The Independent Panel FOR PANDEMIC PREPAREDNESS & RESPONSE

Pandemic Readiness in an Uncertain World

Actions for leadership, finance, access, and insight

A set of four policy briefs

May 2025

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Foreword

Five years ago, citizens around the world were asking ***why is COVID-19 so destructive, so fast?***

As co-chairs of The Independent Panel for Pandemic Preparedness and Response, we were tasked with helping answer that question. We found major gaps that allowed COVID-19 to spread worldwide, upend daily lives and economies, kill millions of people, and create schisms that still divide countries and communities.

In our May 2021 report, we urged immediate action. We called for greater and accessible financing and guaranteed access to vaccines, tests and other tools for all. We called for a stronger, more authoritative World Health Organization, clear rules for global collaboration including a pandemic framework convention, and sustained, high-level political leadership.

Since then, and despite global uncertainty, the world has made progress. The Pandemic Fund was established. Previously difficult disease outbreaks, including Marburg in Rwanda, have been swiftly contained. Inspired scientists are leading an mRNA innovation and manufacturing programme involving 15 middle-income countries. We see continued efforts from the G20 and regional health bodies. Most recently, the World Health Assembly, in a breakthrough that had many holding their breath for months, adopted the pandemic agreement text.

But there is still much to do. The speed and scale of financing for preparedness and response are too slow, and too low. Medical countermeasures are still largely controlled by wealthy countries and remain out of reach for too many people. Limited monitoring creates blind spots to emerging risks and uncertainty in the readiness of countries and organisations to respond. Pandemic threats are not a priority for most presidents and prime ministers.

Today, abrupt funding reductions by the United States and planned reductions from other donors are changing the global health landscape. The quality of research, disease surveillance, and outbreak response are all at risk, and citizens everywhere are all less safe. The WHO, which Member States rely on for guidance and coordination, is at a crossroads, as is the UN system.

Yet the most difficult moments can also usher in change. It's time to rethink and build a new system. It must be one where leadership and power are less concentrated and more distributed. Where countries and regions are in charge of building resilient futures. We can have a world where nations choose their own paths but work together towards a shared vision for the protection and health of people and planet.

For while some people are divided and making the world less certain, leaders from every political system can—and must—act in the knowledge that pandemic threats are looming. They can strike anytime, anywhere, and they will strike fast.

We must all get ready.

Rt Hon. Helen Clark **H.E. Ellen Johnson Sirleaf**

Co-Chairs of The Independent Panel for Pandemic Preparedness and Response

Executive summary

These four policy briefs set out recommendations to continue making the world safer from pandemic threats even in uncertain times. The world is abruptly entering a new era that will be characterised by greater regional and national self-reliance. Leaders must grapple with this change now, because the volatile biosystem will not wait.

Countries and partners must now use the pandemic agreement text as a foundation for action and progress.

We recognise that important progress has been made even in these turbulent first months of 2025. The pandemic agreement text contains promise that countries will work together to prevent, prepare for, and respond to pandemic threats. We will continue to champion the agreement to come into force as soon as possible. In the meantime, we believe that countries and partners must work today and use the agreement text as a foundation for action and progress.

Informed by an understanding of progress to date, these briefs provide a pragmatic, yet ambitious, path forward on issues of financing, access to outbreak and pandemic medical countermeasures, monitoring and accountability, and high-level political leadership—essential for all progress.

First, we look at finance. Solutions include more regional and domestic investment, supported by a simpler, more transparent, and effective global architecture. We must not forget the countries that simply cannot afford prevention or response, including those most vulnerable to climate change and conflict. Everyone must be safe, and financing should cast a wide net and ensure pandemic readiness is treated as a public good. The World Health Organization must be funded to do the job Member States ask of it.

Next, we consider access to medical countermeasures. COVID-19 showed that vaccines and other urgently needed tools can be produced rapidly when crisis strikes. The power and technology to make these tools, however, largely lie in the hands of a few countries. Charity cannot be relied upon, and containing pandemic threats demands regional self-reliance. Here we take a deeper dive to assess the state of innovation and manufacturing by regions and key countries. We recommend shifts that must happen if the principles of equity and solidarity are to be met and if access is to be available to all.

Third, monitoring of pandemic risks and readiness remains fragmented, and it is not sufficiently transparent or independent. There are blind spots endangering people everywhere, and it remains unclear if countries or institutions are ready to respond. We consider the range of monitoring we believe is required, from pandemic risks to organisational and country preparedness and recovery, and the accountability that must underpin this all, including through the pandemic agreement.

Finally, we see a horizon of critical milestones towards the next UN High-Level Meeting on Pandemic Prevention, Preparedness and Response in 2026. This is a decisive opportunity to enhance cohesion in a system that relies on a diverse array of actors. It is a moment to advance efforts towards a common emergency platform for existential threats, including pandemics, which is in the interest of the safety and security of everyone. Work must start now—through the World Health Assembly, the G7, G20, regional gatherings, and other convenings—to set the stage for a bold political declaration at the UN General Assembly in 2026.

Recurring themes emerge across all of these areas. A clear understanding of how to navigate these themes will be key to future progress.

From fragmentation to a system that can be relied on in crises: The current fragmentation will not serve countries well in a crisis, when all stakeholders need to act fast. Yet from finance and medical countermeasures to monitoring and accountability, too many piecemeal initiatives and efforts remain. Many of these perform important work, but the pieces do not fit together, and important gaps persist.

Transparency: There is too little clarity and transparency around the roles and responsibilities of different stakeholders, and what information exists is often hard to find. Dashboards are created and not updated or sustained; initiatives are announced and are not followed up on. Messages from different organisations at different times can splinter the picture.

Regional self-reliance and distributed leadership: There remain clear functions for pandemic prevention, preparedness and response (PPPR) globally, regionally, and nationally. However, in this climate of shrinking development assistance twinned with stronger regional institutions and initiatives, regions and subregions must lead on plans for PPPR. This must include clarity on available financing and capacities and the gaps needed to be filled. Geneva has a major role, but so do regional centres, and it's time to transition and let the regions lead.

Financing

For most countries, domestic financing is the foundation upon which national capabilities are built. Faced with a new reality, countries must move to increase investment, but this will need to be supported by regional and global efforts to address structural barriers, including the cost of debt.

The global financing architecture is overly complex. **A critical review is needed of the functions that should be led at the national and regional levels, and what can only be done globally. This review should consider which existing initiatives require aligning, consolidating, or in some cases sunsetting.** Done properly, this should usher in a new era of regional leadership and self-reliance. There must be clear plans and a transition phase to minimise disruption in countries.

Equitable access to medical countermeasures

Given the uncertain geopolitical environment, and the need to stop disease outbreaks when and where they occur, regional self-reliance should provide the foundation of an equitable system for access to medical countermeasures. **Work to implement medical countermeasures provisions of the pandemic agreement must start now.** Regional and national leaders need to establish a plan with requisite financing and governance. This will require technology and knowledge transfer, with the freedom to operate to create new regionally and locally appropriate tools. Initiatives such as the mRNA technology transfer programme, involving 15 innovators and manufacturers in middle-income countries, require ongoing support and a shift to ensure governance by those countries.

Independent monitoring and accountability

Monitoring of pandemic prevention, preparedness and response must be broad in scope, evidence-based, transparent, and politically and financially independent, in addition to incentivising participation and holding national and organisational leaders accountable.

The current system requires an assessment and investment into **a common, unified plan and vision**. Countries, multilateral agencies, civil society, philanthropies, and other interested stakeholders should come together this year to agree essential functions and a unified plan. Stakeholders could consider a global observatory with robust regional functions, to fill gaps in risk assessment, organisational preparedness, response, and recovery. Such an observatory could provide scientific evidence to an eventual Conference of the Parties of the pandemic agreement.

The 2026 UN High-Level Meeting

The second UN General Assembly High-Level Meeting (HLM) on Pandemic Prevention, Preparedness and Response is scheduled for 2026. This is a decisive moment to bring all UN Member States together with international organisations and civil society to align around a common agenda for investment and action. A moment like this can galvanise multisectoral action and the leadership of Heads of State and Government.

With a view to September 2026, leaders should lay the platform so the HLM and its political declaration can bring together the many actors working on pandemic prevention, preparedness and response , make bold, measurable commitments, and set an ambitious path forward.

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The Independent Panel FOR PANDEMIC PREPAREDNESS & RESPONSE

Financing pandemic prevention, preparedness and response

Invest now or pay a heavy price in the future

May 2025

Over many decades, countries invested too little in the capacities needed to prevent, prepare for, and respond to pandemic threats. COVID-19 starkly demonstrated the consequences of this underinvestment. Some 28 million excess deaths,[1] trillions (USD) in economic losses,[2] and lasting impacts on poverty reduction, health, and education. It also has left a legacy of polarisation, distrust,[3-5] and heightened global insecurity.

With this lived experience and the knowledge of how to address past failures, today's leaders have a duty to protect current and future generations.[6] Adequate financing for preparedness and emergency response—both for countries and for regional and global systems—is one critical element. Yet in a June 2024 report, The Independent Panel for Pandemic Preparedness and Response (The Independent Panel) concluded that despite some progress, the international financing architecture remains incoherent and fragmented. It is too reliant on development financing, and overall, remains insufficiently funded.[7]

Now in 2025, the system upon which much pandemic prevention, preparedness and response (PPPR) funding relies has been upended. The United States—long the leading global health security funder to bilateral and multilateral partners, and for its own research and operational institutions—has largely withdrawn from collaboration in global health. Other major health funders, including France, Germany, and the UK, have either reduced official development assistance (ODA) spending or announced their intention to do so.

Should leaders try to repair an ailing system or use this moment for major transformation?

For some low- and middle-income countries (LMICs), the abrupt reduction in aid will lead to a huge economic toll. The planned withdrawal of USAID funding alone is estimated to result in an economic shock of at least 1% of gross national income in 23 economies and a 3% shock in eight.[8] Many of these countries face the dual threats of conflict and climate change, which exacerbate the risks for pandemic threats. The cumulative, long-term impacts on outbreak detection and pandemic response capabilities are particularly concerning, including for issues where great progress has been made, notably HIV, tuberculosis, and vaccine-preventable disease.

The first months of 2025 laid bare the vulnerabilities of global health financing and the dysfunctional way in which the system operates, showing plainly that aid dependency is not a sustainable way forward.

Faced with this evolving geopolitical reality and declining international development financing, leaders are now forced to grapple with major questions, including whether to try to repair an ailing system or to use this moment for major transformation.

International financing for PPPR

Along with others, The Independent Panel has maintained that PPPR is a global good and that new international finance should be over and above development assistance.

