



A GLOBAL DEAL FOR OUR PANDEMIC AGE



Financing the
Global Commons for
**PANDEMIC
PREPAREDNESS
AND RESPONSE**

**REPORT OF THE
G20 HIGH LEVEL
INDEPENDENT
PANEL**

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**Report of the G20 High Level Independent Panel on
Financing the Global Commons for
Pandemic Preparedness and Response**

June 2021

A Global Deal for Our Pandemic Age: Foreword

The High Level Independent Panel was asked by the G20 in January 2021 to propose how finance can be organized, systematically and sustainably, to reduce the world's vulnerability to future pandemics¹.

Our report sets out critical and actionable solutions and investments to meet the challenge of an age of pandemics, and to avoid a repeat of the catastrophic damage that COVID-19 has brought. The Panel arrived at its recommendations after intensive deliberations and consultations with a wide range of stakeholders and experts around the globe over a period of four months. **We urge that our proposals be discussed, developed further, and implemented as a matter of urgency.**

Scaling up pandemic preparedness cannot wait until COVID-19 is over. The threat of future pandemics is already with us. The world faces the clear and present danger of more frequent and more lethal infectious disease outbreaks. The current pandemic was not a black swan event. Indeed, it may ultimately be seen as a dress rehearsal for the next pandemic, which could come at any time, in the next decade or even in the next year, and could be even more profoundly damaging to human security.

The world does not lack the capacity to limit pandemic risks and to respond much more effectively than it has responded to COVID-19. We have the ideas, the scientific and technological resources, the corporate and civil society capabilities, and the finances needed.

Our collective task must be to better mobilize and deploy these resources to sharply reduce the risk of future pandemics, and the human and economic damage they bring. This will require whole-of-government and whole-of-society responsibilities, not only those of health authorities and medical scientists. It will mean thinking internationally, not just domestically. It must also involve bolstering multilateralism, not only bilateral initiatives.

Most fundamentally, investing collectively to prevent infectious disease outbreaks, and

to ensure that large swathes of the world's population are not left ill-equipped to respond when a pandemic strikes, is in the mutual interests of all nations, not only a humanitarian imperative in its own right.

In short, we need a global deal for our pandemic age. We must strengthen global governance and mobilize greater and sustained investments in global public goods, which have been dangerously underfunded. Both are critical to building resilience against future pandemics.

It requires establishing a global governance and financing mechanism, fitted to the scale and complexity of the challenge, besides bolstering the existing individual institutions, including the WHO as the lead organization.

The economic case for the investments we propose is compelling. They will materially reduce the risk of events whose costs to government budgets alone are 300 times as large as the total additional spending per year that we propose, and 700 times the annual additional international investments. The full damage of another major pandemic, with its toll on lives and livelihoods, will be vastly larger.

In a historically unprecedented way, security for people around the world now depends on global cooperation. Acting and investing collectively for pandemic security, together with climate change, represents the primary international challenge of our times. Failure to establish the basis for international cooperation will make it almost impossible to address these existential challenges.

In closing, the Panel wishes to record how its thinking was enriched by others. As we are comprised mainly of economic and financial experts, we benefited significantly from extensive consultations with the global health community, including the major international organizations, the medical science community, the private sector, and philanthropic and civil society organizations with deep engagements in the field. The Global Preparedness Monitoring

¹ The membership of the Panel, Project Team and Administrative Secretariat of the G20 High Level Independent Panel (HLIP) on Financing the Global Commons for Pandemic Preparedness and Response is at **Annex A**. The Panel's terms of reference are at **Annex B**.

Board, in particular, provided the Panel with a comprehensive assessment of requirements for pandemic prevention, preparedness and response. We also drew on the insights of the top management and staff of the International Financial Institutions and leading economic and financial professionals².

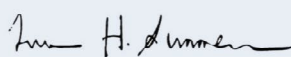
The Panel's thinking is broadly aligned with that of the Independent Panel for Pandemic Preparedness and Response (IPPPR) which published its report in May 2021, and with whose members we had very informative discussions. We also gained insights from interactions with the Pandemic Preparedness Partnership, the Pan-European Commission on Health and Sustainable Development, and the Lancet COVID-19 Commission.

The Panel's work would not have been made possible without the expert knowledge and analysis of our Project Team, constituted by Bruegel and the Center for Global Development, and the timely and efficient coordination by the Administrative Secretariat drawn from the US National Academy of Medicine and the Wellcome Trust.

Finally, we extend our appreciation to the G20 under its Italian Presidency for leadership in convening this important review, and are committed to supporting further discussion of our proposals. We harbor hope that the grim lessons from this crisis will catalyze the collective political will and ambition needed to prevent such a deadly and costly pandemic from happening again.



Tharman Shanmugaratnam*



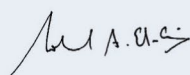
Lawrence Summers*



Ngozi Okonjo-Iweala*



Ana Botín



Mohamed El-Erian



Jacob Frenkel



Rebeca Grynspan



Naoko Ishii



Michael Kremer



Kiran Mazumdar-Shaw



Luis Alberto Moreno



Lucrezia Reichlin



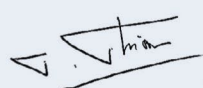
John-Arne Røttingen



Vera Songwe



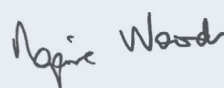
Mark Suzman



Tidjane Thiam



Jean-Claude Trichet



Ngaire Woods



Zhu Min



Masood Ahmed[#]



Guntram Wolff[#]



**Victor Dzau
(Advisor)**



**Jeremy Farrar
(Advisor)**

* Co-Chairs

[#] Project Directors

² A non-exhaustive list of persons consulted is at Annex C.

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High Level Summary

We are in an age of pandemics. COVID-19 has painfully reminded us of what SARS, Ebola, MERS and H1N1 had made clear, and which scientists have repeatedly warned of: without greatly strengthened proactive strategies, global health threats will emerge more often, spread more rapidly, take more lives, disrupt more livelihoods, and impact the world more greatly than before.

Together with climate change, countering the existential threat of deadly and costly pandemics must be the human security issue of our times. There is every likelihood that the next pandemic will come within a decade — arising from a novel influenza strain, another coronavirus, or one of several other dangerous pathogens. Its impact on human health and the global economy could be even more profound than that of COVID-19.

The world is nowhere near the end of the COVID-19 pandemic. Without urgent and concerted actions and significant additional funding to accelerate global vaccination coverage, the emergence of more variants of the virus is likely and will continue to pose a risk to every country. The solutions for vaccinating the majority of the world's population are available and can be implemented within the next 12 months. **More decisive political commitments and timely follow-through will resolve this disastrous global crisis.**

The world is also far from equipped to prevent or stop the next pandemic. Lessons from COVID-19, on how the world failed to prevent the pandemic, why it has been prolonged at such catastrophic cost, and how we can overcome the crisis if we now respond more forcefully, provide important building blocks for the future. We must use this moment to take the bold steps needed to avoid the next pandemic, and not allow exhaustion from current efforts to divert attention from the very real risks ahead.

Plugging Four Major Gaps

Making the world safer requires stepped-up and sustained national, regional and global actions and coordination, leveraging fully the private sector, to prevent outbreaks as well as to respond much faster, more equitably and more effectively when a pandemic emerges. **We must plug four major gaps in pandemic prevention, preparedness and response:**

- **Globally networked surveillance and research:** to prevent and detect emerging infectious diseases
- **Resilient national systems:** to strengthen a critical foundation for global pandemic preparedness and response
- **Supply of medical countermeasures and tools:** to radically shorten the response time to a pandemic and deliver equitable global access
- **Global governance:** to ensure the system is tightly coordinated, properly funded and with clear accountability for outcomes

Investing in Global Public Goods: To Save Immense Costs

We can only avoid future pandemics if we invest substantially more than we have been willing to spend in the past, and which the world is now paying for many times over in dealing with COVID-19's damage.

Countries must step up domestic investments in the core capacities needed to prevent and contain future pandemics, in accordance with the International Health Regulations. Governments will in many cases have to embark on reforms to mobilize and sustain additional domestic resources, so as to build up these pandemic-related capacities and strengthen public health systems more broadly, while at the same time enabling their economies to return to durable growth. Low- and middle-income countries will need to add about 1% of GDP to public spending on health over the next five years.

However, domestic actions alone will not prevent the next pandemic. Governments must collectively commit to increasing international financing for pandemic prevention and preparedness by at least US\$75 billion over the next five years, or US\$15 billion each year, with sustained investments in subsequent years.

The Panel assesses this to be the absolute minimum in new international investments required in the global public goods that are at the core of effective pandemic prevention and preparedness. The estimate excludes other investments that will contribute to resilience against future pandemics while benefiting countries in normal times. These complementary interventions — such as containing antimicrobial resistance, which alone will cost about US\$9 billion annually, and building stronger and more inclusive national health and delivery systems — provide continuous value. Furthermore, the estimated minimum international investments are based on conservative assumptions on the scale of vaccine manufacturing capacity required in advance of a pandemic. Larger public investments to enable enhanced manufacturing capacity will indeed yield much higher returns.

The minimum additional US\$15 billion per year in international financing for pandemic preparedness is still a significant increase. It is a critical reset to a dangerously underfunded system.

These investments are a matter of financial responsibility, besides being a scientific and moral imperative. They will materially reduce the risk of events whose costs to government budgets alone are 700 times as large as the additional international investments per year that we propose, and 300 times as large as the total additional investments if we also take into account the domestic spending necessary. The full damage of another major pandemic, with its toll on lives and livelihoods, will be vastly larger.

Crucially, this additional international funding must add to, and not substitute for, existing support to advance global public health and development goals. It would be short-sighted to scale up efforts for pandemic prevention and preparedness by reallocating multilateral or bilateral Official Development Assistance (ODA) resources from other development priorities, particularly given the likely lasting negative impacts of the current pandemic on economic and human development in low- and lower-middle-income countries. The threat of pandemics to our collective security warrants a new and more sustainable global financing approach, beyond traditional aid, to invest in global public goods from which all nations benefit.

Strengthening Global Governance of Health and Finance

However, money alone will not deliver a safer world without stronger governance. The current global health architecture is not fit-for-purpose to prevent a major pandemic, nor to respond with speed and force when a pandemic threat emerges. As the Global Preparedness Monitoring Board highlights, the system is fragmented and complex, and lacks accountability and oversight of financing of pandemic preparedness. We must address this by establishing a governance mechanism that integrates the key players in the global health security and financing ecosystem, with the World Health Organization (WHO) at the center.

To plug this gap, we propose establishing a new Global Health Threats Board (Board). The proposal builds loosely on the model of the Financial Stability Board, established by the G20 in the aftermath of the 2008 Global Financial Crisis and which has operated successfully as a collective to contain risks to the global financial system.

This new governance mechanism will bring together the worlds of health and finance. The Board should include Health and Finance Ministers from a G20+ group of countries and heads of major regional organizations, with leadership and membership that ensures credibility and inclusivity. It should have a permanent, independent Secretariat, drawing on the resources of the WHO and other multilateral organizations.

This new Board will complement the Heads of State/Heads of Government-level Global Health Threats Council that has been proposed by the Independent Panel for Pandemic Preparedness and Response (IPPPR), to be established by the UN General Assembly. The Panel supports the establishment of this top-level political leadership council, to mobilize the strong collective commitment required for global health security. The Board, on the other hand, will aim more specifically to match tightly networked global health governance with financing, which are both critical enablers to reduce pandemic risks. It should take reference from the initiatives and work of the proposed Global Health Threats Council, to ensure a complementarity of functions.

The Board would provide systemic financial oversight aimed at enabling proper and timely resourcing of capacities to detect, prevent and rapidly respond to another pandemic, and to ensure the most effective use of funds. It must join up the efforts of international bodies, with clearly delineated responsibilities that match their comparative strengths, and ensure that the system fully engages and leverages the capabilities of the private sector and non-state actors. The Board must also track global risks and outcomes, and ensure every country plays its part to enhance global health security.

The Key Strategic Moves

A transformed system, with stronger global financial governance, will require both greater resources for existing institutions, with enhanced mandates where necessary, and a new multilateral funding mechanism that will plug the major gaps in global public goods needed to reduce pandemic risks.

We must make four strategic moves.

First, nations must commit to a new base of multilateral funding for global health security based on pre-agreed and equitable contribution shares by advanced and developing countries. This will ensure more reliable and continuous financing, so the world can act proactively to avert future pandemics, and not merely respond at great cost each time a new pandemic strikes.

This must include a fundamentally new way of financing a reformed and strengthened WHO, so that it receives both enhanced and more predictable resources. The Panel joins the call by the IPPPR for assessed contributions to be increased from one-quarter to two-thirds of the budget for the WHO's base program, which will effectively mean an addition of about US\$1 billion per year in such contributions.

Second, global public goods must be made part of the core mandate of the International Financial Institutions (IFIs) — namely the World Bank and other multilateral development banks (MDBs), and the International Monetary Fund (IMF). They should draw first on their existing financial resources, but shareholders must support timely and appropriately sized replenishments of their concessional windows and capital replenishments over time to ensure that the greater focus on global public goods is not at the expense of poverty reduction and shared prosperity.

The IFIs are a potent but vastly under-utilized tool in the world's fight against pandemics and climate change. The MDBs should partner with countries to **incentivize and increase investments in pandemic preparedness and accelerate closing of critical health security gaps.** This will require enhancing the grant element of their funding through dedicated concessional windows for pandemic preparedness. In this, they should partner with the grant-based global health intermediaries including Gavi and the Global Fund to Fight AIDS, Tuberculosis and Malaria, to leverage each other's funding for investments that will strengthen health system resilience.

The IFIs should also **provide swift, scaled-up access to funds in response to a pandemic,** with relaxed rules on country borrowing and automatic access for pre-qualified countries. This should entail new or strengthened pandemic windows in the IMF and MDBs, and the authorization for MDBs to access additional market funding at the onset of a pandemic to finance a scaled-up response. To ensure that these official funds are used to counter the impact of the pandemic, the IMF, working with the relevant stakeholders, should propose a framework of pre-established rules for relief on debt servicing that involves the participation of all creditors in restructurings instituted in future pandemics.

Third, a Global Health Threats Fund mobilizing US\$10 billion per year should be established, and funded by nations based on pre-agreed contributions. This new Fund, at two-thirds of the minimum of US\$15 billion in additional international resources required, brings three necessary features into the financing of global health security. First, together with an enhanced multilateral component of funding for the WHO, it would provide a **stronger and more predictable layer of financing**. Second, it would enable **effective and agile deployment of funds** across international and regional institutions and networks, to plug gaps swiftly and meet evolving priorities in pandemic prevention and preparedness. Third, it would also serve to **catalyze investments** by governments and the private and philanthropic sectors into the broader global health system, for example through matching grants and co-investments. The Fund's functions should be defined to ensure that it complements rather than substitutes for financing of the MDBs' concessional windows and the existing global health organizations.

The new Fund should support the following major global actions:

- **Building a transformed global network for surveillance** of infectious disease threats. This will require a major scale-up of the network, combining pre-existing and new nodes of expertise at the global, regional and country levels, with the WHO at the center.
- **Providing stronger grant financing** to complement MDBs' and the global health intermediaries' support for country- and regional-level investments in global public goods.
- **Ensuring enhanced and reliable funding to enable public-private partnerships** for global-scale supply of medical countermeasures, so we can preclude severe shortages anywhere and avoid prolonging a pandemic everywhere. This added layer of funding will support a permanent network to drive end-to-end global supply, which builds on the lessons learned from the ACT-Accelerator coalition.
- **Supporting research and breakthrough innovations** that can achieve transformational change in efforts to prevent and contain future pandemics, complementing existing R&D funding mechanisms like the Coalition for Epidemic Preparedness Innovations (CEPI).

The Fund will be structured as a Financial Intermediary Fund (FIF) at the World Bank, which will perform the treasury functions, similar to how it hosts other international arrangements like the Global Environment Facility. Governance of the Fund will be independent of the World Bank, under an Investment Board, which could also be constituted as a committee of the Global Health Threats Board, which will determine the priorities and gaps to be addressed by the Fund.

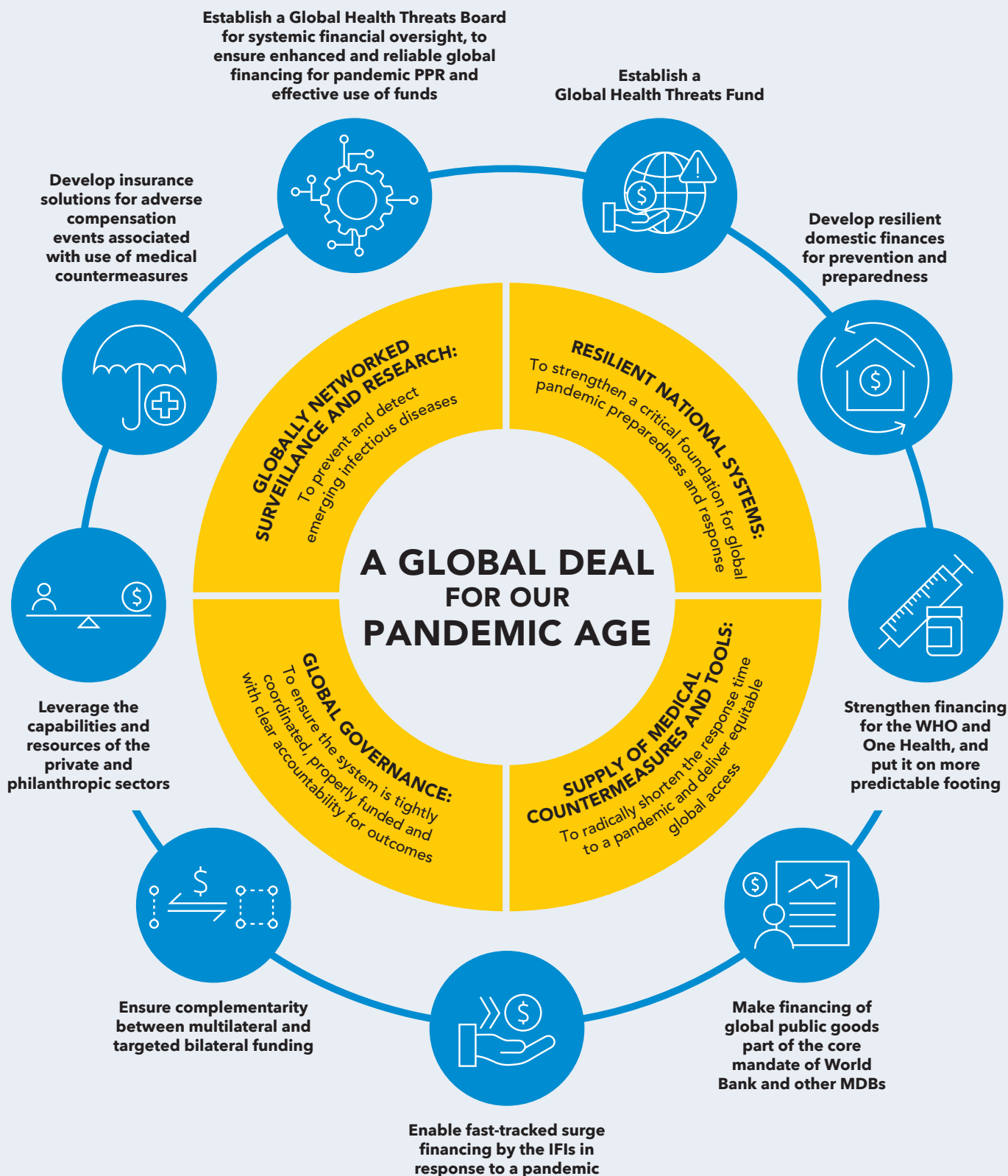
Fourth, multilateral efforts should leverage and tighten coordination with bilateral ODA, and with the private and philanthropic sectors. Better coordination within country and regional platforms will have greater impact in reducing pandemic risks, and enable better integration with ongoing efforts to tackle endemic diseases and develop other critical healthcare capabilities. It will be important to ensure that ODA flows mobilized for pandemic preparedness add to and do not divert resources from other priority development needs.

There is significant scope for governments and the MDBs to mobilize private sector resources for pandemic preparedness and response, especially in developing global-scale capacity for critically-needed supplies, from testing kits and vaccines to oxygen cylinders and concentrators, as well as the whole delivery infrastructure needed within countries. The public sector should also grow partnerships with philanthropic foundations to substantially expand research on infectious disease threats and breakthrough countermeasures. This could include efforts to de-risk early-stage R&D and other high-risk investments, in order to attract private institutional investors.

Significant progress is within reach in the next five years. Strong and sustained political commitment, a recognition of the mutual interests of nations in health security, and long-term financing will be essential.

The collective investments we propose, with equitable contributions by all nations, are affordable. They are also miniscule compared to the US\$10 trillion that governments have already incurred in the COVID-19 crisis.

We must invest without delay. It will be a huge error to economize over the short term and wait once again until it is too late to prevent a pandemic from overwhelming us. The next pandemic may indeed be worse.



Key Proposals and Roadmap

Proposal	Key Action Items	Main Actors	Timeline
1. Establish a Global Health Threats Board for systemic financial oversight, to ensure enhanced and predictable global financing for pandemic PPR and effective use of funds. A minimum of US\$15 billion per year in new international financing is required for effective pandemic prevention and preparedness. Establish an independent scientific advisory panel to provide system-wide analysis of emerging health threats and advice based on the best available science. Establish a Health Security Assessment Program (HSAP), to provide in-depth assessments of countries' pandemic prevention and preparedness capabilities and investments.	i. Develop a charter for the Board including detailed mandate, composition and governance. ii. Establish the Board with a permanent, independent Secretariat. iii. Identify early priorities for funding by the Global Health Threats Fund (see item 2 below). iv. The scientific advisory panel can be formed by transforming the Global Preparedness Monitoring Board (GPMB) to take on this function. v. The HSAP should be coordinated by the WHO and the World Bank, with the outcomes of this assessment reflected in IMF Article IV reports.	G20 GPMB WHO, World Bank, IMF	Q4 2021* Q2 2022 Q4 2022
2. Establish a Global Health Threats Fund. This would be a dedicated fund mobilizing US\$10 billion per year, based on pre-agreed contributions, to support investments in global public goods for pandemic PPR. This new multilateral funding mechanism will enable effective and agile deployment across existing institutions and networks, and help catalyze financing for the broader global health system. It would serve to support a few major global actions:	i. Establish a Global Health Threats Fund structured as a Financial Intermediary Fund (FIF) at the World Bank, with governance independent of the World Bank. ii. Kickstart the Fund with direct contributions by G20 and other governments, ideally in amounts equivalent to an assessed contribution scheme, as well as philanthropic and corporate contributions.	G20	Q4 2021* For (i), to initiate early discussions with the World Bank on establishing the FIF.

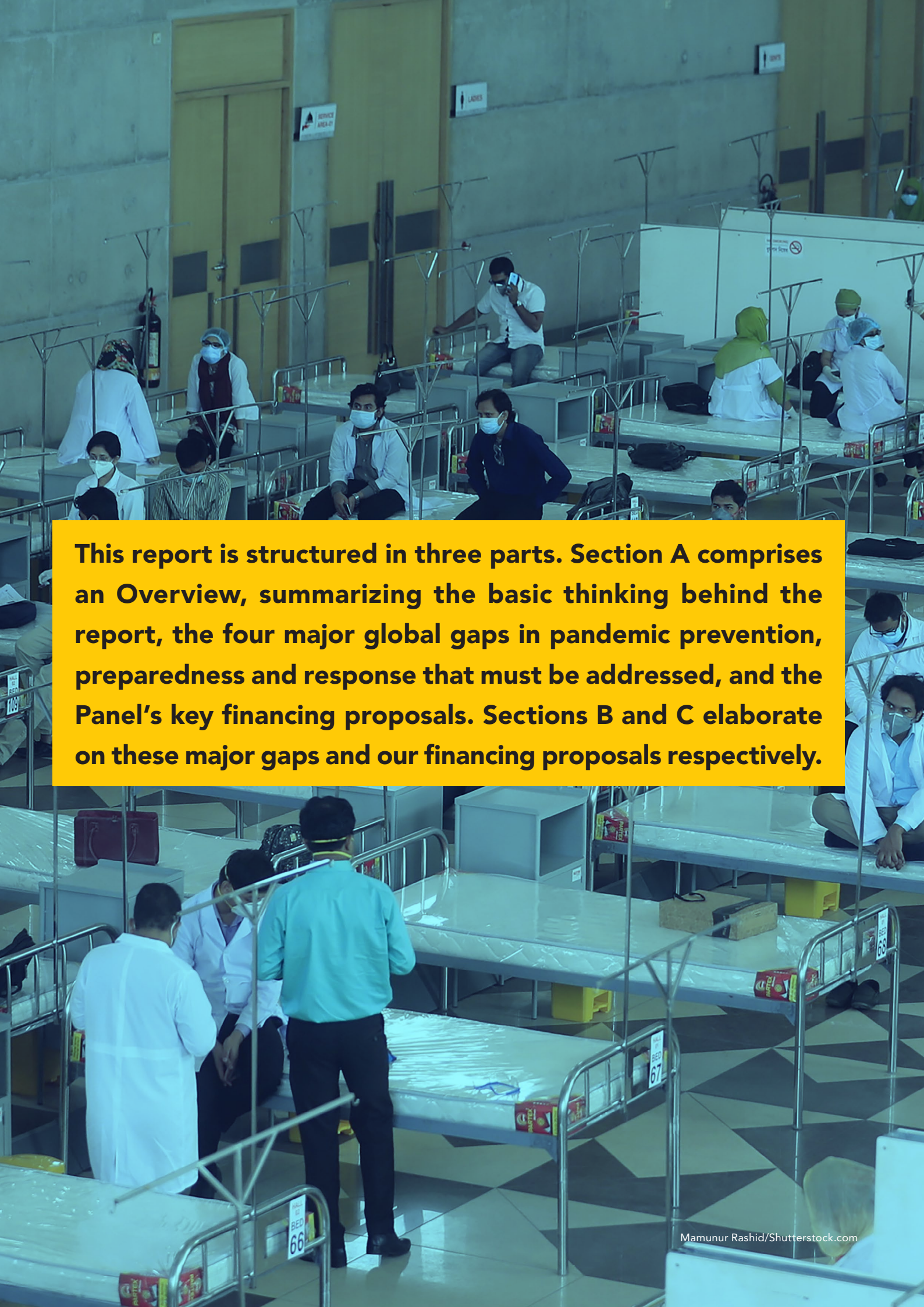
* This is aligned with the timeline for the establishment of the IPPPR's Global Health Threats Council and its International Pandemic Financing Facility.

