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Corporate Pandemic Preparedness:

Current Challenges to and Best Practices for Building a More Resilient Enterprise

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Executive Summary

Authorities such as the World Health Organization have said that pandemic influenza will be a global catastrophe. Health organizations and governments around the world are making plans to mitigate the potential impact of such a crisis. But what about private enterprises and businesses? What are their roles and responsibilities during a pandemic? The politics and science of a pandemic are bewildering, but the critical issues that companies must acknowledge boil down to these:

> “The scientific consensus is that pandemics are due, even overdue. An avian influenza pandemic could sicken 20 percent of the world’s population...”

Pandemics Are Inevitable

The scientific consensus is that pandemics are due, even overdue. An avian influenza pandemic could sicken 20 percent of the world’s population and, if as deadly as previous pandemics, could result in absenteeism of 40 percent of the work force and kill tens, if not hundreds, of millions of people. This means that corporations must be prepared to cope with mass absenteeism and potentially permanent loss of a significant proportion of their employees and customers.

Pandemics Will Spread Along Global Networks

Outbreaks will likely move quickly and uninhibited along modern transportation and distribution chains. SARS, for example, which never came close to reaching pandemic status, spread in weeks from a single case in rural China to cause billions in damage to tourist,

commercial, and transport industries, especially in Hong Kong and as far as Canada. Transportation hubs would be especially vulnerable—and these sites are essential for efficient business operations today. Disruptions at these hubs and along trade and travel routes would be significant and could have an irreversible impact on business.

Complacency, Confusion Inhibit Planning

Pandemic fatigue has kept companies from planning. Even as of late 2006 in Asia, where the perceived urgency of this risk is greatest, less than 25 percent of businesses had pandemic plans in place. Businesses may believe that pandemics are unlikely to strike their operations or are too unpredictable for any preparations to be worthwhile. However, there is no effective risk transfer mechanism for a pandemic, so planning and mitigation activities must be considered, since they will be the first and last line of defense for corporations.

Best Practices Have Emerged

Especially since SARS, some businesses and governments have begun to implement practical, effective measures to protect business models, employees, and other important groups, such as families, vendors, or other stakeholders from the impact of a pandemic. These practices include the identification of alternative supply chains; stockpiling of pharmaceuticals and non-pharmaceutical interventions; and planning for continued business operations during and after a pandemic. A failure to prepare for an impending event that is unfolding before our eyes may be perceived as corporate negligence.

Public-Private Partnerships Should Be Improved

The public sector, led particularly by the World Health Organization, has improved its preparedness for pandemics. Partnerships with businesses should elaborate on best practices for the public and private sector and establish mechanisms for ongoing collaboration. Neither sector has significant experience in dealing with the impacts of a threat of this scale and breadth. Furthermore, there is no reason to believe that either sector can do this on its own. Should both sectors hold discussions in advance of what each can expect from the other and how they can work together, we would all be in a better position to respond and recover from the next pandemic.

Introduction

Globalization is a mature reality of risk. Goods, services, people—and diseases—travel quickly and along the same routes. Avian flu already is endemic in Asia, raising the risks of greater human infections. Furthermore, in recent years the world has seen billions of dollars in damage from pandemics such as SARS, tuberculosis, hoof-and-mouth disease, and influenza.

Sadly, acknowledgement of risk has not translated into preparations. This may reflect pandemic fatigue, a mixture of complacency and confusion about how to react. Some companies appear to regard pandemics as unlikely, others as so unpredictable as to render planning useless, and still others as just another risk for which insurance or general recovery plans will have to do. The public sector is preparing, but these plans leave gaps, placing even more pressure on businesses to be ready.

Fortunately, there is guidance. Preliminary analysis of historical data and mathematical modeling suggests that the early, coordinated application of multiple interventions may be more effective in reducing transmission than the use of a single intervention. In examining the actions taken by businesses that are preparing for a pandemic, one sees an emerging set of best practices. For example, leading businesses in the area of pandemic preparedness have been already or are currently:

- treating a pandemic as a truly catastrophic event versus a "manageable disruption";
- establishing pandemic planning committees, supported by an actual budget;

"Preliminary analysis of historical data and mathematical modeling suggests that the early, coordinated application of multiple interventions may be more effective in reducing transmission than the use of a single intervention."

- identifying and pre-qualifying alternate sourcing capacity;
- incorporating their entire global supply chain—including critical suppliers, customers, and other key stakeholders—into the organization's threat and vulnerability profile;
- prioritizing critical products and services and preparing to protect those, even at the expense of other important elements of a business model;
- developing a plan that considers the spectrum of response, recovery, restoration, and resumption activities;
- identifying critical pharmaceutical and non-pharmaceutical interventions and procuring them now;
- focusing deeply on human resources issues, reviewing existing policies and procedures and, in most cases, updating them in an attempt to provide reasonable accommodations for this special circumstance;
- including a communications strategy as a critical element in the pandemic preparedness plan; and
- estimating and planning for post-pandemic changes, including shifts in demand patterns, in the availability and morale of staff, and in infrastructure, both locally and to vendors.

This list of best practices provides an outline of steps to take, but leaves unaddressed some underlying issues that may color how societies react in a pandemic. These challenges are discussed in subsequent sections of this white paper under the following headings:

- The Business Impact of a Severe Pandemic: The Need For Resilience
- Complacency and Confusion: The Failure to Plan
- Mitigating Risk in the Absence of Traditional Risk Transfer: Emerging Best Practices
- The Challenge of "Accountable Hindsight" in Pandemic Planning
- The Need for Stronger Public-Private Partnerships
- The Operating Realities of a Post-Pandemic World

This white paper is intended to raise awareness around these issues, enabling the broader global community to discuss how to prepare for and respond to the threat of a pandemic.

The Business Impact of a Severe Pandemic: The Need for Resilience

- Globalization of trade, travel, and services also means that infectious diseases can rapidly circle the globe.
- Minor disruptions (of any origin) to supply chains can result in negative impact to supply- and demand-side needs resulting in medium- to long-term market volatility—a severe influenza pandemic can be catastrophic.
- Plans made to mitigate the socioeconomic impact of a severe influenza pandemic can be leveraged to develop general business resiliency.

The scientific consensus is that a global influenza pandemic is inevitable and that the world remains poorly prepared.[1,2,3] When it happens, the World Health Organization (WHO) conservatively estimates that approximately 25 percent of the world's population will fall ill;[4] worker absenteeism will reach 35 percent or higher; medical interventions will be inadequate at the start of a pandemic and potentially for many months subsequent to the first wave of peak illness; and hospital or health care capacity will be inadequate in serving the millions that will require medical attention.[5]

This catastrophic outcome does not include the costs to specific businesses. For example, airlines and related companies would suffer a drop in travel, possibly one ordered by public health officials. Manufacturers of protective equipment would see demand increase—but sales would follow only if they can distribute their goods through

The SARS Example

Though not a pandemic, SARS (Severe Acute Respiratory Syndrome) is one of the best and most recent examples of a major public health threat that generated significant global social and economic impact largely due to international trade, traffic, and travel.

In Toronto alone, nearly $1 billion of GDP in 2003 was lost. Tourism suffered a $350 million loss and witnessed reduced activity in airports resulting in a loss of $220 million. Non-tourism retail sales plummeted by $380 million and 20 percent of businesses had or were expected to lay off staff. Approximately 46 percent of these industries did not have contingency plans in place to mitigate these risks.

In addition to Canada's losses, the Asian Development Bank estimated that the economic impact of SARS was about $18 billion in East Asia, around 0.6 percent of GDP. Tourism, transportation, and retailing were hardest hit; tourism accounts for over 9 percent of East Asia's GDP, about 11 percent for Southeast Asia. Asian travel was significantly impaired for over 3 months.[6]

the transportation hubs and channels that will be shut down by the spread of disease. Just-in-time inventories at manufacturers, pharmacies, hospitals, grocery stores, wholesalers, and in retail energy will make it difficult to meet even limited demand. The costs would ripple along the global value chain. In addition to the critical infrastructure industries, service industries will also likely experience diminished demand and greatly diminished capabilities due to their inherent reliance upon people, who will be fearful for themselves and for their families and friends. In short, a severe pandemic would place unprecedented stress on human capital capabilities resulting in follow-on shortages of most other resources since our society and economy are still heavily dependent upon people to perform a broad spectrum of duties.

From a corporate perspective, when a pandemic does occur, it has two closely linked but distinct impacts—a social impact and an economic impact—and businesses must be prepared to manage both. The social impacts directly relate to the health and well-being of employees, customers, and business partners. Understanding how to manage the social impacts of this threat is critical and is the typical focus of a pandemic plan, when one exists at all. Nevertheless, the economic impact is equally important and is generally overlooked in most plans. The economic impact of a pandemic (i.e., the financial implications associated with the disruption of operations, loss of key vendors, or diminished customer demand) can be extremely severe and directly linked to the organization's ability to recover from the event and resume normal operations.

Not being able to forecast with certainty the risk of morbidity or mortality resulting from the next influenza pandemic frustrates planners and responders alike from governments, private industry, and civil society. Various mortality forecasts have been developed by making strong assumptions about attack rates and case-fatality rates using historical data derived mainly from the 1918-20, 1957-58, and 1968-70 pandemic influenzas using the 1918-20 Spanish flu pandemic as the upper bound on the number of deaths caused by a future pandemic.

