MARSH

INSIGHTS | JUNE 2020

Pandemic Risk Protection

Accelerate Recovery and Build Resilience Now Through Public-Private Partnership

With contributions from:

METABIOTA®

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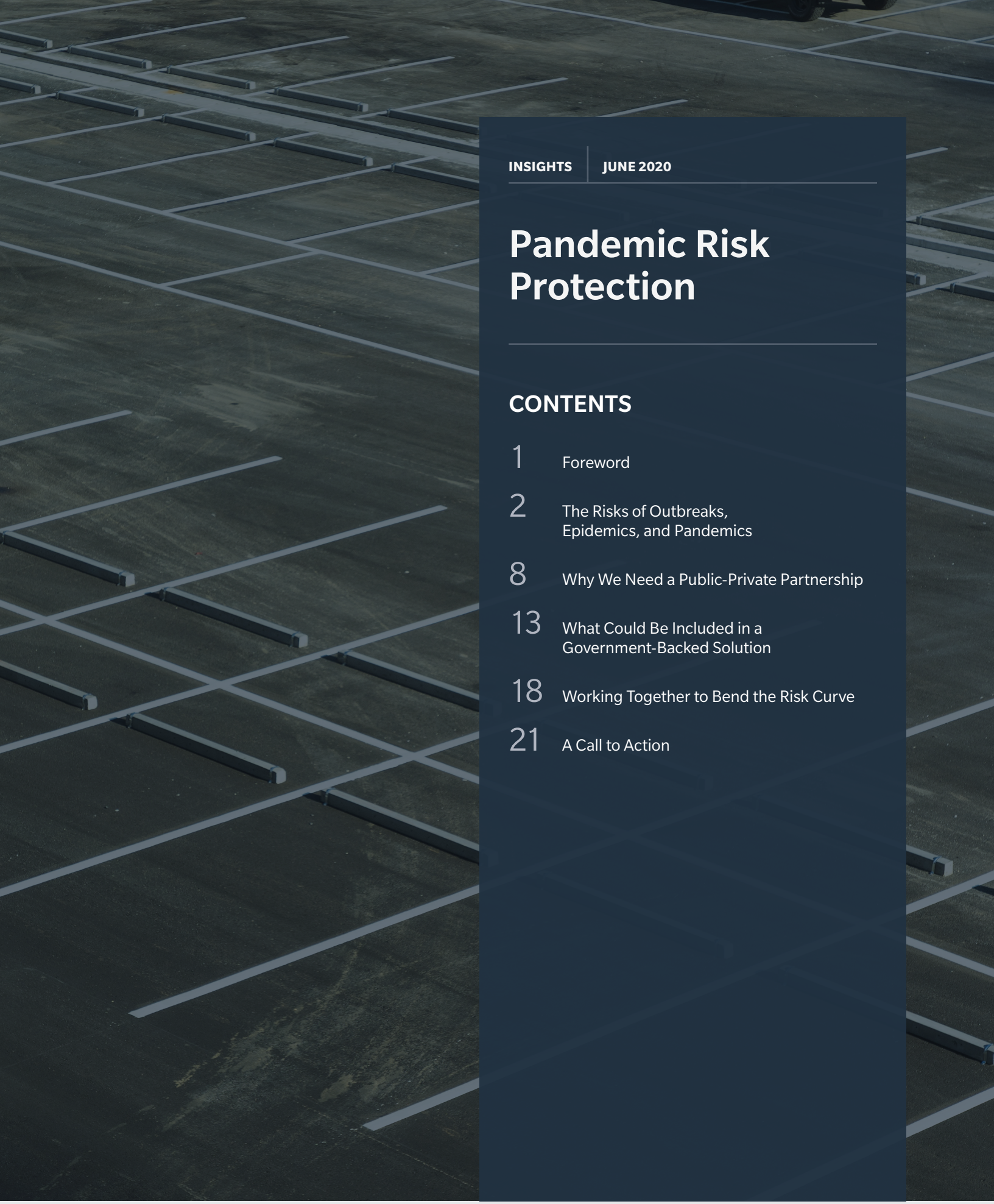

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Pandemic Risk Protection

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Foreword

COVID-19 has affected all of us. And while the pandemic is first and foremost a human tragedy, we are also deeply concerned about its impact on our economy. The stakes — for businesses, nonprofit organizations, workers, and the US economy — are too high to defer action.

As made clear in this report and in my recent letters to Congress and the administration, Marsh believes that creating a public-private pandemic risk solution can accelerate our economic recovery and provide much-needed protection against future pandemic risks. A pandemic risk insurance program is essential for large and small organizations alike.

The last several months have demonstrated that traditional insurance solutions — and the commercial insurance market — cannot fully provide businesses and others with the protection they need from the enormous costs of pandemics. Only the credit and power of the US government can help create the necessary risk program to harness the financial and social benefits of insurance to mitigate pandemic-related economic losses and provide greater certainty about a sustained recovery.

But the insurance industry has a role to play, too. If we create the right economic incentives for insurers, policyholders, and the government, insurance can serve its traditional function of mitigating risk. Over time, the right risk program can spur new technologies, ways of working, services, insurance products, and processes to ultimately chip away at the enormous losses associated with pandemics. That, in turn, can help make pandemic risk more manageable and enable our economy to build the necessary resilience it needs for the future.

We cannot wait until we've fought our way through COVID-19 to build a new solution. Delaying will significantly slow the pace of recovery as lenders and investors fear the absence of a safety net for the next pandemic event. A public-private pandemic risk solution is needed now, to provide confidence to businesses and enable them to do what they do best: be entrepreneurial, take risks, and rebuild the world's economy.

A public-private risk solution will:

- Facilitate access to capital from both lenders and equity markets that will require assurance against future pandemic risks.
- Limit tail risk for commercial insurers, enabling the creation of a viable, sufficiently capitalized insurance market that can offer affordable coverage for pandemic risks.
- Create greater certainty for businesses and employees in the event of a recurrence of COVID-19 or during a future pandemic.
- Enhance the resilience of the US economy and its ability to bounce back following a future pandemic.

As the COVID-19 pandemic continues, we remain committed to being there for our clients, helping to manage current impacts, and advocating for solutions to help mitigate future risks for the entire US economy.

John Doyle
President and CEO, Marsh

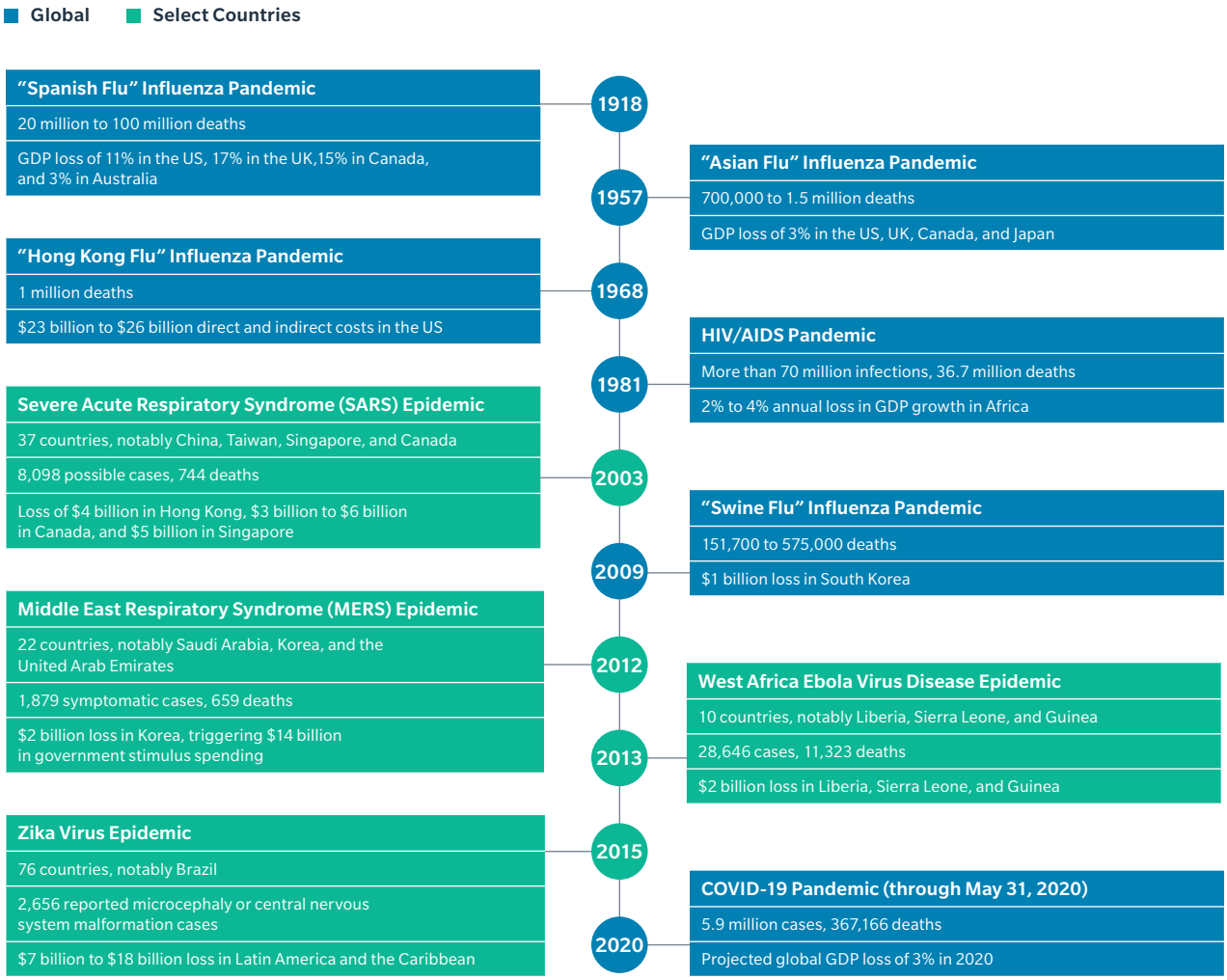
The Risks of Outbreaks, Epidemics, and Pandemics

