks of emergencies and disasters and their associated consequences. The design of Health EDRM strategies requires a systemic approach that takes account of the risks, capacities and the availability of resources to implement risk management measures at local, subnational and national levels. Strategic health emergency risk assessments, assessments of capacity across Health EDRM components and functions, and reviews of existing plans and past experience can assist the development of comprehensive strategies and identification of priorities for action.

The Framework proposes the following areas for action that could be considered by the health sector as the foundation of a comprehensive strategy: surveillance, early warning and alert systems; emergency preparedness for response across all hazards, the health system and all sectors, including operational readiness and mass casualty management systems; and resilient hospitals and health facilities that are safe, secure and sustainable, and that can continue to function in emergency or disaster situations. Strong advocacy and participation by the health sector in international and national forums, including through the National Disaster Management Agency (NDMA), is needed to ensure that the health of the populations remains central to multisectoral policy, planning, and resource allocation dialogues, and in operational coordination at local, subnational and national levels.

WHO is committed to working with Member States and partners to support implementation of the IHR (2005), the Sendai Framework, the SDGs and the Paris Agreement. Effective management of the risks of emergencies and disasters by all stakeholders will make a substantial contribution to strengthen community and country resilience, health security, UHC and sustainable development. It will also enable all communities at risk of emergencies and disasters to attain the highest possible standard of health and well-being. Implementation of the Health EDRM Framework provides a solid foundation for all stakeholders to work together and achieve these objectives.

1 INTRODUCTION

People across the world are faced with a wide and diverse range of risks associated with health emergencies and disasters. These comprise infectious disease outbreaks, natural hazards, conflicts, unsafe food and water, chemical and radiation incidents, building collapses, transport incidents, lack of water and power supply, air pollution, antimicrobial resistance, the effects of climate change, and other sources of risk (Annex 1). Small-scale hazardous events with limited health consequences occur on a regular basis, while other events may lead to emergencies or disasters with significant consequences for public health, well-being and for health development. The health, economic, political and societal consequences of these events can be devastating, both in the acute phase and in the longer term. Developments such as climate change, unplanned urbanization, population growth, migration and state fragility are increasing the frequency, severity and impacts of many types of emergencies throughout the world.

The management of these risks is vital to protect people's health from emergencies and disasters, to ensure local, national and global health security, to attain UHC and to build the resilience of communities, countries and health systems. Sound risk management is essential to safeguard development and the implementation of local, national, regional (7, 6) and global strategies in health and other sectors. This is particularly important for implementing the SDGs, including the pathway to UHC and target 3d to "strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks" (7); the Sendai Framework (8); IHR (2005) (9);¹ and the Paris Agreement (10).

Health systems at all levels have a central role in managing the risks and reducing the consequences of both routine and emergency situations due to all

types of hazards. While its leadership in managing infectious risks and responding to outbreaks is clear, the health sector also has a critical role in preventing and minimizing the health consequences of emergencies due to natural, technological and societal hazards. It can only fulfil these responsibilities in close collaboration with at-risk communities and other sectors.

"Universal health coverage and health security are two sides of the same coin."

**Dr Tedros Adhanom Ghebreyesus,
Director-General, WHO,
17 May 2018**

The aim of this document is to provide ministries of health and other stakeholders with a summary of policy considerations to reduce the risks and consequences of emergencies and disasters, and build the resilience of health systems, communities and countries. The Health EDRM Framework provides an overview of risk management concepts, guiding principles, the components and functions of effective Health EDRM, and guidance on implementing the Framework. This document does not replace existing regional or global frameworks or strategies, including the IHR (2005). Rather, it builds on these to incorporate multiple hazards and to embrace a comprehensive approach to risk management. Policy guidance also aims to assist countries to take joint action and promote coherence in implementing the IHR (2005), the Sendai Framework, the Paris Agreement, the SDGs and other related national, regional and global strategies and frameworks.

¹The IHR (2005) is legally binding and provides an international mechanism for the effective management of biological, chemical and radiological events, especially those that have the potential to cross international borders.

2

CONTEXT: THE HEALTH CONSEQUENCES OF EMERGENCIES AND DISASTERS

Globally, the commonest hazardous events are transportation crashes, floods, cyclones/ windstorms, outbreaks, industrial accidents, and earthquakes (11). Approximately 190 million people are directly affected annually by emergencies due to natural and technological hazards, with over 77 000 deaths (11). A further 172 million are affected by conflict (12). From 2012 to 2017, WHO recorded more than 1200 outbreaks in 168 countries, including those due to new or re-emerging infectious diseases. In 2018, a further 352 infectious disease events, including Middle East respiratory syndrome coronavirus (MERS-CoV) and Ebola virus disease (EVD), were tracked by WHO (13).

In addition to increasing morbidity, mortality and disability, emergencies may result in severe disruptions of the health system. They interfere with health service delivery through damage and destruction of health facilities, interruption of health programmes, loss of health staff, and overburdening of clinical services. A single emergency can set back development gains in public health and other sectors by decades.

The financial costs of emergencies are also staggering. Emergencies caused by natural and technological hazards cost an average US\$ 300 billion annually (14), while the cost of armed conflicts can run into trillions. The expected annual losses from pandemic risk through its effects on productivity, trade and travel have been calculated at about US\$ 500 billion or 6% of global income per year (15). It is estimated that premature deaths associated with air pollution caused about US\$ 225 billion in lost labour income to the global economy in 2013 (16).

Most countries are likely to experience a large-scale emergency approximately every five years (17), and many are prone to the seasonal return of hazards such as monsoonal floods, cyclones and disease outbreaks. Although most international attention focuses on high-consequence disasters, hundreds of smaller-scale emergencies and other hazardous events occur locally each year, such as outbreaks, floods, fires, and transportation crashes. Cumulatively, these account for a high number of deaths, injuries, illnesses and disabilities.

3 HEALTH EDRM: AN INTEGRATED APPROACH TO MANAGE HEALTH RISKS AND BUILD RESILIENCE

Strengthening health systems, implementing the IHR (2005), and developing multi-hazard disaster risk management strategies – together with increased attention to climate change adaptation – are good examples of progress made to improve management of the health risks associated with hazardous events. Nevertheless, many communities, subpopulations and countries remain highly vulnerable to emergencies and disasters. The ability to achieve optimal health outcomes related to emergencies has been hindered by fragmented approaches to different types of hazards; over-emphasis on reacting to, rather than preventing and preparing for events; and by gaps in coordination across the entire health system, and between health and other sectors.

In view of current and emerging risks to public health and the need for more effective coordination, utilization and management of resources, there is a need to consolidate contemporary approaches and practice through the conceptual framework or paradigm of “health emergency and disaster risk management”.

“Prevention and preparedness is the heart of public health. Risk management is our bread and butter.”

Dr Margaret Chan,
WHO Director-General,
30 October 2012

3.1 KEY CONCEPTS AND CHARACTERISTICS OF HEALTH EDRM

Policies and programmes to minimize the health risks and consequences of emergencies and disasters should be based on a risk management approach. Health EDRM is a continuum of measures in which the emphasis is placed on managing the risks of the potential emergency or disaster, and not solely responding to the event or crisis, and on building the resilience of communities and countries.

- ▼ *Risk is defined as “The combination of the probability of an event and its negative consequences” (18). More specifically, emergency or disaster risk is defined as “[T]he potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability and capacity” (19). Hazard-related risks can never be completely eliminated, but they can – and should – be managed. When EDRM activities are designed specifically to reduce the probability of events and to minimize health consequences, the term “health emergency and disaster risk management” can be used.*

Comprehensive Health EDRM addresses a wide scope of natural, biological, technological and societal hazards: a range of risk management measures are employed (e.g. primary prevention and recovery in addition to emer-

prevention and recovery in addition to emergency preparedness and response) with the broad engagement of the health system and multiple sectors, and a strong community focus.

- ▼ *Progress has been made by countries to reduce the health and other consequences of emergencies. The most successful and cost-effective strategies often employ a comprehensive risk management approach that aims to prevent, mitigate, prepare for, respond to, and recover from emergencies. This overall approach should be applied in all emergency circumstances regardless of the cause, while incorporating specificities relevant for each hazard (e.g. biological, geological, chemical, hydrometeorological, societal). Countries have also used after-action reviews and recovery from emergencies and disasters to catalyse policy change, strengthen the health systems at all levels of care, and build capacities in ways to reduce the risk of future emergencies, applying the Build Back Better principle.*

Health EDRM is derived from a range of disciplines, principally risk management, emergency and disaster management, epidemic preparedness and response, and health systems strengthening. Health EDRM serves as a bridge between the multisectoral EDRM community and the health community. It aims to provide a common language and an adaptable approach that can be applied by all those in the health and other sectors who are working to improve health outcomes and well-being for communities at risk of emergencies and disasters.