With the SARS experience in mind (see sidebar) and being advised by WHO that the world is overdue for a pandemic, businesses in all geographical regions have a responsibility to plan ahead to reduce where possible both the social and economic impacts that could affect their operational stability. There is a pervasive cynicism that is generating pandemic fatigue, since those organizations, public and private, which have taken the initiative to be prepared, have yet to see the risk manifest itself in a meaningful way. Be this as it may, the

reality of our vastly interdependent way of life necessitates planning, and for corporations there is a scarcity of information guiding them through the morass of ethical, legal, and liability issues prior to, during, and following a pandemic. Furthermore, there is a noticeable gap in when and how to reintegrate employees and restore business processes in a post-pandemic environment—especially when considering that the world into which we recover will likely be very different than the one we had previously known.

When considering the emergence of the next pandemic, current economic models predict a range of global economic losses from $2-3 trillion (assuming low virulence). An ultra pandemic (2.21 percent mortality), resulting in more than 140 million people killed, could cause an estimated global GDP loss of $4.4 trillion.[7,8,9] Even in its early stages, avian influenza has already caused significant economic damage, primarily to the agricultural sector and poultry production. As the outbreak is ongoing, estimates of the cost vary. One estimate puts the direct cost to the livestock sector in Cambodia, Thailand, and Viet Nam at $560 million. However, when extended to the loss of trade in other industries, the estimates rise substantially.[10]

Globalization, outsourcing and offshoring, quality initiatives, and the search for greater efficiencies have resulted in a highly interdependent, more precarious, and networked economy. The dependence upon suppliers for critical and essential products and services has increased exponentially over the past few decades. Once largely only a consideration for manufacturers, the supply chain now plays a significant role in service industries and all of the industries that span the entire spectrum of products and services as well. Supply chain disruptions almost always have a negative overall effect on stock price, profitability, and share price volatility. While it is necessary to consider the implications of a pandemic to the supply chain because of the potential scale and duration of the disruption, in actuality it does not matter who caused the disruption, what was the reason for disruption, what industry a firm belongs to, or when the disruption happened—any supply chain disruptions can devastate corporate performance (Figure 1).

Figure 1 – Corporate Impact of Supply Chain Disruptions[11]

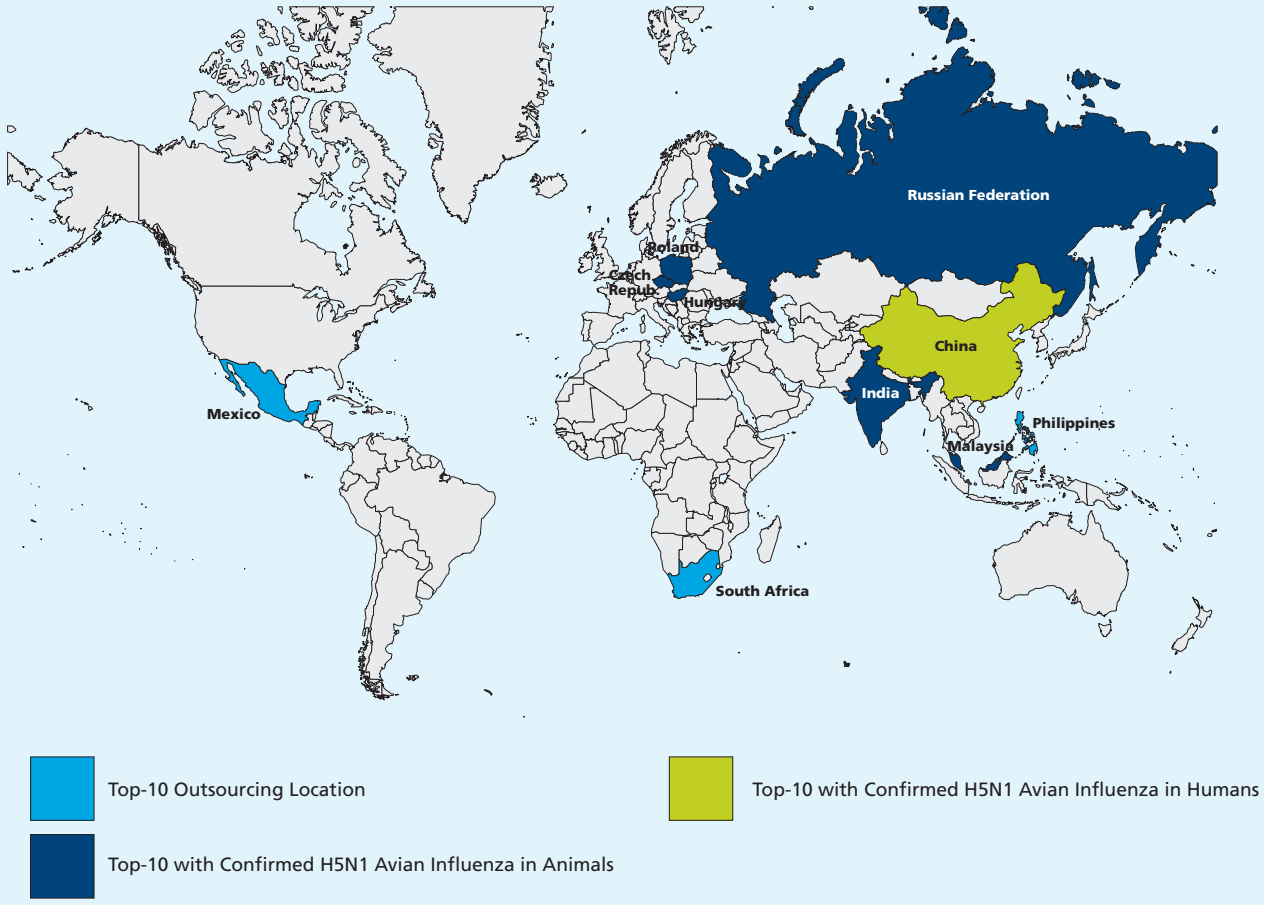
The average effect on the business in the year following supply chain disruption is:

- 107 percent drop in operating income
- 114 percent drop in return on sales
- 93 percent drop in return on assets
- 7 percent lower sales growth
- 11 percent growth in cost
- 14 percent growth in inventories

*Note: These statistics reflect disruptions of any source and duration. It is expected that a pandemic disruption will have a significantly longer than average duration.

The supply chain implications of a pandemic and the potential for resulting disruptions must be considered by all businesses, especially those in search of a reason to prepare for an event that they consider to be an Asia-only problem. For example, out of the top ten countries used by the international community as outsourcing locations, 70 percent of these countries have had confirmed cases of avian influenza, and one country has had a confirmed case of human influenza of avian origin[12] (see Figure 2). To the extent that the next pandemic is likely to be, in part, of avian virus origin—particularly if human infection rates result from unchecked cases of avian influenza among those who handle, consume (undercooked), or live in close proximity to infected poultry—human-to-human transmission and pandemic conditions are likely to be expedited. In the unlikely event that pandemic conditions are not met, but that avian influenza becomes endemic, there would likely be continued risk to local people and the local economies. This in turn can have grave consequences for global businesses.

Figure 2 – Outsourcing Locations and Avian Influenza Outbreaks



Source: Marsh

Beyond simply avoiding the costs of a pandemic and the negative impacts that would be faced by one-off companies, the resilience of the entire global supply chain network is essential. This can only be achieved by the preparation of each part along the supply chain, from its beginning to its end. A resilient supply chain during a pandemic could help ameliorate some of the negative consequences, while the presence of even one weak link, due to poor preparedness or ineffective planning, may cause a ripple effect across the global economy, exacerbating an already difficult situation.

Complacency and Confusion: The Failure to Plan

- A severe influenza pandemic currently is not perceived to be enough of a tangible or material risk for many businesses to warrant an investment.
- Planning to mitigate a severe pandemic means investing in resilience that has collateral benefits which can be realized from intelligently managing risk.
- The time to plan and prepare is now.

It may be enough for some businesses to consider planning in general to be a social responsibility. We feel this is not enough, however. A business case must be made for planning, just as for any business expense. That case has typically not been made with regard to pandemics, and businesses as a result are failing to prepare. We believe that the process of persuasion starts by acknowledging this failure. The case for planning can be made by translating the projections of global and macro consequences into bite-size pieces.

Pandemic Fatigue

For many corporations an influenza pandemic does not currently rank high on the list of imminent and urgent risks, though most acknowledge that a pandemic would have severe consequences should it actually occur.[13] In a recent survey of Asian companies, 49 percent of respondents felt that a pandemic would have significant to catastrophic impacts on

their business, but only 21 percent actually had a pandemic plan in place.[14] Another study found that of businesses surveyed that are planning for a potential pandemic, 44 percent have actually put a preparedness plan in place, 52 percent have formed a committee or team, and 32 percent have started some discussion. Though this study showed that 78 percent of the surveyed companies were at least doing something, it also indicated that 68 percent have not specifically set aside a budget for pandemic planning and response.[15]

There are several reasons for this. Most simply, "risk appeal" can be fickle and fleeting. Often risk issues topping global agendas one day are glossed over the next. But pandemics are simultaneously distant and overwhelming, making it hard for any particular business to decide how much it should worry and what exactly it could do. The challenge of trying to forecast the impact of a particular disease on any given population at any given time can be overwhelming and itself become a pretext for inaction.

