

**Bangladesh 2019** This is Sadyra. He is a natural woodworker and handyman, great with tools. He wants to build a bigger house for his family. He made this chair he is sitting on. People in Bangladesh have faced multiple overlapping hazards in recent years on top of COVID-19. In 2020–2021 Bangladesh was in the top 10 countries that experienced the greatest number of disasters.  
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# PREVENT AND PREPARE





**In a multi-hazard world, we must prevent what we can and prepare for everything else**

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# INTRODUCTION

The COVID-19 pandemic is the biggest single disaster to strike humanity for many decades – in terms of both the number of lives it has claimed to date and the fact that it has affected virtually every living person on Earth in some significant way. It is tempting to believe we will not see anything like it again in our lifetimes, but actually the pandemic is part of a broader pattern of increasing hazards. Biological and climate risks have been growing for many years, with ever-increasing impacts. Urbanization and population density, which present other risks to health, as well as ever-increasing volumes of international commerce and travel, compound these risks. Furthermore, countries are more frequently experiencing multiple disasters or shocks, either simultaneously or in rapid succession. This taxes public systems and community resilience in new ways.

**This multi-hazard world requires a far greater focus on prevention and preparedness.** It also demands an integrated and flexible approach that allows us to respond to a wide variety of hazards. Where health risks, in particular, are concerned, prevention requires a suite of measures focusing on the drivers of risk. These include better sanitation and nutrition, plus improved vector control through a 'One Health' approach that treats human health as a component of the overall socio-ecological system. Alongside this, we urgently need health systems strengthening, with particular attention to primary healthcare and community health systems. It is necessary to reinforce social protection systems (see Chapter 4) and community preparedness and action teams (see Chapter 2). We also need to embrace a culture of epidemic and pandemic preparedness that aligns with preparedness for other types of emergencies to ensure resilient societies and communities.

## Definitions

**Community-based interventions** are designed to promote public health in communities and include – but are not limited to – programmes such as community surveillance, community engagement, nutritional support, health counseling and advocacy, community preparedness, home-based care and health services.

**Community health systems:** The structures, mechanisms, processes and actors needed to support community-led health programming and outbreak management. Core components can include good enabling environments and advocacy for community health; community networks and partnerships; resources and capacity building; community service delivery and organizational and leadership strengthening. They underpin community-led and community-based interventions ([The Global Fund, 2022](#))

**Disease outbreak:** The occurrence of cases of disease in *excess of what would normally be expected* in a defined community, geographical area or season. If a disease is rare, or has serious public health implications, a single case of a disease may be considered an outbreak.



**Guatemala 2022** Tropical cyclone Julia strengthened to a category 1 hurricane, causing intense rains that left various damages in Central America and made continental landfall on the east coast of Nicaragua. Effects were also reported in Guatemala. The Red Cross teams implemented early action responses, continued to monitor damages and needs and to provide assistance after intense floods and landslides. © Guatemalan Red Cross

# 1.1 THE PROBLEM

## COVID-19 IS PART OF A WAVE OF INCREASING HAZARDS

### 1.1.1 The chaotic response to COVID-19

The response to COVID-19 was beset by chaos and mistakes, both within individual countries and internationally. The gaps are delineated in the report of the *Lancet* Commission on lessons for the future from the COVID-19 pandemic ([Sachs et al, 2022](#)).

Internationally, the World Health Organization (WHO) struggled to organize coordinated action. The *Lancet* Commission found that the WHO was too slow to recognize asymptomatic human-to-human transmission, too slow to recommend balanced controls on international travel, such as the use of diagnostic testing, too slow to recommend the use of face masks by the public, and far too slow to acknowledge the airborne transmission of SARS-CoV-2 ([Sachs et al, 2022](#)). Many governments were also very slow in issuing their own findings and imposing clear preventative measures. It should be acknowledged that many of these decisions were not easy. For instance, there was a shortage of masks, which needed to be reserved for emergency health personnel as a priority. Nevertheless, the fact remains that rapid detection, alert and containment mechanisms failed.

Many countries struggled to deploy the essential tools of public health. In some cases, batches of diagnostic testing kits proved to be faulty ([Lee et al, 2021](#)). Even afterwards, testing kits were difficult to access for many months in some countries. Many countries experienced severe shortages of personal protective equipment (PPE) ([Burki, 2020](#)). In some nations, at least 30% of care workers, doctors and nurses reported having insufficient PPE. To make up the shortfall ([Oliver, 2021](#)), governments hastily awarded multiple contracts without tender, only to waste money on poor-quality PPE that was often unusable ([Dyer, 2021](#)). Other shortages were caused in part by a dysfunctional funding system: hospitals were incentivized to minimize costs rather than maintain adequate inventories ([Cohen and van der Meulen Rodgers, 2020](#)). There has also been a global shortage of oxygen, which is essential for treating COVID-19. At times, multiple countries' health systems came close to running out ([Davies and Furneaux, 2021](#)). In low- and middle-income countries, the shortage has persisted into 2022 ([Mahase, 2022](#)).

Government ministries often needed to be faster to coordinate with one another ([Jacobzone et al, 2020](#)). The World Bank has identified several traits of an effective coordination system. Coordination requires strong backing from leadership; focuses on a small number of well-defined targets; uses simple dashboards for reporting data and results; and enables constant communication between different ministries, departments and agencies ([Kunicova, 2020](#)). IFRC adds that they must incorporate the whole of government and society. However, many governments failed to implement one or more of these aspects, particularly in the first few months of the pandemic ([Kapucu and Hu, 2022](#)).

Alongside this, there were widespread failures of communication ([Palma-Oliveira, 2021](#)). Governments and health authorities often did not convey the full extent of the threat of COVID-19 to their populations or were slow to do so ([Zhang, 2020](#)). With a few exceptions, such as Australia, which emphasized effective and coordinated communication ([Hyland-Wood, 2021](#)), many issued confusing and contradictory messages ([Finset et al, 2020](#)). This was exacerbated by widespread disinformation ([Mheidly and Fares, 2020](#)), which spread particularly rapidly on social media ([Malecki et al, 2021](#)). In some cases, political actors sought to politicize the situation ([Biehl et al, 2021](#)), reducing trust in the public health response ([Hatcher, 2020](#)). On top of that, many communities lacked trust in the authorities and were reluctant to engage in the COVID-19 response. One factor in this lack of trust was that many communities had had little or no contact with health systems or national authorities prior to the crisis.