- ▼ *In order to minimize health consequences and improve health, well-being and societal outcomes, concerted efforts from many systems and sectors are required to prevent and mitigate risks, prepare for emergencies, ensure effective response and recovery, and*

collectively contribute to the resilience of communities and countries. Health EDRM builds on past achievements and the trends evident in public health and emergency risk management practices worldwide. It is fully consistent with, and helps to align policies and action for health security, disaster risk reduction, humanitarian reform, climate change and sustainable development agendas.

- ▼ *Health EDRM reinforces implementation of the IHR (2005) – an essential building block for the development of national Health EDRM capacities – and other relevant international and regional agreements and initiatives such as the SDGs (with a focus on target 3d), the Sendai Framework, and the Paris Agreement. To be most effective, these agreements should not be applied in isolation but considered as interrelated and mutually reinforcing.*

Health EDRM is built on the foundation of health system capacities for the management of routine or day-to-day risks.

- ▼ *Health systems play a significant role in reducing hazards, exposures and vulnerabilities, and in establishing capacities to prevent the occurrence or reduce the consequences of hazardous events that may lead to emergencies. Such capacities include primary care, disease surveillance, pre-hospital care, mass casualty management, chemical and radiological safety, mental health, and risk communication. Health systems should also ensure that they have additional capacities in place to manage non-routine or emergency-related risks, e.g. event-based surveillance, specialized emergency health teams, standards for infrastructure in high-risk areas, emergency response plans, and simulation exercises.*

As such, Health EDRM recognizes the roles, responsibilities and contributions of all health system actors, the critical role of primary health care, and the delivery of primary, secondary and tertiary care, in effectively reducing the health risks and consequences of emergencies and disasters.

- Large-scale emergencies, such as prolonged conflicts, often have significant health consequences and pose challenges to the delivery of even the most basic of health services. Health systems must therefore adapt and prioritize services, including assistance from national and international actors, to address the health needs of affected populations and respective subpopulations. This assistance is most likely required in fragile, conflict-affected and vulnerable settings. Health systems will also be required to plan and implement strategies to support, strengthen and restore local capacities during protracted crises and in post-disaster or post-conflict periods.

In summary, Health EDRM is a significant step forward in the transformation of the prevailing policy, practice and culture to promote and protect health, keep the world safe and serve people with vulnerabilities so that “no one is left behind”. The essence of the change in approach is summarized in Table 1.

Table 1: Summary of change in approach through Health EDRM

FROM	▶	TO
Event-based	➔	Risk-based
Reactive	➔	Proactive
Single-hazard	➔	All-hazard
Hazard-focus	➔	Vulnerability and capacity focus
Single agency	➔	Whole-of-society
Separate responsibility	➔	Shared responsibility of health systems
Response-focus	➔	Risk management
Planning for communities	➔	Planning with communities

4 HEALTH EDRM: VISION, EXPECTED OUTCOME AND GUIDING PRINCIPLES

4.1 VISION AND EXPECTED OUTCOME

The conceptual basis of Health EDRM comprises the vision, expected outcome, guiding principles and approaches, components and functions. The **vision** of Health EDRM is “the highest possible standard of health and well-being for all people at risk of emergencies, and stronger community and country resilience, health security, universal health coverage and sustainable development”. The **expected outcome** is that “countries and communities have stronger capacities and systems across health and other sectors resulting in the reduction of the health risks and consequences associated with all types of emergencies and disasters”.

4.2 GUIDING PRINCIPLES

Effective Health EDRM policies, strategies, related programmes and practice are guided by the following core principles and approaches.

Risk-based approach: The risks that emergencies pose to communities are directly related to the communities' exposure to hazards, their vulnerabilities to those hazards, and their risk management capacity both before, during and after events. Countries and communities can therefore most effectively minimize the health and other consequences of emergencies by preventing or mitigating hazards, reducing exposure to those hazards, minimizing their vulnerabilities, and/or strengthening their capacities.

Comprehensive emergency management:

The comprehensive approach refers to a series of closely interrelated prevention/mitigation, emergency preparedness (including operational readiness), response, and recovery measures. It is based on the premise that prevention and mitigation measures can reduce the likelihood and severity of emergencies; that sound preparedness will lead to more timely and effective response; that coordinated response will result in appropriate targeting of health services to the needs of those affected with a focus on the most vulnerable; and that recovery and reconstruction should be designed to reduce the risks of future emergencies (Build Back Better approach, including strengthening of health systems).

All-hazards approach: Different types of hazards are associated with similar risks to health, and many EDRM functions are similar across hazards (e.g. planning, logistics, risk communications). It is neither efficient nor cost-effective to develop separate, stand-alone capacities or response mechanisms for each individual hazard. Health EDRM policies, strategies and related programmes should therefore be designed to address common issues with common capacities, supplemented by risk-specific capacities.

Inclusive, people- and community-centred approach: Community members are central to effective Health EDRM, as it is their health,

livelihoods and assets that are at risk of any hazardous event including emergencies and disasters. They are often well placed to manage their own risks through actions that provide protection to themselves, their families and communities; and are often the first responders to an emergency. Health EDRM employs an inclusive approach based on accessible and non-discriminatory participation. It addresses the needs and capacities of people at greatest risk and disproportionately affected by emergencies and disasters, especially the poorest, as well as women, children, people with disabilities, older persons, migrants, refugees and displaced persons, people with chronic diseases, and other subpopulations with higher levels of risks. All Health EDRM policies and practices should integrate gender, age, disability and cultural perspectives, in which the leadership of women, youth and other at-risk groups should be promoted.

The resilience of communities can be strengthened by assisting them to identify relevant hazards and vulnerabilities, and by building their capacities to mitigate, prepare for, respond to, and recover from emergencies. Building on the “whole-of-society” concept, effective Health EDRM can only be achieved through the active participation of local governments, civil society and volunteer organizations, the private sector, and individual citizens.

Health emergency and disaster risk management is everybody's business.

Multisectoral and multidisciplinary collaboration:

Effective management of the risks that emergencies pose to health requires strong, ongoing intersectoral collaboration. The One Health approach, for example, is based on collaboration, communication, and coordination across public health, animal health and other relevant sectors and disciplines to address a health threat at the human–animal–environment interface with the goal of achieving optimal health outcomes for both people and animals. While the health sector takes a leading technical role in managing the risk of infectious diseases, for most types of hazards and events other sectors will play lead technical roles (e.g. agriculture for food insecurity, meteorological services for early warning of cyclones, civil protection for emergency response to floods). Many EDRM activities required to protect health are also managed by other sectors, e.g. maintenance of critical infrastructure, water and sanitation for human needs and functioning of health facilities, transportation, logistics, emergency services, and food security.

The health sector needs to have strong relationships with the many actors who have a role to play in managing risks of emergencies to health. These include urban planners, civil engineers, operators of hazardous facilities, climate information providers, animal health professionals, the media and emergency services. Effective coordination among many disciplines in the health community is also required, such as emergency medicine, disease surveillance, mental health, nutrition, water and sanitation, health information management and many more.

Whole-of-health system-based: Many general health system strengthening measures are among the most effective for Health EDRM. High baseline coverage rates for essential health services, e.g. through implementation of UHC policies, will improve overall health status, contribute to the prevention of outbreaks, and mitigate the health consequences of emergencies. Improved baseline health and nutritional status is one of the most important contributing factors to community resilience. Integration of Health EDRM principles and practices in national, subnational and local health policies, plans, programmes and services relevant to Health EDRM components and functions (Annex 2) is vital to reduce the health risks and consequences of emergencies and disasters.

Ethical considerations: Multiple sources of ethical challenges arise throughout Health EDRM. Decisions about priorities in reducing risks or responding to disasters include upholding health as a human right (20),¹ ethical aspects, as well as pragmatic, economic, political and other considerations. Standards of ethics and international health law are relevant in Health EDRM, driven by principles such as respect for persons, justice, solidarity and cultural sensitivity (21). These principles enable ethical action with respect to Health EDRM policy, practice, communications, evaluation and research, and promote trust in interactions with affected communities.

Governments, intergovernmental and nongovernmental organizations (NGOs) should take account of the diverse needs of populations, especially those with higher levels of vulnerability who should be included in participatory approaches to planning, design and delivery of services that affect them. People should have ready access to accurate, up-to-date and easily understood information about risks of emergencies, and appropriate local and individual actions. The best available scientific and socioeconomic evidence, analyses and disaggregated data should be used to inform planning, implementation and evaluation of the effectiveness and impact of policies and action, especially with respect to disadvantaged groups, so that corrective adjustments can be made in a timely manner.

¹The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition. Constitution of the World Health Organization (20).

5 COMPONENTS AND FUNCTIONS OF HEALTH EDRM

Health EDRM encompasses a wide range of functions and components in health and other sectors that enable countries to manage the health risks of emergencies and disasters. These functions form systems to manage risks collectively at all levels, which underscores the need for effective coordination for successful Health EDRM.