As one global community, we must educate ourselves on the potentially devastating impacts resulting from a pandemic and ensure that we do our part today to plan and prepare toward mitigating the impacts of such catastrophic events to the extent possible. The challenge is that businesses, as well as governments, have little experience in dealing with matters of this magnitude and potential severity. With no "one-size-fits-all" approach or planning guide, organizations have been paralyzed by the seemingly overwhelming scope of their pandemic planning and response efforts.

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Risk-savvy corporations recognize that they too must be prepared to deal with the possibility of a pandemic, as well as other significant business discontinuities and emerging risks. A sound pandemic preparedness strategy is an important extension of existing business continuity strategies, since it addresses broader issues and risks than traditional continuity planning assumptions. Many corporations getting started in this process may feel hampered by an inability to broaden their assumptions and to consider the significance of this specific risk.

This combination of complacency and confusion makes it difficult for businesses to commit the resources needed to prepare. In order to allocate necessary resources and define particular procedures, there is a need to garner financial commitment at the earliest possible planning stages. This usually manifests in the form of a pandemic business case, which demonstrates the materiality of the potential impact, thus enabling the business to pursue mitigation strategies, some of which require material investments in their own right.

The key to deciding whether to commit resources for planning is to start with informed assumptions. Accurate and realistic planning considerations should be at the core of any pandemic plan. Three major considerations must be integrated into planning assumptions in order to develop an appropriate corporate pandemic preparedness program (see Figure 3).

Figure 3 – Pandemic Planning Considerations

The key pandemic planning considerations are as follows:

- Business vulnerabilities extend far beyond the organization and region, as many critical competencies and capabilities necessary for successful execution have been outsourced and/or offshored. The organization's threat and vulnerability profile now must encompass the global supply chain.
- A pandemic should be considered a catastrophic versus a disruptive and manageable event. The magnitude and extent of the planning process must be expanded beyond what an organization typically incorporates in a resiliency process. A "failure to imagine" was the common flaw in organizations' planning efforts around September 11 and Hurricane Katrina. Under a pandemic scenario, the extended duration of the catastrophe must also be considered in planning efforts.
- A pandemic requires the scope of continuity activities to extend beyond immediate recovery (e.g., first 72 hours). Recovery, restoration, and resumption all need to be considered. The impact of a pandemic would have a longer-than-usual duration, may come in multiple waves, and could greatly affect the environment in which one recovers.

Once the need to act is understood, many organizations' pandemic planning activities may falter because they cannot agree on where to start. Since no organization has unlimited resources, staff, time, management attention, or working capital to tackle a pandemic scenario, the most rational way to prepare may be to have a specific focus on those business priorities that create the greatest value and represent the greatest impact to the organization should they be disrupted. Since business disruptions are often unforeseen and unexpected and can have a material impact on performance, senior executives who mishandle such an event can open themselves up to litigation from disgruntled shareholders or customers, as well as face difficult questions and potential fines or even prison sentences from regulators.

In addition to the general need for all companies to prepare and play a role in mitigating the severity of a pandemic, all industries have their

own specific needs, concerns and goals associated with their pandemic response, which can either create an extreme downside for them if handled poorly (or go entirely unaddressed) or can provide tremendous benefits for enabling resilience if managed appropriately. These industry considerations should also be valuable inputs or catalysts to creating an urgency to prepare and to act.

The following section illuminates those specific issues that should be driving the urgency to prepare in each of the major industries in the global economy.

Retail, Wholesale, and Consumer Packaged Goods

Among the primary challenges for these industries will be the impact of employee absence, possible quarantine of public spaces, and the lack of available products and goods due to supply chain and logistics failures. These industries could also expect a severe negative effect on customer satisfaction, market share, and sales for both in-store and online retailers as a result of pandemic related disruptions. Many of these industries have considered strategies that involve a sound and systematic shut-down of operations at the onset of a pandemic with the goal of reopening as soon as practical, avoiding the issues stemming from operating through the pandemic. However, for some retailers, such as grocers, pharmacies, and other providers of essential products, this strategy is not acceptable, since there are government and community expectations that they will continue to operate and provide essential services throughout a pandemic. Additionally, some retailers are realizing that e-commerce channels may actually see an increase in "page-views" as "foot-traffic" in "brick and mortar" stores decreases, resulting in the need to prepare for a change in business priorities and pandemic preparedness strategies. Retailers, regardless of their strategy, also recognize that once the initial wave of a pandemic and subsequent waves subside, there may likely be a surge in demand, as consumers will need to replenish their depleting supplies of essential products, and sometimes feel the surprising need, as post-trauma survivors, to purchase luxury goods.

Real Estate and Construction

The real estate and construction industries face a major challenge in that while dealing with their own business problems resulting from a pandemic, there may be an expectation from their tenants and investors that they provide solutions to their pandemic business problems as well. These industries may thus be faced with managing tenant exposure

to biological contagion, communicating with tenants about the status of mitigation efforts, and handling the disruption of client and public service due to employee illness. For property owners and managers, managing impacts to their own organizations and serving as front-line liaison with government agencies for local tenants, both residential and commercial, will likely be a significant challenge. On the front end of the real estate spectrum, within the construction industry, the failure to meet construction project deadlines due to employee illness and the lack of timely material delivery due to supplier shortfalls may be one of the primary challenges that must be dealt with.

Aviation, Hospitality, and Gaming

The industries of aviation, hospitality—including hotels and restaurants—and gaming should expect devastating impacts from a pandemic, on a scale far beyond the impact of recent catastrophes such as September 11, Hurricane Katrina, and the 2004 Indian Ocean Tsunami. These industries would be required to deal with the economic challenges resulting from the loss of business due to public fear, imposed travel restrictions, or government quarantines. Their heavy dependence on employee "presence" at work to provide "high-touch" products and services makes these industries particularly vulnerable to a pandemic. It is becoming increasingly clear that, in the event of an outbreak, one of the primary containment strategies will be to limit, if not halt, air travel to and from known and suspected infected areas—as was the case with SARS. Though this would have a direct and immediate impact on the aviation industry, this strategy would also have a cascading impact throughout all travel-related industries, as well as the greater economy in general. While largely unwarranted, restaurants may even face a loss of business income or face business closure due to the public's fear of food contamination, in addition to the more relevant threat of contracting pandemic influenza.

Sports, Media, and Entertainment

The corporations in these industries would have a significant challenge in making sure there is content to provide viewers, most of whom will be home, searching for a means of entertaining and informing themselves as they wait out or recover from the pandemic. From an infrastructure standpoint, that means that media and entertainment companies must ensure that they can resource their stations and operations centers sufficiently to keep a broadcast signal up and running, while also being able to manage everyday disruptions with

only a skeleton staff. From a talent perspective, athletes, actors, and news anchors will obviously not be immune from a pandemic, so this industry must also prepare for the reality that this scarce resource pool may be even further constrained. Even if sporting events continue during an outbreak, it is widely believed that athletes will be competing in stadiums with no spectators, much like they were during the SARS outbreak, when venues were changed, events cancelled, and games were played in front of TV cameras instead of live fans. From a business perspective, this would result in lost revenue for sports and entertainment venues; the concessions industry; and all of the ancillary businesses that benefit from increased consumer traffic resulting from concerts, performances, and sporting events. Even though these events could still be delivered to an audience through television broadcasts, the business challenge for media outlets would be whether or not it will be possible to generate advertising revenue in a climate where people are sick or dying, and advertisers are reluctant to spend any money on marketing due to cash flow concerns and the fear of backlash for promoting their products and services during such a traumatic time.

“Even if sporting events continue during an outbreak, it is widely believed that athletes will be competing in stadiums with no spectators, much like they were during the SARS outbreak, when venues were changed, events cancelled, and games were played in front of TV cameras instead of live fans.”

Energy, Utilities, and Telecommunications

A major focus of government pandemic preparedness has been targeting aspects of the critical infrastructure, which is often privately owned in many countries. The energy, utilities, and telecommunications industries are all vital to the successful operation of both businesses and communities. These industries face major challenges in the areas of managing the disruption of critical services and the inability to service emergency requests due to employee absenteeism. With regard to telecommunications, the industry also expects an increased demand for remote telecommunications alternatives, which would be constrained by absenteeism, band-width issues, and other challenges with the existing public infrastructure. While these industries have been deemed critical by most governments and have been incorporated in many public sector pandemic plans, it is often not completely clear what role these industries will play, how much of their organization’s services and employees are covered by government plans, and what the specific expectations will be for them in the event of an outbreak. This lack of clarity, and perhaps a false sense of security, has made it very difficult for the private sector components of these industries to adequately prepare and act with a sense of urgency.

