Strengthening the Global Architecture for Health Emergency Preparedness, Response and Resilience

White paper for consultation

4 May 2022

World Health Organization

Executive summary

The COVID-19 pandemic continues to highlight the need for a stronger and more inclusive health emergency preparedness, response, and resilience (HEPR) architecture.

Building on the work of numerous reviews, panels, and consultations, this White Paper outlines the Director-General's 10 proposals to strengthen HEPR under the aegis of a new overarching Pandemic Accord that is currently under negotiation. The recommendations are grouped by the three main constituents of the global pandemic architecture:

Governance:
1. Establish a Global Health Emergency Council and WHA Committee for Emergencies
2. Make targeted amendments to the International Health Regulations (2005)
3. Scale-up Universal Health and Preparedness Reviews and strengthen independent monitoring

Systems:
4. Strengthen a global health emergency workforce that is trained to common standards, interoperable, rapidly deployable, scalable and equipped
5. Strengthen the network of health emergency coordination hubs, and standardize approaches to strategic planning, financing, operations and monitoring of health emergency preparedness and response
6. Expand partnerships for a whole-of-society approach for collaborative surveillance, community protection, clinical care, and access to countermeasures

Financing:
7. Establish a coordinating platform for financing to promote domestic investment, direct existing and gap-filling international financing to where it is needed most
8. Establish a Financial Intermediary Fund for pandemic preparedness and response to provide catalytic and gap-filling funding
9. Expand WHO Contingency Fund for Emergencies to ensure rapidly scalable financing for response

10. Strengthen WHO at the centre of the global HEPR architecture

The Director-General's proposals are designed to support and contribute to decision-making in the various fora within and beyond WHO that will determine the future global architecture of HEPR.

The Secretariat welcomes comments from Member States and partners on these proposals through informal consultations and feedback in writing.

The secretariat will publish a final version of the Director-General's proposals ahead of the Seventy-fifth World Health Assembly.

Introduction

"The doctors were unable to cope, since they were treating the disease for the first time and in ignorance: indeed, the more they came into contact with sufferers, the more liable they were to lose their own lives. No other device of men was any help. Moreover, supplication at sanctuaries, resort to divination, and the like were all unavailing. In the end, people were overwhelmed by the disaster and abandoned efforts against it. … I shall give a statement of what it was like, which people can study in case it should ever attack again, to equip themselves with foreknowledge so that they shall not fail to recognize it. I can give this account because I both suffered the disease myself and saw other victims of it."

1. This is the description of the plague of Athens in 430 BCE, as told by the ancient Greek historian Thucydides in his History of the Peloponnesian War. Almost two-and-a-half millennia later, the COVID-19 pandemic has demonstrated that although much has changed, much has not.

2. At the time of writing, more than 6.2 million deaths have now been reported to WHO, but the true toll is likely to be much higher. Health systems have been overwhelmed, and many health workers have lost their lives or left their jobs because of burnout, stress and anxiety. The global economy was plunged into its deepest recession since the Second World War, forcing 135 million people into poverty, and triggering trillions of dollars of stimulus. Widespread misinformation and disinformation have caused confusion and distrust, dividing families, communities and societies.

3. The pandemic has exposed and exploited divisions and inequities within and between countries, and gaps in the world's ability to prepare for, prevent, detect and respond rapidly to epidemics, pandemics and other health emergencies. COVID-19 hit the poor and vulnerable hardest, while reminding even the most privileged that infectious diseases still have the power to upend not only health systems, but also societies and economies.

4. The risk of new health emergencies continues to increase, driven by the escalating climate crisis, environmental degradation, and increasing geo-political instability, disproportionately impacting the poor and most vulnerable. Humanitarian crises affected 300 million people in 2022, putting them at an increased risk of the health emergencies that inevitably follow.

5. The overall lesson is clear: the world is not prepared. But this lesson is not a new one. Just this century, epidemics of SARS, H5N1, H1N1, MERS, Ebola and Zika have emerged, only to be followed by a pattern of panic and neglect, in which concern during emergencies gives way to apathy and underinvestment in their aftermath.

6. Dealing effectively with the multiplying complex and multi-dimensional threats requires a strengthened approach to the way we prepare for and respond to health emergencies. Where previously there has been chronic neglect and underinvestment in national capacities, we need to make smart, evidence-based investments that deliver the best possible return in terms of lives saved, sustainable development, global economic stability, and long-term growth.

7.   That means recognizing that the core capacities for Health Emergency Preparedness, Response and Resilience (HEPR) are not only essential for national security, but for the functioning of resilient national systems more broadly. A renewed global architecture for HEPR must be built on national health systems foundations. Sustainable investments in HEPR are de facto sustainable investments in resilient health systems and should be made in the broader context of progress towards universal health coverage and healthier populations.

8.   Where before there has been fragmentation in the global architecture for health emergency preparedness and response, we need smart investments that deliver collaboration and coordinated, collective action.

9.   Thucydides wrote his account of the Plague of Athens so that future generations might avoid the suffering he experienced. While COVID-19 has taken so much, it has also given us the opportunity to learn the painful lessons it has taught us, and use them to build a healthier, safer, fairer world for the generations to come. We must seize that opportunity before the world moves on to other priorities.

Purpose of the white paper for consultation

10.   There have been many expert reviews of the global response to the COVID-19 pandemic including the Independent Panel for Pandemic Preparedness and Response (IPPPR), the report of the Review Committee on the Functioning of the International Health Regulations (2005) during the COVID-19 response, the report of the Independent Oversight and Advisory Committee for the WHO Health Emergencies Programme, and many others have yielded more than 300 recommendations. These recommendations have been analysed and discussed through the Working Group on Strengthening WHO Preparedness and Response to Health Emergencies and the Intergovernmental Negotiating Body as well as G7, G20, and other international processes.

11.   Considering the inputs from these independent reviews and ongoing consultation processes, the purpose of this white paper is to outline the key principles and proposals for strengthening the HEPR architecture to form the basis for further consultation with Member States ahead of the Seventy-fifth World Health Assembly.

12.   Three key principles have been identified:

- It must be **equitable**, with no one left behind – equity is both a principle and a goal, to protect the most vulnerable.
- It must be **inclusive**, with the engagement and ownership of all countries, communities and stakeholders from across the One Health spectrum. Commitment to diversity, equity and inclusivity is key to effective HEPR at all levels, including equal participation in leadership and decision-making regardless of gender.
- It must be **coherent**, reducing fragmentation, competition, and duplication, aligned with existing international instruments such as the International Health Regulations (2005) and the PIP Framework, ensuring synergy between institutional capabilities for systems strengthening and financing, and integrated into national health and social systems based on universal health coverage and primary health care.

13.   These principles must underpin the three pillars of the health emergency preparedness and response architecture:

- **Governance** that ensures a coherent, equitable and coordinated global health emergency preparedness response
- **Systems** and tools to prepare for, prevent, detect, and rapidly respond to health emergencies
- **Financing** to support those systems and tools

Proposals for strengthening for HEPR

14.   One of the key recommendations for strengthening the global architecture for HEPR is for a new instrument to provide the framework of accountability for pandemic prevention, preparedness and response. The World Health Assembly has established an Intergovernmental Negotiating Body to draft and negotiate such a "Pandemic Accord", with the aim of agreeing an overarching framework to promote political commitment at the highest level, ensure an all-of-government and whole-of-society approach within countries, and sustain sufficient political and financial investment within and among countries.

15.   This white paper for consultation presents ten proposals for strengthening HEPR under the aegis of the "Pandemic Accord". These proposals are grouped into three main pillars of the HEPR architecture: systems, governance, and finance (see Figure 1).

