

EXPLAINING

# PANDEMIC INFLUENZA

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A GUIDE FROM THE MEDICAL OFFICER OF HEALTH



calgary health region

December 2005

## **“Most experts believe that it is not a question of whether there will be another severe influenza pandemic but when.”**

**Getting ahead of the curve – a strategy for combating infectious diseases**

*A report by the Chief Medical Officer, National Health Service, January 2002*

*(An Infectious Disease Strategy for the United Kingdom.)*

### Reader Information

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Explaining Pandemic Influenza: A Guide from the Medical Officer of Health

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**Explaining Pandemic Influenza:** A Guide from the Medical Officer of Health provides health professionals and members of the public with a better understanding of pandemic influenza, its likely impact on Canada and the *Calgary Health Region's* plan to respond.

This document has been adapted from “Explaining Pandemic Flu: A Guide from the Chief Medical Officer,” National Health Service, United Kingdom (2005). With permission.

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## PANDEMIC INFLUENZA IN THE NEWS

### **“Nightmare Scenario Frightens Health Experts”**

The Edmonton Journal, March 9, 2005

### **“New Cases Have No Symptoms”**

The Edmonton Journal, March 10, 2005

### **“Disaster Officials Prepare For Flu”**

The Calgary Sun, March 29, 2005

### **“At The Crossroads Of Animal And Human Health”**

The Calgary Herald, April 13, 2005

### **“Flu Could Kill 1,600 Here”**

The Calgary Sun, November 30, 2005

Headlines like these can be frightening. While they bring attention to a very real threat, they also leave many questions unanswered:

**What is pandemic influenza? • Why are we at risk now? • What is the difference between pandemic influenza and “ordinary” influenza? • How can avian influenza (bird flu) lead to pandemic influenza? • How likely is an influenza pandemic? • What treatments are available • How would it affect Canada? How would it affect me? • And, most important, how do we control it?**

Understanding the nature of pandemic influenza is an important part of being prepared. This handout will answer these, any many other questions you may have.

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## FOREWORD FROM THE MEDICAL OFFICER OF HEALTH

The World Health Organization (WHO) and the Public Health Agency of Canada have recently warned that an influenza (flu) pandemic is both “inevitable” and “imminent.” Such warnings have been fuelled largely by the persistence of a highly infectious strain of avian influenza (bird flu) in Asia that experts fear could trigger another influenza pandemic. While these warnings aim to ensure countries are prepared for such an event, they have also caused public concern over the nature of the threat and our ability to respond to it. The consequences of an influenza pandemic would be serious with the numbers of people falling ill and dying being far higher than with “ordinary” winter influenza outbreaks.

There is a great deal of effort under way, at a global, national, provincial and regional level to anticipate and respond effectively to an influenza pandemic. Protecting the public from infectious diseases, including pandemic influenza, is part of the ongoing work of Calgary Health Region and is an integral part of our mandate. This guide aims to provide a proper understanding of the nature of the threat, its likely impact on Calgary, and to reassure people that the Calgary Health Region is ready to respond.

Influenza pandemics are not new. Three influenza pandemics caused public health emergencies during the last century and experts are predicting that another is due. The current epidemic of highly pathogenic avian influenza (A/H5N1), now widespread among poultry in Asia, is generally believed to have increased the likelihood of such an event occurring in the near future.

The Calgary Health Region has been working with Alberta Health and Wellness and local municipalities since 2000 to develop contingency plans to reduce the impact of an influenza pandemic. Being prepared is not only prudent but necessary in today’s global environment. The global expansion in tourism and the vast increase in air travel may accelerate the spread of infectious diseases, allowing little time to prepare. The rapid international spread of Severe Acute Respiratory Syndrome (SARS) in 2003, provided some valuable lessons in emergency public health protection. The SARS outbreak in Toronto highlighted the need for health regions to develop or improve existing contingency plans.

In cooperation with *Alberta Health and Wellness*, the Calgary Health Region’s 2002 Influenza Contingency Plan is being updated, and a more detailed and flexible contingency plan is being developed so that the health region is able to respond to an influenza pandemic. The Calgary Health Region’s plan will incorporate both international and national expertise and recommendations, and is scheduled to be launched in December 2005 ([www.calgaryhealthregion.ca/pandemic](http://www.calgaryhealthregion.ca/pandemic).) The plan is a technical document aimed at health-care workers and emergency planners who will be involved in responding to an influenza pandemic.

It is hoped that this explanatory guide will provide a useful reference document for members of the public and health professionals wishing to better understand the threat, its likely impact on Canada and how they will be asked to respond.

Dr. Brent Friesen,  
Medical Officer of Health  
Calgary Health Region

# I. PANDEMIC INFLUENZA: KEY QUESTIONS

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## **What is pandemic influenza?**

- Pandemic influenza is a type of influenza that occurs every few decades and spreads quickly, affecting most countries and regions around the world.
- Unlike the “ordinary” influenza that usually occurs every winter in Canada, pandemic influenza can occur at any time of year.
- Influenza pandemics have occurred for centuries – three times in the last one hundred years – resulting in many thousands of deaths. (See Table 3).
- Experts predict another pandemic, but cannot say exactly when it will happen. When it does, it may come in two or more “waves,” several months apart. Each wave may last two to three months.
- Pandemic influenza is much more serious than the “ordinary” influenza. At least a quarter of the population may be affected.
- Pandemic influenza is likely to cause the same symptoms as the “ordinary” influenza. However, the symptoms may be more severe because nobody will have any immunity or protection against that particular virus.
- A serious pandemic is also likely to cause many deaths, disrupt the daily life of many people and cause intense pressure on healthcare and other services.
- Every pandemic is different, and until the virus starts circulating, it is impossible to predict its full effects.

## **What causes a pandemic influenza?**

Pandemics of influenza happen when a new influenza virus, which is very different from the commonly circulating strains, appears. Because it is a new virus few – if any – people have any immunity. This allows the new virus to spread widely, easily and to cause more serious illness.

## **Who is at risk?**

Once a pandemic influenza starts, everybody will be at risk of getting pandemic influenza. Certain groups may be at greater risk than others. Until the virus starts circulating, we will not know for sure who they will be.

- Experts predict anywhere between 2 million and 50 million deaths around the world. *The Canadian Pandemic Influenza Plan* assumes that around a quarter of the population will be affected, with an estimated 11,000 to 58,000 deaths.
- In Alberta, it is projected that up to 2.5 million Albertans could be infected, with up to 1.3 million becoming ill. Because we don't know exactly how a pandemic will affect Canada, or any other country, preparing for a pandemic is a huge challenge. The Calgary Health Region's plan is flexible and will be continually updated as more information emerges.

## **Is there a vaccine to protect against pandemic influenza?**

- There is no vaccine ready to protect against pandemic influenza. The virus that causes pandemic influenza will be new and a vaccine to protect against it cannot be made until the virus has been identified. Before a pandemic starts it is difficult, if not impossible, to predict what strain will cause it and even then, the predictions may be wrong, or the predicted virus may have changed enough for a pre-prepared vaccine to be ineffective. Vaccines used for “ordinary” influenza will not give any protection. Even if you have had an influenza vaccine before, you will not be protected from the new virus.

- Medicines called antivirals can be used to treat pandemic influenza. However, until the pandemic virus is circulating, we won't know how well the antivirals will work.

### What are governments doing to prepare for an influenza pandemic?

- The federal and provincial governments have developed a *Canadian Pandemic Influenza Plan* that will be put into action in the event of a pandemic. The plan includes actions to improve our preparedness, before another pandemic occurs.
- The Calgary Health Region is developing a local contingency plan in support of the federal and provincial plans.
- Calgary Health Region staff will be trained in how to manage a pandemic and cope with the demands that are likely to be placed on them.
- The federal and provincial governments are taking steps to be in the best possible position for a vaccine to be manufactured as quickly as possible when a pandemic influenza virus is identified. It will take several months to manufacture the vaccine so it is unlikely that it will be ready when the pandemic starts.
- The federal and provincial governments are building up their stocks of antiviral drugs. They will be used in the most effective way to minimize the impact of pandemic influenza based on how the disease develops.
- If pandemic influenza reaches Canada, there will be announcements in newspapers, on radio and on television. Advice will be given on the best course of action to take. Simple hygiene measures, such as hand washing and reducing social contact, could help to slow the spread and give us some time until a vaccine is ready.

