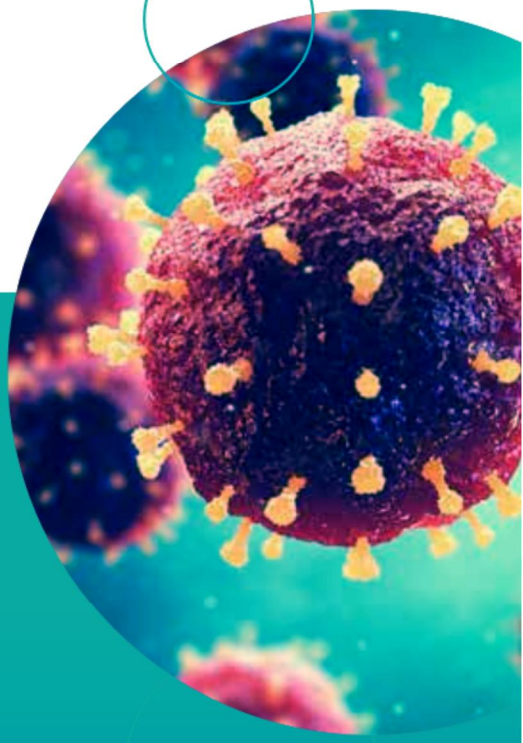
A WORLD AT RISK

Annual report on global preparedness for health emergencies

Global Preparedness Monitoring Board

September 2019



GPMB

GLOBAL PREPAREDNESS MONITORING BOARD

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We extend our warm gratitude to the lead organizations and experts who developed the background papers for the GPMB (please see: www.who.int/gpmb/thematic_report.html for all papers and their contributors; list of organizations in alphabetical order): Anthrologica & the International Federation of Red Cross and Red Crescent Societies; Independent Oversight Advisory Committee (IOAC) for the WHO Health Emergencies Programme; Johns Hopkins University Center for Health Security; University of Oxford & Chatham House; Wellcome Trust; the World Bank Group; and, the World Health Organization.

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A WORLD AT RISK

Annual report on global preparedness for health emergencies

Global Preparedness Monitoring Board

GPMB
GLOBAL PREPAREDNESS MONITORING BOARD

About the Global Preparedness Monitoring Board

As an independent monitoring and advocacy body, the Global Preparedness Monitoring Board (hereafter referred to as the Board or GPMB) urges political action to prepare for and mitigate the effects of global health emergencies. Co-convened in May 2018 by the World Bank Group and the World Health Organization, the Board builds on the work of the Global Health Crises Task Force and Panel, created by the United Nations Secretary-General in the wake of the 2014-2016 Ebola epidemic. The Board works independently of all parties, including its co-conveners, to provide the most frank assessments and recommendations possible. The findings, interpretations, conclusions and opinions expressed in this report and by Board members represent their views only and not those of their organizations or of the co-conveners.

The 15-member Board is made up of political leaders, heads of agencies, and experts, led jointly by Dr Gro Harlem Brundtland, formerly Prime Minister of Norway and Director-General of the World Health Organization and Mr Elhadj As Sy, Secretary General of the International Federation of Red Cross and Red Crescent Societies. Members serve on the Board in their individual capacities.

The goals of the Board are to:

- assess the world's ability to protect itself from health emergencies
- identify critical gaps to preparedness across multiple perspectives;
- advocate for preparedness activities with national and international leaders and decision-makers.

The Board differs from other similar commissions and mechanisms, which are time-limited and often specific to one agency or sector. The Board, with a five-year initial term and benefiting from the engagement of independent experts and the support of a professional Secretariat, will monitor preparedness across a broad range of actors and sectors, urging specific actions to drive change. It complements and enhances existing accountability functions of the World Health Organization, the United Nations, the World Bank and other stakeholders.

Approach to the first annual report – a focus on seven urgent actions

In this first annual report, the Board explores and identifies the most urgent needs and actions required to accelerate preparedness for health emergencies, focusing in particular on biological risks manifesting as epidemics and pandemics. The Board analysed evidence and commissioned seven review papers that explore the challenges of preparedness through various lenses: governance and coordination; country preparedness capacities; research and development; financing; enhancing community engagement and trust; preparing for and managing the fallout of a high-impact respiratory pathogen pandemics; and, lessons learned and persistent gaps revealed by recent outbreaks of Ebola virus disease in Africa. The Board has drawn on these papers and other data to identify areas where preparedness efforts are working and where they are faltering *(1)*.

The Board identified seven actions that leaders must implement to prepare for pressing threats. Some can - and should - be accomplished immediately whereas others are more long-term. One of the Board's first priorities will be to develop a monitoring framework to track progress not only on these actions, but on other national and global political commitments as well. The Board looks forward to engaging with global, regional and national leaders and stakeholders on ways to accelerate progress on these actions.

All background documents, the Board's monitoring framework, strategy, annual plans and related documents are available on the Board's website.

Future GPMB work

Future reports will monitor progress on preparedness for other types of health emergencies, such as those caused by natural disasters. In addition to its monitoring function, the Board will monitor progress in preparedness, assess emerging issues and make additional recommendations as needed.

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FOREWORD

H.E. Dr Gro Harlem Brundtland

Co-Chair
Former Prime Minister of Norway and former WHO Director-General

Mr Elhadj As Sy

Co-Chair
Secretary-General of the International Federation of Red Cross and Red Crescent Societies

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While disease has always been part of the human experience, a combination of global trends, including insecurity and extreme weather, has heightened the risk. Disease thrives in disorder and has taken advantage--outbreaks have been on the rise for the past several decades and the spectre of a global health emergency looms large. If it is true to say "what's past is prologue", then there is a very real threat of a rapidly moving, highly lethal pandemic of a respiratory pathogen killing 50 to 80 million people and wiping out nearly 5% of the world's economy. A global pandemic on that scale would be catastrophic, creating widespread havoc, instability and insecurity. The world is not prepared.

Outbreaks hit lower-resourced communities much harder given their lack of access to basic health services, clean water and sanitation; this will aggravate the spread of any infectious pathogen. Disease amplifiers, including population growth and resulting strains on the environment, climate change, dense urbanization, exponential increases in international travel and migration, both forced and voluntary, increase the risk for everyone, everywhere.

Leaders at all levels hold the key. It is their responsibility to prioritize preparedness with a whole-of-society approach that ensures all are involved and all are protected.

The world needs to proactively establish the systems and engagement needed to detect and control potential disease outbreaks. These acts of preparedness are a global public good that must meaningfully engage communities, from the local to the international, in preparedness, detection, response and recovery. Investing in health emergency preparedness will improve health outcomes, build community trust and reduce poverty, thereby also contributing to efforts to achieve the United Nations Sustainable Development Goals.

For its first report, the Global Preparedness Monitoring Board (GPMB) reviewed recommendations from previous high-level panels and commissions following the 2009 H1N1 influenza pandemic and the 2014--2016 Ebola outbreak, along with its own commissioned reports and other data. The result is a snapshot of where the world stands in its ability to prevent and contain a global health threat. Many of the recommendations reviewed were poorly implemented, or not implemented at all, and serious gaps persist. **For too long, we have allowed a cycle of panic and neglect when it comes to pandemics: we ramp up efforts when there is a serious threat, then quickly forget about them when the threat subsides. It is well past time to act.**

The GPMB will advocate at the highest levels so that continued, sustained commitments – political, financial and social -- are high on the political agenda and we will increase accountability for follow-through. The world is at risk. But, collectively, we already have the tools to save ourselves and our economies.

What we need is leadership and the willingness to act forcefully and effectively.

EXECUTIVE SUMMARY: ACTIONS FOR LEADERS TO TAKE

The world requires determined political leadership to prepare for health threats at national and global levels. **The GPMB calls for:**

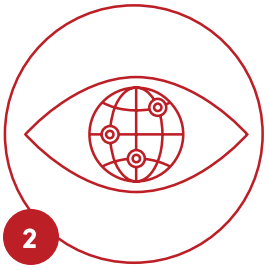
SEVEN URGENT ACTIONS TO PREPARE THE WORLD FOR HEALTH EMERGENCIES

Heads of government must commit and invest.

Heads of government in every country must commit to preparedness by implementing their binding obligations under the International Health Regulations (IHR (2005). They must prioritize and dedicate domestic resources and recurrent spending for preparedness as an integral part of national and global security, universal health coverage and the Sustainable Development Goals (SDG).

Progress indicator(s) by September 2020

- All countries that have completed an assessment of their capacities by 1 July 2019 have developed a costed National Action Plan for Health Security (NAPHS), identified required resources and started to implement the plan.