In many countries the result, especially in the first months of 2020, was chaos in emergency rooms and health systems more broadly. In a 2021 study, 51 healthcare workers from Sweden recounted their experiences. They reported constant, confusing changes to rules governing infection prevention and control. This occurred because there was no pre-agreed plan for such a large-scale health emergency, leading to frantic and repeated changes in response to new information. Furthermore, the staff were asked to operate new and unfamiliar medical technologies, such as high-flow nasal oxygen equipment, without proper training. Combined with multiple other stresses, including fear of contracting COVID-19, this led to stress and burnout ([Rücker et al, 2021](#)).

Finally, while COVID-19 has dominated international attention, other hazards have not stopped. South Asia was hit by Cyclone Amphan, a category 5 tropical cyclone, in May 2020 ([Ellis-Petersen and Ratcliffe, 2020](#)). The following year, in May, Cyclone Yaas struck nearby ([BBC News, 2021](#)). Tonga experienced one of the most violent volcanic eruptions of recent decades on 15 January 2022, when Hunga Tonga-Hunga Ha'apai erupted explosively, causing widespread disruption ([BBC News, 2022](#)).

Sometimes these overlapping hazards accelerated the spread of the coronavirus, and sometimes the pandemic made it harder to respond to other hazards. For example, Bolivia was hit by major floods in January and February of 2021 and again in December. The country had kept COVID-19 case numbers low throughout 2020, partly by closing its international borders. But, in the wake of both floods, it experienced spikes in infections – especially after the second flood in December (see Chapter 8). Similarly, in Honduras, Hurricanes Eta and Iota struck in 2020 at the height of the pandemic. This required a surge response from the IFRC network ([IFRC GO, no date b](#)). One of the key challenges was the availability of shelter. Many people were displaced by the hurricanes and needed shelter ([IFRC, 2021d](#)), but temporary shelters for displaced people had reduced capacity because of the need to maintain social distancing to limit the spread of COVID-19 ([IFRC, 2020a](#)).

## 1.2 WHAT WE LEARNED

# THE WORLD WAS NOT READY FOR COVID-19

One thing that went wrong, which we will address in this chapter, is that prior to the pandemic, most countries had inadequately invested in epidemic prevention and preparedness. As a result, in the first few months of the COVID-19 outbreak, governments and health systems struggled to cope, and many became overwhelmed. The response required coordination between multiple actors, but coordination mechanisms were often unclear or non-existent. Many countries had prepared for specific hazards, but their systems were too inflexible to cope with the novel coronavirus. Some health systems were often already overburdened before the pandemic even started. They had no mechanisms or capacity to shift tasks around ([IPPPR, 2021](#)).

### 1.2.1 The world failed to prevent and prepare

The COVID-19 pandemic was allowed to happen because of failures of **prevention**. There was a failure to prevent the initial outbreak from spreading to encompass the entire globe. There was also an earlier failure to prevent the outbreak itself. In section 1.3.1, we will discuss what can be done to avoid future outbreaks, which requires some radically new policy choices. But even within the existing policy frameworks, there was a great deal that could have been done to control the outbreak and slow its spread – but it was not done or was done too late.

Notably, as discussed in 1.1.1, the *Lancet* Commission highlighted the widespread reluctance to implement controls on international travel. The WHO did not recommend travel restrictions when it issued ‘Temporary Recommendations’ under the International Health Regulations (2005) ([von Tigerstrom and Wilson, 2020](#)) (see Chapter 6). It is true that unjustifiably blanket travel bans have been a problem in past pandemics: they created perverse incentives on transparency when new outbreaks occur. However, there are many options in this policy space, including diagnostic testing for people entering and leaving a country and mandatory isolation upon arrival. With a few exceptions, such as New Zealand, most countries refrained from any such measures and therefore allowed SARS-CoV-2 to enter their territories. Even when control measures were imposed, they were often inadequate. For example, visitors travelling directly from certain countries were banned, while those travelling indirectly from the same origin point were allowed in ([Sachs et al, 2022](#)).

Similarly, many countries repeatedly allowed case numbers to rise dangerously high. In support of this, governments argued that the disease was under control in their jurisdiction so long as there were spaces available in intensive care units. According to a 2020 analysis, this failure to prevent additional cases was a critical mistake because “it makes a big difference whether there are many victims today or spread over a long period” ([Saracci, 2020](#)).



More broadly, it is clear that most countries were not **prepared** for the COVID-19 pandemic. The 2020 report of the Global Preparedness Monitoring Board concluded that the majority of countries were unprepared for COVID-19 because “our understanding of pandemic preparedness has been inadequate” (GPMB, 2020). In some cases, preparedness was understood too narrowly. For example, some countries laid in stocks of PPE but failed to complement this with a robust testing system to identify infected people. They also did not build community-level systems for handling outbreaks. A follow-up noted that this failure happened despite “hundreds of expert recommendations... over the last two decades” and called for “a holistic health emergency system” (GPMB, 2021).

Other mistakes included (but are not limited to) (Sachs et al, 2022; IPPPR, 2021):

- A lack of investment in clear communication protocols, including early warning and early action systems, which led to widespread confusion about the gravity of the threat and which measures were most effective to protect against it.
- Unclear whole-of-government and whole-of-society coordination structures, leading to chaotic and uncoordinated responses.
- A lack of understanding about the importance of community buy-in and trust.
- Insufficient consideration of methods that would have helped relieve overburdened health systems.

In contrast, countries and organizations that had prepared appropriately did do better (IFRC, 2022c). For instance, several east Asian countries/regions, including Taiwan, Province of China, Japan and Singapore, had strong memories of recent outbreaks of avian influenza and severe acute respiratory syndrome (SARS) (Chen et al, 2021). Several had engaged in capacity building after the H5N1 avian influenza outbreak (Corwin et al, 2021). Japan succeeded in preventing a severe initial wave of cases without resorting to



lockdowns. The government prioritized contact tracing, with a focus on working backwards from cases to identify superspreaders and associated clusters of cases. Alongside this, the government adopted a '3-Cs' strategy, encouraging people to avoid "crowded places", "close-contact settings", and "confined and enclosed spaces" (Imai et al, 2022).