Proposal	Key Action Items	Main Actors	Timeline
a. Building a transformed global network for surveillance of infectious disease threats. b. Providing stronger grant financing to complement MDBs' and the global health intermediaries' support for country- and regional-level investments in global public goods. c. Ensuring enhanced and reliable funding to enable public-private partnerships for rapid development, manufacturing and delivery of medical countermeasures on a global scale. d. Supporting research and breakthrough innovations that can achieve transformational change in efforts to prevent and contain future pandemics, complementing existing R&D funding mechanisms like CEPI.			
3. Develop resilient domestic finances for prevention and preparedness. Governments working with international institutions must embark on a major agenda of reforms to mobilize domestic resources on a sustained basis so as to enable investments in the key capacities required to avoid future outbreaks and strengthen national health systems, while enabling their economies to return to durable growth. Low- and middle-income countries will need to add about 1% of GDP to public spending on health over the next five years.	i. Scale up national capabilities for surveillance, detection, and containment of any new outbreaks. ii. National governments and International Financial Institutions (IFIs) to jointly develop a plan for more resilient tax revenues. iii. Define and track budgetary expenditures on outbreak prevention and preparedness. iv. Develop and implement costed national action plans for health security, with Finance and Health Ministries as full partners in this effort, including human resources development, performance-based budget policies and matching fund schemes. v. Ensure necessary external financial assistance to complement national domestic financing.	National governments, with support from WHO, IFIs and OECD	Medium Term To undertake learning around COVID-19, and upgrade National Action Plans for Health Security (NAPHS) by 2022, with clear implementation timelines over the medium term.

Proposal	Key Action Items	Main Actors	Timeline
4. Strengthen financing for the WHO and One Health, and put it on more predictable footing. Greater and more predictable funding is necessary for the WHO to perform its critical functions and ensure that there are no gaps in the surveillance-to-action loop, and to strengthen the integrated One Health approach.	i. Enhance the share of multilateral funding for the WHO through increased assessment-based contributions — with assessment-based core contributions from Member States increased to two-thirds of the budget for the WHO base program, and an organized replenishment process for the remainder of the budget. ii. Support WHO, OIE, FAO and UNEP in their integrated One Health approach.	WHO Sustainable Financing Working Group, World Health Assembly	Q2 2022
5. Make financing of global public goods part of the core mandate of World Bank and other MDBs. The MDBs should incentivize investments in pandemic prevention and preparedness at the country and regional levels, with grants and greater concessionality that complement existing results-based and programmatic lending. They should draw first on their existing financial resources. However, shareholders must support timely and appropriately sized replenishments of their concessional windows and capital replenishments over time to ensure that the greater focus on global public goods is not at the expense of poverty reduction and shared prosperity.	i. Revise MDBs' mandates where necessary to move boldly in support of the global commons. ii. World Bank to set IBRD lending and performance targets for pandemic prevention and preparedness. iii. World Bank to establish a dedicated pandemic prevention and preparedness window in an expanded IDA, as part of a successful IDA20 replenishment and leading to a more permanent mechanism, with funding relying more heavily on new grant contributions from IDA donors. iv. World Bank to develop a strategy for its lending and technical assistance to increase the grant element and concessionality in financing linked to pandemic prevention and preparedness, including through results-based and programmatic lending. v. IDA support for pandemic prevention and preparedness should seek to incentivize domestic investments through matching grants to LIC governments. vi. Each RDB to set out its strategy for supporting pandemic preparedness and reduce risks in member countries, including through the establishment of dedicated lending windows or targets.	World Bank and other MDBs	2022 Most of these outcomes can be achieved by 2022. For items which may require more time, e.g. (vii), a clear roadmap should be developed in the next year.

Proposal	Key Action Items	Main Actors	Timeline
	vii. MDBs to explore greater leveraging of their shareholder capital, with G20 to commission an independent review of scope for doing so as well as the requirements for new capital. MDBs to also consider more innovative financing mechanisms.		
6. Enable fast-tracked surge financing from the IFIs in response to a pandemic. The MDBs and IMF should institute pandemic response windows that are automatically triggered to provide swift, scaled-up access to funds; they should also streamline their operational requirements and relax country borrowing limits during a pandemic. Appropriately designed debt service relief by other creditors will be an important complement to surge lending from the IFIs in responding to future pandemics.	i. World Bank to support countries to participate in pooled global procurement mechanisms for entering into advance purchase contracts in the early phase of a pandemic. ii. World Bank to scale up its capacity to help countries establish a safety net surge response, with a strategy to target supporting 50 countries within five years. iii. Access to MDB crisis response windows to be simplified and made more automatic. iv. MDBs to relax single borrower and country lending limits during a pandemic. v. MDBs enabled to automatically tap financial markets for additional funds in a pandemic, with these loans guaranteed by countries and repaid over time. vi. IMF to establish a pandemic response window (in its rapid financing facilities) that would provide rapid, automatic and at-scale financing to all members in good standing. vii. Rules and access limits for country borrowing from regular IMF facilities to be relaxed automatically in a pandemic. viii. The IMF, working with relevant stakeholders, to design a debt service relief framework for future pandemics.	IMF, World Bank and other MDBs	Next 12 months Most of the mechanisms proposed can be developed within 12 months.

Proposal	Key Action Items	Main Actors	Timeline
7. Ensure complementarity between multilateral and targeted bilateral funding. Multilateral efforts should leverage and tighten coordination with ODA and other bilateral funding streams, which continue to play an important role. Better coordination within country and regional platforms will generate greater impact in pandemic PPR, and better integration with other critical development needs.	i. Multilateral efforts to leverage and tighten coordination with discretionary bilateral funding, including through country platforms.	National governments, multilateral and bilateral development partners, private sector and philanthropies	2022 This must be an ongoing effort, with a clear step-up in coordination within country and regional platforms in 2022.
8. Leverage the capabilities and resources of the private and philanthropic sectors. There is significant scope to catalyze private sector participation in pandemic PPR. This must, foremost, involve installing adequate capacity for manufacturing and supply of medical countermeasures and other critical supplies through public-private partnerships. (See also Item 2 above.) Further, a much bolder shift in government and MDB strategies is needed to mobilize and augment private finance for infrastructure, so as to optimize official balance sheets for investments in both global public goods and economic development. We must also build strengthened and continuous public sector partnerships with philanthropic foundations to meet the needs of an expanded research agenda for pandemic PPR.	i. Scaling up end-to-end global supply chain for medical countermeasures and other critical supplies will require a new, permanent governance structure for the network post-COVID-19, including roles and responsibilities for different organizations, that builds on the lessons learned from the ACT-A coalition of health partners. ii. The IFC and the private sector arms of other MDBs to scale up tools to catalyze private sector investments in capacity for medical supplies. iii. Broaden the base of philanthropic foundations that are engaged in supporting national health resilience and pandemic PPR.	Global Health Threats Board working with ACT-A coalition of partners MDBs National governments and international organizations	Medium Term
9. Develop insurance solutions for adverse compensation events associated with use of medical countermeasures. These schemes can be pooled internationally, as COVAX has done for vaccines procured under its platform.	i. The World Bank and other MDBs should work with countries and private insurers to enable risk financing solutions to better protect LIC governments from the liability of adverse compensation events.	MDBs	Next 6 months This task is relevant to the current pandemic, and should be worked on urgently for vaccines procured by countries outside of the COVAX framework.



This report is structured in three parts. Section A comprises an Overview, summarizing the basic thinking behind the report, the four major global gaps in pandemic prevention, preparedness and response that must be addressed, and the Panel's key financing proposals. Sections B and C elaborate on these major gaps and our financing proposals respectively.

A. OVERVIEW

The Challenge

Plugging Four Major Global Gaps

Financing Pandemic Prevention, Preparedness and Response: the Basic Approach

The Scale of Investments Required



A. Overview

The Challenge

1. COVID-19 is the biggest setback to lives and livelihoods globally since the Second World War.
 - a. A reported 4 million³ lives have already been lost. Estimates of the full death toll are much higher. Vastly more among those who have survived face grave long-term health impairments.
 - b. The number of people living in extreme poverty is projected to reach about 740 million by end-2021, a quarter more than the pre-COVID-19 trajectory⁴ and the first significant increase in two decades. Progress on the Sustainable Development Goals has been set back many years. The most vulnerable in every population have suffered disproportionately.
 - c. Governments' fiscal costs are large and growing: an estimated US\$10 trillion⁵ up to March 2021. The global economy contracted more sharply in 2020 than it has in the last seven decades, and the IMF has projected cumulative losses by 2025 of US\$22 trillion⁶.
 - d. Welfare losses globally will be substantially larger and more lasting. They include the consequences of the loss of a year or more of education for a significant proportion of the world's young, the scarring due to heightened unemployment and under-employment in many economies, and the effects of 'long-COVID' on both earnings and the quality of lives.
2. **Vaccinating a majority of the population in all countries, and ensuring adequate supply of other medical countermeasures, must be the most urgent goal of the international community today.**
 - a. As of June 2021, the ACT-Accelerator still had a large gap in funding to meet its targets to provide vaccines to cover 20% of the world's population by end-2021, and the needed diagnostics tests, treatments and other critical supplies⁷.
 - b. There is significant scope for supply shortages and mismatches to be addressed. We must also extend global support to countries that cannot afford procurements, and tackle delivery bottlenecks. A recent IMF study proposes ways to vaccinate at least 60% of the population in all countries by mid-2022 and ensure adequate supply of diagnostics, therapeutics and personal protective equipment (PPE), at an additional cost of US\$50 billion — comprising US\$35 billion in donor grants and US\$15 billion from national sources or concessional loans⁸.
 - c. Achieving this immediate goal is essential to reduce the risk of new variants and avoid further escalation of the pandemic. The financing solutions exist, and require the urgent attention of the world's leaders.
3. **We must also plan for the eventuality of an endemic COVID-19⁹, with a long tail of costs for all nations.**
 - a. Even with the major push for global vaccination, it will be a long time before the world achieves the immunity needed to stop the virus from spreading. New and possibly more transmissible variants may continue to emerge in the meantime, while protection among those already vaccinated may also wane.

³ <https://ourworldindata.org/covid-deaths>

⁴ <https://blogs.worldbank.org/opendata/updated-estimates-impact-covid-19-global-poverty-looking-back-2020-and-outlook-2021>

⁵ Comprising additional spending and foregone revenue; this does not include another US\$6 trillion in government loans, guarantees, and capital injections. (IMF Apr 2021 Fiscal Monitor)

⁶ <https://blogs.imf.org/2021/01/26/a-race-between-vaccines-and-the-virus-as-recoveries-diverge/>

⁷ For a detailed description of how the COVAX initiative has fallen short, see for example [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(21\)01367-2/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)01367-2/fulltext) dated 19 June 2021.

⁸ <https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2021/05/19/A-Proposal-to-End-the-COVID-19-Pandemic-460263>

⁹ <https://www.nature.com/articles/d41586-021-00396-2>

b. An endemic COVID-19 will blur the lines between responding to the current pandemic and preparing for a future new pandemic.

4. **Even as we fight this pandemic, we must face the reality of a world at risk of more frequent pandemics.**

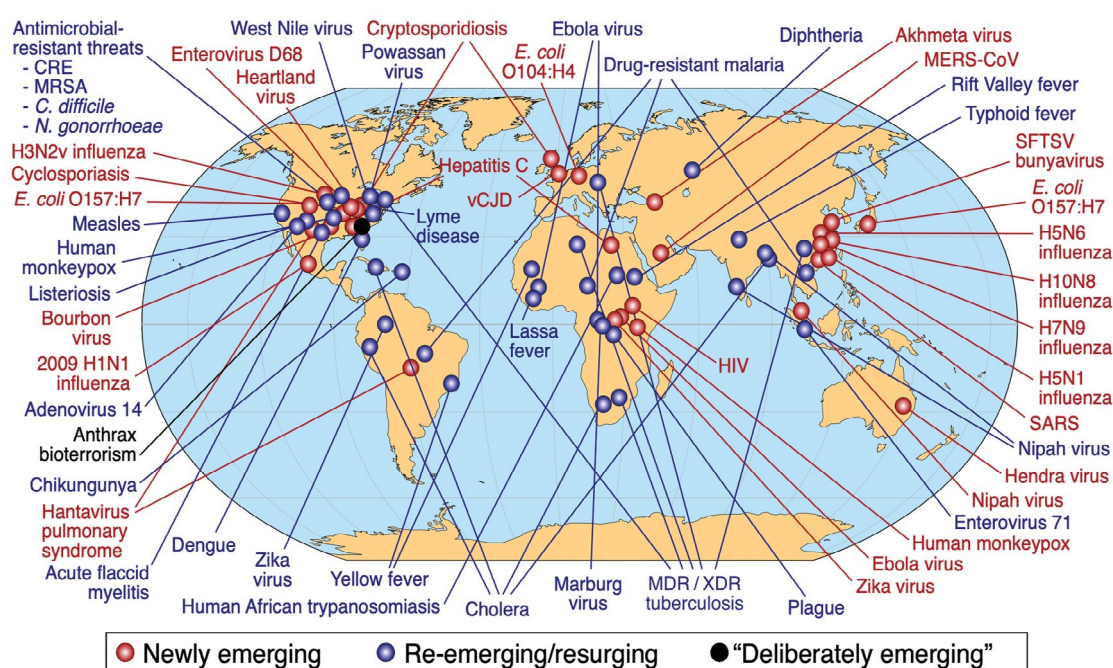
a. The last two decades have seen major global outbreaks of infectious diseases every four to five years, including SARS, H1N1, MERS and COVID-19. (See **Annex D**.) This is besides the ongoing HIV/AIDS pandemic and Ebola, which has seen 29 regional epidemics over the last five decades.

b. **There has been an acceleration of zoonotic spillovers over the last three decades.** (See **Annex E**.) **They account for about three quarters of new and emerging infectious diseases.**

c. Scientists attribute the increased frequency of infectious disease outbreaks to population growth and increased human encroachment on the natural environment; the loss of the world's biodiversity; the growth of the wildlife trade; increasing urbanization, crowded living conditions and increased mobility; and the broader consequences of a warming environment on the life cycle of pathogens and the geographical spread of insect-borne diseases.

d. These assessments also point to the prospect of more frequent and increasingly virulent epidemics and pandemics in future. The Global Preparedness Monitoring Board (GPMB) has warned of the risk of a major pandemic arising from a deadly strain of influenza. Given also other dangerous pathogens that are already known and continuing coronavirus transmissions to human populations, **the next major pandemic can happen anytime. It could come in 20 years, in 10 years, or next year.**

Figure 1: Global Examples of Emerging and Re-emerging Diseases by the Global Preparedness Monitoring Board



Source: Global Preparedness Monitoring Board's 2019 Annual Report on Global Preparedness for Health Emergencies, *A World At Risk*



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 ... 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."

—
**GLOBAL PREPAREDNESS
MONITORING BOARD,**

*2019 Annual Report on Global Preparedness for Health
Emergencies: A World At Risk*



COVID-19 is neither the first nor the last health emergency we will face. My fellow scientists estimate that we will face a pandemic or health emergency at least once every five years from here on. There is a chance that this is the optimistic scenario. The reality could be far worse."

—
SALLY DAVIES,

*Former Chief Medical Officer of England, Master of Trinity College,
Cambridge, 26 September 2020*



Without preventative strategies, pandemics will emerge more often, spread more rapidly, kill more people, and affect the global economy with more devastating impact than ever before."

—
**INTERGOVERNMENTAL SCIENCE-POLICY
PLATFORM ON BIODIVERSITY AND
ECOSYSTEM SERVICES (IPBES),**

Workshop Report on Biodiversity and Pandemics, 29 October 2020

-
5. **Preventing future pandemics, together with action on climate change, has to be a central obligation of national and global governance.**
 - a. **Both require urgent political commitment, clear recognition of the benefits that all nations share, stronger national and global actions, and larger collective financing.**
 - b. **They are both a race against time.**
 - i. Avoiding the next major pandemic is the race of the decade — and a race measured in days and weeks when an outbreak does emerge.
 6. It is within our means to avoid repeating the large-scale collective failures that led to the damaging pandemic of the last 18 months. **The world has the scientific, technological and financial resources to sharply reduce the risk of a pandemic, and the massive human, social, and economic costs it brings.**
 7. **We must better mobilize and organize these resources,** public and private, and ensure that the world is better equipped — individually and collectively — to detect, prevent and counter another major outbreak.
 - a. We must also ensure the system has the capacity to reach vulnerable populations both globally and within countries.
 8. The world faces other catastrophic risks, besides repeated pandemics and climate change which are clearly on the horizon. A key lesson of COVID-19 should be to plan for catastrophic risks generally. Recommendations on how to do so are outside the scope of this report, and other groups could be convened to examine this. However, since addressing global catastrophic risks has intrinsic global public good characteristics, some of the lessons from this report will apply to them.

Plugging Four Major Global Gaps

9. Great progress in pandemic prevention, preparedness and response (PPR) is within reach in the next five years. It requires **bold and sustained national, regional and global investments and actions in normal times, as well as capacity to respond with speed and force in the event of an emerging pandemic threat.**
10. The investments we propose aim at plugging four major gaps in pandemic PPR. They are set out below, and elaborated in Section B of the report:

(1) Globally networked surveillance and research: to prevent and detect emerging infectious diseases

- i. We can substantially reduce the risk of pathogens spilling over into human populations and causing disease outbreaks.
- ii. We need stronger, internationally coordinated efforts to prevent spillovers at their source — especially by reducing the loss of natural habitats, controlling wildlife trade, and addressing livestock production near to wildlife. **Strengthening One Health approaches is critical to this effort.**
- iii. **A massive scale-up of global surveillance and alert systems is needed** to detect cross-species spillovers, send an early warning to the world, enable swift public health responses and accelerate development of medical countermeasures.¹⁰
 1. We must urgently build a global genomic and epidemiological surveillance program, combining pre-existing and new nodes of expertise at the global, regional, and country levels, with the WHO at the center.
 2. This will also require enhancing foundational public-health surveillance capabilities¹¹ at the national and regional levels, including in partnership with regional CDCs and regulatory bodies. Such efforts bring domestic benefits all the time but are also critical in identifying and stopping emerging outbreaks with cross-border potential.
- iv. **Surveillance at scale has to be integrated with a substantially expanded program of research on known and emerging infectious diseases.** This should include an agenda to fully characterize prototype pathogens that are capable of becoming infectious diseases in human populations, creating the building blocks for early development of medical countermeasures that are cross-protective against a range of pathogens.

(2) Resilient national systems: to strengthen a critical foundation for global pandemic preparedness and response

- i. Resilient national health systems — from healthcare capacity to trained human resources and frameworks for policy decisions in crisis — remain the foundation for stopping an emerging outbreak. National surveillance and preparedness is the bedrock of effective global surveillance and information-sharing.

¹⁰ <https://pubmed.ncbi.nlm.nih.gov/33712471/>

¹¹ For instance, every country must be able to report deaths and disease in a complete, accurate and timely manner.

- ii. **We need significant improvements and whole-of-government health security plans to enable countries to comply with the WHO's International Health Regulations (IHR).** Public health strategies must also be developed to identify those who need care and treatment in a pandemic, and provide a comprehensive and effective response. Countries' capacity to respond using non-pharmaceutical interventions, such as lockdowns, quarantines and social restrictions, also requires adequate welfare safety nets.
- iii. **The International Financial Institutions (IFIs) — the IMF, World Bank and Regional Development Banks — must step up their support** for Low-Income Countries (LICs) and Lower-Middle Income Countries (LMICs) to make the needed investments in preparedness, and be ready to swiftly scale up assistance when a pandemic is triggered.
- iv. **Investments in pandemic preparedness should be integrated with the ongoing efforts and infrastructure to tackle endemic infectious diseases.** Existing global health institutions like the Global Fund to Fight AIDS, Tuberculosis and Malaria (hereafter referred to as the "Global Fund") and Gavi should be given a more explicit mandate and increased funding to invest in system-level preparedness.
- v. **International implementing organizations like UNICEF also play a key role in strengthening domestic systems** for agile, last-mile delivery of essential supplies. This applies not just to vaccines but lifesaving therapeutics and oxygen cylinders and concentrators.

(3) Supply of medical countermeasures and tools: to radically shorten the response time to a pandemic and deliver equitable global access

- i. As COVID-19 illustrates: the human and economic costs of a pandemic are driven by the length of time it takes to equip the world with the diagnostic tools, vaccines, therapeutics and PPE to deal with it.
- ii. The global scientific community responded with unprecedented speed to sequence the new virus and develop a portfolio of effective vaccines within a year. We have been far less successful in boosting global supply, ensuring the equitable global distribution of these vaccines and strengthening the capacity of delivery systems to go from vaccines to fully vaccinated people.
- iii. To prevent the major damage caused by highly transmissible and severe diseases, we must develop the capacity to reach the majority of the world's population within a radically shorter timeline — including **a 100-day target** for the development of vaccines, therapeutics and high quality rapid diagnostics.
- iv. We also need substantially larger, **ever-warm capacity** for manufacturing and delivery of critical medical supplies, and modular technologies that allow rapid scale-up of capacity, to meet the surge in demand in a pandemic. This scaled-up capacity is critical to reducing the short-term trade-offs that nations face between meeting domestic and global needs. We also need **greater geographical diversification** of such facilities to ensure resilience of supply chains in a crisis and equitable global access. The facilities should be used as much as possible in inter-pandemic years to address ongoing infectious disease needs.
- v. A **global network of public-private-philanthropic partnerships** must be established to assure such capacity and the delivery mechanisms to reach the world rapidly in a pandemic.
- vi. Both national and global pooling of public sector investments in these partnerships are necessary to ensuring global access to medical countermeasures in a pandemic. **Building on the lessons learned from the ACT-Accelerator initiative** that was launched in the current pandemic, a permanent end-to-end supply ecosystem needs to be created. The lack of proactive public investment for manufacturing and procurement before the pandemic has greatly hampered the response to COVID-19.

(4) Global governance: to ensure the system is tightly coordinated, properly funded and with clear accountability for outcomes

- i. The current global health architecture is not fit-for-purpose to prevent a major pandemic, nor to respond with speed and force when a pandemic threat emerges. As the Global Preparedness Monitoring Board highlights, the system is fragmented and complex, and lacks accountability and oversight of financing of preparedness. We must address this by establishing a governance mechanism that integrates all the key players in the global health security ecosystem, with the WHO at the center.
 - ii. The solution rests not in creating new institutions, but in **introducing a new mechanism of global governance and establishing a tightly networked system of responsibility and accountability among existing institutions**:
 1. A reformed and strengthened WHO¹²; its One Health partners in FAO, OIE and UNEP; the World Bank, the Regional Development Banks (RDBs) and the IMF; the WTO; the specialized global health bodies like Global Fund, CEPI, Gavi, FIND, and Unitaids; and international organizations like UNICEF that address health and humanitarian interventions and delivery mechanisms.
 2. The regional bodies should be integrated in this architecture. The current pandemic has demonstrated the **strengths of regional ownership**, e.g. the major initiatives taken by the African Union and Africa Centres for Disease Control and Prevention (Africa CDC).
 - iii. It must also fully leverage the capabilities of the **private sector and the non-state actors**.
 1. The private sector plays a key and growing role in health service delivery as well as in transport, logistics, communications, data, and other capacities for preparedness and response.
 2. Local-level and non-state actors including **NGOs and the global scientific community** play important roles in detecting emerging threats, strengthening preparedness, and helping communities cope with public health measures in the event of outbreaks. The network of international institutions should continue to have the flexibility to fund these sub-national and non-state actors.
 - iv. A new global governance mechanism is needed to match tightly networked global health governance with financing. We propose **a new Global Health Threats Board**, to provide systemic oversight in enabling proper and timely resourcing of capacities, and to ensure the most effective use of funds. It should join up the efforts of international bodies, with clearly delineated responsibilities that match their comparative strengths, and ensure the system fully leverages the capabilities of the private sector and non-state actors.
11. In plugging these four major gaps, we must recognize above all that **international support for pandemic PPR is fundamentally not about aid, but about investment in global public goods from which all nations benefit**.
- a. Every nation rich and poor benefits when every other nation is equipped and resourced to prevent and respond quickly to disease outbreaks.
 - i. The longer that a part of the world remains without immunity, the greater the scope for new variants of concern to emerge, challenging even previously immunized populations. We have already seen new variants of the SARS-CoV-2 pathogen emerging with higher transmissibility and reducing the efficacy of existing vaccines.