Health Care and Life Sciences

It goes without saying that a pandemic would have enormous primary impacts on the health care and life sciences industries. Health care providers must consider and plan for how they will deal with unprecedented numbers of sick people in emergency rooms and hospitals, overtaxing their ability to deliver appropriate care, while coping with severe supply and employee constraints exacerbated by illness of health care employees. Couple those factors with stringent federal, state, and local health reporting compliance requirements for a pandemic, and the result is an overtaxing of an already overtaxed system dealing with further diminished resources. Additionally, potentially unprecedented levels of stress for employees, such as being on the front lines of infectious exposure, and coping with huge patient caseloads while simultaneously dealing with potential impacts with their own families would continue the downward spiral of the quality of care and patient capacity. The life sciences industry, as a major supplier to health care, providing life-saving medicines, medical devices, and other clinical products, becomes a vital partner in enabling health care providers to remain open and functioning during the pandemic. Should there be a disruption in this industry's supply chains, life sciences companies would quickly have to deal with a diminished capacity to produce and provide drugs and other medical products. Additionally, pharmaceutical companies that are providing pharmaceutical interventions specific to the pandemic must manage financial and reputational risks that could result from demand that outstrips supply, efficacy concerns, or unexpected side effects. While the health care industry—as with other parts of the critical infrastructure—has been included in most public sector plans, it too suffers from a lack of clarity and specificity around what it can expect from the government and what is expected of it.

> "Health care providers must consider and plan for how they will deal with unprecedented numbers of sick people in emergency rooms and hospitals … while coping with severe supply and employee constraints exacerbated by illness of health care employees."

Financial Institutions and Professional Services

Banks, investment houses, accountants, consultants, and law firms are all highly dependent upon specialized people to perform critical tasks and services, which put them particularly at risk with regard to a pandemic. Additionally, financial institutions, along with the designation of being part of the critical infrastructure in most countries, are also extensively regulated, with stringent requirements around high availability and a low tolerance for downtime. Professional services organizations represent a diverse and highly fragmented set of businesses; thus—as one would expect—the level of pandemic preparation across the industry covers the spectrum from "not

prepared" to "highly resilient." Financial institutions, in comparison, tend to favor the "highly resilient" side of the spectrum and have been some of the earliest adopters of mitigation strategies, such as the use of pharmaceutical interventions in a corporate setting. Financial institutions have focused planning and response efforts on dealing with the disruption of service due to employee illness, since they are well aware that a disruption in the financial system would have broad, deep, and lasting impacts on the entire economy, potentially resulting in a global recession.

Mining and Manufacturing

Whether it is a disruption in raw materials at the original point of sourcing, the inability to produce technological products due to logistical issues or the lack of necessary employees to perform their duties along a heavy manufacturing assembly line, a pandemic poses major challenges for the mining and manufacturing industries. In addition to the typical employee issues, the mining industry must also manage a high number of expatriation issues for non-local executives and employees due to the industry's diverse and far reaching geographic footprint. Furthermore, the failure to deliver materials to market due to logistics disruptions and the potential for financial losses and earnings unpredictability due to commodity fluctuations puts the mining industry and the downstream manufacturers at risk. There may also be a possible increase in political risk, in already volatile precious mineral- and diamond-producing geographies, as well as traditionally less volatile markets, resulting from the civil disorder and a breakdown in the general social fabric that can be expected from a pandemic. For these industries, it is not just the immediate impact of a pandemic that is a concern, but also the potential longer-term loss of sales revenue due to economic downturn and the increased health care and related disability costs for self-insured or employer contribution benefits plans.

Transportation and Logistics

The critical fiber that connects most industries, much like the utilities and financial systems discussed previously, is the transportation and logistics industry. Virtually every product or service has some sort of dependence upon transportation and logistics. In a pandemic, even if everything else works perfectly, a disruption in the efficient and effective flow of goods and services would have catastrophic social and economic impacts. Whether it is transoceanic, intermodal, rail, long-haul, or

local, the transportation industry provides the vital link between parts of the supply chain, as well as to the customer and ultimate consumer. This industry must address and plan for potential financial losses if travel is restricted explicitly by authorities or implicitly by public fear of contagion, the disruption of private and public transportation service due to employee illness, and the resulting financial exposure due to business interruption claims from affected customers.

Mitigating Risk in the Absence of Traditional Risk Transfer: Emerging Best Practices

- While limited insurance exists to counter losses associated with a pandemic, insurance alone, even if available, would not meet fiduciary and social obligations to stakeholders (investors, suppliers, employees, customers, civil authorities, and the general public).
- Post-incident compensation may be desired by affected parties and would likely result in litigation.
- Risk mitigation is preferable since it is the only known strategy to reduce the severity of the impact from a pandemic at our disposal today.
- Best practices are emerging. These may become new standards for businesses to follow.

Companies that embarked on pandemic planning efforts 12 to 18 months ago may have gained some competitive advantage by being the first in their industry or geography to prepare. Such companies also have begun to challenge their suppliers and business partners to prepare, highlighting the fact that the risk of a pandemic would extend far beyond any one organization's control. This is the basis on which businesses, the government, and society as a whole will be able to mitigate the impact of a pandemic and build community-wide resilience.

No Insurance: The Absence of Risk Transfer Solutions

While in a few, extremely rare instances "pandemic insurance" of some kind may be available, according to the Society of Insurance Researchers (SIR), such insurance will likely only insure individuals against sustained leaves of absence, disability or death, and more contentiously, possibly workers' compensation. Also, these few pandemic risk transfer options generally cover only a very short duration of time and/or are extremely cost-prohibitive compared to the value that can be derived from them should a pandemic occur.

In the aftermath of the terrorist attacks on the United States in 2001, there was a movement to address insurance coverage related to property or casualty loss arising from terrorist events as well as radically escalating premium coverage to compensate for risks of loss not readily predictable.[16] The purpose of this nationally supported program (Terrorism Risk Insurance Act of 2002—or TRIA) was to provide a transparent system of shared public and private compensation for insured losses resulting from acts of terrorism, in order to: (1) protect consumers by addressing market disruptions and ensure the continued widespread availability and affordability of property and casualty insurance for terrorism risk; and (2) allow for a transitional period for the private markets to stabilize, resume pricing of such insurance, and build capacity to absorb any future losses, while preserving state insurance regulation and consumer protections.

> "The collective morbidity and mortality associated with terrorist incidents in the last decade, however terrible, are not remotely comparable to the extreme mortality risk that would be generated by a severe pandemic."

The collective morbidity and mortality associated with terrorist incidents in the last decade, however terrible, are not remotely comparable to the extreme mortality risk that would be generated by a severe pandemic. Whether or not there is future capacity to transfer this risk through more traditional, as well as unique bridging or temporary risk transfer solutions during and following a severe pandemic, remains uncertain at best and is in great need of further discussion on the part of governments, businesses, and the insurance industry.

Risk Mitigation: The Best—and Perhaps Only—Alternative

In the absence of traditional insurance products, the fact of the matter is that corporate pandemic preparedness must be rooted in mitigation. Protecting one's value proposition thus necessitates investing in

resilience so that the organization can survive during a pandemic, as well as in a post-pandemic economy. Additionally, corporations that invest in pandemic preparedness are also strengthening their capacity to cope with other emerging infectious biological risk of any origin, naturally occurring, accidental, or deliberate.

Once business priorities are identified and the corporation has determined its strategies for dealing with and mitigating the impacts of a pandemic, the organization can begin to consider and document its pandemic risk mitigation strategies. Whether it is human resource policies, travel policies, employee categorization, or the evaluation of pharmaceutical intervention options, just to name a few, the corporation has a variety of mitigation strategies and options to consider; and, unfortunately, there is no panacea or one-size-fits-all solution.

Each organization must consider all the potential mitigation strategies and create a blended set of solutions. These solutions should then be outlined in the company's pandemic preparedness plan, which should fit the organization's unique priorities, risk profile, and risk tolerance. Throughout this section of the white paper, potential pandemic risk mitigation strategies will be illuminated and discussed in detail.

Human Capital Issues and Solutions

Since a pandemic is truly all about the people, human capital issues obviously become paramount in the effort to create an efficient and effective plan. After determining the probable impact to the work force, the next step is to identify and analyze current HR policies and procedures, benefits, and communications. While these procedures have most likely been effective in the past during the normal course of business, and perhaps even during other crises, pandemics have unique attributes with a specific impact on HR. Therefore, a thorough policy review is required to ensure that all the necessary issues, concerns, and challenges are identified and managed. Once such a gap analysis is performed, amendments can be made to the company's HR policies (Figure 4).

In addition to these core policy issues, HR and other aspects of the business should be expected to discuss and promote other behavioral non-pharmaceutical interventions that assist in mitigating the threat of pandemics, such as social distancing, employee categorization, alternative work arrangements, return-to-work (RTW) programs, and travel policies.

Key Corporate Pandemic Planning Questions by Role:

CEO/Board Director

- How do we anticipate risks from a severe pandemic that could harm our company?
- What are the implications of not being able to meet the expectations of our customers, investors, employees, and suppliers?
- Can preparations taken to mitigate the impact of a severe pandemic also enable us to better prepare for other risks (i.e., naturally occurring, accidental, or deliberate)?

