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From Crisis to Confidence

Building a Pandemic-Ready Asia-Pacific

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Abbreviations

ADB	Asian Development Bank
APVAX	Asia Pacific Vaccine Access Facility
CAT-DDO	World Bank's Catastrophe Deferred Drawdown Option
CPGA	Crisis Preparedness Gap Analysis tool
CPRO	COVID-19 Pandemic Response Option
CPRT	World Bank's Crisis Preparedness and Response Toolkit
CRDC	climate-resilient debt clause
EOC	emergency operations center
GDP	gross domestic product
GISRS+	Global Influenza Surveillance and Response System
HEPR	World Bank's Health Emergency Preparedness & Response
IF-CAP	ADB's Innovative Finance Facility for Climate
IFI	international financial institution
IHR	International Health Regulations
IMF	International Monetary Fund
IPF-DDO	Investment Project Financing Deferred Drawdown Option
JEE	Joint External Evaluation
LMICs	low- and middle-income countries
MDB	multilateral development banks
PPR	pandemic preparedness and response
R2R	Ready-to-Respond diagnostic tool
RRO	Rapid Response Option
UHC	universal health coverage
WHO	World Health Organization

From Crisis to Confidence

Building a Pandemic-Ready Asia-Pacific

The COVID-19 pandemic marked a turning point in global health and economic security, exposing systemic vulnerabilities while catalyzing unprecedented collaboration. The crisis revealed deep structural gaps in preparedness, coordination, and financing that transformed a public health emergency into a multidimensional development crisis. Health systems faced acute overload, disrupting essential care in over 90 percent of countries (WHO 2022), while global economies contracted for the first time in six decades. The combined loss in output, employment, and human capital underscored that pandemic preparedness is not merely a health imperative but a foundation for economic stability.

Pandemic prevention and preparedness investments deliver returns far exceeding their costs, both in human and fiscal terms (Fan et al. 2024). Conservative estimates indicate that each dollar invested in preparedness globally can yield over ten dollars in avoided economic losses (Glennerster et al. 2022). Yet, despite this evidence, global pandemic preparedness and response (PPR) spending remains under $5 billion annually against an estimated need of $31 billion (Duran-Fernandez et al. 2024). The shortfall is most pronounced in low- and middle-income economies, where fiscal fragility constrains sustained investment in health security and response systems.

A resilient and pandemic-ready Asia-Pacific rests on four strategic pillars: globally networked surveillance and research, robust national systems, equitable access to medical countermeasures, and coherent global governance and financing. Each pillar reinforces the others by linking early warning to sustained response and long-term recovery. Multilateral development banks (MDBs) and international financial institutions (IFIs) play a decisive role in translating these priorities into finance and implementation, bridging global norms with domestic fiscal frameworks. Innovations such as the G20 Pandemic Fund, the Asia Pacific Vaccine Access Facility (APVAX) and COVID-19 Pandemic Response Option (CPRO), both established by the Asian Development Bank (ADB), and the World Bank's Health Emergency Preparedness & Response (HEPR) platform are redefining how health systems are financed

by treating health as an investment in economic resilience rather than a cost of social protection.

The experience of recent years signals a paradigm shift: from funding disease control to financing systemic resilience. Preparedness must now be embedded within fiscal policy, climate adaptation strategies, and public investment systems. For the Asia-Pacific region, home to over half the world's population and the epicenter of both pandemic risk and growth potential, building pandemic readiness is not only essential to safeguarding lives but also to securing inclusive and sustainable development for decades to come.

HISTORICAL PANDEMIC PREPAREDNESS GAPS: THE PAIN AND NEGLECT CYCLE

Pandemic preparedness has historically been characterized by a cycle of panic and neglect. The world has suffered from episodic, fragmented responses to health emergencies, followed by complacency and a lack of will to build robust preventive systems. From the influenza pandemics of 1918, 1957, and 1968 to more recent outbreaks such as SARS (2003), H1N1 (2009), and Ebola (2014–16), each outbreak led to the creation of new institutions, coordination mechanisms, or emergency funds (World Bank 2025). However, very few measures evolved into sustained systems with predictable financing or accountability. This cyclical approach has created a fragile global architecture, one that learns quickly but forgets faster.

The Global Preparedness Monitoring Board's *A World at Risk* report, published in 2019, warned that the world remained dangerously unprepared for a fast-moving respiratory pathogen (GPMB 2019). It estimated annual underfinancing for pandemic preparedness at roughly $30 billion, with the largest gaps in low- and middle-income countries (LMICs) (Duran-Fernandez et al. 2024). Despite repeated recommendations after SARS (2003), H1N1 (2009), and Ebola (2014–16), investment in prevention, workforce development, and surveillance capacity remained inconsistent (GPMB 2021). Even as global frameworks such as the International Health Regulations (IHR, revised in 2005) and the Global Health Security Agenda expanded, compliance and accountability remained partial.