The global influenza pandemic of 1918 — the "Spanish flu" — infected an estimated 500 million people and killed as many as 100 million. In the century since, many pandemics and epidemics have occurred, several of which caused billions or trillions of dollars in economic losses (see Figure 1). Despite advances in medicine and health care, several intensifying trends have increased the likelihood and potential reach of infectious disease, including global travel and connectivity, urbanization, and land use changes due to commercial development.

FIGURE 1

Pandemics and epidemics have had notable impacts on human health and the economy.

SOURCE: METABIOTA, WORLD HEALTH ORGANIZATION, INTERNATIONAL MONETARY FUND



The potential economic disruptions from today's health crises may be far greater than earlier ones. Frequent, unrestricted travel and far-reaching supply chains mean that an outbreak in a single country can quickly spread, while a severe epidemic or pandemic can cause lasting damage to organizations across several industries.

Some epidemics and pandemics have caused brief, sharp declines in economic activity, but this is not necessarily the norm. A highly transmissible respiratory infection, like the virus that caused the 1918 pandemic, can continue to spread and inflict compounding economic damage for several years. COVID-19 or a future pandemic could play out similarly.

This means that public and private sector organizations should be prepared for potentially extended periods of economic disruption.

Some of the potential risks for businesses include:

- Loss of workforce due to death and illness.
- Increased employee absenteeism and lower productivity due to family care obligations, social distancing, and fear of infection.
- Operational disruptions, including interruptions and delays in transportation networks and supply chains.
- Reduced or changed production or service delivery, including higher operational costs driven by public health regulations or voluntary risk mitigation or response measures.
- Reduced customer demand.
- Reputational damage, if an organization's outbreak response is seen as ineffective or if its communications with stakeholders are seen as incomplete or misleading.

WHAT IS A PANDEMIC?

The World Health Organization (WHO) defines an epidemic as "the occurrence in a community or region of cases of an illness, specific health-related behavior, or other health-related events clearly in excess of normal expectancy." A pandemic is defined by the WHO as "an epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people."

While some businesses and nonprofit organizations have focused on resilience in recent years and are prepared to withstand much of the short- and long-term damage from an infectious disease event, others are not. Over the last several months, many organizations have been forced to make difficult decisions simply to survive, including laying off or furloughing employees, canceling or delaying major projects and capital investments, and declaring bankruptcy. Even with these actions, it is apparent that many companies will not survive COVID-19.

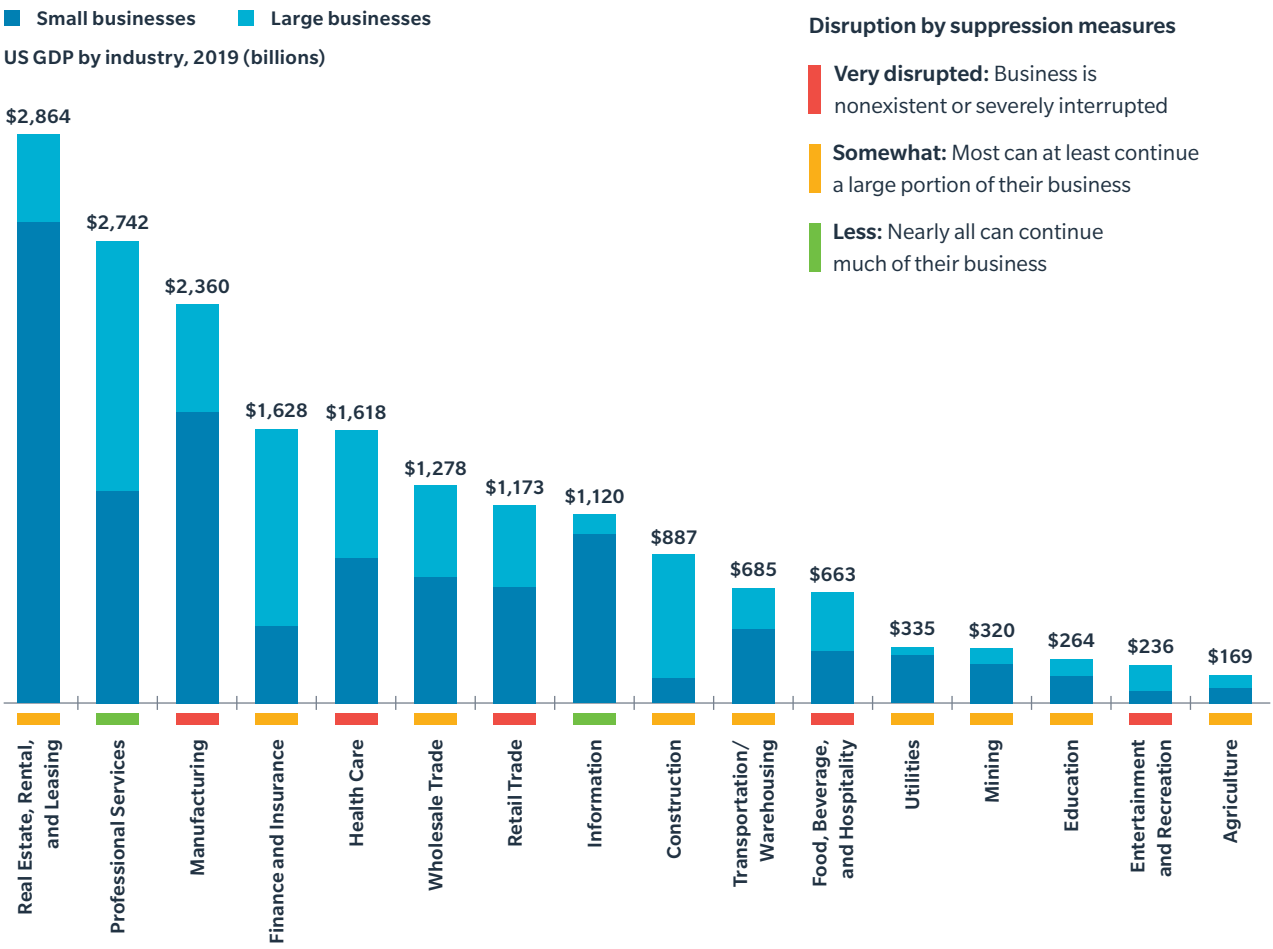
The financial consequences can be particularly acute for organizations in industries that rely on consumer confidence and foot traffic, including retail, hospitality, entertainment, and airlines (see Figure 2). During the 2013-15 Ebola epidemic, for example, airline stocks fell as investors anticipated a sharp decline in travel after an Ebola case was reported at a Texas hospital, while several hundred airline workers did not report for work at LaGuardia Airport in New York due to concerns about their safety. And more than 80% of losses in the Caribbean from the 2015 Zika virus epidemic were tied to lower international tourism revenue, according to the United Nations Development Programme.

