



Learning from Pandemic Flu – Student Instructions



Stop a Flu Pandemic

The flu pandemic of 1918-19 hit the United States in three distinct waves, resulting in an estimated 675,000 deaths. While the origin of the **virus** isn't confirmed, the most likely source is Haskell County, Kansas in January 1918. The small town was overwhelmed by an influenza epidemic unlike any the local doctor had ever seen before. Strong, healthy, robust people were being struck down quickly as if they had been shot. The disease burned through the town quickly with high casualty rates but disappeared after only a few weeks. In March, soldiers from Haskell County, Kansas travelled to nearby Camp Funston and brought flu with them. Troop movement to other bases in the U.S. and in Europe efficiently transmitted the **virus** around the globe. The first wave of the disease was mild compared to what was to come in the fall.



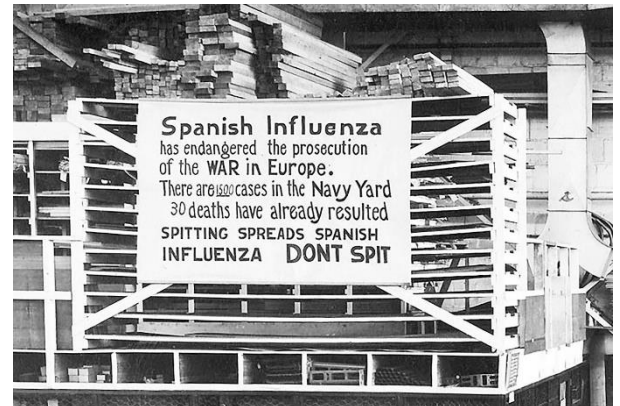
Emergency hospital at Camp Funston, Kansas
(National Museum of Health and Medicine)

The following example comes from events that occurred along the East Atlantic Coast in September 1918. Use the **public health** approach to epidemic investigation to propose an intervention.

▪ **Surveillance:** *What is the problem?*

In early September, Boston held a “Win the War for Freedom” parade where a few infected individuals spread the disease to many soldiers, seamen, and civilian shipyard workers. The flu quickly spread to the rest of the city with high casualties. Sailors from Boston shipped out for Philadelphia and brought the flu with them. Hundreds of sailors in Philadelphia were sick within days, and dozens died.

Death from this flu was quick and unpleasant. Young, healthy people experienced high fevers, body aches, fatigue, and violent coughing fits as their lungs filled with fluid. Unable to breathe, soldiers turned a dark blue color as they died, choked by their own mucus and blood. The flu was very transmissible from person to person and was more than 25 times deadlier than seasonal flu. Firsthand accounts from the period describe “bodies stacked like cordwood” in the hallways of hospitals and infirmaries.



A precautionary sign in a Philadelphia Navy Yard
(US Naval History Museum)

▪ **Risk Factor Identification:** *What is the cause?*

A war bond fundraising parade was planned in Philadelphia for September 28, 1918. The Liberty Loan Drive parade would include floats, community groups, uniformed troops, and even a marching band led by the great John Philip Sousa. Even President Wilson would be attending. The parade was a monumental event, especially during wartime, and was expected to draw tens of thousands of people to the crowded streets of Philadelphia. Wilmer Krusen was the city's politically appointed **public health** director at the time. Faced with rising case numbers and objections from local medical experts, Krusen had a decision to make: how will the city fund the war and control the flu? Answer the questions provided on the Student Data Collection Sheet.

- Intervention Evaluation: What works?

As health director, Krusen has the duty to protect the health of the people of Philadelphia. It's time to start thinking about how to slow or stop the spread of this deadly disease using medical knowledge. Answer the questions provided on the Student Data Collection Sheet.

- Implementation: How would you do it?

Knowing the dangers of this flu and the realities of wartime, what should Krusen do? Cancel the parade and give up a huge fundraising opportunity? Let the parade go on knowing that people might get sick? Something else? Answer the questions provided on the Student Data Collection Sheet.



Prevent a Pandemic

Advance planning and preparedness are critical to help reduce the impact of a pandemic.

In 1999, the World Health Organization (WHO) published a report called "Pandemic Influenza Risk Management" that outlines global needs when responding to pandemic flu. These guidelines were published after cases of a novel H5N1 avian influenza were detected. As a result, the plans put in place using this report guided the response to the 2009 pandemic flu. Read more about an **outbreak** of novel type A influenza and decide how you would proceed using the **public health** approach to epidemic investigation.

- Surveillance: What is the problem?

In May 1997, a 3-year-old boy in Hong Kong contracted an influenza-like illness and died 12 days later. The **virus** was identified as an influenza type A. Further testing showed it to be a type of H5N1 related to an avian strain that killed thousands of chickens in rural Hong Kong chicken farms in March. No other cases were observed in humans, but because of the transmission from bird to human, disease **surveillance** capacity was increased to include routine testing for H5 surface proteins. In November, a small cluster of new H5N1 cases was detected. Of the 17 cases identified, 5 were fatal (18% fatality rate for children and 57% in adults 17+).