Global health security systems face systemic fragmentation, and their governance capabilities remain lacking. The IHR, which are legally binding on all 196 World Health Organization (WHO) member states, require countries to build core capacities in surveillance, laboratory

diagnostics, and risk communication. However, by 2019, fewer than 40 percent of countries had achieved even basic compliance with such requirements (GPMB 2019). Independent reviews of pandemic responses during previous outbreaks identified challenges such as delayed reporting, limited transparency, and insufficient authority to verify data. Moreover, pandemic preparedness was often siloed within health ministries, detached from finance, trade, and defense sectors that determine national resource allocation.

The PPR financing gap compounded long-standing governance weaknesses. Despite repeated calls for sustained investment after SARS, H1N1, and Ebola, global health security financing remained crisis-driven, spiking during emergencies but fading once the immediate threat passed. Between 2016 and 2018, contributions to the WHO Contingency Fund for Emergencies fell by over 30 percent, reflecting the absence of predictable, multi-year funding streams (GPMB 2019). A 2022 WHO–World Bank analysis estimated that only US$4–5 billion was being invested annually in preparedness, compared with an estimated global requirement of $31 billion, including around $10 billion in external support for low- and middle-income countries (WHO and World Bank 2022). Most LMICs lacked fiscal space to maintain surveillance, workforce, and emergency-response functions between crises, relying on fragmented donor projects rather than stable domestic allocations. Without preparedness embedded in national budgets and multilateral frameworks, countries remained locked in a cycle of reactive spending, delayed mobilization, and chronic vulnerability.

The legacy of underinvestment and institutional fragmentation left every region vulnerable, but its consequences were particularly acute in the Asia-Pacific. Despite early lessons from SARS and avian influenza, preparedness capacities remained inequitable. While high-income economies built advanced surveillance networks, many LMICs struggled to maintain routine laboratory and emergency-response operations. Regional mechanisms such as ASEAN's Disease Outbreak Response System of Systems and the South-East Asia Regional Health Emergency Fund represented progress, yet both lacked sustainable financing and interoperability with global frameworks. As a result, the region entered 2020 with strong technical expertise but limited fiscal flexibility, coordination capacity, and supply-chain resilience.

HEALTH AND ECONOMIC SHOCKS OF THE COVID-19 CRISIS

The COVID-19 pandemic produced a simultaneous health and economic shock worldwide. Between January 2020 and December 2023, WHO estimated that over 14 million excess

deaths occurred worldwide, with nearly half of them being in Asia (WHO 2022). Estimates suggest that global excess deaths were about 2.7 times the number of COVID-19 reported deaths (Msemburi et al. 2023). These may have been caused by health system overload, treatment delays, or unrecorded community transmission. In many countries, particularly in the Asia-Pacific region, health infrastructure faced severe shortages of oxygen, intensive care beds, and trained personnel.

During the peak of the crisis, health systems experienced acute overload. In more than 90 percent of countries surveyed by WHO, essential services, including maternal and newborn care, childhood immunization, and non-communicable disease management, were disrupted (WHO 2022). Vaccination campaigns were paused, elective surgeries postponed, and diagnostic and preventive programs scaled back as facilities redirected staff and supplies to emergency response. Community outreach nearly ceased, producing a "missing cohort" of patients whose unmet care needs continue to strain systems even today. In South Asia, outpatient visits in public hospitals dropped by more than 40 percent at the pandemic's height, and recovery has remained uneven across subdregions (Manna et al. 2025). Routine immunization coverage in Southeast Asia fell from 91 percent in 2019 to 83 percent in 2022, erasing nearly a decade of progress (WHO n.d.).

The global economic fallout was equally severe. The International Monetary Fund (IMF) estimates cumulative output losses of $12.5 trillion between 2020 and 2024, equivalent to almost 9 percent of pre-pandemic gross domestic product (GDP) (CNBCTV18 2022). The economies of Asian developing countries collectively contracted by 0.7 percent in 2020, marking their first recession in six decades (ADB 2020). Similarly, the GDP of South Asian countries fell by 5.5 percent (ADB 2020). Tourism revenues plunged by over 70 percent in Pacific Island economies (ADB 2020). ADB estimates that between 108 and 166 million jobs were lost across the region in 2020 alone, with women and workers in informal sectors most affected (Sawada and Sumulong 2021). The resulting income collapse reversed years of gains in poverty reduction, pushing tens of millions back below national poverty lines.

Governments across the world deployed fiscal stimulus and social protection packages amounting to 5–10 percent of GDP, financed largely through deficit spending (IMF 2020). Fiscal deficits widened by an average of seven percentage points in 2020, and debt-to-GDP ratios surpassed 60 percent in half of the region's economies. To meet immediate health and welfare obligations, many countries postponed infrastructure and capital spending. By 2023,

more than 40 percent of low-income Asian and Pacific economies were at high risk of debt distress (IMF 2023).

The socioeconomic consequences of the pandemic continue to persist. Labor-force participation and productivity remain below pre-pandemic levels in developing countries, while inflation-driven food and energy price shocks have aggravated inequality. School closures, averaging 41 weeks in Asia, resulted in an estimated 0.8 learning-adjusted years of schooling lost per child (ADB 2021). The prolonged disruptions to education, employment, and health services have left enduring scars on human capital.