Public entities — including federal, state, and local governments — can also feel the economic effects of a pandemic or epidemic. For example, the decline in the economy — including a rapid rise in unemployment and lower consumer spending — and the delay of tax filing deadlines as a result of COVID-19 has "triggered a severe state budget crisis," according to the Center on Budget and Policy Priorities. Moreover, forecasting potential government revenues is difficult given the uncertainty caused by the pandemic.

FIGURE 2

Disruptions from COVID-19 vary significantly by industry.

SOURCE: US BUREAU OF ECONOMIC ANALYSIS, US SMALL BUSINESS ADMINISTRATION, MARSH/OLIVER WYMAN ANALYSIS



COVID-19's Unprecedented Nature

Past epidemics and pandemics have caused significant — and, in some cases, even greater — loss of life, both in the US and globally. But COVID-19 — and its effects on the economy — has been extraordinary in at least three ways:

1. It was sudden and spread quickly. Within 60 days of the first case being reported in late December, the virus had spread to more than 50 countries across all six populated continents, according to the WHO.

2. The ensuing economic downturn has not been driven by a reduction in supply and demand. Rather, it's mainly been the result of concerted actions by governments to curtail social interactions and other activity that would otherwise accelerate the spread of the virus.

3. The impact of various risk mitigation measures and continued uncertainty globally has been exacerbated by the interconnectivity and interdependence of global supply chains. As shutdowns spread worldwide, questions arose about the availability of raw materials, parts, and manufacturing capabilities to meet critical needs and consumer demands. Restrictions on travel and trade, a contracting workforce, and the shuttering of airports, seaports, and distribution centers has led to significant disarray and impeded economic recovery.

Even as countries and US states loosen restrictions on people and businesses, with the hope of renewed economic activity, some disruptions should be expected to continue. And as social proximity limits, herd immunity thresholds, medical treatments and vaccines, and consumer demand continue to be tested, the ultimate impact of COVID-19 will likely be severe: According to the International Monetary Fund's April 2020 World Economic Outlook, the global economy is projected to contract by 3% in 2020 — far worse than the economic decline caused by the 2008-09 financial crisis — and 5.9% in the US. Global trade, meanwhile, is expected to fall between 13% and 32% in 2020, according to the World Trade Organization.

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IN FOCUS

The Evolution of Pandemic Monitoring and Modeling

Improvements in the ability to forecast the spread of a pandemic and its economic impacts are based on the growing wealth of data and analysis from recent and historical pandemics. For future pandemics, continued advances in monitoring spread and modeling potential human and financial consequences will enable the private and public sectors to make more informed risk management decisions to protect people, ensure operational and financial resilience, and facilitate recovery.

MONITORING

Monitoring tools can allow for early warning when an epidemic or pandemic is emerging and situational awareness while it unfolds. Accurate, complete, and timely data can inform critical decision-making — for example, to determine the appropriate timing for intervention measures and to assess their effectiveness.

Monitoring epidemics and pandemics can prove challenging, however. Data often suffers from reporting delays, a lack of standardization, and limits in spatial resolution and geographic coverage. During the COVID-19 pandemic, for example, these differences have made it difficult to compare data between countries.

Experts in epidemic data monitoring can overcome such challenges by using digital surveillance methodologies that can curate, cleanse, and structure epidemic data from hundreds of reporting sources on a near real-time basis (see Figure 3). These techniques have also been applied retrospectively to construct a database of historical epidemics and further assess the availability, frequency, completeness, reliability, and accuracy of reporting sources so that different data sources can be compared. This can generate an accurate and comprehensive view of each event, and — when coupled with modeling — can provide the full view required to underwrite the risk.

MODELING

For epidemics and pandemics to be insurable, the public and private sectors will require reliable estimates of their potential frequency and severity. Historical data serves as an important starting point, but today's advanced modeling techniques can provide a fuller picture of potential losses.

Using probabilistic modeling techniques, a large catalog of realistic simulated pandemics representing a wide range of possibilities can be built. Such modeling can incorporate information about medical advances, population, and travel patterns. In fact, this approach previously identified coronaviruses as a family of viruses with high pandemic potential.

Epidemics and pandemics can be modeled through large-scale computer simulations that track how they spread globally from person-to-person and place-to-place. These models incorporate input parameters and assumptions about factors such as where epidemics could spark, how frequently they occur, how easily they could transmit, and how deadly they could be. The models start from the time when the pandemic first breaks out and follows how it would progress each day. They include important factors that can change over time, such as mitigation measures and seasonality.

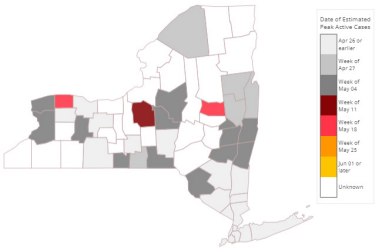
Running millions of simulations over a wide range of possible conditions can produce an event catalog that yields valuable insights about the frequency and severity of epidemic and pandemic events (see Figure 4). This approach, called "catastrophe modeling" or "extreme events modeling," is similar to the way the insurance industry understands the risks posed by low-frequency, high-severity natural catastrophe events, such as hurricanes and earthquakes.

Applying this type of modeling for epidemics and pandemics enables the public and private sectors to better prepare for, mitigate, and manage these risks and provides the insurance industry with the tools it needs to understand and transfer this risk.

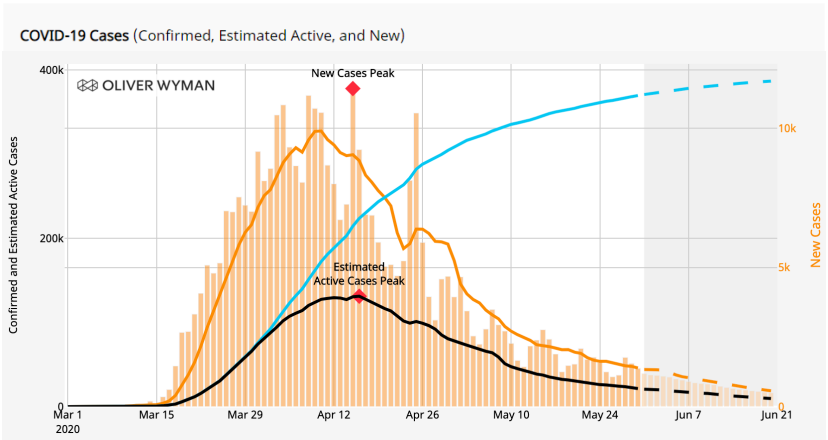
FIGURE 3

New data tools can enable epidemiological monitoring on a near real-time basis.

SOURCE: OLIVER WYMAN



Cases last updated 2020-05-30 from COVID-19 Data Repository by the Center for Systems Science and Engineering, (CSSE) at Johns Hopkins University.



COVID-19 Cases Adjusted for Undetected Cases (Estimated)

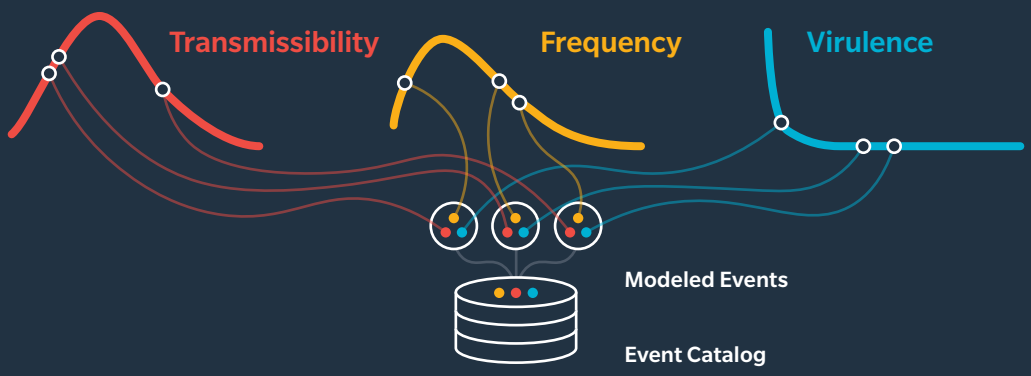
AS OF 2020-05-30	LOWER BOUND	BEST ESTIMATE	UPPER BOUND
% Total Population Infected	1.9%	3.8%	6.7%
Estimate for Total Cases (incl. Undetected)	6,310,197	12,586,075	22,016,504
Total Confirmed Cases (excl. Undetected)	1,766,032	1,766,032	1,766,032
Undetected to Detected Ratio	2.6:1	6.1:1	11.5:1

Our forecasts currently show case counts for Detected Cases (i.e., those officially captured and reported in the JHU dataset). However, there are additional Undetected Cases (e.g. untested asymptomatic or symptomatic cases, tested cases with false negatives, or tested cases with results not yet available) that are not captured in reported data. We provide estimates of the magnitude of the Undetected Cases in the table for you to better understand the progression of the virus through the population. The Undetected to Detected Ratio estimates the cumulative number of Undetected Cases in a region relative to Confirmed Cases. This ratio differs across regions and over time, with a strong correlation to the prevalence of testing. See White Paper for more details.