The Independent Panel and others estimated that US$10–15 billion in additional international financing per annum is needed to address gaps in basic national preparedness in LMICs and to strengthen regional and global functions.[6,9,10] In addition, an estimated US$50–100 billion of surge financing is required. Future preparedness pledges could be front-loaded in times of emergency, with rapid, specific disbursements to countries when needed.[6] The Independent Panel recommended a single financing facility to cover both preparedness and response funding.

Some progress has been made since 2021, and various ongoing initiatives hold promise (see box). Yet overall, the international financing landscape today remains a patchwork.[7,11] In a crisis, countries are forced to engage in negotiations via a complex, insufficient, and underfunded system.

A summary of international and regional financing mechanisms for PPPR
In search of greater clarity, speed, and scale

The Pandemic Fund (Preparedness)
Established in 2022, the Pandemic Fund raised around US$2 billion by the end of 2024, US$700 million of which came from the United States. Across 2023 and 2024, the Fund awarded US$855 million in grants to 47 projects and reported an additional US$6.1 billion mobilised through co-financing and co-investment. While not having have an emergency mandate, the Fund rapidly approved US$129 million in preparedness grants for the mpox response in 10 countries in 2024. With pledges of US$1 billion towards its US$2 billion goal for the next two fiscal years (including US$667 million from the United States), the Fund's viability is uncertain if support pledged by the United States doesn't materialise. The Fund is also assessing other financing models, including the potential issuance of a bond on private capital markets.

IMF Resilience and Sustainability Facility (Preparedness)
In October 2024 the International Monetary Fund, World Bank, and the World Health Organization agreed on principles for cooperation on how to leverage the IMF's Resilience and Sustainability Trust loan option—available for climate finance since 2022—for pandemic preparedness. As of April

2025, no Resilience and Sustainability Facility (RSF) awards have included pandemic preparedness provisions. The IMF should consider reforms to increase demand, including adapting the eligibility rules, and should engage with the World Bank on how the RSF and Pandemic Fund can best complement each other.[12,13]

Coordinating Financial Mechanism (Preparedness)

The mechanism established under the 2024 amendments to the IHRs will also serve the implementation of the pandemic agreement once in force. Functions include promoting sustainable financing by identifying funding sources, promoting harmonisation, and leveraging voluntary contributions. It remains unclear how the mechanism will function in practice, and whether it can fundamentally address the challenges within PPPR financing, specifically those of fragmentation, scale, and speed. With the amended IHRs coming into force in September 2025, the States Parties Committee for their implementation should urgently set out how the mechanism will operate and complement existing structures.

Africa Epidemics Fund (Preparedness and Response)

In February 2025 the African Union approved a framework for the Africa Epidemics Fund, a potential landmark moment following the initial agreement by Heads of State to create the fund in February 2022. The fund is expected to have both preparedness and response functions. Attention now turns to how the Africa CDC will capitalise and operationalise the fund.

PAHO Revolving Fund (Preparedness and Response)

Composed of the Strategic Fund for essential medicines and supplies and the Revolving Fund for access to vaccines, this Pan American Health Organization tool provides a mechanism for pooled procurement in the Americas to improve purchasing and negotiating power, including in response to new disease outbreaks.

WHO Contingency Fund for Emergencies

The WHO CFE aims to provide funding within days to bridge the gap between the onset of an emergency and when funding from other mechanisms becomes available. The fund disbursed US$55.5 million in 2024 and received US$22 million in contributions. While playing an important role in the early stages of disease outbreak response, the fund holds modest capital and must be complemented by other emergency mechanisms.

Gavi Day Zero Financing Facility (Response)

The Day Zero Financing Facility, sponsored by Gavi, the Vaccine Alliance, has a US$500 million First Response Fund to provide financing within days for the purchase of vaccines and related supplies including personal protective equipment.[14] The First Response Fund was activated in September 2024 to secure 500,000 doses of mpox vaccine through an advance purchase agreement with Bavarian Nordic. In addition, the DZF seeks to secure US$2 billion in credit lines from development finance institutions (DFIs), including US$1 billion from the US International Development Finance Corporation. This is important, but it does not cover treatments, tests, and other essentials.

G7 DFIs, MedAccess, EIB, and IFC initiative (Response)

In September 2024, the G7 DFIs, MedAccess, European Investment Bank, and International Finance Corporation announced a surge financing initiative for medical countermeasures, with the goal of establishing the necessary collaboration frameworks and innovative financing mechanisms for rapid and equitable pandemic responses. There are few details yet as to how this will be operationalised.

World Bank Crisis Preparedness and Response Toolkit (Response)

The World Bank has introduced a range of tools to help governments respond to crises.[15] This includes the Rapid Response Option, in which countries can repurpose a portion of their unused World Bank financing for emergencies. The Climate Resilient Debt Clause, now extended to cover public health emergencies, provides the option for small states to defer principal and interest payments of International Bank for Reconstruction and Development loans and International Development Association credits for up to two years.

The choice: repair a broken system or build a new one

In 2025, global health and PPPR financing are at a crossroads; the path forward presents risks but also opportunities. We believe that with the right leadership and vision, a new, more resilient and sustainable financing system can emerge.

Prioritising mission critical systems and the most vulnerable countries

The immediate funding cuts will be most deeply felt in countries with the lowest incomes and those facing conflict and humanitarian emergencies. These countries commonly face the highest risks of disease outbreaks while also having fewer capabilities to respond. As a matter of priority, global health funders, including multilateral development banks and philanthropists, must step in to fill the gaps in the most vulnerable and highest risk settings.

While grossly insufficient, available funding for PPPR has supported critical global and regional infrastructure such as "always on" systems for surveillance and data sharing. As organisations, including the WHO, undertake prioritisation exercises to reduce programming, these systems must continue to be funded and operational.

Faced with a new reality, countries and regions must now move towards greater self-reliance.

Supporting a real transition to greater domestic spending

For most countries, domestic financing is the foundation underpinning national capabilities. Calls for increased domestic spending are not new, but past commitments have not translated into the requisite financing. Faced with a new reality, countries and regions must now move towards greater self-reliance.

Some efforts are underway, including by Africa CDC, which published a new continental financing plan in April 2025.[16] Better tracking of spending will be key to guiding such efforts and ensuring transparency.

Increased domestic spending faces large barriers, but these are not insurmountable. With 3 billion people living in countries that spend more on servicing debt than on health or education, addressing the debt crisis should be a priority.[17] South Africa, under its G20 presidency, has proposed a cost of capital commission to advance solutions. The 4th International Conference on Financing for Development, scheduled from 30 June to 3 July 2025 in Sevilla, Spain, is another key platform.

Imposing fair and transparent taxation systems and addressing illicit financial flows are equally necessary. Over the next two years UN Member States will negotiate a framework convention on international tax cooperation to set standards covering both corporate and individual taxation. This process, if successful, could unlock far greater domestic financing for global public goods.

Essential to all these shifts is sustained political commitment and more distributed leadership on all level: globally, regionally, and nationally.

Simplifying the global PPPR financing architecture and supporting regional leadership

A long-standing critique of the global health system is that, despite its successes, it has not adequately built and strengthened the capabilities of national and regional institutions in LMICs.

The withdrawal of traditional funders presents both an opportunity and responsibility for regional blocs to demonstrate leadership and increase self-reliance. Regional development banks, with their local knowledge and expertise, are uniquely positioned to support integrated approaches to transnational challenges. Initiatives such as the African Epidemics Fund hold great potential but must avoid past pitfalls such as overreliance on a small donor base. Other regions might look to PAHO's Revolving Fund and other successful models to strengthen regional capabilities while building sustainable pandemic preparedness systems.

Efforts to increase regional leadership and self-reliance need to be supported and enabled by changes to the global financing architecture, which remains far too fragmented, complex, and intermediated. A critical review must determine which functions are best led regionally versus globally, and where existing initiatives require aligning, consolidating, or sunsetting. Led by countries and laser-focused on country needs and address the whole financing landscape, including the future of initiatives such as Gavi and the Global Fund to Fight AIDS, Tuberculosis and Malaria.

Finding billions: the need for new financing to secure the world

Alongside national and regional investments, international financing will continue to play a critical role in the PPPR ecosystem. This is not about aid or charity, but about having adequate investments in global public goods that benefit all countries.

Preventing pandemics and responding quickly when threats emerge is a global security issue. Countries must look beyond health and ODA budgets to see these as investments in economic resilience, national stability, and global security infrastructure.

New and ambitious financing models also need to be considered. The Independent Panel has supported the concept of global public investment whereby all countries contribute based on an ability to pay formula, all benefit according to their needs, and all decide how to spend the funding. GPI aims to redistribute ownership and responsibility away from a charity-based model to one of collective responsibility. There is precedent for collaborative efforts that deliver shared benefits at the regional and global levels, from air traffic and intellectual property (e.g., WIPO) to research endeavours (e.g., CERN). Now is the time for countries, or regions, to engage seriously in discussions on how such a model could be realised.

Closing message—bold and visionary leadership is needed now to invest in our collective future

Faced with a rapidly evolving geopolitical reality, declining international development financing, and major economic headwinds, past gains on PPPR appear fragile and future progress seems highly uncertain. Yet our message remains simple: *without financial investment in public goods, there can be no pandemic preparedness or response*.

Making the world safe from pandemic threats requires bold, visionary, and distributed leadership, from countries and their Heads of State and Government and from regional and international organisations. This is a moment to truly invest in our collective future, or all people, everywhere, will once again pay a heavy price.

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The Independent Panel FOR PANDEMIC PREPAREDNESS & RESPONSE

Regional self-reliance for innovation and manufacturing of pandemic tools

Now more urgent than ever

May 2025

If outbreaks are to be stopped before they become pandemics, regions must work now towards self-reliance in order to innovate and produce their own medical countermeasures. The challenge is that ownership of technology, knowledge, and intellectual property remains in the hands of entities within a few countries, and a largely market-based approach has not historically fostered public health–oriented outcomes to manage health emergencies.

The COVID-19 emergency highlighted that while effective medical countermeasures (MCMs) can be developed and produced in a matter of months, the bigger challenge is to deliver them equitably within a highly unequal world. It requires at minimum more balanced distribution of manufacturing capabilities throughout the regions, alongside a shift in governance over critical technologies.

Current geopolitical shifts, massive and erratic cuts to development assistance, and a breakdown of solidarity in domestic and global policies underscore that a core strategy for pandemic prevention, preparedness and response must be regional and subregional self-reliance for MCM innovation and manufacturing. This self-reliance must be complemented by regional and national political leadership and based on the principle of subsidiarity.