CFO

- How much will a pandemic cost our company?
- What are the regulatory and fiduciary requirements for managing the risk of a pandemic in our business?
- What is the business case for the investment required to protect our company from the impacts of a pandemic?

COO

- Which products and/or services must continue to be produced and delivered, even in the event of a pandemic?
- Can the operations continue to function despite fewer employees, the loss of critical employees, or shortfalls in other essential resources?
- What will be the demand impact on our products and services before, during, and after a pandemic?

HR

- To what extent have HR policies been reviewed to ensure they meet the needs of protecting employees and the business during a pandemic?
- Have critical employees within the organization been identified, and have alternates for those roles been established and cross-trained?
- What would be the impact to the business if we tried to continue to operate while dealing with 40 percent employee absenteeism?

Figure 4 – Human Capital Considerations

HR, along with management, will need to consider the effectiveness of the following current policy and procedure areas as they relate to a pandemic:

- "crisis" or "hazard" pay for employees performing response and recovery functions;
- relaxing employee attendance requirements;
- leave-with-pay or paid-time-off;
- return to work procedures;
- requirements for compliance (or the implications of non-compliance) with supplemental pandemic health, safety, and security procedures;
- distributing and cashing paychecks;
- employee insurance coverage and other benefits (including workers' compensation and disability insurance);
- expatriate policies;
- contractor and visitor policies;
- guidance to employees for at-home care of family members;
- next of kin notification; and
- death benefits.

Across the corporation, each function and location should categorize employees based upon the expected requirements for personnel to operate and maintain the critical processes and business operations. HR and functional management should have the responsibility to maintain an accurate and current categorization of employees. Some organizations have cultural or ethical concerns around prioritizing their employees since they believe that every employee is important. While this is a reasonable initial reaction, it is important to consider the fact that this is a discussion of equity rather than equality. Just as companies don't pay every employee the same salary, not every employee has the same priority when it comes to keeping the business running in the event of a crisis. Categorization enables the vital aspects of the business to remain in operation with the fewest number of people, so that the organization can limit the unnecessary exposure of the majority of its work force. While many companies have recently abandoned the process of categorizing employees in order to determine priorities for distribution of pharmaceutical and non-pharmaceutical interventions, deciding instead to stockpile for everyone, this is still a critical exercise in order to ensure the organization's critical personnel are identified and incorporated into pandemic plans.

Communications

A crisis can be a defining moment for an organization. The appropriate insight and planning can help a company survive almost any adverse event and, if managed properly, even emerge with a stronger reputation and greater competitive advantage. In the case of a pandemic—potentially a prolonged crisis—an ongoing communications effort is essential. When an event unfolds over weeks or even months, repetition and reinforcement are critical to ensuring that messages are heard and not quickly forgotten.

Ultimately, the goal is to become a reliable, responsible source of information for stakeholders—reporting not only how your organization will handle the pandemic but, during the event itself, how your organization is faring. This requires time, dedication, and a commitment to stakeholder communications. For example waiting until the WHO declares that the pandemic has reach stage 4 or 5 may be too late. The most reliable crisis communications programs start by educating stakeholders before concerns escalate, provide guidance during the event, and if necessary repair an organization's reputation and relationships with stakeholders after the event.

“Ultimately, the goal is to become a reliable, responsible source of information for stakeholders—reporting not only how your organization will handle the pandemic but, during the event itself, how your organization is faring.”

Implementing a strategic communications program before the pandemic becomes a crisis can help a company build a foundation of trust and establish or deepen relationships with stakeholders. By building up a reservoir of goodwill with all stakeholders, an organization can be better positioned to counteract negative stories, intercept inaccurate rumors, and position the organization as a trusted resource for pandemic response information.

The organization's reputation is protected and stakeholders are prepared when:

- Customers know what to expect
- Employees understand and can follow the procedures related to work attendance
- Suppliers can better respond to changing business needs
- Shareholders understand the organization is prepared for the crisis
- The media know who to call with questions and can become a reliable ally for distributing your message

Once the crisis has ended, communications allows the company to begin the recovery process. The company must inform stakeholders that the immediate danger has passed and, if necessary, describe what

it is doing to make the organization whole again. This is an opportunity to redefine and reassert the organization's core values and focus on building a firm foundation for growth, including rebuilding the company's reservoir of goodwill.

Personal Protective Equipment (PPE)

The use of personal protective equipment (PPE)—especially gloves and surgical masks or certified respirators (Figure 5)—as precautionary measures will be at an all-time high, regardless of their actual efficacy in providing protection against a pandemic in a corporate setting. The use of PPE in a clinical environment is very different from PPE use in a corporate environment. Even in a clinical setting, it has been reported that PPE reduces but does not completely eliminate the possibility of infection. PPE is only effective if used correctly and at all times where contact may occur.[17] Despite the use of PPE, exposure to infected people should be kept to the absolute minimum necessary to perform the business functions required. Since pandemics are community-based diseases, it is important that corporations encourage employees to use PPE (and in some cases provide employees with additional PPE) while at home and in transit to the workplace, in addition to while they are at work, in order to reduce the likelihood of exposure. The continuity of the use of PPE beyond the workplace is an often overlooked, yet critical, point that should be illuminated in all corporate pandemic plans advocating PPE use.

Figure 5 – Standard Types of PPE[18]

Items typically considered as PPE include the following:

- Masks (US NIOSH-certified N95, EU FFP2, N/P/R-100, or equivalent respirator; if not available N80 or surgical masks as last resort)
- Gloves and aprons
- Hair covers
- Protective eyewear (goggles)
- Boots or shoe covers

In a corporate setting, masks (both surgical and respirator), gloves, and eye protection are the items typically considered and recommended when PPE is part of a mitigation solution. In this environment, PPE may provide some level of protection; however, the primary benefit may be largely psychological. Eye protection and gloves are likely the

least controversial in a corporate setting because they are easy to use and provide sufficient protection for the areas they cover but do not eliminate the potential for the cross-contamination of other surfaces. In that same way, people who do not wear PPE, especially goggles and masks, on a daily basis to perform their jobs might also be more likely to touch their own face, also increasing the likelihood of exposure to the virus.

Most controversial, with regard to the corporate use of PPE, is the subject of masks. In general, evidence suggests that masks are most effective when used by someone who is infected and the mask provides a barrier against droplets being spread from the infected person to uninfected people. In addition to little evidence that even respirator masks can protect the wearer from becoming infected, there are significant challenges around their use. The primary issue is that respirators are only effective when properly fit tested for each user. Any gap (even one caused by facial hair) between the mask and the user's face creates a potential entryway for the virus into the body. The second issue is the respiratory stress users may experience if they are wearing masks for the first time and/or over an extended period of time. The best way to overcome some of these issues is to get employees to practice wearing these items and perform their jobs with them, so that they can get used to the feeling of wearing PPE, and hopefully reduce the likelihood that PPE usage will feel strange or awkward during a pandemic. While there are significant challenges to using PPE in a corporate setting, compared to the relative success in a clinical environment, if used in conjunction with other mitigation strategies, PPE may have an impact on reducing the likelihood of transmission among essential employees who must report to work.[19]

“While there are significant challenges to using PPE in a corporate setting, compared to the relative success in a clinical environment, if used in conjunction with other mitigation strategies, PPE may have an impact on reducing the likelihood of transmission among essential employees who must report to work.”

Many corporations are including PPE in their plans because it is often demanded by employees. Organizations should not discount the positive psychological impact PPE has on employees. PPE is a very visible and tangible mitigation strategy that employees can relate to quite easily. PPE is also currently available and relatively inexpensive to source, which is another factor for its prevalence in corporate pandemic plans. If a company makes the decision to use PPE as part of its pandemic risk mitigation strategy, it is critical that these stockpiles, as well as stockpiles for other interventions for that matter, are acquired immediately, as there is no guarantee that any interventions will be readily available after an actual outbreak. Further, it is essential that the PPE stock be stored where it can be readily accessed at all times (24 hours a day), and is available for dispatch to a facility/transport where and when it is needed. The stock must be accessible after normal

business hours, on weekends, and on holidays; and the people who are expected to use these PPE supplies must receive appropriate training in their use in advance.

Pharmaceutical Interventions

Probably the most debated aspect of corporate pandemic risk mitigation, and the one with the least guidance from international or national authorities, has been the use of pharmaceutical interventions in the corporate setting. Building upon their proven success in managing seasonal influenza, pharmaceutical interventions, namely vaccines and antivirals, already play a major role in international and national pandemic strategies, though their role in corporate planning activities is less clear. It is important to point out that despite significant hopes for the development of an effective vaccine, antivirals are currently the only corporate option for mitigating the risk of pandemics through pharmaceutical interventions.

Some corporations, governments, and supra-governmental organizations are looking to vaccines in their efforts to prepare for and protect against the potential impacts of a pandemic. While this seems to be a logical strategy, there are several issues that must be considered. Most important is the fact that, to be effective, the vaccine must be based upon the specific viral strain it is attempting to help manage. Since it is not yet known what the specific strain will be that causes the next pandemic, it is difficult, if not impossible, to develop a vaccine that will have a high likelihood of efficacy until the actual pandemic viral strain presents itself and can be identified.[20] That being said, there have been some governmental and private sector efforts to develop a pre-pandemic vaccine, which is based upon a pre-pandemic viral strain. Without much certainty around what strain will actually become the pandemic strain, these efforts are little more than a best guess and cannot be depended upon solely to help manage a pandemic.