In December 2019, just weeks before COVID-19 became known, the International Red Cross and Red Crescent Movement adopted a resolution on "Tackling epidemics and pandemics together" (Faller, 2020). Subsequent research suggests that National Red Cross and Red Crescent Societies that improved their preparedness capacities before the pandemic – both for disease outbreaks and in general – showed higher performance levels in their COVID-19 responses (Johnston, 2022). For example, the Mongolian Red Cross Society developed an influenza preparedness plan ahead of the winter of 2019–2020, which it leveraged to help contain COVID-19 (Natoli et al, 2020). IFRC has identified two lines of evidence indicating that National Societies with more preparedness and prior experience responded better to COVID-19. This evidence is summarized in the 2022 *Everyone Counts COVID-19 Edition* report (IFRC, 2022b):

- National Societies that achieved more in 2019 also achieved more during the pandemic. For instance, in 2019, some National Societies reached more people than others with their health, disaster risk reduction and water, sanitation and hygiene (WASH) programming. These National Societies were more likely to score highly on COVID-19 tracking priorities like infection prevention and control. This is measured using data from the IFRC's Federation-wide Databank and Reporting System, which records key performance indicators for each National Society. The analysis is purely correlation-based, so it does not explain why prior achievement predicts success during the pandemic.
- National Societies with prior experience of epidemic emergencies also had higher achievements on two additional indexes: community-based surveillance (CBS) and management of the dead. To give one example, the Somali Red Crescent Society has conducted CBS for diseases since 2018. A Somali Red Crescent Society volunteer identified one of the country's first reported cases of COVID-19 in late March 2020.

The central lesson of COVID-19 is that we must be prepared for a broad but credible range of disease outbreaks. This must include pathogens that a country has not previously experienced but which could plausibly enter. But even this is not enough. Other hazards have continued to occur since the emergence of COVID-19, either before or during the pandemic, creating intersecting and compounding risks that are even harder to deal with if unprepared (see Box 1.1). Furthermore, the next global emergency might be another type of pandemic, another category of disaster like a drought or a multi-hazard event. Whatever form it takes, we will only have limited warning. That means we need to get ready for all potential hazards now. We must embrace multi-hazard preparedness.

Equally, countries must prepare for as many common impacts of hazards as possible. In particular, they should focus on the most vulnerable and hard-to-reach. This is not only to prevent impacts on everyone but also to prevent the aggravation of **inequities**, as impacts are felt much more strongly by the most vulnerable and marginalized. It is tempting to prepare only for the most immediate needs, but all disasters have multiple, ramifying impacts across the whole of society. For instance, many people lost their jobs when businesses collapsed during pandemic restrictions.

## BOX 1.1 / CASE STUDY

### CONTENDING WITH A COMPLEX EMERGENCY IN AFGHANISTAN

Afghanistan is experiencing a complex humanitarian crisis. It faces multiple hazards, combined with a breakdown of authority due to internal conflict. The hazards include drought, earthquakes, the COVID-19 pandemic, and numerous other infectious diseases – all in the context of a decades-long armed conflict.

The country has struggled to contain COVID-19. By the end of 2021, less than 15% of the population was fully vaccinated (Reuters, no date). Only a limited number of hospitals are still offering COVID-19 treatments (Gannon, 2022). Throughout the pandemic, Afghan hospitals have been in dire need of medical items like swabs, sample collection kits, liquid oxygen and personal protective equipment (PPE) (Ibrahimi and Safi, 2020). Over 30 hospitals were forced to close due to heat and a lack of medical experts.

Case and death numbers stayed low in the official figures, but these are probably underestimated, and anecdotal evidence paints a different picture. For example, gravediggers in Kabul reported death rates almost three times the usual (Blanc et al, 2020). The pandemic also had a negative impact on people's income, access to food and access to clean water and sanitation. As of January 2022, 65% of households in Afghanistan have been impacted by COVID-19 (UN OCHA, 2022a).



*Afghanistan 2022 IFRC supported Afghan Red Crescent to distribute cash-based assistance for shelter to 941 households that were affected by earthquakes in Khost province.  
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All this was compounded by drought. In the last two years, Afghanistan has experienced its worst drought in the last 27 years. Of the country's 34 provinces, 25 have been affected ([IFSPC, 2021](#)). Over two-thirds of the population is affected. Food insecurity has increased, while access to clean water and sanitation has been impaired ([Amoli and Jones, 2022](#)). This has led to further disease outbreaks. For example, groundwater levels fell, impacting the quantity and quality of water: this triggered the first reported cholera cases since 2016. The inability to access safe and clean water is also increasing rates of acute watery diarrhoea, measles and dengue fever.

All these crises are contributing to growing food insecurity. Harvest levels in 2021 were 20% less than 2020 levels and 15% less than the five-year average. Consequently, people's food consumption has fallen dramatically. The proportion of households in the 'poor' category of the Food Consumption Score nearly tripled from 2020 (14%) to 2021 (almost 40%). In drought-affected households, people are increasingly relying on extreme coping strategies.

Alongside the COVID-19 response, Afghanistan has suffered multiple shocks ([IFRC, 2022a](#)). Over 28,000 people were affected by floods and other disasters in the first eight months of 2021. Then an earthquake on 22 June 2022 killed over 1,000 people, severely damaged or destroyed 13,000 homes, and caused minor or moderate damage to 48,000 homes ([Center for Disaster Philanthropy, 2022](#)). It also damaged health facilities, education facilities, water services and grain stores ([UN OCHA 2022b](#)). This was followed by off-season rains in July and August that caused widespread flooding, washing away people's livelihoods.

The outlook for 2023 is worrying. Several assessments conducted by humanitarian partners show that drought and economic hardships will continue being major drivers of humanitarian needs in 2023. Monthly household income has decreased due to economic hardships, to some degree exacerbated by implications of sanctions, while household expenditure has skyrocketed as prices of essential items hit the roof. People are left with only two options: to employ coping mechanisms or depend on humanitarian assistance. The food security outlook is grim. It is projected that between November 2022 and March 2023, some 20 million Afghans will be in crisis and acute food insecurity ([IFRC, 2022e](#)). If the current drought persists in 2023, millions of Afghans will remain dependent on food assistance.

Resolving the complex humanitarian crisis in Afghanistan will require a massive, sustained international effort. It exemplifies the need for multi-hazard preparedness.



## 1.2.2 Increasing, overlapping and compounding hazards

Worryingly, our experience of the COVID-19 pandemic is a sign of things to come. We are living in an increasingly hazardous world. Many risks are increasing, with hazards – and the disasters they trigger – becoming either more frequent or more intense, or both.

The number of disasters triggered by natural hazards occurring every year continues to increase. IFRC's latest analysis of data from EM-DAT, the international disasters database, found 332 disasters in 2020 and 378 in 2021 (see Chapter 8) ([EM-DAT, no date](#)).

