

1. Background

Every expert on influenza agrees that the ability of the influenza virus to reassort genes means that another pandemic not only can happen. It almost certainly will happen ... influenza is among the most contagious of all diseases ... the influenza virus can spread from person to person before any symptoms develop. If a new influenza virus does emerge, given modern travel patterns it will likely spread even more rapidly than it did in 1918.

The Great Influenza, John M. Barry

1.1 Why Does Ontario Need a Plan for an Influenza Pandemic?

During the 20th century, the world experienced three influenza pandemics. The most deadly, the "Spanish Flu" of 1918-19, killed 40 to 50 million people worldwide. Although no one can predict when the next influenza pandemic will hit, public health officials have warned that a global influenza pandemic is overdue.

Appropriate planning for an influenza pandemic can reduce: the number of people infected (i.e., the extent of the outbreak), the amount of illness, the number of deaths, and the level of socio-economic disruption. Every jurisdiction must be prepared to mobilize resources quickly and effectively to limit the impact of an influenza pandemic.

1.2 About Influenza

Influenza is a contagious respiratory illness caused by a group of viruses: influenza A, B, and C. Most seasonal influenza epidemics are caused by types A and B; type C rarely causes human illness.

Influenza can cause mild to severe illness. It usually starts suddenly. Common symptoms include: fever (usually high, lasting 3 to 4 days); headache (often severe); aches and pains (often severe); fatigue and weakness (can last 2 to 3 weeks); extreme exhaustion (very common at the start);

stuffy nose; sneezing, sore throat, chest discomfort and cough; and nausea, vomiting and diarrhea (in children). A lot of different illnesses, including the common cold, can have similar symptoms.

While most healthy people recover from influenza without complications, some people – such as older people, young children, and people with certain health conditions – are at high risk for serious complications from influenza. Some of the complications caused by influenza include: pneumonia (bacterial or viral), dehydration, and worsening of chronic medical conditions, such as congestive heart failure, asthma, or diabetes. Children and adults may develop sinus problems and ear infections.

A highly infectious disease, influenza is *directly* transmitted from person to person primarily when people infected with influenza cough or sneeze, and droplets of their respiratory secretions come into contact with the mucous membranes of the mouth, nose and possibly eyes of another person (i.e., droplet spread). Droplets expelled during coughing or sneezing can be inhaled by someone who is within two

Case Definition for Influenza Like Illness (ILI) in the General Population

Acute onset of respiratory illness with fever and cough and with one or more of the following - sore throat, arthralgia, myalgia, or prostration, which could be due to influenza virus. In children under 5, gastrointestinal symptoms may also be present. In patients under 5 or 65 and older, fever may not be prominent.

Source: Fluwatch (national case definition for the 2006-2007 season).

metres of the coughing or sneezing person (short-range transmission).

Because the virus in droplets can survive for 24 to 48 hours on hard non-porous surfaces, for 8 to 12 hours on cloth, paper and tissue, and for 5 minutes on hands, it can also be transmitted *indirectly* when people touch contaminated hands, surfaces and objects, and then touch their face (i.e., contact spread).

During certain health care procedures (e.g., intubating patients), droplets containing influenza virus may become aerosolized and can be spread through the air. The issue of whether influenza can also be spread by airborne transmission in situations other than during aerosol-generating procedures is controversial. Current scientific literature and experience with other influenza viruses does not conclusively confirm or rule out airborne transmission. (For more information about the risks of influenza transmission in health care settings, see Chapter 7 – *Occupational Health and Safety and Infection Prevention and Control*.)

The incubation period for influenza is from 1 to 3 days. People with influenza may be able to transmit the virus for up to 24 hours before symptoms appear. Adults are infectious for 3 to 5 days after symptoms appear while children are infectious for up to 7 days after symptoms appear. People with influenza tend to shed more virus in their respiratory secretions in the early stages of the illness. Viral shedding tends to last longer in infants, young children and people with weak or compromised immune systems.

Influenza is primarily a community-spread disease: that is, most transmissions occur in the community rather than in health care settings. Once the virus is widespread in the community, it becomes more difficult to stop or slow its spread.

1.3 When Does Influenza Become a Pandemic?

Strains of influenza are circulating throughout the world all the time. When does a strain cause a pandemic? Only influenza A viruses are associated with pandemics. Influenza pandemics arise when all four of the following occur:

- a novel influenza A virus emerges
- the new virus can spread efficiently from human to human
- the new virus causes serious illness and death
- the population has little or no immunity to the new virus.

The WHO (2005) suggests two mechanisms for the emergence of influenza viruses that cause pandemics:

- genetic reassortment, which occurs when two different viruses infect the same cell and exchange some gene segments. If the new virus can infect humans, cause serious disease, and spread easily from person to person, it can start a pandemic.
- adaptive mutation or stepwise changes in a virus, which occurs during sequential infection of humans or other mammals. The virus gradually changes to be more transmissible among humans.

Most new influenza strains emerge in Southeast Asia where human populations have close interactions with pigs and domestic fowl. The probability of a new strain emerging in North America is relatively low.

Flu Terms

Seasonal (or annual) influenza is a contagious respiratory illness in humans that occurs every year. An annual vaccine is available.

Pandemic influenza is a global outbreak that occurs when a new influenza A virus emerges, to which the population has little immunity, that has the capacity to spread easily from person to person and cause serious human illness.