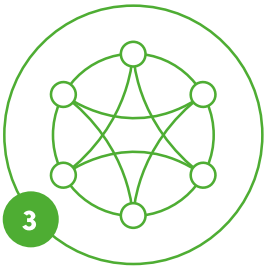


Countries and regional organizations must lead by example.

G7, G20 and G77 Member States, and regional intergovernmental organizations must follow through on their political and funding commitments for preparedness and agree to routinely monitor progress during their annual meetings.

Progress indicator(s) by September 2020

- G7, G20, G77 and regional intergovernmental organizations monitor their commitments to preparedness for health emergencies.

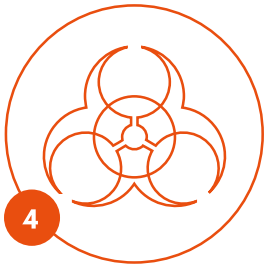


All countries must build strong systems.

Heads of government must appoint a national high-level coordinator with authority and political accountability to lead whole-of-government and whole-of-society approaches, and routinely conduct multisectoral simulation exercises to establish and maintain effective preparedness. They must prioritize community involvement in all preparedness efforts, building trust and engaging multiple stakeholders (e.g. legislators; representatives of the human and animal health, security and foreign affairs sectors; the private sector; local leaders; and women and youth).

Progress indicator(s) by September 2020

- At a minimum, the 59 countries that have completed a NAPHS identify a national high-level coordinator (board, commission or agency) to implement national preparedness measures across all sectors, and to lead and direct actions in these sectors in the event of a public health emergency.
- WHO, the World Bank and partners, working with countries, develop and cost packages of priority interventions to increase preparedness capacity that can be financed in current budget cycles and map these interventions to expected results in the near term.
- There are fewer, but better harmonized coordination mechanisms, global, regional and country networks, institutions and initiatives for preparedness and readiness and for research and development (R&D).



Countries, donors and multilateral institutions must be prepared for the worst.

A rapidly spreading pandemic due to a lethal respiratory pathogen *(whether naturally emergent or accidentally or deliberately released)* poses additional preparedness requirements. Donors and multilateral institutions must ensure adequate investment in developing innovative vaccines and therapeutics, surge manufacturing capacity, broad-spectrum antivirals and appropriate non-pharmaceutical interventions. All countries must develop a system for immediately sharing genome sequences of any new pathogen for public health purposes along with the means to share limited medical countermeasures across countries.

Progress indicator(s) by September 2020

- Donors and countries commit and identify timelines for: financing and development of a universal influenza vaccine, broad spectrum antivirals, and targeted therapeutics. WHO and its Member States develop options for standard procedures and timelines for sharing of sequence data, specimens, and medical countermeasures for pathogens other than influenza.
- Donors, countries and multilateral institutions develop a multi-year plan and approach for strengthening R&D research capacity, in advance of and during an epidemic.
- WHO, the United Nations Children's Fund, the International Federation of Red Cross and Red Crescent Societies, academic and other partners identify strategies for increasing capacity and integration of social science approaches and researchers across the entire preparedness/response continuum.

Financing institutions must link preparedness with financial risk planning.

To mitigate the severe economic impacts of a national or regional epidemic and/or a global pandemic, the International Monetary Fund (IMF) and the World Bank must urgently renew their efforts to integrate preparedness into economic risk and institutional assessments, including the IMF's next cycle of Article IV consultations with countries and the World Bank's next Systematic Country Diagnostics for International Development Association (IDA) credits and grants. Funding replenishments of the IDA, Global Fund to Fight AIDS, TB and Malaria (Global Fund), and Gavi should include explicit commitments regarding preparedness.

Progress indicator(s) by September 2020

- The IMF and the World Bank integrate preparedness in their systematic country risk, policy and institutional assessments, including in Article IV staff reports and for IDA credits/grants respectively.
- International funding mechanisms expand their scope and envelopes to include health emergency preparedness, including the IDA19 replenishment, the Central Emergency Response Fund, Gavi, the Global Fund and others.

Development assistance funders must create incentives and increase funding for preparedness.

Donors, international financing institutions, global funds and philanthropies must increase funding for the poorest and most vulnerable countries through development assistance for health and greater/earlier access to the United Nations Central Emergency Response Fund to close financing gaps for their national actions plans for health security as a joint responsibility and a global public good. Member states need to agree to an increase in WHO contributions for the financing of preparedness and response activities and must sustainably fund the WHO Contingency Fund for Emergencies, including the establishment of a replenishment scheme using funding from the revised World Bank Pandemic Emergency Financing Facility.

Progress indicator(s) by September 2020

- WHO member states agree to an increase in contributions for preparedness at the Seventy-third World Health Assembly in 2020; and Member States, the World Bank and donors provide sustainable financing for the Contingency Fund for Emergencies to a level of US$ 100 million annually.

The United Nations must strengthen coordination mechanisms.

The Secretary General of the United Nations, with WHO and United Nations Office for the Coordination of Humanitarian Affairs (OCHA), must strengthen coordination in different country, health and humanitarian emergency contexts, by ensuring clear United Nations systemwide roles and responsibilities; rapidly resetting preparedness and response strategies during health emergencies; and, enhancing United Nations system leadership for preparedness, including through routine simulation exercises. WHO should introduce an approach to mobilize the wider national, regional and international community at earlier stages of an outbreak, prior to a declaration of an IHR (2005) Public Health Emergency of International Concern.

Progress indicator(s) by September 2020

- The Secretary-General of the United Nations, with the Director-General of WHO and Under-Secretary-General for Humanitarian Affairs strengthens coordination and identifies clear roles and responsibilities and timely triggers for a coordinated United Nations systemwide response for health emergencies in different countries and different health and humanitarian emergency contexts.
- The United Nations (including WHO) conducts at least two system-wide training and simulation exercises, including one for covering the deliberate release of a lethal respiratory pathogen.
- WHO develops intermediate triggers to mobilize national, international and multilateral action early in outbreaks, to complement existing mechanisms for later and more advanced stages of an outbreak under the IHR (2005).
- The Secretary General of the United Nations convenes a high-level dialogue with health, security and foreign affairs officials to determine how the world can address the threat of a lethal respiratory pathogen pandemic, as well as for managing preparedness for disease outbreaks in complex, insecure contexts.

A world at risk

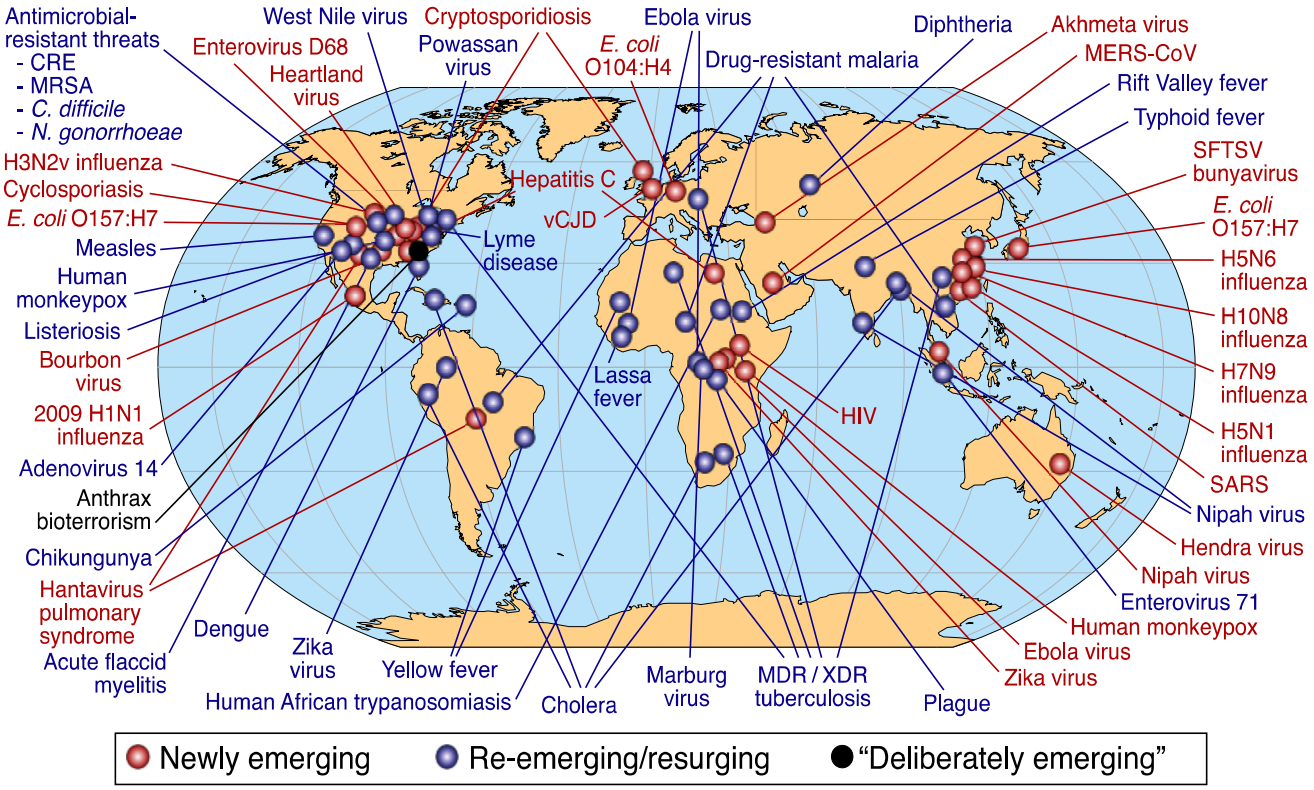
The world is at acute risk for devastating regional or global disease epidemics or pandemics that not only cause loss of life but upend economies and create social chaos.

