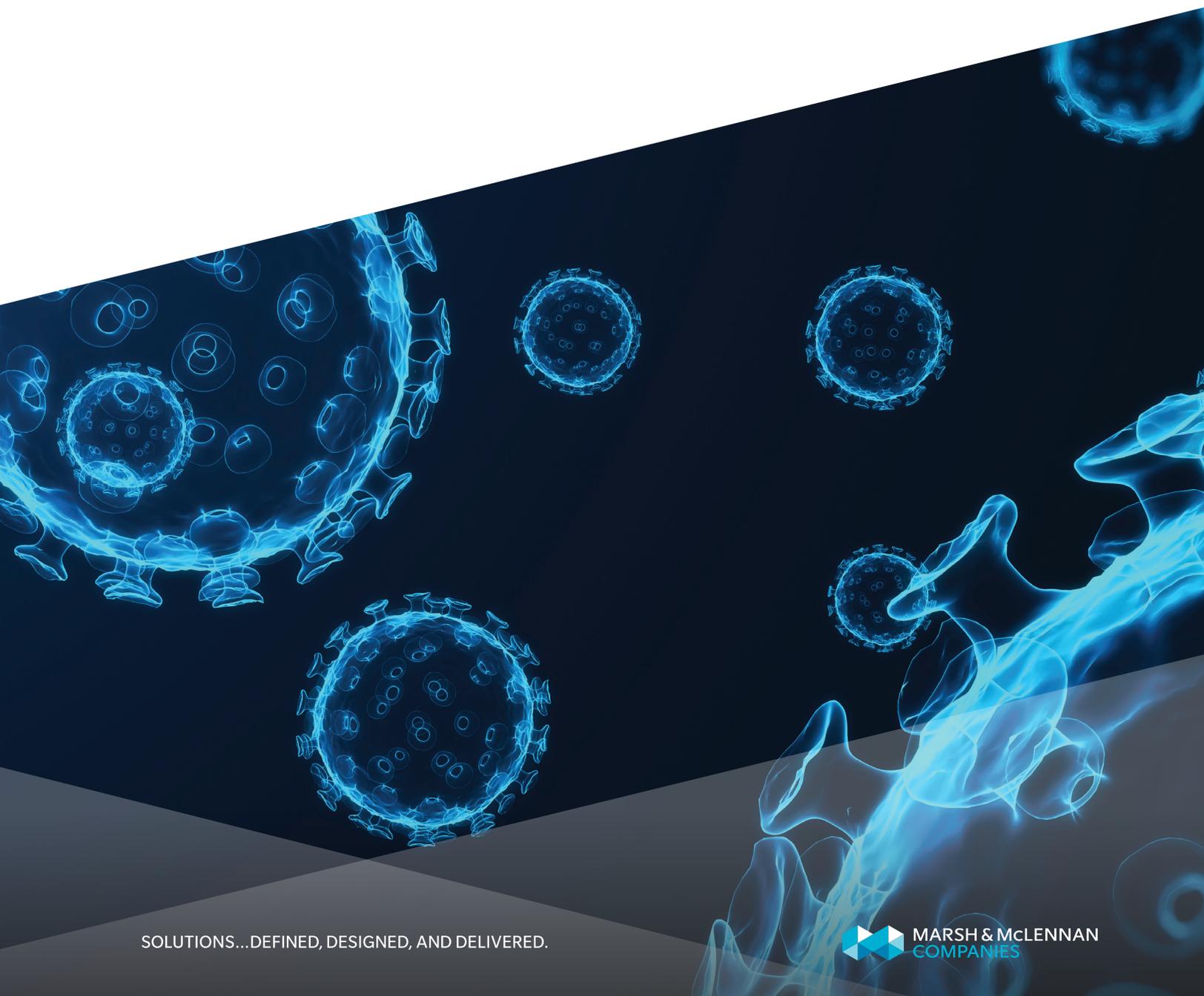


# Pandemic Readiness: Risk Finance and Mitigation Strategies



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# Introduction

A century ago, the Spanish flu spread across the world, killing as many as 100 million people and causing devastating economic losses. Since then, tens of millions of lives have been claimed by pandemics and epidemics that also wreaked havoc on businesses and damaged national economies. Despite advances in medicine and improved infection control practices, the swine flu and Zika pandemics in the last decade, and the currently developing novel coronavirus, are a stark reminder of the dangers posed by rapidly spreading disease.