Figure 1: Proposals for strengthening HEPR
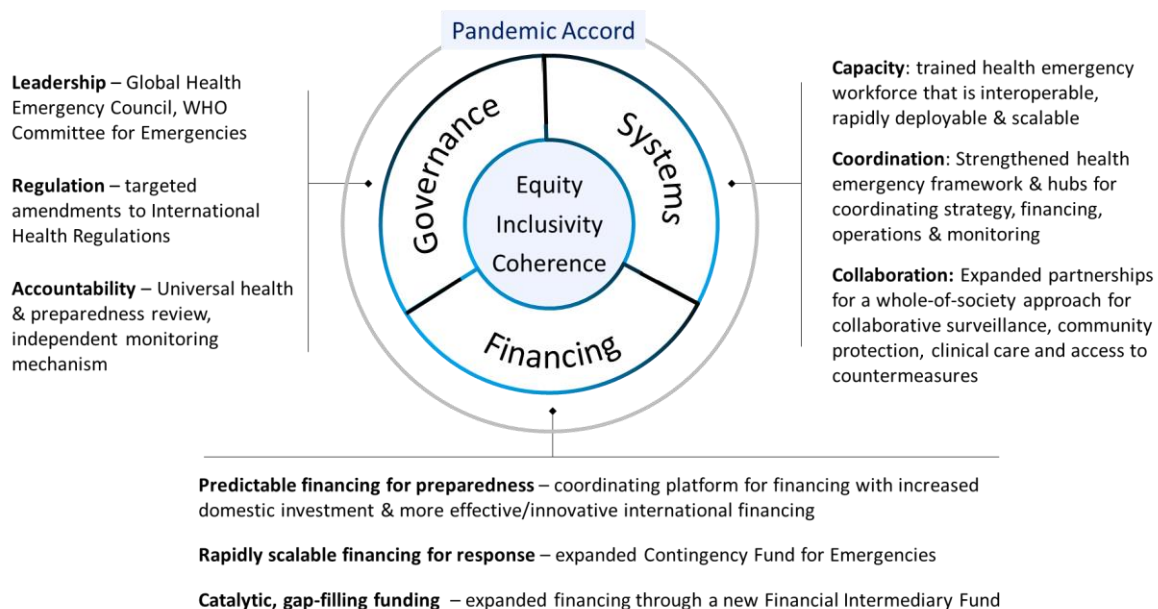
16.   The proposals draw from the recommendations of previous reviews and analyses. Some of the proposals build on existing frameworks and capacities established after previous crises, such as the International Health Regulations (2005), WHO Emergency Programme, Pandemic Influenza Preparedness Framework, the Coalition for Epidemic Preparedness Innovations, Global Outbreak Alert and Response Network, Emergency

Medical Teams, Global Influenza Surveillance and Response System, Inter-agency Standing Committee, Global Health Cluster, EPI-WIN, Collective Service for Risk Communication and Community Engagement, the WHO R&D Blueprint, the WHO Academy, WHO Contingency Fund for Emergencies, and Epidemic Intelligence from Open Sources.

17.   Other proposals build on new and innovative mechanisms put in place during the COVID-19 pandemic to fill critical gaps, such as the Access to COVID-19 Tools Accelerator, COVAX, UN COVID-19 Supply Chain Task Force, UN Crisis Management Team, the WHO BioHub System, WHO Hub for Pandemic and Epidemic Intelligence, International Pathogen Surveillance Network and the mRNA Vaccine Technology Transfer Hub which now need to be adapted and refined according to the lessons of the pandemic in consultation with Member States and partners.

18.   A small number of proposals call for the establishment of new mechanisms or structures which are currently being discussed in ongoing Member State processes. The ten proposals for strengthening HEPR are outlined below.

Governance

19.   While the pandemic accord can provide the overarching political agreement and commitment, sustained implementation depends on good governance – the systems, structures, rules, and processes that are required to enable governments and other stakeholders to work together effectively to set goals; establish norms, standards and other international agreements; and ensure accountability through transparent monitoring and assessment.

20.   COVID-19 and other recent health emergencies have demonstrated that the architecture of HEPR is complex and fragmented, and its governance is inadequate. It has failed to ensure effective collective action and equitable access to countermeasures, both of which are essential for effective preparedness and response.

21.   Effective governance is essential to bring greater equity, inclusivity, and coherence to the global architecture of HEPR, enabling Member States and partners to work collectively around a shared plan, galvanized by political will and with the resources to sustain positive changes.

Proposal 1. Establish a Global Health Emergency Council and WHA Committee for Emergencies

22.   HEPR must be elevated to the level of heads of state and government to ensure sustained political commitment, and break the cycle of panic and neglect that has characterized the response to previous global health emergencies.

23.   Several panels have proposed the establishment of a high-level council on global health emergencies, comprising heads of state and other international leaders. WHO supports this concept and proposes the establishment of a Global Health Emergency Council, linked to and aligned with the constitution and governance of WHO, rather than creating a

parallel structure, which could lead to further fragmentation of the global architecture of HEPR.

24.   The Council would have three primary responsibilities:

- Address obstacles to equitable and effective HEPR, ensuring collective, whole of government and whole of society action, aligned with global health emergency goals, priorities and policies
- Foster compliance with and adherence to global health norms and policies
- Identify needs and gaps, swiftly mobilize resources, and ensure effective deployment and stewardship of these resources for HEPR

25.   The Council would meet annually immediately prior to the World Health Assembly to review progress in pandemic preparedness and response, and as required in the event of a public health emergency of international concern. The Council would be supported by the WHO Secretariat.

26.   The work of the Council would complement and be linked with the creation of a Standing Committee on Health Emergencies as a sub-committee of the Executive Board. In considering this proposal, Member States may wish to consider establishing this alternatively as a committee of the World Health Assembly to:

- Review the work of WHO under GPW-13 Pillar 2: One billion more people better protected from health emergencies
- Act as a conference of State Parties to the International Health Regulations
- Act as the peer review mechanism for the Universal Health and Preparedness Review

Proposal 2: Make targeted amendments to the International Health Regulations (2005)

27.   The IHR is the international legally binding framework that defines the rights and obligations of its 196 States Parties and of the WHO Secretariat for handling public health emergencies with potential to cross borders.

28.   The COVID-19 pandemic has revealed some weaknesses in the interpretation of, application of, and compliance with the IHR. The inherent tension between the aim to protect health and the need to protect economies by avoiding travel and trade restrictions has been noted by the IHR Review Committee and the IPPPR as the most important factor limiting compliance with the IHR. In addition, too many countries still do not have sufficient public health capacities to protect their own populations, and to give timely warnings to WHO; the global alert system is still too slow; and the current self-reporting mechanism on the implementation of core capacities lacks incentives for compliance with the IHR. The absence of a Conference of the Parties for the IHR is an overarching limitation in their effective application and compliance.

29.   The IHR remains useful and important. But to build further trust and strengthen global governance for health emergencies, amending certain articles of the IHR, while

strengthening their implementation, is necessary. Such targeted amendments should make the instrument more agile and flexible and should facilitate compliance with its provisions.

30.   A related issue is the need to streamline the process to bring IHR amendments into force, which at present can take up to two years. Ensuring that the IHR can be efficiently and effectively amended to accommodate evolving global health requirements is key to their continued relevance and effectiveness. A targeted amendment to achieve this streamlining has been proposed and is currently being discussed informally. The approval of this proposal at the 75th World Health Assembly will contribute substantially to ensuring that the IHR remains a foundational and relevant global health legal instrument.

Proposal 3. Scale-up Universal Health and Preparedness Reviews and strengthen independent monitoring

31.   Following a request by Member States, the Universal Health and Preparedness Review (UHPR) was announced by the WHO Director-General in November 2020, with the goal of building solidarity, mutual trust, and accountability for health, by bringing Member States together as neighbours and strengthening national capacities for pandemic preparedness, universal health coverage and healthier populations.

32.   The vision of UHPR is to strengthen health emergency preparedness through an innovative intergovernmental review process that integrates available information, engages national leadership at the highest level, catalyses interactive dialogue and pragmatic, specific actions to improve preparedness, resulting in substantial and sustained increases in the attention, focus, and financing of health emergency preparedness. The UHPR is a Member State-led mechanism where countries agree to a voluntary, regular, and transparent peer review of their comprehensive national health emergency preparedness capacities to:

- Enhance transparency and understanding of a country's comprehensive preparedness capacities among relevant national stakeholders
- Promote whole-of-government and whole-of-society dialogue on preparedness in countries, including close cooperation with governments, regional organizations and civil society
- Encourage compliance with commitments made under the IHR and related WHA resolutions in the field of emergency preparedness
- Elevate considerations for preparedness beyond the health sector and ensure the comprehensive implementation of recommendations
- Promote national, regional, and global solidarity, dialogue and cooperation.

33.   Following a pilot phase in 2021, UPHR should now be scaled up and complemented by independent monitoring at the international level by strengthening the Global Preparedness Monitoring Board (GPMB) and the Independent Oversight and Advisory Committee for the WHO Health Emergencies Programme (IOAC) as accountability tools for governments, international organizations and other stakeholders across all sectors to identify the risks and determinants of health emergencies; to reveal gaps and weaknesses in the capacity and performance of health emergency systems and their financing and governance; to develop and implement solutions to ensure equity, effectiveness and

efficiency; and to promote compliance with obligations under international law, including the IHR and the pandemic accord currently under negotiation.