Once the pandemic strain does present itself and is identified, the resulting vaccine will likely be the best way to help control the outbreak and provide immunization to large segments of the population. While this is certainly good news, the issue that remains is the period of elapsed time between the identification of the viral strain and the commercial availability of meaningful quantities of vaccine for public and private use. It is expected to take anywhere from six to nine months to produce any meaningful amount of pandemic vaccine after the identification of the pandemic strain. Also, once vaccines become

available, there will be a pre-determined prioritization for the distribution and use of the vaccine, so it may take several more months to provide vaccination access to all those in need. Additionally, the vaccine, unlike existing antivirals, will not likely undergo stringent clinical trials on humans prior to mass production. There are some lingering concerns around the safety of such a vaccine due to previous instances when vaccines were rushed into production with limited testing and had harmful consequences.[21]

If vaccines are likely to be the preferred pharmaceutical intervention, organizations must still consider how they will mitigate the spread of the virus from the point of the initial outbreak to the time when the pandemic vaccines are available. For governments, and now many corporations, the answer to this question has been antivirals. There are several antiviral medicines available that should provide meaningful relief from pandemic influenza symptoms, if taken for treatment (within 48 hours of the onset of symptoms) or immediately after known exposure to the virus. Additionally, some antivirals are indicated for use in prevention (prophylaxis)—i.e., they may be effective in preventing the user from getting ill at all. An added benefit of pre-exposure prophylaxis is that if the user is exposed to the virus while taking the antiviral, there is nothing with regard to the antiviral that prevents the user from developing natural antibodies while completing his/her prescribed treatment. As mentioned earlier, there are several antivirals already available. However, only two, Tamiflu, oseltamivir, (produced by Roche) and Relenza, zanamivir, (produced by GlaxoSmithKline), are neuraminidase inhibitors, which are indicated on their labels to target all clinically relevant influenza A and B viruses. Tamiflu is taken by mouth, as either capsules or suspension, while Relenza is given by inhalation using an inhaler device. We believe that these are the most appropriate antivirals for use in the corporate (non-clinical) setting, due to their expected efficacy in a pandemic strain and their ease of distribution.

“If vaccines are likely to be the preferred pharmaceutical intervention, organizations must still consider how they will mitigate the spread of the virus from the point of the initial outbreak to the time when the pandemic vaccines are available.”

In the last few years, there have also been major concerns around whether or not pharmaceutical companies have had enough antiviral capacity to satisfy the public sector demand, not to mention the private sector. Today, most government orders have been filled or are scheduled to be filled; and production capacity outstrips demand. Antiviral producers are carefully managing the supply of these products in accordance with demand, and while antivirals are readily available today in a pre-pandemic period, it is extremely likely that demand will greatly outstrip supply once WHO Phase 4 is declared.

Despite the expected scarcity of pharmaceutical interventions at the onset of a pandemic, many organizations have been slow to proactively establish the necessary stockpiles of these potentially life-saving supplies. Several barriers to purchase exist, whether financial, tactical, or ethical; while certainly not insurmountable, they have slowed the incorporation of these interventions into the pandemic risk mitigation process for corporations (Figure 6).

Figure 6 – Barriers to the Purchase of Pharmaceutical Interventions

Intervention-specific Knowledge

- How effective is it?
- How do you use it?
- Does it have any side effects?
- How much does it cost?

Stockpile Storage

- Where do I store supplies?
- How long can I store them?
- How do I safeguard my business stockpiles from government acquisition?

Distribution

- Does the intervention need a prescription?
- Do staff need a doctor consultation?
- When do I distribute interventions to staff?
- Can I use a third party to manage this?

Liability/ Legal Issues

- Are we liable if staff die after being asked to report to work?
- Are we subject to discrimination lawsuits if we distribute interventions only to critical employees?
- Are we required to prepare?

Insurance

- Will insurance cover pandemic expenses?
- Can I persuade insurance companies to bear some of the burden?

Payment

- Should we pay for staff to remain home?
- Should we pay extra for staff to report to work?
- Should we pay for interventions?

Coverage

- Should I only cover critical employees?
- Should I cover all employees?
- Should I cover family as well?

Communication

- When/how do I communicate about pandemics to staff?
- How do I avoid negative perceptions?

Source: Marsh and The Oliver Wyman Group

The Challenge of “Accountable Hindsight” in Pandemic Planning

- Planning from the position of “accountable hindsight” rather than from behind a “veil of ignorance” acknowledges that there are reasonable measures businesses’ can take to mitigate foreseeable points of disruption throughout a business’ end-to-end supply chain.
- A set of best practices is emerging worldwide among pandemic preparedness leaders, and these emerging best practices demonstrate a reasonable approach to an unprecedented risk.
- Pharmaceutical stockpiling is an example that illustrates such unique regulatory and legal issues, including questions of equity in distributing medicines and in access to stockpiles for persons outside a business.

Any action or inaction will be questioned, especially in the atmosphere of uncertainty, worry, and scarcity that will develop as a pandemic unfolds. A plan must be robust enough to build confidence in a company’s approach while also allowing for changes as events require. Moreover, there is a very high likelihood that decisions will be reviewed after the pandemic, possibly even in adversarial environments such as litigation or in the event a host country review seeks to scapegoat multinational companies. In short, accountability will likely be imposed in hindsight and standards may be created retroactively.

In such an environment, companies will want to act in accordance with the best-in-class practices going in. They may want to ensure that their practices are endorsed by a public-private partnership (a topic we discuss later in this document). And at a minimum they will want to show that their decision making during the pandemic gave reasonable consideration to information that they should have been expected to know. This pattern and practice of decision making can go far in justifying the steps a company takes and protecting the company from political and other repercussions once a pandemic ends.

In pandemic planning, as with other business risk issues, executives must clearly define, articulate, and act upon what their fiduciary duties are to investors and social responsibilities are to employees, customers, suppliers, civil authorities, and the wider community during a pandemic, in order to best protect themselves from post-pandemic scrutiny and liability.

It is critical to reiterate that there is no one-size-fits-all approach for developing corporate pandemic preparedness plans; however, there are many core elements of pandemic plans that if implemented could credibly be considered reasonable.

"As most companies are not in the business of health care, they are not set up to provide prescription medications or other interventions to their personnel; this has the potential to result in ethical, legal, and logistical problems."

To Stockpile or Not? Pharmaceutical Interventions

Representative of the myriad of challenges faced in the broader area of accountable hindsight is the debate around acquiring and utilizing pharmaceutical interventions. As most companies are not in the business of health care, they are not set up to provide prescription medications or other interventions to their personnel; this has the potential to result in ethical, legal, and logistical problems. Most companies have been or are seeking guidance as to how to best bridge the gap between generally accepted or legally mandated practices for the prescription and administration of antivirals, especially when such requirements may be illogical, counterproductive to a speedy response, or impossible to comply with during a pandemic.[22] Even companies large enough to have their own medical departments are not prepared to evaluate or treat every single employee. Hence, companies considering whether to stockpile any interventions will have to address the practical problem of distributing them on a timely basis to those that need them. The broader ethical, legal, and logistical challenges will be discussed in more detail in the following sections of this chapter.

Ethical Challenges

With regard to the stockpiling of any supply, including equipment, pharmaceuticals, food, water, and/or cleaning products, ethical issues will certainly arise around which employees receive access and which do not. Access to supplies should not be considered an issue of employee equality, but one of equity. Certain employees are more critical in keeping the business running during a pandemic, and corporations must ensure that they protect these employees in order to protect the business. That being said, based upon anecdotal evidence collected during our most recent engagements, companies have begun to conclude that it is too difficult to draw a line between employees who get treatment and those who do not. As a result, many have decided to make supplies available to all employees, not just the ones who have been deemed critical. Executives around the world must also remember that not deciding is also a decision, and may expose a company to unexpected operating costs, liability and litigation—the moral minimum for decision making.

> "... companies have begun to conclude that it is too difficult to draw a line between employees who get treatment and those who do not. As a result, many have decided to make supplies available to all employees, not just the ones who have been deemed critical."

If the determination to stockpile for all employees has been made, corporations quickly learn that they must also consider whether or not they should consider purchases for the families of their employees as well. These corporations acknowledge that employees will be more likely to show up for work and contribute in a meaningful way if they know that their families are protected. For example, 91 percent of the 300 paramedics surveyed said they would remain on duty if they were fully protected against smallpox (given protective wear and vaccination); this number fell to 38 percent when the respondent believed that his or her immediate family was not protected.[23] This issue is difficult, since adding families to the total purchase-base of stockpiled products significantly increases the cost of the mitigation strategy. There are also questions of how to define family, but this should be managed consistently with the company's normal practices toward dependents.