Although public health officials must lead much of the preventive work needed to limit the effects of infectious diseases, organizations can manage their own risk by planning their response to protect their people and fiscal integrity.

To effectively respond to these threats, businesses should take a two-pronged approach, starting with establishing preparedness strategies that cover emergency response, business continuity, crisis management, and crisis communications. Aside from the ability to monitor the progress of emerging pandemics and epidemics and understanding their potential impact, plans should also be in place to continue operations in case of travel restrictions and if organizations are directly affected.

Secondly, businesses should understand how existing insurance coverages may respond to a pandemic, and make any necessary changes to their policies, keeping in mind the potentially global nature of various diseases.

We hope you find this report to be a useful tool to help you take steps to manage your pandemic and epidemic risk.



# The Cost of Epidemics and Pandemics

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.”

The global influenza pandemic of 1918 — known to history as 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 emerged (see Figure 1).

Although recent pandemics and epidemics have been deadly, the mortality rates from these outbreaks are generally far lower than health crises of the past, owing in large part to advances in medicine and infrastructure. Yet the potential economic impacts of today’s health crises can be far greater in scope than earlier ones. The increasing reliance of businesses on technology, frequent and

unrestricted travel, and far-reaching supply chains mean that an outbreak in a single country can have global repercussions. The World Bank estimates that the cost of a severe flu pandemic **could total as much as 5% of global GDP.**

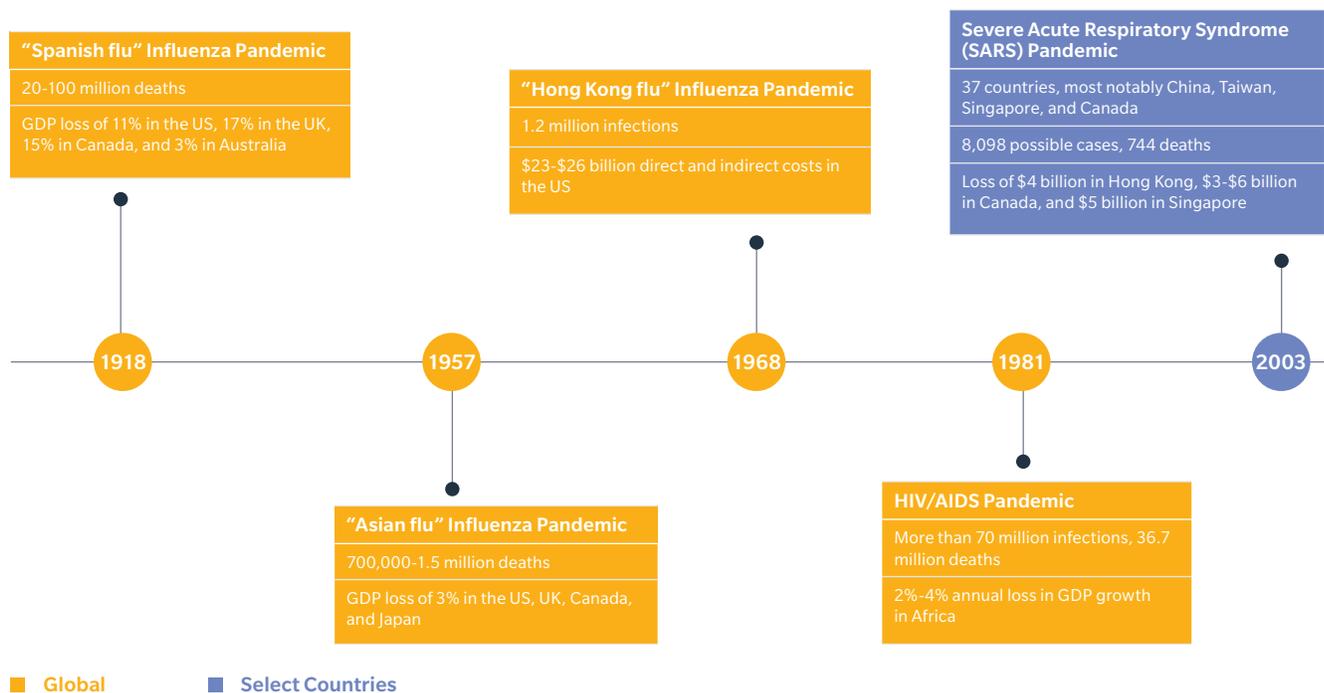
For businesses, potential risks include:

- 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 customer demand.
- Reputational damage if an organization’s response to an outbreak is seen as ineffective or if its communications with internal and external stakeholders are seen as incomplete or misleading.

FIGURE  
1

## Notable epidemics, pandemics, and the impact on human and economic health

SOURCE: Madhav, N., Oppenheim, B., Gallivan, M., Mulembakani, P., Rubin, E., & Wolfe, N. (2018). Pandemics: risks, impacts, and mitigation. *Disease control priorities*, 9, 315-345



NOTE: List of events is illustrative rather than exhaustive. All US dollar amounts rounded to nearest billion.

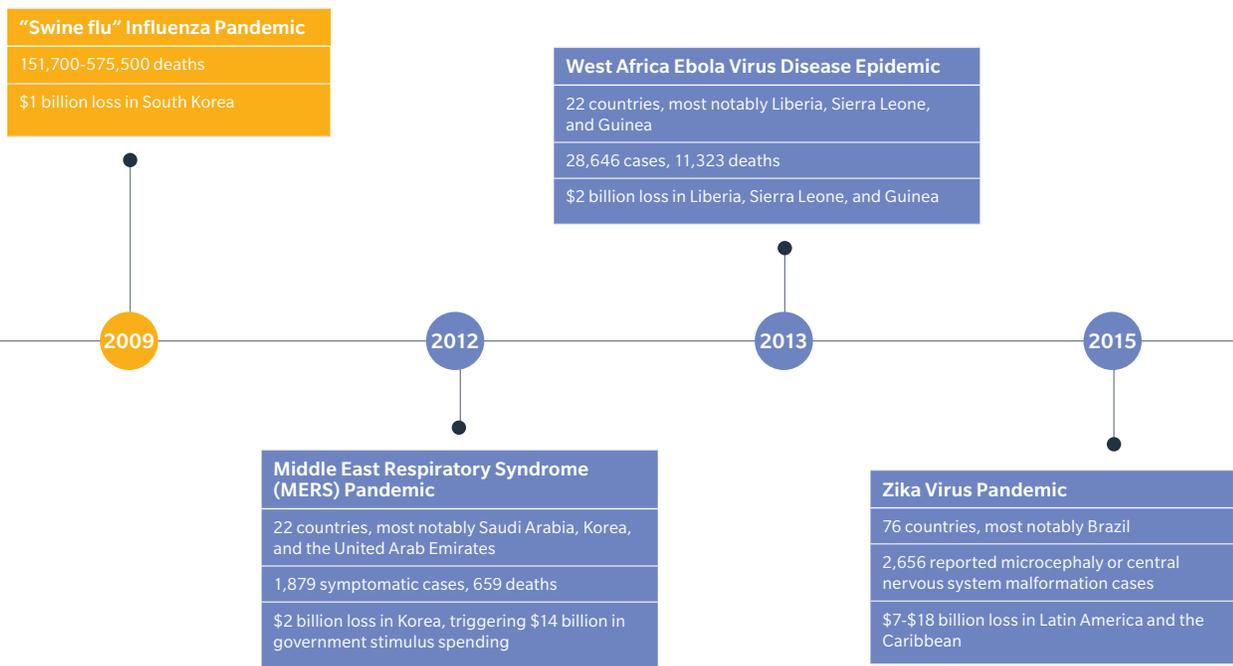


When public confidence is eroded by public health crises, the effects can be felt on a company’s bottom line. The risks can be particularly acute for organizations in such areas as retail, hospitality, entertainment, and airlines. For example, during the 2013-14 Ebola outbreak, airline stocks fell as investors anticipated

a sharp decrease 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 outbreak [have been tied to lower international tourism revenue](#), according to the United Nations Development Programme.

At the same time, health care providers may face patient overloads and illnesses among staff, which can adversely affect service delivery during critical times. Higher education institutions may also face a variety of risks stemming from their role in providing housing and other services to students and local communities, international travel by students and faculty, and more.

Organizations cannot prevent an outbreak, but they can be prepared to respond, remediate, and recover.



# Response Planning

Organizational preparedness to manage a disease outbreak includes emergency response, business continuity, crisis management, and crisis communications. As they monitor the progress of emerging pandemics or epidemics, businesses should review, exercise, and update or otherwise adjust response plans, including crisis management, crisis communications, and business continuity plans.

To remain resilient, organizations should seek to answer several critical questions. For example:

- Which products and/or services are of greatest value and how would revenue be affected by a disease outbreak?
- Will our plans work in the event of border closures, travel restrictions, or reduced exports of certain commodities?
- What if we lose critical people, or have staff working from remote locations?
- Will the fear of infection affect our key customer base?
- How should we engage with public health and government entities?
- Who should we involve in our response efforts?
- How can we position the organization to respond positively?