¹² As recommended by the IPPPR in its Main Report: "WHO is and should be the lead health organization in the international system, but it cannot do everything... WHO should focus on providing strategic direction and analysis, and formulating norms, standards and technical advice to ensure that countries have resilient health systems that are prepared with the required response capacities for health emergencies. In the case of emergencies WHO has an important operational role to play providing technical advice and support." It adds in its Institutional Review of the WHO that "WHO's mandate should be focused on activities where it provides true added value, where it makes the most use of its core competencies, and where there is less overlap with the mandate of other actors in the busy and crowded global health space."

- ii. Ensuring widespread global access to tests, vaccines, treatments, and other medical countermeasures is hence both a humanitarian imperative and a scientific and economic necessity everywhere.
- b. We distinguish between two levels of global public goods, with different implications for financing and accountability.
 - i. There are 'pure' global public goods such as **surveillance and R&D**, which require both international- and country-level capacities, but where the benefits are mainly not internalized by countries. In the case of LICs and LMICs in particular, these should be largely financed by collective mechanisms.
 - ii. There are other investments that have a clearer benefit for individual countries or regions, such as **strengthened national capacities** to stop the spread of infectious diseases, but which nonetheless have positive externalities for the global community. Governments have to mobilize domestic resources to develop and maintain these capacities, complemented by external financing support to ensure a strong alignment of incentives.

Financing Pandemic Prevention, Preparedness and Response: the Basic Approach

12. **The broad principles that underpin financing for pandemic PPR flow from its global public good nature. Prevention and preparedness require predictable and sustained funding. Financing of response in a pandemic must be rapid, available to all countries that need it and delivered without complicated, business-as-usual requirements. All funding flows must show clear accountability for outcomes.**
 - a. **Pandemic PPR should be anchored in enhanced, reliable and timely multilateral funding**, complemented by bilateral funding streams and philanthropic contributions.
 - i. A predictable system of pre-agreed contributions and callable capital is needed for reliable funding **in normal times**, and for the swift scale-up of financing needed **in a pandemic**. Both have been badly lacking.
 1. The current experience with ACT-A shows how the absence of a system of pre-agreed commitments leads to considerable underfunding when it is needed.
 2. Without pre-agreed rules of funding, we risk a waiting game in which governments and institutions delay investments because they expect these to be covered by others at some point in the future.
 - ii. We echo the call by the Independent Panel for Pandemic Preparedness and Response (IPPPR) for the **WHO to be more reliably funded for its critical roles** — with assessment-based core contributions from Member States increased to two-thirds of the budget for the WHO base program, and an organized replenishment process for the remainder of the budget.
 - iii. Our recommendations also call for stronger multilateral funding of pandemic PPR through other bodies, including a larger role for the IFIs.
 - iv. **Targeted bilateral funding provides an important complement, and a catalyst for action.** ODA should have a component to help LICs prepare to mitigate the cost of future pandemics, for example through investments in human capital and resilient health systems.
 - v. But an international system that rests heavily on discretion is open to free-riding, and complicates processes for ensuring accountability. Such investments must therefore only be complementary to enhanced multilateral funding.

b. Empower the IFIs to more boldly support the global commons

- i. The IFIs, despite record lending, are not structured to address global threats forcefully. **They should be clearly mandated to support country- and regional-level investments in global public goods, which have both local and global benefits.** They must adjust their business models to meet this sharpened mandate.
 - ii. **The IFIs are uniquely placed to do so:** by their ability to mobilize international resources; leverage capital or guarantees; incentivize countries to invest in global public goods and other enabling spending; and catalyze private investments.
 - iii. Their activities should be more boldly oriented towards supporting countries and regions in meeting the largest global challenges of the 21st century, including climate change and pandemics. While in-country development challenges are still pronounced, poorer countries are also most vulnerable to these challenges to the global commons. Further, both future pandemics and climate change can only be managed if developing countries have the capacities to be fully engaged in the process.
 1. The Bretton Woods institutions have historically had country-focused business models. They were also established at a time when capital markets were much less developed.
 2. **The World Bank and RDBs should move decisively to help countries invest in global public goods to reduce pandemic risks** — including through the strengthening of health systems and core public health capacities that are critical to effective pandemic prevention, preparedness and response.
 - a. To achieve this, they will need a stronger mandate and deep technical capacities in pandemic preparedness, along with more fit-for-purpose instruments that can combine loans with grant buy-downs and other incentives to fund countries and regional initiatives more effectively.
 3. **They should do so without it being at the expense of their current goals on poverty reduction, shared prosperity, and financial stability. This will require new resources.**
 4. **There is also significant scope to optimize the use of their balance sheets so as to augment resources for both global public goods and economic development.** The MDBs should work with countries to move more decisively to leverage private finance. The mechanisms for doing so include appropriately designed risk guarantees, as well as the expanded use of blended finance to catalyze private investments, especially for infrastructure with clear economic returns.
 5. The IMF, World Bank and the other MDBs should also play major roles in helping countries respond to pandemics, including by providing **pandemic response windows that are triggered automatically**, for example, upon the WHO's declaration of a Public Health Emergency of International Concern (PHEIC).
- c. **Provide stronger incentives for LICs and LMICs themselves to invest in global public goods in pandemic PPR, especially through expanded grant support and matching funding for domestic investment, accompanied by accountability for outcomes**
- i. **Failure to prioritize and budget for pandemic prevention and preparedness has been an issue for countries at all income levels¹³.**
 - ii. **LICs and LMICs in particular face more binding budget constraints to make investments that have positive global externalities.** National investments are stymied by uncertainties about the scale of domestic benefits, as well as the hard trade-offs between spending on preparedness for a future event of uncertain timing versus other pressing health and development priorities, given limited resources. The COVID-19 recession has worsened long-standing fiscal constraints on already insufficient public spending on health.

¹³ While existing international benchmarks, including the Joint External Evaluations (JEEs) and Global Health Security Index (GHS Index), have not been very useful predictors of individual country performance in the current pandemic, we have to take seriously the broad-based international preparedness gaps they highlight: the average country 2019 GHS Index score was 40 out of a possible 100.

- iii. Countries have hence historically been reluctant to use their limited borrowing envelopes from the MDBs for this purpose.
 - iv. Grants can be used strategically to incentivize investments in global public goods through co-investments by national governments, **as has been done via Global Fund and Gavi.**
 - v. Contributions by bilateral development partners for pandemic preparedness have also been small, and should be increased. These resources should not be taken from resources for poverty alleviation or aid budgets more generally, as discussed below.
 - vi. Governance and institutional capacities also need strengthening. We need a more robust global mechanism to assess countries' plans and data on pandemic prevention and preparedness, provide technical assistance, encourage countries towards closing any identified gaps, and tie financing to performance on preparedness indicators.
- d. **Maximize complementarities between different funding streams in global health, including private and philanthropic investments**
- i. **New funding for pandemic PPR must add to rather than substitute for existing streams of funding.**
 - 1. It would be short-sighted to bolster our efforts for pandemic prevention and preparedness by reallocating resources from other critical development priorities in poverty alleviation, human capital development, climate, and other priorities.
 - ii. Today's different streams of funding must be tightly coordinated.
 - 1. Internationally, we must tackle the threat from multiple pathogens more effectively and support multiple PPR interventions — instead of a disjointed landscape organized around specific diseases and interventions.
 - 2. Regional and country platforms should bring together multilateral and bilateral partners, as well as philanthropic and private investors, coordinated by national authorities, to ensure a sustained and coherent effort to build up national preparedness.
 - iii. We need a **different construct for public partnerships with the private and philanthropic sectors: with continuous engagement, not only once a pandemic strikes.**
 - 1. Besides the core requirement to enter into such partnerships to scale up end-to-end supply chains for medical countermeasures, the private sector must also be mobilized to boost supply of other critical medical supplies.
 - 2. Pandemic PPR plans must also consider all health providers, and the ways in which people can most readily access care. In most LICs and LMICs, private sector providers are important sources of care and have to be mobilized and properly regulated in support of public policy objectives, even as governments working with external partners seek to build up more resilient national healthcare systems over the longer term.
 - iv. **The major philanthropic foundations have been playing a critical role in supporting investments with high risk and/or low commercial incentives.** However, the major scale-up of research on infectious diseases and countermeasures needed will have to involve stronger partnerships between the public and philanthropic sectors, nationally and globally.
 - 1. These include early-stage investments, e.g. the search for vaccines that can provide broad protection against a range of pathogens; and interventions that can address the rising threat of drug resistance.

2. Governments should develop strong partnerships with philanthropies to enable research for interventions where commercial interest is low, including many ongoing regional epidemics for which global demand is weak.
- e. **Improved policy-making and regulatory processes are critical complements to enhanced financing of global health security**
- i. The experience of the last 18 months has shown the importance of international and national leadership, collaboration, and policy-making in determining the effectiveness of responses to the pandemic.
 - ii. Internationally: we must create incentives for countries to **keep supply chains open — especially for critical medical supplies, and their components and raw materials**. WTO has a key role in monitoring and surveillance of member countries' trade practices, to ensure export restrictions and trade facilitation issues are quickly tackled.
 - iii. Domestically: even financially-equipped countries have not always pursued the policies needed to contain the damage brought by the pandemic.
 1. As highlighted by the IPPPR, too many governments took a wait-and-see approach, while international agencies were slow to act, constrained by their limited mandates, capacities and silos.
 2. Getting policies right based on science and evidence, and taking actions early and **mobilizing capabilities and resources on a whole-of-country basis**, can suppress the spread of a pandemic and buy precious time for medical countermeasures to be developed and procured.
 - iv. Governance, communication and behavioral science tools have also been important in **shaping social adherence to public health measures**, and minimizing distrust of science and medical professionals.
 - v. Rigorous, quantitative **research on the causal impact and efficacy of various non-pharmaceutical interventions**, building on countries' varied responses to COVID-19, is also necessary to guide policy responses.

The Scale of Investments Required

13. **We can only avoid future pandemics if we invest substantially more resources than we have been willing to spend in the past, and which the world is now paying many times over in dealing with COVID-19's damage.**
14. Greater domestic investments by national authorities in the key capacities are needed to prevent and contain future pandemics. These investments, specifically for pandemic prevention and preparedness, must be part of broader national efforts for healthcare and public health system strengthening. **Together, these efforts would require low- and middle-income countries to add about 1% of GDP to public spending on health over the next five years.**
15. However, domestic actions alone will not prevent the next pandemic. **We must collectively commit to expanding international financing by US\$75 billion over the next five years — or US\$15 billion each year.** This will comprise funding for both global-level functions and the support needed for LICs and LMICs to invest in the country-level global public goods needed for pandemic PPR.
16. The scale of investments required reflects the need to catch up from a long period of underfunding. Investing upfront in the next five years is critical to lowering the growing risks of pandemics.

17. **The Panel believes that US\$15 billion per year is the absolute minimum in the new international investments required in global public goods that are at the core of effective pandemic prevention and preparedness.** This estimate excludes the cost of other complementary investments that will contribute to resilience against future pandemics, while providing benefits to countries in normal times.
- It excludes the costs of containing antimicrobial resistance (AMR),** which is a growing threat to health security nationally and globally. AMR may worsen the impact of future epidemics and pandemics by rendering ineffective the treatment of such infections and associated co-infections, as evidenced in previous influenza pandemics¹⁴. Countering AMR is estimated to cost US\$9 billion annually¹⁵. Since AMR containment measures have benefits well beyond pandemic PPR and operate through ongoing programs for more rational use of antimicrobials in health and agriculture, we have not included these costs in our estimates.
 - The estimated costs would also be much higher if they included **upstream environmental investments** for prevention and a **more extensive scope for One Health** including upgrading of veterinary services; **basic and pre-clinical research**; and the **broader strengthening of healthcare systems and delivery infrastructure** beyond that directly related to pandemic PPR. These actions provide continuous benefits to countries, and have therefore been excluded from our strict estimates of costs specific to pandemic PPR.
 - Further, the estimated minimum investments required are based on conservative assumptions on the scale of at-ready manufacturing capacity required for medical countermeasures¹⁶.
18. We set out in Section C of the report several key financing proposals to help close the major gaps in pandemic PPR:
- Adopt a systemic approach to ensure enhanced and predictable global financing for pandemic PPR.** The Global Health Threats Board should provide financial oversight to ensure adequate funding across the system and effective use of funds. Two-thirds of the total additional international financing needed, i.e. US\$10 billion per year, should be pooled in a new, multilateral funding mechanism (Proposal 2 below), with the remaining US\$5 billion going directly towards strengthening funding to WHO and other existing institutions.
 - Establish a Global Health Threats Fund.** This would be a dedicated fund amounting to US\$10 billion per year, based on pre-agreed contributions, to support and catalyze investments in global public goods for pandemic PPR. The new multilateral mechanism will enable effective and agile deployment across institutions and networks.
 - Develop resilient domestic finances for prevention and preparedness.** Governments working with international institutions must embark on a major agenda of reforms to mobilize domestic resources on a sustained basis so as to enable investments in the key capacities required to avoid future outbreaks and to strengthen national health systems, while enabling their economies to return to durable growth. Low- and middle-income countries will need to add about 1% of GDP to public spending on health over the next five years.
 - Strengthen financing for the WHO and One Health, and put it on more predictable footing.** Greater and more predictable funding is necessary for the WHO to perform its critical functions and ensure that there are no gaps in the surveillance-to-action loop, and to strengthen the integrated One Health approach.

¹⁴ See, for example, ReAct network's briefing note circulated ahead of the 74th World Health Assembly: <https://www.reactgroup.org/wp-content/uploads/2021/05/ReAct-Briefing-Pandemic-Preparedness-and-Antibiotic-Resistance.pdf>

¹⁵ <https://documents1.worldbank.org/curated/en/323311493396993758/pdf/final-report.pdf>

¹⁶ Our costings for incentivizing supply capacity for **all medical countermeasures** are about half of the costs estimated for vaccines alone by the Accelerating Health Technologies (AHT) group (comprising economists and statisticians, including G20 HLP member Michael Kremer). The AHT group estimates that investments in needed production capacity and supply chain inputs for **vaccines alone require US\$60 billion in public funding** to enable the capacity to be installed over a period of years, and about US\$2 billion per year thereafter to maintain this capacity. Their estimates take into account that most vaccine candidates fail, and in order to repurpose capacity in parallel with clinical trials, any vaccine capacity would need to be split between many candidates. There is therefore a need for significantly larger vaccine capacity. However, the added investments generate far greater benefits in future and far higher returns than a small scale of investments would.

- (5) **Make financing of global public goods part of the core mandate of World Bank and other MDBs.** The MDBs should incentivize investments in pandemic prevention and preparedness at the country and regional levels, with grants and greater concessionality that complement existing results-based and programmatic lending. They should draw first on their existing financial resources. However, shareholders must support timely and appropriately sized replenishments of their concessional windows and capital replenishments over time to ensure that the greater focus on global public goods is not at the expense of poverty reduction and shared prosperity.
 - (6) **Enable fast-tracked surge financing by the IFIs in response to a pandemic.** The MDBs and IMF should institute pandemic response windows that are automatically triggered to provide swift, scaled-up access to funds, with relaxed rules on country borrowing and automatic access for pre-qualified countries. Appropriately designed **debt service relief** by other creditors will be an important complement to surge lending from the IFIs in responding to future pandemics.
 - (7) **Ensure complementarity between multilateral and targeted bilateral funding.** Multilateral efforts should leverage and tighten coordination with ODA and other bilateral funding streams, which continue to play an important role. Better coordination within country and regional platforms will generate greater impact in pandemic PPR, and better integration with other critical development needs.
 - (8) **Leverage the capabilities and resources of the private and philanthropic sectors.** There is significant scope to catalyze private sector participation in pandemic PPR. This must foremost involve installing adequate capacity for manufacturing and supply of medical countermeasures and other critical supplies through public-private partnerships. (See also Item 2 above.) Further, a much bolder shift in government and MDB strategies is needed to mobilize and augment private finance for infrastructure, so as to optimize official balance sheets for investments in both global public goods and economic development. We must also build strengthened and continuous public sector partnerships with philanthropic foundations to meet the needs of an expanded research agenda for pandemic PPR.
 - (9) **Develop insurance solutions for adverse compensation events associated with use of medical countermeasures.** The MDBs should work with countries and private insurers to enable risk financing solutions to better protect LIC governments from the liability of adverse compensation events, particularly in the form of no-fault compensation schemes or an explicit compensation fund with pre-determined compensation awards. These schemes can be pooled internationally, including amongst G20 governments, and could be put in place in the inter-pandemic period, supported by international financing.
19. The reforms and investments we proposed are critical to future global security. With contributions apportioned equitably, they are affordable to all nations. They are also miniscule compared to the enormous costs the world will incur if we fail once again to invest ahead of the next pandemic.
- a. **They provide immense social returns, both nationally and globally.**
 - b. They will materially reduce the risk of events whose costs to government budgets alone are 700 times as large as the additional international investments per year that we propose, and 300 times as large as the total additional investments if we also take into account the domestic spending necessary.
 - c. The next major pandemic may come at any time. Even if it occurs only 10 or 20 years from now, the costs to governments will still be 10 to 25 times the cumulative additional investments in prevention and preparedness over the years until then, in present value terms¹⁷.
 - d. The full damage of another major pandemic, with its toll on lives and livelihoods, will be vastly larger. Based on estimates by Metabiota, there will be 4 million expected deaths in the next decade from the three pathogen groups — pandemic influenza, epidemic coronaviruses and viral hemorrhagic fever — which is roughly equivalent to the losses to date in today's pandemic.

¹⁷ Even if we assume the investments in prevention and preparedness only reduce the probability of a pandemic by 50%, and reduce the cost of any resulting pandemic by 50% — hence saving 75% of the costs of a COVID-19-scale pandemic — the cost savings to government budgets are 8 to 18 times the cumulative additional investments over the next 10 to 20 years, in present value terms.

B. PLUGGING FOUR MAJOR GLOBAL GAPS

Globally networked surveillance and research: to prevent and detect emerging infectious diseases

Resilient national systems: to strengthen a critical foundation for global pandemic preparedness and response

Supply of medical countermeasures and tools: to radically shorten the response time to a pandemic and deliver equitable global access

Global governance: to ensure the system is tightly coordinated, properly funded and with clear accountability for outcomes

Establish a
Global Health Threats Board



B. Plugging Four Major Global Gaps

20. The investments that the G20 HLIP proposes will enable the world to plug the four major gaps in pandemic PPR:
- a. **Globally networked surveillance and research: to prevent and detect emerging infectious diseases**
 - b. **Resilient national systems: to strengthen a critical foundation for global pandemic preparedness and response**
 - c. **Supply of medical countermeasures and tools: to radically shorten the response time to a pandemic and deliver equitable global access**
 - d. **Global governance: to ensure the system is tightly coordinated, properly funded and with clear accountability for outcomes**

(1) Globally networked surveillance and research: to prevent and detect emerging infectious diseases

21. **Without significant investments in an early warning system, we will not be able to prevent and address future outbreaks quickly enough.**
- a. We must step up our investments in **One Health**.
 - i. WHO, OIE, FAO and UNEP must be supported to drive the development of standards for the prevention and control of health risks at the human-animal-ecosystems interface, with the WHO providing active support to the immediate response to emerging outbreaks once identified.
 - b. We must prioritize installing a **global genomic and epidemiological surveillance program within the next five years to prevent and detect cross-species spillovers and to rapidly share data:**
 - i. Comprising a tightly coordinated network of authorities and experts, with the WHO at the center. There should also be representation especially of countries and regions at higher risk of cross-species spillovers.
 - ii. With just-in-time sharing of data on new pathogens.
 - iii. Enabling rapid genome sequencing.
 - iv. This is a critical capacity for detecting emerging outbreaks, **allowing for rapid tailoring of public health interventions** based on the attributes of a pathogen and its transmission, and the **early development of diagnostic kits, vaccines and therapeutics** where viable.
 - 1. A good but underfunded precedent to build on is the WHO's Global Influenza Surveillance and Response System.

- v. The G7 has recently endorsed a broadly similar proposal for an enhanced international pathogen surveillance network¹⁸ which will be docked into the WHO, and supported by partners from national public health agencies, governments and research organizations to ensure the utility of the network all the time.
- c. As proposed by CEPI experts, the development of countermeasures would also be sped up through a **global prototype pathogen agenda** — that addresses the problems of vaccinology and develops vaccines against representatives of the roughly 25 viral families known to cause disease in humans. The number of prototype vaccines required to substantially reduce future risk has not been determined but, even if large (~100), is clearly finite.
- d. We must build up the requisite **in-country and regional capacities** for effective surveillance. International financing and technical assistance are needed to help build this up especially for LICs and LMICs.
 - i. Investment is required in specialized labs and staffing, advanced molecular diagnostic capabilities, and digitalization and data integration.
 - ii. These capacities for detecting new outbreaks have to be **built on systems that are able to provide continuous and cost-effective utility**¹⁹. This can leverage the work of the Global Fund and other global health bodies which have been developing such systems in many countries.
 - iii. We must also build up effective capabilities for the broader disease surveillance pyramid that should include **timely reporting of the number of deaths** and the domestic circumstances in an outbreak in all countries; the strengthening of conventional diagnostics and community health worker reporting; population-based CRVS (Civil Registration and Vital Statistics) or sample registration systems so that the impact of outbreaks can be measured; and data surveillance infrastructures to aggregate data and extract recommendations for swift action.
 - iv. Technical assistance can also help in **regulation of wildlife trade** as well as private, informal and unregulated drug-sellers, pharmacies, and providers.
 - v. **National public health institutes, regional centers for disease control, and international agencies like WHO, FAO and OIE require greater funding support** to develop and maintain this key capacity.
 - 1. Urgent work is needed to define and coordinate the partnership ‘hubs’ and ‘spokes’, put key infrastructure and training in place, and define the necessary policies, principles, and an underlying ethical framework essential for global cooperation within the network.
 - 2. There is also a need for a globally networked group of pandemic responders who can be embedded in national and regional public health institutes.
- e. A deeper understanding of zoonotic infections and disease origins is absolutely critical to successfully prevent future outbreaks.
 - i. We know that we must urgently enhance our ability to track, report and immediately respond to disease outbreaks at local, national and international levels.
 - ii. It will require minimizing possible spillovers from animals and humans, through internationally coordinated efforts to reduce the loss of natural habitats, regulate the wildlife trade and take down illegal trade, and address livestock production near to wildlife. **Strengthening One Health approaches is critical to this effort.**

¹⁸ <https://s3.documentcloud.org/documents/20860689/carbis-bay-g7-summit-communique-430kb-25-pages-1.pdf>

¹⁹ There are already well-functioning surveillance systems for HIV, tuberculosis, malaria and influenza, and can be augmented by including other pneumonia, meningitis, typhoid, cholera, STIs, drug resistant pathogens and clusters of defined clinical syndromes, as well as tracking the interplay between human and animal pathogens.

1. Few policies today seek to minimize human-animal interactions linked to environmental degradation, close live wildlife markets, reduce wildlife consumption, or ban commercial trade of high-risk wildlife — and rarely do these topics come up in mainstream health policy discussions.
2. Interventions to arrest environmental degradation not only help to reduce the risk of spillover, they also help to reduce greenhouse gas emissions, conserve biodiversity and provide natural climate solutions.
- iii. Policies governing gain-of-function virological research should be reviewed with accountability for safeguards and responsibility clearly placed on sponsors and funders²⁰.

(2) Resilient national systems: to strengthen a critical foundation for global pandemic preparedness and response

22. Every country must play its part, share information, and be accountable for strengthening pandemic PPR. Doing so has benefits both domestically and for the rest of the world.
 - a. Countries that are in the tropics or have significant interfaces between human and wildlife habitats are more vulnerable to pathogens jumping into human populations, and becoming the source of a future outbreak.
 - b. But highly urbanized countries and those which are most closely integrated within their regions and globally, run the risk of amplifying the spread if they are unable to keep pandemics under control.
23. **It is not possible to neatly separate efforts to counter new diseases with epidemic potential from continuing efforts to contain existing infectious diseases.** They require many similar investments in infrastructure, healthcare workforce and technical specialists, and technologies and information systems.
24. It is therefore critical to have robust, **whole-of-government health security plans** that are regularly and transparently stress-tested, and assessed for compliance with the IHR and adherence to best practices. The IMF should incorporate assessments of health security status into regular monitoring of countries' broader economic resilience (see below).
25. National authorities have the primary ownership and responsibility.
 - a. However, **the strong element of global public goods in national-level pandemic PPR, the scale of past underinvestment, and today's gaps in capabilities require significantly enhanced funding and technical support for LICs and LMICs.**
 - i. Stronger funding support should be provided by the MDBs, working together with the WHO, the One Health partners, other global health intermediaries and regional healthcare organizations, as well as with bilateral partners and philanthropies.
 - ii. **A significant share of the additional financing will have to be in the form of grants.** Grants are required for investments in global public goods, and to incentivize countries to borrow from the MDBs (by making their non-concessional loans more IDA-like). Grants should also be used to incentivize governments to allocate their own budgetary resources to complement external support from their development partners.

