

# INFLUENZA PANDEMIC GUIDE

for Québec Financial Institutions

AUGUST 2006



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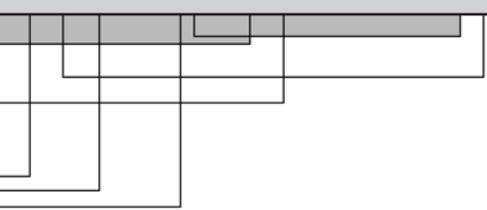
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## WARNING

This guide focuses on how to prepare for an influenza pandemic and is intended for Québec financial institutions supervised by the *Autorité des marchés financiers* (AMF). It assumes that an influenza pandemic could occur without indicating how and when such a situation might arise. Our comments should not be considered alarmist, as it is up to scientists and qualified government authorities to decide on the scope, duration and risk of an influenza pandemic. It is also important to note that the information contained in this document is valid as of the date of publication.





## SUMMARY

In the current context, it is essential for financial institutions to integrate, as government bodies, health organizations and other organizations are doing, a possible influenza pandemic into their risk management. However, the management of such a risk presents many challenges:

- ❑ Much uncertainty surrounds the characteristics of a possible influenza pandemic. It is difficult to predict when an influenza pandemic might occur, the geographic scope it could have, how long it could last and the extent of its consequences. As long as the virus has not undergone a mutation making it transmissible between humans, scientists cannot speak authoritatively on these issues.
- ❑ It is difficult to assess the economic and financial impact of an influenza pandemic due to a lack of historical data that can be used as a basis for making projections intended for preparation and modelling purposes.

One of the solutions to overcoming these challenges is to analyze the risk according to different scenarios. However, the assumptions on which such scenarios are based must remain consistent.

In this sense, the projections that have been made all maintain that an influenza pandemic could have a major economic impact, followed by a rapid recovery. Economists anticipate a decrease in demand due to a considerable change in consumer habits and greater risk aversion on the part of investors. In terms of supply, a decrease is also expected as economists anticipate a lower level of productivity.

It should also be noted that the effects of a pandemic would be different from one industry to another. For example, according to current projections, the impact on the life insurance and reinsurance industry should be more significant than for the damage insurance industry.

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From another point of view, the procedures that would be set up to limit the spread of a pandemic (for example, reduced travel to and within infected regions) present constraints that must be taken into consideration in preparing a business continuity plan.

Apart from this type of constraint, the business continuity plans of financial institutions for a possible influenza pandemic must be adapted to the many specific features of such a risk. One example mentioned is the fact that such plans must ensure critical operations over a lengthy period (how long a pandemic would last being unknown), taking into account that several waves of varying intensity could occur.

Accordingly, the guidelines given by regulatory authorities on developing business continuity plans in the financial sector are intentionally broad so that financial institutions can adapt them to their own situation.

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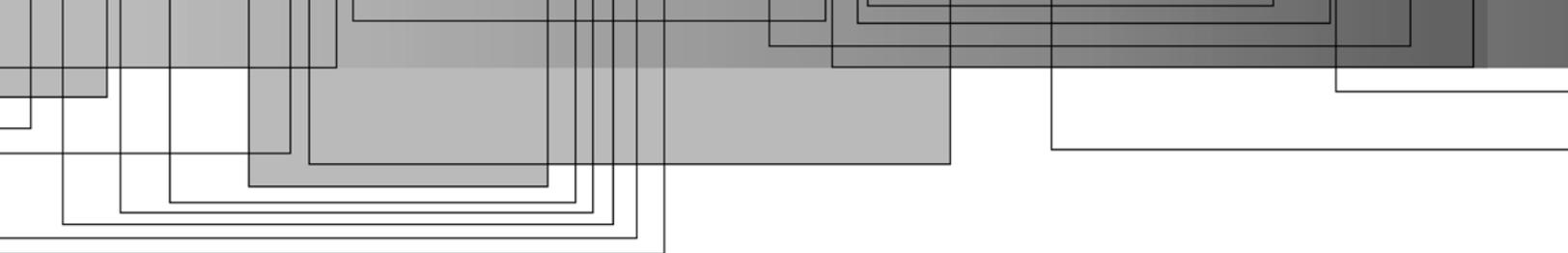
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# INTRODUCTION

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The *Autorité des marchés financiers* (the AMF) is issuing this document as a guide intended for Québec financial institutions to prepare for a possible influenza pandemic. Its recommendations are in keeping with the guidelines of the International Monetary Fund<sup>1</sup> (IMF) and the Joint Forum<sup>2</sup> of the Basel Committee. The reports published by these bodies encourage all participants in the financial sector to prepare for a possible influenza pandemic and to build communication and co-ordination networks between the various entities involved, in order to further discussions on the best practices for managing this risk.

Furthermore, the uncertainties surrounding the risk of an influenza pandemic are leading to major disparities in terms of the procedures being set up, as well as discrepancies in terms of the assessment of the impacts of this risk. As a result, the AMF encourages financial institutions to adopt an approach that takes into consideration several scenarios related to developing business continuity plans or to modelling the impact of a possible influenza pandemic on their financial health.

Accordingly, this document is designed as a tool for Québec financial institutions. Its goal is to raise their awareness of the risk of a possible influenza pandemic, the impacts it could have and the importance of preparing for such an event. Other than raising awareness, this document is intended to help orient the actions to be taken by Québec financial institutions. However, institutions will have to adapt these orientations to their particular situation. To this end, this guide is divided into three parts:

- **The first part** deals with the risk of an influenza pandemic in terms of the various parameters to be considered in analyzing the risk based on the most recent statements of the World Health Organization (WHO). It also gives an assessment of the risk in terms of probability and severity, according to several scenarios.

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1. Based in Washington, the International Monetary Fund (IMF) is an international organization that was created at the Bretton Woods conference held in 1944. One of the missions of the IMF is to ensure the stability of the international monetary system. On February 28, 2006, it published a document on avian flu that gives estimates of the impact of a possible pandemic on the economic and financial systems and the role of regulatory organizations.

2. The Joint Forum was created in 1996 to promote dialogue and discussion among three international organizations in charge of developing standards applicable to the financial sector: the Basel Committee on Banking Supervision (BCBS), the International Organization of Securities Commissions (IOSCO) and the International Association of Insurance Supervisors (IAIS). In November 2004, these organizations instructed the Joint Forum to publish a document on the best practices for business continuity. That document was published in February 2005. It confirms that the adoption by financial institutions of best practices in business continuity would help strengthen the stability of the financial system.