Systems

34.   The ability to prepare for, prevent, detect, and respond effectively to health emergencies depends on five core subsystems (see Figure 2):

- **Collaborative surveillance** and public health intelligence through strengthened multi-sectoral disease, threat and vulnerability surveillance; increased laboratory capacity for pathogen and genomic surveillance; and collaborative approaches for risk forecasting, event detection and response monitoring
- **Community protection** through two-way information sharing to inform, educate and build trust; community engagement to co-create public health and social measures based on local contexts and customs; and a multi-sectoral approach to social welfare and livelihood protection to support communities during health emergencies
- **Clinical care** that is safe and scalable, with effective infection prevention and control that protects, patients, health workers and communities; and resilient health systems that can maintain essential health services during emergencies
- **Access to countermeasures** through fast-track research and development, with pre-negotiated benefit sharing agreements; scalable manufacturing platforms and agreements for technology transfer; and coordinated procurement and emergency supply chains
- **Emergency coordination** with a trained health emergency workforce that is interoperable, rapidly deployable and scalable; coherent National Action Plans for Health Security for preparedness, prevention, risk reduction and readiness; and rapid detection and scalable response through a standardized and commonly applied Emergency Response Framework

Figure 2: Interconnected subsystems
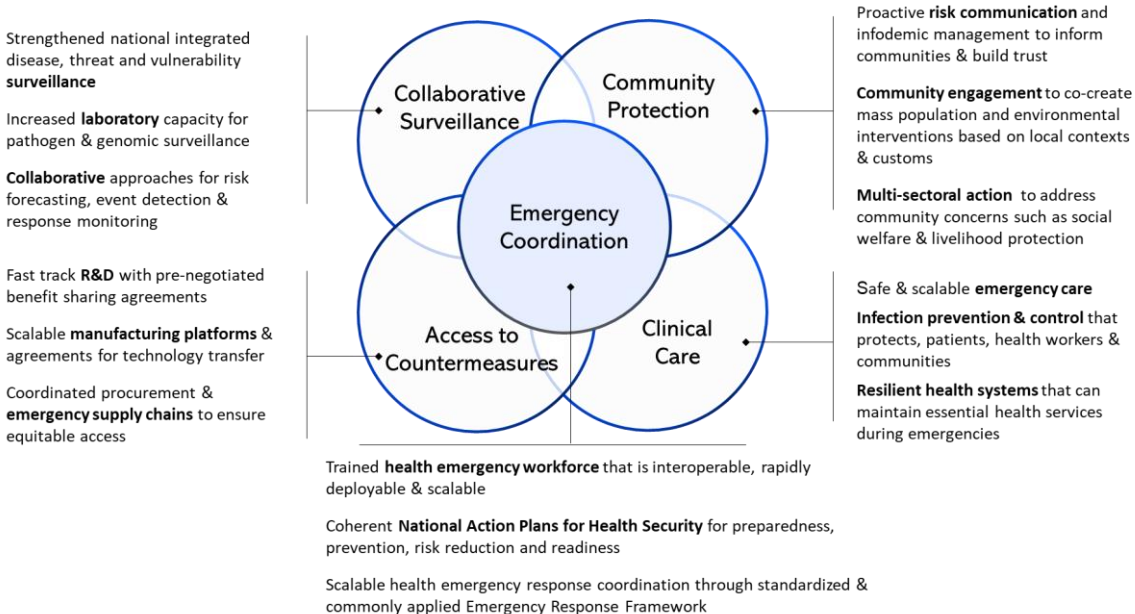
35.   Together, these five subsystems, and the strength of the linkages between them, dictate the strength and resilience of national, regional, and global health security. Proposals for strengthening both the subsystems and linkages between them are outlined below and described in more detail in Annex 1.

Proposal 4. Strengthen a global health emergency workforce that is trained to common standards, interoperable, rapidly deployable, scalable and equipped

36.   The pandemic continues to expose national-level deficits in the core capacities required for effective HEPR. National capacities are the fundamental building blocks of global health security; therefore, these deficits confer profound systemic risks.

37.   Mitigating these risks will require substantial investments in many countries to build and strengthen a professionalized multidisciplinary health emergency workforce, fully integrated into national health systems and other relevant One Health sectors. The scale and nature of workforce needs depend on national context, but the most substantial and widespread gaps highlighted by COVID-19 are in the areas of epidemiology and surveillance, including laboratories; the health system workforce required to rapidly scale safe emergency clinical care and maintain essential services during an emergency; and the community engagement and infodemic management resources needed to strengthen trust in health authorities and community resilience to health emergencies.

38.   Smart investments in strengthening national capacities will enable the development of a Global Health Emergency Workforce to strengthen regional and global preparedness, detection and response. It is proposed to build on the capacities and lessons learnt of the Global Outbreak Alert and Response Network, Emergency Medical Teams and Global Health Cluster to further develop networks that promote interoperability of national health emergency workforces through common training practices and operating procedures. Combined with a global mechanism to support training and accreditation, and coordinate and support deployment, strengthened national capacities can give rise to a country-owned yet internationally deployable Global Health Emergency Workforce.

Proposal 5. Strengthen the network of health emergency coordination hubs, and standardize approaches to strategic planning, financing, operations and monitoring of health emergency preparedness and response

39.   The health emergency subsystems are dependent on each other for operational effectiveness. For example, scaling safe and effective emergency care relies on accurate public health intelligence, access to medical countermeasures and essential supplies, and optimized health-seeking and risk-reducing behaviour in communities, backed by social and economic support measures. Bringing these subsystems together is the key role of health emergency coordination.

40.   At national level, COVID-19 demonstrated that overall health emergency preparedness and response management systems were often fragmented, resulting in responses that were often less than the sum of their parts. At regional and global levels, the pandemic highlighted a lack of consistency in national approaches, and a lack of effective

mechanisms to coordinate and communicate action between countries, and a lack of coordinated support.

41.   Remedying this fragmentation will require further investment in ensuring greater consistency and standardization in emergency coordination at national level, through a commonly applied Emergency Response Framework. Application of this framework must be enabled by strengthened infrastructure, workforce, and leadership that is resourced and empowered to assess risks and vulnerabilities; develop context-specific strategies and plans for preparedness, prevention, readiness and response; mobilize the necessary resources; and monitor and evaluate actions. Health emergency management should be embedded in broader whole-of-government national disaster management systems.

42.   A strengthened network of health emergency coordination hubs can connect international and regional technical, financial, and operational support to national emergency management systems, at the same time as improving coordination between countries and international partners across the health emergency cycle.

Proposal 6. Expand partnerships for a whole-of-society approach for collaborative surveillance, community protection, clinical care, and access to countermeasures

43.   COVID-19 has shown that resilience to health emergencies can be strengthened in key areas by broader and closer collaboration between organizations and institutions at national, regional, and global levels before health emergencies hit. This will require the strengthening and, where required, the establishment of whole-of-society, interdisciplinary, multi-partner networks for collaborative surveillance, clinical care; community protection; and access to countermeasures.

44.   Ad hoc and time-limited regional and global collaborations between national authorities, multi-lateral institutes, and the private sector, such as the Access to COVID-19 Tools Accelerator, COVAX, and the African Union Vaccine Acquisition Trust, played a crucial role in accelerating the development of COVID-19 medical countermeasures. Consolidating and building on these COVID-19 successes whilst ensuring collaborative arrangements are in place to ensure fair access and scalable manufacturing will help to protect the world from both known and theoretical pandemic threats.

45.   At the same time, forecasting pandemic risks and detecting infectious threats can be transformed by closer interdisciplinary collaboration nationally, regionally, and globally. Combining diverse data sets with innovative methods of modelling and analysis is termed collaborative surveillance, and can guide public health decision-making based on improved risk forecasting and situational awareness. The WHO Hub for Pandemic and Epidemic Intelligence is a new initiative that will play a leading role in strengthening collaborative surveillance. The WHO Hub will also drive further development of initiatives such as Epidemic Intelligence from Open Sources and the International Pathogen Surveillance Network. Established global surveillance systems for specific pathogens, such as the Global Influenza Surveillance and Response System, also provide a strong foundation from which to build.