FIGURE 4

A modeling approach for understanding epidemic and pandemic risk.

SOURCE: METABIOTA



Why We Need a Public-Private Partnership

The enormity of the economic loss caused by COVID-19 in the US and globally, only a fraction of which will be covered by insurance, poses recovery and resilience challenges for businesses, governments, and insurers. The complex nature of pandemic risk necessitates close cooperation by the public and private sectors in managing its impacts and restoring confidence in the functioning of markets, economies, and society at large. Key to building a more proactive and agile response to the next pandemic will be an insurance and risk management partnership that helps facilitate coverage, aligns the desires of both insurers and insurance buyers to avoid losses, and incentivizes pandemic risk preparedness and mitigation efforts. Recent history provides examples of just how this has been accomplished.

The Economic Recovery Challenge

It remains to be seen how quickly the US economy will recover from COVID-19. The scenarios being considered hold lessons for future pandemic response and recovery, as well as actions to be taken jointly by the public and private sectors.

To describe their projections, economists often turn to letters of the alphabet resembling the shape of paths observed in past recessions and recoveries. They commonly use V, U, W, and L — ranging from the quickest recovery to the slowest — to describe the trajectory of GDP, employment, and other key metrics tracking economic conditions (see Figure 5).

Despite the various scenarios and potential paths to recovery, the answers to two questions will ultimately determine how quickly the US economy recovers from the current pandemic:

- How quickly can the imminent health threat be brought under control?
- How quickly can a vaccine be developed and distributed?

To ensure a swifter V- or U-shaped recovery, the US must get COVID-19's imminent health threat under control. The longer that shutdowns and uncertainty about a solution or a clear path persist, the more businesses will suffer and fail.

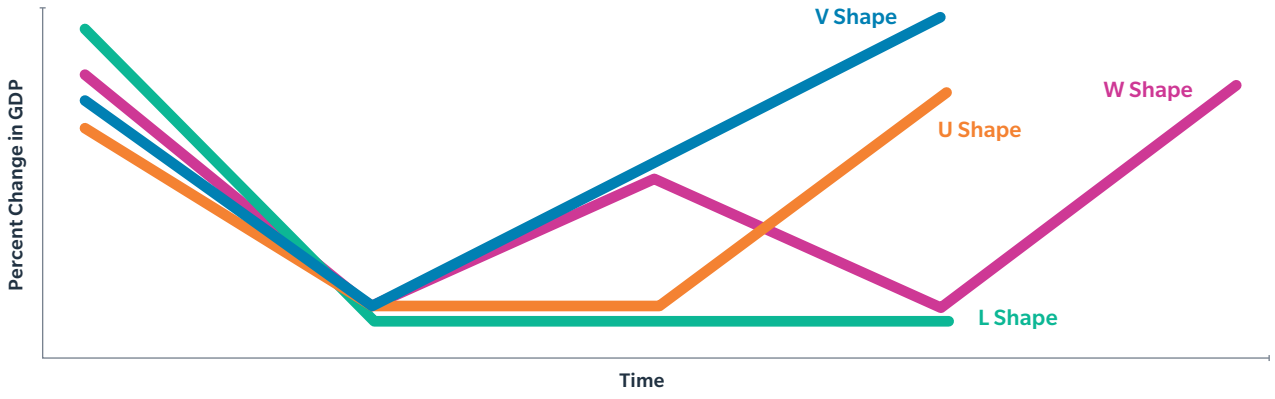
A W-shaped recovery would be characterized by a period of quick recovery followed by a second period of decline, likely attributable to a new wave of COVID-19 cases as the economy reopens or seasonality of the virus.

The actual pace of the recovery will depend on the nature and degree of uncertainty in the marketplace. In reality, no one knows when the pandemic will be behind us and when we can return to our pre-pandemic routines. And there is no certainty on the timing of a vaccine being developed. There is also the fear of other pandemics to come.

FIGURE 5

Economic recovery from COVID-19 can take many shapes.

SOURCE: MARSH



In the face of such uncertainty, businesses must make crucial decisions, such as:

- What levels of investment should be made in the business? And in what areas?
- Should employees be kept on the payroll or be laid off, which would sever employment relationships that could be difficult to rekindle when business returns to normal?
- Should idle capacity be maintained or should machinery and factories be mothballed, knowing that the eventual restart could take time?

Such decisions may be somewhat easier for those businesses with access to liquidity and the resources to pursue any claims under applicable insurance policies. However, smaller businesses lacking capital and relevant coverage are faced with a perilous gamble.

Smaller businesses lacking capital and relevant insurance coverage are faced with a perilous gamble.

The Foundation for a Rapid Economic Recovery

In consideration of the various recovery scenarios, steps can be taken to minimize the length of the economic downturn, expedite the economic recovery in the coming months and years, and bend the risk curve by improving the resilience of all stakeholders to future pandemics.

First, businesses, governments, the insurance industry, and all other stakeholders must address the imminent threats of the current pandemic. This includes ensuring the efficacy of critical care, the expansion of testing, and the development of effective therapies and vaccines. These efforts should also take into consideration the ability to reduce and mitigate the risk of future waves of COVID-19 infection and combat new pandemics.

Second, the government should ensure that risk mitigating measures are not only effective, but also minimally disruptive to the economy. After all, federal and state authorities will ultimately determine if, when, and how "shelter-in-place" restrictions are eased. Moreover, how the government responds will determine the business infrastructure that will exist when the health crisis is contained. For example, financial support of small businesses may help avoid business closures and high unemployment rates, which would allow businesses to reopen quickly with the staff they need to ensure the quick return of important goods and services.

Third, uncertainty should be reduced. Once businesses reopen, they will have to assure employees, customers, suppliers, distributors, regulators, and investors that it is safe to resume commercial operations. The effort required can affect the speed and enthusiasm with which individual businesses will decide to return to their pre-crisis levels of economic activity. Similarly, business owners may be reluctant to reopen if they are worried that the pandemic may return or if they lack the necessary resources to protect employees and customers. Uncertainty will weigh especially heavily on those businesses with highly interconnected and interdependent supply chains, where future shutdown risks — production slowdowns, distribution bottlenecks, revenue potential, and more — may complicate decisions to reopen. Uncertainty around managing these risks can filter down to employees who may be reluctant to return to work, investors who may be hesitant to invest or re-invest, and insurers who may be unwilling to cover future pandemic risk impacts.

While the true shape of recovery will only be evident in hindsight, the consensus is that its pace will be contingent upon our ability to manage the spread of the virus over the

The last several months have demonstrated that there may be significant limitations to the extent that property and liability policies respond to pandemic-related losses.

next few months and the steps taken to mitigate continued uncertainty and risk. For a quick and sustained recovery, it is not enough to have a vaccine, ease social restrictions, and maintain the nation's business infrastructure. It will be important for the public and private sectors to work together to reduce the uncertainty across the market and for individual businesses of all sizes.

Commercial Insurance Coverage Limitations

Given the far-reaching business impacts of governmental measures already taken to control the spread of COVID-19, many companies are looking to their insurance policies for potential responses to the ongoing financial loss. The last several months, however, have demonstrated that there may be significant limitations to the extent that property and liability policies respond to pandemic-related losses.

While some specialty polices may include coverage for pandemic claims, the vast majority of policies do not explicitly cover this risk. And given the specific and extensive effects of COVID-19, many insurers are expected to broadly exclude pandemic risk going forward.

The following overview of selected forms of standard coverage provides an indication of many of the challenges faced by insureds and the support and confidence that a government-backed standalone pandemic insurance solution could lend to building a better market for this risk.

Policyholders should note that the specific language in individual policies will ultimately determine any COVID-19 or future pandemic coverage. Organizations should work closely with their advisors and counsel to guide them through these various issues.

Property and Business Interruption

Standard property policies generally are triggered by insured physical loss or damage. Many include coverage for business interruption loss, other time element coverages, and extensions such as interruption by civil authority, ingress/egress, attraction or leader property, and contingent business interruption/extra expense.