- ❑ **The second part** is an analysis of the impact of a possible influenza pandemic on Québec financial institutions. This analysis was conducted based on historical data available on past pandemics, economic and financial impact studies and declarations made by government authorities. In its initial version, this analysis gives the opinion of the AMF and is based on data available as of publication. Updates will be issued as needed according to developments. The AMF also encourages financial institutions to forward their comments for the purpose of enhancing this analysis based on their own experience and their perception of the impact of this risk on their organization.
- ❑ **The third part** highlights the importance to financial institutions of adopting a business continuity plan. It discusses the specific aspects for consideration in developing a business continuity plan in preparation for an influenza pandemic, giving points to be taken into account for adapting an existing continuity plans to this risk.

To achieve the goals of this document, it is important to define certain terms:

- ❑ The term **pandemic** is used to refer to an epidemic that affects a large number of people in a very broad geographic area.
- ❑ **Avian flu** is a bird disease caused by the type A influenza virus, which in turn is divided into subtypes, such as H5 and H7. The disease can infect almost all species of wild or domestic birds. Occasionally, it can transmit to other species, or become highly pathogenic. The avian flu virus can exceptionally be transmitted to humans by direct contact with infected species, as is the case for the H5N1 virus subtype. Also, this subtype can easily mutate and could therefore become transmissible between humans.
- ❑ An **influenza pandemic** corresponds to the emergence of a new strain of flu virus that is easily transmissible between humans, making it virulent. The new virus would have a unique genetic structure against which populations are not immunized, neither by prior exposure nor by vaccination. Such a strain could result from a mutation of the H5N1 virus subtype.
- ❑ In this document, the term “influenza pandemic”, although it is not always preceded by the word “possible”, is used in a context of conjecture.

# INFLUENZA

## Pandemic Risk Assessment

In its latest report, the World Health Organization (WHO) stated that all the prerequisites for an influenza pandemic among humans caused by the H5N1 virus have come together except one: Although the virus is currently responsible for the avian flu, it still does not have the ability to transmit between humans. However, according to the WHO, it is impossible to determine whether the virus will undergo a mutation. It is also difficult to predict when an influenza pandemic could occur, whether it would involve the H5N1 virus or another strain of virus, and whether or not the pandemic would be severe. The WHO believes that a pandemic could occur if the virus undergoes a mutation that makes it transmissible between humans.

Experts therefore agree on several uncertainties surrounding the characteristics of the risk of an influenza pandemic (see Table 1).

**TABLE 1** Characteristics of the risk of an influenza pandemic

RISK CHARACTERISTIC	DEFINITION	ESTIMATE
<b>Contagiosity (morbidity)</b>	The proportion of people infected with the disease	Experts can estimate the level of contagiosity of the flu virus transmissible between humans. There are therefore estimates of the number of people who could become ill. The <i>Ministère de la Santé du Québec</i> (Department of Health) has published its estimates for Québec.
<b>Virulence (mortality)</b>	The proportion of people who die from the disease	This parameter is difficult to estimate. Pandemics generally produce a mortality rate of 0.4%, although the Spanish flu caused the death of 3% of infected people. As of June 20, 2006, the mortality rate from avian flu was 57% (228 people infected, including 130 deaths <sup>3</sup> ). However, according to scientists, viruses lose much of their virulence during mutation.
<b>Occurrence date</b>	The date when the H5N1 virus mutates into a form transmissible between humans	Although it is highly likely that the virus will mutate, it is impossible to predict when the mutation would occur since each new human case gives the virus the possibility of associating with a human viral strain, thereby encouraging mutation of the virus.
<b>Duration</b>	—	The pandemic could occur in several waves of variable intensity, of approximately six weeks' duration. The overall duration of the pandemic could be from 12 to 36 months.

3. Although the virus has not mutated yet, as of June 20, 2006, the WHO had identified 228 cases worldwide of contaminated persons, including 130 deaths, as a result of direct and extended contact with infected poultry. The most recent figures are available on the following website: [http://www.who.int/csr/disease/avian\\_influenza/country/en/index.html](http://www.who.int/csr/disease/avian_influenza/country/en/index.html)

These uncertainties complicate preparations for a possible influenza pandemic. This complexity could be overcome by carrying out a scenario-based analysis using a series of assumptions as adopted by the World Economic Forum<sup>4</sup> in its *Global Risks 2006* report.

The analysis of the risk of an influenza pandemic put forward in that report proposes two scenarios:

- The **base-case scenario**, which outlines the evolution of the risk by projecting current trends;
- The **worst-case scenario** which represents the worst plausible developments.

These two scenarios are considered for two different time horizons:

- Short-term over one year (2006);
- Long-term over 10 years (by the end of 2015).

This analysis assumes that the risk of a pandemic is a “global risk”, as the pandemic would extend over at least three regions of the world, on at least two continents. The economic impacts extend over a greater geographic area due to a high level of interconnection among the financial markets and the interdependence of economic systems. A possible influenza pandemic therefore represents a systemic risk<sup>5</sup> for financial institutions.

The risk is estimated in terms of probability and severity. The probability represents the likelihood of a pandemic occurrence, whereas the severity of the risk of an influenza pandemic gives an appreciation of the impact of the pandemic. For this analysis, this appreciation is based on three parameters: losses in terms of human lives, the economic impact and the impact on the rate of growth of the world gross domestic product<sup>6</sup> (world GDP). A score is assigned to each level of severity (see Table 2).

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4. The World Economic Forum (WEF) was created in 1971 under the name European Management Forum. It “is an independent international organization committed to improving the state of the world by engaging leaders in partnerships to shape global, regional and industry agendas.” Each year it publishes a study on global risks. This publication is prepared in collaboration with MMC (Marsh & McLennan Companies, Inc.), Merrill Lynch and Swiss Re, and in association with the Wharton School of the University of Pennsylvania.

5. According to the *Payment Clearing and Settlement Act* (Canada), “systemic risk” means the risk that the inability of a participant to meet its obligations in a clearing and settlement system as they become due or a disruption to a clearing and settlement system could, through the transmittal of financial problems through the system, cause other participants in the clearing and settlement system to be unable to meet their obligations as they become due, financial institutions in other parts of the Canadian financial system to be unable to meet their obligations as they become due, or the clearing and settlement system’s clearing house or the clearing house of another clearing and settlement system within the Canadian financial system to be unable to meet its obligations as they become due.

6. World GDP corresponds to the rate of growth of the gross domestic product of all countries.

**TABLE 2** Levels of severity of the impact of an influenza pandemic according to the World Economic Forum in 2006

SCORE	LOSSES IN TERMS OF HUMAN LIVES	ECONOMIC IMPACT (LOSSES IN U.S. DOLLARS)	IMPACT ON GROWTH (% OF WORLD GDP)
1	Less than 100	10 to 50 billion	less than 0.2%
2	100 to 10,000	50 to 250 billion	0.2% to 0.7%
3	10,000 to 1 million	250 billion to 1 trillion	0.7% to 1.5%
4	Over 1 million	Over 1 trillion	Over 1.5%

Source: World Economic Forum, *Global Risks 2006*

The World Economic Forum has put forward four estimates of the risk of an influenza pandemic. Table 3 summarizes these estimates.