The Health EDRM functions are grouped into the following components, derived from a number of sources including adaptation of the health system building blocks, multisectoral emergency and disaster management, and the IHR (2005) including epidemic preparedness and response. Further details on the suggested list of components and functions can be found in Annex 2.

5.1 POLICIES, STRATEGIES AND LEGISLATION

Health EDRM considerations should be integrated into relevant policies and strategies, supported by appropriate legislation. They should be included in national health policies, strategies and plans, be aligned with national planning and budget cycles, and be mainstreamed in the broad range of national and subnational health programmes. A national policy or strategy on Health EDRM should outline the roles and responsibilities of all public, private and civil society stakeholders, across the components of all-hazards Health EDRM, and include those responsible for planning and coordination, IHR (2005), surveillance and early warning, emergency preparedness and response, recovery, safe hospitals, and health and related services. Similarly, multisectoral EDRM policies and legislation should refer to the protection of people's health and the minimization of health consequences as specific aims and outcomes

of action by all sectors. Since health issues are not often well represented in intersectoral policies and strategies, strong advocacy may be required to ensure a more central place for health in these important multisectoral policies, strategies and initiatives.

5.2 PLANNING AND COORDINATION

A range of plans are required to implement Health EDRM, including those developed to support national implementation of the IHR (2005) and the Sendai Framework. They should be informed by the findings of risk and capacity assessments, exercises and reviews, especially those conducted for national multisectoral all-hazards disaster risk management and under the IHR Monitoring and Evaluation Framework. Relevant health considerations should also be fully integrated into health and multisectoral plans, such as national action plans for health security, national disaster risk reduction plans, plans for preparedness, response and recovery, and incident management systems. There should be coherence and continuity between the plans of different levels and jurisdictions – local, subnational and national. Plans for emergency preparedness and response need to be regularly tested and reviewed. Business continuity plans will also be required by public and private institutions to ensure that vital functions and services continue throughout an emergency (22, 23).

Health EDRM coordination mechanisms and/or dedicated units should be established to ensure appropriate coordination across the health sector and with other sectors at each level. They should also have procedures to issue requests for, receive and coordinate international health partners in case of large-scale

emergencies that exceed national capacities. This includes having systems in place to receive, screen, register and task these partners, as well as anticipating, requesting and receiving donations of medicines and equipment.

5.3 HUMAN RESOURCES

Dedicated personnel to manage Health EDRM strategies and related programmes and to implement activities are required at national, sub-national and local levels. Key human resource management considerations include planning for staffing requirements (including surge capacity for emergency response), education and training for competency development, and occupational health and safety. Skilled human resources are central to the effectiveness of Health EDRM strategies and related programmes; they require specific and long-term investment in education and training across the spectrum of Health EDRM capacities in technical areas such as emergency planning, incident management, epidemiology, laboratory diagnostics, information management, risk and needs assessments, logistics, risk communication, and health service delivery.

5.4 FINANCIAL RESOURCES

Adequate financial allocations are required from governments, including the Ministry of Health, and other sources to develop capacities and implement programmes and activities. Health EDRM, including prevention and preparedness measures, has a recurrent cost which should be fully considered and funded as it is in other sectors related to the safety and security of populations. Financial mechanisms should also include contingency funding for response and recovery. National budgetary systems need to be sufficiently flexible to provide financing expeditiously in the aftermath of an emergency. For advocacy and planning purposes, it is important to document the economic impacts of past disasters on health and the health system, as well as to estimate the costs for future potential emergencies and disasters.

5.5 INFORMATION AND KNOWLEDGE MANAGEMENT

Information and knowledge management capacities will need to be strengthened to support risk/needs assessments, disease surveillance and other early warning systems, and public communications. It is important that information collection, analysis and dissemination be harmonized across relevant sectors, and mechanisms put in place to ensure that “the right information gets to the right people at the right time”. Research supports the evolution of evidence, knowledge and practice and the development of new drugs, vaccines and innovative risk management measures. Evidence-based technical guidance is required to build capacity through training programmes and health systems improvements.

5.6 RISK COMMUNICATIONS

Communicating effectively, including risk communication, is a critical function of Health EDRM, especially when relating to other sectors, government authorities, the media, and the public. Real-time access and exchange of information, advice and opinions are vital so that everyone at risk is able to make informed decisions and take action to prevent, mitigate and respond to potential emergencies. Public information activities should be coordinated among stakeholders in order to avoid conflicting information being disseminated, and be tailored to the risks and needs of diverse at-risk populations, including those with higher levels of vulnerability.

5.7 HEALTH INFRASTRUCTURE AND LOGISTICS

Making hospitals, health facilities and related infrastructure safe and secure, prepared for emergencies, and energy efficient will protect the lives of their occupants, enable effective health response and recovery, protect public and private investments, support sustainability and reduce the impact of health care on climate and the environment. Many basic services, such as water, sanitation and energy,

upon which health and health services depend, should be available and continue to function before, during and after an event occurs. Supporting logistics will include stockpiling and prepositioning of medicines and supplies, effective supply chains, and reliable transportation and telecommunications systems (24, 25).

5.8 HEALTH AND RELATED SERVICES

Public health, pre-hospital and facility-based clinical services must be well prepared to respond effectively in the event of an emergency with health consequences. They should have the capacity to scale up service delivery to meet increased health needs (e.g. through increasing bed capacity, establishing temporary facilities or mobile clinics, vaccination campaigns) and to take specific measures related to certain hazards (e.g. isolation of infectious cases). A range of health-care disciplines contribute to Health EDRM and to building resilience of communities and countries, including preventing and mitigating risk, preparedness, response and recovery. As far as possible, representatives from the various disciplines should contribute to risk and capacity assessments, planning, implementation, and monitoring and evaluation.

5.9 COMMUNITY CAPACITIES FOR HEALTH EDRM

Participation of communities in risk assessments to identify local hazards and vulnerabilities can identify actions to reduce health risks prior to an emergency occurring. Many lives can be saved in the first hours after an emergency through effective local response, before external help arrives. The local population will also play the lead role in recovery and reconstruction efforts. Community capacities and activities – including primary health care – and the roles of local health workers, civil society and the private sector are therefore central to effective Health EDRM. Civil society can

contribute to community-level surveillance, household preparedness, local stockpiling, first aid training, and emergency response. Ministries and the private sector may be responsible for managing critical infrastructure (e.g. water supply, electricity, transport, telecommunications) and contribute to civic activities. Their active engagement in activities related to all aspects of EDRM is therefore vital.

A healthy population is a resilient population; a resilient population is a healthy population.

5.10 MONITORING AND EVALUATION

Processes to monitor progress towards meeting health EDRM objectives and core capacities should be integrated into existing health sector monitoring systems. Standardized indicators to monitor risks, capacities, and programme implementation are all necessary. Sources of relevant indicators include the Sendai Framework Monitor for targets and indicators, IHR Monitoring and Evaluation Framework, WHO global survey on country capacities for Health EDRM and WHO regional monitoring and evaluation mechanisms. Ongoing monitoring can be complemented by intermittent evaluations, especially of preparedness (e.g. simulations), response and recovery activities.

6 WORKING TOGETHER TO IMPLEMENT HEALTH EDRM

Effective implementation of Health EDRM strategies and related programmes and activities is not limited to the health sector. Collaboration with all sectors is essential to collectively reduce the health risks and consequences of emergencies and disasters (26). The components and functions, described in section 5, will also enable a country to implement the Sendai Framework, the SDGs, IHR (2005),¹ the Paris Agreement, and other relevant national, regional and global frameworks.

National and subnational priorities for capacity development and operational planning for Health EDRM will depend on the respective country and community contexts with respect to the risks and events they face, the current levels of capacity and the available resources to implement and sustain Health EDRM. Therefore, a strategic and systemic approach calls for a country – or subnational or local levels – to take some key steps to analyse the context, the risks and the capacities in place, and develop and implement priorities for Health EDRM with the active participation of major stakeholders.

6.1 KEY STEPS IN DEVELOPING HEALTH EDRM STRATEGIES AND IMPLEMENTING PRIORITY ACTIONS

- ▼ Conduct a strategic health emergency risk assessment to identify and analyse the risks of hazardous events at local, subnational and national levels. Existing risk assessments should be used when available and updated on a regular basis. Strategic risk assessments that analyse national and
- ▼ local hazards, vulnerabilities and capacities are fundamental for effective Health EDRM, including planning for prevention, emergency preparedness, response and recovery. Assessments should follow standardized formats and be conducted at national, subnational and local levels, with all relevant sectors, and updated at agreed intervals. In particular, efforts should be made to use the most recent data on, for example, water and sanitation services.²
- ▼ Assess the current capacities for managing health risks associated with emergencies and disasters. These assessments may address a wide spectrum of Health EDRM components or specific components at all levels. Existing plans and capacity assessments should be reviewed and updated on a regular basis. A number of global, regional and national system-wide and capacity-specific tools are available for this purpose. Capacity assessments will identify strengths and areas for development, including priority actions, at community, subnational and country levels to manage the assessed risks.³
- ▼ Develop and implement multisectoral and health sector capacity development strategies, national action plans for health security, plans for specific components (e.g. health workforce, mental health, disease surveillance) and plans to address prevention, emergency preparedness,

¹National action plans to develop capacities to implement the IHR (2005) will further contribute to broader Health EDRM as well as to local and national multisectoral and all-hazards EDRM plans as described in the Sendai Framework.