In particular, climate change is driving increases in extreme weather events. In the *World Disasters Report 2020*, IFRC documented a dramatic rise in the proportion of annual disasters attributable to climate and extreme weather, from 76% in the 2000s to 83% in the 2010s ([IFRC, 2020c](#)). That trend continued in 2020 and 2021, with 91% of the disasters recorded in the EM-DAT database of disasters attributable to climate and extreme weather (see Chapter 8).

In line with this, the latest report of Working Group II of the Intergovernmental Panel on Climate Change concluded that hazards are increasing due to climate change. The report identified increases in the frequency and intensity of weather extremes, including heatwaves, heavy rainfall events and droughts. This has led to increases in heat-related deaths, areas burned by wildfires, and adverse impacts from tropical cyclones – all attributed to anthropogenic climate change ([IPCC, 2022](#)).

This is paralleled by an increased risk of disease outbreaks, of which COVID-19 is the most dramatic example. A 2014 study compiled 33 years of disease data from 1980 to 2013. This encompassed 12,102 outbreaks of 215 human infectious diseases. The researchers controlled for confounders such as improvements in disease surveillance. They found significant increases in the total number of outbreaks and in the diversity of diseases. **In the early 1980s, there were fewer than 1,000 disease outbreaks per year, but by the late 2000s this had tripled to over 3,000.** Bacteria and viruses caused 88% of the outbreaks. Similarly, zoonoses – diseases entering the human population from animals – were responsible for 56% of outbreaks ([Smith et al, 2014](#)).

More recently, a review identified “a wave of severe infectious disease outbreaks” in the 21st century ([Baker et al, 2021](#)). These included the 2003 SARS coronavirus outbreak, the 2009 swine flu pandemic, the 2012 outbreak of Middle East respiratory syndrome (MERS) coronavirus, the 2013–2016 Ebola epidemic in West Africa and the 2015 Zika epidemic. Similarly, a 2018 analysis by the WHO said: “Epidemics of infectious diseases are occurring more often, and spreading faster and further than ever, in many different regions of the world”. The analysis found 1,307 epidemic events between 2011 and 2017. They were caused by a range of diseases, including yellow fever, cholera and shigellosis. That equates to an average of 187 epidemic events per year ([WHO, 2018](#)).

Experts cite various reasons for these epidemic trends. [Baker et al, 2021](#) links them to dramatic changes in where people live and how much they travel. As of 2007, population density continues to increase generally, while more people live in urban areas than rural, creating conditions for rapid spread. Meanwhile, airline flights have doubled since 2000, enabling diseases to spread internationally rapidly. Other factors include climate change, which affects the emergence and distribution of new or modified pathogens and the re-emergence of older ones, and how vulnerable people are to them ([Romanello et al, 2022](#)). Changes in land use and habitat destruction result in greater contact between humans and wildlife, and thus greater potential for spillover. Food production methods, which sometimes favour large concentrations of animals in unsanitary conditions, are another culprit. Finally, other types of disasters affect people's vulnerability to pathogens via poor sanitation, nutrition, and access to health services.

These rising hazards mean a growing tendency toward overlapping and compounding hazards. Communities and nations are increasingly experiencing two or more hazards at once, or multiple hazards in rapid succession. IFRC analyses indicate that, since 1990, every year there has been an average of 199 instances of overlapping disasters in the same country. Similarly, on average 44 countries every year experienced overlapping disasters at least once, with a peak of 64 countries in 2000 (see Chapter 8). Of course, countries experiencing conflict and other types of fragility are also struck by multiple types of natural and biological hazards.

When disasters overlap or occur in close succession, the impacts can be magnified. If two disasters occur together, the impacts of each can be far greater. For instance, IFRC's analysis of EM-DAT data suggests that a spell of extreme temperature that occurs at the same time and location as another hazard can affect more people and lead to additional deaths. Similar patterns can be seen for other hazards such as floods, storms and wildfires (see Chapter 8).

It is easy to understand why: two hazards are more likely to overpower a community's resilience than just one, responders are expected to be overstretched, and the first hazard may undermine a coping strategy that would have created resilience to the second. Furthermore, disasters do not have to overlap in time to affect one another. A disaster will have more significant impacts if it occurs relatively soon after another, compared to the same disaster striking after a long period of quiet. In general, the greater the time interval between disasters, the weaker the impacts of the later disaster. This may be because communities have had time to recover, restoring some of their resilience (see Chapter 8).

Many of the same unsustainable trends drive both pandemics of COVID-19 and climate change. One analysis links both to "modern consumptive industrialization, including burning of fossil fuels, increasing human population density, and replacement of natural with human dominated ecosystems". Meanwhile, the factors that make people more vulnerable to the hazards are also often the same: notably poverty, substandard housing and outdated infrastructure ([Pelling et al, 2021](#)).

# 1.3 WHAT WE NEED TO DO INVEST IN PREVENTION AND PREPAREDNESS FOR A MULTI- HAZARD WORLD

We live at a time when hazards of all types, including communicable diseases, are growing more frequent and/or dangerous. The most prudent, economically sound way to mitigate the risk we face can be summed up in eight words: prevent what we can, prepare for everything else.

In this section, we explore the actions required to prevent another health calamity like the COVID-19 pandemic – both how to prevent disease outbreaks from occurring at all, and then how to prevent them from spiralling out of control into major emergencies. Then we tackle the challenge of preparing societies to prevent, detect and respond early and efficiently. Finally, we explore how to expand these preparedness lessons beyond disease outbreaks to a multi-hazard world of increasing, compounding and overlapping risks.

## 1.3.1 Prevent as many health hazards as possible

**The most effective way to handle disasters is to prevent them from happening in the first place.**

Prevention is the ideal response because it avoids or at least reduces the impacts of disease outbreaks, plus all the costs of responding. There is no need to interrupt regular health programming to focus only on one health threat, no need to close down businesses or borders for extensive periods of time, or to manage the long-term socioeconomic impacts of a global pandemic. Avoiding these harms and costs carries enormous benefits. Life can go on as normal, uninterrupted by devastation or trauma. The advantages of prevention are widely known: in occupational health, hazards are managed using a five-tier ‘hierarchy of controls’, the first and most effective being to simply eliminate the hazard ([NIOSH, no date](#)). But this has not always translated into action. In disease risk management – including public health emergencies – it is possible to prevent significantly more risks than we do at present.

