



Influenza Virus: Evolution of a Deadly Virus in our World

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DISCLOSURES

- This author does not have any disclosures or conflicts of interest for this presentation.
- This presentation does not represent any formal opinion of the Veterans Healthcare Administration.



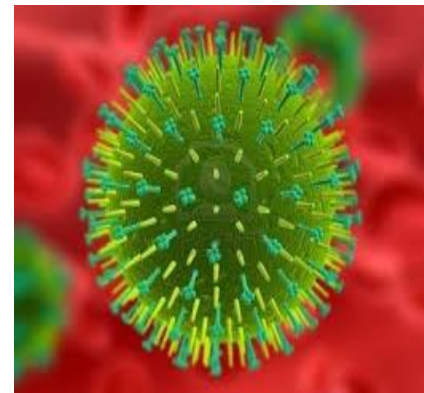
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Purpose

- The Objectives of this presentation are:
- 1) Discuss the evolution of Influenza virus worldwide.
- 2) Describe current strategies to prevent and treat Influenza in all age groups.
- 3) Provide the World Health Organization (WHO) current health policies guidelines on Influenza Virus.



Audience Survey

- In the past year, how many of you received an Influenza vaccine?
- How many of you recommended the vaccine for your patients?



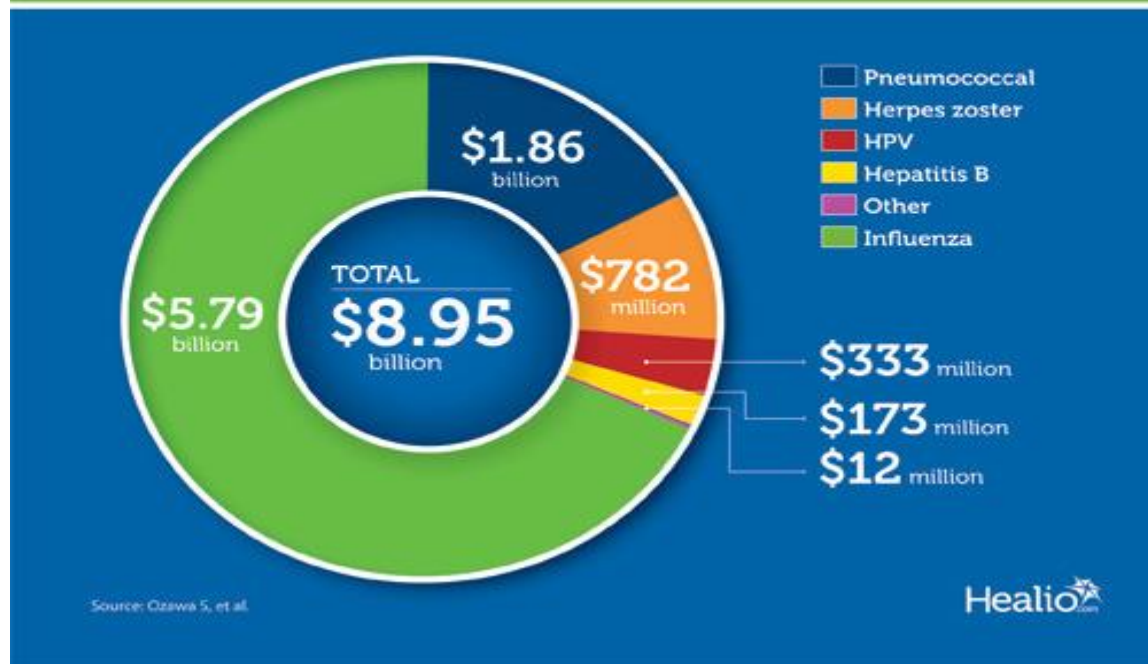
Statistics on Influenza

- Since the 1918 Spanish Flu Epidemic, some type of surveillance has occurred.
- Since 1969, the World Health Organization(WHO) set up the Global Surveillance Network. And was renamed the Global Influenza Surveillance System in 2008.
- 110 countries participate.
- Influenza is still listed in the top 10 causes of death today
- 3-5 million people contract Influenza annually.
- Up to 1/2 million lives are lost to Influenza worldwide