46.   COVID-19 has also highlighted the role that collaborative efforts play in building the resilience of communities to health emergencies. Be it through collaborations between public health institutes and influential private companies and individuals to communicate risk and raise awareness, or with social media providers and researchers to develop infodemic management and community engagement tools, collaborative approaches are key to understanding and empowering communities. The need to invest in collaborative arrangements that bring communities of practice and communities of circumstance together to co-design response and resilience measures has been highlighted after every major health emergency of the past two decades: COVID-19 makes these calls impossible to ignore.

Financing

47.   Studies commissioned since the onset of COVID-19 have estimated the international financing need for HEPR, and have also started outlining the fundamental elements of the financing architecture required to deliver it. The total need is estimated to be above US$ 30 billion per year, with a current funding gap of approximately US$10 billion per year.

48.   Most of the financing needs of HEPR today fall at the national level. National costs are estimated at between US$ 20 billion and US$ 28 billion per year, most of which should be financed through domestic resources. All countries will need to increase and sustain domestic HEPR financing to address the critical gaps identified during COVID-19. Domestic funding for HEPR cannot be subject to political and economic cycles, and should be well-coordinated with and complementary to other health priorities.

49.   In addition to national financing, COVID-19 and previous health emergencies have also highlighted gaps in the sustainable financing of regional and global HEPR institutions, and the availability of flexible and predictable funding to initiate and sustain emergency response operations.

50.   Financing an effective health emergency preparedness and response architecture will not only require more funds, but strengthened and innovative mechanisms to ensure funds are accessed and delivered in ways that ensure the best possible return on investment and the most effective allocation of resources to fill critical gaps.

Proposal 7. Establish a coordinating platform for financing to promote domestic investment and direct existing and gap-filling international financing to where it is needed most

51.   Every country should step up domestic investments to prepare for health emergencies, but low-income countries and some lower middle-income countries need urgent international support to strengthen HEPR. This support can be technical and financial. Technical support can include capacity assessments and the identification of domestic resources. International financial support can come from many different actors, both public and private, with often overlapping and competing priorities.

52.   Greater coordination is required across this funding landscape to ensure that existing funding flows are coordinated and targeted to the most critical gaps in the global HEPR architecture, such as national level preparedness gaps, funding for regional and global HEPR

institutions, investments in upstream and emergency research and development and downstream manufacturing and procurement, and rapidly accessible funding to initiate and scale emergency response operations. Where existing funding flows are insufficient to fill critical gaps in core national and global HEPR capacities, these flows should be augmented by additional catalytic and gap-filling funding through a financial intermediary fund (see below).

53.   To bring coherence and efficiency across domestic and international investments, including through a proposed financial intermediary fund, a new oversight and coordination mechanism is required that unites the technical know-how and input of WHO and other partners across the One Health spectrum with the financial know-how and input of the World Bank and partners from the international financing ecosystem. This coordinating platform for finance and health would measure the performance of HEPR funding flows, improve effective allocation to critical priorities, and help to mobilize and direct catalytic and gap filling financing support. This new mechanism should strive for worldwide representation, building on the work of the G20 Joint Finance and Health Task Force.

Proposal 8. Establish a financial intermediary fund for pandemic preparedness and response to provide catalytic and gap-filling funding

54.   Existing funding flows fail to cover gaps in the HEPR architecture. A new pooled fund has been proposed by several reviews and organizations as a potential solution. Most recently, WHO and the World Bank recommended to the G20's Joint Finance and Health Task Force Track that a Financial Intermediary Fund (FIF) be established, to be hosted by the World Bank.

55.   The FIF should avoid duplication and ensure complementarity with existing financing efforts and institutions. Critical design elements for a FIF should include:

- Central role for WHO to enable direct linkage between national HEPR assessment and planning processes and the investments proposed by the FIF.
- Governance mechanisms that include a coalition of participating donors, and that are informed by objective assessments of HEPR needs and the perspectives of beneficiary country governments.
- Work with existing multilateral development banks and implementing partners, who should be eligible for financing.
- Disburse funds exclusively based on proposals submitted by countries (alone, or jointly with other countries, regions, or implementing partners), targeting gaps identified through UPHR (see above).

Proposal 9. Expand the WHO Contingency Fund for Emergencies to ensure rapidly scalable financing for response

56.   More predictable and rapidly scalable financing is needed for emergency response. In the first weeks of a new event, rapid access to funding is needed to respond to and control emergencies before they escalate. This funding should be fully flexible, and available to fill gaps in national response through the deployment of appropriate elements of a global health emergency workforce, key partner capacities, and response-critical supplies. In the

event that initial containment efforts fail, access to predictable and sustained funding is required to scale and adapt the response, with a mechanism to draw down funding based on pre-negotiated triggers and thresholds.

57.   At present, funding mechanisms for emergency response are fragmented and unpredictable. The WHO contingency fund for emergencies (CFE) is able to disburse relatively modest amounts rapidly for early response, but it is not designed to directly finance elements of national response, nor the efforts of key partners, often leading to operational gaps when implementing multi-disciplinary and multi-sectoral response plans. In addition, in the event that initial containment efforts fail, WHO's CFE is not designed to support the scale-up and adaptation of response, nor sustain a response over durations longer than the initial few months. In the absence of pre-negotiated draw down mechanisms to enable access to larger tranches of flexible funding triggered by the escalation of health emergencies, critical windows for scale-up are often missed due to a reliance on unpredictable, often inflexible, and frequently insufficient funding from ad hoc appeals.

58.   Addressing the problems above will require two innovations. First, the CFE should be expanded in size and scope to enable the direct financing of national and international partners in the first stages of the response, including deployments through the health emergency workforce and emergency supply chain. This will ensure that multi-sectoral health emergency response plans can be fully and rapidly implemented. Second, in the event that initial response efforts are unable to contain an infectious threat or sufficiently mitigate the effects of a non-infectious hazard, an additional substantial draw down facility should be triggered to ensure that the multi-sectoral response can be scaled up to cover additional geographical areas and populations for an extended duration. The triggers for activation of this draw-down facility should be pre-negotiated, transparent, and based on the "no regrets" precautionary principle.

59.   An expanded CFE could satisfy both needs, with contingency funds accessed via two transparent mechanisms: a rapid response facility (RRF), and a sustained scale-up facility (SSF), both of which would be linked to a standardized and commonly applied Emergency Response Framework for alert, verification, risk assessment and jointly developed strategic plans and resource requirements for rapid and scalable response.

Proposal 10. Strengthen WHO at the centre of the global HEPR architecture

60.   Finally, it is clear that at the heart of the HEPR architecture, the world needs a strengthened WHO, with the authority, financing and accountability to effectively fulfil its unique mandate as the directing and coordinating authority on international health work. A pandemic accord, adopted by WHO Member States, should reinforce the legitimacy and authority of WHO and complement steps that Member States are already taking to ensure sustainable financing of the Organization. The accord would also ensure that the technical expertise of WHO, its offices and its various scientific, operational and monitoring bodies and networks, are utilized most effectively and efficiently within an equitable, inclusive and coherent architecture for health emergency preparedness and response.

Next Steps

61.   The HEPR systems, finance and governance proposals described in this white paper represent a coherent approach to developing a fit-for-purpose HEPR architecture. Operationalizing that architecture will require an additional level of detail, followed by implementation by both WHO and our partners. Change will not be easy, but time is of the essence – health emergencies can strike at any time and the COVID-19 pandemic is not over. WHO stands ready to build from the work done during the pandemic to develop the new capabilities required of it and to engage closely in ongoing processes, including the development of a Pandemic Accord.

62.   The Director-General's proposals are designed to support and contribute to decision-making in the various fora within and beyond WHO that will determine the future global architecture of HEPR. History tells us that the world has a small window of opportunity to endorse and implement the proposals in this white paper before global attention shifts and we begin another cycle of panic and neglect.

63.   The Secretariat welcomes comments from Member States on this paper, and Member States will have the opportunity to participate in informal consultations organized at HQ and by Regional Offices, and to submit their feedback in writing. Informal consultations will also take place with UN partners, other international and regional organizations, civil society, and other major stakeholders.

64.   The secretariat will publish a final version of the Director-General's proposals ahead of the Seventy-fifth World Health Assembly.