**TABLE 3** Assessment of the risk of an influenza pandemic in terms of probability and severity

SCENARIOS	ASSUMPTIONS	PROBABILITY	SEVERITY (SEE TABLE 2)
<b>Short-term base</b>	The virus already has the ability to spread from birds to humans. Further mutation or recombination of avian virus H5N1 with existing human influenza virus gives rise to a new virus capable of spreading from human to human, causing illness amongst 30% of the global population who will be absent from work for 2 weeks (one week for their own illness, another week for care of family members). The economy suffers from lost productivity and some company failures in the travel, entertainment and consumer industries, accounting for a temporary 2% reduction in GWP growth. Mortality is low and behaviour rational.	1 to 10%	Loss of human life 3
			Economic impact 4
			Impact on growth 4
<b>Short-term worst</b>	H5N1 affects 30% of the global population but with a mortality rate of 4 per thousand. Governments restrict movement of people, close schools and ban large gatherings. There is public panic, widespread absence from work, supply chain disruptions and a slump in economic activity leading to a 6% reduction in GWP, many company failures and only a slow recovery despite a radical reduction in interest rates.	1 to 10%	Loss of human life 4
			Economic impact 4
			Impact on growth 4

**TABLE 3** **Assessment of the risk of an influenza pandemic in terms of probability and severity** (continued)

SCENARIOS	ASSUMPTIONS	PROBABILITY	SEVERITY (SEE TABLE 2)
<b>Long-term base</b>	There have been radical advances in vaccine development, including a movement away from egg-based development and the establishment of reverse genetic development. Vaccine development is now much faster and is able to reduce the impact of a pandemic. The risk of the emergence of a new human influenza virus remains the same but the impact is now only a third of 2006.	1 to 10%	Loss of human life 2
			Economic impact 2
			Impact on growth 2
<b>Long-term worst</b>	The emergence of the new virus in 2005-7 has given rise to several recombinations over the last 10 years and there have been 2 or 3 new (but less severe) pandemics in that period. Population has become very risk-averse. Travel and entertainment industries have been adversely impacted. Advances in vaccine development have occurred but the capacity is not yet high enough to meet global needs. Pandemic risk is low in the developed world but remains moderate elsewhere.	Less than 1%	Loss of human life 4
			Economic impact 4
			Impact on growth 4

Source: World Economic Forum, *Global Risks 2006*

# IMPACTS

## of a Possible Influenza Pandemic

Most of the risks associated with a possible influenza pandemic fall under the category of external events leading to an operational risk for financial institutions. An assessment of the impacts of the operational risks to be taken into consideration in integrated risk management is especially complex. This complexity is even greater in the case of an influenza pandemic because of the lack of valid historical data that could help with planning and modelling.

During the past century, there were three flu pandemics, with the Spanish flu causing the highest mortality rate. However, the available data on that pandemic are not very useful as they do not allow us to make reliable projections. This stems from a considerable change in context between 1918 and today that relates to vaccine development as well as financial markets and economic systems, due to their increasing interdependence. The most recent pandemics (those of 1957 and 1968) were not widespread and do not represent the same level of risk that an influenza pandemic could have in the future.

**TABLE 4** 20th century flu pandemics  
Global impact

YEAR	STRAIN	ESTIMATED DEATHS	WORLD POPULATION
1918 (Spanish flu)	H1N1	50 to 100 million	1.75 billion
1957-1958 (Asian flu)	H2N2	1 to 4 million	2.75 billion
1968 (Hong Kong flu)	H3N2	1 to 4 million	3.65 billion

Source: BMO Nesbitt Burns

Data are available on the Severe Acute Respiratory Syndrome (SARS) outbreak that occurred in 2003. Although it was only moderately contagious, that outbreak gives some indication of the economic and financial impacts a pandemic could have on our modern systems. According to a WHO report,<sup>7</sup> SARS caused serious economic losses.

In Canada, SARS was confined to the Toronto area. Canada's financial system did not suffer major losses following this epidemic but, although Québec was not directly affected, awareness of the importance of preparing for a possible influenza pandemic and the need for business continuity planning was raised among regulatory authorities and financial institutions.

7. For further details, see Chapter 5 of the 2003 world health report published by the WHO. The report is available on the following website: <http://www.who.int/whr/2003/chapter5/en/index.html>.

Based on all these factors, the following analysis of the effects of a possible influenza pandemic on Québec financial institutions is being suggested for information purposes.

## 1 ANTICIPATED IMPACTS ON THE POPULATION OF QUÉBEC

For the purpose of planning for a potential influenza pandemic, the Québec Department of Health has adopted the following assumptions:

**TABLE 5** Anticipated impacts of a possible pandemic on the population of Québec<sup>8</sup>

- 35% of the population would be affected in the first wave over an eight-week period;
- 2.6 million people would be infected (one person out of three);
- 1.4 million people would need care;
- 34,000 people would require hospitalization;
- 8,500 people may die.

In the scenario suggested by the Québec Department of Health, Canada would experience a first wave of infection within three months of the emergence of a new pandemic viral strain. The first wave might be followed by a second wave three to nine months later. Further successive waves could occur, lasting from a few weeks to a few months.

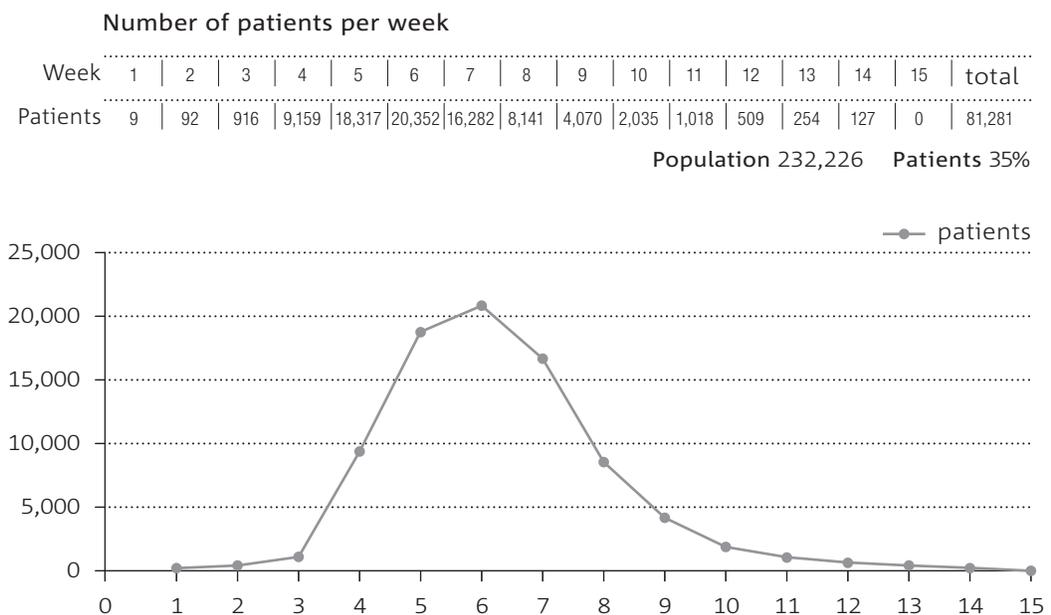
According to the Canadian Pandemic Influenza Plan, the spread of an influenza pandemic in the workplace would be similar to that affecting the population. The plan therefore anticipates that 15 to 35% of the active population would fall ill during the first wave of a pandemic.<sup>9</sup> This proportion does not take into consideration individuals who contract the virus and continue to work. According to the same source, everyone who becomes ill would be absent from work for at least seven days. However, it should be noted that this absence rate is