In public health, the term ‘prevention’ covers a wide range of activities. **Primary prevention** aims to prevent hazards like diseases from occurring in the first place. **Secondary prevention** focuses on preventing such hazards from snowballing into emergencies. **Tertiary prevention** is about reducing the impacts of an illness or injury. Our discussion focuses on primary and secondary prevention.

The international community did not stop the COVID-19 outbreak from escalating into a pandemic. The global cost of this failure has been enormous. Estimates of the cumulative cost of the pandemic are variable, but they are on the scale of trillions of dollars. One study estimated a cost of US\$16 trillion for the US alone ([Cutler and Summers, 2020](#)). The International Monetary Fund has estimated that the pandemic will cost the global economy US\$13.8 trillion by the end of 2024 ([Gopinath, 2022](#)). Controlling the coronavirus in

early 2020 would have required a substantial investment, but this would have paid off by many orders of magnitude. One study examined the cost of three primary pandemic prevention actions, which might have reduced the risk of COVID-19 becoming a pandemic: better surveillance of pathogen spill-over, coupled with the development of global databases of virus biology; better management of the wildlife trade; and reducing deforestation. The researchers found that these three strategies cost “less than 1/20th the value of lives lost each year to emerging viral zoonoses and have substantial cobenefits” ([Bernstein et al, 2022](#)). Similarly, the World Bank estimates improved preparedness for health emergencies would cost less than US\$1 per person per year, at least in countries with reasonably comprehensive health systems ([World Bank, 2017](#)).

Of course, some disease risks and outbreaks cannot be stopped. It is not currently possible to prevent most pathogens from emerging (unless they are produced in a laboratory). For instance, there is no approved vaccine against the Zika virus, so small outbreaks are inevitable. However, this does not mean that prevention is not achievable. For instance, it is still possible to prevent zoonotic pathogens from spilling over into the human population, or to reduce the risk of contracting a disease through better nutrition and sanitation (primary prevention). Furthermore, there is a wide variety of basic measures we can take to prevent initial outbreaks from spiralling into epidemics or pandemics (secondary prevention).

The story of COVID-19 would have been very different if the international community had embraced primary and secondary prevention. The benefits to humanity of stopping such a virus from entering the human population, and of rapidly controlling such outbreaks when they do occur, would be huge. In the coming age of pandemics, early action and response will not be enough ([Smolinski, 2021](#)).

What actions would have been necessary to prevent the COVID-19 pandemic? There are two interdependent approaches: preventing the initial disease outbreak, and preventing the outbreak from growing into an epidemic, which ultimately became a pandemic.

Preventing disease outbreaks requires us to tackle the factors that make us vulnerable to them. Increasing numbers of novel diseases are emerging, and this is being driven by the same human activities that are causing biodiversity losses. The expansion of agriculture, changes in land use, and the trade and consumption of wildlife are all contributing factors. They bring humans, livestock and wild animals into close proximity – increasing the chances of ‘zoonotic spillovers’ where diseases of wildlife spread to humans ([IPBES, 2020](#)). A study published in 2020 looked at 6,801 ecosystems from around the world. It found that in the human-dominated ecosystems, there were far more animals that hosted pathogens and parasites that could infect humans ([Gibb et al, 2020](#)). This means we are creating the conditions for more frequent disease outbreaks, some of which may become pandemics. A 2021 analysis estimated that a person alive today has about a 39% chance of experiencing a pandemic on the scale of COVID-19 in their lifetime – and that this probability may double in the coming decades ([Marani et al, 2021](#)).

We can reduce these human-induced hazards, sometimes with simple interventions. Others are more complex, which can be enormously effective. For instance, Mexico saw its first known case of cholera in 1991 and moved fast to control the disease. It improved access to safe drinking water and sanitation and boosted disease surveillance. The last reported case of cholera happened just 10 years later, and the disease never became endemic ([Sepúlveda et al, 2006](#)) (see Box 1.2). In the case of airborne infectious diseases like COVID-19, there is growing evidence that improved ventilation and air filtration can reduce people’s exposure and thus limit spread ([Berry et al, 2022](#)).







**Guatemala 2021** Community engagement and accountability session. In Guatemala 160.5 people out of every 1000 were affected by disasters in 2020–2021, not including those also affected by COVID-19. © Hermanos Corallo

To reduce the risk of new infectious diseases emerging, we need to adopt a 'One Health' approach ([OHHLEP, 2022](#)). In this framework, human health is considered part of the global ecological system ([Gibbs, 2014](#)). This is crucial to reducing the risk of zoonotic spillovers that can lead to outbreaks, epidemics and pandemics. For example, livestock should be managed, wherever possible, in ways that prevent undue clustering, as animals in close quarters quickly spread diseases. Similarly, it is best to retain a degree of separation between humans and animals that are known to be a major disease risk. Alongside this, integrated surveillance of human and animal health is our best hope of spotting zoonotic spillovers quickly (see Chapter 5) ([Osman et al, 2021](#)).

When outbreaks do occur, it is best to control them while they are still small. Fortunately, we have many ways to prevent small disease outbreaks from exploding into epidemics or pandemics (see Box 1.3). Preventing pandemics means being able to detect disease outbreaks rapidly, reducing general vulnerability, or even forecasting them (as sometimes is the case for cholera ([Pasetto et al, 2017](#))) (see Box 1.4). Depending on the specific disease, this requires some combination of the following:

- Enhanced disease surveillance, including CBS and mechanisms to identify and inform those who are at risk.
- Rapid investigation, contact tracing and active case finding.
- Testing to identify cases.
- Treatment and/or isolation for those who fall ill, when available.
- Measures to reduce risks to healthcare providers and those seeking healthcare.
- Measures to inform those at risk and help them to change behaviours to reduce exposure and vulnerability, such as better sanitation, nutrition and isolation (if required).

The report *Epidemics That Didn't Happen* describes multiple instances of outbreaks being stopped by swift action ([Resolve to Save Lives, 2022](#)). In one case, a cruise ship was sailing near Rio de Janeiro in Brazil on 14 December 2021. Several crew members began experiencing influenza-like symptoms. More than 3,500 people were aboard and potentially at risk. Three days later, the National Health Surveillance Agency of Brazil was notified that three crew members had tested positive for influenza, and 13 others had been in close contact with at least one of them. Local health authorities formed an emergency operations center. On 18 December, field epidemiologists boarded the ship to collect samples, conduct laboratory testing, and investigate further cases. Those who tested positive for influenza left the ship and were isolated in a hotel, where they were monitored daily. Aboard the ship, the teams encouraged additional measures, including mandatory mask use, social distancing and health guidelines. A flu vaccination drive took place on 18 December. Only 10 days later, the outbreak was declared over. No new cases were confirmed, there were no hospitalizations, and no passengers were infected. Nor did influenza spread beyond the ship.

