

What is influenza?

- Influenza usually occurs in the autumn and winter months in the Northern (October through to April) and Southern (April to September) hemispheres and is characterised by explosive outbreaks lasting for six - eight weeks.
- Influenza is a highly contagious viral illness, which typically occurs during the autumn and winter months.
- Influenza is characterised by a sudden onset of debilitating clinical symptoms which affect the entire body.
- Influenza typically affects the upper and lower respiratory tracts, the nose, sinuses, throat, lungs and the middle ear.

Who is at risk?

Everyone is at risk of developing influenza. Every year, 100 million people are affected in Europe, Japan and the USA alone. Up to one in 10 adults and one in three children can be affected by influenza annually.¹

Certain groups of patients are at particularly high risk of developing the virus and additional complications. These include:

- elderly patients (over 65 years of age)
- individuals whose immune system is compromised e.g. by HIV treatment or steroid use
- young children
- patients suffering from chronic illnesses e.g. chronic respiratory, cardiac or renal disease
- diabetics

The symptoms of influenza

- The most defining characteristic of influenza is that symptom onset is sudden, in fact, sufferers can often remember the exact time at which the illness began.
- Symptoms may include: fever/chills, cough, muscle aches and pains, headaches and

fatigue/weakness. These symptoms are a direct consequence of viral replication and are different to symptoms associated with the common cold.

- The acute respiratory symptoms associated with influenza can last for five to seven days, whilst fatigue and weakness can persist for up to two to three weeks.
- Complications of influenza occur in all patient groups and include bronchitis, sinusitis, otitis media, pneumonia and also myocarditis and encephalitis. Children, the elderly and people with chronic respiratory or cardiovascular diseases are most at risk of developing complications as a result of influenza.

Signs & Symptoms	Influenza	Cold
Onset	Sudden	Gradual
Fever/Chills	Common	Rare
Cough	Usual; severe	Less common; mild to moderate
Headache	Prominent	Rare
Muscle aches and pains	Usual and often severe	Slight
Fatigue and weakness	Usual; lasts up to 2-3 weeks	Very mild

Epidemics and Pandemics

- The most prevalent form of the influenza virus is known as type A, and is associated with the most serious epidemics and pandemics.
- Influenza epidemics can occur virtually every year - though the extent and severity of each one varies widely - whilst pandemics – a worldwide epidemic - occur every 10 to 40 years and can affect up to 50 percent of the population.²
- The most severe influenza outbreaks include:
 - 1918-19 “Spanish flu” A (H1N1) 30 million+ deaths worldwide
 - 1957-58 “Asian flu” A (H2N2) 1 million deaths worldwide
 - 1968-69 “Hong-Kong flu” A (H3N2) 800,000 deaths worldwide

The Burden of Influenza

Influenza outbreaks place a huge burden on the healthcare sector and resources, and also on industry.

Healthcare

- Primary care physician consultations are estimated to increase by 150 to 450 percent during influenza epidemics - imposing considerable strain and cost on the healthcare system.³
- Complications due to influenza, such as sinusitis, bronchitis and pneumonia generate additional costs for the healthcare system, both from an outpatient and inpatient perspective. Data from large hospital surveys conducted in the USA show that the rate of hospital admissions increases by 100 to 170 percent during influenza epidemics.¹

Industry

- Influenza has been estimated to account for one-tenth of all sickness absences from work.⁴
- After return to work, 80 percent of adults find that their work performance is reduced.⁵
- Lost productivity costs \$12 billion each year in the USA alone.⁶

Until recently, treatment options for influenza have been limited. The vast majority of patients use over-the-counter medications, such as paracetamol, to reduce the symptoms of influenza, but these agents do not attack the influenza virus itself and therefore the illness continues, which increases the risk of secondary complications.

Vaccination

The prevention strategies for influenza infection focus on vaccination of vulnerable groups and aim to try and prevent infection. In general, studies suggest that vaccines are between 70 and 90 percent effective, but can be less effective in some patient populations, e.g. in the elderly with an effectiveness of 30 and 40 percent. If an unpredicted new strain of virus appears after the vaccine has been manufactured and distributed, individuals who have received the vaccine will not be protected.

Surveillance ensures that influenza vaccine produced each year is effective against the appropriate strain and produced in good time. The World Health Organisation (WHO) co-

ordinates information exchange in the global surveillance of influenza, and advises on the formulation of vaccines against the virus.

Anti-Virals

The use of older antiviral drugs is low due to their limited spectrum of activity, unfavourable side effect profile and rapid onset of resistance. However, newer neuraminidase inhibitors (NAIs) – that attack the virus, the root cause of the influenza infection have been shown to be very effective.

Two NAIs have been developed for the treatment of influenza. The first, zanamivir, is given using a dry powder, inhaler device. The second, Tamiflu[®] (oseltamivir phosphate) a neuraminidase inhibitor is now available in convenient oral formulation that is easily administered to children.

NAIs target one of the two major surface structures of the influenza virus, the neuraminidase protein. The neuraminidase active site is virtually the same in all common strains of influenza. If neuraminidase is inhibited, the virus is not able to infect new cells.

Controlling influenza: Surveillance

The percentage of accurate influenza diagnoses dramatically increases (and can even double) when physicians know influenza is around.⁷ With knowledge of a local outbreak, and when using a defined set of influenza symptoms as diagnostic criteria, physicians can consistently diagnose and treat influenza. Patients are able to present to their doctor early, and receive appropriate treatment. National systems are not available everywhere and where they are available geographic gaps exist resulting in sporadic coverage. Timing of reporting from national systems varies from one - four weeks.

Roche has developed an influenza rapid test, for use by selected surveillance centres for more timely, specific, local influenza outbreak detection, to support accurate influenza diagnoses and treatment decisions.

References:

1. Nguyen-Van-Tam JS. Epidemiology of influenza. In: Textbook of Influenza (Nicholson KG, Webster RG, Hay AJ, eds.). Oxford: Blackwell Science Ltd, 1998: 181–206.
2. Glezen WP. Emerging infections: pandemic influenza. *Epidemiologic Reviews* 1996; **18**: 64–76.
3. Nicholson KG, Webster RG, Hay AJ, eds. Textbook of Influenza. Oxford: Blackwell Science Ltd, 1998: 181–206.
4. Smith A. Influenza, colds and performance efficiency. *Occupational Health Review* 1992; **35**: 13–15.
5. Szucs TD, Snacken R. The socioeconomics of influenza and its control measures. *Pharmacoeconomics*, 1999, Vol 16, Supplement 1:28
6. Nichol, KL et al. The efficacy and cost effectiveness of vaccination against influenza amongst elderly persons living in the community. *N Engl J Med* 1994; **331**: 778-84
7. Treanor JJ. In: Mandell, GL, Bennet GE, Dolin R eds. Principles and practice of infectious diseases 5th ed. New York: Churchill Livingstone, 1999, **14**: 191-197