Vulnerability is heightened by an increase in outbreaks occurring in complex humanitarian emergencies, as well as a novel convergence of ecological, political, economic and social trends including population growth, increased urbanization, a globally integrated economy, widespread and faster travel, conflict, migration and climate change *(2)*. Specific risks are described below:

The world is confronted by increasing infectious disease outbreaks.

Between 2011 and 2018, WHO tracked 1483 epidemic events in 172 countries[3]. Epidemic-prone diseases such as influenza, Severe Acute Respiratory Syndrome (SARS), Middle East Respiratory Syndrome (MERS), Ebola, Zika, plague, Yellow Fever and others, are harbingers of a new era of high-impact, potentially fast-spreading outbreaks that are more frequently detected and increasingly difficult to manage. Fig. 1 demonstrates the global emergence of selected pathogens over the past 50 years, including both those that naturally emerge/re-emerge and those that are deliberately released.

FIGURE 1 Global examples of emerging and re-emerging diseases



C. difficile: Clostridium difficile; CRE: carbapenem-resistant Enterobacteriaceae; E. coli: Escherichia coli; MDR: multidrug-resistant [tuberculosis]; MERS-CoV: Middle East respiratory syndrome coronavirus; MRSA: meticillin-resistant Staphylococcus aureus; N. gonorrhoeae; Neisseria gonorrhoeae; SFTSV: severe fever with thrombocytopenia syndrome virus; XDR: extensively drug-resistant [tuberculosis].

Source: United States National Institutes of Health, National Institute for Allergies and Infectious Diseases *(4)*.

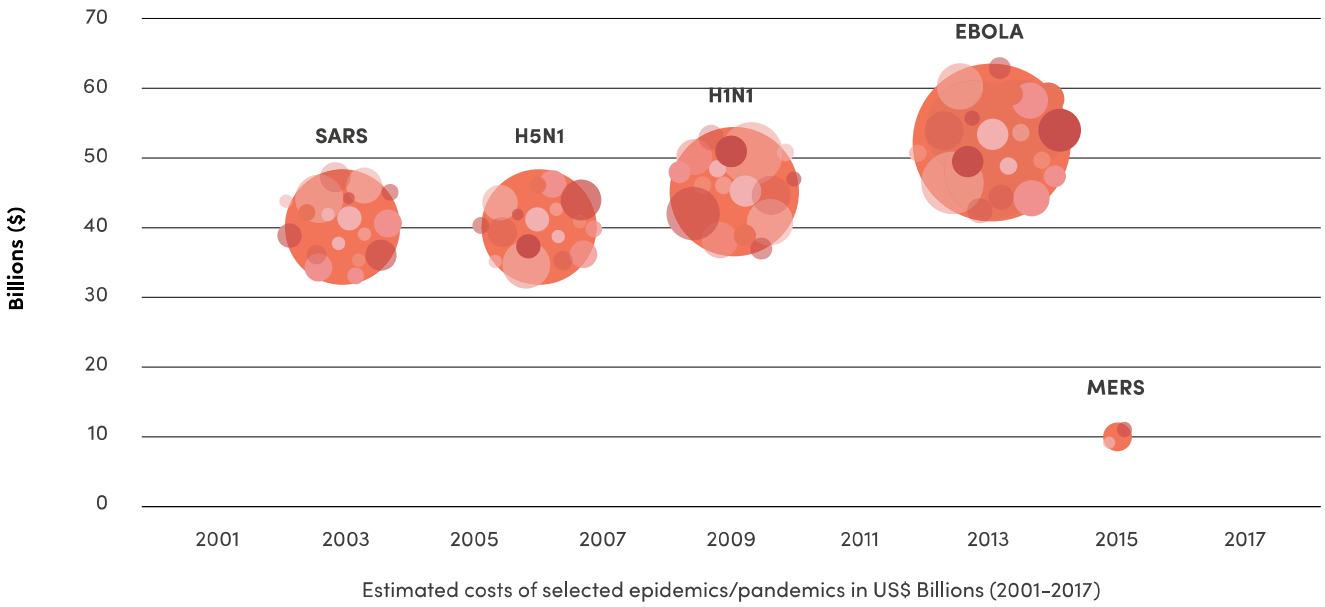
The poor suffer the most.

Any country without basic primary health care, public health services, health infrastructure and effective infection control mechanisms faces the greatest losses, including death, displacement and economic devastation. Disease outbreaks disrupt the entire health system reducing access to health services for all diseases and conditions, which leads to even greater mortality and further economic depression. Negative impacts are particularly profound in fragile and vulnerable settings, where poverty, poor governance, weak health systems, lack of trust in health services, specific cultural and religious aspects and sometimes ongoing armed conflict greatly complicate outbreak preparedness and response.

All economies are vulnerable.

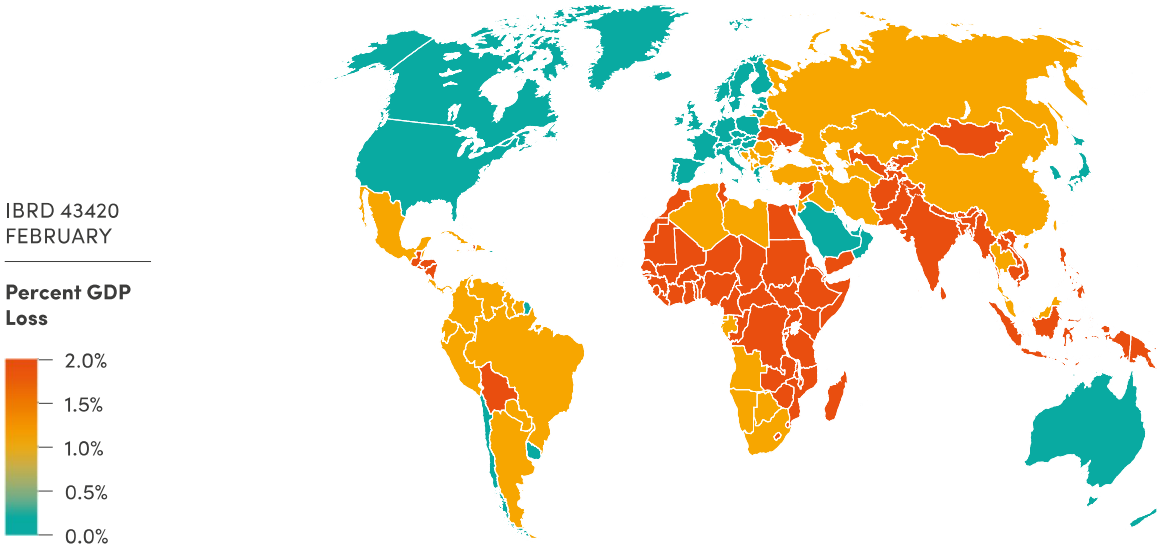
In addition to loss of life, epidemics and pandemics devastate economies. Estimated costs of past events include: a loss of over US $40 billion in productivity from the 2003 SARS epidemic *(5)*; US$53 billion loss from the economic and social impact of the 2014–2016 West Africa Ebola outbreak *(6,7)*; and the US$ 45 to 55 billion cost of the 2009 H1N1 influenza pandemic[8] (Fig. 2). The World Bank estimates that a global influenza pandemic akin to the scale and virulence of the one in 1918 would cost the modern economy US$ 3 trillion, or up to 4.8% of gross domestic product (GDP); the cost would be 2.2% of GDP for even a moderately virulent influenza pandemic *(9)*. Models predict the annual cost of a global influenza pandemic would mean that South Asia's GDP would drop by 2% (US$ 53 billion), and Sub-Saharan Africa's GDP by 1.7% (US$ 28 billion), the latter equivalent to erasing a full year's economic growth (Fig. 3) *(10,11,12)*.