²⁰ The few laboratory biosecurity incidents that have been documented include a 2007 incident at Pirbright laboratories in the United Kingdom that caused a foot-and-mouth outbreak. The laboratory was a Defra category four, similar to those that deal with smallpox and Ebola, and was investigated thoroughly to find that the virus likely leaked from drainage pipework. The incident had wide-reaching international trade repercussions.

- b. Development partners must coordinate better with each other, and with national authorities.
 - i. The use of **country and regional platforms** can leverage the strengths of each development partner; and
 - ii. Allow countries room to decide on the most effective use of PPR funds, but with tracking and reporting to ensure effectiveness of spending and progress towards preparedness standards.
 - c. **Key global health intermediaries like Global Fund, Gavi and UNICEF should work with countries to improve the value proposition for private sector co-investments in dual-use capacities²¹** that can significantly contribute to health outcomes during the inter-pandemic years, including by making a forceful contribution towards the control of endemic diseases.
 - d. **International organizations also play a key role in strengthening domestic delivery systems.** Massive effort has to go into developing in-country systems for agile, last-mile delivery of essential supplies, which are critical in a pandemic but also have continuous utility in normal times. This applies not just to vaccines but lifesaving therapeutics and oxygen cylinders and concentrators.
26. We also **need credible benchmarks** for tracking each country's progress and identifying gaps in preparedness. **The Panel recommends establishing a new Health Security equivalent of the Financial Sector Assessment Program (FSAP),** that will provide in-depth assessments of countries' pandemic prevention and preparedness capabilities and investments, building on lessons learned from the IHR State Party Self-Assessment Annual Reporting (SPAR), Global Health Security Agenda and the associated Joint External Evaluation (JEE) peer review process.
- a. **The Health Security Assessment Program (HSAP) should be led and coordinated by the WHO and the World Bank, with its findings put out in the public domain.** It should factor in findings from the JEE and other voluntary assessments under the IHR.
 - b. **This would include the aforementioned stress tests to assess preparedness and resiliency in multiple scenarios, including highly mutable viruses and non-viral health risks.**
 - i. Administered nationally, stress tests should be supervised by regional and/or global authorities applying the same criteria and methods to all geographies.
 - ii. Stress tests should include quantitative and qualitative assessments to enable authorities to take into consideration all factors when allocating resources, aligned with agreed incentives.
 - c. The outcomes of this regular assessment of pandemic preparedness should be reflected in **IMF Article IV reports, so as to ensure attention by Finance Ministers and national leadership.** This is similar to how climate has recently been integrated into the Article IV surveillance.

²¹ These could include multi-disease surveillance, lab networks, febrile illness detection, supply chain and delivery infrastructure for medical countermeasures, personnel deployment systems, and emergency operations centers.

(3) Supply of medical countermeasures and tools: to radically shorten the response time to a pandemic and deliver equitable global access

27. **Speed, scale and equitable rollout of medical countermeasures are critical in a pandemic.**
28. Experts point to the prospect of a future major outbreak involving pathogens as transmissible as or even more transmissible than SARS-CoV-2. Given the devastating impact of such a pandemic, **a year is too long to wait for vaccines. We must collectively commit to achieving a 100-day goal for the development, production and deployment of effective countermeasures.**
29. Further, each of the medical countermeasures and other essential medical supplies needed in the current pandemic, including diagnostic tests, PPE and ventilators, and the components and raw materials required for their production, have been in **severe shortage, in many cases even one year into the pandemic.** The consequence has been a much wider spread of the virus, and much greater human and economic costs.
30. **With regard to vaccines, governments and international organizations should co-invest with the private sector to strengthen the supply chain during the inter-pandemic years.** Estimates by the Accelerating Health Technologies (AHT) group²² find that **having sufficient at-ready capacity for multiple vaccine candidates generates very high economic returns.** This is because the payoffs to having large quantities of vaccine available rapidly are enormous, most early-stage vaccine candidates fail, and it historically has taken many months to repurpose capacity from one vaccine candidate to another. However, utilizing new, low-cost modular manufacturing technologies that can interchangeably manufacture products across multiple platforms could reduce the need for 'duplicative' capacity in the future, so procurement systems should be open to such proposals.
 - a. During COVID-19, vaccine capacity installation and production was constrained by shortages of production capacity that could be repurposed, trained staff, and inputs. This led to costly delays in vaccination. A shortage of vaccines and inputs also increased incentives for countries to restrict exports and 'hoard' vaccine doses.
 - b. To mitigate this problem for future pandemics, governments and international organizations should create standby production capacity for both finished vaccines and inputs in the vaccine supply chain. Such capacity includes having adequately trained staff, quality checks and procedures in place to ensure that facilities are ready to produce quickly when needed. Companies could submit proposals for providing this capacity which should be judged on both cost and other dimensions.
 - c. As much as possible of this capacity should be kept occupied producing other products during non-pandemic times, which would have the benefit of keeping capacity warm, as it is difficult to rapidly 'engage' manufacturing capacity that is left idle. It might also significantly reduce costs.
 - d. The aim should be to enable vaccine capacity to be ready for each of several vaccine candidates to be produced at scale so that mass vaccination could begin globally as soon as clinical trials prove successful, and for this to be possible even if only one of the candidates was successful.

²² A group of economists and statisticians, including G20 HLIP member Michael Kremer, working on the problem of how to accelerate widespread access to vaccines and other health products to address COVID-19.

- e. **Companies have limited incentives to make investments that will be needed only during pandemic periods.** Some capacity investment may have valuable dual uses in the inter-pandemic years, but having sufficient at-ready capacity for multiple vaccine candidates is socially valuable even if much of it cannot be used during non-pandemic years. Ethical, social and political considerations may prevent companies from charging very high prices during a pandemic which would allow them to recoup costs. Therefore, governments and international organizations will need to be prepared to cover a large portion of the costs of this capacity. To the extent that capacity can be used for other purposes, this will bring down costs and help ensure pandemic readiness.
 - f. Contracting can be undertaken through a standard procurement process, in which governments and international organizations solicit bids from companies.
 - g. These bids should be judged on several dimensions. These include but are not limited to price, quantity, dual-use possibilities, speed to repurpose during a pandemic, geographical location, and reliability.
 - i. For example, a bid which could use capacity to produce other valuable products in peace-time at low cost would be more attractive, both because the dual-use is valuable and because using capacity might ensure that it could be repurposed quickly and reliably during a pandemic. However, capacity which requires high and constant demand to stay 'warm', may be less attractive if that demand does not match social needs.
 - ii. For certain more standardized inputs, stockpiles can be created. Once stockpiles are sufficient, the supplies can be sold and replenished, where ongoing production enables verification of capabilities for achieving contracted capabilities.
31. **When a pandemic hits,** governments and international organizations should sign contracts to repurpose sufficient manufacturing capacity for each of many vaccine candidates, ahead of final regulatory approvals for the successful candidates.
- a. Sufficient capacity is needed to ensure rapid and equitable global access, including by the LICs and LMICs, which is critical to containing a pandemic everywhere. This will require global support. **In order to fund these contracts, a pool of flexibly deployable 'at-risk' funds will be needed.**
 - b. Both national and multilateral investments should be welcomed.
 - c. It is efficient to structure contracts to reimburse companies for most of the cost of capacity repurposing, with an option to buy product from that capacity at a pre-agreed price.
32. **Governments and international organizations should also make investments to ensure sufficient supply and delivery of therapeutics, diagnostics, and PPE.**
- a. The right financing mechanism differs for each product, and should be designed appropriately.
 - b. For example, while for vaccines and therapeutics it is important to duplicate capacity for several candidates, this is not necessary for PPE.
 - c. Some kinds of PPE and medical equipment are useful for a broader set of pathogens than a specific vaccine, meaning it may be possible to maintain stockpiles in advance.

33. We need **to make sure there are sufficient raw materials and intermediate inputs to rapidly provide critical medical supplies at a global scale in a pandemic** and that there is a large enough margin of error to accommodate multiple negative shocks, such as some supplies proving unusable or only one vaccine candidate with particular specialized adjuvant requirements proving successful in clinical trials.
- a. Doing so will also **reduce the short-term trade-offs that nations face** between meeting immediate domestic needs and the global good, which all nations eventually benefit from.
 - b. Ensuring **broader geographical diversification of manufacturing capacity would help develop resilience in supply chains in a crisis**, and avoid the huge trust deficit seen in COVID-19 among countries dependent on unpredictable global arrangements.
 - i. This could begin with a broader distribution of fill-and-finish facilities, while building up more advanced capabilities for biomanufacturing in the longer term.
 - ii. We will however have to ensure that regional supply chains continue to work as part of a global system:
 - 1. The scale required for manufacturing means that individual regions will find it difficult to comprehensively cover all the possible platforms needed for responding to a future pandemic.
 - 2. Regional supply chains can still be vulnerable to localized shocks.
 - iii. The need for greater diversification and resilience of supply chains also extends to PPE and other critical medical supplies²³.
 - c. The remarkable progress achieved in research, manufacturing and market launch for vaccines has to be extended to diagnostics and therapeutics.
34. We also need a **substantially larger network of sustainably-financed, ever-warm manufacturing capacity** that can be repurposed in a pandemic to target specific pathogens.
- a. Multi-modal manufacturing capacity (mRNA, protein, and virus-based vaccines and therapeutics) can rapidly ramp up production of pandemic-specific medical countermeasures when needed.
 - b. At-risk financing is needed for manufacturing of multiple prototype pathogen vaccine/diagnostic/therapeutic candidates before outbreaks.
 - c. Dual-use purposes should be sought for such capacity, which could contribute to controlling endemic diseases and improving health outcomes during the inter-pandemic years. This can also improve the value proposition for such investments.
 - d. Production capacities in different regions would render the system more resilient and contribute to a more equitable global distribution of scarce supplies²⁴.

²³ IPPPR Background Paper 7 — “Access to Essential Supplies.”

²⁴ The recent Franco-German initiative to boost BioNTech vaccine production in South Africa is a positive example in this regard, see <https://www.dw.com/en/vaccine-makers-want-to-help-south-africa-germanys-health-minister/a-57715373>

35. **This requires both public and private participation and risk sharing**²⁵. The private sector cannot on its own invest in excess (peak-load) capacity ahead of a pandemic, given the uncertainties over the scale and timing of demand, and over which specific vaccines or other medical countermeasures will meet regulatory approval.
- a. **A combination of push incentives (co-funding of R&D and supply capacity) and pull incentives (assured procurements) will be needed** ahead of a pandemic, as well as to accelerate R&D and manufacturing capacity expansion at the beginning of an outbreak.
 - i. It is more cost-efficient for this to be weighted towards push contracts. They provide the greatest opportunity for securing significant access commitments because of the higher risk involved in the early stages of developing vaccines and other medical countermeasures.
 - ii. There should also be government funding to support the development of **new manufacturing technologies**, e.g. for mRNA vaccines and therapeutics to be made on biochips. This has the potential of reducing production costs and human capital requirements, and enabling more ready access to supplies.
 - b. Contractual clauses must incentivize early deliveries and commit firms to quantity, **adequate allocations to LICs and LMICs, and affordable pricing**.
 - i. Government funding in the current pandemic, as well as prior public sector investments in R&D, played an outsized role in the funding of vaccine discoveries for COVID-19. However, these were not structured to fully recognize the public good nature of R&D and such discoveries.
 - ii. Future government funding for medical research should attach clearer conditions if successful discoveries are made, e.g. commitments to provide affordable medical countermeasures with cost-plus pricing for LICs and LMICs, treatment of intellectual property and requirements for technology transfers to third-party manufacturers.
 - iii. There is a critical need for transparency of contracts and in particular, with regard to pricing. The lack of this transparency has militated against developing countries in the current pandemic, with some of them ending up paying more than high-income countries for their vaccines.
36. **Expanding public-private-philanthropic partnerships: We should ensure that this end-to-end ecosystem for global supply of medical countermeasures is tightly networked to significantly scale up production of these supplies**²⁶.
- a. We have to leverage comparative strengths across a network of ready-to-act, adequately-funded entities working across different functional areas (from R&D through to manufacturing and procurement)²⁷.
 - b. ACT-A was an important, ad hoc arrangement during COVID-19, to coordinate efforts to fund and enable equitable access to diagnostics, vaccines, therapeutics and implementation of these in health systems.
 - i. Each of the institutions in ACT-A adapted to an evolving situation, and added value through its respective expertise and networks with the private sector and within countries.
 - ii. ACT-A's experience also showed the ability of the international community to assemble a coalition of the willing in short order during a major crisis.

²⁵ <https://science.sciencemag.org/content/371/6534/1107>

²⁶ <https://pubmed.ncbi.nlm.nih.gov/33711296/>

²⁷ This includes the WHO; CEPI; the international procurement agencies (Gavi, Global Fund, FIND, Unitaid and UNICEF); the WBG; national/regional agencies like BARDA, HERA and the African Vaccine Alliance; national regulators; the private sector and non-state entities.

- iii. But it has also shown the drawbacks of waiting for a crisis to occur. The current system — under a loose coordinating mechanism within ACT-A — lacks upfront financing and is not speedy enough. A year on, it remains significantly underfunded, which has hampered progress in purchasing and deploying medical countermeasures to those in need.
 - iv. Further, as also observed by the IPPPR, ACT-A is seen by countries and civil society as supply-driven and not inclusive enough, with large donor countries and institutions having an asymmetric influence on decision-making²⁸, and some parts of the world opting for regional pooling as an alternative.
- c. **We should learn from the COVID-19 experience and develop a permanent, scaled-up and tightly networked ecosystem of partners** — public, private and philanthropic — to enable the following:
- i. Accelerating innovation processes and facilitating the development of candidates and platforms to the regulatory end-point
 - ii. Achieving adequate global scale in manufacturing, including by:
 - 1. Having a full view of global manufacturing capabilities to know which ones can be activated rapidly at any point
 - 2. Enabling adequate global diversification of facilities to ensure supply resilience in a pandemic, and supporting technology transfer to countries or regions to build up manufacturing capabilities
 - 3. Implementing a coherent strategy of push and pull contracts to support the business case for the needed ever-warm global manufacturing capacity, including its use in inter-pandemic periods to meet continuing needs²⁹
 - iii. Focusing on last-mile delivery, including investments in critical domestic supply chains in developing countries for delivering vaccines and other medical supplies
- d. Significantly enhanced, continuous and pre-arranged funding is required to enable this end-to-end supply chain ecosystem and avoid huge gaps in access to medical countermeasures in a pandemic. **We propose that this be financed through a new Global Health Threats Fund (Proposal 2 in Section C), which will provide enhanced and more predictable funding to complement existing global health intermediaries.**
37. **We also need regulatory reforms to speed up time from development of these medical countermeasures to manufacturing.**
- a. Enable trials to be conducted across pharmaceutical companies and for multi-vaccine platform technologies.
 - b. Allow products that are developed in one country to be able to rapidly undergo regulatory assessment internationally.
 - c. Formalize process for adaptive regulatory reviews in emergency situations.
 - i. Governments should also consider setting up commissions to be able to make decisions rapidly on novel study and trial methods — based on both scientific and ethical foundations — in the effort to speed up availability of medical countermeasures.

²⁸ IPPPR Background Paper 5 — “Access to Vaccines, Therapeutics, and Diagnostics.”

²⁹ For instance, CEPI could support development and technology transfer of a yellow fever mRNA vaccine, which would set up a new manufacturing plant with a potential commercial product in the inter-pandemic period but prepared to manufacture mRNA-based vaccines during a pandemic. UNICEF could support the tech transfer for key vaccine platforms from manufacturers to entities based in LICs and MICs by supporting the business case, incentivizing regional supply, supporting prequalification for new manufacturers and awarding them UNICEF offers for pediatric vaccines to ensure a warm manufacturing base and functional production sites.

38. Besides enhancing research upstream, integrated with global surveillance, **a whole range of downstream R&D on medical countermeasures will also have social returns significantly higher than commercial value**, and would be undertaken more swiftly with the aid of the public sector. Examples include:
- a. **Efficacy studies** (e.g. studies to ascertain the optimal dosing regimen given vaccine shortages, and to evaluate mix-and-match vaccine doses, should take place in parallel with standard clinical trials, so this information is available as soon as possible.)
 - b. **Thermo-stable mRNA vaccines**
 - c. **Repurposing of generic drugs**
 - i. A Repurposed Generic Development Program (RGDP)³⁰ could be part of this global ecosystem.
 - ii. Employing public-private partnerships with academic labs, clinical development networks and drug manufacturers, to identify promising drug repurposing targets, coordinate clinical trials, and contract for the manufacturing of promising candidates.
 - d. Earlier release of data from clinical trials, before final regulatory approvals, can also shorten the response time for investments in production capacity.
39. Governments and international organizations should also fund rigorous, quantitative evaluations of the **causal impact and efficacy of various non-pharmaceutical interventions (NPIs)**.
- a. These include mask-wearing, ventilation, closure of different institutions (schools, restaurants, public transport), and reduction in contact between people, indoors and outdoors.
 - b. This will allow governments to design NPIs appropriately to reduce transmission in a way that is more sustainable over time, and minimize the economic and social costs of achieving targeted transmission reductions.

(4) Global governance: to ensure the system is tightly coordinated, properly funded and with clear accountability for outcomes

40. The current global health architecture is not fit-for-purpose to prevent a major pandemic, nor to respond with speed and force when a pandemic threat emerges. As the Global Preparedness Monitoring Board highlights, the system is fragmented and complex, and lacks accountability and oversight of financing of preparedness.
41. We must address this by establishing a governance mechanism that integrates all the key players in the global health security ecosystem, with the WHO at the center. **It should integrate health and finance bodies, within a tightly networked system of responsibility and accountability.**
- a. Ensuring adequate and sustained investment in normal times, to break the cycle of panic and neglect in pandemic preparedness

³⁰ "Generic drug repurposing for COVID-19 and beyond", Susan Athey et al, 15 July 2020.

- b. Enabling the world to respond with speed and force when a pandemic does strike
 - c. Putting the system on stronger and more reliable financial footing, anchored in rules-based multilateral funding
 - i. Going beyond funding for specific diseases and interventions towards broader investments in core capacities needed to prevent and respond to future pandemics
42. **Several global mechanisms have been set up in recent years**, including the Global Preparedness Monitoring Board (GPMB)³¹, Independent Oversight and Advisory Committee (IOAC)³² for the WHO Health Emergencies Programme and the Global Health Security Agenda (GHSA)³³. However, **none has the mandate to ensure the effective coordination of key health and finance institutions needed to achieve the objectives above.**

Establish a Global Health Threats Board

43. **We propose establishing a new Global Health Threats Board (Board). This will comprise a G20+ group of countries and major regional organizations, to provide systemic oversight of finance for pandemic PPR, and ensure coordination and accountability of the key international health and finance organizations. The Board should be supported by a permanent, independent Secretariat, drawing on the resources of the WHO and other multilateral organizations.**
44. This new Board will **complement the recent proposal by the IPPPR for a Global Health Threats Council**, to be established by the UN General Assembly and mainly comprising Heads of State/Heads of Government³⁴. The Panel supports the case for top-level political leadership to demonstrate the strong commitments required for global health security.
45. The Board will **aim more specifically to match tightly networked global governance with financing**, which are both critical enablers to reduce pandemic risks. It is loosely modeled on the successful experience of the Financial Stability Board (FSB), which was established by the G20 following the Global Financial Crisis and has played a key role in strengthening global financial system resilience³⁵. It also has similarities with the Global Health Board proposed by the Pan-European Commission on Health and Sustainable Development.
46. The Board should make available progress reports to G20 leaders as well as to the UN General Assembly through the UN Secretary General. These reports should include the allocation and usage of funds by the Global Health Threats Fund (see below), as well as reliable and transparent reporting of investment outcomes to ensure accountability.

³¹ The GPMB, which was set up by the WHO and the World Bank in 2018, is a time-bound scientific advisory body, not a policy-making board. It provides an independent appraisal for policy makers on progress towards preparedness and response capacity.

³² The IOAC was established in 2016 with a specific mandate to provide ongoing oversight by a group of health and humanitarian experts of the effectiveness of WHO's Health Emergencies Programme.

³³ The GHSA, established in 2014 and currently extended till 2024, facilitates target-driven, multi-sectoral coordination and communication among its members. It currently lacks the necessary higher-level political engagement, financing, and wider country membership required for oversight of pandemic PPR.

³⁴ The UN General Assembly will appoint two Co-Chairs for the Council and the G20 shall be invited to nominate a Co-Chair. The three Co-Chairs will put forward suggestions for the remaining Council members, for the UN General Assembly to endorse.

³⁵ The FSB's role has comprised:

ⁱ Identifying risks to financial stability and orchestrating appropriate responses amongst financial regulators

ⁱⁱ Promoting coordination of policy development and exchange of information and best practices among financial stability authorities and standard-setting bodies

ⁱⁱⁱ Overseeing member jurisdictions' implementation of agreed commitments, standards, and policy recommendations through implementation monitoring, peer review and disclosure

47. **Mandate.** The Panel recommends that the Board be mandated to provide systemic financial oversight to **ensure proper and timely funding for pandemic PPR across the international system and the most effective use of funds**. This will require a few functions:

- a. Identify the **key priorities to be addressed by the proposed Global Health Threats Fund**, which would be established as a Financial Intermediary Fund (FIF) at the World Bank. The most efficient governance arrangement could be for the Board to constitute a committee ('Investment Board') to directly oversee the Global Health Threats Fund. (**Proposal 2** in Section C.)
- b. Contribute to a **tightly coordinated approach among all the relevant international organizations**, with joint and clearly delineated responsibilities, to ensure the most effective use of funds with each institution doing what it does best in pandemic PPR.
- c. **Ensure complementarity between multilateral and bilateral funding and initiatives to maximize their combined impact.**
- d. **Identify gaps for proactive action and funding:**
 - i. Review emerging pandemic threats based on scientific assessments and a global health risk map.
 - ii. Oversee the proposed HSAP, to be instituted and coordinated by the WHO and World Bank.
 1. This will provide in-depth assessments of countries' pandemic prevention and preparedness capabilities and investments.
 2. It would take into account findings from the JEEs and other assessments.

The Board should, in these regards, take reference from the initiatives and work of the proposed Global Health Threats Council.

- e. **Ensure that when a pandemic threat emerges, global resources are swiftly mobilized and flexibly deployed to support the key international institutions**, which should readily constitute a global pandemic response force.
48. **Composition.** The Board should have leadership and membership that ensures credibility, effectiveness and inclusivity.
- a. We believe that the G20 is the most effective platform for this new Board, given the sizeable role of G20 nations collectively in funding pandemic PPR (if relying on established approaches for international contributions), and in containing global pandemic risks given their size and global interconnectedness.
 - b. Anchoring the Board in the G20 also ensures the participation and active collaboration of both Health and Finance Ministers. This will build on the efforts at the G20 to deepen collaboration between health and finance authorities, with the inaugural joint meeting of Health and Finance Ministers in 2019.
 - c. However, the composition of the Board would have to be expanded to **comprise a broader 'G20+' group**, including the major regional organizations and a rotating representation of countries that are more vulnerable to infectious disease outbreaks with pandemic potential. It should also include other significant non-G20 contributors to the proposed Global Health Threats Fund that is discussed in Section C of this report. The geometry of the Board should provide for flexibility so as to respond to the major threats of the day.
49. Provisions should be made to ensure that the leadership of the Board does not rotate every year. We recommend a three-year term to ensure adequate continuity, besides the establishment of the permanent Secretariat.

50. **Advisors.** The leadership of key global and regional agencies with major roles in funding and implementing pandemic preparedness and response programs would serve as Advisors to the Board. Besides the WHO, which plays the leading role, they should include the leading multilateral agencies as permanent Advisors: the IFIs (World Bank, IMF, and the rotating chair of the Heads of Regional Development Bank meeting) and the WTO. They should also involve either on a permanent or rotating basis, the One Health partners (OIE, FAO and UNEP); major global health intermediaries (CEPI, Gavi, Global Fund, FIND, UNICEF, WFP, Unitaid, OCHA); regional Centers for Disease Control and Prevention (e.g. Africa CDC, ECDC); philanthropies with a large role in funding global health and pandemic preparedness; relevant civil society organizations; and leading private sector participants.
51. **Scientific advisory panel.** More effective pandemic PPR requires improved data collection, system-wide analysis of emerging health threats, and advice based on the best available science. GPMB is working on a global monitoring framework and developing a dashboard using a risk scoring and preparedness measurement approach. It will bring together different data sources and synthesize them. **We recommend that the GPMB be transformed to constitute this scientific advisory panel (“Intergovernmental Panel on Epidemic Risks and Infectious Health Threats”),** drawing on the parallel of the Intergovernmental Panel on Climate Change³⁶. The Panel should be independent, and tap on a large network of scientists to analyze data on risks and the level of management of those risks across all geographies. This Panel’s reports would serve as valuable input to both the Global Health Threats Council proposed by the IPPPR and the Board.
52. The Board must ensure that the world **leverages fully the strength of regional ownership.**
- a. An example in the last year has been the African Union (AU)’s initiative to establish the **African Vaccine Acquisition Task Team (AVATT)** to overcome the continent’s lack of access to vaccines. (See **Annex F.**)
 - i. The AVATT was launched in August 2020, under the leadership of the AU and Africa CDC, and supported by the WHO, UN Economic Commission for Africa (UNECA), and UNICEF. It aims to achieve a minimum of 60% immunization of the African population to eliminate COVID-19, augmenting the COVAX initiative.
53. The Board must also ensure that there is continuous learning from responses to pandemics and outbreaks. It should promote post-crisis reviews of responses, especially at the national level, to **generate solid, evidence-based national policies and investment plans for pandemic PPR and enable sharing of best practices globally.** This will help ensure that injections of new resources can be most effectively deployed.