ANNEX 1: STRENGTHENING HEPR SYSTEMS CAPACITIES

1. Collaborative surveillance

Public health decision-making at local, national, regional, and global levels must be based on real-time, accurate public health emergencies surveillance data and analysis of relevant contextual information across the One Health spectrum. Accurate, timely information about emergence, transmission, susceptibility, morbidity, and mortality, as well as in-depth contextual insights on risk and vulnerability, are crucial to initiate and adjust appropriate response measures, including targeting countermeasures to the most vulnerable populations.

The COVID-19 pandemic exposed marked weaknesses in how countries detect and manage public health threats. Countries faced tremendous challenges in understanding changing risks as the virus evolved; vaccines, therapeutics, and diagnostics were developed and deployed; and public sentiment and behavior evolved. Traditional surveillance approaches were often weak, and even where they were strong, they required additional breadth of information for effective management of such a complex public health event. Limitations in surveillance affected multiple aspects of prevention, detection, and response during the pandemic:

- Initial detection and investigation efforts were compromised by inadequate integrated multi-sectoral surveillance mechanisms, spanning the intersection of human, animal, and environmental health. Current surveillance approaches often remain limited mainly to human health data, and we still lack systematic sampling in wild and domestic animal populations to detect and understand transmission and risk, including that of SARS-CoV-2.
- Initial response efforts were also hampered by slow and incomplete data and sample sharing (including due to fragmented data systems and sharing agreements), particularly about the epidemiologic features of transmission and clinical features of infected persons. This reduced the ability of WHO and all Member States to assess the situation based on all available evidence.
- Laboratory molecular diagnostic capacity was inadequate in many countries, and where laboratory capacity was available it was often poorly coordinated and too centralized. Many countries were slow to pivot their existing diagnostic resources for SARS-CoV-2 diagnosis. Genomic sequencing capacity, and broad disease tracking is insufficient in most of the world, leading to global blind spots in our ability to detect and track SARS-CoV-2 variants. The detection and investigation of public health events, including zoonotic transmission events, is weak in many parts of the world, but is fundamental to our ability to mount a swift public health response and to accelerate the development and deployment of medical countermeasures.
- Response monitoring also proved challenging in many countries. Mechanisms for monitoring care capacity, health system utilization or vaccination rates were non-existent or overwhelmed in many cases. This often hindered the ability to identify risks and vulnerabilities, or to adjust public health and social measures on the basis of timely and accurate data and analyses.

Although catch-up investments and adaptations to existing systems have improved the surveillance picture since the onset of COVID-19, many gaps persist. Official COVID-19 case and death counts continue to significantly underestimate true disease burden in many locations, and there remain major blind spots in our ability to detect and monitor new variants of SARS-CoV-2 in humans and animals. These gaps also have significant negative implications for the detection of and response to infectious outbreaks during other public health events and emergencies with health consequences, such as humanitarian crises and natural disasters.

National disease surveillance, starting at the lowest administrative level in a health system, is the foundation on which global HEPR must be built. Transforming fragmented and often antiquated systems into a modern, integrated, and effective global public health surveillance system will require substantial investments in several key areas.

1.1 Strengthened national integrated disease, risk, and vulnerability surveillance

Integrated disease surveillance and field epidemiology based on indicator-based and event-based surveillance, early case investigation and contact tracing delivered by an expert work force, have formed the core of disease surveillance for decades. However, the experience of COVID-19 and other major outbreaks has demonstrated the need to strengthen, modernize, automate, and improve the coordination of surveillance in order to enhance risk and vulnerability assessment and inform decision-making.

Investments in surveillance should include the development of advanced information systems able to synthesize the breadth of information required to effectively assess the extent of inequalities in vulnerability to health emergencies, to better understand access to health care within populations, and to inform policies and programmes that address the deep-seated causes of these inequalities.

The integration of surveillance data and risk and vulnerability assessments into the decision-making process to drive action will need to be strengthened and accompanied by an accountability mechanism to ensure that surveillance leads to action. This responsibility lies within the governance architecture of countries, and should be clearly defined. Countries should build networks of relevant public and private organizations that engage on a regular basis to facilitate the rapid communication of surveillance data to national public health institutes.

Underpinning all the above is the need for a well-trained workforce in the traditional and new competencies required to deliver a modern surveillance architecture and epidemic intelligence function. In particular, rapid verification and understanding of new public health events depends on strong on-the-ground epidemiology. All countries should prioritize development and access to field epidemiology training programmes as part of their critical preparedness and response capacities. WHO should play a leading role in supporting Member States develop a strong field epidemiology workforce, addressing critical factors such as access to high quality training programmes and contemporary training curricula, development of career pathways for Field Epidemiologists within the health system, and workforce planning to ensure that all Member States have sufficient field epidemiology capacity.

1.2 Increased laboratory capacity for pathogen and genomic surveillance

Disease surveillance and health systems more broadly must be underpinned by sufficient laboratory and diagnostic capacity to allow for timely analysis of samples, including mechanisms to harness surge capacity during emergencies. Strengthening laboratory and diagnostic capacity should include enhanced practices and monitoring to ensure biosafety and biosecurity, the strengthening of protocols and practices to allow for the rapid and safe sharing of laboratory data and samples, and standardization and coordination of rapid mobile laboratory capacity.

Many countries have exponentially increased their physical infrastructure for laboratory diagnostics during their COVID-19 response without proper planning for integration into overall surveillance and health systems, and sustainability. To ensure that we gain maximum benefits out of these investments, significant attention will need to be paid to coordination and management.

COVID-19 has also shown the need for further investments in molecular and genomic sequencing capacity, both for the early stages of disease surveillance and outbreak detection, and for epidemiological investigation, monitoring and research and development during outbreaks. The World Health Assembly called on Member States to strengthen genomic surveillance for emergency preparedness and response in 2021, and WHO, after consultation with partners, has now published a Global Genomics Surveillance Strategy to achieve five strategic objectives by 2031, including: 1) improve access to tools for better geographic representation; 2) strengthen the workforce to deliver at speed and scale, and with quality; 3) enhance data sharing and utility for streamlined local to global public health decision-making and action; 4) maximize connectivity for timely value-add in the broader surveillance architecture; and 5) maintain a readiness posture for emergencies.

In response to COVID-19 more than two-thirds of countries now have some sequencing capability for SARS-CoV-2 that must be sustained and incorporated into strengthened surveillance systems. Other countries will require support to establish their genomic surveillance capacities for SARS-CoV-2 and other pathogens with pandemic and epidemic potential.

1.3 Collaborative approaches for risk forecasting, event detection and response monitoring

At the national, regional, and global levels, new approaches are required to integrate and harness information from divergent sources. This should include the integration of diverse contextual information (including zoological, ecological, population, humanitarian, and climate data) with traditional surveillance data to assess risk more accurately. In addition, an effective response depends not only on disease surveillance data, but also on integrated event and health system analysis (including event impact, disease transmission, care capacity, and health system utilization).

Combining diverse strands of data through an improved collaborative intelligence function can guide decision making based on improved risk forecasting and modelling of disease trends. Such collaborative intelligence and advanced analytics will require multi-disciplinary global and regional trust-based networks, building on appropriate and timely information

sharing for local and national health authorities, regional bodies, and WHO, to make timely and appropriate decisions to guide response to emerging threats.

The WHO Hub for Pandemic and Epidemic Intelligence is a new initiative that will play a leading role in strengthening pandemic and epidemic intelligence. The WHO Hub will also drive further development of initiatives such as Epidemic Intelligence from Open Sources (EIOS) and the International Pathogen Surveillance Network (IPSN). Established global surveillance systems for specific pathogens, such as the Global Influenza Surveillance and Response System (GISRS), also provide a strong foundation from which to build.

Rapid sharing of genomic data, pathogens, epidemiologic data, and other relevant information will be a critical enabler for effective pandemic and epidemic intelligence globally; effective sharing is essential not only for outbreak indentation and control efforts but also for expediting research and development process for medical countermeasures. The WHO BioHub initiative launched in 2021 will continue to guide the use of pathogens for research and development under fair allocation conditions, building on the success of initiatives such as the Pandemic Influenza Preparedness Framework.