FIGURE 2 Costs of selected epidemics (US$ billions)



Source: Resolve to Save Lives (www.resolvetosavelives.org).

FIGURE 3 Predicted country vulnerability to pandemic economic loss, 2018 (% GDP loss)



IBRD: International Bank for Reconstruction and Development.
Source: Resolve to Save Lives (www.resolvetosavelives.org).

The direct impacts on countries are severe. Guinea, Liberia and Sierra Leone lost an estimated US$ 2.2 billion in GDP in 2015 *(13)* during the 2014–2016 West Africa Ebola outbreak *(14)* (Fig. 4).

FIGURE 4 Costs of 2014–2016 Ebola epidemic, West Africa (US$)

50%
DROP IN TOURISM
Drop in tourist arrivals in Sierra Leone from 2013 to 2014. The rest of West Africa also saw a 7.7% drop in arrivals in 2014.

51%
NO LONGER IN WORK
% of Liberian wage earners that reported no longer working in their latest job 9 months into the epidemic.

4.9–9.4%
DECLINE IN REVENUES
Decline in government revenues in 2015 in the 3 countries (incl. direct & indirect taxes, VAT).

20%
DROP IN GDP
Drop in Sierra Leone's GDP in 2015, wiping out 5 years of development. The GDP per capita dropped by an average $125 per person in the 3 impacted countries.

Source: Resolve to Save Lives (www.resolvetosavelives.org).

Epidemics and pandemics disrupt trade and tourism, both of which are major global economic drivers and have provided a huge boost to African economies in recent years. In 2017:

- Global merchandise trade estimated at US$ 17.43 trillion
- Commercial services, including tourism: US$ 5.19 trillion.

Combined, they made up about 18% of the global economy.

- The world has become closely interconnected in terms of value chains and population movement, and not only for rich countries. The share of trade held by developing economies:
  - merchandise exports: 44% (almost half as trade among these countries).
  - commercial services, including tourism: 34%

The chances of a global pandemic are growing. While scientific and technological developments provide new tools that advance public health (including safely assessing medical countermeasures), they also allow for disease-causing microorganisms to be engineered or recreated in laboratories. A deliberate release would complicate outbreak response; in addition to the need to decide how to counter the pathogen, security measures would come into play limiting information-sharing and fomenting social divisions. Taken together, naturally occurring, accidental, or deliberate events caused by high-impact respiratory pathogens pose "global catastrophic biological risks." *(15)*

The world is not prepared for a fast-moving, virulent respiratory pathogen pandemic. The 1918 global influenza pandemic sickened one third of the world population and killed as many as 50 million people – 2.8% of the total population *(16,17)*. If a similar contagion occurred today with a population four times larger and travel times anywhere in the world less than 36 hours, 50 – 80 million people could perish *(18,19)*. In addition to tragic levels of mortality, such a pandemic could cause panic, destabilize national security and seriously impact the global economy and trade.

Trust in institutions is eroding. Governments, scientists, the media, public health, health systems and health workers in many countries are facing a breakdown in public trust that is threatening their ability to function effectively. The situation is exacerbated by misinformation that can hinder disease control communicated quickly and widely via social media.

ALL PARTS OF SOCIETY AND THE INTERNATIONAL COMMUNITY HAVE MADE PROGRESS IN PREPARING TO FACE HEALTH EMERGENCIES

… BUT CURRENT EFFORTS REMAIN GROSSLY INSUFFICIENT.

In the next section, the Board lists examples of progress and persistent challenges in the following categories:

1. **Leadership drives progress**
2. **Building effective systems**
3. **Preparing for the worst: a rapidly spreading lethal respiratory pathogen pandemic**
4. **Financing**
5. **International coordination mechanisms**

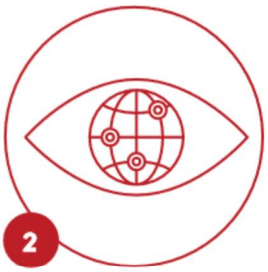
The Board proposes seven urgent actions that national and global leaders must take to prepare for health emergencies. Some aspects of these actions can be achieved in the next year, and the Board challenges political leaders to move forward on these rapidly.

What is preparedness?

The United Nations and WHO define preparedness as the ability (knowledge, capacities, and organizational systems) of governments, professional response organizations, communities and individuals to anticipate, detect and respond effectively to, and recover from, the impact of likely, imminent or current health emergencies, hazards, events or conditions. It means putting in place mechanisms that will allow national authorities, multilateral organizations and relief organizations to be aware of risks and deploy staff and resources quickly once a crisis strikes *(20,21)*.

Progress, challenges, actions

Leadership drives progress



National and local leaders are responsible for ensuring preparedness from the country to the community level. Action and investment prior to an emergency are essential to provide the best possible protection. Ensuring recurrent spending for preparedness is a key articulation of political will and leadership. Long-term, sustained community engagement is crucial for detecting outbreaks early, controlling amplification and spread, ensuring trust and social cohesion, and fostering effective responses.

In addition to their domestic responsibilities, national leaders have preparedness obligations to the world at large.[i] All countries have adopted the binding International Health Regulations (IHR (2005), a treaty requiring governments to develop national core capacities to detect, assess, report and respond to health threats, as well as to report any "public health emergency of international concern" to WHO and to take corresponding action *(22)*.

Regional and global leaders must support country actions and develop networks of partners to aid in preparedness and disease control.

Although, the contexts and drivers for increased frequency and severity of epidemics and pandemics are increasingly complex, leaders can plan and galvanize robust preparedness for their communities, countries, and for the world through determined measures.

i. These obligations include maintaining effective disease surveillance and laboratory systems; reporting newly emerging diseases that could spread internationally; and maintaining the necessary infrastructure to respond to health emergencies. See https://www.who.int/ihr.

Progress to date

- Each country has identified an IHR focal point to manage IHR-related reporting requirements in keeping with their commitments under the IHR (2005). National assessments and planning have improved considerably: as of July 2019, 190 countries reported their progress in implementing IHR (2005) in 2018, using the State Party self-assessment annual reporting (SPAR) tool; 102 countries have conducted a voluntary Joint External Evaluation (JEE)[ii], 103 countries have conducted simulation exercises, 51 countries have completed after-action reviews, 59-countries developed a National Action Plan for Health Security (NAPHS) and 51 have costed them *(23)*.

- Recognizing the shared threat of a global health catastrophe, national leaders have undertaken political actions to advance preparedness. Political bodies, such as the G7, G20 *(24)*, G77 and several regional intergovernmental organizations such as the African Union *(25)* have adopted political commitments for action on various aspects of health and health emergencies, including funding and linkages to health systems strengthening and universal health coverage. The G77 foreign ministers recognized that outbreaks of epidemics or other global health threats deserved to be given the same level of attention as other serious threats confronting countries *(26)*.

- The Global Health Security Agenda (GHSA), a multi-country coalition launched in early 2014 aims to increase country level capacities and coordination for disease detection, prevention and control, has grown to nearly 70-member countries and partner organizations *(27)*. Its Private Sector Roundtable is working with industry to enhance the latter's participation in global health security.

- Multilateral institutions and donors have acted to prepare for the worst pandemic challenges. At the global level, in addition to the IHR (2005) and further recommendations for their improvement adopted in 2009 and 2016, *(28)* health leaders have developed the Pandemic Influenza Preparedness (PIP) Framework to address virus-sharing and benefit-sharing concerns arising from the 2006 H5N1 outbreak.

- In 2017 Germany, India, Japan, Norway, the Bill & Melinda Gates Foundation, the Wellcome Trust and the World Economic Forum founded the Coalition for Epidemic Preparedness Innovations (CEPI) to facilitate focused support for vaccine development to combat major health epidemic/pandemic threats.

ii. A WHO managed process where countries undertake a voluntary, multisectoral assessment of their core capacities under IHR (2005), with national self-assessment and an external evaluation team with experts, See https://www.who.int/ihr/procedures/joint-external-evaluations/en/.

Persistent challenges and obstacles

Insufficient national and local leadership

Preparedness is hampered by the lack of continued political will at all levels. Although national leaders respond to health crises when fear and panic grow strong enough, most countries do not devote the consistent energy and resources needed to keep outbreaks from escalating into disasters.