The pandemic's intertwined health and economic effects underscore that weak health systems carry macroeconomic consequences far beyond the health sector. In the Asia-Pacific, where large informal economies, limited fiscal buffers, and fragmented insurance systems persist, the impacts have been particularly enduring.

STRUCTURAL LESSONS FROM THE COVID-19 PANDEMIC

The COVID-19 crisis underscored the need for a structural transformation in how countries prepare for, govern, and finance health emergencies. The experience has redefined preparedness not as a sectoral function but as a cross-government, economy-wide responsibility.

The pandemic revealed that preparedness cannot rely on episodic emergency measures or donor-driven projects. A robust global framework requires *preventive safeguarding and sustained readiness*. COVID-19 showcased how countries that had invested consistently in prevention, such as Singapore's integrated risk communication systems or Vietnam's field epidemiology programs, managed to contain early outbreak waves effectively. Going forward, preparedness must be treated as a standing public good, funded through multi-year domestic allocations and embedded within fiscal frameworks rather than as ad-hoc responses. Regular stress testing of national health security capacities, linked to expenditure reviews and debt sustainability analyses, can also help governments balance preventive spending with macro-fiscal discipline.

Institutional coordination is essential for faster response to disease outbreaks. During the COVID-19 crisis, fragmented command structures delayed action and complicated logistics. Decision-making often oscillated between health ministries, finance authorities, and interior or trade departments without a unified chain of accountability. A whole-of-government

crisis architecture anchored in high-level coordination bodies and supported by legally mandated emergency operations centers is essential for rapid and coherent response. Integrating preparedness into national disaster risk reduction frameworks and climate adaptation agendas can strengthen this alignment. Regionally, mechanisms such as ASEAN's Health Emergency Operations Network and the WHO's South-East Asia Regional Health Emergency Fund can evolve from coordination forums into operational platforms capable of pooled procurement, data sharing, and joint deployment.

Regulatory strengthening and technology governance are prerequisites for scientific advancement. Science and technology proved decisive in mitigating the COVID-19 pandemic's trajectory, but gaps in regulatory agility and data governance slowed equitable access to vaccines. Accelerated vaccine development demonstrated the potential of global collaboration, yet the absence of harmonized regulatory standards and technology-transfer mechanisms perpetuated delays across LMICs. Building regional regulatory coherence through mutual recognition agreements and fast-track approval mechanisms can shorten the time from innovation to access. Strengthening digital health regulations, data protection laws, and interoperability standards will also be central to scaling real-time surveillance and cross-border information exchange.

A *whole-of-systems approach* to resilience is the only way to successfully navigate through another pandemic. The most critical insight from COVID-19 is that health security cannot be isolated from social and economic systems. Preparedness must extend beyond hospitals and laboratories to include supply chains, education, labor, and social-protection systems that determine population resilience. Countries with robust primary health networks, digital identification systems, and social registries were able to sustain essential services and deploy relief more quickly. Embedding pandemic readiness within universal health coverage (UHC) frameworks and national development plans will ensure that investments yield broader welfare gains while protecting equity.

THE ECONOMIC CASE FOR PANDEMIC-PREPAREDNESS FINANCING

Pandemic preparedness is a strategic investment in resilience rather than a discretionary health expense. The economic fallout from COVID-19 exposed a core fault line in pandemic preparedness and response: countries that underinvested in readiness paid with lost output, heavier debt burdens, and persistent social damage. Since then, quantifying avoidable losses and missed gains has shown that the returns on PPR investments justify sustained financing, especially in LMICs.

The scale of economic disruption during COVID-19 underscores the stakes. IMF projections place cumulative global output losses of roughly $12.5 trillion through 2024, a figure that captures only direct macroeconomic contraction and not downstream human-capital damage or social losses (CNBCTV18 2022). Empirical estimates suggest medium-term output will remain around 3 percent below pre-pandemic trends in many economies, reflecting persistent “scarring” of productivity, investment, and labor supply (IMF 2022). According to the World Bank’s East Asia and Pacific economic update, by the end of 2020, output in the four other major economies (Indonesia, Malaysia, the Philippines, and Thailand) remained, on average, around 5 percent below pre-pandemic levels (World Bank 2021). The lost growth pathways reflect not just the shock year but a lasting interruption to investment, schooling, and cross-border trade.

Health systems also experienced severe setbacks. Countries reported that over 90 percent faced disruption to essential services during the crisis, including immunization, maternal care, and chronic disease management (WHO 2022). The additional morbidity and mortality from deferred care, mental-health impacts, and noncommunicable disease progression signify health system costs due to the backlog of unmet care needs.

Multiple simulated and empirical studies strengthen the case that preparedness delivers high returns. A cost-benefit analysis presented at the Center for Global Development estimates that a COVID-like pandemic scenario yields $1,703 in health gains and $1,102 in economic gains for every dollar invested in pandemic preparedness, while averting 49 to 124 deaths per 100,000 population (Center for Global Development n.d.). Annual global preparedness needs are estimated between $24.8 billion and $43 billion, with benefit–cost ratios exceeding 10:1 (WHO and World Bank 2022). In the context of emerging diseases,

preventive investments often pay off many times over in preserved economic output and avoided health-system collapse.