If COVID-19 manifests at an insured's premises, insurers may contend that there has been no physical loss or damage. Similarly, insurers may argue that possible contamination, proximity to other contaminated premises, or fear on the part of the public does not constitute physical loss or damage for purposes of triggering coverage. If physical loss or damage is established, insurers may seek to invoke "contamination" or other exclusions in the policy.

Policyholders may look to the interruption by civil authority extension in their property policies for potential coverage — for example, arising from shutdowns and closures such as those mandated by governors in several states. There is no single version of a civil authority extension that has been incorporated across all policies, and a careful review of specific policy language will be required. Insurers may argue that shutdown orders in and of themselves do not satisfy policy requirements that physical loss or damage of the type insured by the policy has occurred, which is usually a required trigger of coverage.

A variety of arguments in favor of policyholders have been discussed since the COVID-19 outbreak began, and will likely be developed further. Among the arguments voiced to date is that policies' physical loss or damage requirements are satisfied because the virus reportedly remains on physical surfaces for some time and therefore constitutes physical damage to the property — and similarly, that government shutdown orders create a "loss of functionality" at insured locations that is equivalent to "physical loss or damage." These potential coverage arguments, and others, together with the facts of any specific loss, merit careful monitoring.

A number of coverage disputes have arisen since the pandemic began, some of which have resulted in litigation. It may be months or even years before these and future suits are ultimately resolved.

While insurers may have provided coverage in the past, many carriers are now reducing or eliminating coverage, regardless of pricing and terms. There are now fewer options for insureds.

Workers' Compensation and Employers Liability

Although workers' compensation statutes and case law can vary by state, compensability generally requires that an illness or disease be "occupational." This essentially means that the illness:

- Arises out of and occurs in the course and scope of employment, which will normally be determined by whether an employee was benefitting the employer when exposed.
- Is proven to be the result of a workplace exposure.
- Is "peculiar" to the employee's work, meaning that the disease is found exclusively among or presents greater risk for certain employees.

As COVID-19 has spread, it has become increasingly difficult to determine whether an employee has contracted the illness in the workplace. Health care professionals, first responders, airline and transportation workers, hospitality workers, and others in industries deemed essential are among those with a higher likelihood of exposure. But health care workers, for example, may be infected by patients, coworkers, family members, neighbors, and strangers, and in turn may infect each of these groups.

As the pandemic has progressed, some states have issued executive orders or taken other legislative action that would, in effect, create a rebuttable presumption that any employee or certain classes of employees who contract COVID-19 did so while working.

Whether a specific case is compensable will be determined by the facts established during an investigation of the claim, as well as the governing law in the jurisdiction where the claim is reported. Additionally, since there is no single "test" that can prove whether an illness or disease is compensable, it may ultimately come down to a decision by a court or state workers' compensation board.

Because insurers cannot explicitly exclude occupational illnesses as a result of communicable diseases from their workers' compensation policies — and because employers are required in nearly all states to purchase workers' compensation insurance — the options for buyers could become limited amid future outbreaks, epidemics, and pandemics. The introduction of rebuttable presumptions of illness in many states shifts the

PANDEMIC COVERAGE OPTIONS

Currently, pandemic coverage options for businesses are limited. Marsh, together with Metabiota and Munich Re, sought to address this gap as early as 2018 by launching PathogenRX to help organizations mitigate the risks posed by outbreaks, epidemics, and pandemics.

As epidemics and pandemics are typically excluded from business interruption policies, organizations are exposed to potentially large and sustained losses in revenue due to workplace disruption, absenteeism, sharp declines in consumer confidence and demand, or public health restrictions that limit business activity. PathogenRx provides coverage for these and other losses, helping businesses protect their balance sheets and improve their ability to weather and more quickly recover from epidemic- and pandemic-related losses.

Insurers may seek to assert a variety of potential coverage defenses.

burden of proof; employers must prove that an illness is not work-related in order to deny a claim. This will likely affect workers' compensation market capacity and pricing, especially for employers in industries that are considered essential.

General Liability and Umbrella and Excess

A claim brought by a third party for bodily injury or property damage resulting from an alleged unintentional or negligent failure to protect from the virus should fall within the basic coverage grant of a general liability policy, as well as umbrella and excess coverage. Depending on the circumstances, however, insurers may seek to assert a variety of potential coverage defenses, including:

- **Pollution exclusions:** Insurers may contend that bacteria and viruses constitute "pollutants" under the pollution exclusion. Certain policies define "pollutants" to include viruses; others specifically provide that viruses do not constitute "pollutants"; and some are silent on the issue.
- **Fungi/bacteria exclusions:** Although COVID-19 is viral, illness may occur due to secondary bacterial infections brought on by the virus.
- **Intentional act exclusion:** Depending on the circumstances, carriers may contend that coverage is excluded because the policyholder acted "intentionally." For example, if a policyholder has recently held a large event, an insurer may contend that the decision to proceed in the face of a known risk is an intentional act rather than mere negligence, and therefore excluded. Although courts often reject such defenses — restricting their applicability to situations where the insured actually intended the specific injury alleged — the merit of such a defense will depend on the facts and applicable law.
- **Communicable disease exclusions:** Removing these exclusions going forward — if possible — should be a priority for policyholders and their advisors, although insurers — driven in part by the demands of reinsurers — are likely to dig in and seek to preserve them.

The potential applicability and scope of each exclusion will likely depend on court precedent and the factual circumstances of the claim.

Event Cancellation

Event cancellation insurance coverage could respond if an event must shut down because of a confirmed COVID-19 case on a venue's premises or a ban on mass gatherings by local or state government. Prior to the start of the COVID-19 outbreak, policyholders could generally add back — via endorsement — coverage for communicable diseases that has often been excluded from standard event cancellation policies.

Other forms of event cancellation coverage — for example, those related to trade shows, conventions/expositions, and other specific types of events — have typically included communicable diseases. Following considerable losses related to COVID-19, however, most insurers are now excluding coverage going forward.

Event cancellation coverage will likely not respond if an event is preemptively cancelled due to fear of the pandemic's spread. Policies also often require that an event organizer make a good faith effort to reschedule an event before cancelling it.

What Could Be Included in a Government-Backed Solution

Although the potential risk of a severe public health crisis has been on the radars of governments and businesses for many years, the intensity of COVID-19 caught many off guard. The pandemic, however, is now the top agenda item in boardrooms, statehouses, and legislatures across the country and around the world. To manage current and future uncertainty around reopening, recovery, and resilience, it is imperative that governments, insurers, and businesses work together as they did after past events — including terrorist attacks — to develop and implement solutions that build confidence and strengthen the economy.

Prior to the attacks of September 11, 2001, terrorism was generally not a clearly defined coverage in commercial property insurance policies. Most standard property policies covered terrorism either as part of the policy or without specifically mentioning terrorism — that is, the policies did not directly address terrorism, so they effectively covered it.

In the aftermath of 9/11, reinsurance for terrorism risks was withdrawn and commercial insurers stopped covering them. Insurers' general view at that point was that the risk of loss was unacceptably high, unpredictable, and difficult to price. In November 2002, to address concerns that the lack of terrorism risk insurance could have significant effects on the economy and ensure its continued availability and affordability, Congress passed the Terrorism Risk Insurance Act (TRIA).

TRIA required the Treasury Department to administer a program through which — in the event of a certified act of terrorism — the federal government would share some of the losses with private insurers. TRIA also includes provisions for the Treasury Department to recoup the federal share of losses after a certified act of terrorism. The losses the federal government would cover before such recoupment create an explicit fiscal exposure for the government.

The federal backstop created by TRIA — and reauthorized several times since — mandates that commercial insurers offer coverage to businesses. In turn, the federal government has pledged to cover an increasing share of terrorism-related insurance losses — up to $100 billion each year, above a "deductible" for individual companies that increased from 7% of premium in 2003 to its current level of 20%. Not only did this enable the creation of a viable commercial insurance market for terrorism, it provided much-needed assurances to lenders — without which commercial property development would not be possible — and helped stabilize the overall economy.

A New Pandemic Partnership

A public-private partnership to establish a federally backed pandemic reinsurance program can offer similar benefits. As we are seeing, the economic impact of this pandemic event is enormous, with losses in the US alone projected to reach into the trillions of dollars.