²The WHO/UNICEF Joint Monitoring Programme (JMP) regularly reports on water and sanitation in households, schools and health-care facilities and all country data are available on the JMP website (<https://washdata.org/>).

³For example, IHR (2005) State Party Self-Assessment Annual Reporting tool (SPAR), and voluntary Joint External Evaluation (JEE); WHO Survey of Country Capacities for Health EDRM, and regional assessment and reporting tools; Sendai Framework Monitor; Capacity for Disaster Reduction Initiative (CADRI Partnership); and the Inter-Agency Standing Committee (IASC) Preparedness for Response.

response and recovery. These strategies and plans should be based on a review of existing plans, capacity assessments, risk assessments, costing of activities, mapping of resources and other forms of analysis in consultation with stakeholders. Based on available resources, priority actions should be integrated into the relevant plans. Implementation of the strategies and plans should be monitored, evaluated and regularly reported; they should also be updated in line with policy, planning and budget cycles, and any change in level and type of risk.

6.2 AREAS FOR MULTISECTORAL ACTION AS A FOUNDATION FOR HEALTH EDRM

A comprehensive strategy should comprise all components of Health EDRM as indicated above. This requires strengthening of the health workforce to manage and implement Health EDRM at all levels, making financial resources available for Health EDRM, and investing in information management and research to provide the evidence base for the efficient use of resources. In addition to efforts to strengthen health systems, especially at the primary care level, ministries of health and partners should consider the following areas for action as a foundation upon which to build a comprehensive Health EDRM strategy.

Risk assessments and capacity assessments

Strategic or baseline assessments. The design of Health EDRM strategies, related programmes and activities should be based on the findings of risk assessments and more detailed capacity assessments.

Event risk and needs assessments. When an event with potential health consequences is reported (e.g. suspected outbreak, chemical spill), an initial risk assessment will usually be required to verify its occurrence, to determine its risk to health and to identify requirements

for control measures. Following events where there is an obvious health impact from the outset (e.g. earthquakes, cyclones, outbreaks) a rapid needs assessment will be necessary to determine major health priorities, to identify ongoing hazards and threats, to assess effectiveness of the local response, and to determine the requirements for external assistance.

Surveillance, early warning and alert systems, linked to early action

Early warning of evolving or potential hazards (e.g. disease outbreaks, cyclones, droughts) is necessary for early action, including mitigation measures, operational readiness and timely response. Information from disease surveillance systems, meteorological forecasting and other early warning mechanisms plays a critical role in reducing the health and other consequences of emergencies. There are several established international early warning mechanisms to which national systems may link in order to take action to prevent, detect, prepare and respond to emergencies and disasters.¹

Emergency preparedness for response across all hazards

Evidence-based emergency preparedness (including operational readiness) measures, such as multi-hazard emergency response planning and contingency planning for specific risks, are the foundation of timely and effective response. These plans should address issues such as initial risk/needs assessments, incident/event management, communications, emergency public health measures, pre-hospital care, clinical management, and respective roles and responsibilities across sectors and agencies.

¹For example, Global Disaster Alert and Coordination System (GDACS) for earthquakes, tsunamis, floods, volcanoes, and tropical cyclones; international and regional tsunami warning systems; Famine Early Warning System (FEWS NET), global epidemic intelligence (epidemic intelligence from open sources (EIOS), Global Public Health Intelligence Network (GPHIN)); disease-specific surveillance systems (e.g. polio, measles, influenza, antimicrobial resistance) and subregional disease surveillance networks (e.g. Mekong River Basin Disease Surveillance, Middle East Consortium on Infectious Disease Surveillance).

A resourced emergency operations centre (EOC) to manage and coordinate the response to emergencies from all hazards should be established within the Ministry of Health or other appropriate health authority, with clear standard operating procedures (SOPs). Trained and equipped teams at each level of the health system (local, regional, national) should be available for rapid and scalable responses. A range of health disciplines should contribute to emergency preparedness and response, including public health, pre-hospital care, nursing, primary care, medical and surgical specialties, infectious disease management, surveillance, laboratory services, and risk communication.

Emergency preparedness and response mechanisms, such as for outbreak alert and response and mass casualty management, need to be regularly tested through exercises at each level of the health system, and evaluated after each emergency. Countries and communities should take advantage of the opportunities in post-event recovery to strengthen capacities and reduce risks of future emergencies through effective planning and sustained implementation of rehabilitation and reconstruction measures.

Resilient hospitals and health facilities

A resilient health facility is safe, secure and sustainable, and will continue to function in emergency or disaster situations. Measures to strengthen the structural, non-structural and functional integrity of health facilities are key to effective Health EDRM. As components of a community's critical infrastructure, hospitals and other health facilities must operate throughout emergencies and disasters. They must also be capable of managing the additional patient burden during the response. New facilities should ideally be built in

a manner that makes them resistant to local hazards and takes account of climate change scenarios, while existing facilities should be assessed for their safety and security, and actions taken to make them safe, secure, and better prepared for emergencies. The WHO and Pan American Health Organization Hospital Safety Index is an effective tool to assess facilities and to guide improvements in their safety, preparedness and emergency response capacities.

Health facilities should also provide a safe environment for staff and patients and should include structural and non-structural measures and procedures to protect them from acts of violence and cybersecurity attacks. Combining safety with increased ecological sustainability of health facilities will improve the reliability of power and water supplies and reduce waste of health facilities, thus reducing the overall impact of health care on climate and the environment (25).

Health sector representation within the NDMA and other platforms

Strong representation and advocacy for health in the main national and international forums is necessary to position health effectively within policy, planning, and resource allocation dialogues, and in operational coordination at local, subnational and national levels. Without such representation health priorities risk being overlooked by disaster managers from other sectors, especially during planning for natural, technological, and societal hazards, and in ensuring a whole-of-government approach to the management of biological hazards.

7 ROLES AND RESPONSIBILITIES FOR HEALTH EDRM

The development and implementation of Health EDRM requires the active participation of a wide range of sectors and stakeholders at all levels of society (Annex 3). The roles of some key stakeholders are outlined below.

7.1 WHOLE OF GOVERNMENT, WHOLE OF SOCIETY

Concerted efforts from many ministries and sectors at all levels are required to reduce the health risks and consequences of emergencies and disasters. In accordance with the Sendai Framework, national and local multisectoral and sectoral plans related to disaster risk management should recognize that improved health and well-being are key objectives and outcomes of collective action. People's health is both a source of vulnerability and a foundation of human resilience. Health is also a sector, while biological hazards, along with natural, technological and societal hazards, are critical sources of risk to communities and countries. All these aspects of Health EDRM should be central to the mechanisms for risk and capacity assessments and the development, planning, implementation, monitoring and reporting of multisectoral risk management measures.

The health sector is also dependent on other sectors to enable the health system to function effectively, and needs to build strong relationships with actors who play a role in managing health risks of emergencies at local, national and international levels. These include urban planners, civil engineers, operators of hazardous facilities, climate information providers, animal health professionals, critical infrastructure managers including energy, water and sanitation, telecommunications and transport providers, pharmaceutical companies,

the media, and emergency services. Effective coordination among these sectors is critical to effective Health EDRM.

7.2 MINISTRY OF HEALTH

The Ministry of Health at national and/or subnational level will generally have a leading role in EDRM measures related to outbreaks. The Ministry of Health also has the primary responsibility to advocate with the NDMA or equivalent authority and other sectors on the centrality of Health EDRM across all hazards – natural, technological, societal and biological. A department, unit or focal point within the Ministry of Health should be tasked with the responsibility of managing the national Health EDRM strategies and related programmes, including coordination with the NDMA, other ministries, civil society, and the private sector. This unit/focal point will generally have the responsibility to convene other departments/programmes within the Ministry (e.g. health services, communicable diseases, environmental health) and to ensure their appropriate contributions to Health EDRM, including the development of essential capacities. Based on local contexts and resources, this role could be combined with the responsibilities of the IHR National Focal Point, which would provide a good opportunity to build broader, all-hazard Health EDRM capacities. If there are separate units or focal points for the IHR and all-hazards Health EDRM, close coordination and collaboration will clearly be required.