Legal Concerns

From a legal perspective, corporations are concerned with the implications of making unproven supplies available to employees, or in some cases requiring employees to use equipment or take medicines as part of a pandemic plan. This is a difficult issue facing most corporations since there is not a lot of guidance on the subject. In addition to concerns around litigation for providing drugs or PPE to employees, there are also concerns of litigation for not having provided them when other

companies and governments had found it prudent to do so. In addition to access considerations, efficacy issues could also result in legal problems. Since no product has been or can be tested on the particular viral strain that will emerge as the next pandemic, there are no clinical data that suggests any efficacy against the virus. Most products do have some clinical data with regard to product safety, especially those used to manage seasonal influenza. However, in the absence of pandemic efficacy data, the appropriate legal, as well as ethical, defense for corporations is to demonstrate the use of good judgment and integrity in the pandemic planning and decision-making process.

Since many legal issues, in addition to this one, will likely be sorted out after the pandemic has come and gone, companies must be open and honest when communicating with employees, investors, suppliers, and customers on the subject of pandemic preparedness, so that all stakeholders clearly know what they can depend on from the company and what the company expects of them. Once this has been communicated and understood, the next critical issue is for the corporation to follow through on what it has promised its stakeholders. Having a plan, testing it, communicating it, and following through, may enable the corporation to demonstrate that the necessary due diligence was performed and may make the organization less vulnerable to post-pandemic criticism. It would also be extremely helpful to have public-private partnerships spell out what is expected, because such guidance could provide both advice and protection from criticism. This guidance can be non-binding guidance, as most WHO and other guidance is, or it can be legislative. We believe that several national governments are on the cusp of releasing more direct guidance on these issues in the coming months. Within the United States, Iowa was the first state to extend "Good Samaritan" liability coverage to "a person, corporation, or other legal entity, or an employee of or agent of such person, corporation, or entity, who, during a public health disaster, in good faith and at the request of or under the direction of the department of public defense renders emergency care or assistance to the victim of a public health disaster."[24]

Logistical Challenges

Once a corporation has considered and dealt with the ethical and legal concerns around purchasing and stockpiling supplies, one other typical obstacle remains. The logistical issues around acquiring, storing, and distributing supplies have been difficult ones for corporations. How to acquire prescription-only drugs for employees, how to determine how much PPE will be needed, where and how to store supplies, and then

how to get them to employees so that they are readily available when needed—these are all major hurdles in a company's pandemic strategy.

Given the significant demand for PPE, cleaning supplies, antivirals, and vaccines (when available) corporations, manufacturers, pharmaceutical companies, distributors, benefits companies, third-party administrators, and corporate medical services providers have all collaborated to provide several practical solutions for dealing with these issues in a way that is tailored to the needs of the corporation making the purchase. For example, today many corporations are partnering with outsourced corporate health services to provide medical evaluations, education, and prescriptions for pharmaceutical interventions; and then working with pharmacy networks or third-party pharmaceutical distributors to fill the prescriptions for employees prior to an outbreak.

For antivirals to confer maximum benefit, they must be taken within 48 hours of the onset of symptoms.[25] While this works well for treatment of the seasonal flu, in a pandemic the symptomatic patient must arrange to see a doctor, obtain a prescription, and bring it to a pharmacy for dispensing, all at a time when literally millions may be trying to do the same. These logistics could prove a major barrier to treatment during a pandemic.

A potential solution to helping to ease the distribution burden would be to leverage companies as potential alternate distribution channels. To further alleviate the distribution burden during a pandemic, many companies that have already acquired antiviral stockpiles are putting the medicines immediately in the hands of employees, eliminating most of the distribution challenges faced when trying to accomplish that same task during a pandemic. Beyond the discussion around antivirals specifically, corporations must ensure that they have taken into consideration the difficulty around distributing all types of interventions during a pandemic and must incorporate realistic and appropriate solutions to these challenges while developing their pandemic plan.

"... corporations must ensure that they have taken into consideration the difficulty around distributing all types of interventions during a pandemic and must incorporate realistic and appropriate solutions to these challenges while developing their pandemic plan."

The Need for Stronger Public-Private Partnerships

- An influenza pandemic requires collaboration between public and private sectors.
- Businesses, particularly transnational corporations, have unparalleled resources to help governments collect and disseminate information and address community-wide socioeconomic losses.
- Businesses and the public sector nevertheless have different objectives and roles to play: protecting business operations, employees, and their families for businesses; and protecting the community as a whole for government. These differences should be respected, with neither asked to act in place of the other, even while the sectors cooperate.

All nations, regardless of national sovereignty and ideological ethos, are vulnerable to the spread of infectious diseases. Consequently, they share a common responsibility to engage in ongoing prevention, detection, and response activities.[26] Considerable attention has been spent on identifying and communicating the inability of most of the world's national pandemic preparedness plans to be able to provide medical and non-medical interventions to all national populations.

For approximately the last decade, intergovernmental organizations like the WHO, Food and Agriculture Organization of the United Nations (FAO), and World Organisation for Animal Health/Office International des Epizooties (OIE) have been raising awareness for national governments to engage in pandemic preparedness. According

to WHO Director-General Margaret Chan, all 192 WHO member states have some kind of avian-influenza preparedness plan in the works.[27] This marks definite progress from more than two years ago, when only 50 countries were preparing for a bird flu pandemic, but these plans vary greatly in comprehensiveness and stage of completion. Contributing to the deficiencies of national pandemic preparedness plans are cultural barriers to health as well as the nature and type of health care systems available.

The International Monetary Fund (IMF) reported that countries previously affected by SARS, some countries that had recently dealt with avian flu outbreaks, and several countries with large, complex financial systems generally had more advanced preparations.[28] While some governments have gone to great lengths to develop their own plans, there is a disconnect between what governments are doing, what they expect from the private sector, and what the private sector can expect from the government. For example, there currently are few, if any guidelines, on how corporations should stockpile and distribute pharmaceutical interventions. New and unique partnerships between local health authorities and corporations are necessary. While most publicly available national plans do not speak directly to this disconnect, there are several national plans, which advocate that corporations take the necessary steps to prepare for a pandemic. The limited guidance available thus far is inadequate. There is the need for further discussion on developing new legislation or introducing legislative and regulatory changes that may provide corporations with clearer responsibility, accountability, and the emergency powers necessary to ensure successful execution of their own pandemic plans, in support of and aligned with national and international goals.

To the extent that many governments have indicated that they lack capacity to provide pharmaceutical and non-pharmaceutical interventions for all of their citizens, there is growing consensus that corporations, where and when possible, should engage in preparedness measures in advance of a pandemic (preferably today and absolutely prior to WHO Phase 4). This includes the corporate stockpiling and distribution of layered interventions in order to complement the government response and to mitigate the spread of a pandemic in the absence of an effective vaccine. It is clear that in the event of a pandemic, both the public and private sectors must acknowledge a shared ownership of the problem and the responsibility for the recovery.

More recently, many nations have stepped up their efforts to raise awareness, educate, and build capacity at the governmental levels,

“To the extent that many governments have indicated that they lack capacity to provide pharmaceutical and non-pharmaceutical interventions for all of their citizens, there is growing consensus that corporations, where and when possible, should engage in preparedness measures in advance of a pandemic...”

even going so far as endorsing corporate preparedness plans as corporations are members of the wider communities in which they reside. Several jurisdictions, such as Germany,[29] Hong Kong,[30] Ireland,[31] Japan,[32] Thailand,[33] Sweden,[34] the United Kingdom,[35] and the United States,[36] have advocated the involvement of corporations in a wider national preparedness approach in addition to corporate stockpiling and use of pharmaceutical interventions.

Following avian influenza outbreaks in 1997, WHO issued recommendations that all governments make plans to mitigate the impact of pandemic influenza. Since then, and following similar awareness-raising efforts in the last four or so years after a surge/increase in avian influenza and influenza in humans of avian origin cases, many governments have made preparations involving pharmaceutical responses but have not covered—or have not been able to cover—their entire populations (i.e., 23 countries have ordered antiviral drugs for national stockpiles).[37] Pandemic preparedness plans, including those of Japan,[38] the United States,[39] many European Union countries,[40] India,[41] Hong Kong,[42] Australia,[43] and New Zealand[44] have looked at how to store, distribute, and administer antivirals to critical personnel, including personnel critical to maintaining the national infrastructure.

According to the U.S. Department of Health and Human Services (HHS), in the event of a pandemic, businesses will play a key role in protecting employees' health and safety as well as limiting the negative impact to the economy and society.[45] To keep from "appearing alarmist" in our concern about pandemics, we need to emphasize all hazards readiness and the general need for personal, corporate, and general community preparedness.[46]

The U.K. pandemic plan recommends that "all organizations, including businesses, need to consider the implications for their organizations, based on the information in this plan and make their own business continuity plans."[47] There is also the consensus that in all [EU] countries cross-sectoral preparedness needs to be as broad as possible, including business, private health care providers, trade unions, civil society, and other stakeholders in the society as well as non-health ministries. Previous public health crises, such as HIV and SARS outbreaks, indicate that even when public health response is strong, a weak contribution from other sectors leads to more people being vulnerable; greater suffering; and increased social, economic, and humanitarian consequences.[48]

For the most part, those countries that have national pandemic preparedness plans in place address most of the same core elements in planning and responding to a pandemic. Where there seems to be the

greatest differentiation is on the recommendations provided for the stockpiling and distribution of pharmaceutical and non-pharmaceutical interventions. Further guidance at the supra-governmental level on these issues should lead to further clarity at the national, as well as corporate, levels.