Businesses should consider developing clearly defined pandemic response escalation thresholds specific to their operations so that individual facilities, divisions, and regions can identify potential health threats early and act appropriately to protect the organization, employees, resources, and revenue streams. Organizations should also review critical suppliers and vendors and potential operational or sales impacts if they were to be affected by an outbreak, while also considering alternative and/or geographically dispersed suppliers and vendors.

## Employee Well-Being

To effectively protect people, businesses should consider the nature of any disease — for example, its virulence, mortality rate, and public fears — and within that framework define the potential direct and indirect impacts on employees. Businesses should monitor guidance and updates from public health agencies, governments, industry groups, and other experts, and determine procedures, including notifications to health authorities, employees, and other stakeholders, in the event of a suspected case involving an employee, an employee's family member, or others visiting an area that is known to be affected by an outbreak.

Businesses should also:

- **Review or develop employee health procedures to minimize the potential for transmission of infectious diseases to other people, including employees, their families, and customers.** Among other actions, organizations should consider the need for individuals to be quarantined or isolated and define additional cleaning protocols that may need to be implemented.
- **Keep employees informed and educated about outbreaks and relevant health care precautions.** Consider the role of employee wellness programs, especially if an outbreak happens during cold and flu season. Encourage employees to remain home when sick and consider establishing a remote working policy to limit the spread of disease.



# Insuring Pandemic Risk

Several forms of coverage may apply if an employee, employee's family member, or third party is infected, or if an insured property or a third party's property is contaminated or otherwise affected by an actual or perceived infectious disease threat. The insurance market has also developed parametric, indemnity-based insurance policies that can be triggered without direct property damage.

Ahead of an outbreak, risk professionals should understand the coverages they purchase and how each might be expected to respond to a pandemic.

## Property and Business Interruption

Some property and business interruption (BI) policies include specific time element coverage for "infectious disease outbreaks/notifiable disease," typically under clauses for communicable disease cleanup, removal, and disposal and interruption by a communicable disease. Currently, without such language, coverage is unlikely to be triggered. For example, coverage would not be triggered simply by a fear that a communicable disease may be present in or near the insured's property, thereby leading to employee absences or diminished customer traffic.