7.3 NATIONAL DISASTER MANAGEMENT AGENCY

Many countries have an established NDMA or equivalent that oversees the management and coordination of EDRM activities for large-scale

emergencies and disasters due to most hazards. Other lead agencies may be assigned specific types of hazardous events, such as outbreaks, chemical and radiological nuclear events. The NDMA should ensure that health is fully integrated into all relevant policies and plans, that health outcomes are prioritized, and that health authorities participate actively in all related activities. They should also include health indicators in the overall monitoring of national and subnational strategies (e.g. for implementing the Sendai Framework and SDGs), related programmes and plans.

7.4 COMMUNITIES AND COMMUNITY-BASED ORGANIZATIONS

Local communities, including community members, civil society and the private sector, must be engaged as full partners in all Health EDRM-related strategies, programmes and activities. This will help to ensure that such strategies and activities are context-specific, culturally appropriate, efficient, and cost-effective. Local communities are well placed to play a central role in the identification of hazards, development of preparedness plans, detection and response to emergencies, and the implementation of recovery efforts. Community leaders and the local health workforce (e.g. family doctors, nurses, midwives, pharmacists, community health workers) can build public confidence, disseminate information, and identify people at risk. These groups can also provide community-based services to meet the needs of the vulnerable.

It is important that Health EDRM extends to a local level, including local government, and is supported by central and subnational health authorities. Multisectoral coordination mechanisms that bring together all local agencies and organizations can provide a central focus for cross-agency cooperation to reduce health risks and consequences of emergencies and disasters.

In many countries, in addition to a broad, whole-of-government approach, national and international civil society and community-based organizations will have a key role in meeting the basic needs of vulnerable populations. It is therefore critical that these organizations have capacities in place to manage the health risks of emergencies, including plans regarding how they will continue their essential services during a disaster. Local governments should involve civil society and local communities in risk assessments, planning, capacity development, and providing services and assistance to meet the basic needs of populations with high levels of vulnerability (such as food, health, shelter, water and sanitation).

7.5 WHO

WHO, through its governing bodies and senior leadership, has made better protection of people from emergencies one of the three priorities in its Thirteenth General Programme of Work (GPW) 2019–2023. Health EDRM also depends on, and contributes to, ensuring healthy lives and promoting well-being for all at all ages by achieving UHC; and promoting healthier populations with more people enjoying better health and well-being through the implementation of the SDGs.

WHO supports the development and implementation of the full range of Health EDRM actions through the WHO Health Emergencies Programme (WHE) and the involvement of all WHO offices and technical programmes that support strengthening of national health systems and building the resilience of countries and communities. WHE's mission is to help countries, and coordinate international action, to prevent, prepare for, detect, rapidly respond to, and recover from outbreaks and emergencies. WHO assists countries to build their capacity for all-hazards Health EDRM through provision of policy options, technical support, and establishment of technical guidance, norms and standards. Implementation of the SDGs, Sendai Framework, Paris Agreement,

IHR (2005) and the GPW will continue to guide WHO's actions to strengthen country capacities in managing the risks of emergencies and disasters.

In addition, WHO supports national responses to emergencies from all types of hazards, including through its role as Lead Agency of the IASC Global Health Cluster,¹ as custodian of the IHR (2005), and as the secretariat for the Global Outbreak Alert and Response Network (GOARN), the Emergency Medical Teams Initiative and UHC2030 Partnership, among others. To help inform rehabilitation and reconstruction efforts, WHO can support the health component of nationally led post-disaster needs assessments and recovery planning, supported by the United Nations (UN), World Bank and European Union. WHO also plays an important convening role for Health EDRM at regional level with Member States and partners, and at global level through facilitation of the WHO Thematic Platform on Health EDRM and its associated Research Network, and the Strategic Partnership for Health Security.

7.6 INTERNATIONAL COMMUNITY

The UN and its organizations, other international agencies, intergovernmental organizations, the International Red Cross and Red Crescent Movement, NGOs and the private sector can all contribute to building essential capacities for Health EDRM at country level. They are essential partners of WHO. For example, the UN's CADRI Partnership supports governments to assess, plan and develop national capacities for disaster risk reduction, including preparedness for emergency response. International and regional partnership initiatives for health security, disaster risk management, chemical and radiation safety and incident management, and food safety, can also assist countries to leverage resources, to build capacity and to link to international emergency response mechanisms. Examples of such international and regional mechanisms are UNDRR, the IASC's cluster system, Emergency Medical Teams Initiative, GOARN, and the UHC2030 Partnership.

¹IASC is the primary mechanism at international level for coordination of disaster/humanitarian response. Its members are the main UN and non-UN humanitarian agencies. As Health Cluster Lead Agency, WHO works at country level with ministries of health and humanitarian organizations to ensure that the health sector response to disasters is well led, well coordinated and effective in meeting the needs of the affected population.

8 CONCLUSION

No country – regardless of its economic and social development level – is immune from the increasing frequency and severity of emergencies. All countries require clear policies, strategies and related programmes to minimize health risks and their associated health and other consequences. These policies and strategies should be multidisciplinary, intersectoral, and apply comprehensive, all-hazards and risk management approaches. While Health EDRM requires multifaceted strategies and specific actions to manage the wide range of risks of emergencies, general strengthening of a country's health system, rooted in primary health care, is also crucial.

Capacity development for Health EDRM at country and local levels should take full advantage of, build on, and contribute to, existing programmes and frameworks, including the IHR (2005), the Sendai Framework, the SDGs and the Paris Agreement.

WHO is fully committed to collaborating with ministries and partners to support the development of each Member State's capacities for Health EDRM. Working together will lead to achieving the highest possible standard of health and well-being of all communities at risk of emergencies and disasters, stronger community and country resilience, health security, UHC and sustainable development.

REFERENCES

1. Plan of action for disaster risk reduction 2016–2021. Washington (DC): Pan American Health Organization; 2016 (<http://iris.paho.org/xmlui/handle/123456789/33772>, accessed 31 March 2019).
2. Asia Pacific strategy for emerging diseases and public health emergencies (APSED III): advancing implementation of the International Health Regulations (2005). Manila: WHO Regional Office for the Western Pacific; 2017 (<http://iris.wpro.who.int/handle/10665.1/13654>, accessed 31 March 2019).
3. Western Pacific regional framework for disaster risk management for health. Manila: WHO Regional Office for the Western Pacific; 2016 (<http://iris.wpro.who.int/handle/10665.1/10927>, accessed 31 March 2019).
4. WHO Regional Committee for Africa resolution AFR/RC62/6 on disaster risk management: a health sector strategy for the African Region. Brazzaville: WHO Regional Office for Africa; 2012 (<http://www.who.int/iris/handle/10665/80074>, accessed 31 March 2019).
5. WHO Regional Committee for South-East Asia resolution SEA/RC68/R2 on response to emergencies and disasters. New Delhi: WHO Regional Office for South-East Asia; 2015 (http://www.searo.who.int/about/governing_bodies/regional_committee/rc68-r2.pdf?ua=1, accessed 31 March 2019).
6. Action plan to improve public health preparedness and response in the WHO European Region 2018–2023. Copenhagen: World Health Organization Regional Office for Europe; 2018 (http://www.euro.who.int/_data/assets/pdf_file/0009/393705/Action-Plan_EN_WHO_web_2.pdf?ua=1, accessed 31 March 2019).
7. Resolution 70/1. Transforming our world: the 2030 agenda for sustainable development. Resolution adopted by the General Assembly on 25 September 2015. New York (NY): United Nations; 2015 (A/RES/70/1; (http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E, accessed 31 March 2019).
8. Sendai framework for disaster risk reduction 2015–2030. Geneva: United Nations Office for Disaster Risk Reduction; 2015 (https://www.unisdr.org/files/43291_sendaiframeworkfordrren.pdf, accessed 31 March 2019).
9. International Health Regulations (2005), third edition. Geneva: World Health Organization; 2016 (<https://apps.who.int/iris/bitstream/handle/10665/246107/9789241580496-eng.pdf>, accessed 31 March 2019).
10. Paris Agreement. Bonn: United Nations Framework Convention on Climate Change; 2015 (FCCC/CP/2015/10/Add. 1, accessed 31 March 2019).
11. World disasters report 2016: Resilience: saving lives today, investing for tomorrow. Geneva: International Federation of Red Cross and Red Crescent Societies; 2016 (https://www.ifrc.org/Global/Documents/Secretariat/201610/WDR%202016-FINAL_web.pdf, accessed 31 March 2019).
12. People affected by conflict – humanitarian needs in numbers, 2013. Brussels: Centre for Research on the Epidemiology of Disasters; 2013 (<https://reliefweb.int/report/world/people-affected-conflict-humanitarian-needs-numbers-2013>, accessed 31 March 2019).
13. Disease outbreaks by year. Geneva: World Health Organization (<http://www.who.int/csr/don/archive/year/en/>, accessed 31 March 2019).