The pandemic agreement text confirms the importance of regional self-reliance. It includes numerous provisions that can help move the needle, including commitments to share a 20% target percentage of real-time production and to promote equity, technology sharing, access to pathogens and benefit sharing, regional diversification of technological capacity, and access conditionalities for publicly funded research.[1]

The Independent Panel is clear that implementation cannot wait for the agreement to come into force. Global, regional, and national leadership and investment are needed now to build an end-to-end pandemic MCM ecosystem where regions and subregions are equipped and empowered for research and development, manufacturing, and delivery.

The Panel has recommended and is glad to see several global and regional efforts underway to rebalance a system that has centred power in high-income countries. These efforts, however, are uneven and fragmented. They also have been under-resourced and tend towards market-based solutions that have not solved the issues of equity and access in the past.

Globally, the World Health Organization's Research and Development (R&D) Blueprint for Epidemics provides a valuable scientific framework even as coordination gaps remain.[2] From 2020–2023, just US$1.45 billion was spent for priority pathogen MCM R&D, with 78% of that provided by the United States.[3] Global R&D funding has been far from sufficient and is now at greater risk due to US budget cuts.

The Coalition for Epidemic Preparedness Innovations (CEPI), a global partnership, effectively leads vaccine development efforts but funds innovation primarily in high-income countries and invests comparatively little in research capabilities in low- and middle-income countries (LMICs) beyond manufacturing partnerships.[4] After recent challenges, the future role of FIND (the Foundation for Innovative Diagnostics) whose mission is to ensure equitable access to diagnostics, remains to be established for PPPR. As of yet, there is no coordinated, resourced action to develop pandemic therapeutics.

A promising development in regional self-reliance is the WHO/MPP mRNA technology transfer programme, which is equipping manufacturing partners in 15 middle-income countries for mRNA vaccine and therapeutics development and for manufacturing.[5] The important progress of this initiative must be sustained particularly through regional and subregional investment and governance. The programme should also be given freedom to operate from intellectual property barriers to encourage the creation of new products.

If a new pandemic threat emerged today, our deeper-dive analysis shows there are regions, large countries like India and China, and small countries like Cuba that can at once care for their own needs and add to the global availability of pandemic MCMs, while other regions and subregions require much more support including from finance mechanisms, technology and knowledge transfer, together with industrial health policy that fosters R&D for public health priorities and outcomes.

For a deeper dive into regional self-reliance for innovation and manufacturing of pandemic tools see page 35

Given regional epidemiology, lack of finance and that current efforts focus primarily on manufacturing, there is a risk that the Global South will need to continue to depend on high-income countries for R&D and innovation into the future. At the same time, many high-income countries are pulling support away from LMICs, compounding the risk that in the next major outbreak or pandemic, people in these countries will once again be the last to receive vaccines and other tools. That is why a strong commitment to establish technological sovereignty for MCMs is critical.

Actions towards regional self-reliance:

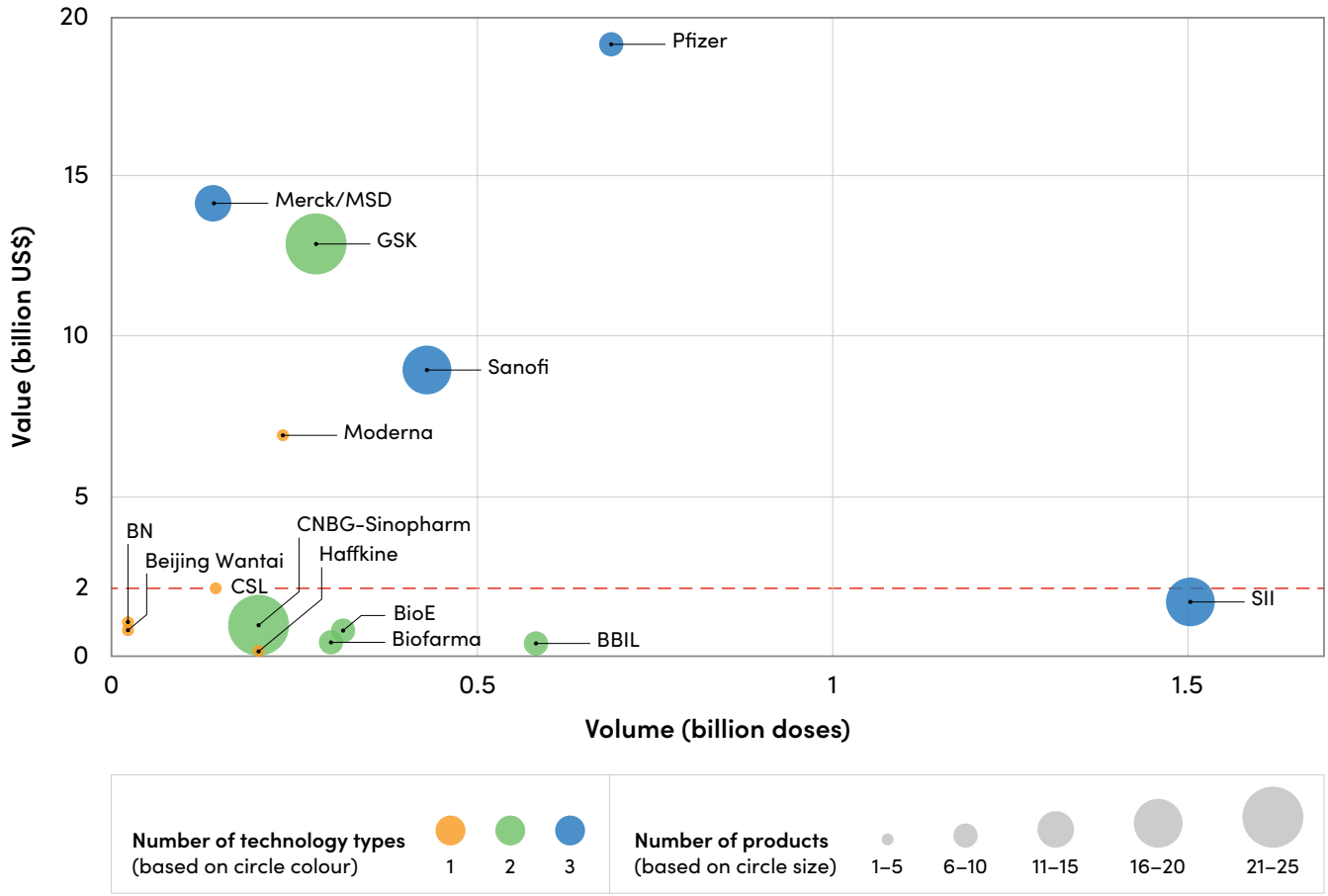
Begin work now to implement MCM provisions of the pandemic agreement, including investment in scientists and developers in LMICs. Pathogens will not wait. Regional and national leaders must take charge now, assess current initiatives, strengthen regional plans, and identify the gaps and needs to be filled

through public and private investment, technology and knowledge transfer, and freedom to operate to expand innovation. CEPI and other Global North actors should go further beyond their current approach to include significant R&D investment and equal partnerships in LMICs.

Sustain progress of the WHO/MPP mRNA technology transfer programme, and use lessons to build further regional initiatives. The mRNA technology transfer programme has achieved much progress, and its efforts must not to go waste. Its partners deserve continued investment to realise the transformative potential for building regional innovation and manufacturing capacity to address regional and local health priorities. Regional initiatives such as Brazil's G20 Global Coalition for Regional and Local Production, Innovation, and Equitable Access, the Pan American Health Organization's Regional Innovation and Manufacturing Platform, the BRICS Vaccine R&D Centre, and the Association of Southeast Asian Nations' coordination efforts should incorporate lessons from the hub experience in order to ensure LMIC-led governance.

Top 10 vaccine manufacturers by volume or financial value, portfolio size and technology types used

In this chart, vaccine manufacturers depicted below the horizontal line are mainly headquartered in India and China, and account for approximately 70% of the total volume of vaccine doses produced. The five manufacturers above the line are affiliated with the International Federation of Pharmaceutical Manufacturers and Associations, and amount to approximately 30% of global volumes but capture almost 80% of total financial value.



Adapted from the WHO Global Vaccine Market Report, 2024.[6]

Middle-income countries and existing funds must play a financing role. Middle-income countries could collectively finance regional R&D and manufacturing projects addressing shared health needs, especially given uncertainties in US funding. The BRICS countries could play a leading role. The Pandemic Fund and Africa Epidemics Fund should integrate access to outbreak and pandemic MCMs as fundamental components of preparedness financing.

Closing message—regional self-reliance for health security

If a new deadly outbreak spread rapidly today, many countries would still be scrambling to have timely access to tools like vaccines, tests and treatments. People's lives would be at risk, and the world would be at risk of another pandemic. Despite some progress in support for regionalised manufacturing, ownership of technology and knowledge to create pandemic countermeasures remains with a handful of countries. Pandemic preparedness requires a shift to regional self-reliance in research and development as well as manufacturing.

This will take time to build and regions should solidify their plans now, invest in them, and be clear on the gaps. In turn, countries that currently hold the power must implement the provisions in the pandemic agreement starting today, and ensure their industries partner to share the technology and knowledge required for all regions to be equipped to stop outbreaks before they become pandemics.

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The Independent Panel FOR PANDEMIC PREPAREDNESS & RESPONSE

The next pandemic threat could emerge anywhere

It's time to understand the risks and be certain we're ready

May 2025

The next deadly pathogen could emerge from a cave, forest, farm, or laboratory. It could even be intentionally released. Can people rely on governments and organisations to monitor and mitigate these risks, and be ready for a crisis? What does it mean to be ready, and how can we assess whether we are?

Current risk and readiness monitoring is fragmented, underfunded, largely self-reported or voluntary, and not sufficiently independent. Transparency is limited, and there are few incentives to comply. Nor are there any consequences for noncompliance with existing legal obligations, such as the International Health Regulations (IHR).

There are major gaps in monitoring systems, which do not assess the full scope of risks, including the environment, climate change, and biosecurity. Monitoring for prevention, response, and recovery are equally lacking. While much effort goes into country preparedness monitoring, gaps remain, and understanding of organisational preparedness is limited.

The geopolitical and economic context, including abrupt and planned decreases in development assistance, are exacerbating the challenges and making everyone less safe. Leaders rarely talk about pandemic preparedness anymore, despite the very recent devastation of COVID-19.

The pandemic agreement offers promise to consolidate a fragmented system, but work is required now as threats persist and the agreement may take years to come into force.

This policy brief examines the strengths and gaps in pandemic monitoring and accountability before and after the COVID-19 emergency. It includes proposed actions for the next 12 to 18 months for a more independent, integrated system—from risk detection to recovery—that policymakers can trust to guide investments and decisions.