Many of these pillars of epidemic prevention can be adapted and undertaken by **local actors** in at-risk communities. For example, in early February 2022, Red Cross volunteers in Makuma village in Sierra Leone reported 32 alerts of fever with red skin rash. These were quickly reported to the community health centre and district surveillance office. Testing revealed measles, sparking a targeted vaccination campaign in Makuma and surrounding villages – rapidly bringing the disease under control (IFRC, 2022d) (see Chapter 2).

## BOX 1.2: PREVENTING OUTBREAKS BY PROVIDING CLEAN AND SAFE WATER

The IFRC is working to prevent outbreaks of diseases spread by dirty and unsafe water. Improved water, sanitation and hygiene (WASH) can reduce the spread of diseases like cholera, so the IFRC has been running the One WASH programme. The aim is to provide safe drinking water and sanitation to communities currently vulnerable to cholera, thus protecting them against the disease. Alongside this, the programme also offers vaccinations and boosts community-based surveillance (CBS) so that outbreaks can be detected swiftly ([IFRC, 2021e](#)).

Prompted by the COVID-19 pandemic, the IFRC is now expanding One WASH with the aim of controlling multiple water-borne diseases. As well as cholera, WASH programmes can reduce the spread of typhoid, Shigella and rotavirus, to name just three. If funding and support can be secured, the IFRC plans to roll out One WASH in up to 100 countries. Similar WASH projects, and analogous programmes to control other types of pathogens, should be widely deployed.



**Mozambique 2019** Hundreds of families fled their homes following Cyclone Idai to seek safety in accommodation centres like this one. Sanitary conditions are poor, putting communities at risk of water-borne diseases such as cholera. Red Cross volunteers are working in these centres to ensure communities have access to safe water to prevent future outbreaks from occurring. © Corrie Butler / IFRC

## **BOX 1.3 / CASE STUDY**

### **AN ANTHRAX EPIDEMIC THAT DIDN'T HAPPEN**

On 15 August 2019, a volunteer with the Kenya Red Cross Society received some worrying news. In Narok, a town near the Maasai Mara National Reserve, a local herder and two students had become ill after eating beef. All three had been diagnosed with anthrax.

The volunteer had been trained on the Kenya Red Cross Society's community-based surveillance (CBS) system (IFRC, 2021b) and swiftly sent an SMS to the system, alerting their supervisor. This message was passed on to local health and veterinary authorities, and the national surveillance system.

The volunteer also had some local knowledge due to their engagement with the community. They reported that the Maasai herders were familiar with anthrax, but many were sceptical about the dangers.

Thanks to the volunteer's quick action and the CBS system, the supervisor and Government County Veterinary Officer investigated the health of livestock in the area. Within days, the county vaccinated 10,600 cattle and 14,000 sheep.

The government and Kenya Red Cross Society knew they needed the trust and participation of local farmers, so they convened a traditional community dialogue session. School teachers were shown how to screen children for infection and how to report illnesses to public health officers or area volunteers. Meanwhile, the Kenya Red Cross Society's Community Epidemic and Pandemic Preparedness Program (CP3) conducted awareness-raising activities, including radio broadcasts, household visits and community group education sessions. These activities improved the community's knowledge of health, particularly how to safely dispose of animal carcasses and report unusual animal illnesses. The outreach work was so successful that the community recognized the risk of anthrax, of which many were previously sceptical. They prioritized mitigation efforts and took over financing their own animal vaccinations.

Just over a month after the initial incident, the situation was deemed under control. There were four human cases and one death. Furthermore, the community was better prepared than before ([Resolve to Save Lives, 2021](#)).



**Kenya 2019** Josphat is a Red Cross volunteer from a Maasai community in Narok County, Kenya. He helps to engage his community in preventing diseases including anthrax and cholera and refers families to a hospital to get the adequate care they need. © Corrie Butler / IFRC

## BOX 1.4: FORECASTING AND ANTICIPATORY ACTION

With more and better data comes the potential for forecasting and acting in advance. Anticipatory actions based on forecasts are key to humanitarian action in the 21st century.

Many disasters can now be predicted ahead of time, with varying degrees of precision and time lag. Droughts and locust outbreaks can be forecast months in advance, while a hurricane making landfall gives a few days' warning at most. Such forecasting enables governments and humanitarians to take action before the hazard occurs, saving more lives and reducing harm in a cost-effective way. For example, if a hurricane is on its way, communities can be evacuated to shelters ahead of time – provided the shelters have been built and the community has a high degree of trust in the people making the forecast ([IFRC, no date a](#)).

The simplest way to translate a forecast into action is to create early warnings. National-level warning systems regularly save lives and should be bolstered, but they often only reach some communities. Community-based multi-hazard early warning systems are essential, and many National Societies have helped local people to create them. **Local action** is best: community early warning systems should leverage local knowledge, skills and experience, plus new forms of data, and harness networks of volunteers to ensure everyone is contacted when warnings are issued (see Chapter 2). To support this, the IFRC joined governmental and agency partners to create the Risk-informed Early Action Partnership (REAP). This aims to make one billion people safer from disasters by 2025 by increasing funding for early action, improving early warning systems, and helping local actors to take early action ([REAP, no date](#)).

Forecasts are more valuable if they lead to a range of coordinated actions. This is enabled by impact-based forecasts, which go beyond simply predicting when a hazard will occur and estimate the likely impacts on people ([Red Cross Red Crescent Climate Centre, 2020](#)). IFRC's GO platform visualizes forecast hazards alongside information about the number of people and critical assets in their paths. To help with longer term planning, it also has information about anticipatory actions communities might take to mitigate risks associated with specific hazards ([IFRC GO, no date a](#)).

Through Forecast-based Action by the Disaster Response Emergency Fund (FbA by the DREF), the IFRC offers dedicated funding to help National Societies swing into action before a disaster strikes ([IFRC, no date b](#)). The mechanism is an example of forecast-based financing ([Forecast-Based Financing, no date](#)). It uses weather forecasts and other risk analyses to determine whether a hazard is imminent and automatically releases funding if it is. Meanwhile, the National Societies have predetermined Early Action Protocols (EAPs), which are activated in response to specific triggers, releasing funds from the FbA by the DREF.