8. For further details, see page 15 of the *Québec Pandemic Influenza Plan*, developed by the Québec Department of Health.

9. The estimates provided by this plan are based on a model developed by Meltzer and his colleagues at the Atlanta CDC, (available at <http://www.cdc.gov/ncidod/eid/vol5no5/meltzer.htm>) using assumptions based on American epidemiological data on various health outcomes in the population for severe type A influenza epidemics and on data relating to prior pandemics. The model does not include the potential impact of antiviral drugs or an effective vaccine. As the plan states, these estimates may overestimate or underestimate the potential impact in Canada; they are only provided for planning purposes and to raise awareness of a very real possibility.

gradual and does not represent a daily absence rate. An example is the case of personnel shortages anticipated in the health network by the Québec Department of Health. Assuming a 35% absence rate, 81,000 people would be unavailable during the first wave, which could last 14 weeks. The peak would be reached during week 6, as illustrated in Figure 1.

**FIGURE 1** Anticipated personnel shortages in Québec health network<sup>10</sup>



Source: Ministère de la Santé du Québec, *Québec Pandemic Influenza Plan*

In addition to the rate of absences due to illness, another absence rate must also be taken into consideration, i.e. persons absent in order to look after those who are ill and school-age children if schools are closed or simply out of fear of contracting the illness. The Pandemic Preparedness Plan for all Canadian Businesses published by Canadian Manufacturers and Exporters (CME) suggests that for every person absent due to illness, another person would be absent for these other reasons.<sup>11</sup>

10. For further details, see page 106 of the *Québec Pandemic Influenza Plan* developed by the Québec Department of Health.

11. For further details, see Appendix 3, page 76 of *Influenza Pandemic: Continuity Planning for Canadian Business* published by Canadian Manufacturers and Exporters (CME) in March 2006.

## 2 ECONOMIC AND FINANCIAL IMPACTS

As mentioned in the section of this document dealing with the risk of an influenza pandemic, the estimate of the economic and financial impacts of a possible influenza pandemic involves many uncertainties surrounding this risk. In both the long-term and short-term scenarios discussed, whether realistic or worst-case, the World Economic Forum believes there would be a significant economic impact. The IMF also expects a major economic impact. However, according to its projections, the IMF believes that the impact would only last for a short time, allowing the economy to recover quickly.

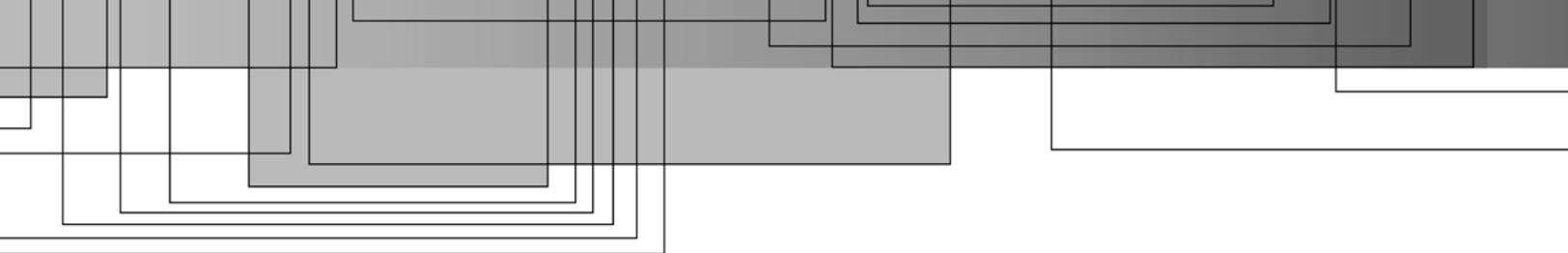
In terms of the impact on the growth rate of the gross domestic product (world GDP), the World Economic Forum forecasts a decline of over 1.5% in all the scenarios under consideration. The World Bank has published similar estimates, setting the decline in GDP at 0.7% in the best-case scenario, 2% in the realistic scenario and 4.8% in the worst-case scenario. The World Bank has also proposed a scenario that breaks down the economic impacts of an influenza pandemic by factor (see Table 6). This scenario considers the effects of mortality and absenteeism by assuming a pandemic similar to the 1958 Asian flu. The scenario also examines the impact of efforts to avoid further spreading of the pandemic, such as reduced travel (both local and abroad) and the closing of buildings with large concentrations of people, and their negative impact on demand.

**TABLE 6** Breakdown of economic impacts of a possible influenza pandemic<sup>12</sup>

% OF GDP GROWTH	MORTALITY	IMPACT OF ILLNESS AND ABSENTEEISM	IMPACT OF EFFORTS TO AVOID INFECTION	TOTAL	TOTAL (IN BILLIONS OF US\$)
<b>World</b>	0.4	0.9	1.9	3.1	965.4
<b>High-income countries</b>	0.3	0.9	1.8	3.0	744.9
<b>Low- and middle-income countries</b>	0.6	0.9	2.1	3.6	220.4

Regarding demand, economists expect that an influenza pandemic could adversely affect consumer confidence and change consumption habits by drastically reducing the activities that cause them to attend large gathering places. Investor confidence would be similarly affected, leading to major

12. For further details about the assumptions underlying the scenario, see pages 37 and 38 of the report entitled *Global Development Finance 2006*, published by the World Bank.



consequences for the financial markets. Growing risk aversion would generate a strong demand for liquidity, and this would lead to a temporary depreciation in asset values. Although these impacts are expected to be temporary, the depreciation in asset values could have a significant impact on the balance sheets of financial institutions.

In terms of supply, productivity could fall as a result of the high rate of worker absenteeism. Lower productivity would also apply to financial institutions for the same reasons. For banks, lower productivity would be accompanied by a drop in the demand for services involving physical contact and an increase in demand for on-line banking services. On the other hand, for insurance companies, lower productivity would be accompanied by an increased demand for services due to higher rates of morbidity and mortality. As well, this drop in productivity would lead to considerable operational risks for financial institutions as it would also affect their business partners, suppliers and subcontractors.