Monitoring in the lead-up to and during COVID-19

Lessons from the tragedy of the West Africa Ebola outbreak (2014–2016) led to major shifts, including through the IHR Monitoring and Evaluation Framework,* the Global Preparedness Monitoring Board (GPMB), the World Health

* The IHR Monitoring and Evaluation Framework, released in 2016, contains four components: a mandatory annual reporting through the States Parties Self-Assessment Annual Report (SPAR) and three voluntary mechanisms: simulation exercises (SimEx), after-action reviews (AAR), and Joint External Evaluations (JEE). The outcomes of JEEs are to be incorporated into National Action Plans for Health Security (NAPHS) and operationalised with adequate financing.

Organization's Emergencies Programme, and its oversight body, the Independent Oversight and Advisory Committee (IOAC).

The IHR monitoring framework represented a step change in assessing disease outbreak readiness, but it remained focused on static health indicators.[1] The IHR has too rarely been incorporated into national legislation,[2] and investment in outbreak and pandemic preparedness has remained far too low.[3]

The prescient September 2019 GPMB report, *A World at Risk*, warned that countries were unprepared to manage a novel non-influenza respiratory virus,[4] a warning echoed in October 2020, when the GPMB stated that "current measures of preparedness are not predictive" and should include focus outside the health sector, such as on social protection measures.[5] While rigorously prepared, the Global Health Security Index[6] did not accurately predict pandemic readiness in key high-income countries, and it undervalued readiness in some LMICs.[7]

In its December 2019 report, the IOAC stated that National Action Plans for Health Security and Joint External Evaluations have an unclear impact on strengthening IHR core capacities. It recommended that the World Health Organization work with countries to streamline processes and develop simpler, "impact-oriented" action plans.[8]

"Are we prepared for the next pandemic threat?"
is a question that remains far too difficult to answer.

Based on its assessment of the response to COVID-19, The Independent Panel made several recommendations in its May 2021 report.[9] It called for the WHO to develop new pandemic readiness benchmarks and a universal peer review system. It recommended amendments to the International Health Regulations. To provide clear rules and enhance accountability, The Independent Panel and other experts recommended a new pandemic framework convention, an outcome-oriented political declaration from the UNGA High-Level Meeting, and a high-level Global Health Threats Council composed of political leaders. The G20 High-Level Independent Panel additionally recommended a Global Health Threats Board to catalyse and monitor financing for pandemic prevention, preparedness and response (PPPR).[10]

What has happened in the years since the COVID emergency

Since the COVID-19 emergency, some efforts have been made to strengthen monitoring and accountability systems, and numerous new initiatives have commenced. While these developments are promising, they also portend a monitoring system that is becoming more complex and cumbersome, is in parts duplicative, and doesn't always help to focus investments where they can have the greatest impact.

Country preparedness—many tools but no clear big picture

Country preparedness is assessed in several ways, but these don't provide a ready overview. The WHO has **updated benchmarks, published new dynamic preparedness metrics**[11], **and introduced the multisectoral peer-based Universal Health and Preparedness Review.** Yet in 2025, many of these have not been stress-tested or are not working at scale, and country preparedness monitoring remains heavily reliant on the self-reported SPAR, States Parties' annual reports. Far fewer countries are undertaking a Joint External Evaluation, simulation exercise, or after-action review. These are reported through a web portal that could be improved to provide a clearer overview[12] (see graphic).

Because intentional or unintentional release of a pathogen also presents future pandemic risks, monitoring implementation of the **Biological Weapons Convention** is relevant to PPPR, but it lacks a binding verification or monitoring mechanism. While the number of country reports has increased over time, less than half of State Parties have submitted a report in a single year.[13]

Organisational readiness—many responsibilities, little clarity on capacity to deliver

There is currently little joined-up monitoring or assessment of the capacities of all UN and other international programmes responsible for aspects of pandemic preparedness and response, including Gavi, the Vaccine Alliance; the Global Fund to Fight AIDS, Tuberculosis and Malaria; the Pandemic Fund; and UNICEF. While the IOAC's scope is limited to the WHO Emergencies Programme, its May 2024 report called for "a transparent monitoring system yielding a global picture of capacity levels."[8]

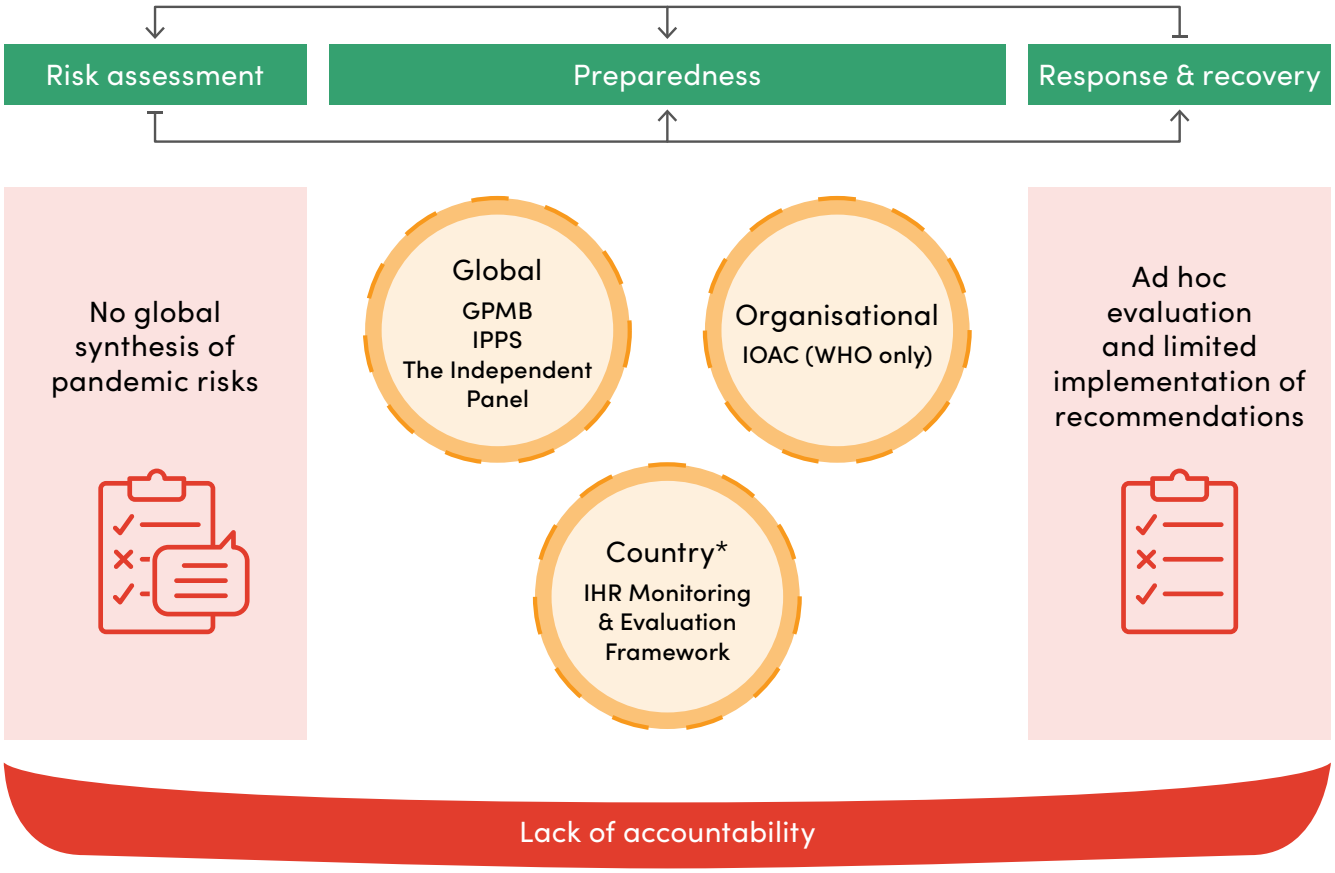
Global preparedness—ongoing efforts and an unclear future

The **GPMB** in its 2023 report, *"A Fragile State of Preparedness,"* **put a new monitoring framework** to the test and will publish a new report this year. It also noted that "there is a need for independent monitoring to complement self-assessment and peer review, at all levels."[14] Hosted directly by the WHO, the GPMB is challenged by independence and is not resourced to the level required. Its mandate is scheduled to end in 2026.

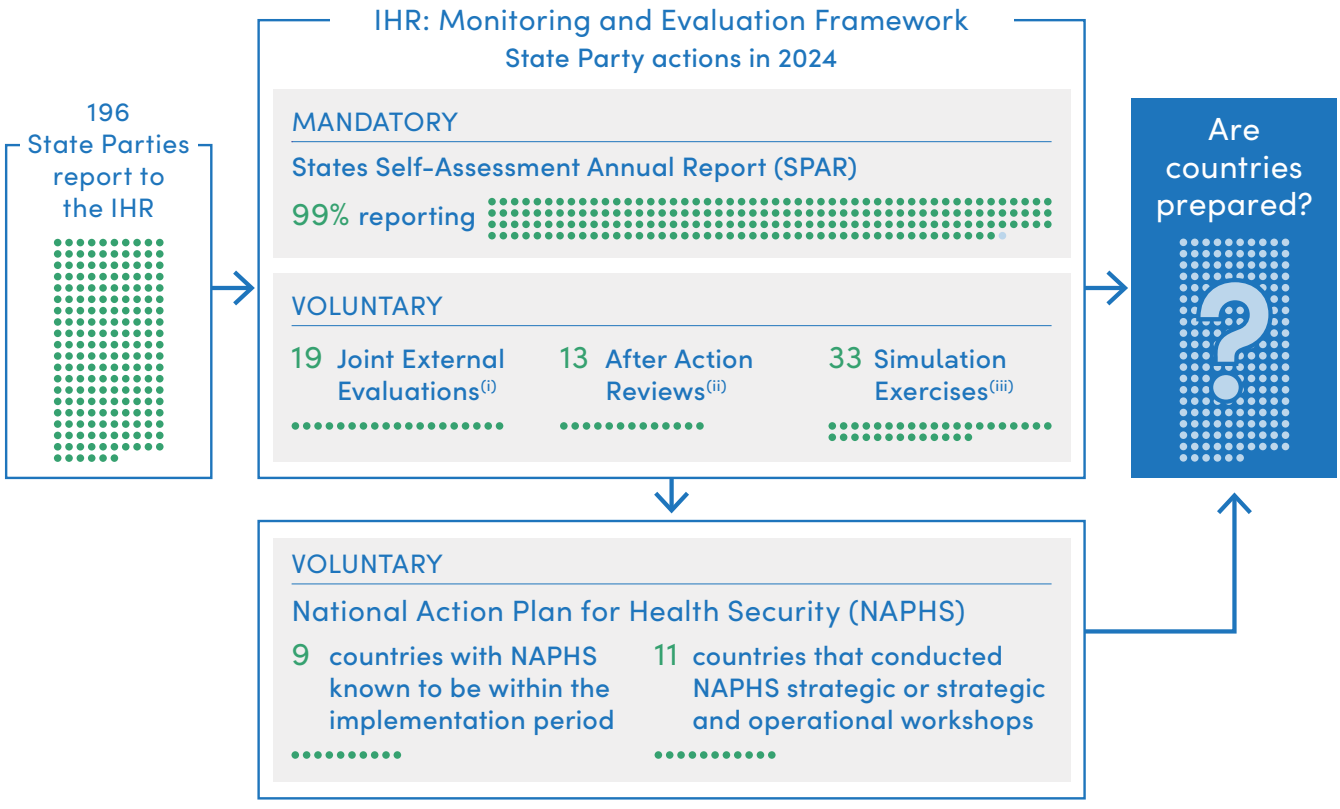
The **International Pandemic Preparedness Secretariat (IPPS)** monitors implementation towards the 100 Days Mission to make tests, treatments, and vaccines available within 100 days of a public health outbreak emergency. The IPPS accountability reports provide a thorough overview of strengths and gaps, and its stress test of the mpox response was appreciated.[15] IPPS analysis would benefit from additional focus on equitable access in addition to availability of medical countermeasures (MCMs). The IPPS is slated to wrap its work in early 2027.

