BUILDING RESILIENCE TO FUTURE OUTBREAKS

INFECTIOUS DISEASE RISK FINANCING SOLUTIONS FOR THE CENTRAL ASIA REGIONAL ECONOMIC COOPERATION REGION

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On the cover: Epidemics and pandemics pose potentially enormous financial costs on governments. Regional infectious disease risk financing solutions can help strengthen countries' disaster risk management strategies and public sector budget resilience.

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Abbreviations

ADB	Asian Development Bank
ARC	African Risk Capacity
CAREC	Central Asia Regional Economic Cooperation
CCHF	Crimean–Congo hemorrhagic fever
COVID-19	coronavirus disease
DRC	Democratic Republic of the Congo
GDDRC	Global Disease Detection Regional Center
GDV	Gesamtverband der Deutschen Versicherungswirtschaft e.V. (German Insurance Association)
IDA	International Development Association
ILS	insurance-linked securities
JEE	joint external evaluation
O&E	outbreak and epidemic
PEF	Pandemic Emergency Financing Facility
PRC	People's Republic of China
SMEs	small and medium-sized enterprises
WHO	World Health Organization

Executive Summary

The coronavirus disease (COVID-19) pandemic and associated social and economic costs have placed infectious disease at the top of sovereign and corporate risk registers. The high level of infections and recorded deaths, along with extensive fiscal and social policies to control outbreak spread and provide support, illustrate some of the impacts from a disease outbreak. The uneven global response confirms that many countries lacked the necessary systems, infrastructure, and policies to mitigate such impacts. Yet, the most damaging effects of outbreaks can be avoided through improved pandemic preparedness to enable quick and aggressive action at the earliest stages, and through systems for identification, contact tracing, and quarantining of initial cases. The dramatically different morbidity and mortality impacts across Central Asia Regional Economic Cooperation (CAREC) member countries exemplify the potential positive influence of early action through planned, proactive crisis management.

The CAREC region was badly affected by COVID-19. Although infections and deaths vary significantly, all countries experienced an enormous economic shock. Asian Development Bank (ADB) economic modeling estimates a 2.1% contraction in the economic growth of Central Asia in 2020. Estimates made in 2019 for 2020 anticipated a 4.5% growth rate, revealing the six to seven percentage-point swing induced by COVID-19. Like others around the world, CAREC governments had few well-designed emergency plans to enact and no specific fiscal support measures on the shelf. Improved infectious disease risk management is essential to safeguard future aspirations of economic development.

This study is part of ADB's support to CAREC member countries to strengthen their disaster risk management strategies and public sector budget resilience. The technical assistance targets the development of a regional risk transfer solution, and infectious disease risk is being scoped in this context. Potential future scenarios for COVID-19 and the risk profile of other outbreaks have been modeled and presented to governments. This report advances such work to explore possible regional and national risk financing solutions for infectious disease outbreaks. It reviews global practice and develops recommendations for CAREC member states to progress toward a risk financing structure. We anticipate that the pilot phase of the regional risk transfer facility is likely to provide flood and/or earthquake risk financing as a first stage. The opportunity to develop infectious disease coverage is significant and urgent following the impacts of the COVID-19 pandemic, and we encourage fully leveraging the regional risk transfer pilot to fast-track implementation of an infectious disease risk financing solution.

A critical pillar of disaster risk management is risk financing. Many governments found financing for infectious disease outbreaks had not been formalized. This prompted a wave of rapidly designed and implemented programs, such as procurement of medical equipment, small and medium-sized enterprises (SMEs) credit and tax measures, and income support. Fiscal rules were altered to enable such extraordinary expenditure. There is broad agreement that, although such structures were necessary, this ad hoc approach is suboptimal in terms of effectiveness and cost-efficiency.

The prearrangement of financing for shock events greatly enhances the timeliness, cost-efficiency, and effectiveness of response. Global evidence indicates that disaster risk financing for natural hazards such as floods, earthquakes, and droughts has provided protection for public and private sector balance sheets following event occurrence. Reserve funds, contingent credit, and risk transfer can provide much needed liquidity for response, recovery, and, in some cases, reconstruction. The ex ante nature of risk financing increases the predictability of the volume and timing of payments that can support contingency planning.

Financing arrangements for pandemic risk were virtually nonexistent before COVID-19. The difficulties with private sector risk transfer, namely insurance, have constrained availability. A respiratory pandemic such as COVID-19 brings extreme risk to lives and livelihoods, as well as the potential for global accumulation of losses; it is the ultimate covariant risk. The maximum possible economic loss from such an event could exceed the total capital of the global insurance industry. This makes the full risk profile of a global pandemic effectively uninsurable with conventional insurance market tools. Insurance can, however, provide targeted and robust financing for aspects of infectious disease risk, including rapid response and containment of infectious disease spillover events which could cause epidemics or pandemics.

Examples of infectious disease risk financing do exist, and are notable given their rarity. Motivated by the West Africa Ebola outbreak in 2015, the African Risk Capacity (ARC) is developing an outbreak and epidemic (O&E) insurance product for member governments. Following capacity building and contingency planning activities, countries would be eligible to become insured under a parametric program, with payouts to help fund agreed contingency plans designed to avoid the further growth of an outbreak. Another approach is the Pandemic Emergency Financing Facility (PEF). Enacted in 2017 as a catastrophe bond supported by the World Bank, PEF targeted fast financing for developing-country government response following an outbreak of one of a number of infectious diseases. Coronaviruses were included and PEF paid the full amount eligible for COVID-19 (\$195 million). This payment, however, lagged the outbreak by a couple of months, not meeting the original intention of the program. An earlier series of Ebola outbreaks in the Democratic Republic of the Congo also did not pay out due to the lack of multicountry mortality, which was a condition of payment. The PEF has not been renewed following the maturity of the bonds. Serving the private sector, and aside from ad hoc coverages that included infectious disease risk (e.g., for sports events such as Wimbledon), a single product was developed, PathogenRx, offering nondamage business interruption insurance to SMEs. However, no PathogenRx cover was ever sold and, at the beginning of 2020, there was a vanishingly small volume of pre-identified infectious disease risk transfer taking place globally outside of the life insurance sector. These programs underline the importance of product simplicity for a complex risk such as infectious diseases. They also illustrate that innovative insurance solutions for tranches of risk can be developed and implemented.

The onset of the COVID-19 pandemic may prove to be a turning point in formal risk financing for infectious disease outbreaks. Interest in financing for a future infectious disease outbreak is unprecedented: an array of public-private risk financing partnerships in India, the United States, the United Kingdom, and across Europe have been rapidly proposed. The diversity of schemes demonstrates the willingness to explore what is possible and what associated initiatives (e.g., improved modeling and surveillance) may be required to improve risk management and financing of outbreaks. Proposals vary in how risk is shared between government and the private sector, the target beneficiaries, the implementation mechanism, and the overall financing commitment. There are similarities with other risks of large socioeconomic impact, such as flooding and terrorism, which necessitated public-private partnerships to find an acceptable and durable balance of responsibilities between the state and the insurance market, and such programs have acted as a starting point for many of these proposals. Although none have progressed beyond concept stage, the sheer number of schemes investigating potential public-private partnerships mirrors the process undertaken following extensive flooding and severe terrorism events to develop durable risk financing solutions for both risks.

A review of these proposals is instructive for CAREC member countries. The proposed schemes broadly require significant government responsibility for risk, with some including ultimate backstopping of the solution via a government guarantee. The use of parametric triggers is popular to provide objectivity in conditions for, and speed of, payment, as well as to reduce operational costs. Many proposals logically aim to help SMEs, who were particularly impacted by COVID-19 control measures but are the backbone of CAREC economies. Proposals also harness the existing infrastructure of insurance companies as distributors: to access and contact beneficiaries, to administer policies, and to make payouts. With a low insurance penetration, it is unlikely CAREC member states will be able to capture these benefits in quite the same way. Finally, most proposals are deliberate in incentivizing or requiring investment in preparedness for future outbreaks, understanding that risk financing works most effectively as part of a holistic risk management strategy.

A series of lessons emerge for CAREC member countries following a review of previous risk financing solutions and newly developed proposals. Identifying the function of financing is the first step. Coverage for emergency response costs is one standout option, much like the motivation of PEF and ARC's product. A CAREC regional facility could build on the progress made by the four sovereign catastrophe risk pools: the Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company, ARC, the Pacific Catastrophe Risk Insurance Company, and the Southeast Asian Disaster Risk Insurance Facility. To appropriately plan financing for response costs, countries need to identify and assess their projected needs. It is this process that links improved preparedness and management of outbreaks to risk financing; early funds, successfully deployed, are hugely cost-effective in infectious disease risk management. A future regional mechanism could provide payment to a government to implement pre-agreed and mutually supportive contingency plans, with a reward for successful control. The regional pool could also be a catalyst and convener for coordinated disease surveillance, laboratory capacity, and catastrophe risk initiatives.

The study proposes three infectious disease risk financing mechanisms for CAREC member countries. First is a *spark risk cover*, to provide rapid financing for countries to manage an outbreak and aim to contain spread within as small an area as possible. This can be designed to access the reinsurance or insurance-linked securities market. Second is a *containment financing mechanism*, to finance activities in neighboring countries to a country claiming under the spark risk cover. Mobilizing and implementing activities in neighboring countries are to further strengthen the initial early response, with the focus on preventing the development of a regional or global outbreak. This is likely to rely on donor financing, and ADB can play a leading role in the development and verification of pre-agreed response activities, as well as to convene donors. Third, is a domestic focused *SME business interruption* program. Economic impacts fall heavily on this sector and support is likely to be necessary in a medium-sized outbreak. A public-private partnership framework is most suitable for this third option.

The enabling environment for a CAREC infectious disease risk financing mechanism should be advanced.

A comprehensive approach to future outbreaks requires the integration of risk financing and risk management. Alone, a risk financing mechanism is unlikely to be sustainable or durable. Therefore, key next steps include the following: assessing country and regional outbreak preparedness, identifying areas of high risk and vulnerability, analyzing gaps to determine and prioritize preparedness investments, assembling data on costs, ensuring local and regional laboratory capacity and surveillance systems, developing a centralized platform for infectious disease outbreak control and response, developing contingency and response plans, and discussing financing and response costs in a CAREC forum. Formally linking risk management to risk financing provides scope to strengthen incentives for proactive identification of outbreaks, and fast and aggressive action when necessary. Cross-region collaboration adds value in such activities.

The CAREC region is exposed to future infectious disease outbreaks. Aspirations for future economic development are intertwined with increased trade, connectivity, and mobility. These exacerbate the exposure of individual countries to a future outbreak and affirm the importance of a regional approach. The COVID-19 experience is just one type of infectious disease outbreak. Epidemics and pandemics vary in their morbidity and mortality impact and in the response measures required. Preparedness, surveillance, and contingency planning for future outbreaks need to be developed to safeguard against the multiplicative nature of infectious disease risks.

1.1 Infectious Disease Risk

The coronavirus disease (COVID-19) pandemic has induced enormous economic and social cost globally, with significant impacts across the Central Asia Regional Economic Cooperation (CAREC) region.¹ Numerous drivers, including intensifying global travel connectivity and natural resource exploitation, point to the future salience of infectious disease risk. Indeed, infectious disease features in the 2021 World Economic Forum Global Risks Landscape as the most severe global risk.² Assessments of this kind tend to emphasize the severity of events over the frequency. A perception of a low-frequency event means preparedness and response may not command appropriate policy decision-making relevance and urgency.

Post-event assessments of epidemic preparedness prior to the COVID-19 pandemic highlight systemic gaps. The variance between and within countries in their initial response to the emergence of a novel agent indicates low levels of coordination. Uncertainty is high in the early stages of an epidemic or pandemic. The highly uneven global response to COVID-19 confirms that many countries lacked sufficient (or did not sufficiently implement) critical contingency planning and emergency protocols that might have dampened and even eliminated early contagion. Many countries also lacked the necessary systems, infrastructure, and policies to mitigate the negative impacts of the pandemic once it had taken hold.

It is instructive to compare epidemic and pandemic risk to other risks and emergencies faced by governments, such as disaster events. Governments generally devote far greater attention to the monitoring, planning for, and reduction of flooding, tropical storm, and earthquake risk. When viewed through this lens, the maturity—more accurately the immaturity—of infectious disease risk management is clear. Preparedness assessments, laboratory capacity, surveillance, and contingency and response plans can all be introduced or advanced, much like the monitoring and response measures for disasters.

¹ CAREC member countries are Afghanistan, Azerbaijan, Georgia, Kazakhstan, the Kyrgyz Republic, Mongolia, Pakistan, the People's Republic of China (Inner Mongolia Autonomous Region and Xinjiang Uygur Autonomous Region), Tajikistan, Turkmenistan, and Uzbekistan. ADB placed on hold its assistance in Afghanistan effective 15 August 2021. All references to Afghanistan in this report are based on information available as of 30 July 2021.

² World Economic Forum. 2021. *The Global Risks Report 2021, 16th Edition.* Geneva.