The risk characteristics of a pandemic event are significantly different than those of a terrorist event, which is highly localized with expected losses within the $100 billion terrorism facility. A severe pandemic event can pose even greater losses than a nuclear terrorist event, which models estimate could result in insured losses of $800 billion or more.

Such a pandemic insurance facility is especially critical now, and commercial insurers can play a valuable role, as they do with terrorism. The US property and casualty insurance industry, however, only has an estimated $312 billion in policyholders' surplus for commercial lines, according to A.M. Best. This figure represents the industry's financial cushion to protect against unexpected or catastrophic losses — and insurers generally consider all of it necessary to underwrite other critical business risks, including hurricanes and other natural catastrophes, workers' compensation losses, and cyber-attacks.

On their own, private insurers do not have the financial resources necessary to fully underwrite the unprecedented losses suffered by businesses since the COVID-19 pandemic began — losses that may continue to mount in the months and years ahead, especially if the virus resurges and new pandemics of equal or greater severity emerge. And while many policyholders are interested in pandemic risk coverage, insurers are reluctant to accept unlimited risk on their balance sheets.

For these reasons, a new solution is required for this systemic risk.

BROAD BUSINESS SUPPORT FOR A PUBLIC-PRIVATE PANDEMIC RISK SOLUTION

The business community at large — and risk professionals, specifically — has expressed widespread support for a government-backed insurance solution to protect against pandemic risk and a willingness to buy pandemic coverage in addition to their current purchases. In an April 2020 survey by RIMS — the leading insurance and risk management trade organization — nine in ten (91%) risk professionals expressed support for a pandemic or epidemic risk solution similar to TRIA.

A number of other trade bodies have similarly advocated for a public-private partnership to address pandemic risk. These include the National Retail Federation, National Restaurant Association, National Multifamily Housing Council, and American Hotel & Lodging Association.

A pandemic risk insurance facility can help limit — but not eliminate — private sector risk, providing critical assurances to lenders and equity markets and helping to accelerate economic recovery. It can also limit the financial impact of a future pandemic by absorbing the initial shock, enabling businesses to retain employees and meet financial obligations through the peak of uncertainty.

A range of risk-pooling models — from pure private partnerships to state-financed funds for non-insurable risks — can be used to address difficult risks (see Figure 6).

Nearly two decades since its initial passage, the federal terrorism backstop should be seen as a model public-private partnership that has facilitated the creation of a viable insurance market for a risk that was previously considered unthinkable, and ensured the stability of both the insurance industry and overall economy. A federally backed pandemic risk insurance program can achieve many of the same goals today.

Lawmakers in the US and globally are currently exploring a variety of public-private risk pooling models. On May 26, 2020, the Pandemic Risk Insurance Act of 2020 (HR 7011) was introduced in the US House of Representatives, calling for a program that resembles the TRIA model but with more capacity to meet the potentially greater financial losses that can result from pandemics. In April, a steering committee of leading UK insurance industry executives announced it is exploring a model based on the country's public-private terrorism risk program, Pool Re. Also in April, a working group created by France's Ministry of Finance that includes the Association of Corporate Risk and Insurance Management, an industry trade group, and CCR, a public sector reinsurer, said it is developing a program that will include both public and private funds at risk.

Like public-private pooling programs for catastrophic perils, such as flooding, terrorism, and crop hazards, pandemic risk pooling programs will likely vary by country, based on the unique risk profiles and risk tolerance of each economy. Successful models will leverage the credit of central banks to drive affordability and create the economic incentives needed for all stakeholders to enact measures to mitigate pandemics.

FIGURE 6

A public-private insurance/reinsurance mechanism could be developed in several ways.

SOURCE: GUY CARPENTER, MARSH

Private ← → Public

SEMI-PRIVATE POOLING REINSURANCE SCHEME

- Joint entity created by insurers to pool risk and share knowledge.
- Participation may be voluntary or legally mandated.
- Financing primarily provided by the private sector, with limited (if any) initial government financing and typically no committed reserve.

PUBLIC-PRIVATE PARTNERSHIP (PPP) REINSURANCE SCHEMES

- Structured risk sharing model between policyholders, insurers, and government.
- Government explicitly provides backing to the private sector to cap exposure and drive affordability.
- Participation may be voluntary or legally mandated.

PUBLIC FUNDS FOR NONINSURABLE RISKS

- Pure government setup, without any direct private involvement (other than aligning coverage).
- Fund is created with a reserve, built up over time, that can be used to pay out claims in the event of a pandemic.
- Claims against the fund should be aimed at covering risk events that cannot be covered by existing insurance offerings.

RELEVANT OPTIONS FOR MANAGING PANDEMIC RISK

Given their global nature, pandemics are unlikely to offer insurers and reinsurers any diversification. Some form of public support will likely be required to enable viable insurance and reinsurance markets.

IN FOCUS

Public-Private Partnership Precedents

Beyond the US terrorism backstop, several other risk pooling schemes that exist globally can provide valuable lessons for both the public and private sectors (see Figure 7).

Other risk financing mechanisms for pandemic response geared towards countries on a global and regional level are also worth examining.

The World Bank's Pandemic Emergency Financing Facility (PEF) is a first-of-its-kind disaster risk financing mechanism focused on large epidemics and pandemics. The intent of PEF is to provide countries and response agencies with a rapid infusion of funds to help cover the cost of disease response activities, such as additional human resources — including clinicians and community health care workers — personal protective equipment, vaccines, and therapeutics. The COVID-19 pandemic has triggered a payout of $195 million. PEF has previously paid out smaller amounts for other epidemics, including two Ebola epidemics in the Democratic Republic of the Congo. Future iterations of PEF-like structures are likely to incorporate lessons learned from the first iteration.

One of the greatest challenges in epidemic and pandemic response is the timely identification and control of local outbreaks. Given their limited resources, low- and moderate-income countries — frequent hotspots for pandemic emergence — are often substantially slower than high-income countries to identify and control infectious disease outbreaks, and generally lack robust contingency plans and emergency financing for disease control. An innovative pilot approach to address this problem is the **African Risk Capacity** outbreak and epidemic sovereign insurance program, which will establish a pool of capital that can be rapidly deployed early in outbreaks. The program is designed to incentivize countries to improve surveillance and report events early by linking payouts to the declaration of events and linking contingency plans to coverage in a way that encourages rapid efforts to quench early outbreaks before they become epidemic or pandemics.

FIGURE 7

Existing risk pooling structures can offer several lessons.

SOURCE: MARSH

Significant loss events or changes in how risks are modeled can lead to market-wide capacity withdrawal.	TRIA was passed in 2002 following a widespread withdrawal of commercial terrorism cover by reinsurers after the September 11, 2001, terrorist attacks. Flood Re was developed to provide affordable flood risk cover to the approximately 3% of UK homeowners living in high flood risk areas. Industrywide improvements in flood risk modeling had made coverage unaffordable for this cohort.
Extreme risks typically require some form of government backstop.	Government treasuries are the insurer of last resort on multiple loss sharing schemes. For example, the US National Flood Insurance Program (NFIP), the UK's Pool Re, and France's CCR Cat Nat and Gestion de l'Asurance et de la Réassurance des risques Attentats et actes de Terrorisme (GAREAT) have unlimited guarantees. TRIA, the Australian Reinsurance Pool Corporation (ARPC), Germany's Extremus, and the Netherlands' Nederlandse Herverzekeringsmaatschappij voor Terrorismeschaden (NHT) have limited guarantees.
Public-private partnerships provide credibility and can be structured to gradually shift risk to the private sector.	The US government's terrorism backstop enabled insurers to access affordable reinsurance for terrorism coverage. Over time, federal reinsurance participation in the program has fallen from 90% in 2002 to 80% in 2020, while insurer deductibles have risen from 7% of premium in 2002 to 20% in 2020. Insurer retentions have also increased, from $5 million in 2002 to $200 million in 2020. The UK government's backing of Pool Re similarly enabled insurers to access affordable terrorism reinsurance. Over time, the Pool Re fund grew and private reinsurer confidence was restored, to the point that £2.4 billion of reinsurance cover is now purchased. As a result, a loss fund of approximately £10 billion (including member retentions) sits between the consumer and the government needing to step in.
Programs can be used to incentivize the adoption of preventive measures.	Eligibility for the US flood risk program, NFIP, requires communities to adopt and enforce strict floodplain ordinances and offers premium discounts for outstanding performance. While there is no direct requirement for risk mitigation by Pool Re stakeholders, premium discounts of up to 7.5% are available for insureds that proactively undertake such initiatives. The US crop insurance industry supports continued agronomic research to determine how farmers can best incorporate risk management best practices in their operations and the impact those practices may have on insured crops. The US SAFETY Act of 2002 was created to spur the adoption of improved security measures by offering to limit liability of companies providing anti-terrorism products and services for qualified vendors. Similar policies, coupled with a robust public-private insurance market, could incentivize private sector adoption of prophylactic measures to drive down exposures. Flood Re is intended as a temporary solution to be phased out by 2039. As such, the government has committed to major investments in preventive measures, while Flood Re has prompted insurers to work to enhance their understanding, mapping, and modeling of flood risk and their collection of data for improved underwriting.