Under-preparedness forces countries to pay twice: first through output loss, then through higher intertemporal borrowing costs and reduced policy space. In response to COVID-19, governments launched stimulus packages averaging 5–10 percent of GDP, often funded by expanded deficits (IMF 2020). Many postponed capital investments in health infrastructure and resilience to meet short-term consumption and welfare demands. Debt-to-GDP ratios rose sharply, and by 2023, over 40 percent of low-income countries in the Asia-Pacific were at high risk of debt distress (IMF 2023).

Preparedness also functions as a counter-cyclical stabilizer. In crisis years, preserving budgets for health-security infrastructure (laboratories, surveillance, stockpiles) reduces the need for more costly emergency borrowing. If such budgets are embedded in medium-term plans, they are less vulnerable to cuts during downturns, thus smoothing macro volatility during crises. In addition, consistent transparency through publicly tracked preparedness metrics enhances investor confidence and can, over time, reduce sovereign risk.

The Asia–Pacific region stands to gain disproportionately from investing in PPR. High population densities, trade openness, and interconnectivity raise exposure to cross-border pathogen spillovers. The region also hosts substantial manufacturing and logistics capacity. Empirical projections suggest that PPR investments in Asia are highly cost-effective, as the incremental GDP preserved by averting even modest pandemic-induced economic contractions would far outweigh the cost of establishing robust PPR systems. The cost for investments in prevention and detection are estimated to be at least six times lower than those for response, indicating that the economic benefits can exceed costs by several multiples (Bali et al. 2024). Moreover, mitigating large economic losses helps prevent divergence in long-term development paths, particularly for secondary cities and rural areas often squeezed hardest in downturns.

The economic case for investing in pandemic preparedness is compelling and quantifiable. The losses from COVID-19 show that readiness is not optional. Preventive investments yield high returns in health, output, and macro stability.

PILLARS OF PANDEMIC PREPAREDNESS AND RESPONSE

Building pandemic resilience requires translating lessons and economic rationale into a clear operational framework. The post-COVID consensus emerging from the G20, WHO, World Bank, and regional development banks converges on four interlocking pillars.

Globally Networked Surveillance and Research

Early detection and transparent information sharing remain the most cost-effective form of pandemic defense. Despite progress since SARS and Ebola, gaps in surveillance, genomic sequencing, and data exchange persist. By 2023, fewer than one-third of low-income countries had the capacity to link genomic data with clinical and epidemiologic surveillance in real time (Gonzalez-Reiche 2023). The Global Influenza Surveillance and Response System (GISRS+), WHO's Epidemic Intelligence Hub (Berlin), and the Pathogen Access and Benefit-Sharing System envisioned under the Pandemic Agreement represent milestones toward an integrated global network. For the Asia-Pacific, advancing this pillar means establishing interoperable regional platforms that integrate human, animal, and environmental health ("One Health") data into risk assessment. ASEAN's Health Cluster 2, ADB's One Health Framework (2023–2027), and the ASEAN Regional Public Health Laboratory Network are critical building blocks. Strong cross-sectoral collaboration and robust data sharing can improve early detection and rapid response mechanisms for zoonotic threats. Integrated surveillance and response frameworks under a One Health approach enable accelerated interventions and outbreak containment at source, thus minimizing transmission risks and reducing economic impact (Zhang, Guo, and Lv 2023). Investments should prioritize (1) real-time digital surveillance infrastructure; (2) secure data standards and cross-border interoperability; and (3) genomic and epidemiologic workforce training. Global modelling indicates that an additional investment of $3–4 billion annually in surveillance capacity could avert $350 billion in global GDP losses in a moderate-severity pandemic scenario (Clarke et al. 2022).

Resilient National Systems

Health-system resilience, the capacity to absorb shocks while maintaining essential services, is the foundation of preparedness. During COVID-19, 90 percent of countries reported disruptions to essential care (WHO 2022). This interruption revealed that surge capacity must be built on strong primary-care and logistics backbones. Resilience requires sustained investment in six "core capacities" identified by WHO and the Joint External Evaluation (JEE):

emergency coordination, surveillance, laboratory systems, workforce, logistics, and risk communication. Countries with pre-existing emergency operations centers (EOCs), multi-sectoral crisis units, and established surge-finance protocols, such as Korea and Thailand, contained outbreaks faster and avoided prolonged lockdowns. For the Asia-Pacific, priorities include integrating preparedness metrics into UHC plans, financing climate-resilient health infrastructure, and establishing protected fiscal lines for emergency logistics and workforce surge. ADB and WHO analyses estimate that closing basic capacity gaps in 20 priority economies would require $6–8 billion annually but yield avoided economic losses of more than $100 billion in a severe outbreak scenario (Bali et al.).