Economic burden of Influenza illness

Annual economic burden of vaccine-preventable diseases by pathogen, 2015

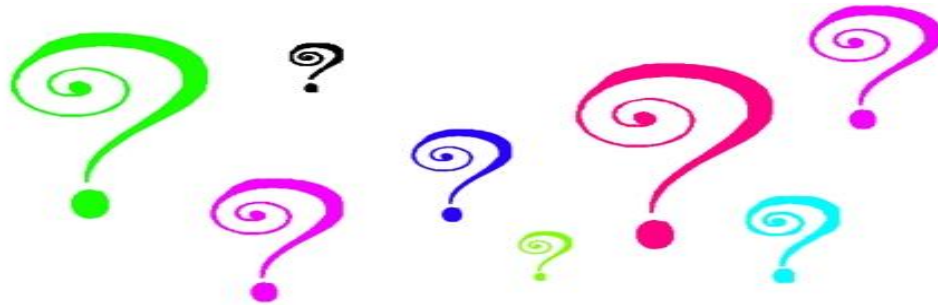


Retrieved from: www.healio.com/infectious-disease/vaccine-preventable-diseases-6-14-2017



Influenza Virus

- The Question is not if but when:



- A PANDEMIC FLU OUTBREAK IS INEVITABLE!

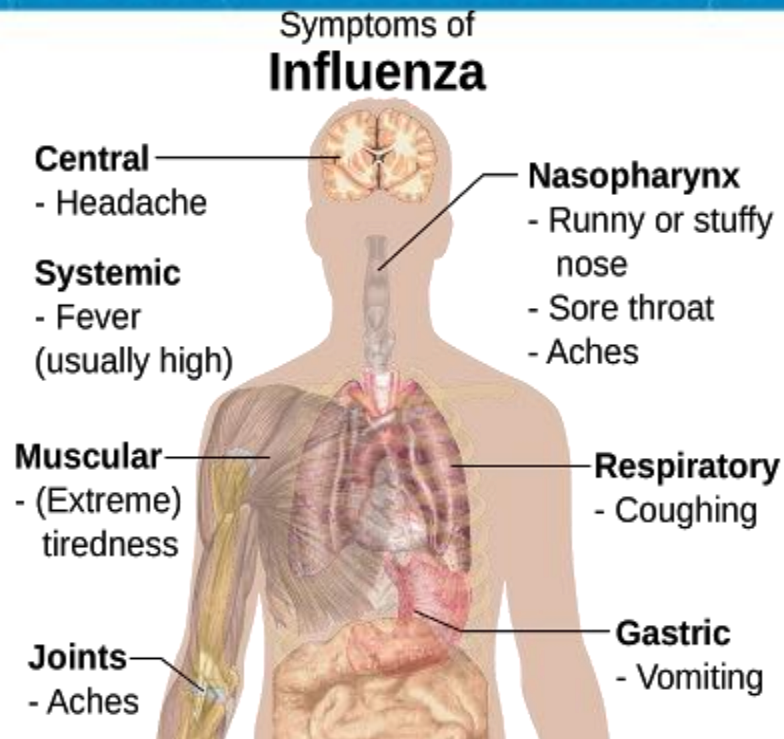


Risk Factors for Influenza

- Anyone can become Infected but most Vulnerable Populations:
 - Elderly
 - Pregnant women
 - Children less than 5 years of age
 - People with certain chronic diseases:
 - HIV-AIDS, HEART DISEASE, DIABETES, LUNG DISEASE INCLUDING ASTHMA & CHRONIC LUNG DISEASE.
 - Health Care Workers
 - ? Obesity



Symptoms of Influenza



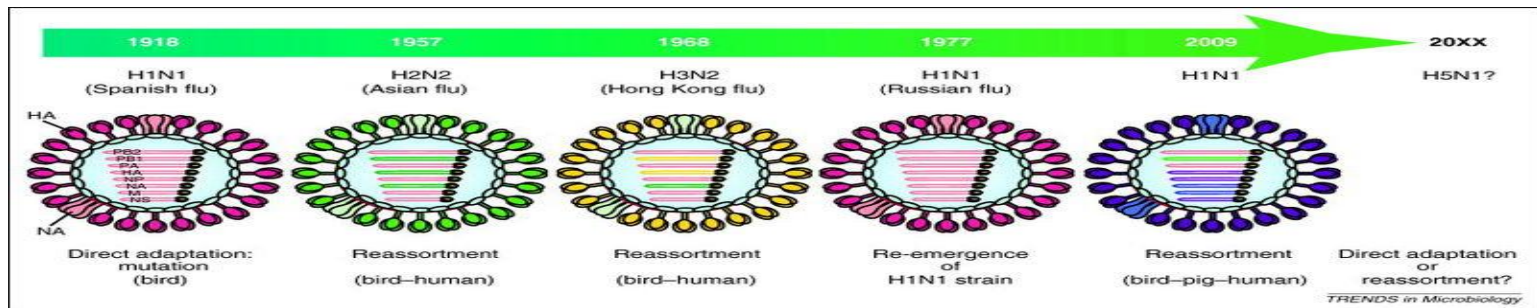
** Taken from : <http://influenza-contagiousdisease.weebly.com/symptoms.html> Retrieved on 6-12-17.