This study is part of the Asian Development Bank (ADB) technical assistance to CAREC member countries to strengthen their disaster risk management strategies and public sector budget resilience. The technical assistance profiles earthquake, flood, and infectious disease risk to inform the design of a regional risk transfer facility to spread and share such risk. The COVID-19 pandemic illustrates the urgency of an improved risk management response. Potential future scenarios for COVID-19 were modeled and presented to governments in December 2020. The risk profiles of other outbreaks were also investigated. This report builds on such work to explore the contours of possible regional risk financing solutions for infectious disease outbreaks. It reviews global practice and develops recommendations for CAREC member states to progress toward a risk financing structure.

Risk financing is a core tenet of holistic risk management. The growth of disaster risk financing instruments to manage the financial impacts of disasters is well-documented, and partially motivated by the increase in the total cost of disaster events. Public sector balance sheets, at a sovereign and subsovereign level, are increasingly seeking financial protection against costs imposed by these events. Likewise, increased use of insurance-linked securities (ILS), specifically catastrophe bonds, demonstrates the interest from capital markets actors beyond the insurance sector in providing disaster risk capital. Abundant supply, coupled with increasing risk recognition, understanding, and quantification, is driving the prominence of these tools for governments.

Epidemics and pandemics pose potentially enormous financial costs on governments. Aptly demonstrated by the COVID-19 pandemic, the most damaging economic and social impacts of the pandemic stemmed from the response to managing the transmission of the virus. Lockdowns, stay-at-home orders, and forced workplace closures are the most tangible manifestations. Income support schemes and other social safety nets have also been introduced or expanded, both vertically (amount of support provided) and horizontally (number of recipients included).

Before the COVID-19 pandemic, explicit private insurance for infectious disease risk was rare outside of the life sector. The global nature of a pandemic, and thus correlation among insurance policyholders, is a foundational actuarial challenge to underwriting this risk. The COVID-19 experience reveals available but rarely in-place coverage in "specialty" lines of insurance, such as event cancellation and trade credit. Some business interruption policies also provided inadvertent cover. Governments and private entities found there to be a large financial gap when the COVID-19 pandemic accelerated. Efforts to close this protection gap now have momentum.

1.2 Report Structure

This report will evaluate the possibilities for epidemic or pandemic risk financing for CAREC member states. The structure is as follows:

- (i) Section 2 describes the infectious disease risk profile of the CAREC region, identifying exposure of countries and possible sources of spark and modalities of spread;
- (ii) Section 3 presents an actuarial view of the characteristics of infectious disease risk to explain why private insurance is scarce;
- (iii) Section 4 details case studies of infectious disease risk financing to collate lessons learned for the CAREC region;
- (iv) Section 5 expands this analysis to review proposed public-private partnerships that deliver risk financing; and
- (v) Section 6 is a series of recommendations to inform infectious disease risk management and financing for CAREC member countries.

2 Infectious Disease Risk Profile

This section identifies the nature of the infectious disease risk profile to inform on the most applicable and effective management measures for CAREC member governments.

2.1 CAREC Risk Profile

Even prior to the COVID-19 pandemic, accumulated evidence demonstrated that infectious disease outbreaks were increasing in frequency,³ with rising health consequences and economic damage. The underlying drivers of this trend—population growth and urbanization, travel, climate change, and greater natural resource extraction—are unlikely to decelerate.

Estimates of disease emergence risk suggest that the CAREC region is relatively unlikely to be the origination point ("spark") for a novel virus. However, the region borders some of the highest risk areas, with South, Southeast, and East Asia of particular concern given travel and trade patterns across the region. An analysis of Metabiota's historical dataset found that, over the last 20 years and with the exception of the endemic Crimean–Congo hemorrhagic fever (CCHF), historical outbreaks of emerging pathogens that have impacted the CAREC region were reported to have begun predominantly in the People's Republic of China (PRC), specifically in provinces and special administrative regions that are not part of the CAREC region. Notable examples include the first severe acute respiratory syndrome-associated coronavirus (SARS-CoV-1) epidemic of 2002/2003 and the ongoing SARS-CoV-2 pandemic.

This suggests that, for CAREC countries, preparedness strategies will most usefully emphasize ongoing health surveillance at key points of entry (airports, border crossings, and major transit routes) that link the region with geographies that have significant risk for infectious disease emergence. This is particularly relevant as there may be an increase in risk of spillover of pathogens from animal to human populations (known as zoonotic pathogens) as climate change alters animal habitats and human–animal interactions.

Despite the aforementioned points identifying relatively low spark risk, the risk to the region for infectious disease events remains significant. Global transportation and trade create the potential for spread and introduction of infectious diseases across regions, and once a pathogen is introduced into the region—especially a respiratory pathogen—there immediately exists the risk for spread among the population.

³ K. F. Smith, M. Goldberg, S. Rosenthal, L. Carlson, J. Chen, C. Chen, and S. Ramachandran. 2014. Global Rise in Human Infectious Disease Outbreaks. *Journal of the Royal Society Interface*. 11(101).

This general pattern is borne out in the results of infectious disease risk modeling carried out for the country risk profile reports prepared under this technical assistance, which are summarized in Table 2.1.

The estimates in Table 2.1 are of average annual loss, which is essentially the expected loss per year. Epidemics and pandemics occur sporadically, and observed losses will generally vary widely from a summary statistic such as average annual loss. Endemic diseases, which may become an epidemic, such as the CCHF, tend to track more closely to the average annual loss. Such is the nature of outbreaks and pandemics that there is the potential for more severe events, such as COVID-19, or other simulated, realistic, and scientifically plausible events, which far exceed the average in terms of human and economic losses.

As Table 2.1 indicates, risk across the region (summarized here in average annual deaths) is driven heavily by respiratory pathogens that are imported into the region, followed distantly by the CCHF (which is endemic to some CAREC areas). The average annual loss to the CAREC region is greater than 25,000 deaths (as well as 4.5 million infections and 60,000 hospitalizations).⁴ These numbers are significant for the region.

Location	Combined	Respiratory (Influenza, Novel Coronavirus)	Crimean-Congo Hemorrhagic Fever	Nipah Virus
Afghanistan	3,234	3,231	3	0
Azerbaijan	197	197	0	0
Georgia	76	76	0	0
Kazakhstan	340	322	17	1
Kyrgyz Republic	128	126	1	0
Mongolia	67	67	0	0
Pakistan	19,540	19,480	53	7
PRC, Inner Mongolia Autonomous Region	405	404	1	0
PRC, Xinjiang Uygur Autonomous Region	406	390	16	0
Tajikistan	165	164	1	0
Turkmenistan	127	126	0	0
Uzbekistan	720	661	58	1

Table 2.1: Estimated Average Annual Loss (Deaths) in the CAREC Region

CAREC = Central Asia Regional Economic Cooperation, PRC = People's Republic of China.

Source: Consultant Team Modeling.

⁴ Estimates from infectious disease modeling analysis of respiratory viruses (pandemic influenza and coronaviruses), CCHF, and Nipah virus.

3 Principles of Infectious Disease Risk Financing

3.1 Principles of Insurance

Private provision of insurance against the financial consequences of infectious disease outbreaks remains very low. Prior to the COVID-19 pandemic, demand for such coverage was not sufficient to motivate serious attention from the nonlife insurance sector. Fundamental actuarial concerns also acted as a disincentive to product development.

As a form of risk financing, insurance converts risk into capital and transfers this onto entities better capable of spreading risk across space and through time. Insurance works by pooling risks, to capture benefits from the law of large numbers. Insurance thus converts a potentially large loss for many into a small, sure cost (the premium) for all.

To permit this transaction, a set of conditions determine "insurability," which is a risk that can be transferred to risk-carrying entities. Insurability is predicated on the risk being quantifiable, diversifiable, and enforceable.⁵

- (i) Quantifiable: it must be possible for an underwriter to assess the risk—the probability of loss and the likely quantum of that loss. Good data reduce uncertainty; high uncertainty means at best higher cost, at worst a lack of appetite at any price.
- (ii) Diversifiable: insurers can bear only so much undiversified risk on their balance sheet. They can seek to balance their portfolio with reinsurance from specialized reinsurance companies who themselves may diversify their portfolio with retrocessional reinsurers or the capital market. If this reinsurance becomes unavailable at economic cost, the ability of primary insurers to accept correlated risk will evaporate.
- (iii) Enforceable: the inverted production cycle in insurance leads to strict solvency regulation. With premiums paid up front, the policyholder relies on the risk carrier remaining solvent throughout the contract period. Capital holdings help secure solvency of the carrier and protect the interests of all policyholders.

There are also basic economics to be fulfilled. Net premiums charged, after reinsurance costs, need to be sufficient to cover expected losses plus the costs of servicing policies and transacting business. These prices must remain affordable to those seeking protection for longevity and sustainability of that product line.

⁵ H. C. Kunreuther, M. V. Pauly, and S. McMorrow. 2013. *Insurance and Behavioral Economics: Improving Decisions in the Most Misunderstood Industry*. Cambridge University Press.

3.2 The COVID-19 Experience

The COVID-19 pandemic revealed the rapid and enormous escalation of economic consequences associated with changes in human behavior, often reinforced through implementation of measures to contain the spread of the virus. Incurred expenditure, revenue foregone, and additional debt were imposed on sovereigns, corporates, and households alike. The scale of this shock, and the speed of fiscal response, is unprecedented.

Broad consensus on the COVID-19 economic impact points to a 4.5%–4.9% reduction in global growth in 2020,⁶ followed by a fast bounce back, leaving the global economy the same size at the end of 2021 as it was in 2019. This translates to 2 years of lost growth when assessed on a global average, with significant regional and domestic disparities.

However, the form of the economic slowdown has meant that recovery in fundamentals is unlikely to be matched by recovery in some other metrics of human health and well-being. Many young people around the world have missed a full year of in-person education. The underemployment or unemployment experienced by many workers during the pandemic may also contribute to sustained economic "scarring" due to skill loss, challenges reentering the labor market, or potentially lasting changes to economic behavior (including reduced risk-taking and increased precautionary savings). These and other effects may have lasting and potentially compounding impacts.

ADB's economic modeling indicates a 2.1% contraction in gross domestic product across Central Asia,⁷ with 3.8% growth in 2021.⁸ Updated forecasts underline regional differences in future economic trajectories. Central Asia is anticipated to lag other regions in 2021 growth for a number of reasons. Among them is the ongoing containment of COVID-19, with the recent uptick of cases in some countries, which is delaying a reversion to expected growth rates. A structurally narrow export base and reliance on natural resources increase vulnerability to commodity price shocks and broader dynamics in the global economy. In contrast, East Asia is anticipated to grow over four percentage-points faster in 2021.

These forecasts have been updated throughout 2020, with Central Asia and Southeast Asia being revised downwards. The main determinant appears to be a more pessimistic view of control over COVID-19 circulation, including expectations on vaccine rollout, leading to longer-lasting requirements for measures to mitigate disease transmission and a slower reversion to normal human behavior and economic activity.

The arrangement of finance can mitigate economic losses and strengthen financial resilience.⁹ Such tools span public and private sector sources of financing, and the arrangement of financing before the event (ex ante) and afterwards (ex post).

⁶ International Monetary Fund (IMF) and Organisation for Economic Co-operation and Development (OECD) baseline projections; and ADB. 2020. An Updated Assessment of the Economic Impact of COVID-19. Manila.

⁷ The Central Asian region is composed of a different set of countries from the CAREC member countries. Some CAREC countries are from the South Asian region. GDP projections are regional-based and not disaggregated.

⁸ ADB. 2020. Asian Development Outlook 2020 Supplement: Paths Diverge in Recovery from the Pandemic. Manila. December.

⁹ W. Juswanto and S. Nugroho. 2017. Promoting Disaster Risk Financing in Asia and the Pacific. *ADB Institute Policy Brief.* No. 2017-1 (January). Tokyo: Asian Development Bank Institute.

26. The magnitude of the economic shock from COVID-19 overwhelms any arranged risk financing. It is highly likely this would overwhelm even the most prepared country. Many countries accessed funds from international organizations such as the International Monetary Fund and ADB. Assistance packages from ADB to CAREC member countries are detailed in Table 3.1. Such emergency assistance was provided on concessional terms and earmarked for activities including the rapid procurement of health system and laboratory capacity, the expansion of social protection mechanisms, and the provision of loans to small and medium-sized enterprises (SMEs). This broad array of activities was targeted at scaling up control measures essential for COVID-19 transmission management, securing a minimum standard of living for citizens, and loosening potential bottlenecks in the economy.

	ADB Assistance Package		
Recipient	Amount (\$ million)	Date	
Afghanistan	40.00	11 May 2020	
	24.00	2 September 2020	
	100.00	2 December 2020	
Georgia	100.00	28 May 2020	
	200.00	29 October 2020	
	2.50	7 December 2020	
Kazakhstan	1,000.00	25 June 2020	
	3.00	28 August 2020	
Kyrgyz Republic	50.00	4 May 2020	
	20.00	16 June 2020	
Mongolia	100.00	12 May 2020	
Pakistan	300.00	5 June 2020	
Tajikistan	50.00	18 June 2020	
	2.50	7 August 2020	
Uzbekistan	1.36	18 May 2020	
	500.00	25 June 2020	
Regional	20,000.00	13 April 2020	
Asia Pacific Vaccine Facility	9,000.00	11 December 2020	

Table 3.1: ADB COVID-19 Assistance to CAREC Member Countries

ADB = Asian Development Bank, CAREC = Central Asia Regional Economic Cooperation, COVID-19 = coronavirus disease. Source: ADB. News Releases on COVID-19 Financial Assistance to ADB Members.