Weak compliance with the IHR (2005)

As of 2018, only one-third of countries have the capacities required under the IHR (2005) *(29)*. While progress has been achieved in many higher income countries, low- and middle-income countries struggle with funding these functions. Not only does this impact their own ability to respond to outbreaks, it puts the whole world at risk. The great majority of national health systems would be unable to handle a large influx of patients infected with a respiratory pathogen capable of easy transmissibility and high mortality.

Inadequate international support for preparedness in the poorest countries

Although G7, G20, G77 and regional intergovernmental organization leaders have made a number of commitments to health and preparedness in recent years, follow-through is lacking. Collective security and the performance of international health systems in an increasingly globalized world are only as "strong as their weakest link." For example, although the G7 has committed to supporting 76 countries in building their IHR (2005) core capacities in four separate meetings *(30)*, G7 Member States have not monitored the follow-up to these commitments.

Required actions

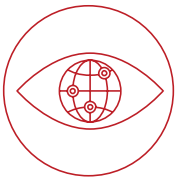
Heads of government must commit and invest

Heads of government in every country must commit to preparedness by implementing their binding obligations under the IHR (2005). They must prioritize and dedicate domestic resources and recurrent spending for preparedness as an integral part of national and global security, universal health coverage and the Sustainable Development Goals (SDG).

Progress indicator(s) by September 2020

- All countries that have completed an assessment of their capacities by 1 July 2019 have developed a costed NAPHS, identified required resources and started to implement the plan.

Countries and regional organizations must lead by example



G7, G20 and G77 Member States and regional intergovernmental organizations must follow through on their political and funding commitments to preparedness and agree to routinely monitor progress at their annual meetings.

Progress indicator(s) by September 2020

- G7, G20, G77 and regional intergovernmental organizations monitor their commitments to preparedness for health emergencies.

Ultimate objectives

All countries have reached full compliance with IHR (2005), have completed voluntary external or other independent assessments, and are objectively monitored by WHO on a regular basis to ensure continued improvement in preparedness. Recurrent national spending for preparedness is secured. Follow-up of countries' political and funding commitments made before G7, G20, G77 and regional organizations are monitored routinely.

Building effective systems

3

Planning for emergencies creates a virtuous cycle, whereby preparedness enables a successful response and from which built capacities and knowledge gained during an outbreak become the foundation to prepare for the next threat. Setting up these arrangements will require prioritizing systems-building across the whole society, in a variety of contexts, testing different models, and creating environments and mechanisms for sharing best practices, among countries at all economic levels.

Effective, accessible and efficient local health systems delivering primary health care, and mental health and psychosocial services essential for prevention will also yield multiple benefits beyond preparedness, including infectious disease prevention and control, better health outcomes and increased community trust, as well as surge response capacity. When a health emergency strikes, national and regional authorities need to be able to count on a global backup system that is well resourced, well-coordinated and well-practised.

Every country and community must be prepared for the unexpected.

Progress to date

- Timeliness in detection of outbreaks has increased significantly, as shown by the swift declaration of the 2016 outbreak of Zika, the 2018 outbreak of Ebola in the Democratic Republic of the Congo (DRC), and the first Ebola cases in Uganda. Rapid detection, isolation and treatment of recent Ebola cases in Uganda reflect better preparedness planning and investments. In addition, nine countries neighbouring the eastern DRC have enhanced their preparedness efforts.

- As part of IHR (2005) monitoring, 103 simulation exercises and 50 after-action reviews have been conducted, and 26 countries have an IHR (2005)–Performance of Veterinary Services national bridging workshop *(31,32)*.

- China, Nigeria and the WHO African and Eastern Mediterranean regions, among others, have developed public health organizations/institutes and training programmes modelled on successful programmes and agencies.

- A number of Member States of the Commonwealth of Independent States Countries and those active in the European Environment and Sustainable Development Advisory Councils have increased their surveillance and laboratory capacities, including rapid operational engagement of mobile medical teams.

- At the global level, the new Health Emergencies Programme established at the World Health Organization (WHO) following the 2014–2016 Ebola crisis in west Africa enabled the organization to take on a stronger, more effective operational role in outbreaks. The reforms have already made a significant difference in emergency response worldwide.

- There is increased awareness of the need for community involvement in all aspects of preparedness. Recent outbreaks of Ebola and Zika, and other diseases saw calls for an increase in community engagement in view of its high effectiveness. WHO's new IHR (2005) monitoring framework has expanded by including risk communication and community engagement assessments.

- Political will, financial investment and health system improvements lead to results. For example, the Republic of Korea successfully contained a second potential MERS outbreak in 2018; before the 2014–2016 outbreak of Ebola virus disease in west Africa, Nigeria implemented an epidemic preparedness infrastructure that resulted in rapid control of Ebola cases and cost savings compared with experiences of its neighbours *(33)*; and recent improvements in India's health system helped that country identify and contain the deadly Nipah virus diagnosed in Kerala in May 2018.

Persistent challenges and obstacles

Poor integration between preparedness and day to day health needs

Too many places lack even the most rudimentary health-care infrastructure. Communities that cannot care for a pregnant woman and her newborn child cannot protect against a disease outbreak.

A clear national leader for pandemic preparedness and response is too often identified only after the onset of a crisis

In the ongoing Ebola response, and for Zika, influenza and other outbreaks in many countries, the national and international leads have been identified after the fact, or changed in mid-course, causing delays in decision making. Leadership should be clearly identified in advanced, authorized and held accountable for preparedness.

Country coordinating mechanisms for health emergency preparedness are not broad enough

Although the IHR (2005) requirements are instrumental, they need to be expanded to sectors beyond health to create a broad continuum of preparedness. As a case in point, only four of the 197 national focal points are located outside the country's Ministry of Health. As potential models, a number of countries have national multisectoral coordination entities to deal with natural disasters, as well as those created to fight against HIV/AIDS.

Whole-of-government and whole-of-society system planning and engagement for preparedness are frequently lacking

Efforts on national and local preparedness planning too often lack an effective "whole-of-government" and "whole-of-society" approach. Other parties that must be engaged include national agencies beyond the health ministry, local governments, traditional and religious leaders, civil society, the research and security communities, the private sector, the media and operational experts. Preparedness-specific and preparedness-sensitive activities need to be included in sector specific strategies and systems-strengthening plans, such as those for universal health coverage; animal health in agriculture and livestock; transport and security; and disaster risk management.

Monitoring is incomplete and infrequent

Repeat assessments to monitor progress for JEEs are not yet in place. IHR (2005) SPAR reporting is done by self-reporting in countries. Additional assessment tools are needed to allow identification of weaknesses in preparedness before a health emergency occurs.

Grossly insufficient involvement of communities in all aspects of preparedness

Community engagement across all aspects of national preparedness planning and response is fundamentally lacking. It is essential to understand community needs and ensure their systematic incorporation into planning and accountability mechanisms. Currently, these needs are not well assessed nor integrated into country and WHO preparedness approaches.

Inadequate inclusion of women and youth

Sustainable preparedness requires involvement of women and youth in planning and decision-making. The majority of both formal and informal care givers are women, and their engagement ensures that policies and interventions are accepted and that they have full access to the services provided. It is important to ensure that the basic health needs of women and girls, including those for reproductive health, are met during an outbreak.

Breakdown of trust and social cohesion

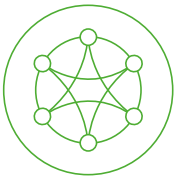
Challenges to poliomyelitis (polio) eradication efforts in Afghanistan and Pakistan and those experienced while containing the tenth Ebola outbreak in the DRC vividly demonstrate the impact that a breakdown in citizens' trust and social cohesion can have on health emergency response. Consequences include attacks on both national and international health-care workers and delays or stoppages in response efforts. In some countries, waning trust in public health and government officials together with cultural and religious beliefs lead to is decreasing vaccination rates and leading to the re-emergence of measles and other vaccine-preventable diseases, a phenomenon found in communities at all economic and educational levels.

Existing health system and disease control assets are not maximized to support preparedness:

Many financial, human, infrastructure, surveillance and laboratory health resources already exist in countries that can directly support preparedness efforts. However, resources for disease-specific programmes, such as those for HIV, tuberculosis, malaria and polio eradication, often do not include or sustainably support preparedness. For example, entities providing funding and programmatic support for countries, such as the Global Fund to Fight AIDS, TB and Malaria (Global Fund) and Gavi, do not explicitly include prevention and preparedness to achieve broader health security. The Global Polio Eradication Initiative has developed extensive laboratory and disease surveillance networks focused on poliovirus detection and identification, but this capacity is not leveraged sufficiently for broader health monitoring. Whereas polio assets have supported other outbreak preparedness efforts (as seen with the outbreak of Ebola in Nigeria in 2014–2016), capacities are threatened, as funding will predictably wane once polio eradication is achieved.