Worldwide Influenza Virus Evolution

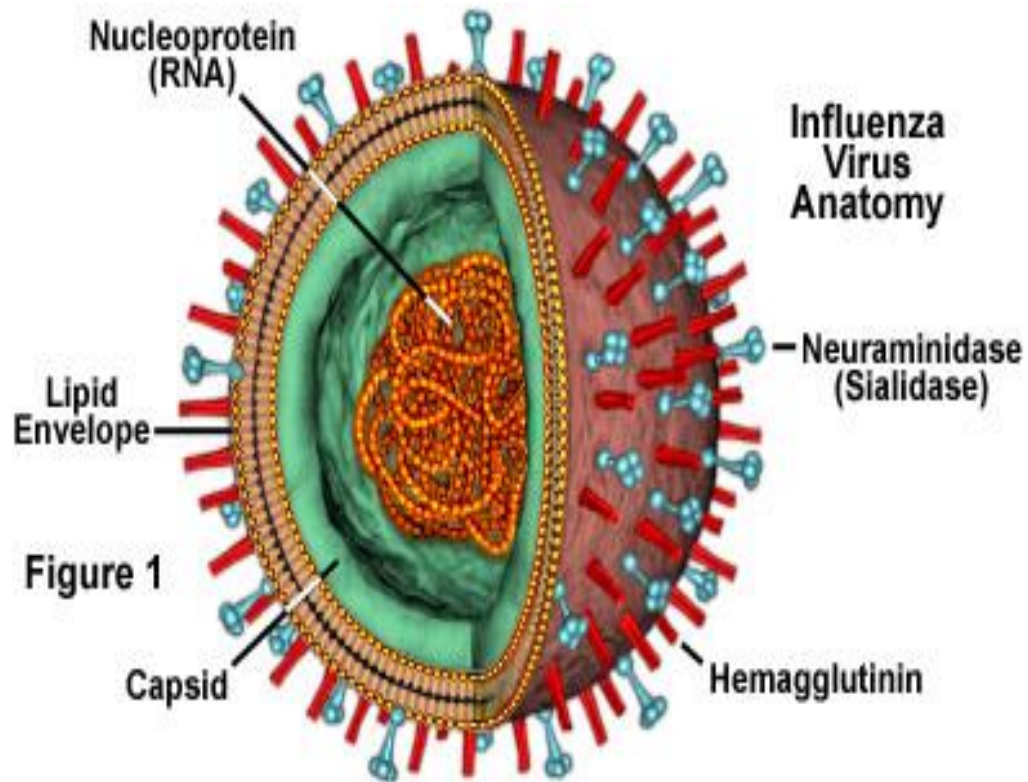
- Three types of Influenza: **A**, **B** and **C**.
- Type **A** and **B** virus are responsible for seasonal flu outbreaks.
- Type **A** is the most prevalent and can infect both humans and animals.
- Animals that can be infected with A includes: pigs, domestic birds, water fowl, horses, whales and seals.
- Type **B** Influenzas Viruses is known as: **B-Yagamata** or **B-Victoria** and has no sub-types.
- Type **C** virus is less virulent and causes a mild form of Flu and is does not cause epidemics.