Regrettably, the forecasting of diseases is still in its infancy. Some diseases display regularity: many countries experience a winter wave of influenza. However, forecasting outbreaks remains a challenge. To date, only a handful of diseases including cholera ([Pasetto et al, 2018](#)) and dengue ([Hii et al, 2012](#)) have been correctly forecast. Nevertheless, anticipatory action is possible: many EAPs include early actions to prevent disease outbreaks that can result from events like floods and heat waves.

## 1.3.2 Prepare at all levels for all major impacts of every health hazard

Sadly, prevention has its limits. Despite our best efforts, it is inevitable that some disease outbreaks will occur, and some will grow into larger health emergencies such as epidemics.

It is, therefore, necessary to boost preparedness. We must engage in preparedness at every level, from the very top of government to the smallest local community (see Chapter 2). A chain is only as strong as its weakest link: if a country ensures its government ministries are prepared for disease outbreaks but neglects **local communities**, it will struggle to cope when outbreaks occur. It is therefore necessary to ensure community preparedness gets as much support as preparedness at other levels of society ([IFRC, 2021c](#)):

- **Communities:** It is crucial that communities possess the knowledge and skills to take preventive action, whether that be alerting medical professionals about a disease outbreak or organizing an evacuation ahead of a hurricane. To achieve this, it is necessary to strengthen community health literacy about epidemic-prone diseases and how to prevent and prepare for outbreaks. This entails coordinating with local stakeholders. We must also mobilize communities to attend health activities such as government vaccination drives.
- **Authorized frontline responders:** Local actors and humanitarian aid organizations, such as National Red Cross Red Crescent Societies, have a huge role to play in helping communities to cope with disease outbreaks. In some places, they are the primary providers of healthcare, running anything from blood banks to mental health and psychosocial support. It is essential that their capabilities be regularly assessed. They must also be given a secure footing through stable funding mechanisms that enable them to retain staff and stockpile resources.
- **Other key stakeholders:** Disease outbreaks and other hazards don't just threaten lives: they can upend many aspects of society, from food production to education (see Chapter 4). To minimize these harmful ramifications, it is crucial for preparedness workers to identify the correct stakeholders early on. Some of these will be technical experts, but they will also include community leaders, owners of private businesses, and more. The private sector has a key role to play in preparedness: it can supply funding, technical expertise, useful technologies and data, and be a source of solidarity. Likewise, the media is crucial for disseminating public health messages.

The overall aim must be health systems strengthening: that is, to improve countries' healthcare systems. The WHO says health systems strengthening aims to create "a well-functioning health system working in harmony...built on having trained and motivated health workers, a well-maintained infrastructure, and a reliable supply of medicines and technologies, backed by adequate funding, strong health plans and evidence-based policies". A key element of health systems strengthening is universal health coverage ensuring everyone in a country has access to the health system (see Chapter 2).



For emergencies like disease outbreaks, regular practice exercises are key. Frequent training and simulations enable response teams to discover the faults in their plans ahead of time and thus fix them.

It is also essential to build communities' trust in the health system before an outbreak occurs. Many people distrust the authorities in their country, have had negative experiences with healthcare, or have strong cultural beliefs that reduce their willingness to seek assistance. Overcoming these barriers to trust takes time and should be undertaken during 'normal' conditions, instead of being neglected until an emergency occurs (see Chapter 2).

Finally, we must remember that a health emergency has impacts that go beyond immediate health consequences – and plan accordingly for **all** the major consequences. The COVID-19 pandemic is a health crisis at its root, but its impacts are not limited to the health impacts of the coronavirus. The pandemic has harmed people's livelihoods, mental health and children's educations. Countries that responded successfully did so in part by supplying medicines and vaccines, but they also supplied financial aid and other forms of assistance. In most countries, the socioeconomic harms of the pandemic have deepened societal inequities. If we are to prevent such unjust outcomes when future hazards arise, we must devise responses that address all of the people's needs. It is, therefore, essential to prepare for the socioeconomic impacts of hazards, for example for in-home care during periods of isolation for people who require regular assistance. It is also essential to develop digital forms of assistance, which can be rolled out at scale (see Box 1.5). More broadly, strengthening social protections is key because such systems can help people through multiple forms of disaster (see Chapter 4).



**Philippines 2021** To ensure that no one is left behind, Philippine Red Cross volunteers travelled to remote areas to conduct mobile COVID-19 vaccinations. Volunteers are patiently addressing people's concerns and fears about the vaccine. © France Noguera

## BOX 1.5: THE MANY USES OF DIGITAL TECHNOLOGIES

COVID-19 created unprecedented challenges for responders, which they often solved using digital approaches. Digital forms of assistance were already growing in popularity for years before COVID-19 emerged, but the pandemic supercharged their use. Restrictions on travel meant it was difficult or impossible to reach the most vulnerable people. The same restrictions also exacerbated vulnerabilities, by cutting people off from their livelihoods, friends and families – making it more urgent than ever to get help to them.

Many forms of health assistance have been delivered digitally during the pandemic. In many countries, health services shifted to online booking systems to reduce the number of people visiting delivery centres. Red Cross and Red Crescent volunteers who would previously have visited vulnerable people in their homes had to telephone or text instead. Training was done online. This shift to digital solutions was an example of adaptability and clearly mitigated some of the pandemic's worst harms, including psychological and socioeconomic impacts. Such approaches are a key element in future humanitarian responses. The IFRC network now offers several smartphone apps, offering advice on first aid, helping people prepare for emergencies like hurricanes ([American Red Cross, no date](#)), and even providing an epidemic control toolkit ([IFRC, no date c](#)).

However, digital aid is only sometimes the best or even a possible substitute for in-person assistance. One such area is mental health and psychosocial support (MHPSS). When people's movement was restricted during the COVID-19 pandemic, IFRC staff provided psychological services over the phone and via video chat ([IFRC Psychosocial Centre, 2020](#)). However, a 2020 IFRC report concluded that "remote support cannot replace face-to-face services". The evidence for the effectiveness of remote MHPSS remains limited, and the physical presence of another person is a benefit in and of itself ([IFRC, 2020b](#)).

A major disadvantage of digital assistance is that it excludes those without online access or those who are uncomfortable with it ([IFRC, 2018](#)). This is a significant failure of **equity**, because it is often the poorest and most vulnerable who are cut off from the digital world. Notably, a 2021 report by the Red Cross Red Crescent Global Migration Lab found that migrants were often subject to digital exclusion during the COVID-19 pandemic ([Red Cross Red Crescent Global Migration Lab, 2021](#)). In Egypt, the processes for issuing and renewing residency permits were online, and not universally accessible. Although the government decided not to charge fines for expired residency permits, and to extend the period of renewal, migrants with no access to online processes were unable to pay bills or receive assistance. Others were uncomfortable using it: digital psychological safety is an important factor, linked to digital literacy, **trust** and protection.