Required actions

All countries must build strong systems



Heads of government must appoint a national high-level coordinator with authority and political accountability to lead whole-of-government and whole-of-society approaches, and routinely conduct multisectoral simulation exercises to establish and maintain effective preparedness. They must prioritize community involvement in all preparedness efforts, building trust and engaging multiple stakeholders (e.g. legislators; representatives of human and animal health, security, and foreign affairs sectors; the private sector; local leaders; and women and youth).

Progress indicator(s) by September 2020

- At a minimum, the 59 countries that have completed an NAPHS identify a national high-level coordinator (board, commission or agency) to implement national preparedness measures across all sectors and to lead and direct actions in these sectors in the event of a public health emergency.

- WHO, the World Bank and partners, working with countries, develop and cost packages of priority interventions to increase preparedness capacity that can be financed in current budget cycles and map these interventions to expected results in the near term.

- There are fewer, but better harmonized coordination mechanisms, global, regional and country networks, institutions and initiatives for preparedness and readiness and for research and development (R&D).

Ultimate objectives:

All countries have identified a high-level coordinator to plan and implement preparedness and response across all sectors, including health, security, finance and other relevant ministries. The coordinator demonstrates through exercises or actual events that national preparedness and response systems are capable of mitigating all types of public health emergencies. Preparedness activities involve communities in all phases of planning and implementation.

Preparing for the worst:

a rapidly spreading, lethal respiratory pathogen pandemic

4

High-impact respiratory pathogens, such as an especially deadly strain of influenza, pose particular global risks in the modern age. The pathogens are spread via respiratory droplets; they can infect a large number of people very quickly and with today's transportation infrastructure, move rapidly across multiple geographies.

In addition to a greater risk of pandemics from natural pathogens, scientific developments allow for disease-causing microorganisms to be engineered or recreated in laboratories. Should countries, terrorist groups, or scientifically advanced individuals create or obtain and then use biological weapons that have the characteristics of a novel, high-impact respiratory pathogen, the consequences could be as severe as, or even greater, than those of a natural epidemic, as could an accidental release of epidemic-prone microorganisms.

Progress to date

- WHO established the Research and Development (R&D) Blueprint to help organizations identify research needs and work with country partners to plan for and implement studies during epidemics *(34)*.

- WHO Member States adopted the PIP Framework to improve pandemic influenza preparedness globally and support a more equitable response. Through the PIP Framework, WHO has supported countries financially and technically to improve certain essential public health capacities and established a virtual stockpile of pandemic influenza vaccines (currently estimated at more than 400 million doses). Global production capacity for influenza vaccines has increased to an estimated 6.4 billion doses *(35)*.

- Bolstering pandemic influenza preparedness, the Global Influenza Surveillance and Response System has grown to 151 laboratories in 115 countries and has been commended repeatedly for timely identification, assessment and monitoring of influenza and other respiratory pathogens, including MERS and SARS.

- Funding for research has increased. While figures on R&D funding for epidemics are difficult to come by, studies show investment in research on neglected diseases rose by 7% between 2016 and 2017, representing a 10-year high. Over the last decade, national public-sector funding from low- and middle-income countries grew 17% *(36)*. As of June 2019, CEPI has raised US$ 750 million to develop vaccines to stop future epidemics *(37)*.

Persistent challenges and obstacles

Lack of planning and readiness for a rapidly moving, lethal pandemic caused by a respiratory pathogen

Preparedness and response systems and capabilities for disease outbreaks are not sufficient to deal with the enormous impact, rapid spread and shock to health, social and economic systems of a highly lethal pandemic, whether natural, accidental or deliberately released. There is insufficient R&D investment and planning for innovative vaccine development and manufacture, broad-spectrum antivirals, appropriate non-pharmaceutical interventions[iii] *(38)*, targeted therapeutics (including monoclonal antibodies), systems for sharing sequences of any new pathogen, and means for equitably sharing limited medical countermeasures across countries. In addition, such a pandemic requires advance planning across multiple sectors (financial, security, transportation, logistics, global communications and industry), for reinforcing social cohesion and for risk communication. Epidemic control costs would completely overwhelm the current financing arrangements for emergency response.

iii. Non-pharmaceutical interventions include public safety protocols, school and business closures, airline and transportation protocols, communications protocols, supply chain readiness etc., as well as coordination between the public and private sectors, national and local authorities.

Lack of data sharing and medical countermeasures in the context of a Public Health Emergency of International Concern is unacceptable

The lack of optimized sample-sharing and information-sharing slows down the public health response and R&D. The PIP framework is limited to pandemic influenza, and there are no frameworks for other infectious diseases with pandemic potential. Concerns exist regarding the impact of the Nagoya Protocol *(39)* on timely sharing of pathogen samples *(40)*.

Limited medical countermeasures are shared inequitably at times and are likely to be prioritized for domestic use during a pandemic. Countries need to trust that, if they share samples and data, they will have access to any advances that result from them.

Research and development, key to developing medical countermeasures and effective preparedness, have major systemic problems

These problems include *(41)*:

- **National capacities are not well developed for research and development, including during outbreaks, as well as for deployment of vaccines, therapeutics, diagnostics, and other medical countermeasures, and creating new vaccine manufacturing methods.** Country research approaches, regulatory, ethics and operational capacities require strengthening. Despite some promising developments, the technologies used for influenza vaccines production have remained almost unchanged since the 1960s, are expensive and time-consuming, and would constitute a serious bottleneck in the event of a pandemic. For other respiratory pathogens, very little progress has been made in developing medical countermeasures.

- **Research infrastructure and level/predictability of funding are weak.** Overall funding remains too low, with sustained investment hampered by the high costs of R&D and high probability of failure. The bulk of R&D funding and activities, including research on neglected tropical diseases, remains in high income countries. While these investments are laudable, research agendas in these countries may not always reflect low income country needs (e.g. development of Ebola countermeasures in developed countries used for biodefence).

- **More resources have gone into vaccines, basic research and therapeutics than into diagnostic advances.** Attention to diagnostics is important not just for treatment of individuals, but also to assess efficacy of vaccines and treatments and to gauge the speed and breadth of disease spread.

- **Social science research is poorly integrated into national and international research portfolios, and not applied to preparedness.**

Required actions

Countries, donors and multilateral institutions must be prepared for the worst

A rapidly spreading pandemic due to a lethal respiratory pathogen *(whether naturally emergent or accidentally or deliberately released)* poses additional preparedness requirements. Donors and multilateral institutions must ensure adequate investment in development of innovative vaccine and therapeutics, surge manufacturing capacity, broad-spectrum antivirals and appropriate non-pharmaceutical interventions. All countries must develop a system for immediately sharing sequences of any new pathogen for public health purposes, along with the means to share limited medical countermeasures across countries.

Progress indicator(s) by September 2020

- Donors and countries commit and identify timelines for: financing and development of a universal influenza vaccine, broad-spectrum antivirals and targeted therapeutics. WHO and its Member States develop options for standard procedures and timelines for sharing of sequence data, specimens and medical countermeasures for pathogens other than influenza.

- Donors, countries and multilateral institutions develop a multiyear plan and approach for strengthening R&D research capacity, in advance of and during an epidemic.

- WHO, the United Nations Children's Fund, the International Federation of Red Cross and Red Crescent Societies, academic and other partners identify strategies for increasing capacity and integration of social science approaches and researchers across the entire preparedness/response continuum.

Ultimate objectives:

The tools and systems needed to respond effectively to a fast-moving and lethal respiratory pathogen are in place: A universal influenza vaccine is effective and routinely used to protect the global population; new therapeutics and broad-spectrum antivirals are widely available to treat and reduce mortality from a range of viruses; novel pathogens are routinely identified and sequenced, and the sequences are shared on a globally accessible website. Distributed manufacturing of vaccines (including nucleic acid types) begins within days of obtaining the new sequences and effective vaccines are pre-tested and approved for use within weeks.

Financing

Even the most conservative models suggest that pandemic risks are on par with other high-profile economic threats, including climate change (0.2–2.0% of global GDP, according to the Intergovernmental Panel on Climate Change 2014) or natural disasters (0.3–0.5% of global GDP and 65,000 deaths per year) *(42)*. The International Monetary Fund's threshold for a major economic disaster is 0.5% of GDP loss *(43)*.

