

## Influenza Information



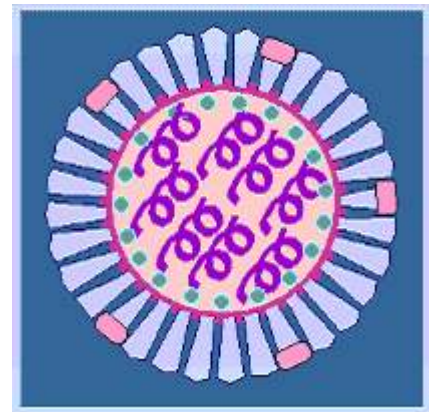
Influenza is characterised by fever, muscle aches and pains, headache and sore throat. In addition there may be cough and lethargy. There is usually no runny nose which characterises common cold infections.

Infection may be very mild, even asymptomatic, moderate or very severe (keep reading). The source of virus is acute infections in other humans. It is spread rapidly via aerosol droplets and fomites (from coughing and sneezing) with inhalation into the throat or upper respiratory tract of the next person. Incubation is short - 1-3 days. Rapid spread leads to epidemics.

Complications tend to occur in the young, elderly, and persons with chronic cardio-pulmonary diseases. They consist of pneumonia caused by influenza itself, and pneumonia caused by bacteria and other viral super-infection, eg. Adenovirus.

Here is a diagram of flu virus. Inside it has a copy of its genes as RNA and the machinery which allows the virus to replicate. The main thing to note is that on the outside the virus has two types of proteins protruding called NA (Neuraminidase) and HA (Haemagglutinin)

These are important because when the virus infects a person these are the only bits that the immune system can see. If the immune system recognizes them (with antibodies) the virus is eliminated and that individual won't get influenza. Otherwise the virus will escape the immune system and start to replicate until eventually new antibodies are made against these surface proteins.



Influenza is caused by any one of three related viruses - Influenza A,B or C. Influenza B and C are nearly always confined to humans (Influenza C can rarely be found in pigs). Influenza A is different, with aquatic birds being its normal host. Because Influenza B and C don't move around from one species to another, populations tend to have some background immunity to them. Hence they cause less severe disease and rarely cause pandemics. Influenza A can abruptly change its HA and NA (because it can jump from a different species). When it does this there is no initial immunity towards it - infection is more severe and pandemics can occur.

Here is an example of how the WHO (World Health Organisation) classifies influenza strains according to the type of HA and NA and the city where it was first isolated:

<b>A</b>	<b>SINGAPORE</b>	<b>6</b>	<b>86</b>	<b>(H1N1)</b>
TYPE of influenza	TOWN where first isolated	NUMBER of isolates	YEAR of isolation	MAJOR TYPE of HA and NA

**This is a list of the different strains of Influenza A**

- 1874 --- (H3N8)
- 1890 --- (H2N2) .....Pandemic
- 1902 --- (H3N2)
- 1918 --- (H1N1).....Pandemic
- 1933 --- (H1N1).....First strains isolated
- 1947 --- (H1N1).....Variation detected
- 1957 --- (H2N2)....."Asian" Flu pandemic
- 1968 --- (H3N2)....."Hong Kong" Flu pandemic
- 1976 --- (H1N1)....."Swine" Flu, non-epidemic
- 1977 --- (H1N1) + (H3N2)....."Russian" Flu epidemic

This constant change down the years means that new vaccines have to be made on a regular basis. Different strains of influenza may be more or less severe (virulence). The classical example is the "Spanish" flu epidemic of 1918 where at least 20 million people are thought to have died from infection, many of them healthy young adults.

In summary influenza is an unpredictable infection - we don't know when the next pandemic will come or how virulent it will be.

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