Equitable Supply of Medical Countermeasures and Tools

The third pillar addresses the chronic inequity and delay in access to vaccines, diagnostics, and therapeutics. Concentrated manufacturing and fragmented procurement left many LMICs months behind in vaccine coverage. Moreover, ten global economies still control more than 80 percent of global vaccine production (WHO 2023). To prevent such disparities, the global community is converging on the need for regional manufacturing ecosystems supported by technology transfer and pooled procurement. CEPI's 100-Days Mission and WHO's mRNA Vaccine Technology-Transfer Hub (South Africa) are prototypes in this direction. Similar initiatives in Asia, such as the ASEAN Vaccine Security and Self-Reliance initiative, the Quad Vaccine Partnership, and India's expansion of bulk-antigen capacity, can collectively shift the region from dependency to self-sufficiency. A 2024 McKinsey–CEPI study estimates that reducing the time from pathogen identification to vaccine availability from nine months to three could save $2–3 trillion in global output losses in a severe pandemic (Sabow et al. 2024). Complementary investments in cold-chain resilience, digital logistics, and regulatory harmonization (e.g., participation in the WHO Listed Authority network) are essential to realize this pillar.

Global Governance and Financing

The fourth pillar underpins the others: coherent governance and predictable financing. The post-COVID global architecture remains fragmented, with overlapping mandates and time-bound resources. The Pandemic Agreement (2025) and the amended IHR (2005) seek to formalize coordination through binding obligations on transparency, data sharing, and equitable access. Yet financing also remains a constraining variable. WHO–World Bank estimates place annual global needs at $31 billion, of which $10.5 billion should be met by international support (Duran-Fernandez et al. 2024). The Pandemic Fund, though catalytic,

currently disburses less than $1 billion per year, a tenth of requirements (Pandemic Fund 2024). Strengthening global governance will mean aligning mandates: WHO for norms and oversight; the World Bank and MDBs for financial sustainability; and regional entities such as ADB for country-level implementation and monitoring. Embedding preparedness within fiscal-sustainability frameworks, including sovereign risk models, national development plans, and debt-relief mechanisms, can reframe PPR as an economic safeguard rather than an emergency cost. Ultimately, predictable global financing and transparent accountability will determine whether the world escapes the "panic and neglect" cycle that defined past responses.

HEALTH-SYSTEM PARADIGM SHIFT AND INTERNATIONAL FINANCE INSTITUTION INNOVATIONS

The aftermath of COVID-19 has catalyzed a fundamental shift in how governments, IFIs, and development partners conceive of health systems. The pandemic revealed that health is not a self-contained social sector but a macro-critical domain that underpins economic stability, fiscal sustainability, and climate resilience. This realization is reshaping investment logic across the multilateral system, driving a transition from vertical, disease-specific interventions to integrated, systems-based financing that links health security, digital transformation, and environmental sustainability.

The emerging paradigm recognizes that preparedness, UHC, and economic resilience are interdependent. Health systems must therefore be designed not only to deliver care but to absorb and adapt to disruptions from pandemics, climate events, and economic crises. The World Health Organization's Health Systems Resilience Framework (2024) articulates this as the capacity to "absorb, adapt, and transform." Countries such as Thailand and the Republic of Korea demonstrated that strong primary-care networks, digital surveillance platforms, and pre-positioned emergency operations centers enable rapid containment without compromising essential services.

IFIs are increasingly aligning their operational models with this resilience agenda. The World Bank's HEPR platform and the Asian Development Bank's recent investments in Mongolia, Sri Lanka, and the Pacific Islands embed preparedness indicators directly into sovereign lending frameworks. These programs finance laboratory networks, digital health architecture, climate-resilient hospital design, and workforce surge capacity under government budget systems rather than donor silos. By treating preparedness as part of fiscal planning

and public-investment management, IFIs help countries shift from reactive aid dependence to long-term system ownership.

The integration of climate and health marks another inflection point. The intensifying climate crisis is amplifying vector-borne and zoonotic diseases, injuries resulting from extreme weather, and nutrition-related morbidity. The World Bank estimates that, without adaptive investment, climate-related health shocks could cause 15 million excess deaths and $20.8 trillion in economic losses in LMICs over the next quarter-century (World Bank 2024). In response, IFIs are embedding health resilience into climate-finance pipelines. The G20 Delhi Declaration (2023) formally recognized climate and health as a shared global priority, and IFIs have begun integrating "green health" metrics into project appraisal frameworks. This includes indicators for renewable-energy systems for hospitals, decarbonized supply chains, and flood-resilient infrastructure, among others. This approach reframes health spending as dual-purpose investment that yields both adaptation and emission-reduction co-benefits.

Financial innovation underpins this transformation. IFIs are piloting blended-finance models that combine concessional funds, guarantees, and private capital to expand fiscal space for health security. Instruments such as debt-for-health swaps, impact-linked financing, and contingent credit lines allow countries to access liquidity rapidly when outbreaks occur while preserving solvency. The World Bank's Catastrophe Deferred Drawdown Option (CAT-DDO) and ADB's guarantee-based Innovative Finance Facility for Climate (IF-CAP) illustrate how balance sheet optimization can multiply resources several-fold. Applying similar mechanisms to health would enable countries to secure "always-on" preparedness financing without adding unsustainable debt.

