

# What is Influenza?

Influenza is a respiratory tract infection caused by influenza viruses.

## What is the Influenza Virus?

- RNA virus, Orthomyxoviridae group
- Easy to mutate
- Has various types: A, B, and C

Symptoms caused by type A are heavier than type B, while type C is more likely to cause no symptoms.

Type A is also the easiest to mutate (both minor mutations and major mutations)

## What are the symptoms of influenza-induced disease?

- Fever
- Cough
- Cold
- Headache
- Throat pain
- Sore
- Weak

# Why should influenza be watched out?

**INFLUENZA is very EASY TO DELIVER (Friends, Family Members, and Patients)**

**Transmitted by air through mediation**

- Cough
- Sneezing
- Saliva
- Objects contaminated by coughing, sneezing and saliva

**INFLUENZA reduces PRODUCTIVITY**

Not going to work or not going to college because of influenza

**An ounce of prevention is worth a pound of cure**

- Higher medical costs
- Discomfort due to symptoms of influenza for several days (dizziness, headache, rheumatic pain, etc.)

**GROWING OTHER CHRONIC DISEASES**

- Strengthening heart disease
- Strengthening lung disease
- Prevent diabetics who are susceptible to flu
- Can result in death from pneumonia

## **EASY and FAST to MUTATE**

Influenza viruses are viruses that are very easy to change (mutate) compared to other viruses. Mutations that occur can be small / minor (antigenic DRIFT) and large / major (antigenic SHIFT).

### **Antigenic DRIFT**

- Minor changes in the HA (haemagglutinin) and NA (Neuraminidase) influenza viruses
- Occurs in all types of influenza viruses

## **Seasonal Influenza Causes**

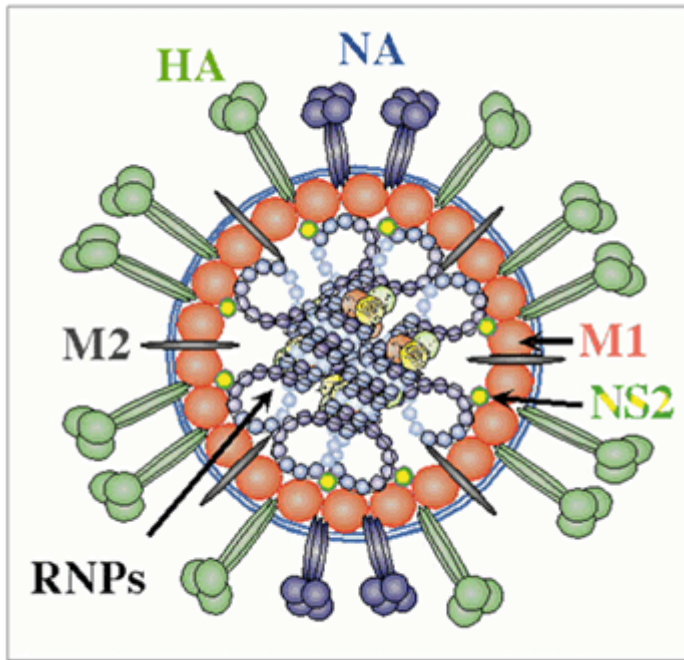
### **Antigenic SHIFT**

- Changes occur in RNA
- 2 different strains of the virus merge to form an RNA segment change - called "reassortment", occurring in one 'reservoir' - infected host
- Causes major changes to HA & NA
- Only occurs in type A viruses
- **Causes of influenza pandemic**
- Causes pain and more death

## **What are HA & NA?**

HA and NA are the buttons on the surface of the influenza virus

- **HA (Haemagglutinin Antigen)**  
Playing a role in attachment of the virus to respiratory epithelial cells (host) so that it can enter into the host cell.
- **NA (Neuraminidase Antigen)**  
Playing a role in releasing viruses which have multiplied in host cells so that they can spread to other cells.



*Diagram kindly provided by Paul Digard, University of Cambridge*

**Have you been vaccinated against influenza?**

**Who is susceptible to influenza?**

Children

Elderly

Immune disorders sufferer

Health worker

**Estimated days lost due to influenza infection**