Coverage may be provided — if the insured has an extended policy — in the notifiable disease, communicable disease, or outbreak provision/extensions. Coverage may require a suspension of the insured's business activities at an insured location if the suspension is caused by the order of an authorized government agency. The policy extension may also cover the reasonable and necessary costs for decontamination, disposal, and removal of an actual substance that is causing the spread of a communicable disease. Such coverage may have a qualifying period.

The policies should also provide definitions of "notifiable disease," "communicable disease," and "contamination," with certain sublimits applying. Property contracts generally require physical loss or damage triggers by an insured peril, either to the insured's property or to property that precludes ingress/egress to the insured's property. This includes civil authority extensions.

If an insured believes it may have sustained an insured loss resulting from an occurrence of a notifiable disease, it should immediately begin the process of gathering documentation to support a potential claim. This should include details of the specific incident to the extent that information is available to the public, including:

- Where the case was diagnosed.
- Where the infected individual is in relation to insured property.
- What authorities have been or are required to be notified and what authorities require of insureds locally.

## INDUSTRY FOCUS: HOSPITALITY AND RESTAURANTS

Generally, industries with the highest level of in-person customer contact stand to suffer the most damage in a pandemic. Hospitality and airline companies may find themselves effectively shut down and may need to draw down cash reserves to stay in business. Restaurant chains, entertainment companies (such as movie theaters), cruise lines, and other leisure-oriented companies face similar risks.

Hospitality and restaurant companies must have specific crisis and communication plans — in place and regularly tested — to address an outbreak. Planning should also address business continuity needs should the organization encounter large-scale absenteeism, whether from employee illness, their need to care for sick relatives, or decisions to avoid potential contagion.

Hospitality and restaurant firms should juggle conflicting demands: ensuring that there is staff on hand to keep facilities running, while protecting employees from the spread of communicable disease. Organizations that encourage employees to come to work and then see these employees fall ill may find themselves the targets of litigation and/or liability claims.

The major risk to hospitality and restaurant companies in a pandemic situation typically is not physical damage, but a sudden and dramatic loss of customer traffic and revenue. Yet traditional property and business interruption policies are usually triggered only by events causing physical damage or property loss. Policies should be reviewed to determine what, if any, pandemic-related losses might be covered and how they may be triggered. In addition to insurance, the company should assemble cash and credit resources to draw upon in the event of a steep and sudden fall-off in customer traffic.

- The specific date of the occurrence.
- Any tracking costs incurred by insureds, in addition to effects on receipts.

Insurance policies that can provide coverage for pandemic risk without physical damage triggers are now available and can help businesses fill some of the coverage gaps that are present in current BI policies (see *In Focus: Innovations in Modeling and Insuring Pandemic Risk* on page 8).

Some policies may contain extensions of cover for non-damage BI for on-premises only infectious disease cover. This will vary by country and policy.

## Workers' Compensation and Employers Liability

Workers' compensation and employers liability insurance could provide coverage for medical expenses and reimbursement of lost wages for infectious disease-related disability, as long as the exposure meets the jurisdictional compensability standard and arises out of the occupation itself.

Employers should also check with their brokers for availability of existing medical expenses insurance within their workers' compensation and employers liability policies and employee medical benefits policies, in particular whether there are any exclusions of "infectious diseases that have been designated a pandemic which requires isolation or quarantine by law".

## Commercial General Liability and Excess Liability

Insurers generally take the position that a general liability policy extends only to actual injuries. They are likely to look closely at the nature of injuries alleged by third parties, and, while "bodily injury" may trigger coverage, insurers may reject claims based on fear of exposure, exposure without actual symptoms, or other mental or emotional injuries unless resulting from actual bodily injury.

A general liability policy typically also responds to claims by third parties that an insured has caused property damage, but the policy will likely require a showing of physical injury to or loss of use of tangible property. Insurers may take the position that certain types of claimed damage are not covered or that the mere presence of the virus in or on a property does not constitute physical injury. General liability policies typically do not cover damage to the insured's own property.