### What can I do?

- You can reduce, but not eliminate, the risk of getting or spreading influenza during a pandemic by:
  - maintaining good basic hygiene (for example, washing your hands to prevent spreading the virus from your hands to your face)
  - covering your nose and mouth when coughing or sneezing
  - avoiding crowds whenever possible
- If you do catch influenza:
  - stay at home and rest
  - follow the advice in the influenza self-care booklet "It's in your hands" available at [www.health.gov.ab.ca/influenza/self\\_care.html](http://www.health.gov.ab.ca/influenza/self_care.html) or by contacting Calgary Health Link at 943-LINK (5465) or 1-866-408-LINK (5465) toll-free.
  - take medicines to relieve the symptoms (following the instructions on the package)
  - drink plenty of fluids

This is both for your own health and to avoid spreading the illness to others.

"It's in your hands" will tell you how you can protect yourself and your family and what to do if you think you are infected. Some people will be recommended for treatment – more information will be given at the time where to seek treatment.

### For more information on pandemic influenza preparedness visit:

Canadian Public Health Agency

[www.phac-aspc.gc.ca/influenza](http://www.phac-aspc.gc.ca/influenza)

Alberta Health and Wellness

[www.health.gov.ab.ca/public/pandemic/pandemicplan.html](http://www.health.gov.ab.ca/public/pandemic/pandemicplan.html)

Calgary Health Region:

[www.calgaryhealthregion.ca](http://www.calgaryhealthregion.ca)

World Health Organization:

[www.who.int](http://www.who.int)

### You can also call Calgary Health Link at

(403) 943-LINK (5465) or  
1-866-408-LINK (5465)  
toll-free.

## 2. UNDERSTANDING INFLUENZA

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### **What is influenza or the “flu?”**

Influenza is an illness resulting from infection by an influenza virus. It is highly infectious and can spread easily from person to person. Because the influenza virus constantly changes, there are many different strains of influenza. Some are more infectious and cause more severe illness than others.

### **What are the symptoms of influenza?**

People are affected differently by influenza. Their symptoms can range from minor to pneumonia and death. Symptoms generally appear suddenly and can include:

- headache
- severe weakness and tiredness
- fever
- cough
- aching muscles and joints
- sore throat
- runny nose

The symptoms of pandemic influenza are similar to the “ordinary” seasonal influenza we see every winter. However, in the case of pandemic influenza, these symptoms are likely to be worse, resulting in more severe illness and possibly death.

### **How does influenza spread?**

Influenza viruses are easily passed from person to person through direct or indirect contact. You can catch influenza through breathing in air containing droplets or aerosols containing the virus produced when an infected person talks, coughs or sneezes. You can also catch it through touching an infected person or surface contaminated with the virus, and then touching your face. Influenza viruses have an incubation period—the time a person is infected with influenza before showing symptoms—of one to three days. People are likely to be infectious from just before symptoms develop until four to five days after the onset of symptoms. Children, however, tend to be infectious for much longer.

### **Are there different types of influenza viruses?**

Influenza viruses are divided into three main groups: influenza A, B and C. Type A viruses are the source of most seasonal flu epidemics and have caused all previous pandemics. Whereas influenza B and C viruses infect humans only, influenza A viruses also infect birds and other animals such as pigs and horses. This ability to jump the species barrier enables influenza A viruses to cause pandemics. (See Table 1).

**Table 1**

INFLUENZA VIRUS TYPES	HOSTS
Type A	Humans, birds, pigs and horses
Type B	Humans only
Type C	Humans only



## Understanding Pandemic Influenza

### **What do we know about pandemic influenza?**

We know that pandemic influenza viruses spread quickly. During the pandemics of 1957 and 1968, the viruses took only three to four months to spread from south-east Asia – where they were first identified – to Europe and North America. The intercontinental spread of Severe Acute Respiratory Syndrome (SARS) in 2003 was even faster. Within four months of the global alert, more than 8,000 people had been affected in 30 countries across six continents, and 900 people had died. In less than two weeks of the alert, SARS cases were being seen in Canadian hospitals. Air travel is likely to make the spread of pandemic influenza just as quick. Once a pandemic influenza strain has been identified as causing illness in one country, it will be too late to begin planning. The exact timing and impact of another influenza pandemic may not be clear; but by preparing for every eventuality now, we stand the best chance of reducing its impact. Even with good planning and preparation, the consequences of pandemic influenza will still be very serious.

### **What are the differences between pandemic influenza and “ordinary” influenza?**

There are important differences between “ordinary” and pandemic influenza (see Table 2). These differences explain why we view pandemic influenza as such a serious threat. Epidemics of “ordinary” influenza occur every year around the world. An epidemic is a widespread outbreak of disease in a single community, population or region. A pandemic, on the other hand, spreads around the world affecting many hundreds of thousands of people across many countries. The word *pandemic* comes from the Greek words *pan*, meaning “all,” and *demos*, meaning “people.” Other diseases of pandemic proportions include HIV/AIDS and tuberculosis.

### **What are the key features of pandemic influenza?**

There are a number of key features that experts look for when deciding whether or not a particular influenza virus could be a pandemic strain. For an influenza virus to be capable of causing a pandemic, it must be able to:

- infect people (not just mammals and birds)
- cause illness in a high number of those infected
- spread easily from person to person
- spread widely because the virus is significantly different from previously circulating strains and most people will have little or no immunity to it

All previous influenza pandemics had these features.

**Table 2: The differences between “ordinary” and pandemic influenza**

ORDINARY INFLUENZA	PANDEMIC INFLUENZA
<p>Ordinary influenza occurs every year during the winter months in Canada.</p>	<p>Pandemic influenza occurs about every thirty years and can take place in any season.</p>
<p>It affects 5-20% of the Canadian population, causing an estimated 4,000-8,000 deaths every year.</p>	<p>It affects many more people than “ordinary” influenza – 25% or more of the population – and is associated with much higher rates of illness and death. The worst influenza pandemic last century was the 1918 Spanish Flu, which caused an estimated 30,000-50,000 deaths in Canada alone and up to 40 million deaths worldwide.</p>
<p>Globally, epidemics of “ordinary” influenza are thought to kill between 500,000 to 1 million people every year.</p>	<p>Pandemic influenza, usually associated with more severe illness, and therefore a higher risk of death, represents a much more serious infection than ordinary influenza.</p>
<p>Most people recover from “ordinary” influenza within one or two weeks without needing medical treatment.</p>	<p>We do not know who will be most affected, how many people will become ill or how many people will die.</p>
<p>Deaths are generally confined to “at risk” groups including:</p> <ul style="list-style-type: none"> <li>• people over 65 years of age</li> <li>• people with existing medical conditions such as lung diseases, diabetes, cancer, kidney or heart problems</li> <li>• people whose immune systems are compromised (due to HIV/AIDS or because they have had a transplant)</li> <li>• infants and young children</li> </ul>	
<p>The vaccine against “ordinary” influenza is effective because the virus strain in circulation each winter can be fairly reliably predicted.</p>	<p>Vaccines may not be available during the early stages of a pandemic.</p>
<p>Annual vaccination, when the correct virus strain is fairly reliably predicted and antiviral drugs are available for those at risk of becoming seriously ill.</p>	<p>Antiviral drugs may be in limited supply and their use will depend on how well they will work. This is information that will only be known once the pandemic is under way.</p>

## Causes of Pandemic Influenza

### How do influenza viruses change?

Influenza viruses have one characteristic that enables them to cause annual epidemics and even pandemics: the ability to change. Type A viruses often change their surface antigens or proteins. These changes can be minor – known as *antigenic drift* – or major – known as *antigenic shift*.

### Antigenic drift: “ordinary” influenza

Antigenic drift occurs constantly among influenza A viruses, which is why we see new strains every year. Some annual influenza epidemics are worse than others. This happens when the new strains are very different from earlier strains. The more a strain differs from previous ones, the less immunity you will have to it.

### Antigenic shift: pandemic influenza

Sometimes, major changes occur in the surface antigens (proteins) of influenza A viruses. These changes are much more important than those related to antigenic drift. Such changes can create a virus that is different from recently circulating strains, leading to a pandemic. The population would have very little or no immunity to it since they will not have been infected with it or vaccinated against it before. This lack of immunity allows the virus to spread more rapidly and more widely than an ordinary influenza virus.

### How does antigenic shift occur?

Antigenic shift usually occurs in two ways: either as a sudden “adaptive” change when a normal virus reproduces, or from an exchange of genes between a human strain of an influenza A virus and an animal strain. This genetic exchange or “re-assortment” produces a new virus capable of causing a pandemic in humans. Genetic exchange occurs when an animal becomes infected with a human and an animal influenza virus at the same time – this is called a “co-infection.” The animal in which this genetic exchange takes place is often described as a “mixing vessel.” The domestic pig is a likely mixing vessel because it is open to both human and avian (bird) influenza. However, more recently experts fear that people may also serve as mixing vessels (see Figure 1).