³⁶ See also <https://www.nature.com/articles/s41591-021-01374-x>

C. FINANCING PRIORITIES

The Immediate Task: Funding ACT-A and COVAX

Financing Future Security from Pandemics

Adopt a systemic approach to ensure enhanced and predictable global financing for pandemic PPR

Establish a
Global Health Threats Fund

Develop resilient domestic finances for prevention and preparedness

Strengthen financing for the WHO and One Health, and put it on more predictable footing

Make financing of global public goods part of the core mandate of World Bank and other MDBs

Enable fast-tracked surge financing by the IFIs in response to a pandemic

Ensure complementarity between multilateral and targeted bilateral funding

Leverage the capabilities and resources of the private and philanthropic sectors

Develop insurance solutions for adverse compensation events associated with use of medical countermeasures



C. Financing Priorities

The Immediate Task: Funding ACT-A and COVAX

54. The G20 HLIP's mandate concerns reforms and financing solutions to strengthen preparedness and response to future pandemics. **However, we must first end this pandemic. We need to take bold, concerted actions to lift the world out of the COVID-19 crisis.**
55. **The first priority for the international community is to agree on and implement an action plan to vaccinate the majority of the world's vulnerable population before the end of 2022.**
- a. Achieving this requires closing the gap in vaccine supply, scaling up delivery capacity across countries to make use of this supply and ensuring that lack of financing is not a binding constraint at any point of this process.
 - b. Despite welcome progress on all fronts, the world is not yet on an assured trajectory to achieve an end to this pandemic by the end of 2022.
 - c. The most immediate task is to close the urgent financing gaps for ACT-A and its COVAX Facility for 2021 and 2022.
 - d. The IMF has presented a cogent US\$50 billion proposal to vaccinate 40% of populations in all countries by end-2021 and 60% by mid-2022, and ensure adequate supply of diagnostics, therapeutics and personal protective equipment (PPE). This will require an urgent combination of grant financing, concessional and non-concessional loans coming from a variety of stakeholders³⁷.
56. There are now a number of promising proposals on how the required funds can be mobilized and deployed to achieve the goal of global immunization against COVID-19. Among them, the following merit urgent consideration:
- a. **Raising additional grant financing is the most appropriate way to support LIC access to vaccines and other medical countermeasures, as well as global public goods like surveillance and research**³⁸. However, relying on ad hoc bilateral contributions — as we have done for the last year and a half — has still left a large gap to be closed. Recent additional commitments from the G7 countries as well as the efforts of Norway and South Africa, Co-Chairs of the ACT-A Facilitation Council, to build support for equitable burden-sharing amongst countries, now need to be accelerated and followed through from commitment to disbursement.
 - b. In parallel to efforts to mobilize additional grants, **LICs and MICs should be able to acquire vaccines and other resources by drawing on concessional finance from the International Financial Institutions (IFIs)**. Borrowing from existing or new IFI facilities should be seen as a second-best alternative to grant funding; however, rapid access to concessional loans is far better than delaying vaccine purchases and vaccination drives until sufficient grants have been mobilized.
 - i. Existing vaccine financing windows in the MDBs need to be expanded and streamlined to disburse funds more expeditiously and through upfront bridge finance, in coordination with ACT-A and the COVAX Facility.

³⁷ <https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2021/05/19/A-Proposal-to-End-the-COVID-19-Pandemic-460263>

³⁸ Agarwal and Reed (2021) suggest that besides an upfront grant of US\$4b to the COVAX AMC, there are two additional options to address the funding gap that rely on the existing institutional framework:

- a. Reducing donors' upfront commitment by relying on the International Finance Facility for Immunisation (IFFIm) to issue Vaccine Bonds against a long-term donor commitment.
- b. Relying on in-kind donations to equalize the distribution of vaccine pre-purchases across countries.

- ii. The IMF should urgently consider introducing a time-bound vaccine financing window that would provide quick access to funds to help LICs and MICs to close remaining COVID-19 vaccine financing gaps, including through COVAX.
- iii. Donor grants could be used to help reduce the cost of this borrowing and to repay the associated principal when it comes due.
- c. In addition, **IDA could provide an additional US\$10 billion in grant support during IDA19, based on immediate reserve capacity.** The grant could be used for vaccine procurement and rollout through COVAX and other regional procurement arrangements for 2021 and 2022. It is important to design this support in a way that facilitates COVAX and other aggregated mechanisms to enter into advance purchase agreements as needed.
- d. **The proposed allocation of SDRs provides a one-off instrument to help meet urgent financing needs in response to this pandemic.** In addition to the direct allocation that LMICs will receive as their proportional share of the total US\$650 billion, a portion of the SDRs of countries not in need could be reallocated to meet urgent needs of LMICs **while preserving the unique character of the SDR as an international reserve asset.**
 - i. This could be done through providing additional general liquidity and balance of payments support, for example through rechanneling \$25 to \$35 billion SDRs under the Poverty Reduction and Growth Trust.
 - ii. The 'excess SDRs' could also be directed more specifically to support accelerated vaccination, for example by funding a newly created, time-bound vaccine window to provide concessional lending for this use.
 - iii. The Panel also supports expeditious exploration of the feasibility of other mechanisms, such as establishing new trust funds or channeling SDRs through MDBs, which aim to further increase the reallocation of resources to support COVAX or the financing needs of countries not covered by the PRGT.
- e. Critical too are efforts to help countries develop implementation plans for broad-based population access to vaccines.
 - i. The World Bank has made significant efforts through its Vaccine Readiness Assessment Program³⁹, including the development of cold chain capacity, information campaigns and training of human resources, but challenges remain, with only about 30% of total commitments out of the World Bank Multiphase Programmatic Approach financing going to delivery and country readiness.
 - ii. The World Bank and RDBs should continue to scale up such programs to help countries fill gaps in vaccine delivery, and the broader strengthening of the public health response.
 - iii. The IFIs should adjust their policies and work with country governments to **assure that fiscal space or lending envelopes do not represent a barrier to financing.**

Financing Future Security from Pandemics

- 57. The key focus of the Panel's proposals is on the governance enhancements and financing required to avoid future pandemics.
 - a. Effective pandemic PPR is the result of a continuum of investments at the **national, regional and global levels.**

³⁹ In October 2020, the World Bank's Board approved US\$12 billion of fast-track financing to IBRD/IDA-eligible countries for purchasing vaccines as well as strengthening primary health care systems to deliver the vaccines.

b. Critically, it requires that investments be **sustained**, and not just made in response to each new crisis.

58. We have made estimates of the scale of funding required — in total and for each function along the continuum of pandemic PPR.

a. Our work benefitted from the inputs of the GPMB on the scope of operations required for pandemic PPR (see **Annex G**). Our estimates also took detailed reference from two comprehensive exercises by the WHO and McKinsey, which we complemented with other sources⁴⁰. We have studied these various estimates carefully and adopted estimates that we feel best match the scope of pandemic PPR for the purpose of this report.

b. **We have grouped the estimates under three main categories of prevention and preparedness.**

- i. Robust Surveillance and detection networks
- ii. Building resilience in health systems
- iii. Supply capacity for medical countermeasures

The costs for each are presented at **Annex H**. For simplicity below, we have reduced the ranges to a set of central figures. These are current best estimates based on WHO, McKinsey and others to size the various requirements for future pandemic prevention and preparedness. The costings will have to evolve, and will have to be reviewed regularly to ensure adequate overall funding across the global health security system.

c. **We can only avoid future pandemics if we invest substantially more resources than we have been willing to spend in the past, and which the world is now paying many times over in dealing with COVID-19's damage.**

d. **Much of this has to comprise domestic investments by national authorities** in the key capacities needed to prevent and contain future pandemics. These investments, specifically for pandemic prevention and preparedness, must be part of broader national efforts for healthcare and public health system strengthening.

e. However, domestic actions alone will not prevent the next pandemic. **We must collectively commit to expanding international financing by US\$75 billion over the next five years — or US\$15 billion each year.** This will comprise funding for both global-level functions and the support needed for LICs and LMICs to invest in the country-level global public goods needed for pandemic PPR.

f. The scale of investments required reflects the need to catch up from a long period of underfunding. Investing upfront in the next five years will lower the otherwise growing risks of pandemic, and reduce the total costs of preventing and responding to major outbreaks in future years.

g. **The Panel believes that US\$15 billion per year is the absolute minimum in the new international investments required in global public goods that are at the core of effective pandemic prevention and preparedness.** This estimate excludes the cost of other complementary investments that will contribute to resilience against future pandemics, while providing benefits to countries in normal times.

i. **It excludes the costs of containing antimicrobial resistance (AMR)**, which is a growing threat to health security nationally and globally. AMR may worsen the impact of future epidemics and pandemics by rendering ineffective the treatment of such infections and associated co-infections, as evidenced in previous influenza pandemics. Countering AMR is estimated to cost US\$9 billion annually⁴¹. Since AMR containment measures have benefits well beyond pandemic PPR and operate through ongoing programs for more rational use of antimicrobials in health and agriculture, we have not included these costs in our estimates.

⁴⁰ Including estimates by the Center for Global Health Science and Security at Georgetown University and Talus Analytics; the Coalition for Epidemic Preparedness Innovations (CEPI); and the G-Finder survey *Landscape of Emerging Infectious Disease Research and Development*.

⁴¹ <https://documents1.worldbank.org/curated/en/323311493396993758/pdf/final-report.pdf>

- ii. The estimated costs would also be much higher if they included **upstream environmental investments** for prevention and a **more extensive scope for One Health** including upgrading of veterinary services; **basic and pre-clinical research**; and the **broader strengthening of healthcare systems and delivery infrastructure** beyond that directly related to pandemic PPR. These actions provide continuous benefits to countries, and have therefore been excluded from our strict estimates of costs specific to pandemic PPR.
 - iii. Further, the estimated minimum investments required are based on conservative assumptions on the scale of at-ready manufacturing capacity required for medical countermeasures⁴².
59. The Panel hence calls for a concerted international effort to provide larger-scale and more predictable resources to fill the major gaps in pandemic PPR. With contributions apportioned equitably, they are affordable to all nations. **They provide immense social returns, both nationally and globally:**
- a. They will materially reduce the risk of events whose costs to government budgets alone are 700 times as large as the additional international investments per year that we propose, and 300 times as large as the total additional investments if we also take into account the domestic spending necessary.
 - b. **The next major pandemic may come at any time. Even if it occurs only 10 or 20 years from now, the costs to governments will still be 10 to 25 times the cumulative additional investments in prevention and preparedness over the years until then, in present value terms⁴³.**
 - c. The full damage of another major pandemic, with its toll on lives and livelihoods, will be vastly larger. Based on estimates by Metabiota, there will be 4 million expected deaths in the next decade from the three pathogen groups — pandemic influenza, epidemic coronaviruses and viral hemorrhagic fever — which is roughly equivalent to the losses to date in today's pandemic.
60. **We highlight our key financing proposals:**
- (1) Adopt a systemic approach to ensure enhanced and predictable global financing for pandemic PPR**
 - (2) Establish a Global Health Threats Fund**
 - (3) Develop resilient domestic finances for prevention and preparedness**
 - (4) Strengthen financing for the WHO and One Health, and put it on more predictable footing**
 - (5) Make financing of global public goods part of the core mandate of World Bank and other MDBs**
 - (6) Enable fast-tracked surge financing by the IFIs in response to a pandemic**
 - (7) Ensure complementarity between multilateral and targeted bilateral funding**
 - (8) Leverage the capabilities and resources of the private and philanthropic sectors**
 - (9) Develop insurance solutions for adverse compensation events associated with use of medical countermeasures**

⁴² Our costings for incentivizing supply capacity for **all medical countermeasures** are about half of the costs estimated for vaccines alone by the Accelerating Health Technologies (AHT) group (comprising economists and statisticians, including G20 HLIP member Michael Kremer). The AHT group estimates that investments in needed production capacity and supply chain inputs for **vaccines alone require US\$60 billion in public funding** to enable the capacity to be installed over a period of years, and about US\$2 billion per year thereafter to maintain this capacity. Their estimates take into account that most vaccine candidates fail, and in order to repurpose capacity in parallel with clinical trials, any vaccine capacity would need to be split between many candidates. There is therefore a need for significantly larger vaccine capacity. However, the added investments generate far greater benefits in future and far higher returns than a small scale of investments would.

⁴³ Even if we assume the investments in prevention and preparedness only reduce the probability of pandemic by 50%, and reduce the cost of any resulting pandemic by 50% — hence saving 75% of the costs of a COVID-19-scale pandemic — the cost savings to government budgets are 8 to 18 times the cumulative additional investments over the next 10 to 20 years, in present value terms.

61. The various proposals are individually necessary, but the **real potential is in operating them in totality** to develop a strong and sustainable financing system for pandemic PPR.

(1) Adopt a systemic approach to ensure enhanced and predictable global financing for pandemic PPR

62. Our key financing proposals, taken as a whole, seek to ensure enhanced and predictable funding of pandemic PPR across the system.
63. The Global Health Threats Board that we have proposed will have the responsibility of **systemic oversight of finance for pandemic PPR**, to ensure that funding gaps are addressed, and build support for each of the organizations' resource mobilization strategies. (See Section B.)
- a. There is some parallel in how the G20 has played a role in building consensus for recent IMF quota review exercises.

The Global Health Threats Board will also ensure coordination and joint accountability of the key organizations involved in pandemic PPR.

64. As set out above, the Panel has assessed that a minimum of US\$75 billion in international support over the next five years (US\$15 billion per year) will be needed for investments in global public goods for prevention and preparedness.
- a. The Panel proposes that two-thirds of this additional amount, i.e. US\$10 billion per year, should be pooled in a **Global Health Threats Fund** (Fund) to be deployed across the various organizations and global initiatives (**Proposal 2**). This new multilateral funding mechanism would enable effective and agile deployment across institutions and networks to meet the most critical priorities.
- b. The remaining US\$5 billion should go directly towards strengthening funding to existing institutions. This must include enhanced and predictable support for the WHO (**Proposal 4**), strengthening MDB resources for dedicated pandemic preparedness windows in IDA and other RDBs' concessional bodies alongside their making better use of grant resources from the global health intermediaries (**Proposal 5**); and a step-up of bilateral and philanthropic funding for global health (**Proposal 8**).
65. We believe this would be an **effective and sustainable approach to international financing for pandemic prevention and preparedness**. Importantly, the new Fund must perform a catalytic function, so that it adds resources rather than substitutes for the necessary and sustained funding of the various organizations.
66. The IMF and the MDBs should also introduce **pandemic response windows, building on their existing emergency lending instruments, to scale up funding quickly during a crisis (Proposal 5)**, with relaxed rules on country borrowing and automatic access for pre-qualified countries.
67. The strengthening of the international financing must be accompanied by an agenda of reform in many countries to **mobilize and sustain additional domestic resources** to enable investments in national capacities to prevent and contain pandemics as well as in the broader strengthening of public health systems. (**Proposal 3**).

(2) Establish a Global Health Threats Fund

68. The Panel proposes the establishment of a new, dedicated Global Health Threats Fund, aimed at mobilizing US\$10 billion per year, **to support and catalyze investments in global public goods for pandemic PPR.**
69. The Fund would serve as a needed multilateral financing mechanism to pool resources internationally, **based on pre-agreed contributions.** This new Fund, at two-thirds of the minimum of US\$15 billion in additional international resources required, brings three necessary features into the financing of global health security.
 - a. Together with an enhanced multilateral component of funding for the WHO, it would provide a **stronger and more predictable layer of financing.**
 - b. It would enable **effective and agile deployment of funds** across international and regional institutions and networks, to plug gaps swiftly and meet evolving priorities in pandemic prevention and preparedness.
 - c. It would also serve to **catalyze investments** by governments and the private and philanthropic sectors, for example through matching grants and co-investments.
70. **We must view this proposed mechanism against the weaknesses of the traditional system of international financing to address pandemic threats.** Bilateral contributions, while valuable, have been unpredictable and collectively inadequate, while encouraging free-riding on the part of others. Further, replenishment of resources for the international institutions has been slow. **The same system will not enable the world to avoid the next pandemic.**
71. The Fund would support the following major global actions to plug key gaps in **global public goods** for pandemic PPR:
 - a. Building a **transformed global network for surveillance** of infectious disease threats. This will require a major scale-up of the network, combining pre-existing and new nodes of expertise at the national, regional and global levels, with the WHO at the center.
 - b. Providing stronger **grant financing to complement MDBs'** and the global health intermediaries' **support** for country- and regional-level investments in global public goods.
 - c. Ensuring enhanced and reliable funding to **enable public-private partnerships for supply capacity:** the rapid development, manufacturing and delivery of medical countermeasures on a global scale, so we can preclude severe shortages anywhere and avoid prolonging a pandemic everywhere.
 - i. The Fund would provide a critical layer of multilateral support for a new, permanent, end-to-end supply ecosystem that will build on the lessons learned from the ACT-A coalition of health partners. (See Section B.)
 - ii. Public investment, through a combination of push and pull contracts⁴⁴, is needed to share risks and enable private investments in R&D and manufacturing capacity ahead of a pandemic, and ahead of product use authorization, so that medical countermeasures can be quickly scaled up in a pandemic.
 - iii. Sufficient capacity is needed to ensure rapid and equitable global access, including by the LICs and LMICs, which is critical to containing a pandemic everywhere. This will require global support. In order to fund these contracts, a pool of flexibly deployable funds will be needed.

⁴⁴ Public resources are necessary for a combination of:

- a. **Push financing — to co-fund R&D and supply capacity.** This includes risk-sharing for facility start-up/maintenance costs in the inter-pandemic period, and for scaling up manufacturing / production for a portfolio of candidates and platforms up to the regulatory endpoint.
- b. **Pull financing — to assure demand via advance or concurrent purchase of medical countermeasures** on behalf of countries via regional and global procurement bodies such as the Global Fund, Gavi, AMSP, and others. This is especially critical during the initial phases of an epidemic or pandemic.

- d. Supporting **research and breakthrough innovations** that can achieve transformational change in efforts to prevent and contain future pandemics, complementing existing global R&D funding mechanisms like CEPI.
72. The new Fund would ensure that these gaps are addressed swiftly, and have the **flexibility to deploy funds across these functions based on emerging priorities**. It would aim to augment the existing international organizations, as well as regional and non-state actors that are performing important roles. **The Fund should complement, and not substitute for, the other sources of financing noted in this report**, in particular the concessional windows of MDBs and funding for the existing global health organizations. The functions of the Fund should be defined to ensure complementarity and additionality in relation to financing for the various other institutions.
73. The Fund will also seek to incentivize joined-up actions by the different organizations to enable forceful and coherent preparedness and response plans. **Funding must also drive progress on accountability for global health outcomes, while not creating duplicative or onerous structures for reporting.**
- a. The Global Environment Facility (GEF), which is a financial mechanism for five conventions including the UNFCCC and Convention on Biological Diversity, is a useful reference in how countries have come together to finance the global commons, in an institutional landscape with many actors⁴⁵.
74. **The Panel proposes the Fund be structured as a Financial Intermediary Fund (FIF)⁴⁶ at the World Bank.** The Bank would perform the treasury functions, and could also leverage contributions on the market, as it does for other FIFs that it hosts — for example, Global Environment Facility and key global health intermediaries like the Global Fund, Gavi and CEPI.
75. Governance of the Fund will operate independently of the World Bank, as with other FIFs, and under an **Investment Board** of its own.
- a. This is necessary as the World Bank may be among the organizations that will receive funds.
- b. **The Investment Board could be constituted as a committee of the Global Health Threats Board, to ensure that its operations are consistent with the Global Health Threats Board's identification of priorities and gaps.**
- c. The Investment Board should also tap on specialist and expert advice on detailed financing.
- d. The Investment Board should ensure transparency on the allocation and usage of funds and their outcomes, and provide updates to the Global Health Threats Board.
76. As it may take time to reach a formal system of binding international commitments to the Fund, **resources should be kickstarted by direct contributions by G20 and other governments**, ideally in amounts equivalent to an assessed contribution scheme, as well as philanthropic and corporate contributions.
77. The Panel considered carefully the scope for the Fund to contribute to the surge financing that will be required for response to a pandemic, in particular by borrowing resources from financial markets. This option could entail borrowing against guarantees of repayment from future national contributions. **The Panel's assessment is that the surge financing role, and the associated market borrowing to support this, would be more effectively placed at the World Bank.** The World Bank has the balance sheet and market presence to raise funds more quickly, and the institutional muscles to disburse funds to countries more flexibly in a crisis. (See **Proposal 6.**) The Global Health Threats Board's role in systemic financial oversight will be essential in coordinating actions with the World Bank to raise funds swiftly when a pandemic strikes.

⁴⁵ There are useful lessons in the GEF's experience: providing a comprehensive strategy for managing the global environmental commons; loose burden-sharing; provision of funding to leverage funding from MDBs, foundations, the private sector and other non-state actors, as well as countries; its relationship with the World Bank as Trustee of the facility.

⁴⁶ A FIF is a type of trust fund for which the World Bank provides tailored administrative, operational, legal and financial services, but in which the Bank's role is limited to providing these services unless otherwise specified. (See <https://fiftrustee.worldbank.org/en/about/unit/dfi/fiftrustee>) In this case, the Panel recommends that the Global Health Threats Fund operate in a functionally independent and effective manner, reporting only to its Board, following on the example of the Global Environment Facility and the Adaptation Fund. This independence is necessary as the World Bank will be among the organizations that will receive funds, and there would be a conflict of interest otherwise. It is for this same reason that the Fund cannot be a part of an existing arrangement such as the Global Fund to Fight AIDS, Tuberculosis and Malaria.

(3) Develop resilient domestic finances for prevention and preparedness

78. National actions remain the foundation of global efforts to prevent and prepare for future pandemics. The Panel calls on governments everywhere to significantly scale up national capabilities for surveillance, detection and containment of any new outbreaks. These should ensure that they meet existing and new WHO, OIE, FAO and other international standards for preparedness and global health security.
79. Besides investing in the public goods directly related to pandemics, governments should also work towards more resilient health systems, as they provide **foundational supports in avoiding future pandemics and minimize excess mortality in pandemic conditions**. These include broader investments in national healthcare and public health systems to address ongoing endemic diseases and improve basic sanitation. Governments should also design safety nets able to expand in response to pandemic shocks.
80. **To achieve this, we need a long-term strategy to enhance domestic resource mobilization for national and global public goods, complemented by international financial support for the LICs and LMICs especially.**
81. The mix of domestic and international financing reflects the different levels of global public goods needed to reduce pandemic risk:
 - a. A system of **globally networked surveillance and research** requires both international- and country-level capacities, but the benefits are mainly not internalized by individual countries. In the case of LICs and LMICs in particular, these should be largely financed by collective mechanisms.
 - b. **Strengthened national capacities** to stop the spread of infectious diseases have clear benefits for individual countries, but nonetheless have positive externalities for the global community. Domestic financing by national authorities must remain the primary source, augmented by external financing support for the LICs and LMICs.
82. The challenges today are considerably larger than they already were before the current pandemic. Poorer countries have very limited capacity to buffer their populations and economies through fiscal and monetary policies, apart from their scarce access to diagnostic tools and vaccines resulting in a much more prolonged crisis. Further, many entered the crisis with elevated debt levels, and are vulnerable to increased debt servicing costs in the years to come.
83. **There is now also a significant risk of lasting health and economic damage in poorer nations over the medium term, more so than they experienced after the Global Financial Crisis. This will make it harder for them to cope with an endemic COVID-19 pandemic, as well as future outbreaks.** Further, the consequences of increased poverty, conflict and displacement will not be purely economic, nor contained within individual nations.
84. **Governments working with the IFIs must embark on a major agenda of reform to mobilize and sustain additional domestic resources** to invest in the key capacities needed to prevent and contain future pandemic risks, integrated with efforts to strengthen national health systems and achieve Universal Health Coverage⁴⁷, while enabling their economies to return to durable growth. **Low- and middle-income countries will need to add about 1% of GDP to public spending on health over the next five years.**
 - a. The IFIs should work with national governments to develop a plan for more resilient tax revenues over the medium term. Efforts to improve tax collection capacity, plug tax loopholes, and strengthen enforcement against illicit financial flows and other leakages must remain critical priorities. Taxing tobacco products and other 'health bads' to reflect their full health and economic costs remains a promising option in many countries.

⁴⁷ Sustained investments in global health towards achieving UHC with primary healthcare at its center was included in the recent Rome Declaration of the Global Health Summit. Promoting and strengthening partnerships to achieving UHC for all continues to be a focus of the G20 Health Working Group.