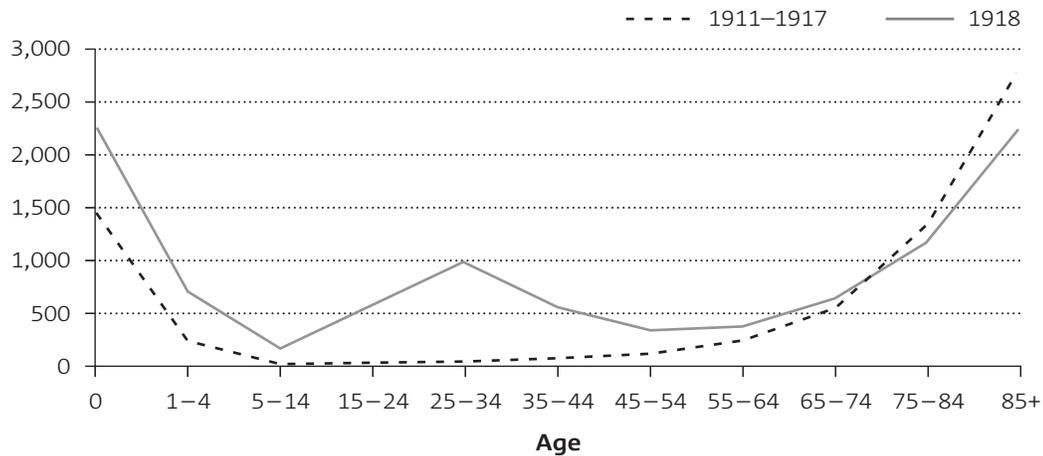
### 3 IMPACTS SPECIFIC TO THE LIFE INSURANCE INDUSTRY

Despite the general increase in benefits that would be paid in the case of a pandemic, either through life insurance death benefits, disability benefits or health care claims, the scope of this increase is speculative. The rates of infection, morbidity and mortality, as well as their distribution by age group, would no doubt have an effect on the amount of claims and benefits to be paid.

For example, with respect to life insurance (see Figure 2):

- In the typical case where excess mortality by age group would take the form of a “U” (dashed line in Figure 2), the impact would undoubtedly be very moderate as the age brackets affected are generally not major consumers of life insurance products. This type of excess mortality is typical of the mortality caused by the common flu that affects us annually.
- Excess mortality in the form of a “W”, where intermediate age groups are much more affected, could represent quite a different challenge, depending on the overall mortality rate experienced. The affected age groups would include in this case a high number of consumers of life insurance products. This was the case for the Spanish flu in 1918, illustrated by the solid line.

**FIGURE 2** Excess mortality per 100,000 people caused by the flu or secondary infections<sup>13</sup>

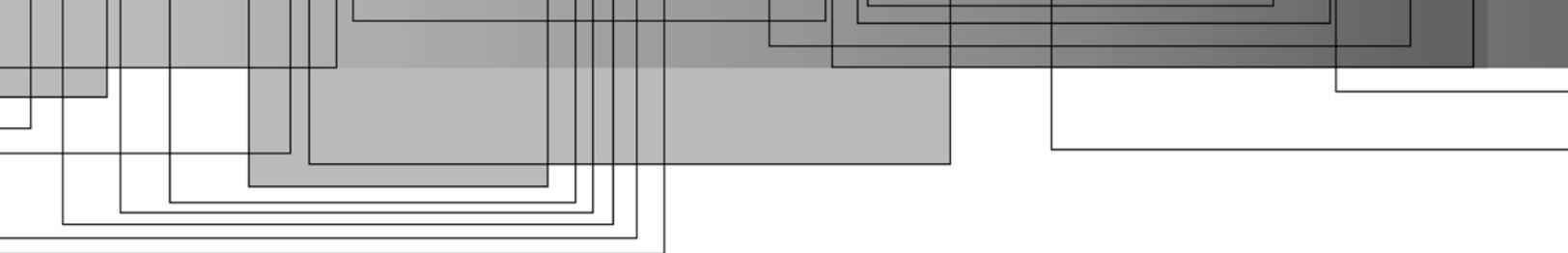


Based on the 1918 experience, Standard & Poor's<sup>14</sup> expects a 50% overall increase in life insurance claims, and it notes that most insurers would sustain such an increase without requiring additional capital. However, it is believed that some of the largest U.S. players might not be able to withstand a 150% jump in claims. These estimates do not account for any other impact that such a number of deaths would generate.

The information available about the impact of a pandemic on disability and health care insurance products is very sparse. However, certain studies anticipate very moderate increases in claims for these products. It is felt that the presence of waiting periods would have a significant mitigating effect on the amount of claims, as the recovery period for the flu is around ten days. For health care insurance products, it is assumed that the increase in benefits directly related to a pandemic could be significantly compensated by the hefty decreases that would result from the cancellation or postponement of any other treatment considered to be "less essential". This phenomenon was noted after Hurricane Katrina struck New Orleans, when a significant overall drop in health insurance benefits was reported.

13. Source: Centers for Disease Control and Prevention – Department of Health and Human Services <http://www.cdc.gov/ncidod/EID/vol12no01/05-0979-G2.htm>

14. Standard & Poor's (S&P) is a subsidiary of McGraw-Hill that publishes financial analyses. It is one of the three main financial rating companies, along with its competitors Moody's and Fitch Ratings. It has published documents concerning the risk of an influenza pandemic dealing with the impacts on the insurance industry that are given as reference in this document.



The transfer of a significant portion of insurance risks to the reinsurance market suggests a significant impact for the latter, especially with respect to the mortality risk. In a recent document, Standard & Poor's estimates that a severe pandemic could have serious consequences for this industry.

It should also be noted that these claims, which would undoubtedly be filed over a short period of time, could lead to substantial liquidity needs that would certainly be amplified by the presence of products with an investment component (universal life insurance, variable annuity, segregated funds, etc.). The potential for large withdrawals, mass transfers to less risky funds, and portfolios rendered illiquid because of low demand could also have serious consequences in terms of liquidity and asset-liability management measures (matching).

With respect to the impact on the quality of credit, Standard & Poor's suggests that the demand for air transportation, hotel services, recreation and food services and, clearly, poultry production would fall sharply following the emergence of a pandemic. There is therefore every reason to believe that an insurer's investments in these areas of activity could markedly suffer the effects of a pandemic. The scope of the possible losses remains speculative, and many believe that they would only be temporary and that matters could return to normal during the same year in which a pandemic occurs.