Evolution of Influenza Virus

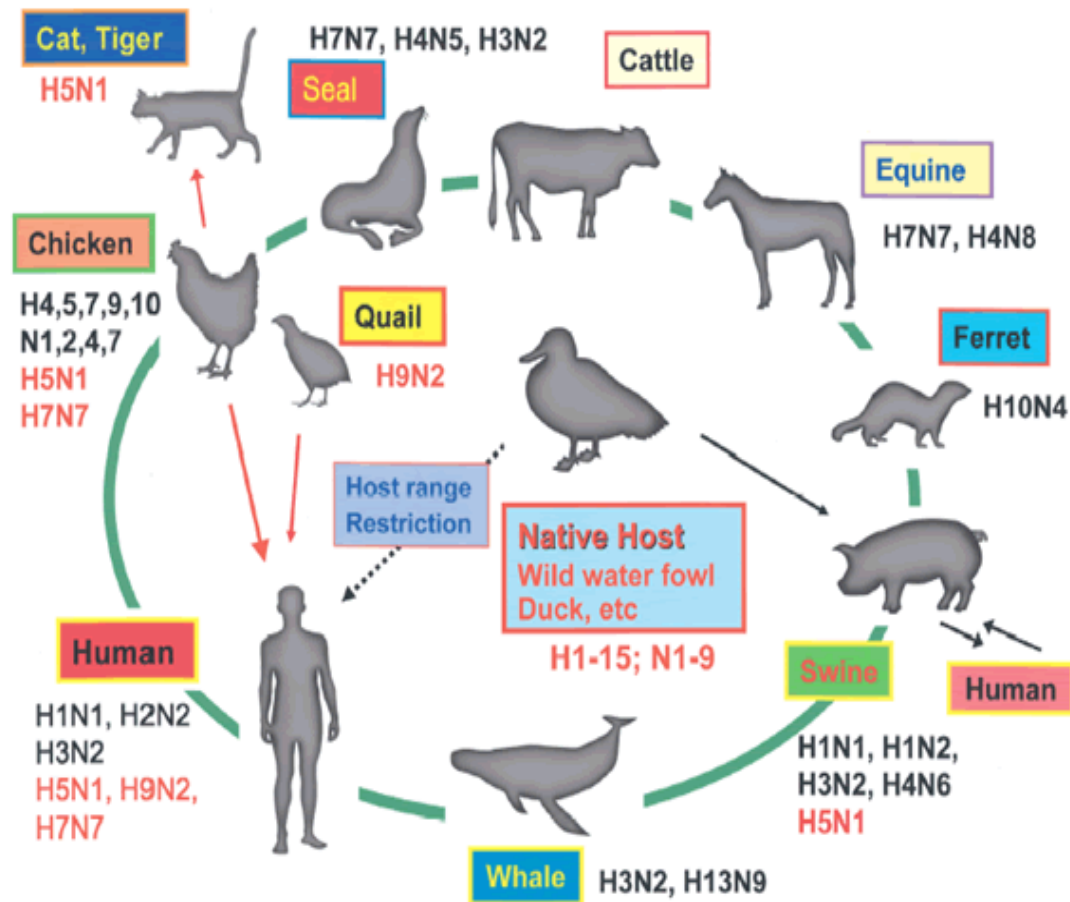
- The Influenza A virus is noted as Haemagglutinin (H), Neuraminidase (N): for example H#N#.
- This virus over time has mutated and today : H1N1, H3N2, H5N1, & H7N9 currently can infect humans.
- The different # corresponds to the order in which this subtype was discovered.