14. Results briefs. Climate insurance. Washington (DC): The World Bank; 1 December 2017 (<https://www.worldbank.org/en/results/2017/12/01/climate-insurance>, accessed 31 March 2019).
15. Fan VY, Jamison DT, Summers LH. Pandemic risk: how large are the expected losses? Bull World Health Organ. 2018;96(2):129–34.
16. World Bank; Institute for Health Metrics and Evaluation. The cost of air pollution: strengthening the economic case for action. Washington (DC): The World Bank; 2016 (<https://openknowledge.worldbank.org/handle/10986/25013>, accessed 31 March 2019).
17. Global assessment of national health sector emergency preparedness and response. Geneva: World Health Organization; 2008 (http://www.who.int/hac/about/Global_survey_inside.pdf, accessed 31 March 2019).
18. 2009 UNISDR terminology on disaster risk reduction. Geneva: United Nations Office for Disaster Risk Reduction; 2009 (https://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf, accessed 31 March 2019).
19. Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction. New York (NY): United Nations Note by the Secretary-General; 2016 (A/71/644; <https://www.unisdr.org/we/inform/publications/51748>, accessed 31 March 2019).
20. Constitution of the World Health Organization. In: Basic documents, 48th edition. Geneva: World Health Organization; 2016:1–9 (<http://apps.who.int/gb/bd/PDF/bd48/basic-documents-48th-edition-en.pdf>, accessed 31 March 2019).
21. Global health ethics: key issues. Geneva: World Health Organization; 2015 (https://apps.who.int/iris/bitstream/handle/10665/164576/9789240694033_eng.pdf, accessed 31 March 2019)
22. International Health Regulations (2005) monitoring and evaluation framework. Geneva: World Health Organization; 2018 (<https://apps.who.int/iris/bitstream/handle/10665/276651/WHO-WHE-CPI-2018.51-eng.pdf?sequence=1>, accessed 22 May 2019).
23. Bangkok Principles for the implementation of the health aspects of the Sendai Framework for Disaster Risk Reduction 2015–2030. Geneva: United Nations Office for Disaster Risk Reduction; 2016 (http://www.who.int/hac/events/2016/Bangkok_Principles.pdf, accessed 31 March 2019).
24. Safe hospitals and health facilities [website]. Geneva: World Health Organization (<https://www.who.int/hac/techguidance/safehospitals/en>, accessed 31 March 2019).
25. Smart hospitals [website]. Washington (DC): Pan American Health Organization (https://www.paho.org/disasters/index.php?option=com_content&view=article&id=3660:hospitales-inteligentes&Itemid=911&lang=en, accessed 31 March 2019).
26. Joint external evaluation tool: International Health Regulations (2005), second edition. Geneva: World Health Organization; 2018 (<https://apps.who.int/iris/bitstream/handle/10665/259961/9789241550222-eng.pdf>, accessed 31 March 2019).

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ANNEX 1. WHO CLASSIFICATION OF HAZARDS

GENERIC GROUPS ¹	1. NATURAL				2. HUMAN-INDUCED ^{2,3}		3. ENVIRONMENTAL			
	1.1 GEOPHYSICAL ⁴		1.2 HYDRO-METEOROLOGICAL		1.3 BIOLOGICAL ⁵	1.4 EXTRATERRESTRIAL ⁴	2.1 TECHNOLOGICAL	2.2 SOCIETAL	3.1 ENVIRONMENTAL DEGRADATION ^{1,7}	
GROUPS	1.2.1 HYDROLOGICAL ⁴		1.2.2 METEOROLOGICAL ⁴		1.2.3 CLIMATOLOGICAL ⁴					
SUBGROUPS	Earthquake: - ground-shaking		Flood: - riverine flood - flash flood - coastal flood - ice jam flood		Drought Wild fire: - land fire [e.g. brush, bush, pasture] - forest fire		Impact: - airburst - meteorite	Industrial hazards: ⁸ - chemical spill - gas leak	Acts of violence	Erosion
Main types	Tsunami		Storm: - extratropical storm - tropical cyclone [cyclonic wind, cyclonic rain, cyclone (storm) surge] - convective storm [tornado, wind, rain, winter storm, blizzard, derecho, lightning, thunderstorm, hail, sand/dust storm]		Glacial lake outburst (flood)		Space weather: - energetic particles - geomagnetic storms - shockwave	- radiation [radiological, nuclear]	Armed conflicts: ^{1,4} - international - non-international	Deforestation
- subtypes	Mass movement (geophysical trigger): - landslide - rock fall - subsidence		Mass movement (hydro-meteorological trigger): - landslide - avalanche (snow) - mudflow - debris flow				Foodborne outbreaks ⁷	Structural collapse: ^{8,9} - building collapse - dam/bridge failures	Civil unrest	Salinization
[sub-subtypes]	Liquefaction		Wave action: - rogue wave - seiche				Insect infestation: ⁴ - grasshopper - locust	Occupational hazards - mining	Stampede	Sea level rise
	Volcanic activity: - ash fall - lahar - pyroclastic flow - lava flow		Extreme temperature: - heatwave - coldwave - severe winter condition [e.g. snow/ice, frost/freeze, dzud] ⁶		Fog		Animal diseases	Transportation: ^{8,11} - air, road, rail, water, space	Terrorism: - chemical, biological, radiological, nuclear, and explosives ^{15,16}	Wetland loss/degradation
							Plant diseases	Explosions	Financial crises: - hyper-inflation - currency crisis	Glacier retreat/melting
							Aeroallergens	Fire ⁸	Explo-sives ^{15,16}	Sand encroachment
							Antimicrobial resistant microorganisms	Air pollution: ⁹ - haze ¹⁰	Financial	
							Animal-human contact - venomous	Infrastructure disruption: - power outage ¹¹ - water supply - solid waste, waste water		
								Telecommunication		
								Cybersecurity		
								Hazardous materials in air, soil, water: ^{12,13} - biological, chemical, radiological		
								Food contamination ⁷		

SOURCES

1. Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction. Note by the Secretary-General. New York (NY): United Nations ; 2016 (A/71/644; <https://www.unisdr.org/we/inform/terminology>, accessed 18 February 2019).
2. OCHA Annual Report, 2017. Geneva: United Nations Office for the Coordination of Humanitarian Affairs; 2017 (<https://www.unocha.org/sites/unocha/files/2017%20annual%20report.pdf>, accessed 18 February 2019).
3. Types of disasters: definition of hazard [website]. Geneva: International Federation of Red Cross and Red Crescent Societies; 2019 (<http://www.ifrc.org/en/what-we-do/disaster-management/about-disasters/definition-of-hazard/>, accessed 18 February 2019).
4. EM-DAT: International Disaster Database [website]. Brussels: Centre for Research on the Epidemiology of Disasters; (<https://www.emdat.be/>, accessed 18 February 2019).
5. International Health Regulations, third edition. Geneva: World Health Organization; 2005 (<https://apps.who.int/iris/bitstream/handle/10665/246107/9789241580496-eng.pdf>, accessed 31 March 2019).
6. Dzud national report 2009–2010. Ulaanbaatar: United Nations Development Programme and Swiss Agency for Development and Cooperation; 2010 (https://www.academia.edu/2426652/How_Mongolian_herders_affected_by_Dzud_natural_phenomena_2009-2010_government_and_pastoralists_disaster_management, accessed 18 February 2019).
7. Jaykus L, Woolridge M, Frank J, Miraglia M, McQuatters-Gollop A, Tirado C. Climate change: implications for food safety. Rome: Food and Agriculture Organization of the United Nations; 2008 (<http://www.fao.org/3/i0195e/i0195e00.pdf>, accessed 18 February 2019).
8. EM-DAT: General classification [website]. Brussels: Centre for Research on the Epidemiology of Disasters (<https://www.emdat.be/classification>, accessed 18 February 2019).
9. Global environmental outlook 3: past, present and future perspectives [website]. Nairobi and London: United Nations Environment Programme; 2002 (https://wedocs.unep.org/bitstream/handle/20.500.11822/8609/GEO-3%20REPORT_English.pdf?sequence=7&isAllowed=y, accessed 18 February 2019).
10. International cloud atlas [website]. Geneva: World Meteorological Organization (<https://cloudatlas.wmo.int/haze.html>, accessed 18 February 2019).
11. Coppola D, editor. Introduction to international disaster management, 3rd edition. Oxford: Butterworth-Heinemann; 2015.
12. Recommendations for the transport of dangerous goods, 19th edition. New York and Geneva: United Nations; 2015 (https://www.unece.org/fileadmin/DAM/trans/danger/publi/unrec/rev19/Rev19e_Vol_I.pdf, accessed 18 February 2019).
13. IHR core capacity and monitoring framework. Geneva: World Health Organization; 2013 (http://apps.who.int/iris/bitstream/10665/84933/1/WHO_HSE_GCR_2013.2_eng.pdf, accessed 18 February 2019).
14. The protocol additional to the Geneva conventions for 12 August 1949, and relating to the protection of victims of international armed conflicts (Protocol I) of 8 June 1977. Geneva: International Committee of the Red Cross; 1977 (<https://www.icrc.org/ihl/INTRO/470>, accessed 18 February 2019).
15. National strategy for chemical, biological, radiological, nuclear, and explosives (CBRNE) standards [website]. Washington (DC): United States. Department of Homeland Security; 2010 (<http://www.dhs.gov/national-strategy-chemical-biological-radiological-nuclear-and-explosives-cbrne-standards>, accessed 18 February 2019).
16. Treaty on the non-proliferation of nuclear weapons [website]. New York (NY): United Nations Office for Disarmament Affairs; 2012 (<http://www.un.org/disarmament/WMD/Nuclear/NPT.shtml>, accessed 18 February 2019).
17. Technical guidance for monitoring and reporting on progress in achieving the global targets of the Sendai Framework for Disaster Risk Reduction. Geneva: United Nations Office for Disaster Risk Reduction; 2017 (<https://www.unisdr.org/we/inform/publications/54970>, accessed 18 February 2019).