The Independent Panel for Pandemic Preparedness and Response has called for existing monitoring tools to be streamlined and for the creation of an independent monitoring body—such as a wholly independent GPMB- or IPCC-type mechanism—and a high-level political champions group.[16] The **Elders** repeated this call in its pandemic position paper released in January 2025.[17] The Independent Panel does not intend to be a permanent body.

Fragmented monitoring of pandemic risk, preparedness and response



Are countries prepared?*



(i) recommended every 4–5 years; (ii) within 3 months of a public health event; (iii) regularly

Source: WHO (https://extranet.who.int/sph/ihr-monitoring-evaluation) and NAPHS (https://extranet.who.int/sph/naphs)

Efforts leave us blind to some threats and uncertain of our readiness

Pandemic risk assessment—a major gap

Today there is no synthesised scientific assessment of pandemic risks and their drivers—as for example the Intergovernmental Panel on Climate Change (IPCC) does for climate—leaving knowledge gaps across geographies and sectors. Countries may be blind to the evolving risk landscape and what they need to do to prepare for and mitigate these risks.

Response and recovery—a lack of systematic learning

There is no independent system now to monitor response to major disease outbreaks. In-action and after-action reviews are essential, but, ideally, they would be better resourced, documented lessons would be shared more systematically, and recommended improvements would be financed.

Recovery assessments require more work to agree what entails successful recovery across health, social, and economic dimensions. Moreover, there is little standardised support for countries to facilitate recovery; many LMICs continue to suffer the compounding economic consequences of COVID-19 years after the emergency.

Countries also undertake individual assessments. These can provide insights for pandemic readiness globally, but there is no systemic drawing on these learnings.

Accountability—persistent gaps

Today there is little robust accountability within the PPPR ecosystem for countries in relation to their obligations and commitments. While State Parties to the International Health Regulations do have legal obligations, there are few to no consequences for noncompliance. The 2024 amendments to the IHR provide for a facilitative and assistive implementation committee, with scope limited primarily to coordination and a new financing mechanism.[18]

The pandemic agreement could eventually provide overall accountability if State Parties allow for this. When the agreement comes into force, State Parties could streamline functions with the IHR Implementation Committee. The pandemic agreement text includes provisions to "regularly take stock of implementation" and review its functioning every five years. At its second meeting, a Conference of the Parties may approve a facilitative, nonbinding and self-reporting mechanism to strengthen implementation of the provisions of the Agreement. For the agreement to make a real difference, State Parties must agree to independent monitoring and more accountability. Another challenge is that at the current pace, the agreement may not come into force for several more years, and not all Member States will necessarily become State Parties.

The High-Level Political Declaration on PPPR agreed by the UN General Assembly in September 2023 contained many provisions, though few clear obligations.[19] Nevertheless, the UNGA will hold another PPPR meeting in 2026, and this will continue to be a forum at which leaders can make bold, measurable commitments—and be held accountable for them.

Ongoing efforts to address enduring gaps and blind spots

A November 2024 workshop on pandemic risk assessment organised by Wellcome Trust, the UN Foundation, PAX *sapiens*, Fiocruz, the GPMB, and the US National Academy of Medicine explored methods for assessing pandemic risk and its intersection with climate change. A forthcoming synthesis paper from the National Academy will provide more detail.

In response to the shortcomings of previous preparedness metrics, the National University of Singapore/Lancet Commission, introduced in June 2023 as the Pandemic Readiness, Implementation, Monitoring and Evaluation (PRIME) Commission, is developing an independent monitoring framework. It is taking a community-led, bottom-up approach and will create dynamic indicators, including measures of trust, population health, and the ability to reach vulnerable populations in an emergency.[20] The commission is expected to report in September 2026 and will deliver a unifying manifesto for action alongside its research and recommendations.

With the aim to support the reporting detailed for the pandemic agreement Conference of the Parties (COP) (Articles 21 and 23), Spark Street Advisors and the O'Neill Institute for National and Global Health Law have developed a zero draft framework to track the eventual implementation of this treaty. The framework is intended as a living tool which can evolve as key provisions are finalized and guidelines are adopted by the COP.[21]

What can now happen in a fraught geopolitical landscape?

Monitoring of pandemic prevention, preparedness and response must be broad in scope, evidence-based, and transparent. It needs to assess pandemic risks and their drivers, take a comprehensive One Health approach, and account for biosafety and biosecurity. The system needs to be politically and financially independent, to incentivise participation, and to hold national and organisational leaders accountable.[22] Assessments should be based on universally agreed metrics and benchmarks that governments trust to guide their investments.

Critically, the system must measure impact and foster accountability from leaders, who must continue to make investments that keep their citizens protected and safe while also participating in a mutually accountable global system.

What can happen to improve monitoring

A common, unified plan and vision to address a fragmented, patchy system.
Countries, multilateral agencies, civil society, philanthropies, and other interested stakeholders should come together this year to agree essential functions and a unified plan. This process should start with considering the scope and essential functions of the system. It also should consider gaps, including in organisational preparedness, response and recovery, and should consider the strengths and weakness of current approaches and where major gaps exist. It can also explore the form of such a system, including reviewing those from other sectors such as human rights monitoring, which includes a peer review mechanism and independent monitors. Importantly, this should lead to an action-oriented path forward that a broad group of stakeholders can align around.

Consider a sustained "global observatory," including regional functions as a solution. Because the GPMB and IPPS are slated to finish their work, an independent body will be required to fill these functions and existing gaps. This could be modelled on the IPCC or the Lancet Countdown on health and climate change. It could identify and fill gaps in monitoring today, draw conclusions from new and existing information including the IHR Monitoring and Evaluation Framework, and build on the principle of "one set of indicators, and one scorecard" with a view towards helping to inform a Conference of the Parties to the Pandemic Agreement. **The work of the Lancet PRIME Commission should be fully taken into account.**

Serious consideration should be given to the feasibility and value of a standardised, multisectoral annual report on pandemic risks. This would draw on science from across sectors and geographies and could help to direct policy-makers and finance ministries to most effectively invest in pandemic prevention and readiness. **Monitoring must also robustly incorporate One Health**, and a monitoring framework will evolve as the evidence base grows in effective policy and operations.

Improve clarity of reporting on country preparedness. The current online IHR reporting is difficult to parse, with a focus on the number of countries that have undertaken exercises and little analysis of the results or follow-up. The WHO should work to improve this so that anyone interested can rapidly understand country preparedness. Member States should pay for this function.

The IHR implementation committee should be established within 12 months of entry into force of the amended IHRs in September 2025. Members should work with a view towards implementation monitoring across the IHR and the pandemic agreement.

Build closer ties between the monitoring and financing architecture. The outcomes of JEEs, peer reviews, and after-action reviews must lead to investments in areas of weakness and gaps. Domestic resource mobilisation is a key to addressing many of these gaps, but for many low- and lower-middle-income countries, international finance will continue to be essential. The Pandemic Fund could more systematically include funding for country priorities identified by reviews, as could the Africa Epidemics Fund once it is operational.

Establish leadership for accountability. The Independent Panel continues its call for a Champions Group comprising current and former Heads of State and Government to promote investment and accountability. Without leadership, the world will simply not be ready for a new pandemic threat.

Closing message— a streamlined system that is independent, transparent and accountable

Leaders can never successfully prevent or respond to a pandemic threat without fully understanding where the major risks loom, or without knowing whether countries and organisations are equipped and ready. Efforts to support country preparedness are ongoing, but these can be streamlined, made more transparent, and have more impact if there is funding and support to fix weak spots. Improving the system will take time, and an independent, evidence-based monitoring system can help to guide priorities and investments, including for a future pandemic agreement Conference of the Parties.

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The Independent Panel FOR PANDEMIC PREPAREDNESS & RESPONSE

The road to the 2026 UN High-Level Meeting

A decisive opportunity for global political leadership

May 2025

In a world beset by uncertainty, The Independent Panel has maintained that political leaders have the power and responsibility to prevent and rapidly respond to pandemic threats. Despite the devastating losses of the COVID-19 pandemic and ever-present infectious threats, most leaders have turned their attention elsewhere—and yet the warning signs remain loud and clear.

Five years on from the start of the COVID-19 emergency, multiple public health outbreaks, including mpox, Marburg, Ebola, and H5N1, reveal enduring vulnerabilities. These outbreaks highlight continued access barriers to rapid tests, vaccines, and other essential tools and to flaws in coordinated, multisectoral emergency response. They also underscore a lack of investment in a One Health approach that would integrate and unify efforts to protect the health of people, animals, and ecosystems.

Working to make the world safer from pandemic threats is neither a theoretical nor purely technocratic exercise; it has real-life implications for people's health and livelihoods and for economic stability. This is a task that requires the leadership of presidents and prime ministers. Our message to them remains clear:

A new pandemic threat will emerge—as leaders, you have a responsibility to act now and not gamble with your country's future.

In 2025 countries are looking inwards, uncertain how to face a rapidly evolving geopolitical and geo-economic landscape. Yet as tens of millions of people cross borders every day, the health of each nation is deeply intertwined. Countries should be in no doubt that cooperation and coordination are essential to strengthen defences and build resilience to detect and stop the next pathogen with pandemic potential.

Given this challenging multilateral landscape, there are decisive opportunities for leaders to commit to building a world safer from pandemic threats. The World Health Assembly's adoption of the pandemic agreement text demonstrates the potential of multilateral cooperation. It now needs the full backing of all leaders to come into force as soon as possible. Leaders must take all opportunities to build upon this, including through their economic blocs, the World Health Assembly, and regional initiatives and platforms.