It is not uncommon for an infectious disease exclusion to be added to a commercial general liability policy. However, depending on the industry, this exclusion may have been removed leaving coverage "silent" or there may be a buy-back for some elements of such coverage.

### **INDUSTRY FOCUS: HEALTH CARE**

Treating infectious diseases can put the health care industry and its employees — including doctors, nurses, assistants, technicians, lab personnel, students, and maintenance workers — at risk. The first line of defense for medical professionals is to follow infection control protocols set forth by public health officials; in the US, these include those published by the Centers for Disease Control and Prevention (CDC), which have been adopted by most local and state health departments. Health providers should also refer to guidance from other independent organizations, such as The Joint Commission and the World Health Organization.

If a health care worker contracts an infectious disease during the course of employment, workers' compensation insurance would likely provide coverage for costs related to treatment of the illness, lost wages, and, in a worst-case scenario, death benefits.

A health care organization that is forced to shut down or restrict access to its facilities due to an actual or suspected case of infectious disease or contamination will likely suffer a loss of revenue. Health care organizations may also face additional operating expenses — for example, to purchase additional personal protective equipment for staff, or to hire additional staff to replace workers who are out sick, or for the handling of increased patient flow resulting from other nearby facilities being forced to close. As noted elsewhere, traditional property and business interruption (BI) policies may not always respond, which is why many health care organizations' policies contain communicable disease contamination sublimits with specific trigger wording.

On the crisis management front, health care providers should make necessary updates to procedures based on evolving health authority requirements. Providers should update employees, provide ongoing training, and regularly review and test pandemic response plans and infection control protocols. All employees should be made aware of the measures to treat potentially infected patients and ensure their safety and that of all others in the hospital or provider environs.

## Group Travel Insurance

Medical expenses arising from infectious diseases are not typically excluded under a group travel insurance policy. They will likely be covered with the same coverage as any other illness, and in some cases could have an added benefit of “Hospital Confinement or Quarantine Cash Allowance due to Infectious Diseases” up to a certain sub-limit which will vary by policy.

Some travel insurance policies may also contain trip cancellation benefits due to infectious diseases. We advise checking these policies with your broker to get an accurate understanding of available travel insurance coverage. Some policies also exclude coverage for employees who travel to certain countries where a travel advisory may be in place.

## Claims Considerations

Before the occurrence of any losses related to infectious disease outbreaks, organizations should develop claim management protocols that establish clear roles and responsibilities for personnel inside and outside of the organization. Such personnel should include insurers’ claims representatives, brokers, and any other insurance advisors who can assist with a claim.

To plan for the worst-case scenario that headquarters and other key locations become inaccessible because of a contamination event, government order, or other factor, organizations should ensure that insurance policies, contact lists, financial and property records, and other key documents are accessible in hard copy and electronic formats at alternative location sources.

In the event of a loss, organizations should begin to gather data for a potential claim filing. Organizations should capture potential loss information and other costs, including those related to medical treatment of employees and cleanup of contaminated surfaces. Businesses should also record photographic and/or video evidence of any environmental contamination, and document any government orders in the event of a partial or full shutdown.

### INDUSTRY FOCUS: TRAVEL PRECAUTIONS

In response to an outbreak, government and health authorities may recommend avoiding travel to affected regions or encourage travelers to follow enhanced precautions. If a warning is issued by government and/or health authorities, organizations should review their business travel approval procedures. For example, an escalation process may be warranted to review travel to an affected region.

If travel to the region is deemed necessary, organizations should ensure that employees are educated about disease transmission and infection-control measures. Specifically, travelers to affected regions should:

- Avoid high-risk activities.
- Pay strict attention to hygiene.
- Monitor their health and seek medical attention if exhibiting any symptoms commonly associated with the disease.
- Carry emergency medical assistance numbers.