This possibility that people could act as mixing vessels has caused concern because of the highly pathogenic avian influenza (A/H5N1) currently circulating in Asia and Europe. This strain of avian influenza has shown the ability to infect people. Experts fear that people infected with avian influenza could also become infected with a human influenza strain at the same time, allowing the exchange of genes that could lead to the creation of a pandemic strain. The avian influenza strain could also evolve into a pandemic strain simply by re-adapting to the human body, thereby having the ability to pass easily from person to person.

**“Some of the commonest infections have a particular ability to change, influenza viruses being the chameleons of the microbial world.”**

Getting ahead of the curve – a strategy for combating infectious diseases

*A report by the Chief Medical Officer, National Health Service, January 2002 (An Infectious Disease Strategy for the United Kingdom.)*

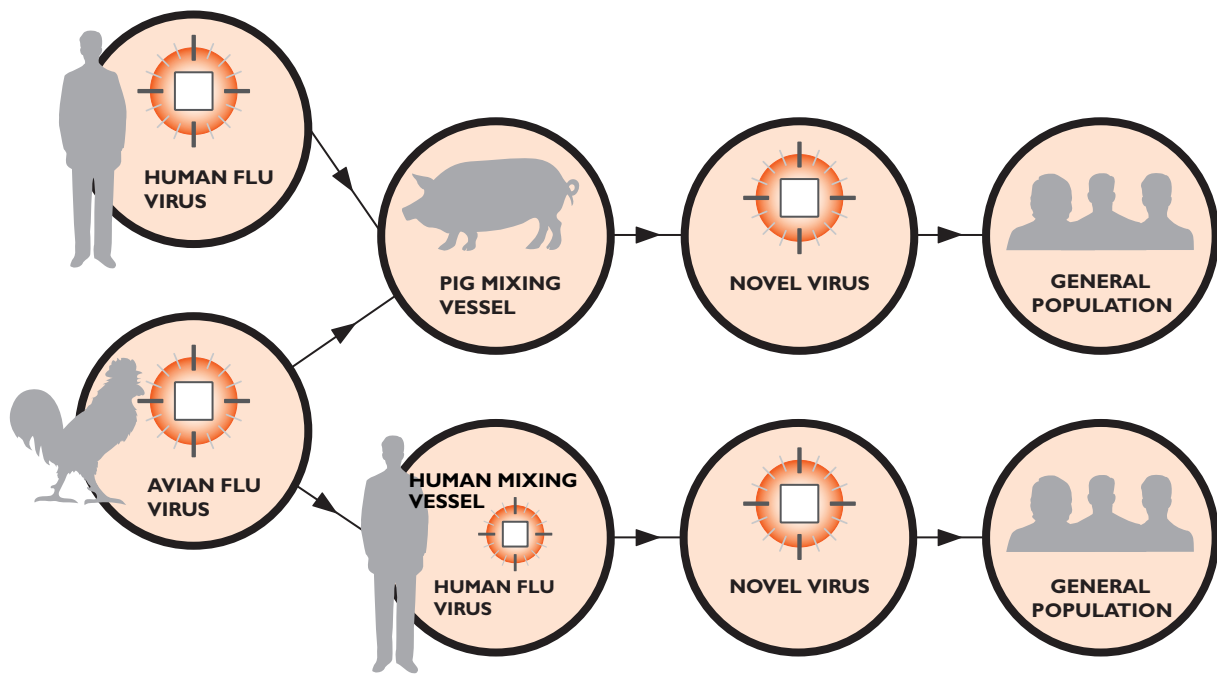


Figure 1: Co-infection with human virus and non-human virus and the birth of a pandemic strain

### Previous influenza pandemics

The influenza A viruses have undergone antigenic shift three times in the last century, resulting in pandemics with large numbers of both disease and death.

Table 3: Pandemics during the last century

PANDEMIC	SPANISH FLU	ASIAN FLU	HONG KONG FLU
STRAIN	A(H1N1)	A(H2N2)	A(H3N2)
YEAR	1918-1919	1957-1958	1968-1969
Likely origin	Not known (first cases identified in Europe and USA)	China	China

Estimated deaths:

Global	20 - 40 million	1 million	1-4 million
Canada	30,000 - 50,000	12,000 or more	12,000 or more
Age group most affected	Healthy young adults (20 - 50 years)	Very young and very old	Very old and those with underlying medical conditions

### Can we use past pandemics to estimate the impact of future pandemics?

Most estimates of the impact of a future pandemic are based on information from previous pandemics. However, it is important to remember that important details of these events are still disputed, especially the true number of deaths. Predictions based on previous pandemics need to take into account that the modern world is very different from 1918 because there have been huge improvements in nutrition, healthcare and opportunities for interventions. Therefore, it is important to understand that all impact predictions are estimates and that the actual impact of the next pandemic may turn out to be very different.

### Where will the next pandemic influenza virus start?

While a new pandemic strain of the influenza virus could first emerge anywhere, including Canada, it is most likely to emerge in China and the Far East, as most previous pandemics appear to have done. In this part of the world, dense human populations, domestic pigs and wild and domestic birds live close together, making it easy for the mingling of human and animal viruses through co infecting, and the resulting genetic exchange that could give rise to a pandemic strain.

### Understanding influenza: summary

- Influenza or “flu” is a highly infectious viral illness, spreading easily from person to person either through droplets in the air or through hand-to-face contact.
- Annual outbreaks of “ordinary” influenza arise as a result of minor genetic changes in the influenza viruses known as antigenic drift, which produce different strains each year.
- The more an influenza strain differs from previously circulating strains, the less immunity a population will have to it.
- “Ordinary” influenza epidemics kill between 500,000 and 1 million people worldwide every year. In Canada, they affect up to 5-20% of the population each year and cause around 4,000-8,000 deaths.
- A pandemic influenza virus is a “novel” (new) virus to which the population has very little or no immunity.
- Pandemic influenza emerges as a result of major genetic changes in the influenza virus known as antigenic shift. This shift occurs about every 30 years.
- Pandemic influenza is generally associated with much higher rates of illness than “ordinary” influenza, affecting a quarter of the population or greater, and causing more deaths.
- The worst influenza pandemic last century killed around 40 million people worldwide and around 50,000 people in Canada alone.

## 3. THE NATURE OF AVIAN INFLUENZA

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### Why should we worry about avian influenza or “bird flu?”

Evidence suggests that recent pandemic influenza viruses originated in birds. Avian influenza or “bird flu” is a contagious disease of birds caused by influenza A viruses. All bird species are thought to be susceptible to infection, but domestic poultry flocks are especially vulnerable. In poultry, these viruses can cause epidemics associated with severe illness and high death rates. There are different types of avian influenza, some of which are more serious than others. The most serious form is very contagious and quickly fatal, with a death rate of close to 100%. Birds may die on the same day that symptoms first appear.

During the last few years, the world has faced several threats with pandemic potential – mostly from outbreaks of avian influenza. Many experts believe that the outbreak of highly pathogenic avian influenza (A/H5N1) in Hong Kong in 1997 in which 18 people were infected, six of whom died, could have led to a pandemic if Hong Kong’s entire poultry population – almost 1.5 million chickens – hadn’t been quickly destroyed. Of the 15 different HA subtypes of influenza A, H5 is the most infectious and poses the greatest threat to humans. The current outbreak of highly pathogenic avian influenza (A/H5N1), which has affected poultry in several countries in Asia and Europe, and has to date infected 132 people, of whom 68 have died, has brought the threat of pandemic influenza close again (November 25, 2005).

### For more information about influenza and pandemic influenza visit:

Canadian Public Health Agency:

[www.phac-aspc.gc.ca/influenza](http://www.phac-aspc.gc.ca/influenza)

Alberta Health and Wellness:

[www.health.gov.ab.ca/public/pandemic/pandemicplan.html](http://www.health.gov.ab.ca/public/pandemic/pandemicplan.html)

Calgary Health Region:

[www.calgaryhealthregion.ca](http://www.calgaryhealthregion.ca)

World Health Organization:

[www.who.int](http://www.who.int)

**“WHO and influenza experts worldwide are concerned that the recent appearance and widespread distribution of an avian influenza virus, influenza A/H5N1, has the potential to ignite the next pandemic.”**

World Health Organization, December 8, 2004

### Where does avian influenza occur?

Avian influenza occurs worldwide. The current outbreak of highly pathogenic avian influenza (A/H5N1), which began in December 2003 in Korea, has affected poultry in 15 countries in Asia (including Hong Kong) and Europe. In five of these countries, this A/H5N1 strain has also infected people. By March 2004, the virus had resulted in the loss of more than 100 million poultry. An up-to-date list of countries with A/H5N1 infections in poultry can be found on the website of the World Organization for Animal Health at [www.oie.int](http://www.oie.int). More information on avian influenza can also be found on the Public Health Agency of Canada's website at [www.phac-aspc.gc.ca](http://www.phac-aspc.gc.ca) or the Canadian Food Inspection Agency at [www.inspection.gc.ca](http://www.inspection.gc.ca).