The second UN General Assembly High-Level Meeting (HLM) on Pandemic Prevention, Preparedness and Response (PPPR) is scheduled for 2026. This is a decisive moment to bring all UN Member States together with international organisations and civil society to align around a common agenda for investment and action. Here we set out a road map to leverage this political opportunity to make all countries safer from pandemic threats.

The 2026 UN High-Level Meeting

High-Level Meetings on health and One Health matters, including HIV, TB, universal health coverage, noncommunicable diseases, and antimicrobial resistance, take issues beyond ministers and Ministries of Health. They can galvanise multisectoral action and the leadership of Heads of State and Government.

The first-ever HLM on PPPR in September 2023 resulted in a political declaration that must now be built upon by agreeing measurable commitments on the way forward.

The HLM presents a unique opportunity to convene Heads of State and Government with all multilateral agencies and civil society organisations that play roles in pandemic prevention, preparedness and response efforts. It provides a platform to help consolidate efforts across other key forums, including the World Health Assembly, the G7, G20, and in regional fora. It is also an opportunity to bring diverse groups together, especially those most affected by and at the forefront of tackling outbreaks, such as countries known as the V20, those in the Intergovernmental Authority on Development, and from across the G77.

Negotiation of the modalities resolution

As per the Political Declaration of the 2023 HLM on PPPR, a second meeting should take place in 2026 with the modalities for that meeting negotiated within the 79th Session of the UN General Assembly (i.e., before 9 September 2025). Italy and Viet Nam are the co-facilitators for the modalities resolution, which will set out the format, participation, and organisational details, including speaking arrangements, civil society involvement, expected outcomes, and timeline.

Our recommendations for the modalities resolution:

1. **Timing:** Schedule the HLM early during the UN High-Level week in September 2026.
2. **Highest-level political engagement:** Recognise that pandemic prevention, preparedness and response are a whole-of-government and whole-of-society issue that require leadership from Heads of State and Government.
3. **Multisectoral leadership:** Highlight that PPPR is not only a human health issue but requires engagement across levels of government, sectors, and disciplines. Create space for organisations across the One Health spectrum to engage, and where appropriate, lead within the process, including the four members of the Quadripartite*. Ensure space for engagement of a breadth of organisations and constituencies, including multilateral development banks, global health initiatives (e.g., Gavi, the Vaccine Alliance; and the Global Fund to Fight AIDS, Tuberculosis and Malaria), those engaged in relevant areas such as children's welfare and education, and academics, civil society, and Indigenous Peoples.
4. **Progress and major gaps to date:** Recognise the progress by WHO Member States to adopt the text of the pandemic agreement, but also the slow pace of action and investment including towards equity and sufficient finance for pandemic preparedness and emergency response.
5. **Civil society engagement:** Hold an interactive multi-stakeholder hearing by May 2026 to enable civil society contributions to inform the negotiations. Commit to include civil society in official meetings, side events, and consultations during the negotiations and in the HLM, with clear and transparent processes for how these organisations can engage.
6. **Theme:** Set an ambitious theme reflecting that while some progress has been made, five years since the onset of the COVID-19 pandemic, major gaps remain across pandemic prevention, preparedness and response. Acknowledge the need for urgent actions to make the world safer from pandemic threats, especially for the most vulnerable countries, and recognise that risks are increasing due to climate change, biodiversity loss, and gaps in biosecurity.

The importance of strong civil society engagement

Community knowledge and resilience are a critical pillar of successful pandemic preparedness and response. Community leaders, health and outreach workers, and risk communicators will report disease outbreaks, provide care and information, social protection, and help people understand and adhere to public health measures.

A Civil Society Engagement Mechanism helps to ensure coordinated, formal, and diverse civil society inputs into the HLM process, outcomes, and follow-up

* Food and Agriculture Organization of the United Nations, United Nations Environment Programme, World Health Organization, and World Organisation for Animal Health.

mechanisms. The Stop TB Partnership, UHC2030, civil society organisations (CSOs) and Indigenous Peoples groups have shown that such a mechanism is key to a political declaration that is reflective of community needs and priorities, sets bold commitments, and helps to ensure accountability.

Community knowledge and resilience are a critical pillar of successful pandemic preparedness and response.

During the first HLM on PPPR in 2023, like-minded CSOs coordinated and engaged, but there was no single, adequately financed mechanism through which CSOs could organise and engage with Member States. Given the time required to establish such a platform, and for interested groups to organise, we call on like-minded CSOs and funders to work together and build a platform that can help deliver a successful HLM and a meaningful political declaration.

The road to the 2026 HLM: What can be achieved

The 2026 HLM will be a moment to reflect on progress, including against the 2023 political declaration. It is a time to consider the advances in science and knowledge of the past three years and to set an ambitious vision and path forward that addresses the remaining gaps across the system.

The political declaration should include bold commitments including on the issues outlined in these policy briefs, covering financing, an equitable ecosystem for medical countermeasures, and a more robust system of monitoring risks and readiness.

The process and outcomes should champion the pandemic agreement. This includes actively encouraging efforts to achieve the requisite number of ratifications for it to come into force, and preparing for its full implementation. It should also support full implementation of the amended International Health Regulations.

This is also time to advance the concept of the emergency platform for complex global shocks, which will continue to be developed within the Pact for the Future. The United Nations General Assembly is the only place where such a platform to coordinate action on existential threats can be realised—whether for pandemics, nuclear accidents, or climate catastrophes—and it is an essential, but missing piece of the current global architecture.

Key moments and milestones on the road to the 2026 HLM

Pandemic Agreement adopted at the WHA (May 2025): The pandemic agreement has been adopted by the World Health Assembly. An Intergovernmental Working Group will be established to negotiate the pathogen access and benefits sharing annex, and should agree a clear time-bound work plan and provisions for expert and relevant stakeholder engagement. Preparatory work to establish the Conference of the Parties should also commence as soon as possible.

G7 Canada (June 2025): G7 countries should reaffirm their commitment in the 2024 Apulia Leaders' Communiqué to strengthening pandemic preparedness and response efforts, including for preparedness and response financing.

Secretary-General's report on the first political declaration (by September 2025): The UN Secretary-General will release a report documenting implementation of the 2023 declaration on pandemic prevention, preparedness and response. This should set out clear recommendations to inform what is needed for a successful HLM in 2026.

Modalities resolution adopted for the 2026 HLM (before 9 September 2025): The modalities resolution should be adopted for the 2026 High-Level Meeting. The resolution should incorporate all of the above recommendations and provide a platform for multisectoral and civil society engagement in the process. This will pave the way for an ambitious political declaration with measurable commitments.

The amended International Health Regulations come into force (19 September 2025): All State Parties and the World Health Organization should be fully implementing the amended IHRs, and State Parties have should have functioning National IHR Authorities.

G20 South Africa (November 2025): The G20 should affirm PPPR as a priority and place equity at the core. The outcome declaration should provide clarity on fully financing PPPR, underscore the importance of the pandemic agreement and the amended IHRs, build on improving equitable access to medical countermeasures, including through the Global Coalition for Local and Regional Production, Innovation and Equitable Access, and commit to a successful HLM in 2026.

Conference on Public Health in Africa (November 2025):** The African Union should commit to full participation at the UN HLM. Members of the AU should also commit to increase domestic financing for pandemic prevention, preparedness and response.

World Health Assembly (May 2026): Ideally, the PABS (pathogen access and benefit sharing) annex text is agreed and adopted at the 79th World Health Assembly. The pandemic agreement is then opened for signature, with Member States signing then ratifying or acceding the treaty as rapidly as possible. Preparations for the first Conference of the Parties should be well underway.

Multi-stakeholder hearing for UN High-Level Meeting on PPPR (May 2026):** An interactive multi-stakeholder hearing should be held with diverse civil society contributions to inform the negotiations.

Negotiations of the Political Declaration (May-August 2026):** Member States should be negotiating the Political Declaration. Organisations across the One Health spectrum, especially the Quadripartite, are encouraged to engage throughout. Civil society organisations are provided the possibility to participate in official meetings, side events, and consultations during the negotiations.

UN High-Level Meeting on PPPR (September 2026): Heads of State and Government from all regions participate in the HLM, along with representatives from civil society. A strong political declaration should be agreed setting out clear commitments that support and enhance existing efforts, including the Pandemic Agreement.

** Timing estimated based on previous practice.

Closing message—a decisive opportunity not to be missed

Political leadership for PPPR is essential for maintaining momentum to close the gaps that make all countries vulnerable to future pandemic threats. It is also the foundation upon which countries cooperate and work together effectively in times of crisis. The 2026 HLM provides a unique platform to reenergise political commitment and leadership that has faded in recent years. It is a decisive opportunity to focus world attention on the ever-present threats of another pandemic and set an ambitious vision and course of action that will keep all people, everywhere, safer.

The Independent Panel FOR PANDEMIC PREPAREDNESS & RESPONSE

A deeper dive into regional self-reliance for innovation and manufacturing of pandemic tools

May 2025

Here we provide a deeper dive on current global, regional, and country initiatives and capacities. There is at once a picture of hopeful progress, but structural barriers to regional self-reliance remain, particularly in vulnerable regions. There are no shortcuts, and investment in a sustainable end-to-end ecosystem must begin now.

Background

COVID-19 demonstrated that collaborative research and development (R&D) involving public, private, and nonprofit actors can produce pandemic medical countermeasures in record time. It also revealed, however, that dynamics around ownership, control of information, technologies, and financing led to inequitable access, benefitting the wealthiest countries first and resulting in preventable deaths in low- and middle-income counties (LMIC). Leaders vowed to never let that happen again.

In 2021, The Independent Panel recommended that in order to stop outbreaks where and when they occur, medical countermeasures (MCMs) for health emergencies had to be considered global health commons.[1] This would require a shift from purely market-driven innovation to a more inclusive approach in which all regions have agency over not only manufacturing, but also research and development of products tailored to local epidemiology and conditions. The panel also recommended that a pre-negotiated end-to-end R&D to access ecosystem be established, with regional research and manufacturing hubs, provisions for timely and effective technology transfer and sharing, the freedom to operate to adopt these technologies towards local priorities, and adequate financing to achieve public health objectives.[2]

Lessons from COVID-19 have prompted initiatives aimed at increasing and decentralising pharmaceutical production capacity, in particular in Africa. To date, most of the focus has been on infrastructure and technical capacity rather than addressing structural and political barriers to equitable access such as the governance over technologies and financing.[3,4]

Progress to date: a patchwork of global and regional initiatives

The latest report of the 100 Days Mission by the Independent Pandemic Preparedness Secretariat (IPPS) shows some progress in relation to MCMs for individual health threats. At the same time, however, it highlights few systemic

changes in the broader R&D ecosystem to sustain and accelerate clinical development, regulatory approval, and equitable access for MCM targeting priority pathogens.[5] The response to several outbreaks since COVID-19, including two public health emergencies of international concern (PHEIC), suggests some progress but points to a long road ahead (see box).