2. Community protection

Outbreaks and epidemics begin in communities, spreading via the social and economic links between us all. Ultimately, all outbreaks also end in communities, through the successful implementation of public health and social measures. Reviews of health emergency responses over the past decade have often called for new approaches to risk communication, community engagement, and methods of fostering community resilience that will pay dividends when the time comes to respond to any threat to health. The difficulties that many countries have faced in implementing public health and social measures during COVID-19 echo challenges that have been noted in many past health emergencies, including the need for additional local capacity. These challenges include:

- Infodemic of COVID-19 misinformation – often combined with ineffective and inconsistent risk communication and public health messaging – eroded public trust in public health authorities and science and undermined the effectiveness of public health and social measures and the demand for countermeasures such as vaccines.
- Effective public health and social measures often proved disruptive to the daily social and economic life of affected communities. Socioeconomic impacts, such as effects on mental health and loss of livelihoods, were not properly assessed or mitigated in many cases. And, like COVID-19 itself, the most marginalized and vulnerable communities are the hardest hit.
- Disruptions to travel and trade would have benefited from more consistent coordination, and clearer communication based on evidence-based policy making.

Recent analyses of the COVID-19 response also suggest that trust in national authorities has a crucial role in determining the effectiveness of health emergency response measures. Involving communities and community-owned and representative structures in designing and implementing COVID-19 response measures has been shown to establish trust in

government instructions and science, but communities have largely been absent from decision-making at local and national levels.

New techniques for infodemic management can counteract some of the corrosive effects of misinformation on public trust in science and authorities, but enduring trust and resilience must be built through effective engagement with communities before, during, and after health emergencies.

2.1 Proactive risk communication and infodemic management to inform communities and build trust

At the national level governments should be supported to invest in and co-ordinate risk communication and infodemic management policies and strategies that ensure health and wellbeing at all times, and build enduring trust and resilience, including resilience to misinformation. These strategies must go beyond generic public messages and must be tailored wherever necessary especially to at risk groups and sub-populations to ensure the inclusion of all communities, including those who are digitally excluded. For example, the Collective Service aims to enable structures and mechanisms that can promote coordinated, community-centered approaches to risk communication and community engagement that are embedded across public health, humanitarian, and development response efforts.

Key aspects of infodemic management include adopting innovative tools and solutions, fostering a dynamic understanding of public attitudes, understanding and conversations about infectious pathogens and public health and response measures; the ability to ensure accurate, evidence-based and appropriate information is available and prominent in public discourse at the expense of misinformation and disinformation with the potential to erode public understanding and trust in public health messages and undermine the effectiveness of public health and social measures.

2.2 Community engagement to co-create emergency interventions based on local contexts

Lessons from the COVID-19 pandemic and other recent emergencies once again demonstrate that communities play fundamental and critical roles in detecting, controlling, and mitigating transmission of infectious disease outbreaks and pandemics. Community capacities and activities – including primary health care – and the roles of local health workers, civil society and the private sector are therefore central to effective health emergency preparedness, readiness, and response.

COVID-19 also demonstrated on a global scale how the effectiveness and feasibility of interventions hinged on the trust that communities had in authorities, and on the support that was provided to communities to ensure that implementing public health measures did not come at too high a cost to livelihoods, education, and social and mental wellbeing. In many contexts this support was inadequate.

Community members are often well placed to identify and manage their own risks through actions that provide protection to themselves, their families, and communities; and are often the first responders to an emergency. The resilience of communities can be

strengthened by assisting them to identify relevant hazards and vulnerabilities, and by building their capacities to mitigate, prepare for, respond to, and recover from emergencies.

Whole-of-society and whole-of-government approaches are required to support communities, build their capacities, and ensure opportunities for engagement. At national level this will require long-term investment in a culture of social connectedness and investment in civic mindedness, and the promotion of participatory decision-making and partnerships between governments and communities to ensure that preparedness, response, and recovery efforts address community needs. Communities, including communities of practice, community health workers, civil society organizations and the private sector should be early partners in the design, planning, implementation, and assessment of pandemic preparedness and response efforts. This approach requires engagement with all stakeholders and appropriate, inclusive governance structures must be put in place to facilitate this and there must be strong links between primary healthcare and community-based health services.

Clear structures and sustained funding for bi-directional community engagement are needed at national level, in addition to technical support from regional and global levels, to foster durable trust in authorities in times of crisis, vulnerability and uncertainty. Earning and maintaining trust is a continuous process. Sustained investment is also required in public health information campaigns and community engagement to promote long-term health emergency preparedness and specific pandemic preparedness goals including reducing the risk of zoonotic transmission (essential to prevent as many spill-over events as possible).

Building community trust and confidence in the health and social care system is essential, and governments, international organizations and all stakeholders must take necessary steps for prevention and response to sexual exploitation, abuse, and harassment. Coordinated community engagement and empowerment strategies can invigorate local ownership, open access to vulnerable groups, enhance surveillance systems and, most importantly, build trust – the pivotal ingredient for all community action.

2.3 Multi-sectoral action to support community implementation of public health and social measures

The COVID-19 pandemic has highlighted the devastating effects of health emergencies on the welfare and livelihoods of people. Examples include an increase in school absenteeism, intimate partner violence aggravated by the closure of professional social support services, and the loss of livelihoods due to the curtailment of certain industries. These impacts were often unevenly distributed, with vulnerable subpopulations affected to a significantly greater extent than others. During the COVID-19 pandemic, the support that was provided to communities to counterbalance such effects was often inadequate, resulting in an erosion of trust between communities and authorities, and ultimately a reduced ability of communities to participate in the response.

Addressing community concerns beyond the health sector, to minimize the impacts of health measures on lives and livelihoods, is a key part of building trust and enabling and incentivizing communities to fully implement public health measures and population-based

interventions. Indeed, the support of communities relies on the assurance that interventions will not come at too high a cost to livelihoods, education, and social and mental wellbeing.

Extensive socioeconomic assessments are needed to understand the unintended negative consequences of public health and social measures. This should be based on experiences from past health emergencies, and encompass a context-specific mapping of community constituents (e.g., students, senior citizens) and vulnerabilities. Building on this evidence base, targeted mitigation measures should be put in place. Additionally, considerations of socioeconomic impacts should guide the design and calibration of public health and social measures.

3. Clinical care

COVID-19 has affected every health system in the world, and exposed marked differences amongst them in terms of their resilience to the shock of an emergency. A lack of resilience in health systems has manifested not only in suboptimal emergency care for patients with COVID-19, but also in the interruption of other essential health services, both of which have been primary drivers of the indirect human and economic costs of the pandemic.

While the current pandemic has highlighted weaknesses in care delivery systems around the world, some of these gaps, especially in low and low-middle income countries, were generally understood before the pandemic and already targeted for strengthening through the Universal Healthcare Agenda. In other cases, well-resourced systems were found to be less resilient to health emergencies than had been previously expected, which backs up the notion that a resilient health system goes beyond mere availability of resources, but hinges on access to intentional systems designed to organize and leverage existing capacities to greatest effect. Although each country's experience was unique, several common themes emerged:

- Healthcare workers bore a disproportionate burden of disease relative to their underlying demographics, in part because of a lack of infection prevention and control measures.
- Health systems continue to struggle to maintain non-emergency essential services while also responding to COVID-19, especially during the first year of the pandemic. This is reflected in the fact that global excess mortality during the pandemic is significantly higher than the number of deaths directly attributable to COVID-19.
- Foundational health system gaps and essential public health functions for emergency management resulted in limited capacity to effectively respond to COVID-19 cases, poor implementation of public health measures and making service delivery vulnerable to disruptions.
- Many health systems struggled to provide high-quality care during surges in the number of patients requiring acute care. In some cases, this was driven by specific resource shortages, such as shortages of oxygen, ventilators, ICU bed space or health staff. Ineffective multi-sectoral coordination and governance stalled the response to rising cases in the early acute phase, including in incident management, implementation of public health measures and the ability to flexibly deploy

workforce to areas of greatest need, to sustain essential health systems functions and service delivery.

Some of the enormous strain that COVID-19 placed on secondary and tertiary services could have been avoided through greater focus on prevention and preparedness, as well as rebalancing clinical loads across levels of care. This includes harnessing the role of primary health care in emergencies and utilizing the roles of different levels health services delivery in detecting cases early, managing simpler cases close to the community, employing triage to protect hospital capacity, and strengthening essential public health functions.

3.1 Safe and scalable emergency care

The most safe and resilient health systems during COVID-19 were those that could surge to meet the increased demands imposed by the health emergency while maintaining essential services and having the flexibility to deploy resources where needed.

The ability to provide safe and scalable emergency care can be reinforced by strengthening essential capacities, in the form of a well-trained health workforce, a modular infrastructure, essential equipment, and sufficient supplies. These capacities should be anchored within rapidly deployable clinical care protocols at facility level to prioritize patient flows during a health emergency, including through patient screening, isolation, acuity-based triage, and targeted referral pathways.