### Can people have the avian influenza?

Avian influenza viruses do not normally infect species other than birds or pigs. In the past, human infections with avian influenza viruses have been rare and usually mild. However, when the first documented infection of people with A/H5N1 avian influenza virus occurred in Hong Kong in 1997, causing severe respiratory disease in 18 people, six of them died. Investigation into this outbreak showed that close contact with live infected poultry was the source of human infection. A/H5N1 emerged again in February 2003 in Hong Kong, infecting two people and killing one. The current outbreak of A/H5N1 began in December 2003 and has to date infected 133 people, killing 68 of them (see Figure 2).

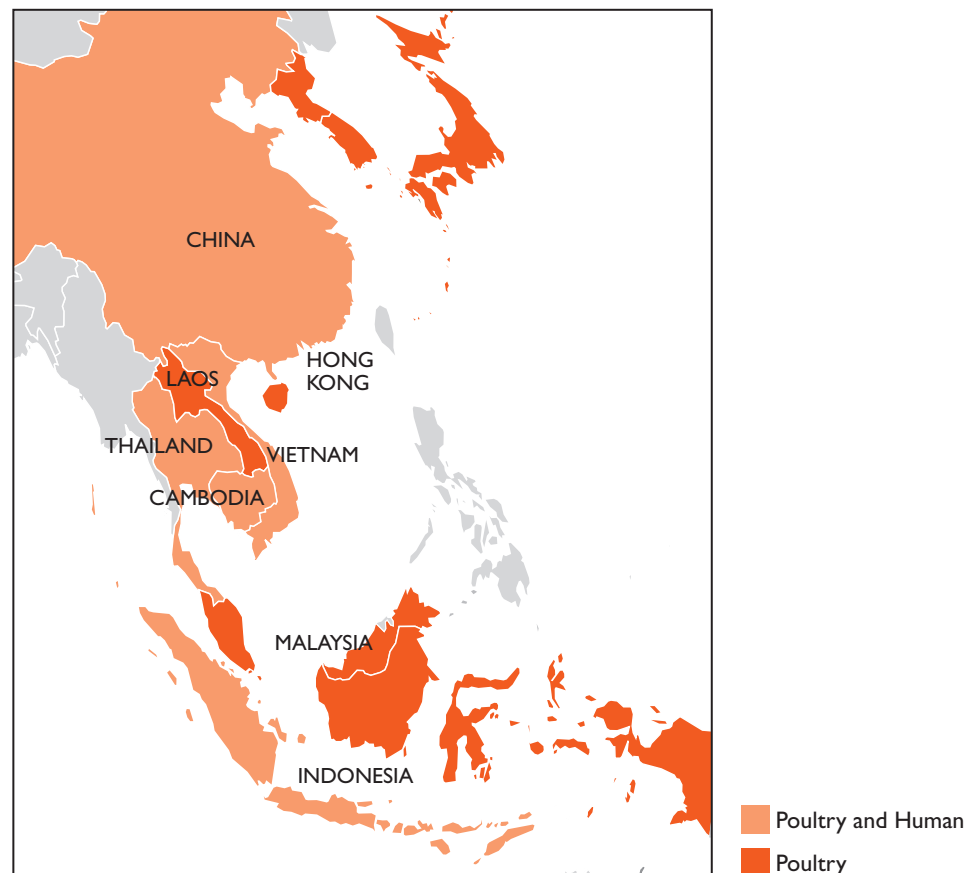


Figure 2: Countries affected by the current outbreak of A/H5N1 (as of November 29, 2005)

Two other avian influenza viruses have recently caused illness in people, but not on the same scale as that caused by A/H5N1. A/H7N7 emerged in the Netherlands in February 2003, causing mild illness in 83 people and one death. A/H9N2 also caused mild cases of influenza in two children in Hong Kong in 1999 and one child in December 2003. Canada had an outbreak of highly pathogenic H7N3 avian influenza in British Columbia in 2004. Mild illness was caused in two people. Seventeen million commercial poultry were slaughtered (See Table 4).

**Table 4: Reported cases of avian influenza in humans up to November 2005.**

YEAR	STRAIN	COUNTRY	NUMBER OF CONFIRMED HUMAN CASES	NUMBER OF CONFIRMED HUMAN DEATHS
1997	A/H5N1	Hong Kong	18	6
1999	A/H9N2	Hong Kong	2	0
2003	A/H5N1	Hong Kong	2	1
2003	A/H7N7	Netherlands	84	1
2003	A/H9N2	Hong Kong	1	0
2003 to date	A/H5N1	Cambodia, China, Indonesia, Thailand and Vietnam	133	68
2004	A/H7N3	Canada	2	0

**Have there been human cases of avian influenza in Canada?**

In 2004, two people in Canada caught an avian influenza virus (A/H7N3) and developed conjunctivitis (an eye infection) and upper respiratory symptoms after exposure to avian influenza-contaminated material. There have been no human cases in this country associated with the current outbreak of A/H5N1. Controls are in place, but there remains a slight chance that A/H5N1, in its current form, could be introduced to poultry or humans in Canada.

The virus could be introduced by:

- the migration of wild birds that are carrying the virus
- illegally imported wild birds that are carrying the virus
- importing contaminated dead chickens meant for us to eat
- someone entering the country after having picked up the infection in an infected area

**How does avian influenza spread?**

Avian influenza viruses spread through poultry flocks either by respiratory secretions or contact with contaminated feces (droppings). A single gram of contaminated feces can contain enough of the virus to infect one million birds. Droppings can also contaminate dust, soil, water, feed, equipment and clothing. People are usually infected through close contact with infected birds or their feces. Person-to-person spread, if it has occurred, has done so only with difficulty and has not resulted in onward transmission of the infection so far.

**What are the symptoms of avian influenza?**

The symptoms of avian influenza in people range from conjunctivitis to typical influenza-like symptoms. These symptoms can lead to pneumonia, acute respiratory distress, viral pneumonia and other severe and life-threatening complications.

**“Never before have we seen so many countries so widely affected by this disease, and with such devastating economic consequences, for rural farms and households as well as for the poultry industry.”**

Dr. Anarfi Asamoah-Baah,  
Assistant Director-  
General, Department of  
Communicable Diseases,  
World Health  
Organization

### How could avian influenza lead to a pandemic?

The current outbreak of highly pathogenic avian influenza in Asia and Europe known as A/H5N1—unprecedented in its scale and rate of spread – is thought to have greatly increased the risk of another influenza pandemic. Since it appeared in poultry in Korea in December 2003, this strain has infected poultry in 15 countries in Asia (including Hong Kong) and Europe (see Figure 2). As of November 29, 2005, there have been 133 reported cases of human infection with the virus, of which 68 have been fatal. Five countries have reported human cases of A/H5N1 infection: Cambodia, China, Indonesia, Thailand and Vietnam—countries with widespread outbreaks in poultry (see Table 5). Although A/H5N1 has appeared before, infecting 18 people and killing six of them in Hong Kong in 1997, the current epidemic of this strain represents a more serious threat to public health. This time it has caused outbreaks at the same time in several countries and is proving difficult to eliminate. Transmission to people remains fairly rare and in most cases, investigation has identified contact with infected poultry as the main cause of infection. Although human infections have been documented in only five countries, it seems likely that more cases have occurred in other countries but have remained unrecognized because of a lack of clinical awareness or diagnostic facilities. A chronology of the current outbreak of A/H5N1 from January 2004 is available on the World Health Organization website at [http://www.who.int/csr/disease/avian\\_influenza/Timeline\\_28\\_10a.pdf](http://www.who.int/csr/disease/avian_influenza/Timeline_28_10a.pdf)

**Table 5: Cumulative number of confirmed human cases of avian influenza H5N1 between 28 January 28, 2004 and November 25, 2005.**

COUNTRY	TOTAL CASES	DEATHS
Cambodia	4	4
China	3	2
Indonesia	12	7
Thailand	21	13
Vietnam	93	42
Total	133	68

To keep up to date with the number of human cases of A/H5N1, visit the website of the World Health Organization’s Communicable Disease, Surveillance & Response unit at [www.who.int/csr/en](http://www.who.int/csr/en)

### How could A/H5N1 cause a pandemic in people?

A/H5N1 could trigger the next pandemic for several reasons. Firstly, it has already shown an ability to infect people and cause severe disease – one of the key features of a pandemic strain. Secondly, this particular virus has a documented ability to mutate and to acquire genes from viruses infecting other species. Experts fear that the virus could either adapt, giving it greater affinity for humans, or exchange genes with a human influenza virus, producing a completely “novel” (new) virus capable of spreading easily between people, and causing a pandemic.