Despite the high cost-benefit ratio of emergency preparedness, governments continue to neglect it. World Bank and WHO analyses indicate that most countries would need to spend on average between US$ 1–US$ 2 per person per year to reach an acceptable level of pandemic preparedness *(44,45)*. Considering the benefits to economic growth (not counting the enormous cost to human life), investing in health systems to implement the IHR (2005) would yield a positive return on investment in all plausible scenarios *(46)*. A yearly investment of US$ 1.9–3.4 billion to strengthen animal and human health systems would yield an estimated global public benefit of more than US$ 30 billion annually *(47)*, a return on investment of 10 to 1 or higher *(48)*. Preparedness capacities and systems are global public goods–all countries benefit from every country's investment.

Not investing is a high-risk gamble, given the potential economic and response costs.

Progress to date

- Some countries and parts of the international community are increasingly recognizing preparedness capacity as a critical part of wider public health systems strengthening and the universal health coverage agenda *(49)*. For example: Senegal created a budget line to support the operating costs of its emergency operations centre; and The Greater Mekong Sub-region Health Security Project began working with the governments of Cambodia, the Lao People's Democratic Republic, Myanmar and Vietnam to improve preparedness for infectious diseases and other health threats.

- Regional initiatives have also increased funding for preparedness, including the following:

  - the Africa Centres for Disease Control and Prevention (US$ 35 million, 2017–2018) developed a five-year strategic plan that provides the rationale for external funders to consider significant direct or parallel financial support;
  - the West Africa Regional Disease Surveillance Systems Enhancement Project (US$ 390.8 million, 2016–2018), is supporting 11 West African countries in increasing national, regional and cross-sectoral capacity for integrated disease surveillance and response;
  - the Indo-Pacific Health Security Initiative invested in product development partnerships to accelerate research on new drugs and diagnostics and applied health systems.

- Ten countries conducted cross-cutting mapping of NAPHS and other health plans and domestic and bilateral/multilateral aid flows, identifying synergies and funding: for example, in Sierra Leone, the exercise identified US$ 47.7 million across eight Ministries and external donors for two-year implementation of the NAPHS *(50)*.

- International financial institutions have begun to prioritize preparedness:

  - WHO established the Contingency Fund for Emergencies (CFE) to respond immediately, within the critical first 24–48 hours, to a disease outbreak and humanitarian crises; since its launch in 2015. The CFE has enabled WHO to respond rapidly to 70 separate events in 48 countries *(51)*;
  - the World Bank developed the Pandemic Emergency Financing Facility (PEF) to make pay-outs early during an outbreak cycle–before it becomes a pandemic–through two windows, insurance and cash; funding requests are assessed based on three criteria– pathogen type, epidemiological thresholds and a technical assessment *(52)*;
  - the World Bank Group, including IDA, has taken steps to develop not only financing, but the political support and coordination needed to build clinical research capacity in developing countries as a crucial component of global epidemic preparedness *(53)*.

Persistent challenges and obstacles

Financing systems for preparedness are broken, particularly at the national level

More and better-targeted funding is required at all levels starting with national governments. Too many national leaders have not prioritized spending on health systems overall and on preparedness in particular. Preparedness investments is also poorly differentiated from other aspects of health system strengthening.

National action plans for health security lack domestic financing

Success in national preparedness rests upon the ability of countries to identify systems gaps, develop their plans and finance them. Despite significant progress in assessing deficiencies and developing plans, **not a single NAPHS** has been **fully financed** *(54)*. Without domestic resources, countries cannot redress the gaps, and momentum in national planning may stall or reverse.

International financing to poorest countries is insufficient, and available funds are not well-utilized

Resource constrained countries are unlikely to finance their NAPHS fully from domestic resources alone. With US$ 75 billion available, the current IDA18 replenishment has met its target of supporting preparedness plans in 25 countries, yet most poor countries will not elect to use their finite IDA envelopes for preparedness given the trade-offs with other development priorities.

Insufficient rapid financing is available for preparedness and rapid response surge capacity

Existing financing mechanisms are inadequate for prolonged outbreaks and would not suffice for a fast-moving global pandemic, particularly one involving a respiratory pathogen.

WHO is underfunded

WHO lacks the predictable, flexible and sustainable funding it needs to play its critical role in coordinating preparedness and response and supporting country health systems. Nearly 80% of the WHO budget is voluntary and highly earmarked, precluding holistic preparedness efforts and hindering WHO's ability to provide a global safety net. Following its use in early response to the current outbreak of Ebola in eastern DRC, the CFE is now depleted *(55)*. A review of the intended purpose and use of expenditure from the CFE, along with lessons for its maximum efficiency and focus, would be useful.

The Pandemic Emergency Financing Facility is in need of reform

To date, the PEF-model is not working because of key design issues; notably its parametric criteria for the diseases covered were set too high for the release of the insurance mechanism *(56,57)*. The World Bank is redesigning the PEF and expects a new model to be ready in mid-2020. This will need to allow greater flexibility and agility so that financing can be made available earlier in a broader range of outbreak situations.

Private sector resources remain largely untapped

Although businesses rely on economic and social stability and have valuable systems, including logistics and supply chains, that could contribute to preparedness efforts, the private sector has not been sufficiently engaged.

Need for investment cases and building donor confidence

A multipronged effort is required to create an environment where policy-makers and communities demand the planning and resources necessary for effective preparedness. There is a lack of long-term, holistic, costed resource mobilization plans for supporting preparedness. Decision-makers must engage the private sector and create investment cases showing preparedness for health emergencies in health systems, human health, animal health, disaster management and the environment.

Required actions

Financing institutions must link preparedness with economic risk planning.

To mitigate the severe economic impacts of a national, regional epidemic and/or a global pandemic, the IMF and the World Bank must urgently renew their efforts to integrate preparedness into economic risk and institutional assessments, such as the IMF's next cycle of Article IV consultations with countries, and the World Bank's next Systematic Country Diagnostics for IDA credits and grants. The funding replenishments of the IDA, Global Fund to Fight AIDS, TB and Malaria, the and Gavi Alliance should include explicit commitments regarding preparedness.

Progress indicator(s) by September 2020

- The IMF and the World Bank integrate preparedness into their systematic country risk, policy and institutional assessments, including in Article IV staff reports and for IDA credits/ grants respectively.

- International funding mechanisms expand their scope and envelopes to include health emergency preparedness, including the IDA19 replenishment, the Central Emergency Response Fund, Gavi, the Global Fund and others.

Development assistance funders must create incentives and increase funding for preparedness.

Donors, international financing institutions, global funds and philanthropy must increase funding for the poorest and most vulnerable countries, through development assistance for health and greater/earlier access to the United Nations Central Emergency Response Fund to close financing gaps for their national health security action plans as a joint responsibility and a global public good. Member States need to agree to an increase in WHO contributions for preparedness and response financing and must sustainably fund the WHO Contingency Fund for Emergencies, including the establishment of a replenishment scheme using funding from the revised World Bank Pandemic Emergency Financing Facility.

Progress indicator(s) by September 2020

- WHO member states agree to an increase in contributions for preparedness at the Seventy-third World Health Assembly in 2020; and Member States, the World Bank and donors provide sustainable financing for the CFE to a level of US$ 100 million annually.

Ultimate objectives:

All countries have completed and fully funded their NAPHS with domestic resources, supplemented by international sources for the poorest countries. The overall level of funding for preparedness has increased. The IMF and World Bank have functioning systems for financially supporting country preparedness and for making funding rapidly available in emergencies. WHO is adequately funded and equipped to support countries' preparedness and to lead a global response to a public health emergency on any scale; and the CFE is sustainably financed by many contributors, including from the World Bank PEF.

International coordination mechanisms

7

While the responsibility for preparedness lies largely with local and national leaders, an effective international response system is an essential global safety net. As the accumulation of new global trends and challenges creates more complex health emergencies, the international community must be better prepared. Poverty, deprivation and weak health and government structures can amplify a disease outbreak into a wide-ranging humanitarian catastrophe that quickly grows beyond what national authorities can manage. While WHO leads the international response to any health emergency, it needs reliable, systematic backup from other United Nations agencies to address logistical and humanitarian developments that are beyond its scope to manage.

Progress to date

- The ongoing tenth Ebola outbreak in the DRC reveals the complex challenges facing global and national preparedness despite increased attention and progress in this area. Among the signs of progress, an apparently successful vaccine has been administered to 170 000 people as of July 2019, and therapeutic approaches (some studied in an earlier outbreak and some newly discovered) are available; strong engagement of the DRC Ministry of Health at the highest levels; rapid WHO deployment of a multidisciplinary incident management team; heightened preparedness levels in neighbouring countries; and use of innovative technologies *(58)*.

- The Inter-Agency Standing Committee (IASC) activated its revised (April 2019) systemwide "Humanitarian Systemwide Scale-up for Infectious Disease Events" protocol to adjust humanitarian response already underway *(59,60)*.