INSURANCE SOLUTIONS FOR SMALL AND MEDIUM ENTERPRISES

Compared to their larger peers, small and medium enterprises (SMEs) typically have smaller balance sheets, less capital, and less access to credit that can be used to meet financial obligations during a shutdown necessitated by a pandemic or epidemic. And according to the US Small Business Administration, businesses with 500 or fewer employees account for 47% of all private sector jobs.

As they develop new and innovative solutions to pandemic risks, it's critical that insurers consider the needs of SMEs, which will play a critical role in the economic recovery from COVID-19 and could experience disproportionate effects from future infectious disease events. Insurers should consider offering policies with shorter duration deductibles and parametric triggers that enable rapid claims payments to SMEs during the early stages of a pandemic or epidemic, allowing them to maintain payroll and improve their chances of remaining operational.

Working Together to Bend the Risk Curve

A government-backed pandemic risk insurance program can provide valuable peace of mind to businesses and organizations as they recover from the effects to date and prepare for the potential reemergence of COVD-19 or another future epidemic or pandemic. But as with traditional insurance solutions for other risks, it is by no means the only way to manage infectious disease risks. Insurers, the private sector, and the government must work together to improve national and organizational resilience, bending the risk curve so that pandemic events can be better anticipated and their impacts better contained.

The Role of Insurers

Beyond their role in issuing and administering pandemic insurance policies in a new marketplace facilitated by a federally backed program and reimbursing policyholders for claims following losses, insurers can play a critical role in developing and encouraging the adoption of pandemic loss reduction measures. The insurance industry has a strong track record of helping businesses of all sizes mitigate critical risks, including natural catastrophes, workplace hazards, cyber threats, and more. That institutional knowledge and expertise can be put to use to similarly help businesses understand and manage pandemic risk.

Specifically, insurers — in concert with insurance brokers and other advisors — can help businesses:

- **Better understand their critical risks.** COVID-19 has made clear that many businesses have not fully contemplated the range of effects that an outbreak, epidemic, or pandemic can have on their people and operations, critical infrastructure, and governments. Greater investment by the insurance industry in data collection and modeling tools can help insurers, brokers, and businesses to anticipate and quantify potential risks.
- **Obtain insurance coverage to meet their unique needs.** Ideally, insurers will not offer one-size-fits-all coverage solutions to prospective buyers. As with terrorism insurance policies made available via the federal backstop, buyers should be able to customize the pandemic insurance policies they purchase — for example, selecting specific infectious disease risks to insure and adjusting limits to meet their risk tolerance and other preferences.
- **Enact practices to prevent pandemic-related losses.** Insurance buyers seek to mitigate their property, workers' compensation, and cyber risks through superior building techniques, workplace safety programs, and cybersecurity programs. Insurers reward policyholders that can demonstrate their commitment to such processes in the form of more favorable pricing and terms and conditions. A federally backed pandemic risk insurance program that encourages improvements in health and safety practices can yield similar benefits.

The Role of the Private Sector

The private sector was largely caught off guard by COVID-19. The immense costs dictate that in a post-COVID-19 world, governments, shareholders, lenders, and ratings agencies will request, and in some cases require, that corporations develop a clear view of their exposure to epidemic risk and document their mitigation plans, which will include risk assessments, response plans, and insurance coverage.

Dynamic Corporate Decision-Making

Traditional resilience measures are not necessarily suitable when contemplating pandemic risk management strategies and immediate response actions. Effectively mitigating this risk demands that corporate boards, senior management, and risk management teams evolve how they view, measure, and act on risk.

Historically, measurement has been viewed at worst as a compliance exercise and at best as a process that seeks to protect an organization's value. The immediate lesson of the pandemic is that the process itself must be dynamic and owned by boards.

Specific metrics can help organizations make critical decisions while facing uncertainty. These metrics include:

- Measures of risk aggregation and interdependencies — first-party and contingent — across the value chain.
- Resilience metrics tied to how much stress an organization can withstand — at what points in the value chain — in order to better understand how stress could reduce decision-making options.
- Intelligence layers that enable early warnings and guideposts to navigate a pandemic crisis and provide "barometers" for key decision paths.
- Evaluations of counterparty risk, which includes collecting metrics on third parties — such as suppliers and key partners — on which they depend.

The ability to construct risk forecasts that evaluate future risk is also necessary. Scenario-based stress testing methodologies allow for the investigation of different outcomes and assumption sets. Such an approach can inform and shape understanding of future risk scenarios, enable the evaluation of potential value chain shocks, and challenge assumptions in an organization's strategy. This can help organizations evaluate risk capital investments, including the tradeoff between resilience and efficiency, from a potential return on investment perspective. It also can help leaders contemplate the ways in which their organizations are most at risk and how non-correlated factors can create disruptive forces.

It also can help organizations demonstrate to underwriters and equity markets that the next pandemic will not be fatal to their balance sheets so they can continue to secure coverage and attract investments. The capacity for businesses to anticipate changes and adapt in ways that continuously build and deliver value for customers is crucial to this process.

EPIDEMIC RISK ANALYTICS

The effect of an epidemic or pandemic on every organization will be different, depending on their characteristics and circumstances, including industry, geographic footprint, supply chain structure, employee density and demographics, and product or service types and consumption. For example, companies moving people and packages by air may share a range of attributes, but their individual epidemic risk exposure could be significantly different.

Epidemic risk analytics can provide the tools needed for understanding the specific risks faced by various industries and individual organizations. Analytics can enable organizations to develop and optimize different preparedness and response strategies. Software tools can also allow organizations to aggregate and visualize historical and real-time epidemic data, which can better enable epidemic risk measurement, mitigation, and management.

Protecting People

In preparation for a possible reemergence of the coronavirus in the near future — and ahead of future outbreaks, epidemics, and pandemics — it is incumbent on organizations to build the necessary infrastructure to help protect the health of their employees, customers, and visitors to the workplace. Organizations can also help limit potential disruptions to their employees' lives and accelerate and ease their return to work following future stay-at-home periods.

Among other actions, risk professionals — working with health officials, HR staff, and others — should focus on:

- **Proactive local screening.** Epidemics and pandemics often start small, but can quickly grow. To mitigate risk and maximize containment, businesses must be able to detect disease patterns at the local level and on site. Techniques such as big data analytics and computational epidemiology can help organizations model, understand, and control the diffusion of disease. Analyzing trends in news reports and on social media, for example, can help spot the emergence of a flu epidemic before any formal declaration from the WHO or other health authorities.
- **Locating employees and contact tracing.** COVID-19 has made clear how important it is for businesses to be able to quickly locate employees and conduct rigorous contact tracing, both of which are core disease control measures and key strategies for slowing or preventing the spread of disease. While widespread monitoring will inevitably raise concerns about privacy, businesses will need to consider the tradeoffs from both a humanitarian and economic perspective.
- **Digital health and telemedicine.** If not in use already, these tools can help employers help their employees reduce their physical exposure to health care and hospital settings. This can support efforts to slow the spread of viruses, bacteria, and other pathogens in the workplace and the larger community.
- **Mental health and employee engagement.** Businesses need healthy, emotionally sound, and engaged employees in order to be productive. Efforts should be made to ensure connectivity — at formal and informal levels — between employees and with management if a pandemic forces social distancing.

Protecting Operations

Organizations cannot predict where the next pandemic will occur. Its specific impact will depend on several factors, including the virulence and transmission rate of the pathogen. But a well-tested, tiered — or phased — action plan outlining company preparedness, response, and recovery actions can help them better prepare and be more agile. Such plans should anticipate potential questions from senior leaders, employees, and others, and set precise criteria for specific policy and procedure implementation, including when and how to close or modify business operations, engage alternative suppliers, or direct employees to work from home or return to workplaces.