The continued spread of A/H5N1 in birds increases the chances for the direct infection of people. If more people become infected over time, the likelihood also increases that, if they are infected with human and avian influenza strains at the same time, they could serve as the mixing vessel for the appearance of a novel subtype virus with enough human genes to be easily transmitted from person to person. Such an event could mark the start of an influenza pandemic. However, the likelihood of this mutation occurring is not easy to predict.



### What about person-to-person transmission?

Human infection with A/H5N1 has been rare up to now. The virus is not yet been able to pass easily from person to person. When it can, the virus would meet all the criteria of a pandemic influenza strain. While there have been instances of possible person-to-person transmission, so far these have been very isolated occurrences. Person-to-person transmission must be efficient and sustainable if the virus is to become capable of causing a pandemic. In other words, there must be a sustained chain of transmission causing community-wide outbreaks. So far, despite increased surveillance, there is no strong evidence of this occurring.

### Why is A/H5N1 hard to remove in poultry?

Being able to remove the A/H5N1 virus in domestic birds is very important to preventing pandemic influenza. However, despite international efforts, the virus cannot yet be removed in poultry. There are several reasons for this:

- **High number of poultry in backyard farms**

The internationally recommended measures for controlling infection in poultry are culling (selecting and killing certain poultry), quarantining and disinfection. These measures are difficult to apply to small rural and backyard farms. In several of the countries that have had outbreaks, 80% of poultry are found in small rural and backyard farms. In China alone, 60% of its estimated 13.2 billion chickens are raised on small farms, close to people and domestic animals, including pigs.

- **Economic significance of poultry production**

Because so many people in the world are so dependent on poultry, important measures such as culling are difficult to do.

- **Lack of experience**

Since the disease is new to most countries in Asia, very little experience exists at national and international levels to guide the best control measures at the country level.

- **Lack of resources**

Several countries with very widespread outbreaks lack adequate infrastructure and resources, including funds to compensate farmers in order to encourage compliance with government recommendations.

- **Scale of spread**

With so many adjacent countries affected, one country's gains in control may be compromised by inadequate control in another.

For these reasons, elimination of highly pathogenic avian influenza in Asia is expected to take several years (and may not even be achievable). During this time, the possibility that the virus could mutate into a pandemic strain remains.

## Protecting People from Avian Influenza

### Is there a vaccine against avian influenza?

To date, there is no vaccine capable of protecting humans from infection with avian influenza. However, the *World Health Organization* has made several candidate virus strains available for use by vaccine manufacturers and institutions to produce a vaccine against A/H5N1, should this be needed.

The Government of Canada has provided \$34 million over five years to assist in the development and testing of a prototype pandemic influenza vaccine. Several different

### For more information on avian influenza, visit:

Canadian Public Health Agency

[www.phac-aspc.gc.ca/influenza](http://www.phac-aspc.gc.ca/influenza)

Canadian Food Inspection Agency

[www.inspection.gc.ca](http://www.inspection.gc.ca)

Alberta Health and Wellness

[www.health.gov.ab.ca/public/pandemic/pandemicplan.html](http://www.health.gov.ab.ca/public/pandemic/pandemicplan.html)

Calgary Health Region

[www.calgaryhealthregion.ca](http://www.calgaryhealthregion.ca)

World Health Organization

[www.who.int/csr](http://www.who.int/csr)

**“WHO believes the appearance of H5N1, which is now widely entrenched in Asia, signals that the world has moved closer to the next pandemic.”**

World Health Organization,  
December 8, 2004.

vaccines have been produced for clinical testing. Whether these will be suitable for use against a pandemic influenza strain derived from A/H5N1 depends on how much the pandemic strain has “drifted” from the A/H5N1 virus currently in circulation in poultry. *The Public Health Agency of Canada* is working with Canadian vaccine manufacturers to ensure they have the manufacturing capacity to produce an A/H5N1 vaccine.

#### **What drugs are available against A/H5N1?**

There is evidence that recent A/H5N1 viruses respond to antiviral drugs such as oseltamivir (Tamiflu) or zanamivir (Relenza). This has led experts to conclude that they may also be effective against a pandemic influenza strain. However, how well antiviral drugs work in a pandemic situation cannot be known until the pandemic is under way.

#### **The nature of avian influenza: Summary**

- Avian influenza or “bird flu” is a contagious disease of birds caused by influenza A viruses. Domestic poultry are especially susceptible.
- Avian influenza was believed to infect people only rarely, and then to cause only mild disease until 1997, when the highly pathogenic avian influenza virus (A/H5N1) infected 18 people in Hong Kong, killing six of them.
- A/H5N1 re-appeared in Korea in December 2003 and has since affected poultry flocks in 15 countries in Asia and Europe. In five of these countries – Cambodia, China, Indonesia, Thailand and Vietnam – it has infected 132 people, killing 68 of them to date.
- Of the 15 different HA subtypes of influenza A, H5 is the most infectious and poses the greatest threat to human health.
- Experts fear that A/H5N1 could trigger the next influenza pandemic by mutating to become capable of passing easily from person to person.
- Despite isolated reports of human-to-human spread, so far there is no strong evidence of sustained person-to-person transmission.
- Work is under way to produce a vaccine against A/H5N1. However, if the virus mutates enough, the vaccine may not be effective.
- There is evidence that antiviral drugs such as oseltamivir and zanamivir are effective against A/H5N1. However, until a pandemic influenza virus derived from H5N1 emerges and spreads, it is not possible to predict how effective oseltamivir or zanamivir will be against the virus.
- So far, there have been no human cases associated with the current outbreak of A/H5N1 in Canada.

## **4. CONTROLLING PANDEMIC INFLUENZA**

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#### **What can we do to prevent or contain an influenza pandemic?**

It is unlikely that the global spread of a pandemic influenza virus could be prevented once it has started. The emphasis in pandemic influenza control is, on reducing its impact. Several tools help achieve this aim:

- year-round global surveillance
- effective and accurate methods of diagnosis
- antiviral drugs
- social interventions
- vaccines (once they become available)

## Surveillance

Surveillance is a year-round global activity. Its objective is to monitor the evolution of influenza viruses and associated illnesses to give recommendations for the annual vaccine, and also to detect the emergence of “unusual” viruses (that may have pandemic potential) as soon as they emerge. The sooner a potential pandemic virus is detected, the sooner control measures can be put in place and the sooner the development of a vaccine can begin. Effective surveillance is vital, not only in detecting the first virus, but also in detecting the first signs of person-to-person transmission. Canada is an integral part of an international network of influenza surveillance to which it contributes, and from which it receives, data.

### The World Health Organization Global Influenza Surveillance Network

This is an international network of laboratories that provide a mechanism for monitoring influenza viruses and detecting the emergence of new viruses with pandemic potential. The World Health Organization network consists of four WHO Collaborating Centres (Australia, Japan, U.S.A. and the United Kingdom), which perform genetic analyses of around 2,000 influenza viruses each year, and 112 contributing national influenza laboratories in 83 countries, including Canada, which collect more than 175,000 samples from patients with influenza-like illnesses.

### The European Influenza Surveillance Scheme

This is a collaborative surveillance network within the European Network for the epidemiological surveillance and control of communicable diseases and is funded by the European Union. It combines clinical surveillance and reference laboratory reports from 23 European countries, allowing influenza activity to be monitored across Europe.

### Public Health Agency of Canada

Influenza surveillance across Canada is co-ordinated by the *Public Health Agency of Canada* throughout the year but with a particular focus over the winter months. The agency collaborates with provinces and territories on their health surveillance activities. Provinces and territories use a range of information sources including data on new family doctor visits and emergency room visits for influenza-like illness, laboratory reports, unusual school absenteeism and hospitalizations for influenza to monitor circulating influenza virus strains and the illness they are causing. It aims to detect new subtypes of epidemic or pandemic potential.