The need for financial security would certainly be amplified by the occurrence of a pandemic and should be sufficient to sustain demand for life insurance, disability insurance and health care insurance products. This demand could, however, be significantly diminished by a reticence on the part of insurers to issue new policies in a pandemic situation. We could therefore expect either a temporary rise in premium rates, which would allow the additional risk to be integrated, or simply an exclusion of risk for certain products. Sales surged in 1919 after the Spanish flu episode, and Standard & Poor's believes that the impact of a pandemic could be similar today.

In terms of annuities, the potential for high mortality, volatility and economic uncertainty would no doubt induce consumers to delay plans to purchase annuities or investments.

The impact of a pandemic on experience development, the creation of assumptions and the calculation of actuarial liabilities is not clear for the moment. For example, the method for determining mortality assumptions in a pandemic, including the possibility of excluding excess deaths, would have to be defined.

#### **4 IMPACTS SPECIFIC TO THE PROPERTY AND CASUALTY INSURANCE INDUSTRY**

Québec's damage insurance industry should not suffer significant losses as a result of an influenza pandemic.

The main protection offered by these insurers, namely property and automobile insurance, aviation and maritime insurance as well as other insurance covering property, which represent the vast majority (around 85% according to 2005 data) of their sales, provides coverage that would not be affected by an influenza pandemic.

Furthermore, liability insurance, representing 13% of sales of damage insurers in Québec, generally covers risks that are not related to a possible pandemic. The few specialized categories of insurance that could be affected by the occurrence of a pandemic, and in particular "business interruption" insurance, generally contain clauses limiting protection in respect of infectious diseases.

Accident and health insurance is the main category of damage insurance that could be affected by the occurrence of an influenza pandemic. In Québec, this category of insurance is generally offered by life and health insurers rather than damage insurers. This category of insurance represents less than 1% of sales of damage insurers in Québec.

The risk related to investments as discussed in the section on the life insurance sector would also be shared, but to a lesser extent.

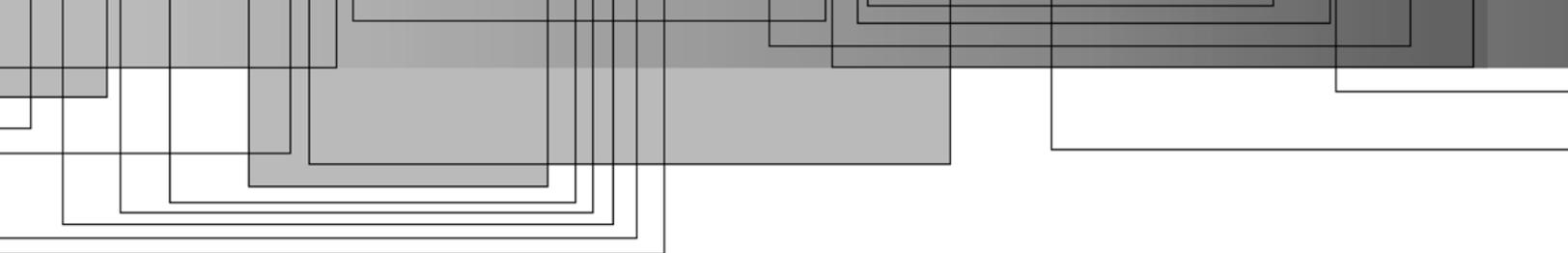
The impact of an influenza pandemic on them should therefore be limited.

#### **5 IMPACTS SPECIFIC TO DEPOSIT INSTITUTIONS**

According to the IMF, in the case of an influenza pandemic, deposit institutions could face increased demand for cash, short-term credit, Internet banking services and electronic payment of retail purchases.<sup>15</sup> They could also suffer negative repercussions from late repayments and the deterioration of the quality of credit. These effects could amplify the liquidity, credit and operational risks of deposit institutions. The Basel Accord, applicable to the banking sector, defines the methods of calculating the capital required for each such risk. However, in the case of an influenza pandemic, no reliable historical data are

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15. For further details, see the IMF report *The Global Economic and Financial Impact of an Avian Flu Pandemic and The Role of The IMF*, published in February 2006.



available on the losses associated with such an event that would allow us to perform these calculations. Banks should therefore conduct a scenario-based analysis to obtain estimates.

Additionally, the Basel Committee recommends that banks adopt sound operational risk management practices<sup>16</sup> and strongly encourages financial institutions to develop and implement a business continuity plan adapted to their risk profile, size and area of business.

In Québec, the deposit institution sector mainly includes trust companies and the Desjardins Group, which covers financial services cooperatives. They are currently implementing the Basel Accord II, taking into account operational risk. With respect to trusts, a growing demand for withdrawals could be expected if the number of deaths due to an influenza pandemic were high. However, this effect could be minimized by the fact that withdrawal terms are determined in advance. In short, Québec deposit institutions are likely to face the same issues as those anticipated by the IMF.

It goes without saying that all business continuity plans drawn up by these institutions should take into account factors that are specific to the preparation of a continuity plan intended to cope with a possible influenza pandemic as recommended in the last part of this document.

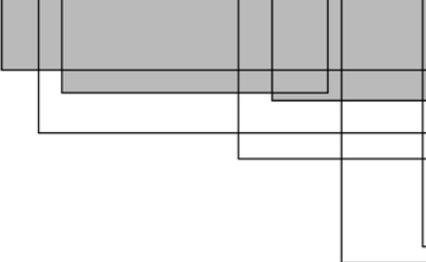
## **6** INDIRECT IMPACTS TO BE TAKEN INTO CONSIDERATION IN PLANNING

Certain measures taken by governments to contain the spread of the influenza pandemic, the level of preparedness of companies and the nature of the reaction of people present difficulties for business continuity planning. When preparing for a possible influenza pandemic, financial institutions should take the following constraints into consideration:

- ❑ Essential services such as transportation, telecommunications and the supply of energy may be disrupted;
- ❑ Subcontractors or suppliers of services might be unable to fulfill their commitments in the case of a pandemic (this merits a great deal of attention in developing a business continuity plan for institutions that draw on outsourcing);

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16. In February 2003, the Basel Committee on Banking Supervision (BCBS) published a document entitled *Sound Practices for the Management and Supervision of Operational Risk*. Principle 7 of that document urges financial institutions to adopt a business continuity plan.

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- ❑ Buildings with a high concentration of people would probably be closed by public authorities to reduce the risk of transmission;
  - ❑ Schools could be closed;
  - ❑ The Internet could be saturated, as this communications channel would be widely used in order to reduce human contact;
  - ❑ People's movements could be limited.

# PREPARING

## a Business Continuity Plan

Many financial institutions have business continuity plans (BCP) covering the operational risks to which they are exposed, such as natural catastrophes, accidents, terrorist attacks, computer breakdowns, etc. Generally, these BCPs ensure business continuity in the case of a deterioration or malfunction in material resources and infrastructures, whereas an influenza pandemic has direct repercussions on human resources.

