H1N1 Pandemic
The medical background

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Pandemic Flu history

• The pandemic of 1918-1919 occurred in three waves.
• The first wave had occurred when mild influenza erupted in the late spring and summer of 1918. The second wave occurred with an outbreak of severe influenza in the fall of 1918 and the final wave occurred in the spring of 1919.
• In its wake, the pandemic would leave about twenty million dead across the world. In America alone, about 675,000 people in a population of 105 million would die from the disease.
Protecting Yourself From Influenza: 1918

- In the absence of a sure cure, fighting influenza seemed an impossible task.
- In many communities, quarantines were imposed to prevent the spread of the disease. Schools, theaters, saloons, pool halls and even churches were all closed. As the bodies mounted, even funerals were held out doors to protect mourners against the spread of the disease.
- Public officials, who were unaware that influenza was a virus and that masks provided no real protection against viruses, often demanded that people wear gauze masks. Some cities even passed laws requiring people to wear masks. Enforcing these laws proved to be very difficult as many people resisted wearing masks.
- Advertisements recommending drugs which could cure influenza filled newspapers.
- Some doctors suggested that drinking alcohol might prevent infection, causing a run on alcohol supplies.
- Some folk healers insisted that wearing a specific type of amulet or a small bag of camphor could protect against influenza.
- States passed laws forbidding spitting, fearing that this common practice spread influenza.
- None of these suggestions proved effective in limiting the spread of the pandemic.
Scientific Milestones in Understanding & Preventing Influenza

- In the early stages of the pandemic, many scientists believed that the agent responsible for influenza was Pfeiffer’s bacillus. Autopsies and research conducted during the pandemic ultimately led many scientists to discard this theory.

- In late October of 1918, some researchers began to argue that influenza was caused by a virus. Although scientists had understood that viruses could cause diseases for more than two decades, virology was still very much in its infancy at this time.

- It was not until 1933 that the influenza A virus, which causes almost every type of endemic and pandemic influenza, was isolated. Seven years later, in 1940, the influenza B virus was isolated. The influenza C virus was finally isolated in 1950.

- Influenza vaccine was first introduced as a licensed product in the United States in 1944. Because of the rapid rate of mutation of the influenza virus, the effectiveness of a given vaccine usually lasts for only a year or two.

- By the 1950s, vaccine makers were able to prepare and routinely release vaccines which could be used in the prevention or control of future pandemics.
Maryland

Photo: Oath-taking ceremony at Camp Meade, Maryland. Camp Meade was the first part of Maryland struck by the pandemic and was also the most devastated by it. [Credit: Library of Congress]

- **Population in 1920:**
  1.44 million. Baltimore was the state's largest city with a population of 733,826.

- **Demographics:**
  The majority of the state's residents lived in urban areas.

- **First Official Report of Influenza:**
  The Public Health Service did not require states to report influenza before September 27th. Maryland first reported the presence of influenza on September 28th, but the disease was undoubtedly present in the state before that date.
1918 vs. 2009

- The influenza A virus was not identified as the causative agent of the flu
- Prevention methods were not scientifically based
- Disease tracking and reporting was instituted until well into the pandemic progression
- Vaccine was not available
- Anti-virals were not available
- Treatment modalities were limited (ventilators etc)

- We know influenza is a virus and we can classify it by subtype
- We understand disease transmission
- Tracking is used and communicated back to states
- Vaccine is available
- Anti-virals are available
- ICU care is available, though questions have been raised regarding the availabilities of the supply to keep up with demand
Seasonal Flu in the US

• Every year in the United States, on average:
  • 5% to 20% of the population gets the flu;
  • more than **200,000** people are hospitalized from flu-related complications; and
  • about **36,000** people die from flu-related causes.

