

Influenza Pandemic Preparedness

« We know that an influenza pandemic is highly likely to occur, and is a matter of **when**, not **if**. »

David Byrne,

European Commissioner for Health and Consumer Protection,
Informal Ministerial meeting of EU Health Ministers,
12 February 2004



**EPIDEMIC
INFLUENZA
(SPANISH)**

This Disease is Highly Communicable.
It May Develop into a Severe Pneumonia.

TO MAKE A MASK

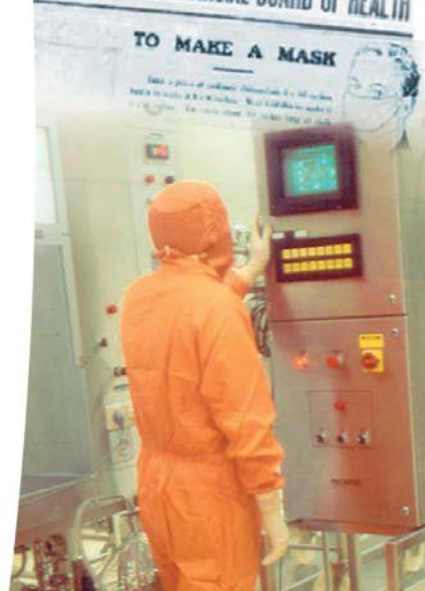
Take a piece of rubber (approximately 6 x 10 inches)
and a piece of cloth (approximately 12 x 18 inches).
Fold the rubber in half lengthwise. Fold the cloth in half
lengthwise. Sew the ends of the rubber together and
the ends of the cloth together. Sew the ends of the
rubber to the ends of the cloth. Sew the ends of the
cloth together. Sew the ends of the rubber to the ends
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ISSUED BY THE PROVINCIAL BOARD OF HEALTH

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»» What is influenza?

Influenza, commonly called “flu”, is an infection of the respiratory tract that affects the nose, throat and the lungs. Although the symptoms are quite different, many people misuse the word “cold” to describe an influenza infection. With influenza a high fever is usually present whereas with a cold this is rare. General aches and pains that can last for two to three weeks are often present with influenza but are usually absent or mild with a cold. Conversely, a runny nose, sneezing and a sore throat are all common symptoms of a cold but are rarely seen with influenza.

For most people influenza is just a nasty experience but in some instances it can be a serious or even life-threatening disease, or lead to serious complications such as bronchitis or secondary pneumonia that may require hospitalisation.

»» How is influenza spread?



Influenza is highly contagious and it is spread easily from person to person, primarily when an infected person coughs or sneezes.

Each year about 10 to 20%¹ of the population contract influenza, usually during the winter months. These influenza epidemics occur every year although the extent and severity vary widely.

»» What causes influenza?

Influenza is caused by a virus. Viruses are the smallest form of life and can only reproduce in the living cells that they infect.

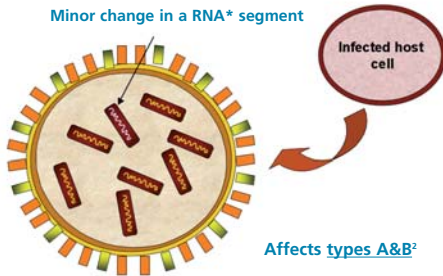
There are three types of influenza viruses, influenza A, B and C. Influenza A can infect humans and animals whereas types B and C are essentially restricted to human beings.

¹ N Eng J Med 1995;333(14):933-4

Influenza A viruses are responsible for annual epidemics and occasional pandemics.

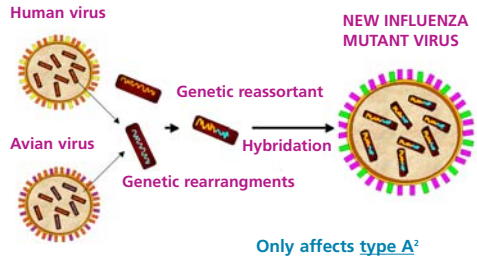
Minor antigenic variations of influenza virus

☞ Antigenic drift causing epidemics



Major antigenic variations of influenza virus

☞ Antigenic shift causing pandemics



* RNA is the genetic material of some viruses.

The influenza virus is capable of producing frequent small changes in the structure of the surface antigens and this means that immunity provided by exposure one year will not necessarily provide protection the following year.

>> What characterises an influenza pandemic?

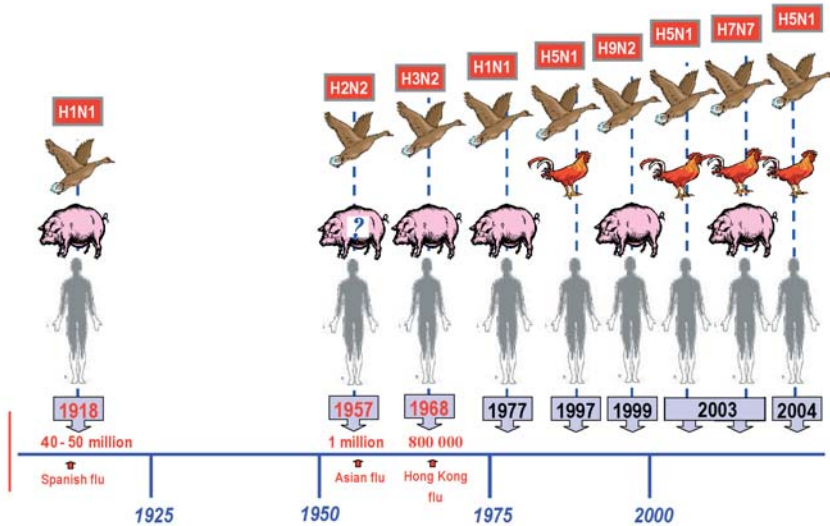
Influenza pandemics are characterised by the spread of a novel type of influenza virus to all parts of the world, causing unusually high morbidity and death, and usually this spreads in 2-3 waves over a total period of 13 to 23 months. Most people are immunologically naive to the novel virus and therefore more susceptible to influenza infection.