ANNEX 2. COMPONENTS AND FUNCTIONS OF HEALTH EMERGENCY AND DISASTER RISK MANAGEMENT

Health EDRM encompasses a wide range of functions in health and other sectors that collectively reduce the health risk and consequences of all types of hazardous events including emergencies and disasters. These functions form systems for managing risks at all levels, which underscores the need for effective coordination of these functions for successful Health EDRM. The breadth of functions recognizes that many stakeholders contribute to, and need to be engaged in developing and implementing capacities for Health EDRM. The focus here is mainly on the roles played by the health sector and those that have direct effects on the performance of the health sector (e.g. multisectoral coordination, logistics).

Although not exhaustive, this Annex provides a suggested list of functions; it is acknowledged that many other functions in health and other sectors contribute to improving health outcomes for people at risk of emergencies and disasters (e.g. land-use planning, food production). Functions are grouped into components that are derived from a number of sources including the health system building blocks, multisectoral emergency and disaster management, and the IHR (2005) including epidemic preparedness and response.

1 POLICIES, STRATEGIES AND LEGISLATION

▼ POLICIES, STRATEGIES, LEGISLATION

- Legal frameworks for Health EDRM and multisectoral EDRM
- Health sector EDRM policies
- Multisectoral EDRM policies¹
- Health and multisectoral policies for specific hazards (e.g. cholera, chemical hazards, floods, road safety)
- Integration of Health EDRM in national/subnational health policies, strategies and plans and in national multisectoral development plans and policies

- Integration of Health EDRM in policies and legislation for specific components (e.g. addressing Health EDRM in national and subnational policies for the health workforce, noncommunicable diseases, mental health, disability, hospitals, antimicrobial resistance, immunization).

▼ CAPACITY DEVELOPMENT STRATEGIES

- Capacity assessments (with reference to the components and functions of this Health EDRM Framework)
- Strategies for capacity development for:
 - Comprehensive Health EDRM (across and including the components and functions according to national and subnational priorities)
 - Specific components and functions of Health EDRM as outlined in this annex
 - Specific hazards (e.g. cholera, radiation, air pollution, extreme temperatures, terrorism)
 - Implementation of global and regional frameworks (e.g. national action plans for implementing the IHR (2005), national and local disaster risk reduction strategies, national action plans for climate change)
- Integration of Health EDRM into:
 - health systems development strategies
 - multisectoral emergency and disaster risk management development strategies
 - climate change adaptation strategies.

¹Multisectoral functions are usually performed by national, subnational and local emergency and disaster management bodies (e.g. national disaster management agencies).

2 PLANNING AND COORDINATION (AT ALL LEVELS – NATIONAL, SUBNATIONAL, LOCAL)

▼ COORDINATION MECHANISMS

- For developing and implementing functions: policies, assessments, planning, capacity development; prevention, emergency preparedness, response and recovery operations; implementation; monitoring and reporting
- Multisectoral coordination mechanisms at different administrative levels/ jurisdictions (e.g. national, subnational, local, community)
- Health sector at different jurisdictions (e.g. national, subnational, district, local, community)
 - Inclusion of various health programmes and disciplines
 - Inclusion of other sectors
- Cross-border, subregional, regional and international mechanisms (e.g. for joint assessments, planning, capacity development (e.g. training), information sharing (e.g. surveillance), operations, logistics)
- Regulations and protocols for international assistance/rules of engagement for external agencies.

▼ HEALTH EDRM UNITS IN MINISTRIES OF HEALTH

- Dedicated staff/unit to coordinate Health EDRM development and operational roles at different administrative levels (community, local, subnational and national)
 - within health sector (across disciplines and jurisdictions)
 - with other sectors

- with other countries, regional and international actors
- IHR (2005) national focal points
- Budget for Health EDRM unit staff, coordinating bodies and related programmes
- Coordination centres /Emergency operations centres.

▼ PREVENTION AND MITIGATION PLANNING AND COORDINATION

- Plans for prevention and mitigation of risks
 - Health sector and multisectoral Health EDRM
 - All-hazards and hazard-specific
- Coordination of programme and project management
- Programme/project monitoring, evaluation and reporting.

▼ PLANNING AND COORDINATION FOR EMERGENCY PREPAREDNESS, READINESS AND RESPONSE

- Pre-event response planning at all levels (health sector and multisectoral)
 - all-hazards response planning
 - contingency planning for specific events
 - planning for specific situations (conflict, mass gatherings)
- Coordination of preparedness/readiness for response measures
- Incident management systems, including command, control, coordination and communications
- Emergency operations centres and networks
- Mass casualty management
- Needs assessments
- Surge capacity planning
- Specific procedures – standing operating procedures (SOPs).

▼ RECOVERY PLANNING AND COORDINATION

- Pre-event recovery planning at all levels (health sector/multisectoral)
- Post-event recovery planning at all levels (health sector/multisectoral)
- Assessments
- Recovery coordination and management
- Transition planning
- Post-event health system strengthening strategies
- Specific procedures and protocols (SOPs).

▼ BUSINESS CONTINUITY MANAGEMENT

- Organizational risk assessments
- Organizational response and recovery plans
- Staff health and welfare.

▼ EXERCISES, SIMULATIONS

- Exercise management programme
- Design, development and conduct of
 - drills
 - discussion exercises
 - field exercises
- Exercise evaluation
- Update of plans, procedures and protocols
- Update of capacity development plans.

3 HUMAN RESOURCES

- Multidisciplinary workforce capacity in place by occupational group
- Essential Health EDRM positions at national and subnational level are filled
- Workforce development strategies (integration of Health EDRM functions and competencies):
 - general health workforce by level, by profession, by occupational group
- Training needs analyses
- Competency frameworks
- Curriculum development
- Learning, training course delivery:
 - pre-service, in-service, university, community level

- Licensing and accreditation of staff/volunteers
- Surge capacity planning for personnel
- Safety and security of all personnel (health and other sectors – in the workplace, in emergencies).

4 FINANCIAL RESOURCES

- Budget for Health EDRM programmes (staff, activities/services, health supplies, hospitals and infrastructure, etc.)
 - Specific programmes/services to fulfil Health EDRM roles
- Contingency funds for emergency response and recovery
- Financial arrangements for emergency care (e.g. cost waiver policies, treatment of non-residents, medical repatriation)
- Social/health safety nets (access to health care, reducing financial barriers – UHC, food assistance)
- Compensation systems (e.g. long-term care for people affected by emergencies and disasters, insurance)
- Cash transfer mechanisms (e.g. vouchers)
- Resource mobilization.

5 INFORMATION AND KNOWLEDGE MANAGEMENT

▼ RISK ASSESSMENTS

- Strategic emergency risk assessments (health and multisectoral)
- Event risk assessments
- Hazard analysis
- Exposure analysis
- Vulnerability analysis at national and community levels
- Capacity assessments
- Needs assessments before, during and after emergencies
- Dissemination of risk assessments for use by policy-makers and practitioners.

▼ **EARLY WARNING AND SURVEILLANCE**

- Indicator-based surveillance
- Event-based surveillance
- Multi-hazard early warning systems
- Early warning for different hazards
- Public health laboratories, diagnostics, characterization
- Epidemiological investigations.

▼ **RESEARCH FOR HEALTH EDRM**

- Health EDRM research agenda
- Case studies
- Operational research
- Research community for Health EDRM
- Pharmaceutical development (e.g. drugs, vaccines), equipment
- Research ethics.