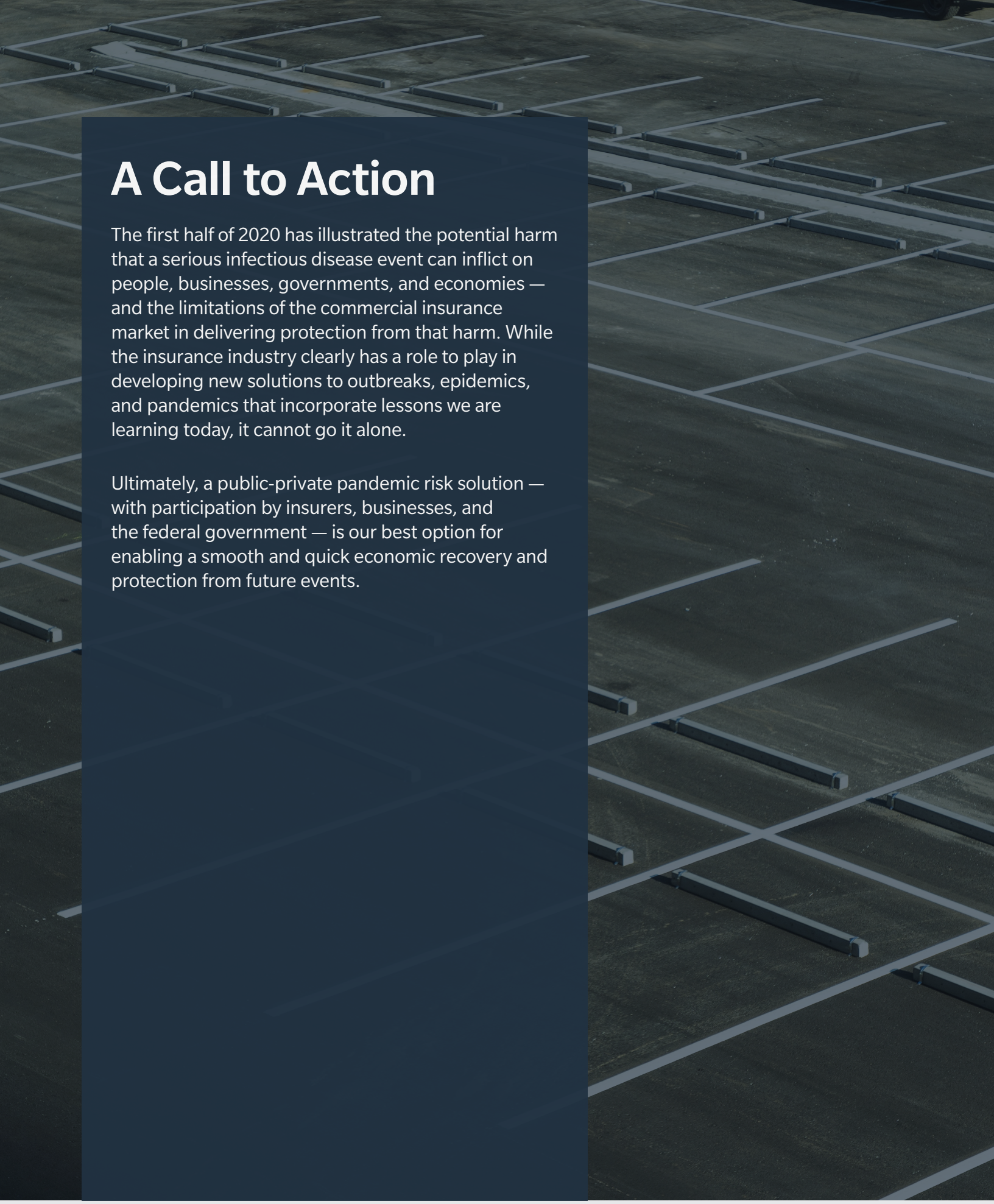
The Role of Government

While the private sector can and should learn lessons from the current COVID-19 crisis in order to better prepare for the next pandemic event, governments at all levels can do much to help manage and mitigate current and future pandemic risk.

COVID-19 has highlighted the need for federal, state, and local governments — in conjunction with national and global health organizations — to focus on three areas:

- **Preparedness.** Federal, state, and local governments must stockpile more equipment, including ventilators, masks, and other types of PPE that have become incredibly valuable commodities for some communities. Crisis response plans are also key, provided they are updated now, to reflect lessons learned from COVID-19 and regularly tested through tabletop exercises and other means. Governments can also encourage and facilitate data-sharing efforts by both the private and public sectors, which can aid preparedness and response efforts.
- **Mitigation.** Largely, mitigation steps — including social distancing, handwashing, wearing masks, and more — are the responsibility of individuals. Governments can support these efforts by providing guidance and education to people and businesses about how they can prevent or slow the spread of the disease. Governments can also facilitate mitigation by providing guidance on how to protect essential workers during a pandemic or epidemic.
- **Insurance.** While commercial insurers excel at allowing businesses, public entities, and nonprofit organizations to transfer the risks related to natural hazards and other critical risks, a pandemic could result in virtually unlimited losses — which, today, are largely uninsured. Historically, insurance coverage for the risks related to infectious disease has been limited or available only at a high cost. And public entities have relied largely on Federal Emergency Management Agency disaster funds or ad hoc funding measures to mitigate financial losses. A federal backstop can facilitate the creation of a viable insurance market that can offer affordable coverage for businesses, public entities, and nonprofits and provide crucial peace of mind to businesses.

Collectively, focusing on these areas can help build economic resilience and national readiness.



A Call to Action

The first half of 2020 has illustrated the potential harm that a serious infectious disease event can inflict on people, businesses, governments, and economies — and the limitations of the commercial insurance market in delivering protection from that harm. While the insurance industry clearly has a role to play in developing new solutions to outbreaks, epidemics, and pandemics that incorporate lessons we are learning today, it cannot go it alone.

Ultimately, a public-private pandemic risk solution — with participation by insurers, businesses, and the federal government — is our best option for enabling a smooth and quick economic recovery and protection from future events.

ABOUT MARSH

Marsh is the world's leading insurance broker and risk adviser. With over 35,000 colleagues operating in more than 130 countries, Marsh serves commercial and individual clients with data driven risk solutions and advisory services. Marsh is a wholly owned subsidiary of Marsh & McLennan Companies (NYSE: MMC), the leading global professional services firm in the areas of risk, strategy and people. With annual revenue over US$15 billion and 75,000 colleagues worldwide, MMC helps clients navigate an increasingly dynamic and complex environment through four market-leading firms: Marsh, Guy Carpenter, Mercer, and Oliver Wyman. Follow Marsh on Twitter @MarshGlobal; LinkedIn; Facebook; and YouTube, or subscribe to *BRINK*.

ABOUT METABIOTA

Metabiota has over a decade of experience partnering with industry and governments worldwide to build resilience to epidemics and protect global public health. Metabiota has expert capability to quantify, mitigate, and manage epidemic risk, supporting global health security and sustainable development. The company is headquartered in San Francisco, California, with additional offices in Washington, DC, Cameroon, and the Democratic Republic of the Congo (DRC). Metabiota's team includes global leaders in epidemiology, veterinary medicine, laboratory science, data science, actuarial science, social science, and political economics, and serves some of the most respected customers in the corporate, insurance, government, and multilateral sectors.

Metabiota has developed a unique data analytics platform to quantify epidemic risk, the Global Epidemic Monitoring and Modeling platform. This platform combines proprietary real-time and historical data, artificial intelligence, economic and risk modeling, and indices. Metabiota's platform houses the most extensive infectious disease modeling catalogs in the industry, as well as a structured outbreak dataset having over 2,500 outbreaks spanning more than 50 years. Metabiota uses the latest scientific understanding of disease progression to create pathogen-specific disease spread models, resulting in hundreds of thousands of realistic simulations of a disease's spread that allow for estimating the frequency and severity of potential epidemic scenarios. Metabiota has also developed an epidemic preparedness index to measure countries' capacities for epidemic detection and response, along with a sentiment score to estimate the level of fear and potential economic losses an epidemic can cause. These tools enable companies, insurers, and governments to assess risk accumulations, implement innovative risk mitigation strategies, and bring new epidemic and pandemic risk transfer products to market. For more information, visit www.metabiota.com.

ABOUT THIS REPORT

This report was prepared by Marsh and Metabiota. Other businesses of Marsh & McLennan — including Guy Carpenter, Oliver Wyman, and NERA Economic Consulting — also contributed.

For more information and insights from Marsh on pandemic risks and solutions, visit coronavirus.marsh.com or contact your Marsh representative.