Factors that need to be present for a pandemic to occur include the emergence of a new viral subtype, the capacity for the virus to spread efficiently from person to person, and being virulent enough to cause disease.

² Mammette A, Influenza viruses, in "Virologie Médicale" Presse Univ Lyon 2002, p 407-420.

About every 25 years the influenza virus undergoes a major genetic change producing an entirely new strain. Since there is limited immunity within the population to the new strain, the virus can spread very rapidly causing a pandemic.

During the past 100 years, there have been three major pandemics



Influenza viruses are defined by two different components or antigens on the surface of the virus. These are spike-like features called haemagglutinin (H) and neuraminidase (N) components. Thus, influenza A virus has two subtypes that are important for humans: A(H3N2) and A(H1N1).

Three times in the last century, the influenza A viruses have undergone major changes in the critical surface antigen (called the haemagglutinin, abbreviated “H”), resulting in global pandemics. It is estimated that during the “Spanish Flu” pandemic in 1918 – 1919, half of the world population became infected and 40-50 million people are thought to have died³.

More recently two other pandemics occurred: in 1957, the “Asian Flu” and in 1968, the “Hong Kong Flu.” Although these were not as devastating as the “Spanish Flu,” infection rates were high and thousands died. Furthermore, in contrast to current influenza epidemics, these pandemics resulted in much ill-health among healthy younger persons.

³ Text Book of Influenza. London: Blackwell Scientific Publications; 1998. p.3-18.

»» How is a pandemic declared?

Because of the serious threat to public health posed by a potential influenza pandemic, a global alert system has been put in place. National centres around the globe monitor all influenza activity and information on new strains is immediately sent to a WHO collaborating centre. Based on these results, the WHO will decide whether or not to declare a pandemic. According to current WHO pandemic planning, once a pandemic is declared, WHO Reference Laboratories identify the proper strain to be included in a vaccine and modify it for the production of a pandemic vaccine. This strain is then sent to manufacturers who will adapt it for large-scale production of the pandemic vaccine.

»» How can Europe best be prepared for an influenza pandemic?

Vaccination is the principal measure for preventing influenza and reducing the impact of the disease. Therefore, a preparedness plan should support equitable distribution of sufficient quantity of pandemic vaccines in a timely manner.

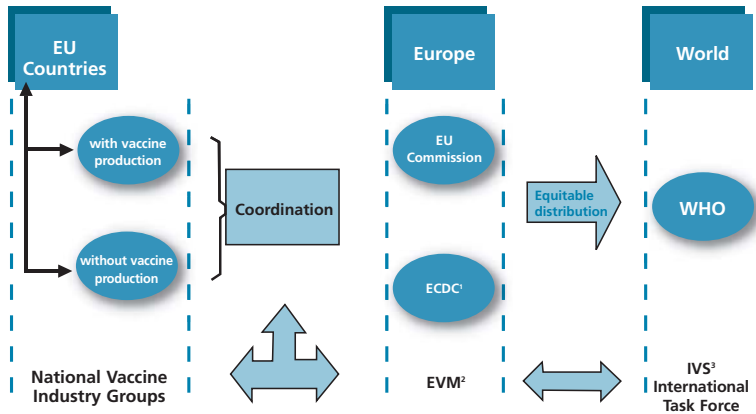
Europe holds a privileged position regarding flu vaccine production, benefiting by having 70% of worldwide production within its territory. Half of this production is exported.

To produce sufficient and timely pandemic vaccines is a challenge that should be anticipated. Due to the variable nature of the influenza virus, influenza vaccines are adapted from one year to another. The development of the annual influenza vaccine normally requires 3 to 6 months. In the event of a pandemic it is critical that vaccines will be available as soon as possible. To reduce this lead-time, the European Commission has set up a specific abbreviated registration procedure. In addition, manufacturers are prepared to work on the development of prototype influenza pandemic vaccines.

Another major challenge is production capacity, which is linked to annual vaccine demands. Production, purification and formulation equipment and facilities are specifically designed for influenza vaccines and up-scaling of additional production capacity has a very long lead-time. In the event of a pandemic, the sudden surge in

demand for a vaccine would outstrip current supply capacity and would inevitably result in shortages. The WHO, in the World Health Assembly Resolution adopted in May 2003, recognised this problem and called for better use of vaccines for seasonal

Need for coordination among stakeholders



¹European Centre for Disease Prevention and Control ²European Vaccine Manufacturers ³Influenza Vaccine Supply

epidemics⁴. Member States should, therefore, anticipate their vaccine requirements to meet a pandemic and adapt their vaccination coverage accordingly. This would have the benefit of significantly reducing annual morbidity and mortality. Equity of access may also be at risk if a pandemic occurs. Mechanisms of coordination among stakeholders are essential to achieve equitable distribution of vaccines not only in Europe but worldwide.

⁴ WHA 56.19 of 19-28 May 2003



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