Persistent challenges and obstacles

International coordination mechanisms are not fit for purpose for health emergencies in complex environments

New approaches for international preparedness and, ultimately response, are needed as insecure contexts, such as the Eastern DRC and Yemen, have blurred the lines between health and humanitarian emergencies. New agile approaches would systematically coordinate key multisectoral international actors for different parts of a response, in order to plan for, monitor, assess, and adjust activities in real time. Further, attention must be given to transition planning from response to long-term development, stability and sustainable development once the outbreak ends.

It is unclear who will be in charge

The Secretary General of the United Nations belatedly identified a lead for public health emergencies in the 2014-2016 West Africa Ebola crisis (the United Nations Mission for Ebola Emergency Response); on 23 May 2019, 10 months after the onset of the Ebola outbreak in eastern DRC, he appointed the United Nations Ebola Emergency Response Coordinator to oversee United Nations systemwide control efforts *(61)*. In the 2009 H1N1 influenza pandemic the WHO Director General was more explicitly in charge, although the United Nations System Influenza Coordinator was also involved, which created confusion *(62)*.

WHO coordination and convening mechanisms are stretched

WHO leadership for health emergencies derives from the IHR (2005), but its convening and coordinating mechanisms are not sufficient to provide fully cohesive support for broad capacity strengthening in countries and for global outbreak response, or to ensure greater accountability of global preparedness. In addition, WHO lacks the systematic support it needs from the United Nations more broadly to tackle issues like security and trade pact violations that are beyond its scope *(63)*.

No intermediate system exists for declaration of health emergencies at an earlier state

The IHR (2005) provide very focused criteria for activation of global resources under the designation Public Health Emergency of International Concern (PHEIC). However, the system lags behind in its ability to mobilize national and international resources and guiding multisectoral action early in an outbreak. The use of the PHEIC system is misunderstood by many stakeholders. Once a PHEIC has been declared, specific actions follow, including sharing critical information for risk assessment, adjusting response plans and implementing temporary measures, as necessary. The role of the PHEIC is limited to the late stages of an outbreak's spread, and there are potential negative consequences resulting from a declaration (such as unilateral, ill-advised country actions to limit travel or trade) *(64,65)*. Developing intermediate triggers before declaring a PHEIC would mobilize the wider national and international community at earlier stages of a response without interfering with the criteria for a PHEIC that met the needs of the IHR (2005) *(66)*.

Required actions

The United Nations must strengthen coordination mechanisms.

The Secretary General of the United Nations, with WHO and United Nations Office for the Coordination of Humanitarian Affairs, must strengthen coordination in different country, health and humanitarian emergency contexts, by ensuring clear United Nations systemwide roles and responsibilities; timely triggers to rapidly reset preparedness and response strategies during health emergencies; and, enhancing United Nations system leadership for preparedness, including through routine simulation exercises. WHO should introduce an approach to mobilize the wider national, regional and international community at earlier stages of an outbreak prior to a declaration of an IHR (2005) Public Health Emergency of International Concern.

Progress indicator(s) by September 2020

- The Secretary-General of the United Nations, with the Director-General of WHO and Under-Secretary-General for Humanitarian Affairs, strengthens coordination and identifies clear roles and responsibilities and timely triggers for a coordinated United Nations systemwide response for health emergencies in different countries and different health and humanitarian emergency contexts.

- The United Nations (including WHO) conducts at least two systemwide training and simulation exercises, including one covering the deliberate release of a lethal respiratory pathogen.

- WHO develops intermediate triggers to mobilize national, international and multilateral action early in outbreaks, to complement the existing mechanisms for later and more advanced stages of an outbreak under the IHR (2005).

- The Secretary General of the United Nations convenes a high-level dialogue with health, security and foreign affairs officials to determine how the world can address the threat of a lethal respiratory pathogen pandemic, as well as managing preparedness for disease outbreaks in complex, insecure contexts.

Ultimate objectives:

There is no ambiguity or delay in the United Nations systemwide response to a global health emergency. There are clear rules, roles and responsibilities, along with a designated leader, empowered with the authority to coordinate across the system and experienced in leading a global response through regular simulations or actual events. WHO can rapidly mobilize countries and partners early in an outbreak or health emergency.

ABBREVIATIONS

CEPI	Coalition for Epidemic Preparedness Innovations
CFE	WHO Contingency Fund for Emergencies
DRC	Democratic Republic of the Congo
Gavi Alliance	Global Alliance for Vaccines and Immunisation (earlier title)
GDP	Gross domestic product
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
GHSA	Global Health Security Agenda
GPMB	Global Preparedness Monitoring Board
IDA	International Development Association (World Bank)
IDA19	19th replenishment of the International Development Association Funding
IHR (2005)	International Health Regulations (2005)
IMF	International Monetary Fund
JEE	Joint External Evaluation
MERS	Middle East respiratory syndrome
NAM	United States National Academy of Medicine
NAPHS	National Action Plan for Health Security
NIAID	United States National Institute of Allergy and Infectious Diseases
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
PEF	Pandemic Emergency Financing Facility
PHEIC	Public Health Emergency of International Concern
PIP	Pandemic Influenza Preparedness Framework.
R&D	Research and development
R&D Blueprint	WHO Research and Demonstration Blueprint
SARS	Severe acute respiratory syndrome
SDG	Sustainable Development Goal
SPAR	States Parties' annual reporting under the IHR (2005)
WHE	World Health Organization Health Emergencies Programme
WHO	World Health Organization

GLOSSARY

Coordination. The organization of different stakeholders to enable them to work together effectively, through synchronization and integration of activities, responsibilities, and command and control structures to ensure that the resources are used most efficiently in pursuit of the specified objectives. There can be three levels of coordination: among organizations, among functions, and within programs.

Epidemic. An increase, often sudden, in the number of cases of a disease above what is normally expected in that population in that area (e.g. Ebola virus disease in West Africa in 2014–2016).

Health Security. The activities required to minimize the danger and impact of acute public health events that endanger the collective health of populations living across geographical regions and international boundaries.

Nagoya Protocol. Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity. The main components are: 1) the obligation to obtain the authorization of providing countries before using a biological resource from their areas under national jurisdiction territory; and 2) the obligation to share monetary or non-monetary benefits with providing countries. The Protocol establishes broad terms of a bilateral system, implemented differently in each country. It can involve a wide range of requirements, from the need to obtain a permit to access a biological resource to the need to pay royalties on profit generated from commercial products developed using these resources. This results in a complex patchwork of legislation, which could potentially be difficult to navigate at the time of a public health emergency.

Pandemic. An epidemic that has spread over several countries or continents, usually affecting a large number of people (e.g.H1N1 influenza in 2009).

PHEIC. Public Health Emergency of International Concern. A PHEIC is defined in the IHR (2005) as "an extraordinary event which is determined to constitute a public health risk to other States through the international spread of disease and to potentially require a coordinated international response". This definition implies a situation that is serious, sudden, unusual or unexpected; that carries implications for public health beyond the affected State's national border; and may require immediate international action.

PIP Framework. The Pandemic Influenza Preparedness Framework is an international mechanism adopted in 2011 by WHO Member States. It aims to improve global pandemic influenza preparedness and response by encouraging the sharing of pandemic influenza viruses, building global preparedness capacities against pandemic influenza and securing more equitable access to vaccines and other medical countermeasures in advance of an influenza pandemic.

Preparedness. The ability (knowledge, capacities, and organizations systems) of governments, professional response organizations, communities and individuals to anticipate, detect and respond effectively to, and recover from, the impact of likely, imminent or current health emergencies, hazards, events or conditions. It means putting in place mechanisms which will allow national authorities, multilateral organizations, and relief organizations to be aware of risks and deploy staff and resources quickly once a crisis strikes.

Response. Includes immediate actions to save lives, protect property and meet basic human needs. Response also includes the execution of emergency operations plans.

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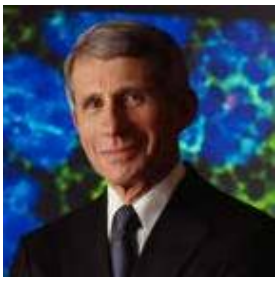

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Chief Medical Innovation and Technology Officer, La Red de Salud UC-Christus, Chile

Professor K. VijayRaghavan

Principal Scientific Advisor to the Government of India

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GLOBAL PREPAREDNESS MONITORING BOARD

Contact information

Global Preparedness Monitoring Board Secretariat
c/o World Health Organization
20, Avenue Appia
1211 Geneva 27
Switzerland
gpmbsecretariat@who.int
www.who.int/GPMB

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