- b. Governments should clearly define and track budgetary expenditures on outbreak prevention and preparedness, building on newly established expenditure categories for preparedness as part of national health accounts at the OECD and WHO, and how these enable them to meet the WHO's IHR, with consistency across different levels of government.
- c. Building on the findings of the proposed Health Security Assessment Program (HSAP) to be conducted by the WHO and the World Bank, and other metrics such as the JEEs, State Party Self-Assessment Annual Reporting (SPAR), and GHS Index, every country should prioritize the development, costing and implementation of a national action plan for health security to identify gaps and financing requirements. Finance and Health Ministries should be full partners in this effort.
 - i. This must include a concerted plan to **develop the skilled human resources needed for both surveillance of emerging infectious diseases and resilience in healthcare and public health systems.**
 - ii. **Performance-based budget policies and matching fund schemes between national and sub-national governments are promising strategies.** They can incentivize more accurate, timely, complete, and open reporting of pathogens, diseases and deaths in human and animal populations, if accompanied by independent verification or audit of sub-nationally reported figures.
 - iii. **Increased resources to prevent and contain infectious disease outbreaks are necessary, to avoid crowding out other critical healthcare needs.** Evidence from COVID-19 shows a sharp rise in deaths from non-communicable diseases equal in some cases to COVID-19 deaths, due to delays or a lack of care for persons with other illnesses.
 - iv. These expenditures must however be regularly assessed for value for money — for example, defining the minimum samples needed to representatively conduct genomic surveillance.
- d. **The IFIs, together with the WHO, bilateral development partners, and global health intermediaries like the Global Fund,** should work with governments to develop these strategies, provide technical assistance and ensure the necessary external financial assistance to complement governments' efforts to enhance national domestic financing.
- e. Multilateral and bilateral development partners can also **incentivize investments in pandemic prevention and preparedness at the country level,** via various financial instruments. (See also **Proposal 5.**) These include:
 - i. Making lending for pandemic preparedness more concessional
 - ii. Complementing grants and greater concessionality in financing (e.g. IBRD rate buydowns) with existing instruments such as results-based and programmatic lending to support progress towards standards
 - iii. Incentivizing governments by requiring that grants are co-matched by national fiscal commitments

(4) Strengthen financing for the WHO and One Health, and put it on more predictable footing

- 85. **We need enhanced, reliable and sustainable financing for WHO and its One Health partners to perform their critical functions.**
 - a. The WHO plays a key role in each of the three major gaps we have identified in this report.

- i. **Surveillance.** The WHO must be at the center of a global network of expertise for genomic and epidemiological surveillance. The One Health approach must be supported, with the WHO ensuring that there are no gaps in the surveillance-to-action loop.
 - ii. **Resilient national systems.** The WHO, through its IHR, provides guidance to countries to develop whole-of-government health security plans, with the IHR serving as a benchmark against which to track progress.
 - iii. **Supply of medical countermeasures.** WHO has a leading role within the ACT-A coalition of health partners.
- b. The WHO is heavily dependent on voluntary funding. It is also under-resourced and lacks predictable funding to meet its key functions in global health⁴⁸. The Panel agrees with the IPPPR's assessment on the weaknesses of the funding for WHO, and its proposal to **enhance the share of multilateral funding for the WHO through increased assessment-based contributions** — with Member States' fees to be increased from the current one-quarter to two-thirds of the budget for the WHO base program, and an organized replenishment process for the remainder of the budget.
- i. The latest two-year budget for the WHO is about US\$4.8 billion⁴⁹, of which its base program comprises about US\$3.8 billion.
 - ii. Increasing assessed contributions to two-thirds of the WHO's base program will represent more than a US\$1.5 billion increase, or an additional US\$0.8 billion per year.
 - iii. This increase can be funded in part by a reallocation of existing voluntary contributions from countries, but will also require modest increased contributions from most countries⁵⁰.
- c. Our proposed overall financing framework for global health security calls for strengthened funding to be channeled towards the WHO and other existing institutions, as well as the effective and agile deployment of funds by the Global Health Threats Fund across international and regional institutions and networks to ensure that gaps are plugged on a timely basis and to meet evolving priorities in pandemic PPR.

(5) Make financing of global public goods part of the core mandate of World Bank and other MDBs

86. G20 leaders should work with other shareholders to make global public goods part of the core mandate of the MDBs.
87. **The MDBs are uniquely placed to do so**, by their ability to:
- a. Mobilize international resources
 - b. Leverage capital or guarantees
 - c. Incentivize countries to invest in global public goods, as part of their broader country operations
 - d. Support country and regional investments with direct development impact as well as global health security benefits

⁴⁸ The IPPPR highlighted that: "The way that WHO is financed today has serious impacts on the quality of the organization's performance. Its precarious financing is a major risk to the integrity and independence of its work. Incremental attempts in recent decades to improve the present funding model have not been successful."

⁴⁹ This excludes US\$1 billion for "emergency operations and appeals", which is a one-off, extraordinary item catered for COVID-19 pandemic response.

⁵⁰ The largest share of voluntary contributions comes from the Bill & Melinda Gates Foundation and the US Government.

- e. Provide multi-sectoral coverage and activate robust crisis response mechanisms
- f. Catalyze private investments

They are also moving towards working with other development partners in country and regional platforms.

88. Pandemic PPR should be incorporated as a core activity of the WBG, akin to climate.
- a. The World Bank Board should **set IBRD lending and performance targets** for pandemic prevention and preparedness that are then assessed and tracked as a matter of routine.
 - b. IDA donors should establish a **dedicated pandemic prevention and preparedness window in an expanded IDA**, as part of a successful IDA20 replenishment and leading to a more permanent mechanism. This would ensure that lending for pandemic prevention and preparedness programs is not constrained by country-specific IDA allocations. To ensure that the funds for this are both additional to regular IDA contributions and on sufficiently concessional terms, **funding of this window should rely more heavily on new grant contributions from IDA donors.**
 - c. RDB Boards should ask for each institution's strategy to support pandemic preparedness and reduce risks, including through dedicated strategies and lending targets/windows as appropriate.
89. In **deploying funds**, World Bank and other MDBs have a suite of financial instruments that can **incentivize investments in pandemic prevention and preparedness at the country level.**
- a. **Make lending for pandemic preparedness more concessional.** IBRD lending for these projects could be made more concessional through accompanying grants which could be provided through the proposed Global Health Threats Fund. IDA lending for this purpose could rely more heavily on grants provided under the new IDA pandemic preparedness window.
 - b. **Grants and greater concessionality in financing** (e.g. IBRD rate buydowns) can be **complemented with existing instruments such as results-based and programmatic lending** to support progress towards agreed global standards on preparedness. The World Bank should develop a strategy to effect this through its lending and technical assistance. This would facilitate tracking of progress towards agreed global standards on preparedness.
 - c. **IDA support for pandemic prevention and preparedness should also be made more concessional and should seek to incentivize domestic investments through matching grants to LIC governments.**
 - d. **The MDBs must also work in concert with other grant-making mechanisms** including the global health intermediaries like Global Fund and Gavi, bilateral aid agencies, and the new, multilateral Global Health Threats Fund, to leverage each other's funding for investments that will strengthen health system resilience. This would build on existing co-financing framework agreements, e.g. between World Bank and Global Fund.
90. **Shareholders should be prepared to provide MDBs with additional capital and concessional resources to enhance their role in pandemic PPR:**
- a. **An immediate priority is to ensure the successful completion of the upcoming replenishment of IDA**, and other concessional financing windows, at a level that is able to respond to the heightened needs of LICs in the post-COVID recovery.
 - b. **The MDBs should explore greater leveraging of their shareholder capital. The Panel calls on the G20 to commission an independent review of the scope for doing so.** This will determine the needed scale of future capital increases which should then be forthcoming as required.

- c. **MDB capital requirements can also be met by more innovative mechanisms along the lines of IFFEd⁵¹, which uses donor guarantees to enable MDBs to raise resources on the capital markets**, and go above their lending limits. This will enable donors to leverage their grant contributions by an estimated 27 times, much higher than the IBRD loan to paid-in capital ratio of at most five times. (See **Annex I.**)
- d. Existing trust funds at the MDB for preparedness should also be increased and used to leverage and complement greater IDA and IBRD lending for this purpose.

(6) Enable fast-tracked surge financing by the IFIs in response to a pandemic

91. **We need at-ready surge financing mechanisms to respond effectively to a pandemic.**

- a. Unlike the resourcing needs for pandemic prevention and preparedness (discussed above), we do not know in advance the scale of financing required in a pandemic.
 - i. The size of the resource needs depends on the nature and spread of the pandemic.
- b. Funding for pandemic response must include both health-related funding needs as well as the more traditional fiscal and balance of payments support.
 - i. The latter is fundamentally important as countries lacking access to funding cannot provide an adequate health response.
 - ii. It would be short-sighted to force countries to meet these pandemic costs by cutting other vital expenditures in education, social protection, etc.
- c. **The MDBs have a major role in supporting countries to respond to a pandemic.**
 - i. In the Panel's view, the World Bank and other MDBs should substantially scale up net financial flows to borrowing countries during a pandemic. They should do so with the assurance of shareholders that the resulting requirements for replenishments of concessional funding or for capital increases will be addressed in a timely way. **To this end, single borrower and other country lending limits and IDA country allocation ceilings need to be relaxed during a pandemic period.**
 - ii. **The World Bank should support countries to participate in pooled global procurement mechanisms for medical countermeasures**, through its grants and lending programs. Ensuring guaranteed access to such financing would enable countries without adequate fiscal resources to still enter into advance purchase contracts in the early phase of a pandemic.
 - iii. **Access to MDB crisis response windows should be simplified and made more automatic.** The World Bank and many RDBs have existing financing instruments or mechanisms to provide rapid support in response to natural disasters or other catastrophes.
 - iv. **The World Bank should use its resources to support countries' safety net surge responses** — to enable lockdowns and other pandemic response measures — as it has done in the current crisis. Supporting the establishment of scalable cash transfer and other safety net mechanisms in at least 50 countries within five years should be a feasible target for the institution.

⁵¹ IFFEd provides additional capacity to MDBs, underpinned by paid-in capital and contingent commitments from donors (15% in cash and 85% in donor commitments). In turn, the MDBs would leverage this quasi-equity to mobilize additional financing in capital markets. The vehicle would also provide grants to buy down MDB loans as required to more concessional terms.

- v. **The World Bank and RDBs should work to complement each other's efforts in financing pandemic response.** The RDBs have stepped up their roles in the current crisis and are preparing to do more in a future pandemic.
 - vi. **MDBs should be enabled to raise funds immediately on the market should their resources need augmenting during a pandemic.** They should do so with the assurance that any borrowing over and above their regular market operations would result in associated capital increases or be taken off their balance sheets through shareholder guarantees⁵². The World Bank and other MDBs are well-placed to undertake borrowing from the market during a pandemic, leveraging their triple-A ratings.
- d. **The IMF has a primary role in ensuring a rapid and adequately sized financial response to help countries deal with a pandemic.**
- i. The IMF should establish a pandemic response window **that provides rapid, automatic and sizeable financing to members in good standing**. This window could be established as part of its rapid financing facilities — Rapid Credit Facility (RCF)/Rapid Financing Instrument (RFI) — and would be automatically triggered, for example, upon the WHO's declaration of a PHEIC.
 - 1. The IMF can use this window to **make available up to 100% of quota for all members in good standing**
 - 2. Financing would be made upon demand on presentation of the health situation. It would be concessional and low on conditionality other than health conditionality. The financial conditions would be comparable to existing RCF and RFI lending. In some cases, additional measures might be needed to limit the impact on countries' debt sustainability.
 - 3. Loans disbursed through this window would not be subject to surcharges based on other outstanding IMF loans to the borrowing country, nor would the amount accessed under this emergency financing count towards the calculation of surcharges on other loans.
 - ii. **Access limits for regular IMF facilities should also be relaxed during a pandemic.** The IMF Board should also consider whether the policies on surcharges linked to the duration and size of outstanding IMF loans need to be relaxed during a pandemic.
 - iii. While the best use has to be made of the currently proposed IMF SDR allocation, its utility in future crises should be principally to respond to a global need for liquidity. As currently constituted, SDRs are a blunt instrument for supporting the liquidity needs of developing countries because of their small share in total SDR allocations.
- e. **Appropriately designed debt service relief by other creditors should complement surge lending by the IFIs in responding to future pandemics.** The G20 sponsored Debt Service Suspension Initiative (DSSI) made a significant contribution from bilateral official creditors to helping (mostly) low-income countries during this pandemic. However, delays in reaching agreement on its scope and application slowed down the flow of relief and limited its impact because of the non-participation of some hybrid and most private creditors. Learning from this experience, the G20 should ask the IMF, working with the relevant stakeholders, to propose a framework to involve the participation of all creditors — official, hybrid and private — in restructurings to be instituted in future pandemics.

⁵² This market borrowing would have to be above and beyond the MDBs' existing borrowing operations to leverage their equity to borrow from the market for ongoing lending operations.

(7) Ensure complementarity between multilateral and targeted bilateral funding

92. Multilateral efforts should leverage and tighten coordination with targeted bilateral funding.

- a. Bilateral funding has historically been a source of support to pandemic PPR, and finances technical assistance and know-how exchange in field epidemiology, lab safety, disease surveillance, and general preparedness.
- b. Further, much of the capacity that exists today in preparedness is the result of several decades of bilateral investments in cross-cutting functions under the auspices of HIV/AIDS and Ebola focused programs of funding.
- c. Bilateral funding should continue to play an important catalytic role, such as providing seed money as incentive for LICs and LMICs to make the necessary investments, providing a grant element to complement multilateral funding, and mitigating risks to attract private sector participation.
- d. However, bilateral funding must be better coordinated, so each bilateral development partner's efforts are situated within a broader international framework, with a proper division of responsibilities, to avoid gaps and overlaps.
- e. This will mean tighter coordination within country and regional platforms — led by the relevant authorities — and mobilizing multilateral and bilateral development partners, the private sector and philanthropies.
- f. This will continue to recognize the contributions of each development partner, but generate greater development impact.

93. We have to ensure too that other critical development needs are still met, and targeted bilateral funding is not diverted away from them to fund better pandemic preparedness, prevention and response, which is a global public good.

- a. It would be short-sighted to bolster our efforts for pandemic prevention and preparedness by reallocating resources from other critical development priorities in poverty alleviation and human capital development.
- b. This is particularly as the crisis has escalated the challenges facing the developing world.
- c. Doing so will roll back the gains we have made on the Sustainable Development Goals, and impose larger costs on the international community eventually.
- d. Scarce ODA should only be used for investments that primarily benefit LICs and LMICs, while investments that benefit the world as a whole or primarily HICs or UMICs **should be funded from non-ODA budgets** and the private sector.

(8) Leverage the capabilities and resources of the private and philanthropic sectors

94. The scale of financing for pandemic PPR requires significant and sustained increases in resources from every source — public, private and philanthropic.

95. However, we need a different construct for partnerships as well as policy, with the **official sector engaging the private and philanthropic sectors continuously, not only once a pandemic strikes.**

96. The private sector has a key role to play in several dimensions of pandemic PPR.
- a. First, in working with governments and international organizations, through public-private-philanthropic partnerships, to **scale up global manufacturing capacity and end-to-end supply chains** for vaccines and other medical countermeasures, and other critical supplies.
 - i. **We set out the need for a major scale-up of at-ready manufacturing capacity through partnerships with the private sector in Section B (Item 3) of the report.** These partnerships are critically required in order to make adequate capacity in the non-pandemic years viable, and will give extremely high social returns. In particular, the payoffs to having sufficient at-ready capacity for multiple vaccine candidates are very large.
 - ii. Six months into the current pandemic, global demand for ventilators and face masks was ten times higher than supply. Even 18 months on, PPE and oxygen cylinders and concentrators remain in grossly short supply.
 - iii. The IFC and the private sector arms of other MDBs have the tools to catalyze **private sector investments in capacity for medical supplies**, and should scale this up.
 1. A good example during the current pandemic has been the IFC's US\$4 billion **Global Health Platform** (US\$2 billion from its own account and an additional US\$2 billion from its private sector partners), aimed at increasing access to critical healthcare supplies required to fight the pandemic, including masks, ventilators, test kits, and vaccines⁵³.
 - iv. Countries should work with the MDBs and other organizations like UNICEF to mobilize private sector resources to **develop the whole delivery system** needed within countries to receive and transport medical supplies, including cold chain infrastructure, and provide the necessary technical training.
 - b. Second, in **broadening access to care**. Pandemic PPR plans must consider all health providers in the sector, and the ways in which people can most readily access care. In most LICs and LMICs, private sector providers are important sources of care. They have to be **mobilized and properly regulated in support of public policy objectives**, even as governments working with external partners seek to build up more resilient national healthcare systems over the longer term.
 - c. Third, there is scope to develop private contingency financing tools to help governments to pool and manage pandemic risks (**Proposal 9**).
97. Beyond the private sector role in pandemic PPR itself, there is need for a very significant increase in private sector investments in broader development financing, especially for infrastructure. There is **significant scope for expanding the use of risk mitigation tools, including appropriately designed blended finance instruments, to crowd in and augment private investment and optimize official balance sheets for investments in both global public goods and economic development (Proposal 5)**.
- a. The private sector has had very limited involvement in investing in infrastructure in Africa in particular, where the scale of future infrastructure needs will overwhelm the capacity of the public sector.
 - b. **If we do not make bold changes in strategies of governments and MDBs to mobilize private financing for infrastructure, we face a permanent reduction in economic growth, a slowdown in poverty alleviation, and a neglect of critical public investments for pandemic PPR and other public goods in a large part of the developing world.** With well-designed and transparent risk-sharing features and strengthened regulatory capacity, governments can maximize the efficiency and impact of public incentives.

⁵³ Projects include partnerships with health technology company Philips and the Co-operative Bank of Kenya to help smaller businesses in Africa's health sector purchase essential medical equipment; and with global standards organization ASTM International to raise standards and compliance requirements for PPE and promote its use globally.

98. **The major philanthropic foundations have been playing a critical role in supporting investments with high-risk and/or low-commercial incentives.** However, the major scale-up of research on infectious diseases and countermeasures needed will have to involve stronger partnerships between the public, private and philanthropic sectors, nationally and globally.
- a. These include **early-stage investments, e.g. the search for vaccines and therapeutics that can provide broad protection against a range of pathogens**; and interventions that can address the rising threat of drug resistance.
 - b. They could also be strong partners in supporting research for interventions where commercial interest is low, including many ongoing regional epidemics for which global demand is weak.
99. Governments and international organizations must seek to broaden the base, incentivize and leverage philanthropic foundations that are engaged in supporting discovery science and R&D that contribute to national health resilience and pandemic PPR.
- a. CEPI is an example of a philanthropy inspired, public-private partnership working at the interface between science, R&D, and manufacturing for global public goods.
100. **De-risking by philanthropic and official funders can potentially mobilize significant resources from patient capital, including pension funds and sovereign wealth funds, for R&D and other longer-term investments.**
- a. These investments may have high social returns but will often be beyond the risk appetite of institutional investors. Public and philanthropic participation can bridge this risk gap.
 - b. For instance, a project to develop a new tuberculosis vaccine could be organized with commercial discipline, while partly financed by philanthropy, and with official entities contributing to de-risk the project.

(9) Develop insurance solutions for adverse compensation events associated with use of medical countermeasures

101. **The best insurance for the world against pandemic risks is to invest in global public goods for pandemic prevention and preparedness, as we have laid out in this report.** The investments required to avoid a pandemic amount to a miniscule proportion of the financial costs to governments in a pandemic, not counting the costs of human lives lost, long-term health impairment and broader economic and social costs.
102. **Insurance solutions should also be developed to cover adverse effects associated with medical countermeasures.**
- a. Where vaccines and treatments are developed and regulated using emergency authorization, manufacturers are not generally able to obtain insurance in the usual way that would happen if a product has been licensed under non-emergency arrangements.
 - b. To address this constraint during the COVID-19 pandemic, COVAX used donor funds to enable a **vaccine injury compensation program through a contract with private insurers** — the first of its nature on an international scale. The COVAX No-Fault Compensation Program offers eligible people in 92 LICs and LMICs compensation for rare but serious adverse effects associated with COVID-19 vaccines distributed through COVAX, thereby protecting participating governments and providers as well as vaccine manufacturers from liability. However, this scheme only applies to vaccines acquired through COVAX. A more comprehensive scheme does not exist today.

- c. While high-income countries have been able to waive manufacturer liability by law and regulation, and cover the costs of compensation of adverse events directly, other country governments do not have the arrangements or financing in place. Indeed, for various bilateral procurement deals in COVID-19, **vaccine manufacturers have asked governments to grant them immunity from civil liability arising from adverse events that could result from the use of the vaccines.**

- i. A number of jurisdictions had given vaccine manufacturers indemnity from covering adverse events, placing national assets as collateral.

103. **The MDBs should work with countries and private insurers to develop risk financing solutions to cover adverse compensation events, particularly in the form of no-fault compensation schemes or an explicit compensation fund with pre-determined compensation awards.**

- a. These schemes can be **pooled internationally**, including amongst G20 governments, and could be put in place in the inter-pandemic period, supported by international financing.

104. We have also considered the broader application of insurance solutions to better manage pandemic risks.

- a. The experience with the World Bank Pandemic Emergency Facility (PEF)⁵⁴ points to the significant difficulties in deploying insurance solutions, including the need for transparency, better design of risk triggers, and a rigorous assessment of whether the benefits of protection outweigh the costs.

b. **Any viable insurance solution will require that we first do much better at improving the data, science, surveillance and analytics needed to forecast, assess, and price pandemic risks.**

- i. The data to model risks in most countries is not available. There is potential for innovative methods for capturing this data, for example via social media.
- ii. More work is needed to develop better data and models over time, to quantify pandemic risks and the potential impact of future pandemics.

c. There may be **risk pooling solutions** between countries⁵⁵ that can enable better management of pandemic risk:

- i. **Risk Diversification.** Risk pools can achieve some degree of diversification, as there may be more localized/regional outbreaks requiring a quick fiscal response, especially in the earlier stages of a pandemic.
- ii. **Risk Reduction and Tranching.** In a risk pooling agreement, governments need to be ready to manage the impact of such residual risks through pre-agreed post-disaster plans, backed by pre-planned financing. The process of developing such post-disaster actions plans and identifying related costs can also generate risk information and create incentives to step up investments in prevention and adaptation to reduce risks in the first place⁵⁶. The incentive to reduce the cost of insurance premiums by voluntarily reducing exposure to risk is particularly compelling and insurance can therefore contribute to a positive risk-reducing feedback loop⁵⁷.
- iii. **Cost Efficiencies.** The pooling of risk also has the advantage of improving the affordability of coverage through lowering costs of reinsurance, and sharing of fixed costs (e.g. cost of capital, operating costs and cost of risk information)⁵⁸.

⁵⁴ The PEF has drawn criticism for failing to provide coverage during the Ebola outbreak, and for being too slow in pay-out to poor nations suffering from the COVID-19 outbreak.

⁵⁵ The Africa Risk Capacity is adding coronavirus protection to its planned outbreaks and epidemics parametric insurance product, expected to be launched in 2021. Prior to the inclusion of coronavirus protection, the product was covering Ebola, Marburg, meningitis, and Lassa fever. The product aims to provide countries with early intervention financing to allow more proactive response to an outbreak or epidemic — be it public health or economic recovery response.

⁵⁶ Disaster Risk Financing & Insurance Program, World Bank Group. *10 Lessons for Policy Makers to Bring Catastrophe Risk Pools to Scale*.

⁵⁷ Poole, L. (July 2014). *A Calculated Risk: How Donors Should Engage with Risk Financing and Transfer Mechanisms*.

⁵⁸ Such risk pools can also gradually accumulate capital, allowing insurance premiums paid by countries to gradually decrease over time.