Before traveling, employees should be familiar with any policies regarding employee emergency medical evacuations and understand what medical care (if any) may be available via company resources, in addition to, or instead of, those provided by local health facilities. Organizations may also wish to recommend that employees who travel regularly be immunized against high-risk pathogens for which vaccines are available.

Finally, travelers should be mindful of the possibility that screening and isolation measures may be put into place at airports, seaports, and land crossings. At the height of the 2013-14 Ebola outbreak, for example, passengers arriving from West Africa were screened for elevated body temperature at airports in the US, Europe, Latin America, and the Caribbean. Screened travelers suspected of being sick or having had contact with infected persons were often quarantined, while some countries instituted outright bans against travelers from an affected region.



# Innovations in Modeling and Insuring Pandemic Risk

The risk of disease outbreaks will increase as the world becomes more connected through trade and travel; climate change alters disease ranges; and as the population grows and interacts with animals that may harbor new disease risks. Constant traditional and social media coverage means the fear associated with outbreaks spreads widely and rapidly.

While insurance is usually a central part of preparing for known risks, insurers have been reluctant to cover pandemic risk since little research existed on the associated costs. Insurers have had particular difficulty in quantifying the indirect effects of infectious diseases, including the loss of business because of public fear of travel or congregating in crowded spaces.

That, however, is changing as modeling firms study the historical record and use advanced analytics to quantify the impact of past events and forecast the potential effects of future outbreaks. This analysis involves evaluating such variables as country-level preparedness, population density, and population movement and transportation patterns.

## NEW SIMULATIONS

Computer simulation models assess the likelihood of loss by projecting plausible disease transmission events on a local or global scale. For example, simulations can depict the potential spread of flu-like pandemics or outbreaks akin to the 2003 SARS and 2014 West Africa Ebola events. Probabilistic models show disease emergence, rate of spread, number of people infected, and the resulting rates of health care utilization and mortality. Organizations are often interested in costs, so disease spread models can be coupled with financial models that quantify the economic impact and insurance claims related to outbreaks. Altogether, an extremely large set of simulated events allows for the estimation of potential financial and human losses.

Such models use the probability of individuals moving across travel networks and the probability of their transmitting disease within each network node to simulate differing scenarios of disease transmission and spread. Millions of calculations occur in a single epidemic simulation.

## QUANTIFYING DISEASE IMPACTS

In addition to developing such simulation engines, Metabiota, a leading risk modeling firm, has specifically quantified the “fear factor” by creating a sentiment index that measures the emotional response and potential behavioral changes among populations facing deadly diseases (see Figure 2). This index scores each pathogen — such as Nipah, Ebola, and yellow fever — based on a range of fear-inducing characteristics including disease symptoms, mortality risk, type of transmission, and other factors.

FIGURE  
2

Understanding a disease’s “fear factor” can help in response planning

SOURCE: Metabiota

	GERMANY	JAPAN	MEXICO	UNITED STATES	CHINA
					
FEAR RANK					
1	Nipah virus	Nipah virus	Nipah virus	Marburg virus	Marburg virus
2	Lujo virus	Marburg virus	Marburg virus	Lujo virus	Lujo virus
3	Marburg virus	Lujo virus	Lujo virus	Nipah Virus	Nipah virus
4	Ebola viruses	Ebola viruses	Ebola viruses	Chandipura virus	Ebola virus
5	Hendra virus	Hendra virus	Hendra virus	Ebola viruses	Chandipura virus

By better understanding how the public responds to various outbreaks, organizations of all types — businesses, nonprofits, and governments — may be able to better direct their responses. For example, the 2014 Ebola outbreak was largely confined to West Africa, yet [researchers from the Netherlands](#) found that people’s level of “psychological fear” increased when they heard about isolated cases in countries that were “socially closer.” Specifically, people in the Netherlands showed greater fear of the disease when reading about the few Ebola cases in North America than in Sierra Leone.