### How is influenza diagnosed?

Influenza is essentially a clinical diagnosis, but accurate diagnosis is the backbone of surveillance. An accurate diagnosis is vital for detecting new influenza strains, assessing their risk to the public and monitoring and containing the spread of disease. It can be difficult to distinguish influenza from illnesses caused by other respiratory viruses or even bacteria by symptoms alone. The most common method for diagnosing influenza is by laboratory tests. Samples from swabs taken from the nose and throat are sent to a laboratory for analysis.

## Vaccines

Vaccination is the core of seasonal influenza control. However, vaccines may not be available during the early stages of a pandemic.

### How do vaccines work?

Vaccines are biological agents that stimulate the body to produce antibodies or other immunity. These antibodies are designed to protect the body from the strains of the virus contained in the vaccine. On exposure to the influenza virus, the antibodies help prevent

infection or reduce the severity of illness. Generally, vaccines reduce infection by around 70-80%, hospitalizations in high-risk people by around 60% and deaths by around 40%.

### **Vaccination against “ordinary” influenza**

Every year, a new vaccine must be developed to protect against the three most common influenza virus strains likely to be circulating that winter. The World Health Organization’s Global Influenza Surveillance Network decides which virus strains are likely to be circulating during the upcoming influenza season and should be covered by the vaccine. The strains in the vaccine are chosen to match as closely as possible to the (strongest) strains in circulation. How well the vaccine works depends on how well the vaccine strains match the circulating strains.

In Canada, vaccination is recommended for those most at risk of serious illness from influenza. Vaccination is also offered to health-care workers involved in direct patient care. Approximately 250,000 doses of influenza vaccine are now given each year in the Calgary Health Region, covering over 70% of people aged 65 years and over and a large number of other at-risk groups.

### **Vaccination during a pandemic**

Vaccines also offer the best line of defence in reducing illness and deaths during an influenza pandemic. However, currently available influenza vaccines are likely to give little or no immunity in a pandemic. A new vaccine must be developed to match the pandemic strain of the virus. This work can only begin once that strain has been identified; although some advance work can shorten the time it takes to get the new vaccine produced. This means that:

- once a pandemic virus had been identified, even with the advance work under way, it will probably take around four to six months to produce a vaccine, and possibly longer
- vaccines are unlikely to be available during the early stages of a pandemic and even then will not offer 100% protection
- when a vaccine is available, the aim will be to immunize the whole population as quickly as possible, as vaccine supplies increase
- manufacturers will not be able to produce enough vaccines to immunize everyone right away. This means that vaccines will be given to some high-priority groups of people before others

### **Current vaccine research**

The United Kingdom, working with the *World Health Organization*, is one of the countries leading research aimed at the development of a vaccine against pandemic influenza once the pandemic virus is known. This includes the improvement of routine influenza vaccine strains and the development of prototype pandemic vaccine strains based on the forecasting of possible genetic changes relevant to a pandemic. The United Kingdom has produced a suitable virus, using the avian influenza virus A/H5N1, for the development of an H5N1 vaccine against pandemic influenza. If a pandemic strain derived from this virus does not change much from A/H5N1, this vaccine may prove effective. If a future pandemic virus turns out to be quite different from this A/H5N1 strain, the vaccine may not offer protection but could speed up the production of an effective pandemic vaccine. The government of Canada has provided \$34 million over five years to assist in the development and testing of a prototype pandemic influenza vaccine. An experimental pandemic vaccine may be available in limited supplies before the best vaccine becomes available. This may be used for protection of people at highest risk of infection, such as laboratory workers.

### **Why will there not be enough vaccines to go around right away?**

Another limitation to ensuring that there is enough vaccine supply during a pandemic is the current manufacturing capacity, which is based on the year-on-year use of influenza vaccines for “targeted” population groups. A vaccine cannot be produced until the virus strain is known. It is likely to take four to six months before small quantities of vaccine will become available, increasing over a period of time. Discussions continue at the international and national level on how to boost vaccine production in the event of a pandemic. As part of the *Canadian Pandemic Influenza Plan*, a vaccine manufacturer has been contracted to ensure there is adequate manufacturing capacity in Canada to produce the vaccine. It is also likely that in a pandemic situation, two doses of the vaccine will be needed rather than one.

### **Who would be vaccinated first?**

The Canadian Pandemic Influenza Committee has made conditional recommendations for prioritizing groups for vaccination. These recommendations, used in Canadian provincial and regional plans will need to be reassessed and possibly altered by the Pan-Canadian Pandemic Influenza Advisory Committee, based on what group of people the virus affects the most and other information.

### **What groups will get vaccinated first?**

- **Group 1**  
**Health-care workers, Public Health Responders and Key Health Decision Makers**  
Health-care workers and public relations workers are essential to the health service response and may be at increased risk of infection through their contact with patients.
- **Group 2**  
**Pandemic Societal Responders and Key Societal Decision Makers**  
To prevent disruption to key services through absence due to illness.
- **Group 3**  
**“At-risk” groups (Persons at High Risk of Severe or Fatal Outcomes)**  
To prevent serious illness, reduce hospitalization and deaths.
- **Group 4**  
**Healthy Adults**  
To reduce societal disruption and demand on medical services.
- **Group 5**  
**Healthy Children**  
This group is at lowest risk of developing severe outcomes from influenza during annual epidemics but play a major role in the spread of the disease.

### **Who will buy the vaccine?**

The Government of Canada is responsible for buying and supplying a pandemic vaccine for Canada. *The Public Health Agency of Canada* will liaise with the provincial and territorial health departments for the supply of vaccines to the various administrations.

### **Who will carry out the immunization?**

The precise vaccine formulation, dose and dose schedule will not be known right away, so detailed arrangements for immunization have not yet been made. It is likely that people at risk of becoming infected with pandemic influenza because of their jobs will be immunized at work, while special vaccination clinics staffed by nurses will play a major role in the vaccination of other groups. Health regions are responsible for ensuring local pandemic influenza contingency plans are in place, including making the vaccine quickly available once supplies become available. The Calgary Health Region has developed detailed plans that will be adjusted once details on the dose schedule and vaccine availability are known.

### **Antiviral drugs**

Medicines known as antivirals are the only other major medical counter measure available. They may be used in the absence of, or in addition to, vaccination.

### **How do antiviral drugs work?**

Antiviral drugs work by preventing the influenza virus from reproducing. For treatment, antiviral medication must be taken within 48 hours of the onset of symptoms in order to be effective. Treatment at this stage can shorten illness by around a day and reduce hospitalizations by about 50%. Antivirals must then be taken either before, or within 48 hours of, exposure. Antiviral drugs are not recommended for everybody. They are available to treat people more at risk of serious illness.

### **Antiviral drugs for pandemic influenza**

Antiviral drugs are likely to have an important role in the prevention and treatment of pandemic influenza, especially when there is not enough vaccine available. However, it is important to note the following:

- The effectiveness of antiviral drugs in a pandemic, and in particular in reducing the number of deaths in cases of severe disease is not known.
- It is recommended that antiviral drugs should be given to treat those at risk of serious illness. However, until the pandemic is underway, we cannot say for sure who will benefit most.
- The pandemic influenza virus may develop resistance to antiviral drugs.

### **Are there enough antiviral drugs available for everyone during a pandemic?**

Antiviral drugs are expensive, take time to manufacture, have a limited shelf life and will be in high international demand at the time of a pandemic. Canada and Alberta are building a stockpile of antiviral drugs in the event of an influenza pandemic. As with other medicines, it will be necessary to use them in the most effective way.

### **Who will receive antiviral drugs?**

The *Canadian Pandemic Influenza Plan* has identified strategies and prioritized groups to receive antiviral drugs. However, since it is impossible to be sure who would benefit most from antiviral treatment, these recommendations will be reviewed according to advice from experts on the emerging medical information about the pandemic and other information.

The priority groups are likely to be:

- people hospitalized for influenza
- health-care workers and emergency response workers if and when they develop fever or other influenza symptoms. This is to minimize impact on the health service response to prevent disruption to key services through absence due to illness.
- ill high-risk people in the community
- prevention of disease in health-care workers
- control outbreaks in high-risk residents of institutions (nursing homes and other chronic care facilities)
- prevention of disease in essential service workers
- prevention of disease in high-risk people hospitalized for illnesses other than influenza\*
- prevention of disease in high-risk people in the community\*

\* Note: during a pandemic, the definition of high-risk people may change based on epidemiologic evidence.

### Who will supply the antiviral drugs?

Health regions are responsible for local plans to ensure those who are recommended to get antiviral treatment receive it within 48 hours of the onset of symptoms. The role of pharmacists in the supply of antiviral drugs is still being developed.