▼ **KNOWLEDGE MANAGEMENT – TECHNICAL GUIDANCE AND SUPPORT**

- Technical guidance
- Development of good practice/guidelines/protocols
- Reviews and lessons learned
- Institutionalization of lessons
 - in training programmes
 - health systems improvement
- Local and indigenous knowledge.

▼ **INFORMATION MANAGEMENT**

- Fundamental datasets
- Operational information
- Loss databases
- Emergency reporting
- Standards.

6 RISK COMMUNICATIONS¹

- Public communications
- Media (e.g. engagement, training)
- Coordinated communication strategies
- Risk communication (e.g. public, health workforce, other sectors).

7 HEALTH INFRASTRUCTURE AND LOGISTICS

▼ **LOGISTICS, SUPPLIES**

- Logistics systems (including cold chain for vaccines, specimen transport)
- Essential supplies/medicines
- Health emergency kits
- Temporary health facilities
- Stockpiling, warehousing, pre-positioning of supplies
- Transportation
- Telecommunications
- Security of operations
- Donation guidelines/emergency importation of medicines.

▼ **RESILIENT HEALTH FACILITIES (SAFE, SUSTAINABLE, SECURE, SMART)**

- Health facility standards and codes for existing and new health facilities
- Universal design (e.g. access for people with disabilities)
- Safe siting and construction
- Equipment, devices (safety, security, maintenance)
- Emergency management (e.g. emergency preparedness and response: planning, training, exercises)
- Infection prevention and control (in health facilities and other health-care settings)
- Patient isolation capacity
- Decontamination
- Energy efficiency, reduced carbon footprint
- Security of health facilities
- Surge capacity planning (e.g. staff, supplies, equipment, lifelines)
- Ensuring lifelines/support services (including water, staff welfare).

¹Key functions linked to community Health EDRM including community engagement.

8 HEALTH AND RELATED SERVICES (BEFORE, DURING AND AFTER EMERGENCIES, INCLUDING ROUTINE, EMERGENCY AND SURGE)

1. HEALTH-CARE SERVICES

- Pre-hospital services/care
 - Medivac services
- Primary care services
- Emergency care
- Surgical care
- Communicable disease prevention, control, care
- HIV/AIDS
- Injury prevention and trauma care
- Mental health and psychosocial support
- Sexual and reproductive health
- Maternal and neonatal health
- Child health
- Adolescent health
- Care for the elderly
- Noncommunicable diseases
- Laboratory and diagnostic services
- Blood services
- Rehabilitation services
- Emergency medical/health teams
- Assistive products and services
- Palliative care.

2. PUBLIC HEALTH MEASURES

- Health education and promotion
- Infection prevention and control
- Immunization programmes
- Management of the dead and missing
- Environmental health
 - Water, sanitation, hygiene
 - Vector control
 - General and health care waste management
- Food security
- Nutrition
- Societal measures, (e.g. quarantine, school closures, cancellation of mass

gatherings)

- Prevention and control (services) at points of entry
- Biosafety and biosecurity
- Violence prevention (e.g. children, gender-based, older people)
- Specialized programmes for subpopulations (e.g. poor, disability, gender, age-specific, refugees, migrants).

(NB. Refer to component on Information and knowledge management for early warning and surveillance functions).

3. SPECIALIZED SERVICES AND MEASURES FOR SPECIFIC HAZARDS

- Communicable disease outbreaks
 - bioterrorism
 - zoonotic diseases (One Health with animal health)
- Antimicrobial resistance
- Food safety
- Technological
 - Chemical hazards and toxins
 - Radiological hazards
 - Transportation
 - Cybersecurity
- Conflict, violence, terrorism
- Natural hazards (e.g. extreme temperatures, volcano, flood)
- Air pollution
- Environmental degradation.

9 COMMUNITY HEALTH EDRM CAPACITIES

- Risk awareness
- People-centred action (e.g. people, subpopulations with vulnerabilities)
- Health promotion
- Community risk assessments
- Individual and household measures
- Community risk prevention and mitigation measures for urban, rural and other settings

- Emergency preparedness, operational readiness, response and recovery planning for urban, rural and other settings
- Training of local health workforce for Health EDRM (e.g. community health workers, nurses, family doctors)
- Community health services (e.g. primary health care, community-based clinical care)
- First aid
- Community engagement/social mobilization
- Community support and networks.
- Follow-up and implementation of lessons/recommendation (e.g. updates of planning, training, capacity development)
- Programme and project monitoring, evaluation and reporting
- Statutory reporting at national/subnational/local levels
- Reporting for SDGs, IHR (2005), Sendai Framework and regional frameworks
 - National focal points for IHR
 - Sendai Framework monitoring national focal points (multisectoral); health focal points for Sendai Framework monitoring and reporting
 - Focal points for SDG reporting
- Regional and global reports of country Health EDRM capacities (e.g. IHR State Parties Self-Assessment Annual Reporting, global survey of country capacities for Health EDRM).

10 MONITORING AND EVALUATION

- Performance frameworks (performance standards, indicators, specific targets)
- Ethics frameworks
- Reviews (e.g. policy, planning, operational, after-action reviews, health services)

ANNEX 3. LIST OF STAKEHOLDER GROUPS FOR HEALTH EMERGENCY AND DISASTER RISK MANAGEMENT

Effective Health EDRM requires the active participation of representatives of stakeholder groups who are interested parties in the management of risks, for example, risk owners, groups with vulnerabilities, or groups with capacities to manage the risk. Some of the key stakeholder groups are listed below. Consideration should be given to the involvement of these stakeholder groups at local, subnational, national, regional and international levels for Health EDRM (see also Health EDRM components and functions in Annex 2).

▼ COMMUNITY

- At-risk populations, subpopulations or groups with higher levels of vulnerability according to the local context (e.g. the poor, women, men, children, people with disabilities, older people, indigenous people, migrants, refugees and displaced people)
- Survivors of emergencies and disasters
- Community groups, civil society organizations and networks (e.g. volunteer groups, community welfare groups, students, teachers, indigenous peoples, ethnic groups, faith groups, youth, women, older people, disability, health networks, community service organizations, e.g. Rotary clubs).

▼ GOVERNMENTS (AT ALL LEVELS)

- Leaders, parliamentarians and politicians
- Government ministries and agencies (e.g. health, social services, finance, planning, education, agriculture, foreign affairs, environment, infrastructure, public information, communications, transport, defence, industry, tourism, international development)
- National disaster management agency, multisectoral emergency/disaster management committees (national,

subnational, local)

- Emergency services (e.g. fire, police, ambulance), national hydrometeorological services
- Military services, national security committee.

▼ HEALTH (AT ALL LEVELS)

- Ministries of health (departments, programmes), health authorities, National Institutes of Public Health
- Health EDRM committees, IHR national focal points
- WHO collaborating centres
- WHO Thematic Platform for Health EDRM, WHO Platform for Health EDRM Research Network
- Professional associations (e.g. medical, public health, nursing and midwives' associations, academies/colleges of medicine, World Association for Disaster and Emergency Medicine)
- Health-related NGOs and health networks
- Health-care providers (public, private, nongovernment sectors), local health workforce (e.g. family doctors, nurses, midwives, pharmacists), community health workers
- Hospitals and other health-care facilities
- Private sector health organizations and professionals (health-care facilities, health insurance, pharmaceutical).

▼ OTHER GROUPS (IN HEALTH AND OTHER SECTORS)

- Academia, universities, education and training bodies, research institutes
- Nongovernment and volunteer groups; faith-based groups; labour unions and groups
- Media, social media, new media

- Community influencers, champions for Health EDRM (e.g. musicians, sport stars)
- Private sector (privately owned water, food, power, telecommunications, insurance, technology, hazardous facility managers, etc.), industry associations, transport
- Multinational companies (e.g. energy (power, fuel), communications, infrastructure, media)

▼ **UN, REGIONAL AND INTERNATIONAL ORGANIZATIONS**

- UN and specialized agencies, notably the FAO, UNDP, UNDRR, UNICEF, UN Office for the Coordination of Humanitarian Affairs (OCHA), UN Population Fund (UNFPA), WHO, World Meteorological Organization (WMO), World Organisation for Animal Health (OIE)
- Regional intergovernmental and regional emergency management organizations (e.g. African Union, Arab League, Asian Disaster Preparedness Center (ADPC), Association of Southeast Asian Nations (ASEAN), Caribbean Disaster Emergency Management Agency (CDEMA), Centro de Coordinación para la Prevención de los Desastres Naturales en América Central y República Dominicana (CEPRENAC), European Union (EU), Pacific Community, South Asian Association for Regional Cooperation (SAARC))
- Global clusters, including the Global Health Cluster
- Development cooperation partners, donors
- International NGOs, Red Cross/Red Crescent Movement (IFRC, International Committee of the Red Cross (ICRC))
- Regional and international centres for health and multisectoral EDRM.



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