At the same time, digitalization is redefining both service delivery and governance. Artificial intelligence, big data, and real-time analytics are transforming epidemic intelligence, logistics, and decision-making. Yet these advances outpace regulatory frameworks in many LMICs. Without interoperable standards, cybersecurity safeguards, and equitable access to digital tools, technological progress could entrench new forms of inequity (Ra and Arora 2025). MDBs and development agencies thus face a dual responsibility: investing in digital public goods while supporting governments in developing ethical, privacy-protective governance architectures.

The cumulative direction of change points toward a unified development-health compact. IFIs can operationalize such a compact by establishing cross-sectoral country platforms that

convene ministries of finance, health, and environment to jointly plan and monitor investments. Integrating health security into climate-finance taxonomies, green-bond frameworks, and sovereign-risk assessments will ensure that preparedness is no longer viewed as a cost center but as a stabilizing asset. The paradigm shift is therefore not merely institutional, it is conceptual: from financing disease response to funding resilience.

IFI Innovations: The Example of the World Bank's CPRT

The World Bank's Crisis Preparedness and Response Toolkit (CPRT), launched in 2024, represents a significant evolution in how international financial institutions integrate resilience into development finance. Rather than relying solely on ex-post emergency lending, the CPRT embeds pre-arranged crisis financing and debt-service flexibility directly into sovereign lending portfolios. Through instruments such as the Rapid Response Option (RRO) and Investment Project Financing Deferred Drawdown Option (IPF-DDO), countries can repurpose up to 10 percent of undisbursed funds or access contingent credit lines when emergencies strike. This accelerates response without new borrowing or prolonged approval processes. Complementary climate-resilient debt clauses (CRDCs) allow temporary suspension of repayments following qualifying disasters, freeing fiscal space for urgent recovery needs.

Beyond financial flexibility, the CPRT advances an institutional model for preparedness. The Ready-to-Respond (R2R) diagnostic and Crisis Preparedness Gap Analysis (CPGA) tools assess national readiness across governance, fiscal, and operational dimensions, helping governments identify bottlenecks and prioritize investments. These diagnostics have already been deployed in fragile and small-state contexts, guiding reforms in risk governance and budgetary resilience. Early applications in Mozambique and the Caribbean have demonstrated tangible benefits in the form of pre-agreed contingent funds and CRDC activation enabled governments to mobilize resources within days of cyclones and hurricanes, reducing the lag between disaster onset and fiscal response.

The CPRT exemplifies a shift from reactive crisis management to anticipatory resilience financing. By linking diagnostics, pre-arranged finance, and debt flexibility, the framework offers a replicable model for other MDBs. For the Asia-Pacific region, where natural disasters, pandemics, and climate shocks increasingly intersect, adapting CPRT-like mechanisms within regional development portfolios could ensure liquidity, stability, and institutional readiness before crises escalate. It underscores how IFI innovation can convert financial instruments into strategic tools for long-term pandemic and climate preparedness.

THE ROLE OF MULTILATERAL DEVELOPMENT BANKS IN PPR FINANCING

MDBs and IFIs occupy a unique position in the global pandemic preparedness architecture. Their financial scale, policy leverage, and country partnerships make them critical for operationalizing preparedness as a development priority. MDBs can convert technical regulations into finance, fiscal integration, and implementation pathways. COVID-19 illustrated this complementarity where MDBs deployed over $200 billion in emergency health and social protection financing between 2020 and 2022, cushioning fiscal shocks and supporting vaccine access in over 150 countries (Lee and Aboneaaj 2021).

Despite this mobilization, PPR remains marginal within MDB portfolios, accounting for under 3 percent of total sovereign lending (WHO and World Bank 2022). This underrepresentation stems from traditional portfolio design, which treats health emergencies as temporary shocks rather than systemic risks. Therefore, it is essential to embed PPR within sovereign risk management and national development planning. MDBs can mainstream PPR in three interlinked ways: (1) integrating preparedness metrics into programmatic policy operations; (2) aligning concessional resources with results-based triggers linked to surveillance, emergency response, and service continuity; and (3) leveraging private capital through blended instruments that de-risk investment in health infrastructure and supply chains.

MDBs must extend their traditional health financing mandate beyond universal health coverage to encompass One Health, climate-health resilience, and rapid-response facilities. The Asian Development Bank's IF-CAP offers a relevant model for health: its guarantee-based structure multiplies concessional resources by up to five times, freeing balance-sheet space for crisis response. Similar contingent finance mechanisms could be applied to health, establishing pre-approved pandemic credit lines, counter-cyclical reserves, and parametric insurance triggers that automatically release funds upon verified outbreak thresholds.

Multilateral agencies can also help correct the asymmetry in preparedness investment between high- and low-income economies. Data from the Institute for Health Metrics and Evaluation show that high-income countries spend 30 times more per capita on health security than low-income ones, even though vulnerability is greater in the latter. MDBs can reduce this inequity by pooling financing and providing predictable disbursement mechanisms. Their engagement also strengthens country ownership by embedding preparedness

within fiscal frameworks rather than donor projects, transforming short-term crisis relief into long-term resilience.