To combat digital exclusion, governments must boost both mobile/internet access and digital skills or assistance, especially for remote communities and vulnerable people. This is essential to ensure they are not left behind by the digital revolution.

“

**The international community did not stop the COVID-19 outbreak from escalating into a pandemic. The global cost of this failure has been enormous.**

”



### 1.3.3 Multi-hazard prevention and preparedness

Finally, what do societies need to do to prepare for a multi-hazard world? How does multi-hazard preparedness differ from health emergency preparedness or earthquake preparedness?

The short answer is that we need integrated systems to enable multi-hazard preparedness. Teams of responders that are only trained to respond to a coronavirus outbreak or a tsunami will not be able to cope. Instead, teams must have a broad mix of skills. Specialists and experts are still essential, but they must learn to work in integrated teams. Building such teams requires **trust** and **equity**: members must respect each other's skillsets. Such integration needs to occur at the national, local and organisational levels.

It is crucial to break down the barriers separating disaster risk management and public health. These two areas have often been siloed, which limits their effectiveness. In reality, the two fields are strongly connected. For example, floods do not just increase the risk of drowning, and damage and losses; they also carry water-borne diseases. Again, a One Health approach, which views human health as part of a broader social-ecological system, must be embedded (see Box 1.6).

To create such integrated teams, it is necessary to increase staffing and resources in disaster and health teams – in particular at the community level. Primary healthcare, in particular, needs significant improvement. It is a mistake to run hospitals and other healthcare centres at maximum capacity during normal conditions, because there is no spare capacity to cope with crises. The drive towards efficiency, often in the name of cutting costs, has reduced the resilience of the system. Furthermore, such understaffing means team members do not have the opportunity to learn new skills or improve their processes (see Chapter 5). The same logic applies to community health centres and other **local actors**. The best approach is to build up such teams and their resources during good times. That way, they have a good chance of being prepared when the bad times come.

Training exercises must focus on multi-hazard preparedness. A country may be at high risk of earthquakes because of its location, in which case responders should train for such events. However, those responders should also practise for 'generic' threats like influenza, which may be less salient but are entirely plausible (see Box 1.7).

## BOX 1.6: MULTI-HAZARD PREPAREDNESS IN ACTION

IFRC's Preparedness for Effective Response (PER) scheme helps National Societies improve their preparedness. It is effective, in part, because it emphasizes multi-hazard preparedness. PER helps National Societies to assess how prepared they are for different hazards, to identify areas of improvement and to devise and carry out a plan to become better prepared. At all stages, the process emphasizes coordination with the National Societies' partners, from the community-level responders to the private sector and the authorities (IFRC, 2019).



**Panama 2021** Heavy rains in July inundated several provinces of Panama, causing severe floods and landslides, destroying homes and displacing thousands of people. The Red Cross Society of Panama mobilized volunteers to assist more than 800 families (4,000 people) in the hardest hit townships of Bocas del Toro. © Bienvenido Velasco

## BOX 1.7 / CASE STUDY

### HOW PANAMA HANDLED A HURRICANE DURING THE WORST OF THE PANDEMIC

In early November 2020, Hurricane Eta tore through parts of Central America after making landfall as a category 4 hurricane. It was the second-strongest storm of the 2020 Atlantic hurricane season and caused havoc in multiple countries ([IFRC, 2021a](#)).

In Panama, Eta brought landslides, flooding and strong winds. Thousands of people were forced to leave their homes.

This was potentially a dire situation, because the hurricane had struck during the height of the COVID-19 pandemic. It was an example of how hazards increasingly overlap and compound each other. Panama was already struggling to deal with a dangerous infectious disease for which no vaccine was yet available; now it had a hurricane to handle as well.

One potential impact was the increased spread of COVID-19. Prevention measures like social distancing became harder in evacuation shelters and other places ([IFRC, 2020a](#)).

The Panamanian Red Cross implemented the Preparedness Approach for Effective Response for the first time. This entailed a detailed review of their processes, enabling it to identify weaknesses in previous responses and improve them. These areas of improvement included logistics, communication, and coordination with other actors. By working closely with government figures like mayors, and other actors, the Panamanian Red Cross obtained crucial facilities like storage spaces that it did not previously have.

These improvements meant the Panamanian Red Cross was able to deliver essentials like access to hygiene and drinking water. This is likely to have reduced the risk of infections, whether COVID-19 or other diseases like cholera ([Acosta, 2021](#)).

The Panamanian Red Cross's experience shows that it is possible to respond effectively even when multiple overlapping disasters occur. Doing so requires meticulous preparation and coordination.



# KEY RECOMMENDATIONS

**Prevent disease outbreaks as much as possible.** Notably, the rate at which new diseases enter the human population from animals can be reduced through the One Health approach: for example, integrated surveillance of animal and human health. Meanwhile, public health measures like improved sanitation, nutrition, air quality (for instance through ventilation) and vaccination (when available) can help keep outbreaks contained. Communities must be engaged in the design and implementation of these programmes.

**Strengthen health systems before outbreaks occur, to prevent a crisis from spiralling into epidemics and pandemics.** Health systems strengthening is essential to enable rapid and effective responses. Early warning/early action is critical. It is most effective through permanent presence and surveillance at the community level. Strategies like contact tracing, testing and preventive treatments can slow the spread of a disease and improve people's health outcomes. These must be complemented by other public health countermeasures, such as (well-supported) isolation measures, hand washing and mask wearing.

**National and local authorities should create nationally coordinated preparedness plans.** Preparedness plans must embrace the whole of society, from communities and local actors to health systems and government ministries. It is essential that there are coordination mechanisms in place, and well-defined roles and responsibilities, so these actors can work together smoothly and effectively. This requires regular training. It also demands capacity building for local actors, who have not hitherto received enough support (see Chapter 2).

**Enable multi-hazard preparedness by building integrated teams.** The risk of disease outbreaks is rising, as is the risk of other hazards like hurricanes and droughts. For societies to become resilient, they must invest in multi-hazard preparedness. This requires integrated response teams, particularly at the community level, with the knowledge and resources to respond to multiple and even overlapping hazards. Increasing digital access and literacy will enable more people to receive aid digitally.

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