27. Importantly, these packages were designed to reduce a government's exposure to foreign currency denominated debt in support of macroeconomic stability.¹⁰ Concerns regarding sovereign debt are rife, with many CAREC countries accessing bilateral debt to fund economic expansion. The G20 Debt Service Suspension Initiative provides 44 International Development Association (IDA) countries with a holiday on interest rate repayments on bilateral debt. As of July 2021, Afghanistan, the Kyrgyz Republic, Tajikistan, and Uzbekistan are participating, with Mongolia and Pakistan eligible but not participating.

¹⁰ ADB. 2020. ADB Approves \$200 Million Policy Loan to Support Georgia's Economic Recovery. News release. 29 October.

These ex post fiscal response packages from governments are estimated to total \$16 trillion as of March 2021 globally.¹¹ The magnitude of such response is far in excess of the capabilities of the insurance industry alone to provide financing: total global insurance premium income equates to \$5 trillion, with property and casualty premium income accounting for \$1.6 trillion.¹² Private sector risk financing is unable to match or replace the funding made available through this channel. Instead, future pandemic disaster risk financing should focus upon early response: reducing the probability of outbreak becoming epidemic, mitigating the immediate impact if disease spread is established, and reducing transmission as much and as early as possible.

3.3 COVID-19 and Insurability

The COVID-19 experience illustrates that government actions play an important, though complex, role in causation of impacts and losses of infectious disease events. Containment measures such as lockdowns contributed to enormous loss and damage to the real economy, although they may have also averted potentially large long-term losses. There are two takeaways relevant for the insurability of this event.

First is the difficulty of modeling government response. A majority of governments imposed unprecedented constraints on economic and social activities. The surprise was both the extent of lockdowns and the speed with which they were imposed. Governments responded to emerging data in different ways: some were quicker, while others were harsher in the constraints or slower in the easing of measures. When faced with similar data and high uncertainty, governments acted differently.¹³ Modeling such response is challenging. A confluence of drivers results in such government mandates, many of which are not based on probability. Quantifiability is a core condition of insurability.

Somewhat mitigating these challenges is emerging evidence that predictable human behavior—in particular, fear-induced behavioral changes, such as voluntary social distancing to reduce the risk of infection—is a key driver of economic impacts (e.g., people stop shopping in person before they are told to do this).¹⁴ These changes may also be a valuable proxy, or leading indicator, for government policy responses and actions.

Second is that government-initiated lockdowns resulted in many policyholders notifying claims on business interruption insurance. Common law systems have broadly sided with policyholders where wording on pandemic coverage was not explicitly ruled out.¹⁵ Effectively, the lockdown order from government may trigger losses under an insurance contract, illustrating how the interests of the government and insurance industry are not necessarily aligned. The importance of this government moral hazard is a differentiating factor of infectious disease events to many other systemic risks.

¹¹ IMF. 2021. Fiscal Monitor: A Fair Shot. Washington, DC.

¹² S. Johansson, A. Luo, E. Michel-Kerjan, and L. Zaharieva. 2020. State of Property and Casualty Insurance 2020. Chicago: McKinsey & Company.

¹³ D. Kessler. 2020. COVID-19 a Fractal Shock to the Reinsurance Industry. Industry keynote address for the Singapore International Reinsurance Conference 2020 Re-Mind virtual event. 2–5 November.

¹⁴ A. Goolsbee and C. Syverson. 2021. Fear, Lockdown, and Diversion: Comparing Drivers of Pandemic Economic Decline 2020. *Journal of Public Economics*. 193. 104311.

¹⁵ The Supreme Court of the United Kingdom (UKSC). 2021. Judgment 2021 UKSC 1 on Appeal from 2020 EWHC 2448. Press summary. 15 January.

The characteristics and complex interplay of insurance and COVID-19 are aptly demonstrated by the experiences of tennis tournaments in 2020. The All England Lawn Tennis Club, organizers of Wimbledon, had secured event cancellation insurance with pandemic coverage to much media acclaim.¹⁶ This allowed an early cancellation of Wimbledon, one of the remaining three Grand Slams to be played in 2020 following the global spread of COVID-19. In contrast, both the French Open and US Open were held, albeit with delays and mitigation measures. It was apparent that the French and American organizers did not have event cancellation insurance with events. It is reasonable to discern that the presence of effective insurance impacted the decisions of organizers.

The overall verdict, however, is not so straightforward. Although a loss to the unfortunate insurance carrier, the cancellation of Wimbledon helped control transmission of the virus. The organizers did not take a risk by holding the tournament, which may have increased transmission or, worse, developed into a super-spreader event. That Wimbledon announced an early cancellation also demonstrates that insurance can incentivize proactive, beneficial behavior during a pandemic.

Nevertheless, a comparison with a reasonable worst-case disaster event, such as a powerful earthquake impacting California, reveals how much more extreme pandemic losses can be. The enormous value at risk in California dwarfs that of many other locations and so a solitary event could lead to losses in excess of \$200 billion.¹⁷ This is likely to cause an increase in multiple lines of insurance pricing as risk carriers suffer a large loss. Yet, it is not an existential threat to the entire industry. The risks are well understood, insurers and reinsurers control their net exposure to a Californian earthquake and so contain their losses within their earnings and capital protection appetite. A global, rather than a regional, loss cannot so easily be controlled by such measures.

Following the COVID-19 experience, some insurance industry research affirms that many aspects of pandemic risk are not insurable. The Geneva Association, a think tank providing a view from the insurance industry, recently highlighted the order of magnitude disparity between losses from COVID-19 and the working capital of the insurance industry: business interruption insurance premiums equate to \$30 million a year, with COVID-19 business interruption losses estimated at \$4.5 trillion a year.¹⁸ The quantum is sufficient to appreciate that such risks cannot be fully transferred to the industry in this manner.

¹⁶ C. Ruel. 2020. Wimbledon Set for Coronavirus Windfall in Huge Pay-Out from Pandemic Insurance. *Insurance Times*. 14 April.

¹⁷ L. Jones et al. 2008. The ShakeOut Scenario. United States Geological Survey Open File Report 2008-1150 and California Geological Survey Preliminary Report 25.

¹⁸ K. U. Schanz. 2020. An Investigation into the Insurability of Pandemic Risk. The Geneva Association.

3.4 Pandemics and Insurability

Applying these criteria to pandemics partially explains the unavailability of "pandemic insurance." It is likely that the occurrence of a respiratory disease outbreak, such as SARS-CoV-2 or novel influenza, could potentially affect virtually all policyholders at the same time. The maximum possible loss from an event may not be reasonable or manageable. This aggregation of losses means the load required on premiums is far in excess of a premium that policyholders are willing to pay. The potential for this extreme chaotic accumulation of losses would breach core conditions of insurability.¹⁹

Yet, outbreaks vary widely in terms of their severity and impacts, both in terms of loss of life and economic damage; not all will cause severe, correlated economic losses. Vector-borne diseases, such as Zika virus disease or Chikungunya, could still cause losses sufficient to motivate risk transfer, but not have the same total correlated loss profile.

Outbreak Types

Outbreaks are categorized as follows:

- An epidemic can be defined as "the occurrence in a community or region of cases of an illness... clearly in excess of normal expectancy."
- (ii) A pandemic is an "epidemic occurring over a very wide area, crossing international boundaries, and usually affecting a large number of people."

As such, pandemics are defined by their geographic scale rather than their health or economic impacts. This enlarged spatial extent illustrates the additional challenges for insurability.

The declaration of an event, be that an epidemic or pandemic, by the World Health Organization or other reputable entity may be used to trigger risk management actions, as well as financing.

Source: M. Porta, ed. 2014. A Dictionary of Epidemiology. 6th ed. Oxford University Press.

Two notable outbreaks occurred in the 21st century: 2009 influenza²⁰ ("swine flu") and Zika²¹ in 2015–2016. Each led to elevated morbidity and varying degrees of elevated mortality in affected regions but did not lead to massive social and economic dislocation. This was due to the characteristics of each pathogen; for example, the influenza strain that caused the 2009 outbreak was relatively mild, with lower than expected mortality. As a result, governments did not apply strict, economically disruptive public health measures to control transmission; moreover, while public behavior (and work and consumption patterns) in some areas had short-term shifts, it did not dramatically shift over sustained periods, leading to relatively minor economic damage from the event. Although epidemics and pandemics may be broad in geographic scope, they do not necessarily inflict deep health and economic damage.

¹⁹ A. Richter and T. Wilson. 2020. Covid-19: Implications for Insurer Risk Management and the Insurability of Pandemic Risk. *The Geneva Risk and Insurance Review*. 45(2). pp. 171–199.

²⁰ For further information on the 2009 pandemic influenza: Centers for Disease Control and Prevention. 2009 H1N1 Pandemic (H1N1pdm09 virus).

²¹ For further information on Zika: Centers for Disease Control and Prevention. Zika Virus.

Moreover, that pandemics do not meet the conditions of insurability does not mean some risk cannot be transferred. Limited levels of risk, clearly defined, can be transferred to risk carriers. This is likely to be a fraction of the potential total incurred economic loss but can still create substantial value in controlling the extent of the spread of an infectious disease event and mitigating the economic fallout through early, targeted financing. Likely this is through life and health insurance, specialty lines (e.g., event cancellation covers), and property and casualty insurance (e.g., through nondamage business interruption covers).

An epidemic may be more easily insured. The regional nature compared to the global spread in a pandemic distinguishes these events. Regional containment of an outbreak would limit total losses and enable diversification. Perhaps because the COVID-19 pandemic has generated such significant loss of life and widespread economic and societal disruption, policy discussions—e.g., the Geneva Association report (footnote 18)—amidst the crisis have tended to treat pandemics as a naturally systemic risk, uninsurable because they are both severely damaging and, by definition, broad in geographic scope. We believe this is leading to missing fundamental opportunities for building insurance tools and products that can create value in incentivizing, monitoring, and advancing future risk management.

3.5 Quantifiability

The application of catastrophe modeling techniques to epidemiological modeling is a relatively new development, but one that allows for the creation of a more comprehensive view of risk than the historical record alone. Many epidemic diseases have caused relatively few historical events, which can lead to dramatic underestimations of future risk. However, scientific research on the spatial distribution of pathogens and epidemiological principles allows for the simulation of disease spread using pathogen and population characteristics. These models allow simulation of millions of hypothetical and scientifically plausible events to gain an accurate estimation of risk.

Risk is dynamic over time, especially epidemic risk. As human and animal populations change, as travel and connectivity networks evolve, and as land-use patterns shift, epidemic risk changes as well; hence, the assumptions and input data embedded in epidemic models must be updated. Prior to the West Africa Ebola outbreak in 2014–2016, Ebola was largely considered to be a localized problem that caused relatively small epidemics, which were unlikely to spread very widely. The 2014 epidemic demonstrated that these assumptions were untenable due to underlying changes in population and ecological dynamics, which could lead Ebola epidemics to potentially spread far more widely than in prior events. Like the Ebola virus disease,²² there are other diseases that have remained very localized to date but have the potential to cause much larger epidemics, such as Nipah,²³ Marburg,²⁴ and Machupo.²⁵

²² For further information on Ebola: WHO. 2021. Ebola Virus Disease. Fact sheets. 23 February.

²³ For further information on Nipah: WHO. 2018. Nipah Virus. Fact sheets. 30 May.

²⁴ For further information on Marburg: WHO. 2021. Marburg Virus Disease. Fact sheets. 7 August.

²⁵ For further information on Machupo: M. Patterson, A. Grant, and S. Paessler. 2014. Epidemiology and Pathogenesis of Bolivian Hemorrhagic Fever. *Current Opinion in Virology*. 5(April). pp. 82–90.

Similar to hurricane modeling, epidemic modeling is frequently done prospectively to generate a catalog of potential events, which are then used to create risk analytics that support risk transfer tools. Epidemic modeling can also be used during an event to provide insights into its potential development. For example, this technical assistance generated a set of modeled scenarios of potential trajectories of the COVID-19 pandemic across the CAREC region to analyze the effects of a potential surge in transmission over winter 2020–2021 and the rollout of vaccines. This type of modeling can inform decision-makers as to the potential timing and stringency of nonpharmaceutical interventions, such as lockdowns and social distancing, required to curtail transmission, and the potential benefits of accelerated vaccine rollout (or risks of delays).

However, like hurricane modeling, "live" epidemic modeling is inherently uncertain, and it is challenging to generate accurate estimates beyond the very short term. Epidemic models have an additional and unique complexity, which is that model predictions inform public health strategies and public behavior, leading to changes in disease dynamics; as such, model predictions potentially alter real-life outcomes, sometimes substantially. In the case of "live" epidemic modeling, incorrect model projections may be an indication of a successful application of a previous model iteration to policy—a model is truly, and usefully, a victim of its own success.