CONCLUSION

The COVID-19 crisis was a profound stress test for health, economic, and governance systems worldwide, and its lessons remain urgent. The pandemic revealed that unpreparedness carries cascading consequences, including the collapse of health services, the reversal of development gains, and the destabilization of economies. The magnitude of global losses, measured in trillions of dollars and millions of lives, demonstrated that preparedness is not a discretionary expense but a foundation of macroeconomic stability. Countries that invested early in surveillance, resilient systems, and inclusive access managed to contain shocks and recover faster, proving that health security and economic security are inseparable.

For the Asia-Pacific, the path forward lies in transforming vulnerability into long-term resilience. Building pandemic readiness requires embedding preparedness within fiscal and development planning, not as an emergency measure but as a permanent policy function. The region's diverse economies can draw on collective strengths in manufacturing capacity, technological innovation, and strong regional cooperation to institutionalize the four pillars— globally networked surveillance and research, a resilient national system, an equitable supply of medical countermeasures and tools, and global governance and financing—thereby maximizing pandemic prevention, preparedness, and response. Achieving this will depend on sustained political will and predictable financing, supported by the catalytic role of multilateral development banks and international financial institutions that can align public investment with global standards and private capital.

The coming decade presents a narrow but decisive window to consolidate these gains. Climate change, urbanization, and ecological disruption are intensifying the probability of new zoonotic spillovers. Meeting this challenge demands a shift from episodic response to continuous readiness, from isolated health interventions to integrated systems that link health, the environment, and the economy. Strengthening regional solidarity, transparency, and mutual accountability will be vital in ensuring that no country is left exposed when the next threat emerges.

A pandemic-ready Asia-Pacific is not an aspiration but an imperative. The lessons of COVID-19 call for institutionalized preparedness that transcends political cycles and emergency budgets. By treating health resilience as a global public good, the region can turn its experience of crisis into a model of sustained, inclusive security for the world.

REFERENCES

ADB (Asian Development Bank). 2020. *Asian Development Outlook 2020 Update: Wellness in Worrying Times*. September. https://www.adb.org/sites/default/files/publication/635666/ado2020-update.pdf.

ADB. 2021. *Learning and Earning Losses from COVID-19 School Closures in Developing Asia*. Special Topic of the Asian Development Outlook 2021. https://www.adb.org/sites/default/files/publication/692111/ado2021-special-topic.pdf.

Bali, Sulzhan, Sheila Dutta, Christophe Lemiere, Helene Ries, Jake Robyn, and Minn Thu. 2024. *Preventing the Next Pandemic in East Asia and Pacific: How a One Health Approach Can Help*. World Bank Group. http://documents.worldbank.org/curated/en/099042124233010071.

Center for Global Development. n.d. "What Is the Return on Investment of Pandemic Preparedness?" Event summary. Accessed November 14, 2025. https://www.cgdev.org/event/what-return-investment-pandemic-preparedness.

Clarke, Lorcan, Edith Patouillard, Andrew J. Mirelman, Zheng Jie Marc Ho, Tessa Tan-Torres Edejer, and Nirmal Kandel. 2022. "The Costs of Improving Health Emergency Preparedness: A Systematic Review and Analysis of Multi-Country Studies." *EClinicalMedicine* 44 (January): 101269. https://doi.org/10.1016/j.eclinm.2021.101269.

CNBCTV18. 2022."COVID-19: Total Losses Likely to Touch $13.8 Trillion by 2024, Says IMF Chief Economist Gita Gopinath." January 26. https://www.cnbctv18.com/world/covid-19-total-losses-likely-to-touch-138-trillion-by-2024-says-imf-chief-economist-gita-gopinath-12246202.htm.

Duran-Fernandez, Roberto, Daniel Bernal-Serrano, Jose Alberto Garcia-Huitron, and Raymond Hutubessy. 2024. "Financing for Pandemic Preparedness and Response Measures: A Systematic Scoping Review." *Bulletin of the World Health Organization* 102 (5): 314-322F. https://doi.org/10.2471/BLT.23.290207.

Fan, Victoria, Sun Kim, Diego Pineda, and Stefano Bertozzi. 2024. "Pandemic Financing Demystified: Essential Takeaways from Our New Paper." Center for Global Development. https://www.cgdev.org/blog/pandemic-financing-demystified-essential-takeaways-our-new-paper.

Glennerster, Rachel, Christopher M. Snyder, and Brandon J. Tan. 2022. "Calculating the Costs and Benefits of Advance Preparations for Future Pandemics." NBER Working Paper No. 30565. National Bureau of Economic Research. https://doi.org/10.3386/w30565.

Gonzalez-Reiche, Ana S. 2023. “SARS-CoV-2 in Low-Income Countries: The Need for Sustained Genomic Surveillance.” *The Lancet Global Health* 11 (6): e815–16. https://doi.org/10.1016/S2214-109X(23)00197-3.

GPMB (Global Preparedness Monitoring Board). 2019. *A World at Risk: Annual Report on Global Preparedness for Health Emergencies*. World Health Organization. September. https://www.gpmb.org/reports/annual-report-2019.