Influenza Virus Cell**



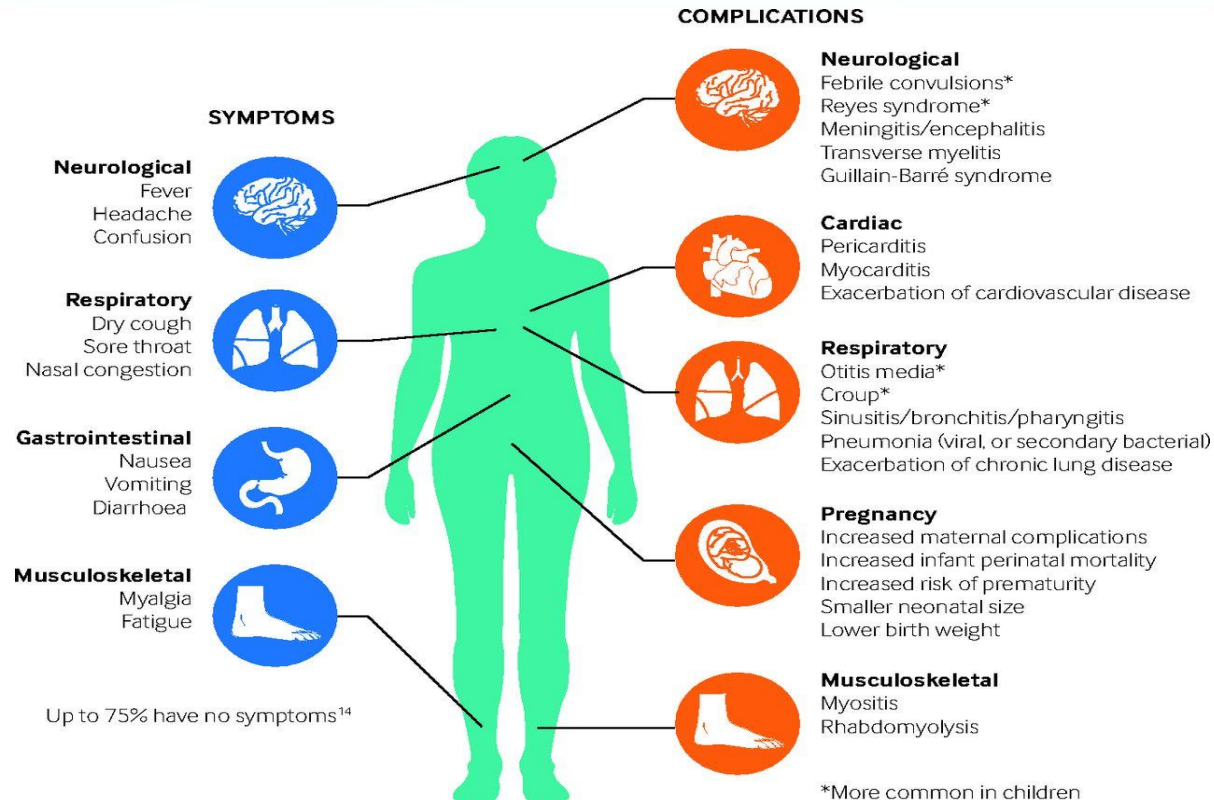
Evolution of Influenza Virus



Levels of Prevention for Influenza

- PRIMARY- prevention includes good hand hygiene, avoidance of contagious exposure and Influenza vaccine
- SECONDARY- Early screening and intervention- symptom control, isolation of contagious exposure and use of medications that may help avert serious sequelae:
 - Meds: Relenza- Zanamivir- 1 inhalation QD for 10 days.
- TERTIARY: Treatment of the Sequelae such as Pneumonia or complications of Influenza virus.

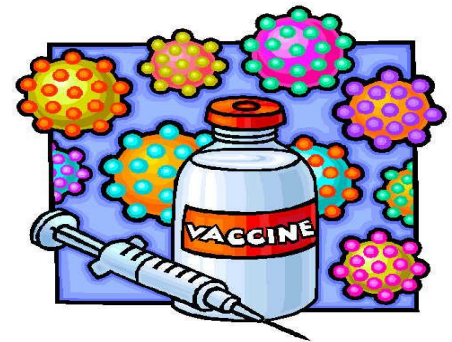
Complications of Influenza Illness*



**BMJ 2016; 355 doi: <https://doi.org/10.1136/bmj.i6258> (Published 07 December 2016) Cite this as: BMJ 2016;355:i6258*

Risks, efficacy and benefits of Influenza Vaccine

- Risks:
- Efficacy of various vaccines
- Benefits based on age groups
- Vaccine Adverse Events Reports:



Influenza Virus types and doses

- WHO convenes an expert panel annually to predict which virus strains are most likely to be virulent.
- Vaccines are then produced annually based on these predictions.
- Three types of Vaccine at this time:
- Standard dose: .05 ml IM
 - **Trivalent**- Two subtypes of A, One subtype of B
 - **Quadrivalent**- Two of subtype A and two of subtype B.
- High dose:
- Nasal spray

World Health Organizations Guidelines On Treatment By Age Group

- Infants > 6 months of age
- Children:
- Adults
- Adults 65+
- Chronic disease risk factors:



Summary

- *Influenza is still a cause of significant morbidity and mortality today.
- *One of the major Infectious diseases in our world that can be mediated by early, effective immunization.
- *Evolution of the virus is ongoing and effective strategies at prevention need to take into consideration the evolving virus and ongoing development of effective vaccines.
- *Targeting all vulnerable populations for immunization is paramount to trying to prevent a pandemic influenza outbreak worldwide.



References/Bibliography

- To be distributed at presentation