All countries should invest in capacities to ensure that adequately trained staff, resources, and infrastructure are available for the management, referral, and transportation of all patients affected by IHR relevant emergencies/hazards, based on risk and vulnerability assessments. Training and long-term planning for health workforce development is crucial preparation for scenarios in which health workers must be redeployed to meet a surge in demand. Protocols should be developed to adapt capacities and redeploy resources during emergencies, including through the phased reallocation of workforce from routine services towards emergency services based on established triggers and thresholds.

In situ capacity should be augmented by rapidly deployable Emergency Medical Teams (EMTs) to support emergency clinical needs. EMTs should have common curricula and assessment criteria to allow them to rapidly add capacity in a range of contexts.

3.2 Infection prevention and control that protects patients, health workers and communities

COVID-19 has confirmed the central role that infection prevention and control (IPC) plays in the prevention and containment of outbreaks in health care facilities and within communities. Data from WHO and Organization for Economic Cooperation and Development show that immediate access to sufficient personal protective equipment (PPE) and IPC training roll out in the first few months of the pandemic would have prevented many infections among health workers globally, saved lives, and averted immense costs.

Indeed, IPC best practices are prerequisites to safe clinical care and to the protection of health workers, patients, and communities at all levels of the health system. Building on the

key learnings of health emergencies, it is critical that the key improvements that were achieved during the pandemic are maintained, and efforts are intensified and harmonized. A global strategy for IPC is required to provide strategic direction, establish agreed targets, and set mechanisms for accountability, including the elements of a legal framework to enforce IPC within the health system in synergy with other programmes such as those dedicated to AMR, quality of care, patient safety and occupational health.

More concretely, IPC measures should go beyond the procurement and use of PPE and supplies for hygiene and cleaning. While these are indeed essential tools for the prevention and containment of outbreaks, more sustainable measures must be introduced, including the implementation of interventions to change practices, and the continuous training of health workers and essential staff on IPC measures and the rational use of PPE. Additionally, the design and implementation of IPC measures should ensure that family and visitors can be close to their loved ones during care.

Furthermore, environment interventions based on water, sanitation, and hygiene (WASH), which are key enablers of IPC, should become permanent elements of the infrastructure and extend beyond isolation wards to other priority wards of health facilities. Similarly, access to WASH services should also be provided in public places and community spaces most at risk, with special considerations for vulnerable collective sites (including for homeless people, migrants, and long-term care populations) and community isolation centers.

3.3 Resilient health systems that can maintain essential health services

Significant lessons and opportunities have emerged from the experience of COVID-19 that can improve and transform approaches to building health systems resilience. For example, the WHO position paper on building health systems resilience for Universal Health Coverage and Health Security during the COVID-19 Pandemic and beyond provides a number of policy recommendations based on the experience of national health systems during the pandemic.

Solutions to strengthen resilient health systems must address foundational health system gaps and essential public health functions, which provide a cost-effective, holistic approach to strengthening public health capacities. Leveraging technologies can provide new ways of organizing health services to provide alternative platforms for health service delivery to improve response and recovery efforts. Structural deficiencies in health, social and economic policies and sectors that impact the resilience of health systems and societies must be addressed, with a focus on equity. This may include instituting health and social protection measures, addressing financial barriers to high-quality health care, improving equitable access to health services, and promoting context specific, integrated, and effective support to all populations.

Resilience of the health workforce includes non-clinical aspects of protection, such as working conditions, fair remuneration, the availability of hazard pay, professional education and development, and mental health support.

Finally, the provision of accurate real time data about health system capacity and utilization is vital for effective decision-making. Health information systems contribute to resilience and to the safe scaling of clinical care in emergencies by enabling the efficient allocation of

resources within the health system, which helps to limit the interruption of essential services.

4. Access to countermeasures

On 31 December 2020, WHO granted the first Emergency Use Listing (EUL) for a COVID-19 vaccine – a research and development milestone that usually takes years was reached within 12 months of the first report of SARS-CoV-2. But as extraordinary as the work to develop vaccines was, the roll out of vaccines has been highly inequitable. 16 months after the first vaccine doses were given in high-income countries (HICs), only 12 % of the population in low-income countries (LICs) are fully vaccinated. Similarly, the rapid development of effective diagnostics for SARS-CoV 2 has been followed by an uneven scale-up of testing across the world. The development of novel therapeutics for COVID-19 has also lagged behind the development of vaccines and diagnostics. It has taken almost 2 years since the onset of the pandemic for effective oral antivirals to be granted EUL, whilst deployment of these new treatments at scale is still months away.

The end-to-end value chain for medical countermeasure, from research to deployment, includes: research and development, before and during a pandemic; early discovery to inform the development of target product profiles (TPPs); scaling of emergency trials and protocols; regulatory evaluation, approval and monitoring; incentivizing and building production capacity, including at risk; scaling up and scaling out manufacturing to all regions, including through technology transfer and licensing agreements; procurement and enabling minimum access of countermeasures based on equity in all countries; and demand generation and support for in-country delivery. Without concerted and coordinated effort across all the steps of the countermeasures value chain, in the future it is unlikely that we will be able to match the pace at which countermeasures were developed and deployed for COVID-19.

The world was fortunate in 2020 to be able to build on previous work on coronaviruses and on new vaccine technology, giving the world a crucial head start in the research and development process. The response to COVID-19 has shown that, in times of crisis, it is possible to mobilize resources, rapidly accelerate development, and increase global and regional coordination between governments, private sector, academia and international organizations. However, the COVID-19 pandemic has also uncovered several fundamental impediments to the development and roll out of crucial countermeasures, including:

- A lack of predictable HEPR financing and mechanisms to support rapid actions across the value chain to develop medical countermeasures still hinder our abilities to prepare for and respond to emergencies. Coordinated and strategic end-to-end development of medical countermeasures can only work if it is appropriately financed, including predictable financing for both surge capacity during acute response and sustainable financing to maintain development and dual-use manufacturing capacity during inter-pandemic periods. The lack of predictable financing for the scale-up and roll out of COVID-19 tools has led to inequities in access to and uptake of COVID-19 tools. Despite the implementation and availability of financial mechanisms such as advance purchase agreements, the associated risks

and significant capital costs of development discouraged investment in the development of diagnostics and therapeutics, especially in low-income countries.

- Despite the benefits of accelerated emergency authorization processes, there is a lack of standardized regulatory capabilities across countries, leading to both repeated regulatory review and different standards in different locations. These variations in regulatory approach and capacities contributed to marked variations in the speed at which medical countermeasures were implemented in different regulatory jurisdictions.

- Access to COVID-19 medical countermeasures – including mechanisms for manufacturing and equitable distribution – remains highly inequitable across countries, and the failure to ensure equitable access to countermeasures has been a key factor prolonging the acute phase of the pandemic. This is primarily due to the absence of pre-agreed terms with manufacturers to guarantee LICs and lower-middle-income countries (LMICs) access and hoarding of medical countermeasures by countries that could afford to invest in at-risk development. Certain countries with production capabilities prioritized introduction of medical countermeasures nationally. Mechanisms such as the ACT-Accelerator partly mitigated these challenges by procuring countermeasures that could otherwise not access them, but no initiative was able to overcome the political incentives for high-income countries to ensure their own access first regardless of vulnerability, nor were they able to sufficiently expand manufacturing capacities to LICs and LMICs.

Drawing on lessons from the response to the COVID-19 pandemic, including from the work of various international and regional organizations such as the UN COVID-19 Supply Chain Consortium, ACT-Accelerator, COVID-19 Solidarity Trials, and from other mechanisms such as the PIP Framework for Influenza pandemics (adopted after the H1N1 pandemic), WHOs R&D blueprint, the International Coordinating Group (ICG) on Vaccine Provision, the SDG Global Action Plan and more, we must focus on addressing weaknesses and gaps across the value chain for developing and delivering essential medical countermeasures.

4.1 Fast-track research and development with pre-negotiated benefit-sharing agreements

Pre-negotiated benefit-sharing agreements and frameworks for accelerated emergency research and development of countermeasures are needed to ensure global coordination and collaboration and avoid duplication. Upstream research and development efforts should be prioritized and driven according to a well-resourced global research and development roadmap that builds on lessons from the WHO R&D Blueprint, COVID-19 Solidarity Trials, PIP Framework, ICG, and other initiatives, with efforts directed towards medical countermeasures such as diagnostics, vaccines, and therapeutics for priority pathogens of pandemic potential.