Stress-testing the system with mixed results

Mpox (2022–2025): The contrasting responses to two mpox emergencies demonstrate persistent inequities. In the 2022–2023 mpox PHEIC initially affecting Europe and North America, stockpiled health security vaccines were deployed swiftly, as was a treatment initially developed for smallpox. Through relatively rapid access to MCMs and effective community mobilisation, the PHEIC, ultimately affecting 110 countries, was over within nine months. Yet despite continued low-level mpox transmission, none of the MCMs was registered, made available, or used in West and Central African countries where mpox is endemic.

In August 2024, transmission of the clade 1a virus accelerated particularly amongst children in the Democratic Republic of Congo (DRC) and a new clade 1b was identified. A new PHEIC and African continental emergency was declared, but vaccines arrived months later and in limited quantities. Barriers included diagnostic limitations, hoarding of preferred vaccines in wealthy countries' stockpiles, complex administrative hurdles, high prices, and reluctance to transfer technology to African producers (though it will be transferred to India). By 22 April 2025, 662,740 vaccine doses had been administered of only 1,045,180 million doses delivered to the African continent, with the WHO advising providers to use spare dose strategies given limited vaccine supply.[6] In addition to supply challenges, mpox vaccination is subject to vaccine hesitancy, heightened insecurity in the most affected eastern provinces of DRC, and most recently the fallout of the US funding freeze. As of 9 May 2025, the mpox outbreak remained a PHEIC.

Marburg in Rwanda (2024): Rwanda's response to its first Marburg outbreak proved highly effective. Building on strong government leadership and public health infrastructure, and with international support including from the United States and the WHO, the outbreak was efficiently contained with nonpharmaceutical infection control measures, as vaccine and treatment trials were also being initiated. The outbreak was declared over in December 2024 with 66 confirmed cases and 15 deaths.

Sudan Ebola in Uganda (2025): When Sudan ebolavirus reappeared in Uganda in January 2025, researchers and WHO partners including IAVI, the International AIDS Vaccine Initiative, initiated a vaccine trial within four days thanks to prepositioned vaccines and preapproved clinical trial protocols.

In each of these outbreaks, vaccines, including trial candidates, had been developed through publicly funded research (mainly by the US government), were manufactured in high-income countries, and all had to be shipped to the African region.

H5N1 bird flu: The ongoing H5N1 outbreak in US dairy cattle highlights how political considerations can hamper effective outbreak response even in wealthy countries when agricultural industry interests are prioritised over public health. A key mRNA vaccine development contract is now under review, potentially reversing prevention and preparedness efforts. The experience also underscores why one country should not be the prime investor in R&D.

The WHO R&D blueprint provides a scientific framework for preparedness, but gaps remain in coordinating global research priorities. Newer WHO initiatives such as the Collaborative Open Research Consortium[7] and i-MCM-Net[8] are important, but add to a complex landscape of overlapping networks with uncertain integration including with the future Global Pandemic Supply Chain and Logistics Network agreed in the text of the pandemic agreement.[9]

Funding for R&D investments in MCM is completely insufficient, and the future is uncertain: IPPS reports US$1.45 billion mainly for vaccines, some therapeutics, and diagnostics R&D for priority pathogens (excluding COVID-19) during 2020–2023.[5] US government departments provided 78% of this funding, and this already thin pipeline is now at greater risk due to abrupt US cuts in 2025.

The Coalition for Epidemic Preparedness Innovations CEPI has remained at the centre of many efforts to support PPPR vaccine development and manufacturing and is expanding into biological drugs. So far, the majority of CEPI's R&D investments have been granted to entities in high-income countries (HICs),[1] with LMIC partners solicited primarily for manufacturing. CEPI's funding may also be vulnerable to US funding cuts. The future of the Foundation for Innovative Diagnostics (FIND), important in guiding diagnostic development and rollout during COVID-19, is uncertain. There is as of yet no effective coordination or funding to establish a global PPPR therapeutics development coalition.

Several global initiatives focus on increasing Global South resilience. The WHO/Medicines Patent Pool (MPP)-coordinated mRNA technology transfer programme, supported by Canada and European donors including France, represents a potentially transformative initiative supporting regional R&D capacities.[10] The South African technology hub has developed and is sharing an mRNA platform with manufacturers in 15 middle-income countries. Brazil has also developed its own mRNA technology. However, the endeavour is challenged to develop new products with freedom to operate and without intellectual property barriers—which is critical to become economically sustainable.

With a greater focus on manufacturing and hosted by CEPI, the Regionalized Vaccine Manufacturing Collaborative (RVMC) aims to foster sustainable regional manufacturing networks that can produce vaccines for routine use and ramp up in times of crisis,[11] while the International Vaccine Institute (IVI) has increased its footprint with projects including the Advancing Vaccine End-to-End Capabilities initiative in Africa.[12] Under Brazil's leadership, BRICS countries are discussing a BRICS vaccine R&D centre.

How resilient are regions and what are the barriers?

Several regions are harnessing political leadership towards greater self-resilience and resilience, but finance, governance, regulatory simplification, and other issues need continued attention and resolution.

Latin America

Latin America has diverse pharmaceutical manufacturing capabilities, particularly in Argentina, Brazil, Chile, Colombia, Cuba, and Mexico. Publicly funded vaccine producers form cornerstones of health systems in Brazil and

Cuba, and Cuba was the only Latin American country to develop its own COVID-19 vaccines, for which it transferred technology within and beyond the region.[13] During the pandemic, several countries received technology transfers, primarily for fill-and-finish operations, from AstraZeneca, CanSino, Gamaleya, and Sinovac.[14] Brazil's public manufacturers (Butantan and Bio-Manguinhos) were key recipients, with only Bio-Manguinhos receiving both fill-and-finish and drug substance transfers from AstraZeneca, enabling fully sovereign production.[15] While mAbxience in Argentina received drug substance technology, fill-and-finish was transferred in Mexico, creating bottlenecks to supply and access.[14]

The region is actively strengthening innovation capabilities, and Brazil and Argentina are participants in the WHO/MPP mRNA technology transfer programme. Argentina, Brazil, and Cuba have substantial and growing diagnostics R&D and manufacturing across multiple platforms.[16] Generic drug manufacturing including some biological drugs is significant, though home-grown therapeutic innovation remains limited.

Recent regional resilience initiatives include PAHO's Innovation and Regional Production Platform[17] and Brazil's G20-launched Global Coalition for Local and Regional Production, Innovation, and Equitable Access.[18] These build upon PAHO's successful pooled procurement mechanisms, so far used primarily to buy at low cost in the international market. With political will and the right policy framework, it could be harnessed as an incentive for regional developers. Sinergium Biotech in Argentina will be the first Latin American company to supply a regionally produced vaccine (a technology transfer from Pfizer) to PAHO's Revolving Fund.[19] Bio-Manguinhos' mRNA development project, designed to navigate the complex intellectual property (IP) landscape and establish freedom to operate, exemplifies local innovation efforts.

Key challenges in Latin America persist, including limited access to new technologies and continued reliance on international companies for new product R&D, restrictive licensing agreements that constrain freedom to operate beyond initial products, and financing difficulties as countries face historic debt burdens and high interest rates for international capital.

Africa

Despite numerous new initiatives strengthening pandemic preparedness in Africa, pharmaceutical self-sufficiency remains primarily framed around building a competitive marketplace, with unclear implications for equitable access.

The African Union (AU) and Africa Centres for Disease Control and Prevention (Africa CDC) have taken steps to strengthen regional pharmaceutical manufacturing capacity, and more modestly R&D capacity, with a goal to locally manufacture 60% of Africa's immunisation needs by 2040.[4,20] This builds upon AU pooled vaccine procurement for COVID-19 and includes the Platform for Harmonized African Health Products Manufacturing with investments in infrastructure, local manufacturing, and regulatory oversight. These efforts receive support from international partners including the World Bank, European Investment Bank, US International Development Finance Corporation, Team Europe, and development agencies and foundations including Gavi, the Vaccine Alliance; CEPI, IVI, the Gates Foundation, Wellcome Trust, and the Mastercard Foundation.

Africa CDC leads on PPPR and coordinates this complex, multiyear effort. As of mid-2024, 25 vaccine manufacturers operate on the continent in varying stages of maturity and technology transfer, backed by different investors. While three manufacturers are expected to produce eight WHO-prequalified vaccines by 2030,[25] affordable supply is already available through mainly India-based high-volume, low-cost suppliers and procured by UNICEF. Incentivising sustainable local production will require novel approaches including a clear health-industrial policy as is common practice in HICs that finance industry to benefit society.[21] For local manufacturing for health equity, this could include Africa CDC efforts to prioritise regional health needs such as Ebola, Marburg, and mpox, and focusing on collaboration for equitable access rather than the marketplace competition approach currently envisaged, including through Gavi's African Vaccine Manufacturing Accelerator.[22]

Specialised workforce capacity is another challenge. Africa CDC's Regional Capability and Capacity Networks address skills gaps in biomanufacturing and research, with five African institutions leading the efforts. Sustainable investments must include prepositioned clinical trial capacities and robust R&D pipelines.[23] Africa CDC has also launched a continental blueprint to combat endemic and neglected tropical diseases.[24]

The WHO/MPP-coordinated mRNA technology transfer programme centres on an R&D hub at Afrigen in South Africa, includes six African manufacturers, and has expanded research to include TB, HIV, RSV (respiratory syncytial virus), and Rift Valley Fever. However, it struggles to secure long-term financial and political support and economic sustainability. Each manufacturer is expected to compete in the market, including with each other and with other donor-supported mRNA initiatives as in Rwanda and Egypt. It also remains to be seen which of these initiatives will have the freedom to operate from IP constraints to adapt the mRNA platform to address regional health needs, and not merely produce under license of HIC innovators.