## Interventions

### Social interventions

Non-medical, “social” or “social distancing” interventions will be important in delaying or slowing the spread of pandemic influenza to allow time for a vaccine to be produced. These interventions are still being considered and may be revised pending guidance from the *World Health Organization*, national advisory bodies and evidence obtained during the pandemic.

### Personal interventions

There are some basic measures you can take to reduce the risk of infection:

- hand washing: prevents picking up the virus from contact with infected surfaces and prevents you from passing it on
- covering your mouth and nose when coughing or sneezing and washing your hands afterwards
- avoiding crowds where possible

### Population-wide interventions

Other interventions at a provincial or regional level may also be introduced at various stages during the pandemic:

- restrictions of mass gatherings: this will probably only be effective early on and could include the banning of large gatherings such as concerts and sporting events. It may also include local gatherings.
- travel restrictions: travel to or from infected areas may be restricted. Recommendations on restricting national travel may also apply.
- childcare, school and education facility closures: daycares, schools and educational institutions may be closed to prevent the spread of infection.
- voluntary home isolation of people.
- voluntary quarantine of contacts of known cases in early stages of pandemic.

### Will screening people entering Canada help?

This is unlikely to be effective because of the highly infectious nature of the influenza virus. Screening can only detect people who are showing symptoms. Since you may be infectious with the pandemic virus even before you have any symptoms, screening would not detect the virus in time to stop the spread.

### Will wearing a mask help?

The widespread wearing of masks by the general public during a pandemic is unlikely to be effective in preventing people from becoming infected with the virus. However, masks may have some limited use for those already infected with the virus in order to prevent them from spreading the germs.

### For more information on pandemic flu control, visit:

Canadian Public Health Agency:

[www.phac-aspc.gc.ca/influenza](http://www.phac-aspc.gc.ca/influenza)

Alberta Health and Wellness:

[www.health.gov.ab.ca/public/pandemic/pandemicplan.html](http://www.health.gov.ab.ca/public/pandemic/pandemicplan.html)

Calgary Health Region:

[www.calgaryhealthregion.ca](http://www.calgaryhealthregion.ca)

World Health Organization:

[www.who.int](http://www.who.int)



**“Influenza pandemics are recurring events but no one can predict when or where they will strike. What we can do, however, is take all reasonable measures to be prepared.”**

Dr. Carolyn Bennett, Minister of State (Public Health)  
(February 2005.)

### **Controlling pandemic influenza: summary**

- surveillance, diagnosis, vaccination, antiviral drugs and “social” interventions are the main tools in controlling pandemic influenza.
- a vaccine for use against pandemic influenza can only be produced once the pandemic strain has been identified. This means that vaccines will not be available right away.
- antiviral drugs are the only other medical counter measure available but there are limitations to their use, including uncertainty over how well they will work.
- the *Canadian Pandemic Influenza Plan* has identified strategies and has prioritized groups to receive both the vaccines and antivirals according to their availability.
- various “social” interventions at both the personal and national level may be necessary. These include personal hygiene and possible restrictions on travel and mass gatherings.

## 5. HOW WILL PANDEMIC INFLUENZA AFFECT CANADA?

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### **Predicting the impact**

If a pandemic influenza strain is causing outbreaks overseas, it will almost certainly reach Canada. Once it reaches Canada, it is expected to spread throughout the country in a matter of weeks, causing much more illness and higher death rates than those seen with the “ordinary” influenza. This will result in intense pressure on health and other essential services and disruption to many aspects of daily life.

It is currently impossible to predict when the influenza pandemic will begin. It is also difficult to predict its impact with any accuracy. A great deal of uncertainty is associated with estimating the scale of illness, death rates and the identification of those likely to be most affected.

### **Illness and deaths at the global level**

Experts predict that the global death toll could range between 2 million to over 50 million deaths worldwide. Studies by the *U.S. Centers for Disease Control and Prevention* reduce that range to between 2 million to 7.4 million deaths worldwide. However, narrowing the range cannot be done with any confidence until the pandemic is under way. The level of preparedness in each country will also influence the final death toll. While the exact figures are not known, the burden on health systems is likely to be great. In high-income countries alone (including Canada), which represent 15% of the world’s population, experts expect between 280,000-650,000 deaths, 134 – 233 million hospital visits and 1.5-5.2 million hospital admissions. The impact is likely to be more severe in developing countries, whose health systems are already overburdened.

### **Illness and deaths in Canada, Alberta and the Calgary Health Region**

For planning purposes, the *World Health Organization* advises that national plans are based on a cumulative clinical attack rate of 25%, compared to the attack rate of 5-10% associated with “ordinary” influenza. A clinical attack rate is the percentage of the total population who become infected and show symptoms of the virus. (See Table 6).

- Experts predict that the next pandemic is likely to affect around a quarter of the population, with over 50,000 more deaths occurring over one or more waves (lasting around three months each).



- An estimated 4.5 to 10.6 million Canadians will become ill enough that they would be unable to attend work or other activities for at least half a day.
- It is expected that between 2.1 and 5 million people would need to be seen by a doctor or receive some form of outpatient care.
- Hospital admissions for acute respiratory and related conditions are likely to increase by around 25%, with between 34,000 and 138,000 new patients needing hospital admission.
- Hospitalizations and deaths will be higher if the elderly are most affected and lower if adults aged 15-64 years are affected.

**For more information on the impact of pandemic influenza, visit:**

**Canadian Public Health Agency:**  
[www.phac-aspc.gc.ca/influenza](http://www.phac-aspc.gc.ca/influenza)

**Alberta Health and Wellnes:**  
[www.health.gov.ab.ca/public/pandemic/pandemicplan.html](http://www.health.gov.ab.ca/public/pandemic/pandemicplan.html)

**Calgary Health Region:**  
[www.calgaryhealthregion.ca](http://www.calgaryhealthregion.ca)

**World Health Organization:**  
[www.who.int](http://www.who.int)

**Table 6: Estimated deaths and hospitalizations during an influenza pandemic**

	EXPECTED DEATHS	EXPECTED HOSPITALIZATIONS
Global	2-50 million	6.4-28.1 million
High-income countries	280,000-650,000	1.5-5.2 million
Canada	11,000-58,000	34,000-138,000
Alberta	100-3,000	3,000-12,000
Calgary Health Region	Up to 1,600	8,700

### Impact on health services

As the figures in Table 6 show, an influenza pandemic will place great pressure on health and social services due to the increased burden of patients with influenza needing treatment and less of the workforce available due to illness and other disruption. This will mean delays in dealing with non life threatening conditions, as sometimes occur during an unusually bad epidemic of “ordinary” influenza. Non-urgent work will have to be suspended or cancelled during the pandemic and because of pressure on beds, staff and resources. The Calgary Health Region will aim to maintain essential services for life threatening conditions.

The Calgary Health Region's contingency plan includes planning for large and sudden increases in the numbers of patients and the minimizing of staff absenteeism due to illness. Calgary Health Region staff will be trained for new or different roles they will be asked to assume during an outbreak of pandemic influenza. The Calgary Health Region's Emergency Operation Center will be activated to manage the increased demand that will be placed on the health care system and health care providers.

### Impact on business

An influenza pandemic is likely to affect all age groups, with more than 10% of the population likely to lose working days.

- The *Canadian Pandemic Influenza Plan* assumes that 25% of the Canadian workforce will take five-to-eight working days off over a three-month period.
- During the peak of the pandemic, estimates suggest that absenteeism will double in the private sector and increase by two-thirds in the public sector.

This has important implications for the business continuity. Advice for employers on how to maintain business continuity is available at [www.municipalaffairs.gov.ab.ca](http://www.municipalaffairs.gov.ab.ca).

### Impact on schools and services

#### Schools

Pandemic influenza is likely to spread quickly in schools leading to possible closures. Schools could also be affected by staff absenteeism and disruption to transport services.

**“The overall goal of pandemic influenza preparedness and response is to first minimize serious illness and overall deaths and second to minimize societal disruption among Canadians as a result of an influenza pandemic. The Canadian Pandemic Influenza Plan 2004 is intended to be dynamic and interactive and will be updated and revised regularly.”**

Canadian Pandemic  
Influenza Plan 2004

#### Services

Pandemic influenza will impact all services including police, fire, military, fuel supply, food production, distribution and transport, prisons, education and businesses. All are likely to be affected by staff illness, travel restrictions and other potentially disruptive counter measures. The federal, provincial and municipal emergency response is covered by other contingency plans that will come into effect should they be needed. These will ensure the maintenance of essential services, transport, food distribution, utilities and communications, the maintenance of public order and the role of the police and armed services.