In addition, research and innovation efforts should focus on technology platforms, ethics and regulatory pathways, and health system operational research that would benefit the development, manufacture, and rapid deployment of countermeasures in response to both a priority pathogen and in the event of a "disease X" scenario.

Fast-tracking regulatory pathways and quality assurance for medical countermeasures, for example through greater harmonization of regulatory pathways at the national and international level, including WHO pre-qualification of manufacturing facilities, can also accelerate the roll out of countermeasures.

4.2 Scalable manufacturing platforms and agreements for technology transfer

COVID-19 has highlighted the need to significantly re-think our approach to ensuring equitable access to countermeasures for future events. Investment in additional globally distributed manufacturing capacity that can be rapidly pivoted to emergency needs during crises would ensure that more people will have early access to future countermeasures. This dual-use capacity should be planned to manufacture all major categories of emergency medical countermeasures (including vaccines, therapeutics, and diagnostics) and be maintained in a state of readiness, including through integration into the manufacturing of non-emergency products, such as vaccines for routine immunization programmes, so that it can be called on during emergencies.

Allocation of manufacturing capacity should ensure an even distribution across global regions to balance aggregation of demand with proximity to end users. This capacity should be complemented by pre-defined mechanisms for licensing and intellectual property sharing, such as that created through WHO's C-TAP Medicines Patents Pool voluntary licensing agreement. Equity of access should be ensured by robust emergency supply chains so that the system defaults to an equitable approach.

4.3 Coordinated procurement and emergency supply chains to ensure equitable access

The COVID-19 crisis has shown that in times of outbreak, scarcity/shortage of supplies can paralyze response mechanisms and increase inequities between countries. Emergency supply chains and logistics are needed to ensure the world does not run out of supplies when and where they are most needed, and the logistics to access them are robust enough to stand in times of crisis. Capacities established and lessons learnt under the Coordinated UN COVID-19 Supply Chain Task Force must be sustained and applied.

This includes resilient and scalable supply chain capacities focusing on last-mile delivery and scalable, cross-sectoral delivery and implementation plans for emergencies, pre-negotiated and coordinated procurement, pre-negotiated distribution contracts, stockpiling/logistics hubs and emergency supplies lists. Ensuring access to predictable and timely financing will be a crucial determinant of success.

5. Emergency coordination

Coordination of HEPR systems is critical to systematically marshal and deploy the appropriate resources (knowledge and data, financial, material, technical and operational) to prepare for, prevent, detect, alert, and respond rapidly to any health emergency, and guide the recovery of society and the evolution of the preparedness and response systems in the period following a crisis. Effective coordination enables all the other sub-systems to deliver on their potential. At all levels of organization, accountable leadership must be underpinned

by effective multisectoral, and multidisciplinary coordination, particularly in incident management of acute response.

At the national, regional, and global levels, COVID-19 exposed deficiencies in our collective ability to coordinate pandemic preparedness, alert, and rapid response. While some individual elements of the global response were effective (for example, the speed of vaccine development), the lack of an overall integrated response framework meant that the impact of these successes was less than it should have been. Specific challenges included:

- COVID-19 underlined the need for more comprehensive multi-sectoral planning processes, more fit-for-purpose frameworks on health security and more systematic use of simulation exercises, and intra-action and after-action reviews (IARs and AARs), that are integrated within national health systems planning, processes and based on the principle of One Health.
- The existing global health emergency workforce is too dependent on the good will of ad hoc voluntary contributions, and requires a more professionalized and predictable workforce and coordination mechanism.
- Few pre-existing coordination mechanisms existed to facilitate whole-of-government and whole-of-society response to a multifaceted crisis such as COVID-19, contributing to the initially slow response to COVID-19 in many cases. Similarly, a lack of integration and coordination between different capacity strengthening initiatives across the health emergency cycle has given rise to fragmented and siloed health emergency capacity that is less than the sum of its parts.

Strengthening leadership capacities and multi-sectoral coordination at national level, in addition to multi-lateral coordination at the regional and global levels, is a crucial step towards reversing the fragmentation of the HEPR architecture, with several key areas that require urgent attention. Coordination and collaboration on One Health must be strengthened and accelerated between relevant international agencies, with clearly established priorities, areas of responsibility, joint work plans to prevent health emergencies and promote the health of humans, animals, and the natural environment.

5.1 Trained health emergency workforce that is interoperable, rapidly deployable & scalable

The vision of the Global Health Emergency Workforce (GHEW) is to have a multidisciplinary team in every country, that is ready to detect, prevent, alert, and respond to emergencies. Specialized teams such as national Emergency Medical Teams (EMTs) will also be established or reinforced if they exist already. The primary building block of a GHEW will be strengthened national capacities to effectively manage health emergencies, and therefore our collective efforts must be geared towards enabling these country-owned capacities.

Although centered in national capacities, taking into consideration already established quality-assured mechanisms, the global health emergency workforce should train to a common set of norms and standards to allow for effective coordination and interoperability, and draw on and support the institutional capacities of partners in the Global Outbreak Alert

and Response Network (GOARN), the Global Health Cluster (GHC), and EMT initiative for both domestic and international rapid response.

5.2 Coherent National Action Plans for Health Security for preparedness, prevention, prevention, and readiness

Breaking the cycle of panic and neglect when it comes to health emergency preparedness is about more than just financing. Scaled prevention and readiness, including the routine integration of One Health approaches, must be a cornerstone of HEPR. At the national level, authorities should establish coherent cross-government One Health strategies.

Planning is a key component of preparedness coordination at the national level; through the development and implementation of National Action Plans for Health Security (NAPHS) and their equivalents, Member States can seize the opportunity to plan investments in national systems to strengthen health security, enhance national emergency preparedness to serve the vulnerable, and promote health.

NAPHS can unite a broad range of technical, operational, and financial support behind a single coherent national vision that addresses any risks and vulnerabilities identified through capacity-assessment processes, including voluntary Joint External Evaluations and other components of the IHR Monitoring and Evaluation framework (State Party Self-Assessment Annual Reports, IAR, AAR, Simulation exercises), dynamic preparedness metrices, and in the future, the Universal Health and Preparedness Review process.

Comprehensive multi-sectoral planning and resource mapping should engage all relevant stakeholders, including civil society organizations, multi-lateral organizations, and private sector. NAPHS must be aligned with the broader national health strategy to minimize duplication and ensure that the dual benefits of health security investments are fully realized. The Global Strategic Preparedness Network will aim to provide peer to peer human resources support for the sustainable implementation of NAPHS.

5.3 Scalable health emergency response coordination through standardized & commonly applied Emergency Response Framework

Timely, effective, and rapidly scalable response must characterize the approach to all health emergencies. Response readiness should be guided by regular risk and vulnerability assessment to highlight the most likely threats. From the early detection of emergency signals to the coordination of a large-scale response operations, WHO has specific responsibilities and accountabilities under the International Health Regulations (IHR) (2005) and within the global humanitarian system as the Interagency Standing Committee (IASC) Global Health Cluster Lead Agency, and in addition to coordinating partners in GOARN. For example, WHO's responsibilities are captured in the all-hazards Emergency Response Framework (ERF) that provides guidelines, operational criteria and standards from the early detection, verification, risk assessment (of acute events), situational analysis (for protracted emergencies), grading and response coordination (through the incident management system).

Effective response can only be enabled and coordinated by strong local and national leadership. In line with the recommendations of the Independent Panel on Pandemic Preparedness and Response, national authorities should appoint health emergency coordinators accountable to the highest levels of government with the mandate to drive whole-of-government and whole-of-society coordination for both preparedness and response. These coordinators should ensure that national and subnational institutions have adequate multidisciplinary capacities to ensure the early detection of hazards to enable early action and prevent public health events from becoming emergencies, drive risk and vulnerability assessments to improve decision making for effective response, and collaborate with international actors to ensure effective, scalable coordination of response.

Coordination and leadership capacities at national level should be reinforced through Emergency Operation Centers (EOCs). Within the GHEW, a global network of aligned public health EOCs (PHEOCs) across all member states could be established to enable strategic decision making and coordination of preparedness for and response to future health emergencies. At the regional and global levels, a WHO-led coordination and support mechanism should enable support for national workforces through the deployment of complementary regional or international teams.