4 Case Studies of Infectious Disease Risk Financing

The potential severity of epidemic and pandemic events motivated efforts to develop and deliver formal risk financing. Although the evidence base is sparse, financing programs have innovated in an attempt to address the insurability concerns identified in Section 3. Each program seeks to demarcate and limit the exact risk to be covered in order to provide a sustainable contract between risk carrier and the insured. This section details three structures: a development bank-led international financing arrangement, a nondamage business interruption cover, and a regional risk pool proposal.

4.1 The Pandemic Emergency Financing Facility

Objectives

The Pandemic Emergency Financing Facility (PEF) was a financing arrangement designed to provide additional financing for low-income countries for response to an emerging infectious disease pandemic and/or regional epidemic. The PEF used ILS to access private capital ("insurance window"), complementing a smaller "first-loss" ("cash window"). The beneficiaries were IDA countries, with any payouts structured to be made directly to governments and other pre-approved frontline organizations.

The objectives were to

- "(i) make available essential surge financing to key responders, including, inter alia, governments, multilateral agencies, and civil society organizations, to respond to an outbreak with pandemic potential and to minimize its health and economic consequences; and
- (ii) help catalyze the creation of a global market for pandemic insurance instruments by drawing on resources from insurance, bonds, and/or other private sector financial instruments."²⁶

The PEF was designed to provide international financing to facilitate more effective national response at an early stage of an infectious disease outbreak. This financing was intended to fill the gap before a humanitarian relief effort is mobilized and translated into frontline mitigation measures. Initial funding for the PEF was provided by donors, including Japan, the IDA, Germany, and Australia.

²⁶ PEF Steering Body. 2018. Operations Manual: Pandemic Emergency Financing Facility. Washington, DC: World Bank.

Structure

Issued by the World Bank Treasury, \$320 million of bonds and \$105 million of swaps were sold to or transacted with investors in June 2017, maturing in July 2020. The bond issuance has not been repeated. The bonds were issued in two tranches: Class A covered flu and coronavirus; and Class B covered filovirus, coronavirus, Rift Valley fever, Lassa fever, and CCHF. Investors received a coupon in excess of the risk-free rate to reflect the risk of full or partial loss of principal and subsequent coupon payments should a defined event occur (the equivalent of an insurance premium). Both tranches were oversubscribed, reflecting strong investor appetite for risk thought to be uncorrelated to normal financial assets and with a high return, reflecting a high margin of the "premium" element to expected losses.

The PEF utilized a series of specific trigger conditions. These conditions were intended to simulate, through parametric means, the occurrence of a regional pandemic, which could negatively affect IDA countries to a degree such that funding from the PEF's cash window would be insufficient. The trigger was based on the following: (i) number of cases and/or deaths caused by a pandemic from a named virus, (ii) speed of development, (iii) duration of development, and (iv) geographic spread.

This structure is unlike conventional extreme mortality bond structures covering pandemic risk, noting the differentiated objectives of PEF to such covers, targeting liquidity for effective intervention rather than post-settlement capital repair. Calculation for potential payouts was based on the World Health Organization (WHO) reporting and monitored by AIR Worldwide.

The PEF's insurance window provided funding as per conventional ILS structure, with payment made following the outlined triggers. The cash window was a novel element, designed to provide financial support for an outbreak that did not meet all trigger conditions. Instead, a steering committee approved expenditure, which was made direct to agencies such as WHO and UNICEF (the United Nations Children's Fund).

On 17 April 2020, COVID-19 triggered all conditions, resulting in a \$195.84 million payout—the maximum payout for a coronavirus pandemic.²⁷ Payouts were made in early May 2020, with assistance ranging from \$1 million to \$15 million depending on the population size and reported cases in each IDA eligible country. Funds were released to several CAREC countries, including Afghanistan, the Kyrgyz Republic, Mongolia, Pakistan, and Uzbekistan.²⁸ This was the first payout from the insurance window in the lifetime of the bonds. WHO declared the COVID-19 outbreak a global health emergency on 30 January 2020 and declared a global pandemic on 11 March 2020, 5 weeks earlier than triggering and 8 weeks before payment. Noting this delay, the World Bank highlighted that PEF beneficiary countries accounted for less than 1% of cases at the time of triggering.²⁹

²⁷ World Bank. 2020. Fact Sheet: Pandemic Emergency Financing Facility. Brief. 27 April.

²⁸ World Bank. 2021. Pandemic Emergency Financing Facility Country Allocations. Updated February.

²⁹ World Bank. 2020. PEF Allocates US\$195 Million to More than 60 Low-Income Countries to Fight COVID-19. Press release. 27 April.

Prior to COVID-19, the insurance window did not pay out. The 2018 Ebola outbreak in the Democratic Republic of the Congo (DRC) did not meet the required conditions. Given the severity and longevity of this event, the cash window, however, provided \$72 million over four payouts (May 2018 and February, May, and August 2019) following PEF's committee-based trigger approach.

Commentary

The PEF has been subject to much discussion in popular media³⁰ and the ILS community.³¹ We draw on a few characteristics worthy of discussion for pandemic risk financing and for CAREC member countries.

Perhaps the most discussed element of PEF is the *complexity of the trigger*. As presented above, the multistep triggers for payout required a series of thresholds to be breached simultaneously. Individual triggers, such as the growth rate, were particularly contentious as these were new to the market and introduced a set of new modeled assumptions.³² For example, for viruses other than flu, initial measurement of growth rate was 12 weeks after the designated start of the event, thereby building in an intrinsic payment lag when the mechanism targeted early response.

Similarly, the geographic spread requirement meant the reporting of cases across international boundaries. With emergency response efforts from governments, WHO, UNICEF, and others, the objective is to contain the spread across borders. Payouts from the insurance window were not triggered for the DRC Ebola outbreak at various points because of successful efforts to contain an international spread, but at a large domestic cost.

This reveals the difficulty of designing a parametric trigger for a novel risk. The financial protection objective necessitates a balancing act: to match the release of contingent financing with an outbreak, at a time to still invest in containment measures, on terms that are affordable for beneficiaries and acceptable to the international market.

Moreover, a raft of *public opinion and perception* of the design and cost of the product quickly turned sour. This indicates the need to balance the functioning of such products with communication. Importantly, it highlights the strengths of simple product design for innovative developmental financing. A set of digestible conditions with a higher basis risk³³ may be preferable to a more complex structure, which appears opaque, particularly when the product exists to support surge financing for containment and relief, and when sophisticated financial institutions are on one side of the deal.

³⁰ C. Hodgson. 2020. World Bank Ditches Second Round of Pandemic Bonds. *Financial Times*. 5 July; and E. Ritchie and M. Plant. 2020. A Good Idea Executed Badly: Why the World Bank Should Not Renew the Pandemic Emergency Facility Insurance Window. *Center for Global Development*. 9 April.

³¹ S. Evans. 2020. World Bank Shelves Plan for PEF 2.0 & Further Pandemic Cat Bonds. Artemis. 6 July.

³² Further discussion is available at C. Meenan. 2020. The Future of Pandemic Financing: Trigger Design and 2020 Hindsight. Centre for Disaster Protection. 19 May.

³³ Basis risk is the risk that the performance of an index diverges from the experience of the policyholder. Basis risk is an important design consideration for parametric insurance, where payment is triggered by a pre-agreed threshold rather than the reported or assessed experience of the policyholder. Trigger design often aims to reduce basis risk and is, therefore, intertwined with the success of a parametric product. Complexity of trigger design with simplicity of product structure is a balance to be sought.

The creation of a cash window reveals how the policy objectives were built into the bond structure. The cash window is a recognition that the objectives of a multilateral development bank, on behalf of beneficiary countries, are not wholly aligned with those of the ILS market. The complex trigger design de-risked the transaction to ensure the bond was affordable, while providing an attractive risk-adjusted return to investors. Such bonds need to have transparent, robust structuring and address a risk in an economical fashion. Although the PEF received much criticism, there were only 6 months throughout the life of the bond when there were no conditions for a potential recovery (first Ebola and then COVID-19),³⁴ indicating the extent of the risk it addressed.

The cash window essentially provided a basis risk wrap around the insurance window bonds. The bonds were designed to respond to regional epidemics and pandemics but, as in the DRC for Ebola, a flexible single-country response is also required to prevent a national crisis becoming larger within that country and also spreading across borders. In retrospect, the balance between the cash window and the insurance window was wrong. A larger cash window could have provided greater, faster immediate response. If that cash window included an element with a guaranteed intervention over a similar, but lower, trigger to the insurance window parametric structure, then it would have made the insurance window more attractive to investors. Guaranteed early intervention reduces the risk to investors, and so should be reflected in lower cost for the insurance window.

Broadly, the PEF was focused on surge financing for the response effort. The identification of responder organizations and activities such as health worker deployment and provision of drugs, vaccines, and medication equipment are all helpful. These are, however, ancillary benefits and framed under the top-up nature of the PEF. The quantum of financing available from the PEF was not to cover all response costs, but to provide financing sufficiently quickly to enable successful actions to mitigate broader spread of disease, reducing, but not eliminating, the probability that a large-scale humanitarian effort would be required.

When viewed against the stated objectives, PEF offers useful lessons for future attempts at broad-based pandemic risk financing. Simplicity and transparency of product design are to be desired, helping with aligning expectations and communication.

4.2 PathogenRx

A nondamage business interruption product, called PathogenRx, was created in 2018 through a partnership between Marsh, an insurance broker; Munich Re, a reinsurer; and Metabiota, an infectious disease modeling company. The product was intended to provide financial protection for businesses that might experience economic losses due to infectious disease outbreaks. The insurance policy was designed to provide coverage for the loss of gross profits, loss of revenue, and extra expenses that might be incurred by a business as a result of an infectious disease outbreak in a designated geographical coverage area.

³⁴ M. N. Lane and R. G. Beckwith. 2020. World Bank Pandemic Redux and Quarterly Market Performance Report – Q2 2020. Lane Financial LLC. 30 June.

The initial products used a combination of triggers including infections and deaths within a specific geographic area, and Metabiota's Sentiment Index—a score estimating public fear and behavioral changes that could be generated by an infectious disease outbreak. The intent behind combining these triggers was to ensure a payout would be provided both for highly destructive events that cause significant loss of life, as well as for losses driven by pathogens like the Zika virus, which might lead to very little mortality, but still generate fear-induced behavioral changes that could create cascading economic damage.

Commentary

PathogenRx was marketed broadly to private companies as well as local governments and other public entities for roughly 2 years, with no policies binding prior to the COVID-19 pandemic.³⁵ The new product was, in some cases, perceived to be expensive and, despite interest, it was challenging to convince risk managers and financial officers responsible for purchasing to insure against a risk which had not, for most prospective customers, recently generated losses.

As was the case with the PEF, the mortality-based trigger element also required substantial market and customer education. The Sentiment Index, as a new trigger concept, required customer education as well as transparent empirical validation to ensure—and to confirm for prospective customers—that it would pay out under appropriate conditions and loss profiles. New iterations of the product incorporated alternative triggers, such as a civil authority lockdown or a declaration of a public health emergency of international concern by WHO, potentially in lieu of (or in conjunction with) the epidemiological triggers such as infections or deaths.³⁶

In general, the experience of PathogenRx underlines the importance of simplicity and transparency in trigger design, as well as market education on the historical and estimated future frequency of epidemics and pandemics that could create economic losses. The solution remains on the market today, and although pricing is specific to each policy, public documents cite an indicative (nonbinding) price range of 3%–8% rate-on-line.

4.3 The African Risk Capacity Outbreak and Epidemic Insurance

African Risk Capacity

African Risk Capacity (ARC) is a specialized agency of the African Union dedicated to supporting governments in their management of extreme weather events and other natural hazard events. The 38 member countries have access to tailored risk identification, modeling, and response advice from ARC. Sister organization, ARC Insurance Company Limited (ARC Limited), provides disaster insurance.

³⁵ E. Ratliff. 2020. We Can Protect the Economy from Pandemics. Why Didn't We? *Wired.* 16 June.

³⁶ Marsh McLennan. PathogenRX: An Innovative Solution for Pandemic and Epidemic Risks.

Insurance is available on a risk pool basis, with ARC Limited providing parametric disaster insurance to governments. ARC Limited manages the pool of capital and seeks reinsurance protection. Drought and tropical cyclone insurance have been available, with the earliest policy issued in 2014.

A mutualization of risk increases diversification, reducing the requirement for external reinsurance and so retaining profits in the pool for the benefit of ARC Limited members. It also creates the opportunity for innovative and robust risk management functions. Member countries are provided with access to Africa RiskView, software with real-time drought monitoring and forecasting. Ownership of risk brings innovation.

Before being permitted to purchase such insurance, member countries must secure a certificate of good standing. This confirms that they have undergone a drought risk assessment and developed contingency plans, meeting a peer-agreed standard, for immediate response, to be funded via any insurance payout. Plan development is supported by ARC Agency with best practice shared. A replica program allows humanitarian partners to purchase complementary cover to integrate their contingency planning and disaster response with replicated governments.

Outbreak and Epidemic Insurance

Following the 2014 West Africa Ebola outbreak, ARC was mandated by the African Union member states to conceptualize an infectious disease outbreak insurance product. This built on the principles of the existing drought insurance program, including risk identification, contingency planning, investment in preparedness, use of early warning tools, and flow of funds via insurance payouts to support earliest possible actions to mitigate the spread of an emerging pathogen.