#### Effect of pandemic influenza on the Calgary Health Region: summary

- We do not know with any certainty who will be most affected, how many people will become ill or how many people will die.
- What we do know is that the next pandemic is likely to be associated with a much higher degree of illness and many more deaths than “ordinary” influenza and will cause considerable social and economic disruption.
- Worldwide experts predict anywhere between 2 million and 50 million deaths.
- There may more than 11,000 additional deaths in Canada.

## 6. CANADA, ALBERTA AND THE CALGARY HEALTH REGION'S RESPONSE TO PANDEMIC INFLUENZA

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#### The Canadian Pandemic Influenza Plan

Canada was one of the first countries to have a pandemic influenza plan in place. It set out specific measures and actions required from health and other government departments and organizations at national, provincial and local levels to support an effective response to an influenza pandemic. The current plan is being updated to take account of new scientific developments, changes in the health service, lessons learned from the 1997 outbreak of avian influenza in Hong Kong and from the 2003 SARS outbreak, and experience in emergency planning since the events of September 11, 2001.

The *Canadian Pandemic Influenza Plan* has been developed in accordance with international recommendations issued by the *World Health Organization* and adapted to meet national needs. The goal is to minimize the impact of an influenza pandemic on the Canadian population. Key elements are:

- the organizational arrangements for an effective response
- identifying pandemic influenza and monitoring its spread and impact
- containing the spread of infection to the extent that this is possible
- reducing illness and saving lives
- ensuring the continuation of essential services, thereby minimizing social and economic disruption
- ensuring that the public, health professionals and media have up-to-date, comprehensive information at all stages

### **An integrated international, national and local response**

The *Canadian Pandemic Influenza Plan* provides the overall framework for a Canada-wide response and covers the national health response. Contingency plans have been developed at the provincial and local level. Health regions, for example, are responsible for developing their own contingency plans, ensuring local needs are met while remaining integrated in the national and international response.

### **A collaborative multi-agency response**

Responding to a pandemic involves coordinating the contributions of many different organizations, not just those relating to health. All organizations involved in preparing for and responding to an influenza pandemic in Canada and Alberta are expected to produce their own specific contingency plans, using the Canadian and Alberta plans as their key guidance tools. It is hoped that this will ensure a coherent national response across all sectors.

### **A flexible response**

There is much uncertainty associated with the next pandemic: the scale and severity of illness, which groups will be worst affected and the availability of antivirals and vaccines and how well they will work. The Canadian and Alberta plans are flexible, enabling us to adapt our response as new information emerges.

## How Does the Plan Work?

### **A phased response**

The *World Health Organization* has defined a series of phases in the progression of an influenza pandemic which have been incorporated into the Canadian plan. These are currently under review and the new categories will be included in the Canadian, Alberta and Calgary Health Region plans. The principles remain the same. The phases cover the progression of an influenza pandemic from the first emergence of a novel virus to its worldwide spread. Each phase will be announced by the *World Health Organization* and will dictate specific actions at the national levels.

The phases are grouped into three periods:

**Inter-pandemic period:** actions required to strengthen influenza pandemic preparations at global, national, provincial and regional level.

**Pandemic alert period:** actions required to ensure early and rapid detection and efforts to delay or contain spread.

**Pandemic period:** actions to minimize the impact of the pandemic.

### Canadian alert levels

The *Canadian Pandemic Influenza Plan* reflects the World Health Organization pandemic phases, which allows actions within Canada to be related to international activity:

WHO PANDEMIC PHASES	DEFINITION
<b>Inter Pandemic (or Pre Pandemic)</b>	
Phase 1	No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection may be present in animals. If present in animals, the risk of human infection or disease is considered to be low.
Phase 2	No new influenza virus subtypes have been detected in humans.. However, a circulating animal influenza virus subtype poses substantial risk of human disease.
<b>Pandemic Alert Period</b>	
Phase 3	Human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread in close contact.
Phase 4	Small cluster(s) with limited human-to-human transmission but spread is highly localized, suggesting that the virus is not well adapted to humans.
Phase 5	Large cluster(s) but human-to-human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk)
<b>Pandemic Period</b>	
Phase 6	Pandemic: increase and sustained transmission in general population
<b>Post Pandemic</b>	
Return to inter-pandemic period	Return of the seasonal “epidemic” cycle with major disease impact on the elderly and very young.

### Signaling the start of a pandemic and the activation of contingency plans

The Canadian, Alberta and Calgary Health Region plans, along with other national contingency plans, will be activated at the close of the pre-pandemic period, when the *World Health Organization* confirms evidence of sustained person-to-person transmission and the onset of the pandemic.

### What happens next?

1. The *Public Health Agency of Canada*, which has overall responsibility for developing and maintaining the Canadian contingency plans and for coordinating the health response across Canada, will collaborate with other provincial and territorial health departments.
2. The Pandemic Influenza Committee will be convened as the pandemic potential of a virus has been confirmed. This committee will advise Canadian, provincial and territorial health departments on the health response in Canada.

3. The *Public Health Agency of Canada* will provide the focal point for a Canada-wide strategy and coordinate the response across all government departments.
4. The Chief Public Health Officer will quickly alert provincial/territorial Chief Medical Officers, who would implement the pandemic influenza contingency plans and alert health regions who would mobilize their response.

### **The public health response**

The *Public Health Agency of Canada* leads the development, purchase, supply and distribution of a vaccine for Canada in discussion with manufacturers and in liaison with the other provincial/territorial departments of health. The public health response will depend on whether:

- no vaccine is available
- vaccine is available but in limited supply
- vaccine is widely available

### **The Public Health Agency of Canada**

The *Public Health Agency of Canada* is the lead agency responsible for advising and supporting the national public health response to major infectious disease incidents and outbreaks. The agency will coordinate its activities with provincial, territorial health departments/agencies. It will play a key role in national surveillance, providing reference laboratory support, developing expert advice and guidance, research and gathering international data which will inform decisions such as choice of vaccine or antiviral strategy across Canada.

### **Calgary Health Region**

In Alberta, the health regions will use their own coordinated contingency plans to provide health services, public health arrangements and information at the local level, which includes:

- looking after patients in the community
- providing specialist care for those who need it
- ensuring the existence of appropriate infection control facilities
- arranging the distribution of antivirals
- making arrangements for mass vaccination
- minimizing the disruption to other essential health-care services
- making arrangements for enough staff to be available in the event of absenteeism due to illness, which may include the use of volunteers

### **For more information on pandemic influenza control, visit:**

**Canadian Public Health Agency:**

[www.phac-aspc.gc.ca/influenza](http://www.phac-aspc.gc.ca/influenza)

**Alberta Health and Wellness:**

[www.health.gov.ab.ca/public/pandemic/pandemicplan.html](http://www.health.gov.ab.ca/public/pandemic/pandemicplan.html)

**Calgary Health Region:**

[www.calgaryhealthregion.ca](http://www.calgaryhealthregion.ca)

**World Health Organization:**

[www.who.int](http://www.who.int)

### **Or call Calgary Health Link at**

943-LINK (5465)  
or 1-866-408-LINK (5465)  
toll-free.

## Keeping the Public Informed During the Pandemic

### **How will I know what to do in a pandemic?**

Information and advice on how best to protect individual citizens and their families will be made widely available through information leaflets, websites and the media. Such advice will include when, where and how to seek medical assistance.

### **What do I do if I think I am infected?**

If you think that you or a member of your family might be infected:

- stay home
- take medicines to relieve symptoms
- drink plenty of fluids
- review “It’s in your hands” influenza self-care guide available on the web at [www.health.gov.ab.ca/influenza/self\\_care.html](http://www.health.gov.ab.ca/influenza/self_care.html). To have a copy mailed to you, please contact our public information line (403) 944-2106 or toll-free 1-866-944-2060.
- contact Calgary Health Link at 943-LINK (5465) or 1-866-408-LINK (5465) toll-free for advice.

### **How Canada will respond to an influenza pandemic: summary**

- Canada has a national pandemic influenza contingency plan outlining actions to be taken in the event of a pandemic.
- The plan provides guidance for the development of contingency plans for other departments, agencies and organizations involved in responding to a pandemic.
- The plan is based on phases, as recommended by *The World Health Organization*, describing the progression of a pandemic from the identification of a novel pandemic influenza virus to its worldwide spread. These phases dictate specific actions at the national level.
- The public health response is based around the rapid production of a vaccine and the stockpiling of antiviral drugs.
- The public health response will be informed by advice from the Public Health Agency of Canada and will be carried out by *Alberta Health and Wellness* and the health regions.
- Arrangements will differ at the local level in order to meet local needs.
- The public will be kept informed through information leaflets, websites and the media.



calgary health region

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