- Risk Factor Identification: What is the cause?

Travelling, eating or preparing poultry products, and recent exposure to those with respiratory infections were not associated with these patients' illness, but exposure to live poultry in the week before illness was. Those infected had visited live chickens in local marketplaces in the days before illness onset, which suggested direct transmission from bird to humans rather than person-to-person transmission. Blood tests showed that some people who had direct physical contact with infected individuals had H5 antibodies, indicating that some degree of human-to-human transmission had occurred but did not result in illness. Answer the questions provided on the Student Data Collection Sheet.

- Intervention Evaluation: What works?

Suppose you were a **public health** official in Hong Kong during this time. Use the background information to come up with a plan that will address the **outbreak**. In this step of the **public health** approach to epidemics, you must think about what has worked in the past. Answer the questions provided on the Student Data Collection Sheet.

- Implementation: How would you do it?

From your idea list above, choose the one that you think will be the most effective to end the **outbreak** and prevent future spread of H5N1 flu. Answer the questions provided on the Student Data Collection Sheet.

Updates: What Really Happened?

Now that you have analyzed the information given and made your choices, see how the events unfolded in real life by reading the updates for each of the case studies you examined.

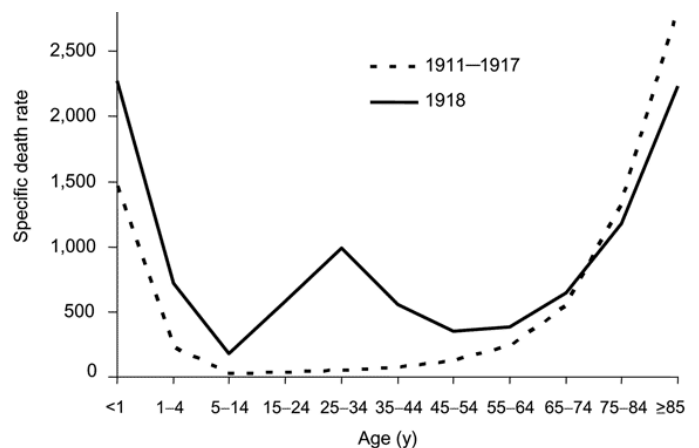
Stop a Flu Pandemic



Wilmer Krusen minimized the threat that flu posed, claiming it was just an old-fashioned flu. Despite many objections and reports of deadly **outbreaks** nearby, he allowed the parade to go ahead with promises to create an information campaign against coughing, spitting, or sneezing. The politics of wartime won out over **public health**.

The results were predictable. Within 72 hours, every hospital bed in the city was full. The city went into full lockdown 5 days after the parade, but it was too late to contain the illness. About 2,600 people were dead within a week. More than 12,000 would die in the next few weeks. Hospitals were overwhelmed, and Krusen tried to find more doctors and nurses to treat the abundance of patients. He increased sanitation efforts in the city and hired people to remove bodies from homes, which would later be dumped into mass graves due to a casket shortage. Philadelphia was one of the cities hardest hit by influenza in large part thanks to the deadliest parade ever.

Deaths due to pneumonia and influenza per 100,000 population in each age group



For photos and videos from the parade, watch these videos:

<https://youtu.be/6MzoAm6LUZg> and <https://www.loc.gov/item/mp76000040>



Prevent a Pandemic

In December 1997, health officials made the decision to slaughter all 1.5 million birds within the farms and markets in the territory. Importation of poultry from other areas was stopped temporarily while markets were cleaned. Once the initial **outbreak** was contained, other permanent measures were instituted. A 5-day quarantine and H5 infection testing program was put into place for all poultry coming into Hong Kong. New processes require the segregation of chicken from waterfowl. New licensing requirements and increased disease **surveillance** have been implemented to quickly detect infections in bird imports before they reach the live markets. Health officials also put measures into place to reduce exposure to live birds and have placed restrictions on imported and backyard poultry. This event may be the first example of successful containment of a potential global influenza.

Since then, the Asian H5N1 has been detected in poultry and wild birds in more than 50 countries in Africa, Asia, Europe, and the Middle East. It is considered to be endemic, or naturally occurring, in Bangladesh, China, Egypt, India, Indonesia, and Vietnam. Thorough disease **surveillance** and less human-bird contact are essential to preventing recombination of different flu genes. Strategic national stockpiles of **vaccines**, drugs, and medical equipment are also part of the plan to treat infected individuals and stop further spread in the event a flu pandemic occurs.

Read for more info: [The Next Influenza Pandemic: Lessons from Hong Kong, 1997](#)



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The Influenza Division of the National Center for Immunization and Respiratory Diseases (NCIRD) improves global control and prevention of seasonal and novel influenza and improves influenza pandemic preparedness and response. In collaboration with domestic and global partners, the influenza division builds **surveillance** and response capacity, monitors and assesses influenza **viruses** and illness, improves **vaccines** and other interventions, and applies research to provide science-based enhancement of prevention and control policies and programs. Connect with them on Twitter using **@CDCFlu**.