A major driver of the interest in a parametric insurance solution was the recognition that early action, supported by finance, might have vastly reduced the overall social and economic impact of the West Africa Ebola outbreak. The first (unmet) request for response financing by WHO in April 2014 was for \$5 million; and, while this may have been insufficient to eliminate this Ebola outbreak entirely, the ultimate economic cost of the event was around 1,000 times greater, strongly hinting at the huge value of early action to address infectious disease outbreaks.

ARC has developed a framework for an outbreak and epidemic (O&E) product. Mirroring the existing approach, the O&E product will require country health system development and contingency plan completion before having access to risk transfer. The objective is to provide fast, predictable funding and improve the regional, national, and subnational response efforts. The proposed mechanism is to establish a pool of capital for rapid deployment, with conditionality for access.

A risk profile of each country is estimated by assessing the probability of disease emergence and spread. Determinant factors include land use and agriculture practices, urbanization, sanitation, climate, public health and disease infrastructure, transportation, political landscape, and demographics. A set of plausible events is then developed, and probabilities assigned at national, regional, and continental levels. This profiling informs country capacity development, contingency plan identification, and risk-based pricing.

Country capacity development is focused on preparedness and contingency planning for outbreaks. Drawing on established best practice, activities span the following:

- (i) surveillance mechanisms to detect an outbreak;
- (ii) infection prevention and control to minimize and eliminate the spread of cases;
- (iii) diagnosis, case, and contact management to isolate and treat identified cases and perform contact tracing; and
- (iv) community engagement to inform on public health and required behavior changes.

A set of diseases with different characteristics, and thus requiring different management responses, has been chosen for the first iteration of the product. These include Ebola, Marburg, Lassa fever, and meningococcal meningitis.³⁷ ARC's O&E program was piloted in two countries, Uganda and Guinea, over 2018–2019, with efforts focused on preparedness assessment, contingency planning, and risk modeling. The ARC product is designed to provide incentives for preparedness and planning, intending to bolster a range of response capabilities, such as rapid identification, reporting, and tracing of the first case or the escalation of intensive care capacity. Table 4.1 details the primary response pillars for three of these diseases.

These pillars are the basis for the required financing from any insurance payout. The upfront identification of response measures and cost tailors the financing to match needs. Countries are, therefore, only purchasing required protection: an efficient risk transfer strategy.

Response Pillar	Description			
Coordination	Making sure all elements of the outbreak response are synchronized			
Surveillance	Knowing where the virus is—identifying the sick and the at risk			
Infection prevention and control	Preventing virus transmission in clinical settings			
Risk communication and community engagement	Informing the public of risks and government action, and influencing public behavior			
Laboratory	Testing blood and other samples			
Case management	Treating positive and suspected positive patients			
Safe burial	Dead body management to prevent infections from corpses			
Vaccination	Deployment for high-risk populations			
Psychosocial nutritional support	Providing counseling, food, and community education for infected or affected populations			
Logistics	Moving people and supplies across the response			
Security	Costs associated with quarantining at-risk populations and controlling civil unrest			
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Table 4.1: Response Pillars for Ebola, Marburg, and Lassa Fever

Source: ARC. 2020. African Risk Capacity: The Outbreaks and Epidemics Product in the Context of COVID-19.

³⁷ African Risk Capacity. 2020. African Risk Capacity: The Outbreaks & Epidemics Product in the Context of Covid-19. News and press release. 25 March.

Risk-based pricing is proposed. Although not at free-market costs, the risk profiling informs on the exposure and vulnerability of a country. Reflecting improved vulnerability through some form of risk-based pricing is important to signal to member governments the benefit of investment in public health system infrastructure.

A tiered payout structure tracking infection levels will finance the response costs identified in contingency plans. The thesis is that a smaller payout at initial, early detection can be highly effective. As an outbreak develops, a larger payment may be necessary if major control factors are instituted. The idea is to optimize the timing of payments with the dynamics of outbreaks, and scale if relevant. The ultimate goal is to reduce the chances that a given outbreak will become a regional epidemic, and that a regional epidemic will become a global pandemic. Insurance is playing the role of an objectively triggered and very early source of capital to fund a pre-agreed contingency plan to be put into action.

The payout trigger starts with an epidemiological event of a given severity, declared by the government. The timing and extent of the payout are calculated following a pre-agreed formula that reflects the spread and severity of the event. Countries must produce a final implementation plan, an adaptation of the contingency plan to address the realities of the event. ARC Agency approval of the final implementation plan triggers the payout. The execution of plans will be monitored by ARC Agency, as is the case for natural hazard events.

Commentary

The similarities in structure and objectives mean the ARC O&E approach is instructive for CAREC member states. ARC is a regional risk transfer facility seeking to dramatically strengthen national and regional risk management and financing for infectious disease outbreaks. Activities for risk management, and how these can be linked to financing, are discussed in more detail in Section 5.3.

Risk management and capacity development are at the core of the ARC approach. In parallel with infectious disease outbreaks, it is the management response to signs of a meteorological drought that can have material socioeconomic impact. With ARC Agency devised to inform and advance the drought forecasting and management response, there is a commonality for infectious disease outbreaks. A CAREC risk transfer facility should likewise firmly focus on robust risk management, from detection and forecasting to early and effective response.

Regional collaboration and ownership of risk is another defining characteristic. ARC as an organization is established by treaty, providing legitimacy for the development of innovative risk management and transfer programs. Additionally, that health ministers commissioned ARC in 2015 to investigate a solution demonstrates the demand for an infectious disease risk transfer solution. Developing and articulating similar demand from CAREC member states will provide the regional organization with legitimacy to pursue a similarly ambitious agenda. That CAREC is not treaty-based does not affect the ability to develop risk financing. In the case of ARC, it was a coordinated request from the health ministers that triggered development of the O&E framework.

As a result of this regional grounding, an ARC objective is to encourage the reporting of cases and declare a public health emergency. The broad view is that member governments tend to not declare outbreaks proactively, but instead wait for developments to reach certain thresholds. These thresholds may be too late to contain an outbreak and prevent an epidemic or worse. Linking public health system development and contingency plans to risk financing incentivizes the proactive declaration of an emergency and appropriate mobilization of resources.

This perspective provides a different rationale to that outlined by the insurance industry, that there is large moral hazard for governments as the policyholder to be able to trigger insurance financing. In the design of a risk transfer solution that is closely wedded to management plans, insurance market acceptability may increase. This deliberate approach enhances the feasibility of risk transfer. For example, if a regional facility offers guaranteed payment using a similar trigger, but at a lower level, to its reinsurance, with auditable contingency plans in place, then reinsurers can be comforted that funding has been released and action taken to contain the outbreak and so minimize their likely involvement.

The commitment to a risk-based approach is commendable. Risk identification and modeling translate an abstract but real notion into a monetary value. This has enormous signaling power to inform the policyholder and stakeholders of their exposure to a perverse event. Risk-based pricing provides information on the exposure and can incentivize investment in risk mitigation and reduction. The current operating structure of the ARC risk pool provides implicit subsidization to member states, largely supported by donor interest-free funds capitalizing ARC Limited and so minimizing the need for reinsurance allowing profit to be retained and so premiums reduced.

5 Public-Private Partnerships

Risks of severe socioeconomic consequence, such as terrorism or flooding, are often not left to the private market equilibrium. Pool Re and Flood Re in the United Kingdom, and the Terrorism Risk Insurance Act and the National Flood Insurance Program in the United States (US), are public-private sector partnerships that provide insurance against flood and terrorism. Without these, robust, sustainable insurance coverage may be unavailable. The challenges to insurability, and large value at risk, mean government intervention is routinely justified. For both terrorism and flooding, a high frequency of events or particular benchmark events and damage (e.g., the 9/11 terrorist attacks) prompted social and political will to develop such risk-sharing arrangements between the public and private sector. There are many similarities with the risk of infectious disease outbreaks.

The economic cost from the COVID-19 pandemic triggered urgent studies from governments and regional organizations around the world to identify equitable and efficient public-private partnerships for infectious disease risk transfer. None of these proposals developed during the COVID-19 pandemic have progressed beyond concept stage. This underlines the difficulty of the design and implementation of a solution where the respective capabilities of the public and private sector are harnessed. Risk financing alone faces some of the core insurability challenges discussed in Section 3. This section discusses proposals around the world, and how incentives for risk management can be promoted through regional collaboration.

5.1 Public-Private Partnerships Framework

Government intervention for excess risk management addresses the government's role as insurer of last resort. Such interventions create liabilities for the government. In managing extreme risk, government's role as the insurer of last resort is focused on financial guarantees (for third-party debt) and explicit government insurance.³⁸

There are four broad forms of government financing for these contingent liabilities:³⁹

(i) Post-event aid: emergency government funding ex post, and reactive to the characteristics and consequences of the event;

³⁸ Government of the United Kingdom, HM Treasury. 2020. Government as Insurer of Last Resort: Managing Contingent Liabilities in the Public Sector. London.

³⁹ R. Hartwig, G. Niehaus, and J. Qiu. 2020. Insurance for Economic Losses Caused by Pandemics. *The Geneva Risk and Insurance Review*. 45(2). pp. 134–170.

- (ii) Primary insurance: government provision of insurance, likely with directly subsidized premiums; typically a dedicated organization to administer policies (e.g., US National Flood Insurance Program and New Zealand Earthquake Commission). Functions ex ante;
- (iii) Reinsurance: government-backed reinsurance to insurers, who then provide retail insurance coverage to businesses and households (e.g., Pool Re). Likely that the insurance industry covers some initial loss, with the government providing a guarantee or a backstop. Functions ex ante; and
- (iv) Social insurance: a broad-based, far-reaching scheme with payments accruing over many participants and many years through taxation. Employers and employees both contribute, with government top-up, so payments can be made post-event (e.g., Germany's Kurzabeit).⁴⁰

Post-event aid delivered in response to COVID-19 relied on structured income support measures and an expansion of social assistance programs. These are a primary component of government response and of total costs incurred in Central Asia, as similar to many other countries globally. These measures were made available in Azerbaijan, Georgia, the Kyrgyz Republic, Mongolia, Pakistan, the PRC, Tajikistan, and Uzbekistan.⁴¹ Kazakhstan provided more limited income for a short period of time, and such support was not made available in Afghanistan or Turkmenistan.

The introduction of post-event aid is essentially a financial guarantee. This form of implicit contingent liability demonstrates that government support is necessary for events of such magnitude. The prearrangement of financing, however, provides certainty for businesses and citizens and cushions the immediate impact. This financing also creates time for governments to assess and calibrate the wide-ranging fiscal response.

Table 5.1 provides a simple overview of the characteristics of each form of government intervention. These are assessed against core public policy criteria of operational efficiency, risk mitigation incentives, matching of funds with needs, and the overall economic impact.

	Government Role			
Objective	Post-Event Aid	Reinsurance	Primary Insurance	Social Insurance
Operational efficiency	Medium	Medium	Low	High
Risk mitigation incentives	Low	High	Medium	Low
Match funds with needs	Low	High	Medium	Low
Impact on economy	Medium	Medium	Medium	High

Table 5.1: Government Roles in Public-Private Partnerships

Source: R. Hartwig, G. Niehaus, and J. Qiu. 2020. Insurance for Economic Losses Caused by Pandemics. *The Geneva Risk and Insurance Review*. 45(2). pp. 134–170.

⁴⁰ Kurzabeit is a social insurance program in Germany where employees have their hours reduced by their employer, instead of being made redundant. The government provides an income replacement rate at 60% of the employee's salary. Restrictions were relaxed and more generous support provided in response to COVID-19.

⁴¹ IMF. 2021. Fiscal Monitor: Database of Country Fiscal Measures in Response to the COVID-19 Pandemic.

Administrative costs and program efficiency must rank highly. Historic public-private partnerships attest to the potential complexity of implementation. Some trends are generalizable. The ex ante arrangement of financing tends to be more efficient and more closely links risk management incentives with receipt of funds. Likewise, as the prearrangement of funds is focused on expected losses, a well-designed ex ante scheme should better match funds with losses than one rapidly instituted post-event. Finally, a broader base of recipients often means higher cost to the economy.

These are important considerations for the design of a public-private risk financing solution for CAREC member states.

5.2 Proposed Public-Private Partnerships

A series of public-private pandemic risk financing solutions have been proposed globally. These vary in their objective, core features, and stage of development. At the time of writing (March 2021), none of these has progressed to an implemented solution. Eleven of the publicly available proposals are presented in Table 5.2. Although this list may not be comprehensive, these proposals were sufficiently developed to be published in some form or another.