GPMB. 2021. *From Worlds Apart to a World Prepared: Global Preparedness Monitoring Board Report 2021*. World Health Organization. https://www.gpmb.org/docs/librariesprovider17/default-document-library/gpmb-annual-report-2021.pdf .

IMF (International Monetary Fund). 2020. *Fiscal Monitor, October 2020: Policies for the Recovery*. October. https://doi.org/10.5089/9781513552705.089.

IMF. 2022. *World Economic Outlook: War Sets Back the Global Recovery*. April. https://www.imf.org/en/Publications/WEO/Issues/2022/04/19/world-economic-outlook-april-2022.

IMF (International Monetary Fund). 2023. IMF Annual Report 2023. https://www.imf.org/external/pubs/ft/ar/2023/in-focus/public-debt/.

Lee, Nancy, and Rakan Aboneaaj. 2021. “MDB COVID-19 Crisis Response: Where Did the Money Go?” CGD Note. https://www.cgdev.org/sites/default/files/mdb-covid-19-crisis-response-where-did-money-go.pdf.

Manna, Ridwana Maher, Md Hafizur Rahman, Tasnu Ara, et al. 2025. “Impact of COVID-19 on In-Patient and Out-Patient Services in Bangladesh.” *PLOS One* 20 (2): e0315626. https://doi.org/10.1371/journal.pone.0315626.

Msemburi, William, Ariel Karlinsky, Victoria Knutson, Serge Aleshin-Guendel, Somnath Chatterji, and Jon Wakefield. 2023. “The WHO Estimates of Excess Mortality Associated with the COVID-19 Pandemic.” *Nature* 613 (7942): 130–37. https://doi.org/10.1038/s41586-022-05522-2.

Pandemic Fund. 2024. *Building a Pandemic-Resilient World: The Pandemic Fund Inaugural Progress Report 2023–24*. https://www.thepandemicfund.org/annual-progress-report.

Ra, Sung Sup, and Dinesh Arora. “Global Health at a Crossroads: Why Now is the Time for Fundamental Reform.” Shorenstein Asia-Pacific Research Center. October 6. https://aparc.fsi.stanford.edu/news/global-health-crossroads.

Sabow, Adam, Jennifer Heller, Michael Conway, and Rosa Poetes. 2024. “Beyond the Pandemic: The Next Chapter of Vaccine Development.” McKinsey & Company. May 16. https://www.mckinsey.com/industries/life-sciences/our-insights/beyond-the-pandemic-the-next-chapter-of-innovation-in-vaccines.

Sawada, Yasuyuki, and Lea Sumulong. 2021. "Macroeconomic Impact of COVID-19 in Developing Asia." ADBI Working Paper Series No. 1251. Asian Development Bank Institute. April. https://doi.org/10.2139/ssrn.3912360.

WHO (World Health Organization). 2022. "14.9 Million Excess Deaths Associated with the COVID-19 Pandemic in 2020 and 2021." News release. https://www.who.int/news/item/05-05-2022-14.9-million-excess-deaths-were-associated-with-the-covid-19-pandemic-in-2020-and-2021.

WHO. 2023. "Global Vaccine Market Report: 2023 Update." https://cdn.who.int/media/docs/default-source/immunization/mi4a/who_gat_008_global_vaccine_market_report_march_12.pdf?sfvrsn=a61f4733_1.

WHO. n.d. "Global Excess Deaths Associated with COVID-19 (Modelled Estimates)." Accessed November 11, 2025. https://www.who.int/data/sets/global-excess-deaths-associated-with-covid-19-modelled-estimates.

WHO (World Health Organization) and World Bank. 2022. *Analysis of Pandemic Preparedness and Response (PPR) Architecture, Financing Needs, Gaps and Mechanisms*. Prepared for the G20 Joint Finance & Health Task Force. March 22. https://thedocs.worldbank.org/en/doc/5760109c4db174ff90a8dfa7d025644a-0290032022/original/G20-Gaps-in-PPR-Financing-Mechanisms-WHO-and-WB-pdf.pdf.

World Bank. 2021. *Uneven Recovery* World Bank East Asia and Pacific Economic Update. April. DOI: 10.1596/978-1-4648-1702-1.

World Bank. 2024. *The Cost of Inaction: Quantifying the Impact of Climate Change on Health in Low- and Middle-Income Countries*. https://documents1.worldbank.org/curated/en/099111324172540265/pdf/P5005831a1804a05f19aae18bc0f1396763.pdf.

World Bank. 2025. "Preparedness for Epidemics and Pandemics: Evaluation of World Bank Group Support." Approach Paper. June 3. https://openknowledge.worldbank.org/bitstreams/dc97564c-1c89-4573-89be-2667e7e7ed59/download.

Zhang, Li, Wenqiang Guo, and Chenrui Lv. 2023. "Modern Technologies and Solutions to Enhance Surveillance and Response Systems for Emerging Zoonotic Diseases." *Science in One Health* 3 (December): 100061. https://doi.org/10.1016/j.soh.2023.100061.

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