

Influenza virus infections in humans (August 2017)

This note is provided in order to clarify some of the differences between seasonal influenza, pandemic influenza, and zoonotic (e.g. swine or avian) influenza.

Currently, SEARO is experiencing some increased level of influenza activity in several of our member states. Recently, Maldives, Sri Lanka, and India all have had strong flu epidemics during their typical seasons, and currently Myanmar, Bangladesh, Thailand, and Nepal are experiencing similar flu activity. The influenza activity can vary in strength between years, between seasons, and sometimes between countries that are close to each other even during the same season.

What is “seasonal” influenza?

Seasonal influenza viruses circulate and cause disease in humans every year. In temperate climates, disease tends to occur in the winter months, spreading from person-to-person through sneezing, coughing, or touching contaminated surfaces. Seasonal influenza viruses can cause a range of illness from relatively mild to severe illness and even death, particularly in some high-risk individuals. Persons at increased risk for severe disease includes pregnant women, the very young and very old, immune-compromised people, and people with chronic underlying medical conditions.

Seasonal influenza viruses evolve continuously, which means that people can get infected multiple times throughout their lives. Therefore the components of seasonal influenza vaccines are reviewed frequently (currently biannually) and updated periodically to ensure continued effectiveness of the vaccines.

There are three large groupings or types of seasonal influenza viruses, labeled A, B, and C. Type A influenza viruses are further characterized by subtype according to the specific variety and combinations of two proteins that occur on the surface of the virus, the hemagglutinin or “H” protein and the neuraminidase or “N” protein. Currently, influenza A(H1N1) and A(H3N2) are the circulating seasonal influenza A virus subtypes. This seasonal A(H1N1) virus is the same virus that caused the 2009 influenza pandemic and it is now circulating every year seasonally. In addition, there are two type B viruses that are also circulating as seasonal influenza viruses, which are named after the areas where they were first identified, Victoria lineage and Yamagata lineage.

Type C influenza causes milder infections and is associated with sporadic cases and minor localized outbreaks. As influenza C poses much less of a disease burden than influenza A and B, only the latter two are included in seasonal influenza vaccines.

What is “Pandemic” influenza?

A pandemic occurs when an influenza virus which was not previously circulating among humans and to which most people don't have immunity emerges and is transmitted among humans. These viruses may emerge, circulate and cause large outbreaks outside of the normal influenza season. As the majority of the population has no immunity to these viruses, the proportion of persons in a population getting

infected may be quite large. Some pandemics may result in large numbers of severe infections while others will result in large numbers of milder infections, but the reasons behind these differences are not completely understood. The most notorious pandemic for which data are available was the “Spanish Flu” in 1918-1919 which caused an estimated 20-50 million deaths worldwide. Subsequent pandemics in 1957 and 1968 resulted in many fewer deaths in spite of large portions of the world’s population being susceptible to infection.

In 2009, a strain of influenza A(H1N1) virus which had not ever been seen before, emerged, spread across the world and caused the 2009 H1N1 pandemic. This pandemic A(H1N1)2009 virus has been widely circulating across the globe since 2009, and is now established in human populations as a seasonal influenza virus, as described above. Currently there is no longer a “pandemic” virus circulating in the world, it is the seasonal virus.

The H1N1 virus currently circulating is sometimes mistakenly called “swine” flu. This is not accurate. While the virus that emerged in 2009 had some swine flu bits, it also had avian (bird) bits in it too, but most of the virus was actually human influenza, which is why it spread so easily among humans.

What is a real “swine” or “avian” flu (zoonotic influenza)?

Animal influenza viruses are distinct from human seasonal influenza viruses and do not easily transmit to and between humans. However, some animal influenza viruses may occasionally infect humans causing disease in humans ranging from a mild illness to death. As such these viruses become zoonotic influenza viruses. Two main animals i.e. birds and swine are the natural hosts for avian and swine influenza viruses respectively. The recently known outbreaks in humans caused by zoonotic avian influenza viruses are the A(H5N1) virus influenza A(H7N9) which emerged in humans in 1997 and 2013 respectively. Most swine influenza viruses do not cause disease in humans, but some countries have reported cases of human infection from certain swine influenza viruses. These viruses have occasionally infected humans through direct contact with infected animals or contaminated environments, but has not adapted to humans which means that these viruses do not easily transmit between humans.

If such a virus acquired the capacity to spread easily among people either through adaptation or acquisition of certain genes from human viruses, it could start an epidemic or a pandemic. When animal influenza viruses infect their natural animal host, they are named for that host, as in avian influenza viruses, swine influenza viruses, equine influenza viruses, etc. As such, the term “swine flu” refers to swine influenza viruses infecting swine, and should not be used when such viruses adapted to humans to easily infect people.

¹ http://www.who.int/influenza/gisrs_laboratory/terminology_variant/en/index.html

² http://www.who.int/entity/influenza/human_animal_interface/influenza_h7n9/H7N9VirusNaming_16Apr13.pdf