D. CONCLUSION



D. Conclusion

105. **COVID-19 was not a black swan event. It may also constitute a dress rehearsal for a far worse pandemic, which could come at any time.**
106. **We must prepare for a world where pandemics are more frequent and increasingly dangerous. Preventing them, and never again allowing the human costs and economic damage that we have seen in the current crisis, must be a central obligation of national and global governance.**
107. **It fundamentally requires thinking internationally and not just domestically. We cannot prevent or quickly contain the next pandemic through domestic measures alone.**
108. **In a historically unprecedented way, security for people around the world now depends on global cooperation. Acting and investing collectively for pandemic security, together with climate change, represents the primary international challenge of our times. Failure to build the basis for international cooperation will make it almost impossible to address these existential challenges.**
109. **We must not let exhaustion from efforts to get past the COVID-19 pandemic defer actions to address the growing risks ahead. The threat to humanity is too great.**

G20 High Level Independent Panel on Financing the Global Commons for Pandemic Preparedness and Response: Members, Project Team and Administrative Secretariat

Members:

Tharman Shanmugaratnam*	Senior Minister, Singapore; Former Deputy Prime Minister and Minister for Finance Chair, G20 Eminent Persons Group on Global Financial Governance (2017/18)
Lawrence Summers*	Charles W. Eliot University Professor, Harvard Kennedy School Former United States Treasury Secretary
Ngozi Okonjo-Iweala*	Former Finance and Foreign Minister, Nigeria Director-General, World Trade Organization (WTO) Former MD, World Bank Former Chair, Gavi, the Vaccine Alliance African Union Special Envoy on COVID-19
Ana Botín	Group Executive Chairman, Santander Group
Mohamed El-Erian	Chief Economic Adviser, Allianz President, Queens' College, Cambridge University
Jacob Frenkel	Chairman, Board of Trustees, Group of Thirty (G30) Former Chairman, JPMorgan Chase International Former Governor, Bank of Israel Former Economic Counsellor, IMF
Rebeca Grynspan	Secretary General, Ibero-American General Secretariat Former UN Under-Secretary General and Associate Administrator, UNDP Former Vice-President of Costa Rica
Naoko Ishii	Executive Vice President and Director, Center for Global Commons, Professor, Institute for Future Initiatives, University of Tokyo Former CEO and Chairperson, Global Environment Facility Former Deputy Vice Minister of Finance, Japan
Michael Kremer	University Professor and Director, Development Innovation Lab, The University of Chicago 2019 Nobel Laureate
Kiran Mazumdar-Shaw	Founder and Chairperson, Biocon Founder and Managing Trustee, Biocon Foundation Chairperson, Mazumdar-Shaw Medical Foundation
Luis Alberto Moreno	Former President, Inter-American Development Bank Former Minister of Economic Development, Colombia
Lucrezia Reichlin	Professor of Economics, London Business School Chairman & Co-Founder, Now-Casting Economics Former Director General of Research, European Central Bank
John-Arne Røttingen	Ambassador for Global Health, Ministry of Foreign Affairs, Norway Founding Chief Executive Officer, Coalition for Epidemic Preparedness Innovations (CEPI)

Vera Songwe	UN Under-Secretary General and Executive Secretary UN Economic Commission for Africa
Mark Suzman	CEO, Bill and Melinda Gates Foundation
Tidjane Thiam	African Union Special Envoy on COVID-19 Executive Chairman, Freedom Acquisition 1 Corporation Former CEO, Credit Suisse and Prudential Former Minister of Planning and Development, Cote d'Ivoire
Jean-Claude Trichet	European Chairman, Trilateral Commission Former President, European Central Bank Honorary Governor of the Banque de France
Ngaire Woods	Dean, Blavatnik School of Government, University of Oxford
Zhu Min	Chair, National Institute of Financial Research, Tsinghua University Former Deputy Managing Director, IMF
Masood Ahmed#	President, Center for Global Development
Guntram Wolff#	Director, Bruegel

* Co-Chairs # Project Directors

Advisors:

Victor Dzau	President, National Academy of Medicine, US
Jeremy Farrar	Director, Wellcome Trust

Project Team:

Bruegel	Center for Global Development
Guntram Wolff (Project Director)	Masood Ahmed (Project Director)
Anne Bucher (Lead)	Amanda Glassman (Lead)
Scarlett Varga	Carolyn Reynolds
Alma Kurtovic	Eleni Smitham
Marta Dominquez	Hannah Brown
Ben McWilliams	

Administrative Secretariat:

National Academy of Medicine	Wellcome Trust
Cecilia Mundaca Shah	Megan Challis
Morgan Kanarek	Alice Jamieson
Stephen Chukwurah	Beth Thompson

Terms of Reference
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G20 High Level Independent Panel (HLIP) on Financing the Global Commons for Pandemic Preparedness and Response

- A G20 High Level Independent Panel (HLIP) on Financing the Global Commons for Pandemic Preparedness and Response is established on 26 January 2021.
- The HLIP is mandated by the G20 to fulfil the following responsibilities:
 - Identify the gaps in the financing system for the global commons for pandemic prevention, surveillance, preparedness and response.
 - Propose actionable solutions to meet these gaps on a systematic and sustainable basis, and optimally leverage resources from the public, private and philanthropic sectors and the international financial institutions. Solutions should take into account and build on related ongoing international initiatives, undertaken by relevant bodies, such as the Independent Panel for Pandemic Preparedness and Response (IPPPR) and the Global Preparedness Monitoring Board (GPMB), to ensure coherence and avoid duplication.
- The members of the independent Panel comprise eminent individuals who collectively bring deep knowledge and experience in finance and governance. Members will contribute in their personal capacities. The Panel will be supported by a Project Team constituted by Bruegel and the Center for Global Development and a Secretariat from the US National Academy of Medicine and Wellcome Trust.
- The HLIP will provide an update of its work to the G20 Finance Ministers and Central Bank Governors (G20 FMCBGs) at their meeting in April 2021, before presenting its report at the July 2021 meeting of the G20 FMCBGs.

Annex C**List of Institutions and Persons Consulted**

The G20 High Level Independent Panel benefited significantly from extensive consultations with the global health community, including the major international health organizations, infectious disease and public health experts, the private sector, and philanthropic and civil society organizations with deep engagements in the field. The Global Preparedness Monitoring Board, in particular, provided the Panel with a comprehensive assessment of requirements for pandemic prevention, preparedness and response. We also drew on the insights of the top management and staff of the International Financial Institutions and leading economic and financial professionals.

The Panel also gained useful insights from discussions with members of the Independent Panel for Pandemic Preparedness and Response (IPPPR), the Pandemic Preparedness Partnership, the Pan-European Commission on Health and Sustainable Development, and the Lancet COVID-19 Commission.

A non-exhaustive list of institutions and persons we consulted is set out below. The Panel also had informative consultations with the official sector.

Institutions:

- The Access to COVID-19 Tools Accelerator (ACT-A)
- Accelerating Health Technologies Group (AHT)
- Afreximbank
- Bill & Melinda Gates Foundation (BMGF)
- Civil20 (C20)
- Center for Global Development (CGD)
- Coalition for Epidemic Preparedness Innovations (CEPI)
- The Foundation for Innovative New Diagnostics (FIND)
- G7 Pandemic Preparedness Partnership
- Gavi, The Vaccine Alliance (Gavi)
- GHSA Sustainable Financing Action Package Working Group (GHSA SF AP WG)
- Global Virome Project
- Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM)
- Global Preparedness Monitoring Board (GPMB)
- Imperial College London
- Independent Panel for Pandemic Preparedness & Response (IPPPR)
- International Federation of Pharmaceutical Manufacturers & Associations (IFPMA)
- International Finance Corporation (IFC)
- International Monetary Fund (IMF)
- Lancet COVID-19 Commission
- McKinsey & Company
- McGovern Foundation
- Metabiota
- Organisation for Economic Co-operation and Development (OECD)
- Pan-European Commission on Health and Sustainable Development
- Pandemic Action Network
- Preventing Pandemics at the Source
- UN Economic Commission for Africa (UNECA)
- UNICEF
- Unitaid
- World Bank Group (WBG)
- World Economic Forum (WEF)
- World Health Organization (WHO)
- WHO Council on the Economics of Health for All

Individuals:

- Tedros Adhanom Ghebreyesus (WHO)
- Ruchir Agarwal (IMF)
- Philippe Aghion (London School of Economics)
- Ximena Aguilera (Universidad del Desarrollo, Chile)
- Robert Agyarko (African Risk Capacity)
- Pedro Alba (The Brookings Institute)
- Pascale Allotey (UN University International Institute for Global Health)
- James Anderson (IFPMA)
- Susanne Andreae (World Economic Forum)
- Alan AtKisson (Sida)
- Paul Astrup (Boston Consulting Group)
- Susan Athey (Stanford University)
- Hala Audi (The Trinity Challenge)
- Bruce Aylward (WHO)
- Chandrika Bahadur (SDG Academy)
- Arthur Baker (The AHT Group)
- Stéphane Bancel (Moderna)
- Chatib Basri (Creco Research Institute)
- Priya Basu (WBG)
- Carolin Baumgartner (The Trinity Challenge)
- Dan Bausch (UK Public Health Rapid Response Team)
- Erik Berglof (Asian Infrastructure Investment Bank)
- Stanley M. Bergman (Henry Schein)
- Seth Berkley (Gavi)
- Stefano Bertozzi (UC Berkeley School of Public Health)
- Manisha Bhinge (The Rockefeller Foundation)
- Agnes Binagwaho (University of Global Health Equity)
- Laurence Boone (OECD)
- George Bridges (Banco Santander)
- Gordon Brown (UN Special Envoy for Global Education)
- Gro Brundtland (GPMB)
- Eric Budish (University of Chicago)
- Annabelle Burgett (BMGF)
- Stefania Burbo (C20)
- Agnès Buzyn (WHO)
- Mauricio Cardenas (IPPPR)
- Dennis Carroll (Global Virome Project)
- Sergio Carmona (FIND)
- Joanne Carter (RESULTS)
- Juan Camilo Castillo (The AHT Group)
- Guillaume Chabert (IMF)
- Jagan Chapagain (International Federation of Red Cross and Red Crescent Societies)
- Mukesh Chawla (WBG)
- Helen Clark (IPPPR)
- Lorcan Clarke (WHO)
- Sonila Cook (Dalberg)
- Matt Craven (McKinsey)
- Thomas Cueni (IFPMA)
- Monica de Bolle (Peterson Institute for International Economics)
- Kieran Daly (BMGF)
- Genya Dana (WEF)
- Jeff Davies (Legal & General)
- Nicoletta Dentico (Society for International Development)
- Vilas Dhar (McGovern Foundation)
- Makhtar Diop (IFC)
- Kate Dodson (UN Foundation)
- Simon Duffield (Gavi)
- Steph Eaneff (Georgetown University)
- Chris Eleftheriades (International Rescue Committee)
- Chris Elias (GPMB)
- Anas El Turabi (McKinsey)
- Valeria Emmi (C20)
- Meaghan English (McGovern Foundation)
- Tamer Farag (Facebook)
- Manuela V. Ferro (WBG)
- Karin Finkelston (IFC)
- Kevin Fletcher (IMF)
- Stephen Flynn (Northeastern University)

- Giovanni Forchini (Imperial College London)
- Henrietta Fore (UNICEF)
- Tom Frieden (Resolve to Save Lives)
- Kurt Frieder (C20)
- Vitor Gaspar (IMF)
- Kristalina Georgieva (IMF)
- Githinji Gitahi (Amref Health Africa)
- Tore Godal (GPMB)
- Rebeca Godoy (African Risk Capacity)
- Ian Goldin (Oxford University)
- Ellie Graeden (Talus Analytics)
- Peter Greiff (Banco Santander)
- Frederico Guanais (OECD)
- Jaclyn Guerrero (Metabiota)
- Peggy Hamburg (Nuclear Threat Initiative)
- Richard Hatchett (CEPI)
- John Hicklin (CGD)
- Tom Hart (ONE)
- Katharina Hauck (Imperial College London)
- Kim Holloway (Northeastern University)
- Amanda Hosken (Swiss Re)
- Daniel Hougendobler (GPMB)
- Chikwe Ihekweazu (Nigerian Centre for Disease Control)
- Bikas Joshi (IMF)
- Madhav Joshi (India Health Fund)
- Donald Kaberuka (GFATM)
- Shobana Kamineni (Apollo Hospitals Enterprise)
- Nirmal Kandel (WHO)
- Rebecca Katz (Georgetown University)
- Michel Kazatchkine (IPPPR)
- Oanh Khuât (Centre for Supporting Community Development Initiatives)
- Gunther Kraut (Munich Re)
- Ilona Kickbusch (GPMB)
- Justin Koonin (ACON)
- Soonman Kwon (Seoul National University)
- Acha Leke (McKinsey)
- Nisia Trindade Lima (Fiocruz)
- Alessandra Løchen (Imperial College London)
- Nita Madhav (Metabiota)
- David Malpass (WBG)
- Robert Matiru (Unitaid)
- Mariana Mazzucato (WHO Council on the Economics of Health for All)
- Rosemary Mburu (WACI Health)
- Amanda Meadows (Metabiota)
- Conor Meenan (Centre for Disaster Protection)
- Roshni Mehta (Imperial College London)
- Mariska Meurs (Wemos)
- David Milliband (IPPPR)
- Patricia Miranda (C20)
- Suerie Moon (The Graduate Institute of Geneva)
- Susanna Moorehead (OECD)
- Mario Monti (Pan-European Commission on Health and Sustainable Development)
- Melinda Moree (BMGF)
- Riccardo Moro (C20)
- Owen Morris (Aviva)
- Stephen Morrison (Center for Strategic and International Studies)
- Edward Mountfield (WBG)
- Nanthalile Mugala (PATH)
- Mamta Murthi (WBG)
- Bob Nelsen (ARCH Venture Partners)
- Aurélia Nguyen (Gavi)
- Jamie Bay Nishi (Global Health Technologies Coalition)
- Akihiko Nishio (WBG)
- John Nkengasong (Africa Centres for Disease Control and Prevention)
- Anders Nordström (IPPPR)
- Jim O'Neill (Pan-European Commission on Health and Sustainable Development)
- Rachel Ong (C20)
- Ben Oppenheim (Metabiota)
- Muhammad Pate (WBG)

- Mari Pangestu (WBG)
- Rosa Pavanelli (Public Services International)
- Ceyla Pazarbasioglu (IMF)
- Adrian Peralta-Alva (IMF)
- Nicolas Pinaud (OECD)
- Peter Piot (London School of Hygiene and Tropical Medicine)
- Jean Pisani-Ferry (Sciences Po)
- Mark Plant (CGD)
- Stefano Prato (C20)
- Ben Pyne (Skoll Foundation)
- Elizabeth Radin (International Rescue Committee)
- Uma Ramakrishnan (IMF)
- Sheila Redzepi (WBG)
- Tristan Reed (WBG)
- Ferdinando Regalia (IDB)
- Carmen Reinhart (WBG)
- Amelie Rioux (GPMB)
- Alberto Rodriguez (WBG)
- Jeffrey Sachs (Lancet COVID-19 Commission)
- Rodrigo Salvado (BMGF)
- Peter Sands (GFATM)
- Benjamin Sarda (Boston Consulting Group)
- Bill Savedoff (Inter-American Development Bank)
- Stefano Scarpetta (OECD)
- Haje Schutte (OECD)
- Klaus Schwab (WEF)
- Nina Schwalbe (UN University International Institute for Global Health)
- Yakhara Ngally Sembene (IFC)
- Minouche Shafik (G7 Pandemic Preparedness Partnership)
- Anant Shah (Merck)
- Michael Sheldrick (Global Citizen)
- Rahul Singhvi (Resilience, Inc.)
- Ellen Johnson Sirleaf (IPPPR)
- Nigel Sizer (Rainforest Alliance)
- Peter Smith (Imperial College London)
- Ian Smith (GPMB)
- Antonio Spilimbergo (IMF)
- Devi Sridhar (The University of Edinburgh)
- Liesbet Steer (The Education Commission)
- Nicole Stephenson (Metabiota)
- Elena Sterlin (IFC)
- Arvind Subramanian (Peterson Institute for International Economics)
- Preeti Sudan (IPPPR)
- Alex Tabarrok (George Mason University)
- Katherine Tan (BMGF)
- Brandon Joel Tan (The AHT Group)
- Chorh Chuan Tan (Office for Healthcare Transformation)
- Tomasz A. Telma (IFC)
- Adrian Thomas (Johnson & Johnson)
- Eloise Todd (Pandemic Action Network)
- Brad Tytel (BMGF)
- Axel van Trotsenburg (WBG)
- Jeanette Vega (Red de Salud UC-Christus)
- Andres Velasco (London School of Economics)
- Reinhilde Veugelers (Bruegel)
- Stephanie von Friedeburg (IFC)
- Trae Wallace (Talus Analytics)
- Kevin Watkins (Save the Children UK)
- Beatrice Weder di Mauro (Center for Economic Policy Research)
- Nick White (Oxford University and Mahidol University)
- Suwit Wibulpolprasert (Folk Doctor Foundation)
- Matt Wilson (McKinsey)
- Prashant Yadav (CGD)
- Gary Young (Northeastern University)
- Simon Young (Willis Towers Watson)
- Ernesto Zedillo (IPPPR)
- Olivia Zetter (Resilience, Inc.)

Annex D**Table 1: Major Infectious Disease Outbreaks in the Past Two Decades**

YEAR	OUTBREAK
2019	SARS-CoV-2
2018	Lassa
2017	Zika
2017	Ebola
2014	Chikungunya
2014	Ebola
2012	MERS
2010	Cholera
2009	H1N1 Influenza
2004	H5N1 Influenza
2003	SARS-CoV-1
2001	Enterovirus 71
2001	Nipah

Increasing Frequency of Wildlife Zoonotic and Influenza Spillover Events

The Panel studied data from Metabiota on historical trends in wildlife zoonotic and influenza spillover events.

Chart 1 shows the frequency of epidemics caused by wildlife zoonoses. (It fits a log-linear model to the observed data.) **There has been a clear exponential increase of such epidemics, which increased in frequency by a factor of about 3 every 20 years.**

Chart 2 shows the number of influenza spillover events. (It applies a linear best fit to the data.) **There have been around 10 influenza spillover events each year in recent years, compared to hardly any 25 years ago.**

Source: Metabiota

Chart 1: Increasing Frequency of Epidemics caused by Wildlife Zoonoses (excluding Influenza) (log-normal scale)

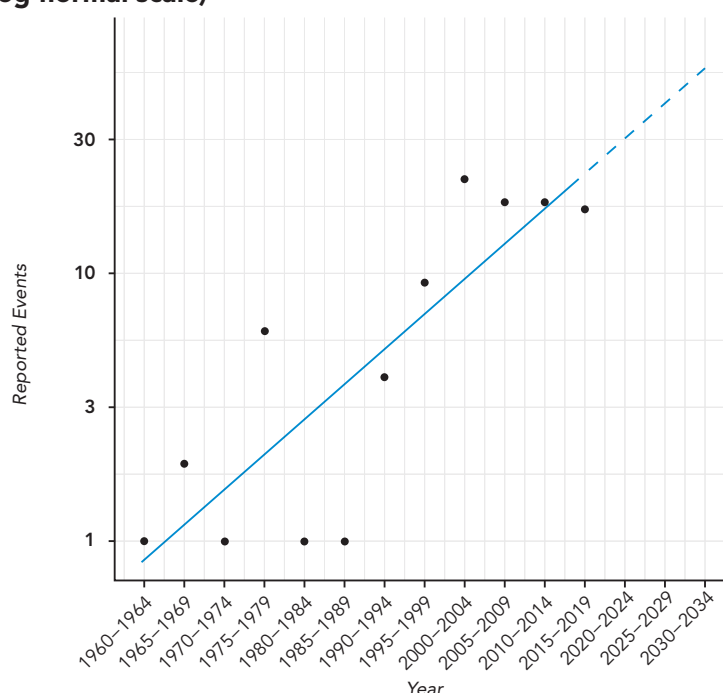
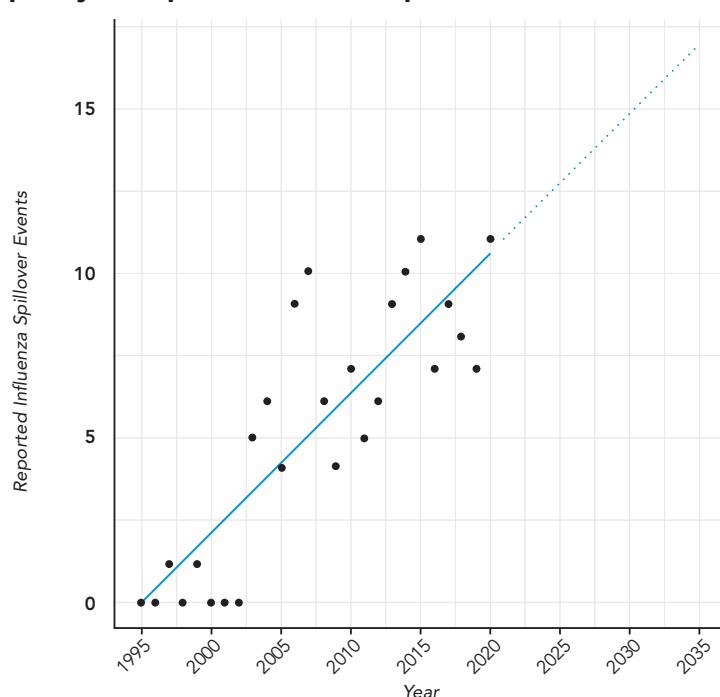


Chart 2: Increasing Frequency of Reported Influenza Spillover Events



Annex F

COVID-19 African Vaccine Acquisition Task Team

The COVID-19 African Vaccine Acquisition Task Team (AVATT) was established to support the Africa Vaccine Strategy and endorsed by the African Union Bureau of Heads of State and Government on 20 August 2020. The AVATT seeks to complement the ACT Accelerator's COVAX pillar by securing vaccine doses for 15% of the African population and with a view to increase this figure until the target of 60% herd immunity is achieved.

This note summarizes information obtained from the United Nations Economic Commission for Africa (UNECA) and Afreximbank on AVATT, which illustrates the potential for regional initiatives to boost access to medical countermeasures.

The AVATT works collaboratively with key regional and international partners to achieve its mandated objectives:

1. The **African Vaccine Acquisition Trust** is a Special Purpose Vehicle that serves as a central entity for the negotiation, procurement and payment for vaccines. It also acts as the interface between AU Member States and the vaccine manufacturers.
2. The **Africa Centres for Disease Control and Prevention** (Africa CDC) serves as the secretariat to the AVATT and offers scientific guidance. The Africa CDC also reviews documentation from vaccine suppliers and provides guidance to the national regulatory bodies on Emergency Use Authorization.
3. The **African Medical Supplies Platform (AMSP)** was mandated by the AVATT to support the ordering and allocation process for the vaccine procurement mechanism. The AMSP is a not-for-profit initiative launched by the AU as an immediate, integrated and practical response to the COVID-19 pandemic, to facilitate access to an African & global base of vetted manufacturers and enables Africa Union Member States to purchase certified medical equipment such as diagnostic kits, personal protection equipment, and clinical management devices with increased cost effectiveness and transparency.
4. The **Afreximbank** was mandated by the AU to urgently put in place financing mechanisms and instruments to achieve the vaccination target of 60% of the African continent's population and to support post-COVID-19 economic recovery. Under the AVATT, Afreximbank plays the role of financial and transaction adviser, partaking in negotiations with vaccine suppliers, and facilitating payments.
 - a. The Afreximbank has supported the AVATT by putting in place a US\$2 billion **Advance Procurement Commitment Guarantee Facility** (APC). The APC aims to ensure (1) timely, equitable and cost-effective availability of COVID-19 vaccine supplies within the African continent, (2) providing a credible platform around which a blend of funding to support Africa's vaccine procurement requirements, and (3) providing assurance to vaccine manufacturers that orders placed by the AMSP are firm and will be paid for.
 - b. The Afreximbank also put in place an **Instalment Payment Plan** (IPP) facility that supports countries that are unable to pay for their orders with cash upon delivery so they can make the payments in accordance to their fiscal situation.
5. The **UNICEF** supports the AVATT through procurement, logistics and payment services since it is one of the leading players in the procurement and delivery of vaccines globally.
6. The **UNECA** provides technical backstopping to the AVATT, especially on the economic dimensions of the vaccine access and rollout. The UNECA ensured that the AVATT process had critical information and data to support the negotiations.
7. In June 2021, the **World Bank** and the African Union announced a partnership, with World Bank financing supporting the purchase and deployment of doses secured by AVATT to help countries vaccinate up to 400 million people across Africa.

Key Capacities and Functions of Preparedness and Response

The G20 High Level Independent Panel requested the Global Preparedness Monitoring Board (GPMB) to provide an assessment of the key capacities and function requirements for pandemic prevention, preparedness, and response (PPR), including standards and performance required for public health capacities.

The framework⁵⁹ below is based on the GPMB's work in developing its Monitoring Framework, and describes specific key capacities and functions of preparedness and response needed at the national, regional and global levels.

	CAPACITIES & FUNCTIONS	NATIONAL STANDARDS	REGIONAL/GLOBAL STANDARDS
PREVENTION and PREPAREDNESS	One Health surveillance and risk assessment	All countries have integrated systems for detecting and reporting novel and emerging pathogens across the one-health spectrum, including genetic analysis capacity.	There is a global mechanism for surveillance with data management, analytics, modelling and real-time communication at the one health interface.
	Immunization	All countries have implemented routine immunization for diseases with pandemic potential, including measles, influenza, yellow fever, and others.	
	Health system capacity and access	All countries have adequate workforce, facilities and equipment within national health systems to handle a surge of cases from respiratory pathogens or other infectious hazards.	There is a global deployable surge workforce of health workers with plans for upskilling, partnerships, shortages and deployment.
	Pandemic planning and exercising	All countries hold regular simulations, trainings and after-action reviews (and other methods to operationalize capacity-building measures) and publish and implement findings.	

⁵⁹ This reflects the GPMB's current views. The Monitoring Framework is in development and it is expected that the Board's views will evolve over time as they receive more inputs and further consider the issue.

	CAPACITIES & FUNCTIONS	NATIONAL STANDARDS	REGIONAL/GLOBAL STANDARDS
	Data and information sharing	All countries have made commitments to sharing genetic data, clinical specimens, and/or isolated specimens (biological materials) in both emergency and nonemergency contexts.	There is a data sharing platform with open centralized access to data and rapid pathogen sharing. There is a global platform for sharing data and information integrated across sectors to support decision-making and resource allocation.
	Norms, standards, evidence-based policy, technical support		There is a global mechanism to develop, review, and disseminate norms, standards, evidence-based policy and provide technical support to countries.
	R&D on future and emerging infectious diseases	There is deployable research capacity.	There are regional laboratories responsible for conducting research, growing virus samples, curating them and sharing them, and creating animal models. Multi-sector discovery networks for medical countermeasures. There are global mechanisms to support technology transfers and R&D capacity building. There are existing vaccine platforms or agents that have gone through phase 1, are ready, and are broadly cross-protective against a range of pathogens. There is sufficient deployable regional manufacturing capacity, measured as number of vaccine doses/ diagnostic tests/therapeutics needed versus capacity to manufacture them.