Location	Structure	Objective	Features
India	Risk pool with government backstop	For small and medium-sized enterprises (SMEs) and migrant workers	Pool of \$700 million, government backstop of \$10 billion
			Triggered after 15 days of lockdown, payment within 3 weeks
			Target premium of \$14-\$21 per employee
France	Risk pool, with	For all businesses	Pool size €2 billion per year, as co-insurance
	reinsurance from public reinsurer	covered by a retail or corporate insurance policy	Purchase up to 50% of lost revenues, paid within 30 days, limit of €500,000 and 3 months
			Triggered on a World Health Organization (WHO) declaration and total or partial closure of businesses
United	Reinsurance facility, majority government funded	For all businesses (business interruption and event cancellation)	Mandatory offer to businesses but purchase voluntary
States (US)			Insurers pay first 5% of losses, government pays the next 95%. Insurers set premium rates on the 5%, backstop is not chargeable
			Financing available after first \$250 million losses paid by insurer, cap of \$750 billion
			Mirrors the terrorism program (Terrorism Risk Insurance Act)
iness Continuity US :ection Program ^d	Risk pool, majority government funded	For all businesses (business interruption and event cancellation)	Purchase up to 80% of revenue replacement, capped at 3 months
			Triggered on federally declared public health emergency
			Voluntary participation from insurers
			Administered by the Federal Emergency
	Location India France United States (US) US	LocationStructureIndiaRisk pool with government backstopFranceRisk pool, with reinsurance from public reinsurerUnitedReinsurance facility, majority government fundedUSRisk pool, majority government funded	LocationStructureObjectiveIndiaRisk pool with government backstopFor small and medium-sized enterprises (SMEs) and migrant workersFranceRisk pool, with reinsurance from public reinsurerFor all businesses covered by a retail or corporate insurance policyUnitedReinsurance facility, majority government fundedFor all businesses (business interruption and event cancellation)USRisk pool, majority government fundedFor all businesses (business interruption and event cancellation)

Table 5.2: Proposed Public-Private Partnerships for Future Infectious Disease Outbreaks

Table 5.2: Continued

Program Name	Location	Structure	Objective	Features
Pandemic Business Interruption Program ^e	US	Risk pool and risk facility, majority government funded	For all businesses (business interruption, differentiated between SMEs and large firms)	\$750 billion immediate cash transfer and a \$400 billion voluntary program Triggered on declaration of pandemic and lockdown Payouts based on historic payroll expenses, limit of \$50 million Every property and casualty insurer mandated to offer coverage Proposed by US insurer, Chubb
GDV (Gesamtverband der Deutschen Versicherungswirtschaft e.V. or German Insurance Association)	Germany	Risk pool with government contribution	For all businesses To provide financial protection for smaller events To provide immediate liquidity and time for support schemes	Insurance industry as service providers instead of hastily arranged public facilities Financing to be "correlated" with the risk Triggered on WHO and regional declarations Charged on existing lines of business
Pandemic Re ^g	United Kingdom (UK)	Reinsurance company, state-backed	For SMEs	A series of proposals to support SMEs with simple premium structures, with some risk-based pricing Capped at less than 6 months Government backstop
European Insurance and Occupational Pensions Authority ^h	European Union	Risk pool	Details not released	Early concept, where national schemes must be implemented by each member country, and to be exhausted before accessing a regional fund Emphasis on prevention, mitigation, and cooperation
ReStart ⁱ	UK	Ring-fenced insurance pool	For SMEs (business interruption)	Strictly defined product to help SMEs respond to the coronavirus disease (COVID-19) pandemic Without government backing, with capacity from Lloyd's of London
Recover Re ⁱ	UK	Retail insurance product	For all businesses	Immediate payout to policyholders Flexible pricing to allow insurers to pay claims and recover over a long-time horizon (up to 20 years) Could be expanded to include other systemic events, with capacity from Lloyd's of London
Black Swan Re ⁱ	UK	Reinsurance pool, backed by government	For all businesses	Protects against extreme events, beyond pandemic Pricing to not be fully risk-based with indirect government subsidization

^a G. Mathew. 2021. Pandemic Risk Pool Soon, May Have Government Backstop Provision. *The Indian Express*. 19 March.

^b French Insurance Federation (Fédération Française de l'Assurance). 2020. The FFA details its "CATEX" project. 26 November.

^c Government of the United States, House of Representatives. 2020. *Pandemic Risk Insurance Act of 2020*. H.R. 7011 of the Second Session of the 116th Congress. 26 May.

^d National Association of Mutual Insurance Companies (NAMIC), American Property Casualty Insurance Association (APCIA), and Independent Insurance Agents & Brokers of America (Big "I"). 2020. Business Continuity Protection Program (BCPP).

^e Chubb. 2020. Pandemic Business Interruption Program. Zurich.

^f German Insurance Association (GDV). 2020. Green Paper: Supporting the Economy to Better Cope with the Consequences of Future Pandemic Events. Berlin.

^g Insurance Journal. 2020. Pandemic Reinsurance Solution Gains Wide Support from UK Re/Insurance Industry. 1 June.

^h European Insurance and Occupational Pensions Authority. 2020. Issues Paper on Shared Resilience Solutions for Pandemics. Staff paper. Frankfurt am Main.

¹ Lloyd's of London. 2020. Supporting Global Recovery and Resilience for Customers and Economies: The Insurance Industry Response to COVID-19. London.

Source: List compiled by the Consultant Team. Each program is referenced individually.

The proposals listed are from developed and large economies, perhaps reflective of the willingness of government to explore solutions with a mature insurance industry. These economies tend to have public-private partnerships already implemented, such as those for flooding and terrorism previously discussed, providing some optimism that equitable, robust solutions could be found. Most proposals focus on supporting SMEs, although some proposals are more flexible to support future unknown events, while others attempt to find an acceptable balance of responsibilities between the private sector and the public balance sheet.

Structures are either "primary insurance" or "reinsurance" as discussed in Section 5.1, with the vast majority envisaging some form of risk pool. A ring-fenced risk pool would receive premium contributions and pay infectious disease outbreak claims. If the pool functions on a primary insurance basis, the pool interacts directly with policyholders such as SMEs. If the pool is providing reinsurance, the counterparty would be insurance companies. Again, this tracks closely to implemented schemes to address flooding and terrorism risk. As such, the operating structure is not the area of contention.

Instead, the challenge is to identify the relationship between the private and public sectors. Virtually all proposals require significant government contribution, either upfront through capital contributions or through explicit, legally binding guarantees. The likelihood and severity of a claim from an outbreak would deplete such a fund rapidly and immediately. As such, many of these proposals result from modeling, which indicates a government backstop would be necessary for inception.

There are three Lloyd's of London proposals, which are more private-sector-orientated. Instead of requiring material government financing, the proposals alter other contractual conditions, such as the contract length, seeking to extend this from 1 to 20 years to spread the risk in time. Such proposed innovation identifies the extent to which conventional understanding and current functioning of insurance are insufficient to meet the needs of infectious disease risk transfer.

Observations for CAREC Member States

The review of these proposals provides guidance for CAREC member countries in their planning for the financing and management of future infectious disease outbreaks.

All solutions require significant government intervention. Initial capitalization of the risk pool, subsidization of premium, backstopping of the pool, compulsory levies on premiums, or mandating of insurance coverage are features of all schemes. These activities are fiscally intensive forms of intervention as part of a government's role as the insurer of last resort. These tend to be driven by the finance ministries, given the quantum of government support required. More tailored products and programs will likely require involvement of the health ministries or specialist infectious disease outbreak agencies as an implementing partner. This reaffirms the divorce in the scale of expected economic losses with the capabilities of the insurance industry. Risk transfer will require a significant fiscal contingency liability on the public sector balance sheet.

Parametric-based solutions are favored. The objective nature of parametric payment triggers, and the certainty provided to policyholders, are core appeals. Ambiguity in business interruption insurance policy wordings following lockdown orders and the uncertainty of coverage has increased the attractiveness of

objective indicators. Reference to qualifying events, such as a WHO-declared pandemic and locally declared lockdowns, are commonly proposed. This also reduces reliance on intermediaries such as loss adjusters to calculate and finalize claims. Scarcity of such intermediaries is to be expected given the scale of claims across the economy. The speed of payment enabled by parametric triggers is also identified, with some schemes targeting immediate liquidity following declaration of an outbreak.

Proposals focus on the provision of liquidity to SMEs. Given the burden of economic loss from COVID-19, it is unsurprising that many proposals focus on SME financing. This structural exposure was witnessed across the CAREC region, with SME-focused support schemes made available in most countries. In fact, the continued state ownership of the largest companies across the region amplifies the economic exposure of SMEs. Tourism, hospitality, small construction, transport, and trade were identified as most exposed.⁴² Rapidly devised programs included loan guarantees, ring-fenced funds, and tax, social security, and audit relief.⁴³ These schemes reveal the government's implicit contingent liability of financial support to SMEs. A risk transfer solution for SMEs ultimately benefits the public balance sheet.

The existing capacity and infrastructure of insurers are captured. Rapid design and implementation of support schemes introduce execution risk and fraud risk. The existing customer base, relationship, and infrastructure of policyholders and insurers are harnessed across these proposals. This synergy is expected to be much lower in Central Asia, with a much lower insurance penetration and thus existing customer base. Such SME agencies as the Enterprise Development Fund in Kazakhstan, the SME Development Fund in Mongolia, and the Entrepreneurship Fund in Tajikistan could instead be suitable mechanisms. With SMEs already identified and registered with these funds, additional financing can rapidly be disbursed to SMEs. By leveraging these administration benefits, the efficiency and equity criteria of expenditure are improved.

There is a focus on improved future risk management of outbreaks. Early detection of new outbreaks and contingency plans are featured in many proposals. Most proposals explicitly recognize that the containment of the spread of an outbreak is intricately linked to the financial burden on the scheme. A more robust future management response increases the viability of risk financing.

The proposal of the European Insurance and Occupational Pensions Authority specifically focuses on the capabilities of a regional organization to guide future events. The development of a risk transfer solution is desirable, but the proposal focuses on reducing losses through prevention to increase the viability of risk transfer, specifically central coordination to support prevention and adaptation. This includes the creation of an expert group for data sharing and risk modeling, and a platform for coordination of contingency and prevention measures. Many prevention measures fall within the remit of public authorities and isolated measures are unlikely to be effective, thereby underlining the case for central coordination.

⁴² United Nations Development Programme (UNDP). 2020. COVID-19 and Central Asia: Socio-Economic Impacts and Key Policy Considerations for Recovery. New York: UNDP Europe and Central Asia.

⁴³ OECD. 2020. OECD Policy Responses to Coronavirus (COVID-19): COVID-19 Crisis Response in Central Asia. Updated 16 November.

There are many parallels with the CAREC program. These recommendations are broadly consistent with those made under the CAREC health scoping study. The study recommends the strengthening of regional health security through regional modeling and forecasting, regional simulation exercises, and joint capacity building.⁴⁴

5.3 Strengthening Incentives for Preparedness and Mitigation

The establishment of a regional risk financing mechanism can provide incentives to increase preparedness and mitigation against epidemics and pandemics. The ability of the mechanism to provide incentives will be greater when the benefits are transparent and more directly tied to the behavior being incentivized.

Key behaviors to be incentivized are preparedness and early detection, and any mechanism would need to be structured around these activities. For example, a mechanism could be designed such that a country would not be able to participate or gain access to response funds if they do not meet certain minimum criteria (compare with the ARC approach). Other potential incentives could include reduced premiums and access to a greater portion of the funds. Although not comprehensive, below are three areas where incentives could improve preparedness and mitigation efforts.

Preparedness Assessment and Tools

An initial step when a country would like to participate in a risk financing mechanism is often an assessment of the readiness and preparedness levels present in the country for infectious disease outbreaks. This can include a detailed or targeted national level assessment, such as the WHO Joint External Evaluation (JEE),⁴⁵ Epidemic Preparedness Index,⁴⁶ Global Health Security Index,⁴⁷ or a more resource-intensive subnational level approach.⁴⁸ The preparedness assessment would serve as a baseline indicator of how ready a country (or subnational region) is to detect and respond to epidemic threats. Such measures typically take a systematic stock of health systems, personnel, supplies, and essential institutional capacities that are needed to support epidemic detection and response.

⁴⁴ ADB. 2021. Enhancing Regional Health Cooperation under CAREC 2030: A Scoping Study. Manila.

⁴⁵ V. Gupta, J. D. Kraemer, R. Katz, A. K. Jha, V. B. Kerry, J. Sane, J. Ollgren, and M. O. Salminen. 2018. Analysis of Results from the Joint External Evaluation: Examining Its Strength and Assessing for Trends Among Participating Countries. *Journal of Global Health.* 8(2).

⁴⁶ B. Oppenheim, M. Gallivan, N. K. Madhav, N. Brown, V. Serhiyenko, N. D. Wolfe, and P. Ayscue. 2019. Assessing global preparedness for the next pandemic: development and application of an epidemic preparedness index. *BMJ Global Health*. 4(1). e001157.

⁴⁷ S. J. Ravi, K. L. Warmbrod, L. Mullen, D. Meyer, E. Cameron, J. Bell, P. Bapat, M. Paterra, C. Machalaba, I. Nath, L. O. Gostin, W. James, D. George, S. Nikkari, E. Gozzer, O. Tomori, I. Makumbi, and J. B. Nuzzo. 2020. The Value Proposition of the Global Health Security Index. *British Medical Journal Global Health*. 5(10). e003648.

⁴⁸ Oppenheim, B., J. Guerrero, J. Euren, Kyobe Bosa, R. K. Degraft Agyarko, A. Bah, J. Maeda, A. Kakunze, A. Muruta, I. Makumbi, and M. Béavogui. 2020. Quantifying preparedness for emerging infectious diseases: A new methodology to assess health security at the subnational level in African countries. *International Journal of Infectious Diseases*. 101. 266.