The direct repercussions of an influenza pandemic are human in nature: a considerable number of illnesses and deaths affecting distributors, clients or claimants in the case of financial institutions. It could spread quickly but, unlike isolated events such as natural disasters, computer breakdowns or terrorist attacks, a pandemic could last a long time (three to four months per wave for a total of 12 to 36 months). In addition, the geographic scope of the event would be international. Therefore, BCPs designed to operate from a location in another geographic area might not be effective.

It is therefore essential to adapt BCPs taking into account the following:

- ❑ BCPs should be developed in several stages, reflecting the evolution of a pandemic according to factors such as the mutation of the virus and a pandemic's spread level, as proposed by the WHO.<sup>17</sup>
- ❑ The fact that pandemics are triggered progressively gives organizations time to adapt BCPs, test them, inform and train employees and contact third parties. However, as the extent, duration and occurrence of a pandemic are unknown, BCPs should be based on assumptions and provide for several scenarios.
- ❑ BCPs should place particular importance on back-up plans for decision-making.
- ❑ BCPs should ensure that critical operations are maintained for a long period of time (the duration of the pandemic), taking into account that several waves of varying intensity could occur.
- ❑ BCPs should designate replacement staff for critical operations (and provide necessary training). They should also anticipate additional sites so that teams can be separated in order to reduce the risk that an entire team assigned to critical operations could become ill or be quarantined at the same time.

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17. The WHO recommends that companies adopt continuity plans in stages based on developments in the pandemic. For further details, see page 7 of the WHO world plan on preparing for an influenza pandemic, published by the WHO in 2005.

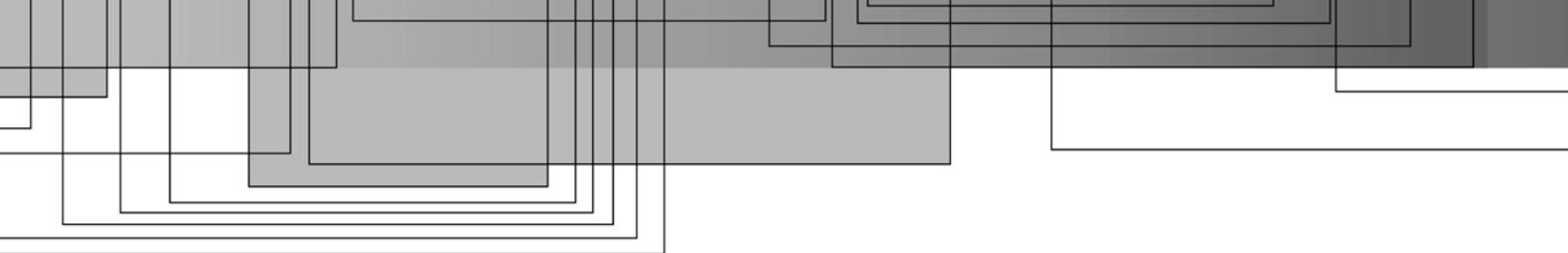
BCPs should develop technological procedures that encourage work at home and distance relationships with clients (Internet, telephone, paperless transactions, electronic signatures, etc.). These procedures must be operational for long periods of time, while anticipating the risks caused by this type of solution (for example, loss of confidential information).

Taking these factors into consideration, we propose, as an example, the broad stages that financial institutions could follow when preparing for a possible influenza pandemic based on phases in the evolution of a pandemic (see Table 7). Note that the first two stages — planning and the development of a business continuity plan — correspond to the current state of the evolution of an influenza pandemic. Accordingly, the AMF recommends that financial institutions pursue their preparations to meet the objectives of these two stages as soon as possible.

## PLANNING

The first stage urges financial institutions to designate a team in charge of preparing for an influenza pandemic, if they have not already done so. The role of the team would be to carry out a preliminary study. To reach this goal, the team should, among other things:

1. Determine whether existing business continuity plans are applicable in the case of a pandemic;
2. Identify which activities are vital to the institution, the corresponding skill sets and the minimum resources necessary for these activities to function;
3. Review the location of various offices and service outlets of the institution based on the vital activities identified and the level of staff exposure in order to determine which offices and service outlets could be closed;
4. Contact business partners, suppliers of services and subcontractors to assess their state of readiness and provide alternative solutions in the event they are unable to carry on their activities;
5. Draw up an action plan that assigns the responsibilities of each of the entities of the institution in preparing for an influenza pandemic;
6. Submit an initial report to senior management that documents the results of the above measures.



The preliminary study should give rise to a reliable action plan that the institution could carry out within a reasonable time frame. An action plan necessarily involves the departments that perform vital functions and prompts them to consider new ways of operating that minimize human contact, as presented in Table 8 as an example.

Once the team in charge of planning has submitted its preliminary study and its action plan, senior management should ensure the action plan complies with the strategic orientations of the institution. It should then forward the plan to the entities that will be involved in carrying it out and raise awareness among the various participants of the importance of preparing for a possible influenza pandemic.

#### DEVELOPMENT

When the action plan is being carried out by the various entities involved, the team in charge of preparation will be responsible for:

1. Co-ordinating the various actions of the entities solicited in connection with the action plan;
2. Drawing up a coherent, practical and effective BCP for the institution;
3. Documenting the action plan in writing;
4. Testing the business continuity plan and correcting any shortcomings and weaknesses;
5. Continually monitoring developments relating to the influenza, recommending new actions accordingly and updating the BCP;
6. Determining the elements that will trigger implementation of the BCP;
7. Designating a contact person with whom other entities of the institution, the regulatory authorities, business partners and clients can communicate regarding the influenza.

Once the BCP is prepared, management should organize an internal information session for staff on the possibility of a pandemic. It should also provide for a presentation of the plan and a Q&A session with staff. Senior management may also decide to notify its various business partners of the institution's level of preparedness.

## PREPARATION

The logical next stage is preparation for implementing the BCP. This stage takes place after appropriate authorities have declared that transmissions among small numbers of persons have been identified. Based on the planning assumptions of the Québec Department of Health, after the emergence of a new strain of the flu virus transmissible between humans, a first wave would be expected in Canada after three months. A similar period can be assumed for this stage.

Preparing for implementation of the BCP involves training sessions for employees that encourage communication and discussion. These training sessions should also be used to highlight the responsibilities of each person, both from the point of view of the employer and the employee.

At this stage, certain measures outlined in the BCP may already be set up, such as reduced travel.

## INTERVENTION

If an influenza pandemic is declared, the next stage would be intervention, the duration of which would depend on the nature of the virus, but the estimates vary from 12 to 36 months.

Activation of the BCP should be accompanied by an ongoing review of the adequacy of the measures based on events. Also, following-up on absent employees should not be neglected.

## RECOVERY

It would then be important to provide for procedures intended to resume activities and effectively return to normal operations.