	CAPACITIES & FUNCTIONS	NATIONAL STANDARDS	REGIONAL/GLOBAL STANDARDS
	Clinical trial and regulatory capacity	All countries have national emergency regulatory approval procedures and capacity.	There are global and regional platforms that are operational and ready to conduct large-scale clinical trials.
	Mechanisms for ensuring advance equitable access to countermeasures		There are global mechanisms to enable equitable access to future safe and effective vaccines and therapeutics, including advance purchase agreements and pooled demand.
	Supply chain networks and stockpiles		There are mechanisms for procurement, supply chain networks and regional stockpiles for essential commodities, such as oxygen, PPE, and essential medicines with capacity for scaled replenishment and planning for regulatory issues accessible to all countries in WHO regions. There are robust regional supply chains to ensure free and rapid flow of raw materials for medical countermeasures.
	Community engagement and trust	All countries have established consultation processes, engagement mechanisms and platforms in place to capture the views and experiences of communities, including the most vulnerable in society, in order that these can be incorporated into preparedness. All countries have an infodemic management plan and established communications channels to share information transparently, including plans to utilize digital and social media.	There is a global mechanism to monitor digital/social information sources, to measure and build knowledge of relevant communities, to coordinate fact-checking initiatives and to produce and disseminate information and educate the public.

	CAPACITIES & FUNCTIONS	NATIONAL STANDARDS	REGIONAL/GLOBAL STANDARDS
	Governance and coordination	All countries have regulatory frameworks and independent public health bodies with the authority and political accountability to lead whole-of-government and whole-of-society preparedness and to lead and direct actions in these sectors in the event of a public health emergency.	There is a dedicated global platform for the governance of health emergencies preparedness and response, where national, regional and global stakeholders can coordinate, plan, and agree on priorities and that can be leveraged in the event of a health emergency. There is an independent monitoring and accountability mechanism for preparedness and response. There is a global agenda-setting and coordination mechanism for R&D.
	Surge financing mechanisms	All countries have established national contingency funds for health emergencies.	There is a global, adequately financed and sustainably replenished mechanism for rapid funding of health emergency response.
RESPONSE	One Health surveillance and risk assessment	There is active surveillance of cases, including genetic analyses.	Global and regional support to affected and vulnerable countries, including provision of technical guidance.
	Health system	Deployment of health system capacity, including health workforce, facilities and equipment.	Global health workforce is deployed.
	Emergency development of diagnostics, vaccines, and therapeutics (in response to actual outbreaks)	Affected and vulnerable countries deploy data sharing, surveillance, research and regulatory capacities.	Global research capacity, clinical trial capacity and regulatory capacity is deployed and coordinated.
	Manufacturing of countermeasures		Existing manufacturing capacity for vaccines, diagnostics and therapeutics is activated. Supply chain for raw materials is upsurged and cross-border flow is coordinated.

	CAPACITIES & FUNCTIONS	NATIONAL STANDARDS	REGIONAL/GLOBAL STANDARDS
	Procurement, logistics, and distribution of medical products and supplies	National procurement and supply chains mechanisms are activated.	Mechanisms for procurement, logistics and distribution of medical products and supplies are activated. There is support for procurement of medical products and supplies for lower-income countries and countries in need.
	Procurement, logistics and distribution of vaccines, diagnostics, and therapeutics	National procurement and supply chains mechanisms are activated.	Deployment of vaccines, diagnostics and therapeutics is coordinated and medical countermeasures are deployed rapidly, equitably based on a public health need assessment. This includes deployment of workforce and health system capacities. There is support for procurement of medical countermeasures for lower-income countries and countries in need.
	Knowledge generation and communication	Countries deploy community engagement and communication activities.	Process to develop, review and disseminate information is activated.
	Governance and coordination	There is multisectoral, multistakeholder coordination and governance platforms are activated.	There is multisectoral, multistakeholder coordination and governance platforms are activated.

Annex H

Estimated Financing Needs for Global Public Goods for Pandemic Prevention and Preparedness

This Annex explains the approach undertaken by the Panel and its Project Team to derive estimates of international and national financing needs for **pandemic prevention and preparedness**. The estimates represent the **additional investment** required in the **global public goods** that are at the core of effective pandemic prevention and preparedness. They **do not include the costs of response**, as this will depend on the nature of future outbreaks and the degree of implementation of pre-crisis pandemic prevention and preparedness measures at the national, regional and global levels.

The two tables below summarize the total public funding needs over the first five years. Investments would have to be sustained in subsequent years; a key lesson from outbreaks to date has been how the absence of continuous investments in prevention and preparedness leaves the global system vulnerable.

The explanatory notes that follow Tables 1 and 2 set out the definitions and assumptions used in this costing exercise. **It has to be emphasized that we have on the whole adopted very strict definitions of global public goods for purposes of pandemic prevention and preparedness, and conservative assumptions of the required scale.**

Table 1: Additional Public Funding for Prevention and Preparedness over 5 Years (US\$ billion)

Category	Total	International Financing	National Budgets
Robust surveillance & detection networks	74	26	49
Building resilience in health systems	63	19	44
Supply capacity for medical countermeasures	34	34	-
Total	171	78	93
Average Annual Investment	34	16	18

Table 2: Additional Public Funding for Prevention and Preparedness over 5 Years (US\$ billion) (Breakdown by Global- and Country-Level)

Category	Total	Global Level Capacities	Country-level Global Public Goods				
			HIC	MIC		LIC	
				International Financing	National Budgets	International Financing	National Budgets
Robust surveillance & detection networks	74	5	11	11	36	10	1
Building resilience in health systems	63	-	4	9	39	10	1
Supply capacity for medical countermeasures ⁶⁰	34	34	-	-	-	-	-
Total	171	39	15	20	75	20	2
Average Annual Investment	34	8	3	4	15	4	0.4

⁶⁰ This refers to the additional financing required to meet global-scale demand, and is additional to what countries would invest on their own for national needs. See 'Explanatory Notes' below.

Explanatory Notes

This report divides spending into three major gaps of global public goods: (1) robust surveillance and detection networks; (2) building resilience in health systems; and (3) supply chains for medical countermeasures.

These global public goods reside at both the national and global levels. International financing is required for both the global-level capacities and to support a portion of LICs' and MICs' national-level global public goods.

Our work benefited from the inputs of the Global Preparedness Monitoring Board (GPMB) on the scope of operations required for pandemic PPR (see **Annex G** for the GPMB's submission to the Panel).

- **Robust surveillance and detection networks.** This covers the GPMB's categories of One Health surveillance and risk assessment; data and information sharing; and R&D on future and emerging infectious diseases⁶¹. Most needs are at the national level, where ongoing data collection, integration, analysis and dissemination systems will need to be put in place. Diligent detection of infections requires a distributed infrastructure of laboratory facilities. National public health institutes play a key role in providing robust surveillance systems at national, sub-national, and local levels. At the global level, WHO with its six regional offices is the anchor to coordinate and organize global surveillance; the system also relies on key regional centres, like the Africa CDC. These different structures all need some strengthening going forward. Our cost estimates have also taken into account the need to implement the One Health approach for the monitoring and detection of zoonotic spillovers.
- **Building resilience in health systems.** This encompasses the GPMB's categories of immunisation; health system capacity and access; pandemic planning and exercising; norms, standards, evidence-based policy, technical support; and community engagement and trust. This function is mainly at the country-level. The gaps in health system resilience are primarily found in low- and middle-income countries, and include essential public health services and equipment, in particular, the ability of health systems to detect and treat infectious cases and to organize emergency operations.
- **Supply chains for medical countermeasures.** This includes the GPMB's categories of R&D on future and emerging infectious diseases; clinical trial and regulatory capacity; mechanisms for ensuring advance equitable access to countermeasures; supply chain networks and stockpiles and surge financing mechanisms. The GPMB definition covers vaccines, therapeutics, and diagnostics, as well as personal protective equipment. This will require more developed global R&D structures and investments in capacity to ensure availability for all countries.
 - For the sake of simplicity, national stockpiles of essential medical supplies are recorded within the second category above (building resilience in health systems), as they are a key component of resilience.
 - Investments in supply capacity for medical countermeasures for the current purpose are therefore focused exclusively on the global networks for research, manufacturing and procurement.
 - These investments are additional to those that countries would make for their own national needs. The major scale-up of supply capacity that we estimate to be necessary is to provide for global-scale demand, which as the report discusses extensively, is critical to containing a pandemic everywhere including within the HICs. For the present costing exercise, we have classified the incremental spending required under 'global level' spending.
 - However, it should be noted that our estimates for supply capacity for medical countermeasures are, to begin with, very conservative; alternative estimates by the Accelerating Health Technologies (AHT) group suggest much larger requirements. (See below.)

⁶¹ This category is covered by both 'Robust surveillance and detection networks' and 'Supply chains for medical countermeasures'.

Sources of estimates and additional assumptions

The estimates provided in these tables are primarily based on two studies: the WHO's report to the G20 "*Assessment of Gaps in Pandemic Preparedness*" in 2020, and McKinsey & Company's report "*Not the last pandemic: Investing now to reimagine public-health systems*". While a number of studies have attempted to measure pandemic PPR investment needs, recent estimates converge to a range which is higher than pre-COVID estimates, and point to a need to significantly scale up current financing. The Panel had chosen to use data from the WHO and McKinsey studies as they were the most recent and systematic estimates of needs at the global and country levels⁶². However, while these two reports are used as the primary baseline, we have modified certain estimates following our consultations with industry experts to be consistent with GPMB's categories. This included triangulating the estimates with those from the Coalition for Epidemic Preparedness and Innovations (CEPI) for the development costs of new diagnostics, vaccines, and therapeutics, and from Georgetown University on country-level financing.

Both the WHO and McKinsey studies apply a bottom-up methodology estimating total prevention and preparedness needs by identifying the set of functions or institutions necessary at global level, including coordination functions and the key functions which surveillance and health systems need to provide at country-level. The estimates at country-level are broken down according to income groups: High Income Countries (HIC), Medium Income Countries (MIC), and Low Income Countries (LIC). The Panel's approach defines international financing as the public financing needed for global commons: the global-level capacities and the funding to incentivize countries to make the necessary investment in their surveillance and health systems. McKinsey computes only total needs, while WHO estimates both total needs and international financing requirements.

The WHO and McKinsey approaches differ in a number of respects, in particular in the scope and cost calculation methods or references. It is hence difficult to make straightforward comparisons of the estimates yielded by the two approaches. Some additional triangulation of data and judgments had to be made so that the two sets of data could be incorporated within the GPMB's framework, and our best estimates derived.

The report has not retained the WHO's estimate for HIC spending as it was a significant outlier when compared with other estimates of needs⁶³. McKinsey provided additional information to the Panel to break down all prevention and preparedness estimates between global- and country-level investment requirements, according to country income groups.

Estimates provided in the report cover a five-year period; both WHO and McKinsey have identified the need for some frontloading of spending. McKinsey's approach identifies gaps compared to pre-defined targets for each function of prevention and preparedness, and distributes the total costs over a ten-year period with some degree of frontloading. For the purpose of this report, the frontloading embedded in McKinsey's calculations has been slightly amplified, reflecting the need to catch up from a long period of underfunding, and the required urgency. Our estimates for the first five years assume that they would require the spending of 60% of the total ten-year figure. However, as highlighted above, our estimates for supply capacity for medical countermeasures are very conservative.

Additionally, the cost of antimicrobial resistance (AMR) has been excluded from the McKinsey estimates, for reasons explained below. (The WHO estimates had not included AMR.) The WHO estimates for R&D and manufacturing of medical countermeasures have been updated to take into account more recent projections by CEPI and ACT-A⁶⁴. The WHO estimates have also been adjusted to incorporate annual replenishments of the Contingency Fund for Emergencies (CFE) as part of a strengthened surveillance as in McKinsey's estimates.

Calculation of public sector contribution

Finally, the report is focused only on the needs for public funding. The private sector plays a role in pandemic PPR, especially in R&D and supply of medical countermeasures. Concretely, arising from our consultations with

⁶² In particular they use the most up to date and robust country estimates: D. H. Peters, O. Hanssen, J. Gutierrez, J. Abrahams & Tolbert Nyenswah (2019): Financing Common Goods for Health: Core Government Functions in Health Emergency and Disaster Risk Management, Health Systems & Reform <https://doi.org/10.1080/23288604.2019.1660104>

⁶³ Preliminary results of Georgetown University estimates based on the IHR costing tool are very close to McKinsey's as well.

⁶⁴ See CEPI's report titled "The Urgency of Now: Turning the Tide Against Epidemic and Pandemic Infectious Disease" published in March 2021.

various experts, it is estimated the private sector will cover 15% of research needs⁶⁵ for global countermeasures, and 30% of the cost of building and maintaining manufacturing capacity⁶⁶. These private sector costs have been excluded from the estimates presented in our costing tables here.

Calculation of international financing

In line with the global public goods approach adopted by the Panel, international financing is needed to support prevention and preparedness expenditures at the global level, but it should also account for some spending at country-level. National-level financing needs encompass measures that should be executed nationally, whose success, however, has direct global implications given the existence of global externalities. To avoid underinvestment and in light of existing budget constraints, we propose a formula for partial external financing of national level measures in low- and middle-income countries.

The estimates provided are computed under the assumption that low-income countries receive international support to cover 88%⁶⁷ of financing needs. While a certain degree of local ownership is beneficial, these countries face severe budget constraints and a large opportunity cost to financing prevention and preparedness activities. They also cover a set of conflict states which are more fragile. Further, the benefits of these investments in global public goods do not accrue primarily to the countries themselves; this is in their nature as global public goods. The report uses the WHO's assumption on international support covers one-off capital expenditures; and a large share of recurrent expenditures.

Similarly, the estimates provided are computed under the assumption that middle-income countries will cover 76%⁶⁸ of expenditure domestically, and receive international support for the remaining 24%. The WHO also assumes that support should be especially concentrated on capital expenditure, with recurrent expenditures being largely nationally financed. When using McKinsey's figures, the estimates in the report assume a higher international co-financing rate for surveillance (30%) than for resilience in health systems (15%) which should be a national responsibility.

The ranges provided can generally be considered conservative. First and foremost, the cost focuses on the needs within the health sector. It does not make a costing of the whole-of-government approach, which would include prevention and preparedness activities in other sectors, such as water and sanitation or continuity of key services such as electricity supplies or transportation. Moreover, there is no unique definition of PPR and more or less extensive scope can be defined for some categories of prevention and preparedness.

In particular, some restrictive assumptions have been made in four areas to exclude certain activities that have indirect but still significant impact on prevention and preparedness.

- Firstly, antimicrobial resistance (AMR) which erodes the capacity to treat infections has been referred to as one of the big threats to future global health, which will be compounded by pandemics. AMR containment measures are considered to be an integral part of effective infection prevention and preparedness systems. The World Bank (2017)⁶⁹ estimated the cost of AMR containment measures at US\$9 billion annually. This cost is partly integrated into the McKinsey estimates but we exclude it from the values presented in our report. While there is some overlap and synergies between pandemic prevention and preparedness and AMR containment, AMR requirements for both animal and human health are relatively distinct. The World Bank's estimates would increase investment needs presented for LMICs by nearly 40%, compared to the estimates presented in this report.

⁶⁵ This is in line with the G-Finder survey: https://policy-cures-website-assets.s3.ap-southeast-2.amazonaws.com/wp-content/uploads/2021/04/15055816/G-FINDER-2020_Final-Report.pdf

⁶⁶ The assumption of a 30% funding share for the private sector in establishing scaled-up at-ready manufacturing capacity is in-line with the analyses by the AHT group and others. The large majority of funding will have to come from the public sector to enable these investments in capacity. This is discussed fully in Section B (Item 3) of the Panel's Report.

⁶⁷ The Panel used the overall intensity of aid provided by the WHO with more granular assumptions: for LICs, domestic budgets cover 15% of recurrent costs but no capital costs over 5 years.

⁶⁸ WHO assumes that Lower-middle income countries cover 50% of capital costs and 70% of recurrent costs over 5 years, while Upper-middle income countries cover 100% of capital and recurrent costs over 5 years.

⁶⁹ See World Bank's report titled "Drug-Resistant Infections: A Threat to Our Economic Future" published in March 2017.

- Secondly, the zoonotic nature of many viruses calls for a One Health approach to surveillance, meaning surveillance that also covers animal health and veterinary services. The estimates take a One Health approach when considering surveillance requirements for research, data collection and processing or, in the case of the McKinsey costing, some cost of biosecurity in farms and of wildlife and wild meat trade. However, it would have been difficult to provide comprehensive and up-to-date estimates of the wider approach for this report, thus estimates for a full One Health approach are not included in our calculations⁷⁰.
- Thirdly, the estimates presented in this report include R&D investment, specifically research linked to new pathogens, as part of surveillance and research into vaccines, therapeutics and diagnostics. However, basic research is excluded from these estimates. Basic research has been defined as scientific investigation that involves the generation of new knowledge or development of new theories. That is, research with results that often cannot be applied directly to specific clinical situations and therefore will only be indirectly beneficial to pandemic prevention and preparedness. Pre-clinical and basic research can nonetheless have a significant impact on pandemic prevention and preparedness⁷¹.
- Fourthly, in the category of medical countermeasures, our estimates for the cost of manufacturing are very conservative. The dedicated stream of work from the AHT group for the Panel indicates that investing in US\$60 billion upfront to expand production capacity for vaccines and supply chain inputs (US\$2.2 billion per year thereafter to maintain capacity) would provide far greater benefits⁷².
- Finally, outbreaks occur more frequently in countries that have overall weak health systems and building resilience in health systems to best prepare them against pandemics requires, as a prerequisite, a much broader strengthening in many low- and middle-income countries. The cost of such measures has also been excluded from the main estimates of the report as being only indirectly related to the global public good approach on which the report focuses. The WHO estimates the health system financing needs towards the objective of universal health coverage at US\$555 billion over five years. Following the same financing formula employed for the main estimates, **this would result in an additional US\$89 billion in international finance over five years — compared to the estimate we have given of US\$75 billion.** The broader strength of the health system can be a determinant to countries' ability to contain and manage an outbreak and as such is an important source of externalities. It is not part of the prevention and preparedness global public goods but should be properly integrated in country programs and allocation of ODA to the health sector.

Based on the methodology we have described above, Tables 1 and 2 show the estimates that the Panel has employed in this report. For more details referencing the respective estimates based on those by the WHO and McKinsey, please refer to Tables 3 and 4 below. (There are two estimates for each item in these tables. The figures on the left have been derived on the basis of WHO estimates, while those on the right have been derived from McKinsey.)

⁷⁰ The World Bank's study titled "People, Pathogens, and Our Planet: The Economics of One Health", published in June 2012, shows that the total cost of One Health prevention and preparedness comprised 45% for animal health, 41% for human health, and 14% for joint planning and communication.

⁷¹ Di Masi et al. (2016): Innovation in the pharmaceutical industry: New estimates of R&D costs. In Journal of Health economics — May 2016.

⁷² In the event of a pandemic, this investment would have expected benefits of US\$1.6 trillion, relative to a scenario where countries made no further advance investments. This would fund 25 billion units of capacity, enough to vaccinate 80% of the global population with each of four vaccine candidates. This differs from the methodology of McKinsey which computes the costs for producing 7.5 billion courses of vaccine in six months: the AHT methodology takes into account that the production capacity is shared by different technology platforms (mRNA versus traditional platforms) and with the non-negligible probability of failure of different vaccine candidates, part of the capacity will have to be repurposed. Since repurposing capacity takes time, it would be hugely beneficial to install substantially more capacity to cover the reference needs of 7.5 billion of vaccination courses.

Table 3: Additional Public Funding for Prevention and Preparedness over 5 Years (US\$ billion)

Category	Total	International Financing	National Budgets
Robust surveillance & detection networks	53/94	20/35	33/59
Building resilience in health systems	60/66	19/18	41/48
Supply capacity for medical countermeasures	19/34	19/34	-
of which R&D	8/13	-	-
of which manufacturing	11/20	-	-
Total	131/194	58/87	74/107
Average Annual Investment	26/39	12/17	15/21

Table 4: Additional Public Funding for Prevention and Preparedness over 5 Years (US\$ billion) (Breakdown by Global- and Country-Level)

Category	Total	Global Level Capacities	Country-level Global Public Goods				
			HIC	MIC		LIC	
				International Financing	National Budgets	International Financing	National Budgets
Robust surveillance & detection networks	53/94	5/5	5/15	8/18	27/43	7/11	1/2
Building resilience in health systems	60/66	-	6/1	10/8	33/45	8/10	1/1
Supply capacity for medical countermeasures	19/34	19/34	-	-	-	-	-
of which R&D	8/13	-	-	-	-	-	-
of which manufacturing	11/20	-	-	-	-	-	-
Total	131/194	24/39	11/16	19/26	60/88	15/22	2/3
Average Annual Investment	26/39	5/8	2/3	4/5	12/18	3/4	0/1

Annex I

The International Finance Facility for Education (IFFEd) Model and Pandemic PPR Financing

The IFFEd, an independent non-profit legal entity set up in 2020, aims to expand Multilateral Development Bank (MDB) lending capacity for education by strengthening MDB balance sheets through the use of portfolio support as well as grants to make these loans more concessional.

In the IFFEd model, a combination of paid-in grants as capital and guarantees by donors can provide development institutions, including MDBs, RDBs, or single-purpose credit facilities, with quasi-equity that they in turn can leverage on capital markets. This leveraging would depend on the capital requirements of each institution and the IFFEd's credit rating. The financial efficiency of IFFEd also depends on the additional leveraging that comes from the treatment of donor guarantees as paid-in capital in IFFEd's balance sheet. Under this model, additional grants can also be deployed 'pari passu' with the loan to make the terms of the finance more concessional.

Using the parameters developed for IFFEd — that have been reviewed and assured by credit-rating agencies — the proposed vehicle would require from donors commitments of 15 per cent in cash and 85 per cent in contingent commitments (guarantees) for every US\$1 dollar of portfolio insurance. In turn, consultations with four large MDBs indicated that they would leverage this portfolio insurance four times if IFFEd was rated very strongly. Thus, for every 15 cents of cash, the vehicle would produce US\$4 of financial support to clients, resulting in an overall leverage rate of 27 times.

Cost Calculations for Applying the IFFEd Model to Pandemic Prevention and Preparedness

Although the IFFEd financing instrument was developed to increase education lending, its design can also be applied to vaccines, pandemic preparedness, or other global public health goods as long as the institutions have a strong credit rating and preferred creditor treatment with the capacity to manage these donor commitments and loans.

The governance of any IFFEd-type vehicle for pandemic prevention and preparedness would rely as much as possible on existing arrangements and accountabilities. Donors would fund the paid-in capital and guarantees required, the vehicle's independent board and contributors would decide on the magnitude and timing of the portfolio insurance to the MDBs, and the MDBs would make lending decisions.

As an illustration, to provide an extra US\$4.5 billion annually in financing to Middle-Income Countries (MICs) by the World Bank's IBRD with the same grant element or concession equal to IDA-regular terms through a combination of a loan and a grant, would require an annual grant inflow of US\$1.57 billion if this was done by using a standard capital increase mechanism and grants to recipients in conjunction with the loan to increase the grant element.

This annual grant inflow from donors would be split between an increase in paid-in capital of US\$0.73 billion (20 percent of the US\$3.66 billion IBRD loan) and US\$0.84 billion for the grant to the recipient to bring the total finance provided to IDA terms.

With the IFFEd model, in comparison, the same increase in lending would require an annual grant inflow of US\$0.98 billion split between paid-in capital of US\$0.14 billion (accompanied by guarantees of US\$0.78 billion) to support the loan, and the same grant of US\$0.84 billion to recipients. Additional illustrative calculations are presented in the table below:

Financing IBRD countries (Group B) with a grant element equal to IDA-regular

Finance	Grant	Loan	Paid-in capital		Guarantees
			IBRD	IFFEd	IFFEd
\$4.00	\$0.75	\$3.25	\$0.65	\$0.12	\$0.69
\$4.50	\$0.84	\$3.66	\$0.73	\$0.14	\$0.78
\$5.00	\$0.94	\$4.06	\$0.81	\$0.15	\$0.86

The portfolio insurance provided by the IFFEd to the institution executing the loans, as noted above, is backed by cash or paid-in capital provided through donor grants. These donor grants could be provided by sovereigns or 'Public' actors but this financing instrument could also work with grants from Private actors.

While the use of guarantees as quasi-equity is financially attractive, it is important to note that these guarantees must fulfill key necessary properties. The technical requirements under the IFFEd model are:

1. Portfolio guarantees offered by the entity must be long term to underpin the additional loans that the participating MDBs will offer to eligible borrowers.
2. These Guarantees must be applied to a portfolio of loans and not to any individual loan.
3. Guarantees must originate from a strongly rated independent entity that is very likely to maintain that credit rating over the long term.
4. The entity must be able to meet its obligations on a timely basis and not be subject to donor political and administrative complications.
5. The entity needs to be financially viable, able to meet over time annual administrative and financial costs from self-generated resources.

