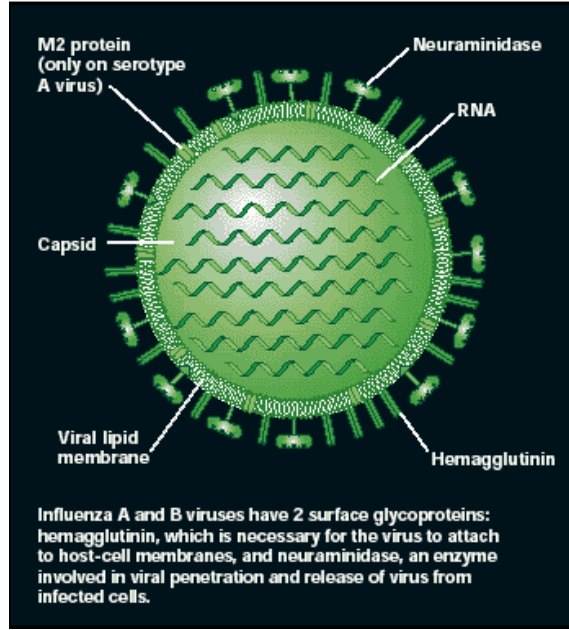
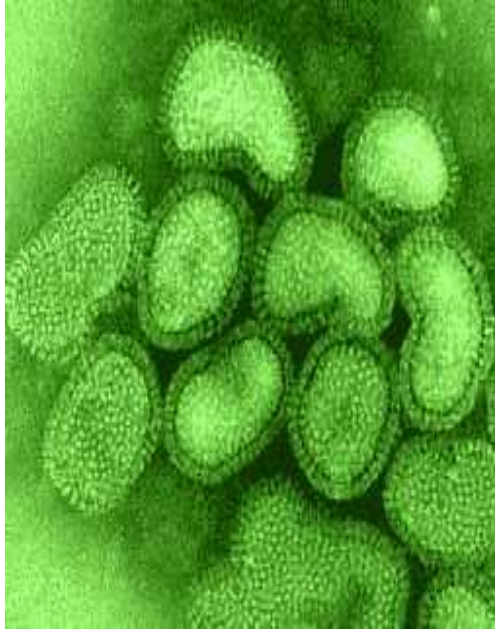


1. Virology of Influenza

Segmented and enveloped , spherical RNA virus



Taxonomy

Family	Orthomyxoviridae		
Genus	Influenza Virus		
Types (based on Nucleo Protein and M Capsid Protein)	Type A	Type B	Type C
Sub Types or Sero types (based on hemagglutinin (H) and the neuraminidase (N) 17 H and 10 N H 1-17 N 1-10	The subtypes based on the combination of H and N proteins :H1N1, H1N2, H2N2, H3N1, H3N2, H3N8, H5N1, H5N2, H5N3, H5N8, H5N9, H7N1, H7N2, H7N3, H9N2, H10N7 Infect multiple species; Human, Avian, Swine,	No subtypes Infect humans	No sub types Infect humans and pigs

	equine etc		
Genetic Plasticity	<p>Undergoes mutation that can take place within the genome (Antigenic drift) / or re-assortment among the genetic materials of subtypes (Antigenic Shift) resulting in a new virus.</p> <p>Antigenic Drift is responsible for new seasonal strains that makes necessary surveillance to detect these strains and to prepare new seasonal influenza vaccine (yearly basis)</p> <p>Antigenic Shift may result in a new virus easily transmissible from man to man for which the population has no immunity : Results in Pandemics</p>	Antigenic variations infrequent	Antigenically stable
Public Health Importance	<p>Causes Pandemics</p> <ul style="list-style-type: none"> • Spanish Flu [A (H1N1)] 1918-19; • Asian Flu [A (H2N2)] 1957-59; • Hongkong Flu [A (H3N2)] 1968-68; • “Swine Flu” [A (H1N1)] 2009-10 <p>Causes Epidemics, seasonal Influenza outbreaks and sporadic cases.</p>	Causes Epidemics Seasonal Influenza	Causes mild respiratory disease Does not Cause epidemic

2. Epidemiology of Seasonal Influenza (Seasonal Flu)

Agent Factors		
	Agent	Presently circulating strains [A (H1N1)2009; Circulating seasonal influenza A (H3N2) and Influenza B
	Reservoir of Infection	Humans
	Source of infection	Case or sub-clinical case
	Communicability	3-5 days from clinical onset in adults; Up to 7 days in young children Peak viral shedding occurs on day 1 of symptoms
	Incubation Period	1-2 days
Host Factors		
	Age and sex	All ages ; incidence higher in extremes of ages / both sex
	High Risk	young children with pre disposing risk factors, old age; Pregnant mothers, Health workers, Co-morbid conditions (Lung disease, heart disease, liver disease, kidney disease, blood disorders, Diabetes); Immuno-compromised; long term steroid treatment.
	Immunity	No cross-immunity between different sub-types/ strains. Antibodies appear in 7 days after an attack; reach maximum. Level in 2 weeks; drops to pre-infection level in 8-12 months
Environmental Factors		

	Seasonality	Temperate zones: epidemics occur in winter Tropics/ Sub tropics: epidemics occur in rainy season Sporadic cases: round the year
	Overcrowding	Mostly affect urban and peri-urban areas.
	Closed populations	High attack rates may be witnessed in Army Barracks, College hostels, Schools, Residential hostels of schools, aircrafts, ships etc
Disease Transmission		
	Airborne	Droplets from infected human beings;
	Contact	Direct contact/ contact with fomites