**TABLE 7** **Influenza pandemic risk management plan in five stages**

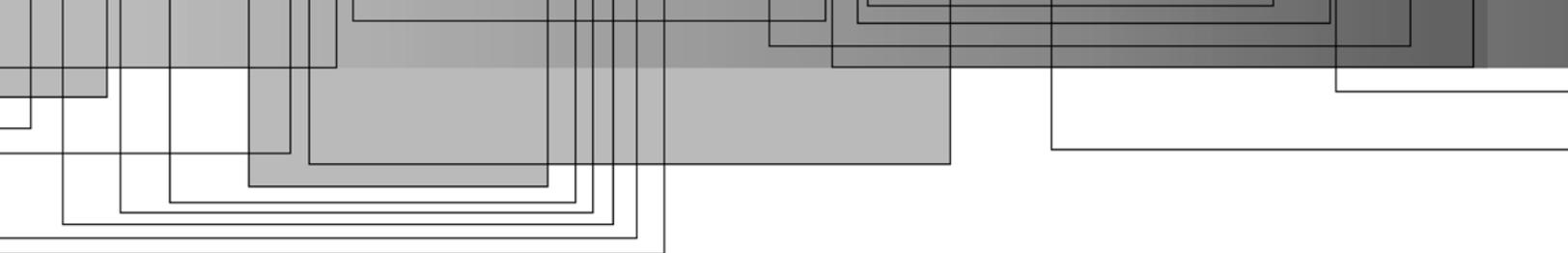
STAGES	ACTIONS	PHASES OF THE PANDEMIC*	ESTIMATED DURATION**
<b>Planning</b>	<ol style="list-style-type: none"> <li>1. Designate a team in charge of planning and co-ordination;</li> <li>2. The team in charge should conduct a preliminary study and draw up an action plan;</li> <li>3. Senior management should communicate the action plan to the entities involved.</li> </ol>	Human infections with a new subtype, but no transmission among humans or, in very rare cases, transmission by close contact (current state)	No estimate available
<b>Development</b>	<ol style="list-style-type: none"> <li>4. Each entity involved in the action plan should carry out its assigned duties within the specified time and report to the team in charge of planning and co-ordination;</li> <li>5. The team in charge should co-ordinate the various actions taken by the other entities of the institution in order to set up a business continuity plan. It should also ensure that it is updated based on changing data regarding the pandemic;</li> <li>6. Senior management should inform internal and external entities that the institution has adopted a business continuity plan in preparation for a possible influenza pandemic.</li> </ol>		
<b>Preparation</b>	<ol style="list-style-type: none"> <li>7. Train employees on the implementation of the business continuity plan.</li> <li>8. Purchase protective and cleaning equipment, and other material according to the needs determined under the business continuity plan.</li> <li>9. Reduce travel by employees in infected regions.</li> </ol>	Limited transmission among humans and disease is highly localized (possible risk of pandemic)	Roughly three months
<b>Intervention</b>	<ol style="list-style-type: none"> <li>10. Activate the measures set out in the business continuity plan.</li> <li>11. Monitor absent employees (reasons for absence, state of health, return date, etc.).</li> <li>12. Encourage employees who are no longer ill to return to work.</li> </ol>	Increased and sustained transmission in the general population	12 to 36 months
<b>Recovery</b>	<ol style="list-style-type: none"> <li>13. Manage the return to normal operations.</li> </ol>	End of the pandemic	—

\* According to statements by the WHO.

\*\* The estimated duration of the phases of a possible influenza pandemic apply to Québec based on estimates of the Québec Department of Health.

**TABLE 8**      **Action plan for preparing a BCP**

IN CHARGE	ACTION
<b>Departments that perform vital functions</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Develop for each vital activity the appropriate organization method to continue its operations in the event of a high level of absenteeism, encouraging telecommuting and limiting transmission of the virus (for example, designate two teams for the same duties with different work schedules; if one of the teams is quarantined, the other could still operate).</li> <li><input type="checkbox"/> Draw up a list of key staff, the persons who could replace them in case of absence and the training to be given to these persons.</li> </ul>
<b>Computer department</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Identify the various possibilities of telecommuting to avoid face-to-face meetings as much as possible.</li> <li><input type="checkbox"/> Ensure that the communication and telecommuting systems ensure the confidentiality of information.</li> <li><input type="checkbox"/> Determine the alternatives for each system in the case of a breakdown.</li> <li><input type="checkbox"/> Provide staff information sessions about telecommuting.</li> </ul>
<b>Human resources department</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Update policies on sick leave and leave for family and medical reasons relating to cases of the flu.</li> <li><input type="checkbox"/> Check what the institution's responsibilities are as an employer and the responsibilities of employees regarding occupational health and safety in the case of an influenza pandemic under the Québec Labour Code.</li> <li><input type="checkbox"/> Define the symptoms that would prevent an employee from reporting to work and the quarantine strategies to be adopted for persons who came into contact with the employee (provide closed spaces for persons placed in quarantine).</li> <li><input type="checkbox"/> Set up a strategy for communicating with persons who are telecommuting for updates on their state of health.</li> <li><input type="checkbox"/> Ensure that the strategies proposed under the business continuity plan concerning human resources comply with the Québec Labour Code.</li> </ul>
<b>Administrative services</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Evaluate the level of exposure of employees to a pandemic and the transmission risks (geographic location of the offices and service outlets, population concentrations in these areas, risks associated with air conditioning, etc.).</li> <li><input type="checkbox"/> Determine strategies to protect employees who come to the offices (hygiene rules, medical equipment, cleaning products and accessories, masks, etc., with a list of vendors of such items).</li> </ul>
<b>Finance department</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Determine the costs of implementing telecommuting.</li> <li><input type="checkbox"/> Assess the costs of hygiene products and protective equipment.</li> </ul>
<b>Department involved (e.g. actuarial department and client services)</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Determine the possible effects of a pandemic on the financial health of the institution (sales, reserves to be held, level of capital required by law).</li> <li><input type="checkbox"/> Anticipate the effects of a pandemic on the number of claims, requests for information and the sales force in order to maintain client services.</li> </ul>



## CONCLUSION

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If an influenza pandemic occurs, its severity would depend on the preventive measures set up by governments and the level of preparedness of businesses. It would also depend on scientific progress in terms of vaccine development and production capacity. The psychological impact that a pandemic would have on society must not be underestimated. This last factor would define the level of absenteeism to a great extent.

As a result, the financial sector should be prepared for such an eventuality. Preparation includes the development of a reliable business continuity plan adapted to an influenza pandemic. It should also cover the estimate of the impacts of such a risk on the institution.

Mindful of the challenges that the management of this risk presents, the AMF is asking the financial institutions under its supervision to draw on this document to develop their own approaches. The main goal is to make effective preparations for all possibilities, regardless of the level of severity of the influenza pandemic.



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