China and its role as supplier to LMICs

Since the 2003 SARS outbreak, China has invested substantially in MCM R&D, yielding a diversified pipeline to support rapid response to disease outbreaks.[26] The nation's emphasis on self-sufficiency in pharmaceutical development has resulted in end-to-end capacities across vaccine, therapeutic, and diagnostic value chains. Chinese researchers actively engage in pandemic readiness research through international collaborations such as the Pandemic Research Alliance.[27] China recently developed its own R&D blueprint for emerging infectious diseases and adapted WHO methodology to domestic risks of endemic and imported disease.[28]

During the COVID-19 pandemic, China emerged as the world's largest supplier of vaccines by volume (40% of global total)[29] and produced approximately 4 billion doses for domestic use and 2 billion for export. Primary manufacturers Sinovac Biotech (21%) and Sinopharm-BBIBP (19%) both produced inactivated virus-based vaccines that received WHO Emergency Use Listing in mid-2021. Chinese entities subsequently developed and manufactured vaccines using diverse technology platforms, including adenoviral vector, recombinant protein, and mRNA technologies.[30]

China's comprehensive capabilities mean it could rapidly adapt various technology platforms to emerging health threats and scale production to supply its population with vaccines, while also supporting international needs through donations, commercial sales, or technology transfer as it did during the COVID-19 emergency. Of note, China has large-scale and low-cost capabilities across the full supply chain, from raw materials to a range of finished products, as well as equipment, laboratory consumables, vials, and other products needed to supply pharmaceutical manufacturers globally, which can help lower the cost of R&D and MCM manufacturing.

India

India has long functioned as the "pharmacy of the developing world," with extensive capacity for low-cost generic drugs and vaccines. The Serum Institute of India (SII) is the world's largest vaccine producer. It supplied 22% of global doses in 2024, while Bharat Biotech, another Indian company, contributed an additional 9%.[31] India also leads in essential medicines production, including anti-infectives that were in short supply during the COVID-19 emergency. At that time, multiple Indian companies played crucial roles: SII, following technology transfer, produced over 2 billion doses of Oxford/AstraZeneca's adenoviral vector vaccine (Covishield), with 500 million exported across Africa, Asia, and Latin America; Dr. Reddy's Laboratories manufactured the Russian adenoviral vector vaccine Sputnik V, mainly for the Indian private market; and Bharat Biotech developed Covaxin, India's first domestically developed COVID-19 vaccine.

The country has demonstrated wide technological versatility, with Biological E producing Corbevax (a recombinant protein vaccine based on technology from Texas Children's Hospital), Zydus Cadila creating ZyCoV-D (the world's first DNA vaccine), and Gennova Biopharmaceuticals developed a self-amplifying mRNA vaccine (Gemcovac). Biological E has also joined the WHO/MPP mRNA technology transfer programme, positioning India to expand its mRNA capabilities. Several Indian manufacturers also signed licensing agreements with the Medicines Patent Pool to produce antivirals including molnupiravir and nirmatrelvir.

Despite these impressive capabilities across multiple technology platforms, Indian producers have primarily contributed to large-scale manufacturing of externally developed technologies rather than innovating their own. The question for the future is whether they will remain the high-cost, low-volume supplier for LMICs, or whether India's skilled scientists will also be incentivised to develop novel MCMs during future disease outbreaks and include commitments to affordable equitable access.

Rest of Asia

Many Asian countries, having experienced both SARS and COVID-19 and recognising risks exacerbated by climate change, continue to prioritise outbreak preparedness. Public-private initiatives including those catalysed by the Asian Development Bank, ASEAN (the Association of Southeast Asian Nations), and APEC (Asia-Pacific Economic Cooperation) advance regional collaboration across the R&D to manufacturing value chain including on active pharmaceutical ingredient production. The region's heterogeneity in technological capabilities, wealth, and health system structures provides opportunities for complementary approaches.

An ASEAN workshop concluded that vaccine R&D and manufacturing represent regional public goods that promote equity and system resilience.[32]

In Southeast Asia, emerging regional networks share commitments to public health R&D to fuel growing manufacturing capabilities and build regional resilience. For instance, the WHO/MPP SEA Vaccine R&D Consortium is researching mRNA vaccine candidates that target regional priorities such as dengue, hand-foot-mouth disease, and malaria. Another key initiative is the UK–SEA Vax Hub, aimed at synchronising R&D and manufacturing efforts across the region. The National Vaccine Institute in Thailand has established a strategic funding mechanism to support Good Manufacturing Practice clinical batch manufacturing and early clinical development efforts by academic researchers.

Europe

The **European Union** (EU) has strengthened its pandemic preparedness through the European Health Union[33] to improve coordination amongst member states, with key roles for the European Medicines Agency, European Centre for Disease Prevention and Control, and the Health Emergency Preparedness and Response Authority (HERA). The EU is home to a strong base of large and smaller pharmaceutical companies considered strategic partners for PPPR. The companies also wield significant influence with policymakers at the national and EU levels. HERA pioneered EU-wide pooled procurement during COVID-19 and oversees a network of four prepositioned vaccine manufacturing sites across three technology platforms (EU FAB) to be activated during emergencies.[34]

The EU is discussing an EU-wide compulsory licensing framework for emergency use,[35] despite opposing the TRIPS compulsory licensing waiver during COVID-19 and in pandemic agreement negotiations. While reasonably prepared for rapid MCM development and production, the EU's complex administrative structure, including the fragmentation of competencies between the EU governance and its members, proved a barrier during the 2022–2023 mpox outbreak. Similarly, PPPR funding is fragmented with countries both collaborating and competing. Recent geopolitical shifts are increasing investment in defence and the likely deprioritisation of other issues that could include health, environment, development cooperation, and PPPR, all of which are relevant to epidemic preparedness. Individual EU countries may retain a vested interest in PPPR, like Germany through its support of BioNTech both domestically and in Rwanda.

The United Kingdom has significant infectious disease research capacity and vaccinology expertise, with substantial government support for academic institutions and biopharmaceutical companies. For COVID-19, Oxford University rapidly developed a vaccine that was commercialised by AstraZeneca, then transferred to over 20 manufacturing sites globally and distributed to more than 170 countries. Unlike mRNA vaccines targeting wealthy markets, Oxford's vaccine was designed for global use with relative heat-stability, affordability, and nonexclusive licensing arrangements. The UK has recently established dedicated research infrastructure including Oxford's Pandemic Sciences Institute and Liverpool's Pandemic Institute, though government budget constraints for research and development aid, together with companies' concerns about a deteriorating investment climate, may affect future potential.

Russia has maintained pharmaceutical self-sufficiency, developing and producing the Sputnik V COVID-19 vaccine without significant international collaboration.[36]

For the **rest of Europe**, two of the WHO/MPP mRNA technology transfer partners are in Ukraine and Serbia.

United States

The US government's longstanding investments in health research and MCM development through the National Institutes of Health (NIH) and the Biomedical Advanced Research Development Authority (BARDA) provided the backbone of global pandemic response capacity. The US government was the largest research funder during COVID-19, providing an estimated US$2.2 billion for vaccine R&D alone, and by mid-2023 had donated some 685 million doses overseas.[37]

In addition to COVID-19 vaccines and treatments, the US health security ecosystem includes a range of pharmaceutical companies that have successfully delivered treatments and vaccines for Ebola, mpox, Marburg, and other outbreaks and is well equipped to mobilise its scientific and technological capacity against novel health threats. During 2020–2023, the United States was the biggest funder (78%) of the US$1.45 billion in investments in vaccines, therapeutic, and diagnostics R&D across PPPR priority pathogens globally (excluding COVID-19).[5]

US policy frameworks primarily derisk private sector innovation without conditions on access or pricing, which enabled Moderna and Pfizer to generate nearly US$100 billion in revenue during 2021–2022 while maintaining commercial monopolies that impeded equitable access. Recent steps to address this include NIH's policy requiring companies to develop access plans for publicly funded research.[38]

Recent major funding cuts and staff departures at NIH, CDC, and the Food and Drug Administration, however, signal a deprioritisation of science and research for health security, and big questions remain as to the role of the United States in R&D, manufacturing, and distribution of pandemic MCMs going forward.

An uneven system needs governance, investment, and orientation to equity

There are hopeful signs of progress and models upon which to draw, but the global and regional picture is fragmented and uneven. There are regions, large countries like India and China, and small countries like Cuba that can both care for their own needs and add to the global availability of PPPR MCMs. Others require much more financial support including from regional finance mechanisms, technology and knowledge transfer, and industrial health policy that favours R&D for public health outcomes. Given regional epidemiology, a focus on manufacturing without also investing into R&D capacity in an end-to-end ecosystem will maintain Global South dependency on HICs.

How to improve the ecosystem

Work to implement MCM provisions of the pandemic agreement must start now. The pandemic agreement contains provisions on R&D, technology and knowledge transfer, and manufacturing, which, if implemented in the spirit of equity, solidarity, and also subsidiarity, can lead to a system of collaborative research and regional resilience where outbreaks can be contained through rapid access to medical countermeasures.

Regional and national leaders must continue to build now towards the capacities agreed in the pandemic agreement, and they should treat outbreak and pandemic MCMs as public goods. They must take full stock of vulnerabilities to outbreaks and pandemic threats in their own country and region, and they must act to fill the gaps in health industrial policies, investment in R&D, arrangements for technology transfer, and manufacturing capacities to ensure sustained regional resilience.

Priority should be given to foster pilot R&D and manufacturing projects, for instance by adopting and adapting mRNA technologies or developing and producing therapeutic monoclonal antibodies. This will require equitable technology transfer and knowledge sharing to regional R&D hubs, with freedom to operate without undue IP barriers. This is a difficult hurdle, but overcoming it is essential to future pandemic preparedness and response.

CEPI and other predominantly Global North actors within the PPPR MCM ecosystem should expand their modus operandi to include significant R&D investments and equal partnerships in LMICs. They also should support technology and knowledge transfer for local/regional innovation, not just manufacturing.

Sustain the WHO/MPP hub, and use lessons to build further regional initiatives

The mRNA technology transfer programme holds promise but continued investments are not guaranteed, putting this potentially transformative project at risk. Future efforts must be designed with LMIC-led governance, address the needs of local developers and manufacturers, and financed to achieve regional resilience and equitable access.

Regional initiatives such as the G20 Global Coalition for Local and Regional Production, Innovation and Equitable Access, PAHO's Innovation and Regional Production Platform, and ASEAN's coordination efforts are promising and can also learn from the hub experience.

Middle-income countries must play a role in sustainable finance for MCMs

Financing for an MCM ecosystem must become a regional and also global priority, given the scale of funds required and now in major question due to US cuts. Middle-income countries could come together and collectively finance

some regional pilot R&D and manufacturing projects that address critical shared health needs, for instance in Asia or under the umbrella of PAHO's Innovation and Regional Production Platform. The BRICS could also play a leading role, including through the BRICS R&D Vaccine Centre.

Eventual pandemic agreement financing must ensure investment in regional self-reliance, and in the interim, existing mechanisms including the Pandemic Fund and the Africa Epidemics Fund should consider access to outbreak and pandemic MCMs as integral to pandemic preparedness.

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“Now is the time for leaders to act, with certainty, and make sure COVID-19 is the last pandemic of such consequence.”