• Some people, such as older people, young children, pregnant women and people with certain health conditions (such as asthma, diabetes, or heart disease), are at increased risk for serious complications from seasonal flu illness
H1N1 2009

- **Novel strain:** This is a new influenza A(H1N1) virus that has never before circulated among humans. This virus is not related to previous or current human seasonal influenza viruses.
- The new influenza A(H1N1) appears to be as contagious as seasonal influenza, and is spreading fast particularly among young people (from ages 10 to 45). The severity of the disease ranges from very mild symptoms to severe illnesses that can result in death.
- There are no known instances of people getting infected by exposure to pigs or other animals.
- The place of origin of the virus is unknown.
Vaccine Target populations

**Seasonal flu vaccine recommendations**

- Children aged 6 months up to their 19th birthday
- Pregnant women
- People 50 years of age and older
- People of any age with certain chronic medical conditions
- People who live in nursing homes and other long-term care facilities
- People who live with or care for those at high risk for complications from flu, including:
  - Health care workers
  - Household contacts of persons at high risk for complications from the flu
  - Household contacts and caregivers of children <5 years of age with particular emphasis on vaccinating contacts of children <6 months of age (these children are at higher risk of flu-related complications)

**H1N1 flu vaccine recommendations**

- People 6 months through 24 years of age
- Pregnant women
- People 25 years through 64 years of age who have certain medical conditions that put them at higher risk for influenza-related complications
- People who live with or provide care for infants younger than 6 months (e.g., parents, siblings, and day care providers),
- Health care and emergency medical services personnel,
H1N1 – 2009 timeline

- March / April 2009: Novel influenza A (H1N1) is a new flu virus of swine origin that first caused illness in Mexico and the United States
- April 15, 2009: The first novel H1N1 patient in the United States was confirmed by laboratory testing at CDC
- June 2009: WHO declared that a global pandemic of novel influenza A (H1N1) was underway - over 70 countries had reported outbreaks.
- June 19, 2009, all 50 states in the United States, Washington DC, Puerto Rico, and the U.S. Virgin Islands have reported novel H1N1 infection.
- October 17, 2009: Worldwide there have been more than 414,000 laboratory confirmed cases of pandemic influenza H1N1 2009 and nearly 5000 deaths reported to WHO.
- Since August 30, 2009, CDC has received 53 reports of influenza-associated pediatric deaths that occurred during the current influenza season (three deaths in children less than 2 years, seven deaths in children 2-4 years, 21 deaths in children 5-11 years, and 22 deaths in individuals 12-17 years).
- Forty-seven of the 53 deaths were due to 2009 influenza A (H1N1) virus infections, and the remaining six were associated with influenza A virus for which the subtype is undetermined. A total of 95 deaths in children associated with 2009 H1N1 virus have been reported to CDC.
- Among the 53 deaths in children, 32 children had specimens collected for bacterial culture from normally sterile sites and seven (21.9%) of the 32 were positive; Staphylococcus aureus was identified in five (71.4%) of the seven children.
H1N1 today

Data Collected: October 11-17, 2009

- 4,855 (37.5%) specimens tested were positive for influenza.
- All subtyped influenza A viruses being reported to CDC were 2009 influenza A (H1N1) viruses.
- The proportion of deaths attributed to pneumonia and influenza (P&I) was above the epidemic threshold.
- Eleven influenza-associated pediatric deaths were reported. Nine of these deaths were associated with 2009 influenza A (H1N1) virus infection and two were associated with an influenza A virus for which subtype is undetermined.
International update

- The 2009 H1N1 influenza virus is the predominant influenza virus in circulation in most countries worldwide.
- The epidemiology of disease caused by 2009 H1N1 influenza in the Southern Hemisphere is very similar to that described in the United States in the spring of 2009.
- There have been no significant changes detected in the 2009 H1N1 influenza viruses isolated from persons in the Southern Hemisphere as compared to viruses isolated from persons in the Northern Hemisphere.
- According to WHO, the majority of 2009 H1N1 influenza isolates tested worldwide remain sensitive to oseltamivir, an antiviral medicine used to treat influenza disease.
Pneumonia and influenza mortality
October 11-17, 2009

• During week 41, 6.9% of all deaths reported through the 122-Cities Mortality Reporting System were due to P&I.
• This percentage was above the epidemic threshold of 6.6% for week 41.
• Including week 41, P&I mortality has been above threshold for three consecutive weeks.
QUESTIONS???