Performing such an assessment prior to an outbreak would reveal gaps in readiness and identify impactful improvements. Through engagement, countries could also obtain access to data, analytic, and modeling tools to better understand and quantify their risk. These can also inform on cost-benefit analyses for decision-making about the most efficient use of investments in preparedness. Additionally, funds could be structured at the outset of the program such that they could be used toward improving preparedness levels, prior to providing financing during an outbreak. This would reduce overall program costs. A large body of evidence shows that investments in preparedness and early action tend to be the most cost-effective.

This step also reveals how the process of engagement with risk financing supports risk management. The identification of gaps in preparedness may reveal the details of the investment and organizational capacity required to close the deficit. In doing so, countries are then able to make targeted requests for support, be that through concessional finance, technical assistance, or other forms of knowledge sharing.

Laboratory Capacity, Surveillance Systems, and Information Sharing

A key requirement of a risk financing system is a rigorous and transparent trigger. This necessitates verifiable data for the trigger to be accepted by all key stakeholders. This can be achieved through the development of laboratory capacity for confirmatory testing of the causative agent of an outbreak. Such capacity can continue to provide confirmation of cases throughout the course of the outbreak.

A robust surveillance system is also important to quickly identify suspected cases and send samples for laboratory confirmation. Such a system would provide for the reporting of cases through the information chain, up to and including national and supranational health authorities. While many countries do have reporting systems, there are often issues with underreporting, use of paper-based solutions, and reporting lags; these shortcomings can be improved through system testing and mitigative action prior to an outbreak occurring and as a prerequisite for participating in the risk transfer mechanism. Surveillance and reporting are critical to identifying when an outbreak has reached the predefined trigger thresholds for the release of funds.

Contingency, Coordination, and Response Plans

A third area where disaster risk financing mechanisms can incentivize preparedness is in requiring participating countries to create contingency and response plans prior to an epidemic or pandemic. The plans would demonstrate the ability to effectively utilize the funds upon their deployment. Typically, developing these plans has the added benefit of requiring precoordination among all the required groups involved in an outbreak response (e.g., nongovernment organizations, aid agencies, and ministries of health, wildlife, agriculture, and defense), so they are not meeting each other for the first time during an epidemic response. As far as possible, these plans can be integrated into the national policy architecture. Specifically, contingency and response plans should be an essential component of the wider public health emerging response plans.

Development of contingency plans also requires an understanding of the financial needs required for response measures, such as the unit costs of various equipment, salary amounts and hazard pay required for workers, costs of vehicles, and many other components. Combining this type of information on outbreak response cost requirements can allow for a better understanding of what overall costs might be required to fully contain an outbreak, depending upon the speed at which it is contained.

The contingency plans would also demonstrate a country's absorptive capacity for the funds. This information can then be used to estimate what sizes and types of infectious disease outbreaks would be manageable by in-country funds, what sizes of outbreaks are likely to require external funds, and the size of the overall program-wide funding pool that is needed.

Although disaster risk financing mechanisms can generally play an important role in incentivizing preparedness and mitigation approaches against epidemics, care must also be taken not to inadvertently introduce perverse incentives. For example, if care is not taken in the structuring of the mechanism, this could lead to deliberate distortion of surveillance data or introducing moral hazards such as engaging in riskier activities. These issues can be mitigated to some extent by requiring minimum levels of preparedness and surveillance accuracy to participate, verification of data by an independent body, phased payouts for triggers, and incentives for successful outbreak containment.

6 Recommendations for the CAREC Region

Risk management and financing of infectious disease outbreaks can be improved in the CAREC region. Drawing on the COVID-19 experience, and case studies of risk financing, a set of recommendations are identified to enhance the preparedness of CAREC member states. Three product options are then presented as concrete proposals for validation and co-development with member states.

The creation of a risk pool as an outcome of this technical assistance is an exciting opportunity. Sovereign catastrophe risk pools globally have supported regional disaster risk management, innovating over time to provide risk awareness, management, and financing needs for member states. Many of these facilities have benefited regional cooperation. The same promise exists for CAREC and its member states.

6.1 Recommendations in Preparation for a Regional Financing Mechanism

Conduct country and regional preparedness assessments. An assessment of current status is essential for governments to understand their ability to respond to the next outbreak, which will likely differ in characteristics to COVID-19. Such evaluation would be the foundation of the risk transfer mechanism to develop an objective view of risk for each country.

(i) The WHO JEEs are a reasonable starting point. As of July 2021, many CAREC countries have already completed a JEE assessment (Afghanistan, Georgia, Kazakhstan, the Kyrgyz Republic, Mongolia, Pakistan, and Tajikistan) and one is ongoing in Uzbekistan. Mission reports for the region are publicly accessible and contain both quantitative and qualitative data.⁴⁹ Although a comprehensive analysis of the JEE mission reports and country scoring profiles is beyond the scope of this report, a summary review of JEE scores indicates that most CAREC countries that have completed an assessment have limited capacity and preparedness levels. Recommended investments span workforce development, laboratory capacity, surveillance, legislation, preparedness, emergency response operations, and risk communication. In brief, this indicates that the region has some fundamental capacities in place, which should be further strengthened through technical assistance and investment.

⁴⁹ WHO Regional Office for Europe. WHO European Region: Joint External Evaluation (JEE) Mission Reports.

(ii) The JEE process includes country self-assessment as well as external analysis and validation by experts in public health preparedness under the auspices of WHO, and thus constitute a high-reliability assessment of core public health capacities. However, the JEE process does not consider other aspects of preparedness beyond the health system, including governance and financing. Assessing these other dimensions, which contribute substantially to overall preparedness for epidemic and pandemic risks, would be an important dimension of developing regional plans for investment in preparedness as well as financing mechanisms. Other preparedness measures, such as the Epidemic Preparedness Index (footnote 46) and the Global Health Security Index (footnote 47), can provide data and support evaluations of these factors.

Utilize risk assessment tools to identify areas of high risk and vulnerability. Such tools, including spark maps, vulnerability maps, and epidemic risk modeling estimates (e.g., estimates of average annual loss or other metrics included in the risk profiles developed under this technical assistance), can offer a way to quantify the risk. The disciplined use of risk assessment tools can also uncover areas of high risk, but with potential underreporting. Quantifying the risk is a critical step toward developing a disaster risk financing mechanism.

Perform gap analyses to determine where greatest preparedness investments are needed. In this step, the areas of least preparedness and highest intrinsic risk are identified to determine where to strategically place resources to minimize gaps in preparedness.

Assemble data on costs. During many outbreaks, especially those requiring local and international response, data on the costs to respond to those outbreaks are fragmented and can be challenging to obtain and collate. However, having these data is essential to understand the level of required financing for a future outbreak. This will also inform the financing trigger design and pricing. This would be the very basis of a disaster risk financing mechanism to cover response costs. Should the financing scheme instead be used to cover other types of costs, such as business interruption, real-world cost data in this domain would be very valuable for mechanism structuring.

Ensure the presence of robust local and regional laboratory capacity and surveillance systems. Adequate laboratory capacity and surveillance systems are critical components of a successful implementation of a disaster risk financing mechanism. In response to the COVID-19 pandemic, investments have been made in this area that can be leveraged to further build health system resilience. These systems can be strengthened in multiple ways, including developing harmonized standards for laboratory diagnostics and surveillance data, which can be supported via technical assistance, promoting the development of regional networks to facilitate information sharing and coordination mechanisms, and establishing regional reference laboratories. It may also be helpful to support development of mechanisms for cross-border outbreak investigation and information sharing, so that public health authorities can rapidly track, assess, and contain the potential spread of outbreaks.

In addition to the general overall benefits to the public health infrastructure, these systems enable the rapid and accurate identification of when trigger conditions for disaster risk financing are met, along with ensuring the verifiability of the information. Additionally, for covered perils, establishing a historical baseline for incidence and prevalence of different infectious disease threats will help ensure that trigger conditions are set at appropriate thresholds. Further, the sooner a pathogen is identified after emergence or arrival, the earlier appropriate response actions can begin, and the better the chance that the spark can be put out. **Develop a platform for coordinating infectious disease outbreak response** would be a landmark advancement for the health system capacity of the CAREC region. This is a recommendation of the CAREC health scoping study. The ad hoc nature of the response to COVID-19 indicates the benefits from improved coordination. The risk transfer facility should have formal and deep linkages into this centralized platform. Coordination of response reduces the risk of the collective, reducing the cost of risk transfer. Commitments to investment in laboratory capacity, in contact tracing capabilities, and in contingency plan development can be made under this centralized program.

Develop coherent contingency and response plans. Having such plans in place will allow disaster risk financing mechanisms to cover the full breadth of necessary activities and costs incurred during an infectious disease event. Integrating these plans into the wider public health response will ensure that activities targeting the immediate containment of an outbreak are supported by measures to shore up the health system.

Discussion of financing and response costs in a CAREC forum. Raising awareness of the possibilities for risk transfer and how these may operate for the CAREC region can build demand for a regional solution. Options to cover sovereign response costs, SME business interruption, or wider costs are all under development. Yet, the possibility of such solutions may not be forefront in policy makers' minds, or the cost of individual cover may be seen to be expensive. The CAREC program is well positioned to initiate and drive this discussion.

Based on global experience, the pilot phase of a regional risk transfer facility is likely to first provide flood and/or earthquake risk financing before introducing infectious disease coverage. However, introduction of infectious disease coverage is facilitated by progress on the issues outlined above, work upon which can and should start at the earliest opportunity.

6.2 Recommendations for a CAREC Infectious Disease Financing Mechanism

Three discrete, but complementary financing options are presented here. These blend private sector risk financing with rules-based contingency financing. The options coalesce around incentivizing investment in preparedness and response because the most effective form of financing is that which prevents the spread of an outbreak into an epidemic or pandemic. This central principle informs the recommendation of these options. Collectively, these options may form part of an emerging framework on infectious disease risk financing.

- (i) Spark risk cover—a very fast paying cover for immediate response costs;
- (ii) Containment financing—contingent financing available for the implementation of agreed plans; and
- (iii) SME business interruption—financing for SMEs required to shut or suffering from consumer behavior changes associated with infection control measures (e.g., a stay-at-home order).

This section details each of the three mechanisms, in concept and substance. The specific implementation and product design are flexible and worthy of further investigation, such as whether these can work on a regional or national basis, the design of product structure, and indicative pricing. The section introduces and applies these mechanisms as suitable for CAREC member countries. It is the first attempt to apply a risk layering approach on a regional basis for infectious disease risk financing.

These mechanisms all offer the ability to share infectious disease risk with the private market and create certainty. Importantly, these mechanisms bring improved risk management as well risk financing. The development and creation of contingency plans, as well as investment in preparedness, could be used as an incentive for governments to engage. It is possible that certified contingency plans are a prerequisite to access these financing mechanisms, certainly if concessional rates are made available.

Spark Risk Cover

One financing mechanism could cover spark risk, providing financing and incentives for immediate response. Early containment of an outbreak that has the potential to become an epidemic or pandemic is the most effective way to avert both significant national, regional, and major global socioeconomic impact. This relies on the initially affected country to act quickly and effectively in recognizing the threat and controlling spread.

The initial country bears the brunt of the extreme economic and social impact that results from the severe restrictions and quarantine measures needed to contain spread. To be most effective, these measures often need to be instituted before the full potential of the pathogen is recognized. A country introducing early and hard measures runs the risk of overreaction to a pathogen that turns out to have less potential, which may be economically costly. However, because of the extreme amount of risk imposed by more dangerous pathogens, overreaction rather than underreaction may be warranted, and even preferable. A risk pooling mechanism that provides near immediate financing in the case of an outbreak initiating would ensure that the impacted country has the funds to respond quickly and would mitigate the risk of a country taking a wait-and-see approach.

The mechanism could include a "reward" financing element for successful containment. First, this incentivizes and explicitly recognizes quick and aggressive action. Second, this further supports the case to invest in preparedness measures that allow for early detection and response. Finally, this mechanism is to strengthen regional solidarity between member countries. As defined here, successful containment of the outbreak means that it does not spread to a second country. Case detection for spread would be the responsibility of the second country affected and not the initial country, which would mitigate the moral hazard. This could also improve case detection in the initial country.

The design of a spark risk cover would need to be carefully tailored to the specific epidemiological risk and disease surveillance capacities of the CAREC region, and the "trigger" conditions required to release a payout would be designed with these parameters in mind. Trigger conditions could include thresholds for observed cases or deaths for a set of named perils (e.g., influenza, Nipah, or other pathogens).

Development of cover for CAREC countries would begin by identifying a subset of priority diseases, which has potential to spill over (i.e., cause a first human case) within the region; examples include novel influenzas and Nipah virus. Subsequent analytical work would identify capacity and financing gaps to establish the scale of resources needed to support rapid country response to outbreaks; this step would help determine the size of payouts, as well as the overall structure.

Containment Financing

A containment financing mechanism could be developed for CAREC member states, functioning in tandem with the spark risk cover. If a country provides notice of case detection under the spark risk cover, particularly for respiratory pathogens or other agents that might rapidly spread across borders, additional financing could be released to neighboring countries. Such financing would be used to implement pre-agreed contingency plans designed to be proactive and aggressive. This could include mass testing in border regions, the scaling up of laboratory capacity, and tailored public health information delivered to border regions or travel hubs.