Corporations are in fact constituents of the wider local communities in which they reside. Consequently, the question that remains is how to develop best practice guidelines for stockpiling and distributing relevant pharmaceutical (antivirals and vaccines) and non-pharmaceutical interventions (including masks, durable and perishable good, and disinfectants and decontaminants) in partnership with the government authorities, municipalities, and communities.

Businesses should also be prepared for public health interventions and recommendations that may increase absenteeism. Additionally, elements of the private sector should be prepared to support all levels of government efforts to ensure that critical infrastructure is sustained.[49] It is important for businesses to respect the role of governments; for example, shuttering businesses, schools, and transportation hubs will hurt business but may be among the more effective public responses. The role of leaders in both sectors is to make emergency preparation an ethic, not an episode—to constantly make the point that when we prepare for pandemics, it makes for safer and healthier nations.[50]

“It is important for businesses to respect the role of governments; for example, shuttering businesses, schools, and transportation hubs will hurt business but may be among the more effective public responses.”

Of critical importance in pandemic preparedness is the need for intersectoral planning involving partners outside the health sector. These partners include other government departments across multiple levels of government, as well as partners in the private sector, including industry and non-governmental organizations.[51] The private sector will play an integral role in a community response to pandemic influenza by protecting employees’ and customers’ health and safety, and mitigating impact to the economy and the functioning of society. Collectively employing the thought leadership found in international organizations, the resources of world governments, and the execution capabilities of the business community improves the chances of each individual stakeholder/sector more effectively managing and mitigating the negative impacts of a severe pandemic.

The Operating Realities of a Post-Pandemic World

- After a pandemic, there would be demand-side and supply-side volatility, within supply chains and among consumers.
- Human resources would be among the most difficult issues after a pandemic. How to manage the reintegration, re-absorption, re-appropriation, and redirection of human resources—the most vulnerable part of any business—to resume previous functions, fill "role-holes," or rehabilitate employees will require advanced planning, which could include temporary and more permanent redundancy approaches, psychosocial support, and potentially unique in-house aid programs that provide meals to employees and places to relax, in addition to temporary child-care facilities.
- The world we recover into may not be the world we are accustomed to, and our planning must take this into consideration.

Pandemics, by their nature, are social events, gaining momentum with increased social networking and interaction. Severe pandemics are characterized by high morbidity and mortality resulting in high rates of absenteeism and the potential to leave professional "role holes" and resource gaps. A highly virulent pandemic would tax health care facilities, health care professionals, and generate unprecedented psychosocial stress throughout the affected communities and nations. When the pandemic is brought under control, it will not leave the world unchanged.

Post-Pandemic Economic Conditions

Corporations must consider how customer demand would change as a result of a pandemic and what the world, and the resulting new operating realities, would look like as the business begins its recovery. An example of this type of demand shift is common to the tourism and hospitality industry, in which natural hazards (including earthquakes and infectious diseases, e.g. SARS, tsunami, hurricanes, etc), accidents (rail, air, road accidents), and deliberate events (terrorism, political violence, labor strikes, etc.) can all dramatically influence demand. In April 2003, Hong Kong received just half a million visitors compared to 1.4 million in the same month a year earlier. Occupancy rates plunged to 22 percent compared to 85 percent in April 2002.[52] Another example came in the aftermath of Hurricane Katrina, when cash was the commodity experiencing extremely high demand and unexpectedly low supply. There are likely to be special liquidity needs in the event of a future pandemic, when many individuals will want cash for emergency spending should they venture outside their homes. The lessons learned by the financial services industry from Hurricane Katrina have been factored in as this industry envisions its own recovery, and its supporting role in the overall economy's recovery, in a post-pandemic environment.[53]

> "Even in normal times, the business cycle can surprise companies. After a pandemic, poor information and a lack of examples for recovery would add to concerns."

Post-pandemic demand uncertainties will likely be exacerbated by uncertainty at the macro level. Even in normal times, the business cycle can surprise companies. After a pandemic, poor information and a lack of examples for recovery would add to concerns. This will be especially true if a pandemic affects a financial center or regional stock exchange, so that capital flows are in question. The level of uncertainty may begin to decline once information regarding the scope and degree of damages are gathered, analyzed and disseminated; however, the speed of this decline can be influenced by many factors, such as the release timing of recovery plan, the priority of recovery, the damages to the other regions, etc. These uncertainties are difficult to be quantified with objective mathematical probabilities, and are also difficult to be measured even with subjective preference.[54] Are there any expectations for operating under economic uncertainty plus labor shortages that must be managed following a global biological disaster?

The relationship between macroeconomic and microeconomic issues during and after a natural disaster, such as market trends and production practices, will likely bare witness to some volatility as anticipated production (sometimes automated) exceeds demand during and directly following a disaster. However, in most cases of natural disasters, this levels out. A severe influenza pandemic is not, however,

like most natural disasters. Therefore, making assumptions about the recovery of demand in the event of a pandemic is more uncertain than in the case of an earthquake, flood, or a terrorist incident.

Human Resources Post-Pandemic

Business resumption and recovery will heavily rely on the reintegration of employees back into the workplace, rather than on the reconstruction of infrastructure. Consequently, there is a need to address a host of potentially uncomfortable scenarios that may result from a pandemic and ultimately slow business recovery: (1) work-force attrition due to death, disability, or the need to act as a domestic caregiver; (2) work-force attrition due to fear (i.e., "the worried well"); and (3) work-force attrition due to opportunism (e.g., fraudulent absenteeism to collect benefits as long as other co-workers are). How effectively businesses manage the reintegration, re-absorption, re-appropriation, and redirection of their human resources to resume previous functions, fill role-holes, or rehabilitate employees will require advanced planning which includes temporary and more permanent redundancy approaches, psychosocial support, and potentially unique in-house aid programs that provide meals to employees and places to relax, in addition to temporary child-care facilities. Furthermore, flexible plans that account for continued telecommuting (to the extent that it is feasible and can be supported by the communications infrastructure during the pandemic crisis) in the aftermath of a pandemic will need to be systematically reviewed in predetermined stages following local peak outbreaks.

"How effectively businesses manage the reintegration, re-absorption, re-appropriation, and redirection of their human resources to resume previous functions, fill role-holes, or rehabilitate employees will require advanced planning..."

Initial planning assumptions are often made on projected ranges of risk and their correlative range of impacts. To the extent that uncertainty after a disaster is different from the projected occurrence of a particular risk—in this case, a severe influenza pandemic—the effects of uncertainty ought to be incorporated into the analysis of economic impacts of a pandemic, since the decision making and response to supply and/or demand changes can be noticeably different from the ones in the pre-disaster context.[55] Consequently, the usual assumptions of the laws of supply and demand ought to take into consideration uncertainty and behavioral changes based upon the speed, accuracy, and flow of information. Factoring in uncertainty may influence production planning, especially for manufacturing sectors with respect to gauging in which direction manufacturers decide to direct the level of production in anticipation of the future demand stream in addition to bringing additional impacts on inventory management and production scheduling.[56]

While developing a pandemic plan, companies must look at their portfolios of products and services to determine which ones will take precedence during the pandemic. Of the businesses that plan to operate during a pandemic, they must determine which products or services will be of greatest need and demand so that they can ensure that appropriate resources are allocated (and reallocated) to promoting the resiliency of those products and services. The most natural approach is to plan to recover from a pandemic back to the previous status quo; however, companies must also consider which of their products or services will be of greatest demand in the post-pandemic environment, so that they can best ensure that those products and services can be delivered to meet demand.

This exercise is not as easy as it may seem, since there are several unknowns about the post-pandemic world. Businesses should try to visualize what that world may look like so that as they prepare for their recovery into that environment, they can be positioned in such a way to best enable their future success. This will certainly provide opportunities for businesses that have foresight and imagination to envision and define what products and services will be most in demand in the post-pandemic world.

Conclusion

In a global economy, minor supply chain disruptions can have significant negative impacts on a company's ability to operate as well as on share price. A severe influenza pandemic—spreading along the value chain that normally supports profits—has the potential to devastate all operations and bring a catastrophic halt to commerce. The threat is not only to the businesses directly dependent on those supply chains but on those affected by the economic impact of a pandemic (i.e., the disruption of operations from public health measures, illness among vendors or consumers, or the simple drop in customer demand).

Further study cannot resolve uncertainties. Attempting to project the economic impact of a severe pandemic is hampered by the fact that the social and economic burden of influenza during interpandemic periods has not been well studied; consequently, extrapolating macroeconomic projections, forecasts, and models of impending economic loss poses direct intangible challenges to independent business operators. Translating this risk into tangible and digestible loss and recovery times for an individual company can be daunting in the face of so much uncertainty.

Fortunately, there are best practices emerging in preparing for a pandemic. There is, of course, no one-size-fits-all approach to planning for businesses, but there is guidance available. A corporate commitment to resiliency planning can illuminate difficult issues, allow for the adoption of policies that can produce results, and lay the groundwork for a response that can protect employees and corporate value.

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