And for the communities where Ebola did the most harm, evidence suggests that certain types of media reports and other communications and behaviors [increased the level of fear among some people](#). This in turn helped to perpetuate behaviors that increase the spread of the disease. Among other steps, researchers recommend “[devising] communication and awareness-raising strategies, behavioral interventions, risk governance, and community engagement approaches that can diminish the disease impact of FRBs [fear-related behaviors] in the future pandemics.”



## INDUSTRY FOCUS: MARINE

Commercial vessels and seaports [carry more than 80% of global trade by volume](#), according to the United Nations Conference on Trade Development's Annual Report 2017, making the maritime community particularly vulnerable to communicable disease outbreaks. For example:

- Port closures due to pandemics could frustrate voyages and threaten contractual obligations if goods are unable to be delivered or loaded.
- Because some diseases can be spread via cargo and crew members, vessels and crew that leave areas affected by pandemics may be barred from entering other ports. Infections to crew may only become apparent while vessels are at sea, where treatment or evacuation may be difficult.
- In countries where other infrastructure is limited, vessels and seaports may be the most effective way of transporting medical supplies to respond to a pandemic, which could inadvertently accelerate disease transmission.

Several forms of insurance coverage could respond to these risks. These include protection and indemnity insurance (specifically for vessel owners), maritime employers liability insurance, charterer's legal liability policies, and delay in startup coverage for projects that may be affected by pandemics. Maritime companies — and others that rely on marine transport — should review their insurance programs to ensure they have adequate protection from the potential effects of pandemics.

Beyond insurance, owners and operators of ships and seaports can take other actions to reduce pandemics' potential impact on people and operations. Crisis management and response plans should be tested ahead of an event to ensure they will be effective in a crisis; among other items, these plans should address how to impose quarantines, if necessary. Ship owners and charterers should also be prepared to choose backup ports in the event that preferred ports are closed because of a pandemic.



## INDUSTRY FOCUS: EDUCATION

Educational institutions — especially those that provide food, lodging, and social activities, such as colleges and universities — can be particularly hard-hit by pandemic outbreaks. Among their unique concerns are the significant numbers of students and faculty who travel internationally as part of their education, research, or career.

Depending upon the timing and circumstances of an outbreak, foreign students, faculty, or staff may leave school to return to their home countries or choose not to attend or return to an institution if a disease threat has the potential to affect them or their families. Similarly, those participating in overseas programs may be exposed to disease, or refused (re)entry if travel bans are enacted.

Campus environments can place students, faculty, and staff in close proximity to one another, while also drawing in larger communities for sporting events, lectures, concerts, and other activities. Administrators must therefore balance potential revenue loss and reputational damage against the possibility of contributing further to the spread of a pandemic. And, of course, many larger universities run teaching hospitals, which are subject to the risks and concerns of a health care services organization.

Educational institutions should develop crisis management and crisis communication plans around pandemic risk and engage in careful analysis to quantify and estimate those risks. For instance, many institutions could find research funding at risk if activity is interrupted due to a pandemic. Similarly, crisis planning should also address the possible need to undertake a large-scale disinfection of affected facilities and provide isolated housing, food, and medical services to students and other individuals who may be quarantined on campus for extended periods of time.

# Conclusion

The battle against pandemics is taking place on multiple fronts. The global public health community seeks to identify emerging pathogens, control their spread, and develop effective vaccines and courses of treatment. National and local governments refine their public health policies and cooperate with international organizations such as the WHO to develop effective protocols for outbreak detection and response. And businesses and other organizations hope to mitigate the economic and other effects of pandemics through risk management, business continuity, and contingency planning. Modeling and analysis of pandemic risk — supporting pricing and placement of pandemic-specific insurance coverage — can give organizations another important tool in preparing for the unpleasant but inevitable reality of a pandemic outbreak.

## ABOUT THIS REPORT

This report was prepared by Marsh with support from Munich Re and Metabiota, a leading risk modeling firm.

For more information on how you can manage pandemic risk, visit [marsh.com](https://marsh.com) or contact your Marsh representative.

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