The central objective of the containment mechanism is to prevent an outbreak developing into an epidemic or pandemic. In this sense, the measures implemented, and financing directed, are for the greater good of the regional or global community. The structure thus blends national financing with regional solidarity, reflecting the fact that infectious disease risk cannot be addressed on a purely national basis.

As a multilateral development bank, ADB could be the cornerstone of the containment financing mechanism. With other donors, ADB could provide the capital for disbursal under this mechanism. A technical committee, administered by ADB, could publish best practice guidelines for country response and verify country engagement.

Importantly, the more engagement and investment a country commits to the contingency plan, the more financing can be made available. In this sense, the containment financing mechanism would also provide strong incentives for countries to conduct periodic contingency planning processes, refreshing operational plans and coordination mechanisms, and updating cost estimates for containment and response activities. The identification of activities to scale up should be closely aligned to the gap analysis identified under the WHO JEE process or other assessments.

Moreover, there are subregions across CAREC member states that may be additionally challenging for case detection or early action. Rural or mountainous areas, those which are contested, or subject to political turmoil, may require extra consideration for infectious disease outbreak monitoring and early action. This is where containment financing may be delivered effectively, with an understanding of the local sensitivities, but from an international source.

The release of financing for specific activities under a rules-based approach has much appeal. This has similarities with the cash window of PEF, where a technical committee ruled on whether disbursements from a donor-supported fund could be made. This ensures that autonomy remains with CAREC member countries in their investment in infectious disease outbreak management infrastructure. Best practice guidelines would be a standalone public good.

Under the uncertainty typically associated with the early stages of an outbreak, a proactive, robust approach tracks more closely to the precautionary principle than little or no action—this latter choice was noticeable in many countries globally in the early stages of COVID-19. Financing to support containment activities can alleviate political considerations that may inhibit action.

Finally, integrating the spark risk cover with this containment mechanism is a form of risk layering. Financing structures are designed to match the risk faced: where targeted, rapid payouts are required, the international risk transfer market can support; where larger activities are to be funded, the humanitarian community could prearrange such financing.

The design of a containment cover would follow directly from that of a spark risk cover. As noted above, a containment cover would be appropriate for a subset of pathogens that has potential for efficient transmission and rapid spread across borders, particularly respiratory pathogens. Analytical work would be required to estimate the probability of spread and provide information on which regions within CAREC countries would be required to implement contingency measures (such as enhanced disease monitoring, testing, quarantines, or travel restrictions) in the case of an outbreak, as well as the associated operational and economic costs. These factors would inform the design of the cover (e.g., disbursement amounts and timing) as well as costs.

Small and Medium-Sized Enterprise Business Interruption Cover

A third mechanism for consideration is for (nondamage) business interruption to SMEs. Financial protection for the economic loss suffered due to an infectious disease outbreak could cover loss of profits, loss of revenue, or any other additional expenses incurred. This tracks closely to the objective of the PathogenRx product.

Much of the focus of public-private partnership proposals is for SME business interruption, given the size and scale of losses. A government-supported business interruption program provides guarantees to business and reduces operational risk. It may also reduce hesitancy for behavior changes, which are beneficial for managing the spread of an outbreak.

Such a scheme will likely require public guarantees, as exemplified by many of the proposals from around the world. These should be judged against the enormous cost of governments devising, funding, and implementing extensive income support schemes.

Consequently, the SME business interruption cover is closely related to the political economy and realities of each country. The extent of the scheme, and thus likely the burden carried by the government, means this product is better developed on a national rather than regional basis. Ultimately, such financial protection for SMEs is a public policy decision, requiring the consideration of other policies to be rolled out and fiscal budget balancing over time. Of the proposals covered in Section 5, only the European Union proposals were on a regional basis. As a monetary union, the European Union countries have a long history of financial integration. This extent of integration and joint decision-making is not replicated across the CAREC countries.

Fitting with the broad approach, this cover would also be complementary with the spark risk and containment financing mechanisms. Each risk financing tool seeks to match a different layer of risk. The SME cover is focused on containing the economic impact of an infectious disease outbreak. Instead, the first two mechanisms are proactive, aiming to reduce the likelihood of recoveries under the SME business interruption cover.

Government commitment is likely to be the most important consideration to developing an SME business interruption cover. This is more suitable on a domestic rather than regional basis, such as the spark risk and containment mechanisms. Consequently, it is appropriate to identify partner governments who demonstrate an interest and robust commitment to exploring an SME business interruption cover. The likely requirement for significant public sector involvement necessitates this. The range of product and program options, such as extent of cover (duration), distribution of responsibilities between the public and private sectors, repayment timeframes, integration with other national policies, and logistics of administration, can then be determined according to the local market context.

Pricing

These three risk financing mechanisms provide incentives for improved outbreak response. Designing and implementing such mechanisms requires a concerted effort from governments, donors, health system partners, and the insurance industry. The extent of this cooperation will be highly influential on the objective, functioning, and pricing of each mechanism.

A series of key drivers of the pricing from the insurance market can be identified. These apply to all three mechanisms and, indeed, are applicable to any form of risk financing. We explore these in further detail to inform on mechanism design.

Expected loss: the expected loss is the average loss that the risk carrier (i.e., insurance market) can expect to pay in a single year. Obtaining an accurate estimation of expected loss is the starting point for pricing, which will additionally include considerations surrounding market conditions, uncertainty, expenses, and profit.

Market conditions and uptake: it is highly likely the infectious disease risk transfer market will be supply-limited, in that relatively few risk carriers will be willing to take on this risk at reasonable prices. A few carriers have demonstrated interest and commitment to infectious disease risk before, and these will be important to build momentum. The expected low level of participation, however, is likely to lead to higher pricing, owing to a lack of competition and the necessity that any carrier will have to accept a greater proportion of the overall risk.

Uncertainty: this refers to the extent to which infectious disease risk is well constrained within current risk models. Although risk modeling exists, influences on infectious disease impact are difficult to capture in a traditional modeling framework. For example, the timing and nature of decisions that affect the spread and the subsequent variability of impacts are enormously challenging to capture and assess. Higher uncertainty results in higher pricing since carriers apply greater uncertainty loads where they perceive that modeling efforts do not wholly and accurately capture the risk to which they are exposed.

Loss amplifiers: insurance pricing accounts for how loss may compound in the circumstances of disruption caused by an event (e.g., demand and price for water pumps following a flood). For infectious disease risk, loss amplification factors (e.g., timing and extent of lockdown measures) are myriad and difficult to identify accurately. These loss amplifiers will increase the cost of risk financing. A fast response to contain an outbreak, which requires suitable response plans, can reduce the impact of amplifiers.

Novelty and precedent: the familiarity of a given risk or product exerts an influence on the willingness of carriers to take on risk. It will take longer to establish a competitive market covering business interruption losses triggered by infectious disease since this is an emerging line of insurance coverage. The complex and varying experience of insurance companies following the COVID-19 outbreak further highlights the lack of consensus. By comparison, precedent for infectious disease impacts in life insurance means there is increased familiarity and comfort, resulting in competitive pricing.

These factors underline the pivotal importance of demarcating an explicit function for risk financing. The recommendation of these three financing mechanisms is rooted in this understanding. A series of management measures, such as laboratory capacity and response plans, help narrow the required role for financing. Similarly, linking financing for specific purposes, such as to implement response plans, helps identify the limit of payouts, increasing comfort in the insurance market. These are deliberate design recommendations to strengthen infectious disease risk management and improve the viability of risk financing. Further design measures are identified in Table 6.1.

Spark Risk	Containment Financing	SME Business Interruption	
Pathogens covered	Pathogens covered	Pathogens covered	
Frequency of outbreaks originating in CAREC countries (historical and modeled)	Frequency of outbreaks originating in CAREC countries (historical and modeled)	Duration of support	
Outbreak investigation and response cost	Duration of event (and duration required for containment measures)		
	Contingency plan cost		

Table 6.1: Financing Mechanism Design Considerations

CAREC = Central Asia Regional Economic Cooperation. Source: Consultant Team.

Moreover, ADB's lead sponsorship of these mechanisms can create favor in the risk financing market. The very nature of this infectious disease risk financing is highly innovative, and should thus be marketed as an attractive risk to potential carriers. With the support of ADB, and noting the potential for global spread of an outbreak, there is a robust justification for the social and public good benefits from such risk financing mechanisms.

6.3 Pathways for Implementation

The presented options for outbreak preparedness and infectious disease risk financing can provide a regionally robust approach to managing infectious disease outbreak risk. This is not to provide full protection against the negative social and economic costs that may come from an event, but to dramatically strengthen the mechanisms in detecting and containing an outbreak in the early stages, and to arrange financing so as to mitigate some of the perverse impacts that may materialize.

The basis of a regional surveillance system already exists in the CAREC region. A mapping of what currently exists and plans to develop capabilities have been articulated in the CAREC health scoping study (footnote 44). An understanding of how these plans can account for the requirements of infectious disease risk financing deserve further investigation. For example, as of July 2021, several CAREC countries (Afghanistan, Azerbaijan, Georgia, Kazakhstan, and Pakistan) have adopted the One Health approach developed by WHO.⁵⁰ The use of the Electronic Integrated Disease Surveillance System in Azerbaijan, Georgia, and Kazakhstan provides the foundation for data collection and sharing. Kazakhstan's use of the Electronic Integrated Disease Surveillance of the CCHF identifies a pathway for other CAREC countries.

The Global Disease Detection Regional Center (GDDRC) in Kazakhstan already functions as a coordinating hub for the region. Collaboration between WHO and the Kyrgyz Republic, Uzbekistan, Tajikistan, and Turkmenistan means the GDDRC is well-placed to advance a CAREC-wide surveillance approach. Ambitions for this are articulated in the CAREC health scoping study, such as for a regional laboratory network with a reference laboratory.

These plans could be directly integrated with advances toward regional risk financing. The roles of the GDDRC or the Lugar Center in Georgia would be important for the triggering of any of the three financing mechanisms proposed. Such facilities would be required to process tests as part of contingency plans under the spark risk cover or containment financing mechanism.

A detailed review of CAREC member government appetite and commitment to engage in risk management and risk financing for infectious disease outbreaks should be conducted. For each of the three risk financing approaches, strong public sector support will be a prerequisite, either to implement associated risk management measures or to provide financial support. The investment in preparedness and development of response plans is not a straightforward tick-box process, but essential to the creation of these risk financing mechanisms. Investments made in response to COVID-19 provide an initial platform. It is expected that the regional risk transfer facility will first offer earthquake and/or flood insurance coverage in the initial phase. In parallel, outbreak preparedness and response can be strengthened.

⁵⁰ Broadly speaking, a One Health approach attempts to link health programming and approaches across sectors, e.g., linking human and animal health sectors to better monitor zoonotic diseases that might spill over from animal to human populations. WHO. 2017. One Health: Q&A. 21 September.

Practically speaking, government appetite and commitment is likely to be of most relevance for the spark risk cover and the SME business interruption product. The containment financing will likely partially or wholly draw on donor funds. Financial support and organizational capacity are required for both mechanisms. The extent and the objective of the mechanisms are contingent on the profile of the country. Following a risk layering approach, risk transfer should address a specific type (frequency and severity) of risk. Financing mechanisms should thus be developed and implemented alongside and complementary to CAREC member states' investment in infectious disease outbreak preparedness and risk management measures.

As such, understanding the setup of the insurance market in each country is also relevant. This includes the current regulatory environment for SME insurance, as well as the capabilities and network of the insurance industry, which are important for design of the mechanism.

Once the role of risk financing is determined, options to tailor the mechanisms and sources of financing can then be explored. The mix of private and public sector financing across mechanisms should be approached holistically. The containment financing mechanism, which may tap donor or humanitarian financing, can incentivize government investment in preparedness measures or commitment to paying premiums for the spark risk cover. Complementarities with ADB's contingent disaster financing modality should also be sought.

Building Resilience to Future Outbreaks

Infectious Disease Risk Financing Solutions for the Central Asia Regional Economic Cooperation Region

The Central Asia Regional Economic Cooperation (CAREC) region was badly affected by the COVID-19 pandemic. Associated social and economic costs have placed infectious disease at the top of sovereign and corporate risk registers. Prearranged financing for shock events greatly enhances the cost-efficiency and effectiveness of response, but this was virtually nonexistent for infectious disease risk prior to the COVID-19 outbreak. This study provides a review of infectious disease risk financing schemes to draw lessons and recommend solutions for CAREC member countries to strengthen their disaster risk management strategies and public sector budget resilience.

About the Central Asia Regional Economic Cooperation Program

The Central Asia Regional Economic Cooperation (CAREC) Program is a partnership of 11 member countries and development partners working together to promote development through cooperation, leading to accelerated economic growth and poverty reduction. It is guided by the overarching vision of "Good Neighbors, Good Partners, and Good Prospects." CAREC countries include Afghanistan, Azerbaijan, the People's Republic of China, Georgia, Kazakhstan, the Kyrgyz Republic, Mongolia, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan.

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