



The image features a pair of rich red, draped curtains that are pulled back to reveal a white background. The curtains have a textured, velvety appearance with deep folds and highlights. The text is centered within the white space, rendered in a bold, red, sans-serif font with a slight drop shadow.

# **Plagues, Pestilences Poxes and Pandemics**

# Course Overview

- ⦿ Session 1 Sept. 1: Definitions, Biblical Plagues.
- ⦿ Session 2 Sept. 8: The PLAGUE through time & place.
- ⦿ Session 3 Sept. 15: Cholera, Yellow Fever, Malaria, etc.
- ⦿ Session 4 Sept. 22: The Columbian Exchange.
- ⦿ Session 5 Sept. 29: 20<sup>th</sup> Century Pandemics.
- ⦿ Session 6 Oct. 6: HIV/AIDS
- ⦿ Session 7 Oct. 13: 20<sup>th</sup> and 21<sup>st</sup> Century Viruses.
- ⦿ Session 8 Oct. 20: Corona and other Coming plagues(?)

# Session 5

## Pandemics in the 20<sup>th</sup> Century

# Session Overview

- ⦿ Definition of Pandemic.
- ⦿ The Influenza Virus.
- ⦿ The “Big 4” of the 20<sup>th</sup> Century.
  - 1. Spanish Flu.
  - 2. Cholera.
  - 3. Asian Flu.
  - 4. Hong Kong Flu.
- ⦿ Other non-pandemic epidemics.

# Session 5

## 20<sup>th</sup> Century Pandemics and Epidemic illnesses.

# Epidemic

- *Sudden and rapid* spread of disease to a large number of people in a population within a short period of time.
- Used for infectious diseases, and for diseases with an environmental origin.

# Pandemic

- ⦿ An *epidemic* that crosses international boundaries, usually affecting people on a worldwide scale.
- ⦿ Near-global disease *outbreaks* when multiple countries across the world are infected.
- ⦿ Term refers to **extent** of illness not **speed** of spread.

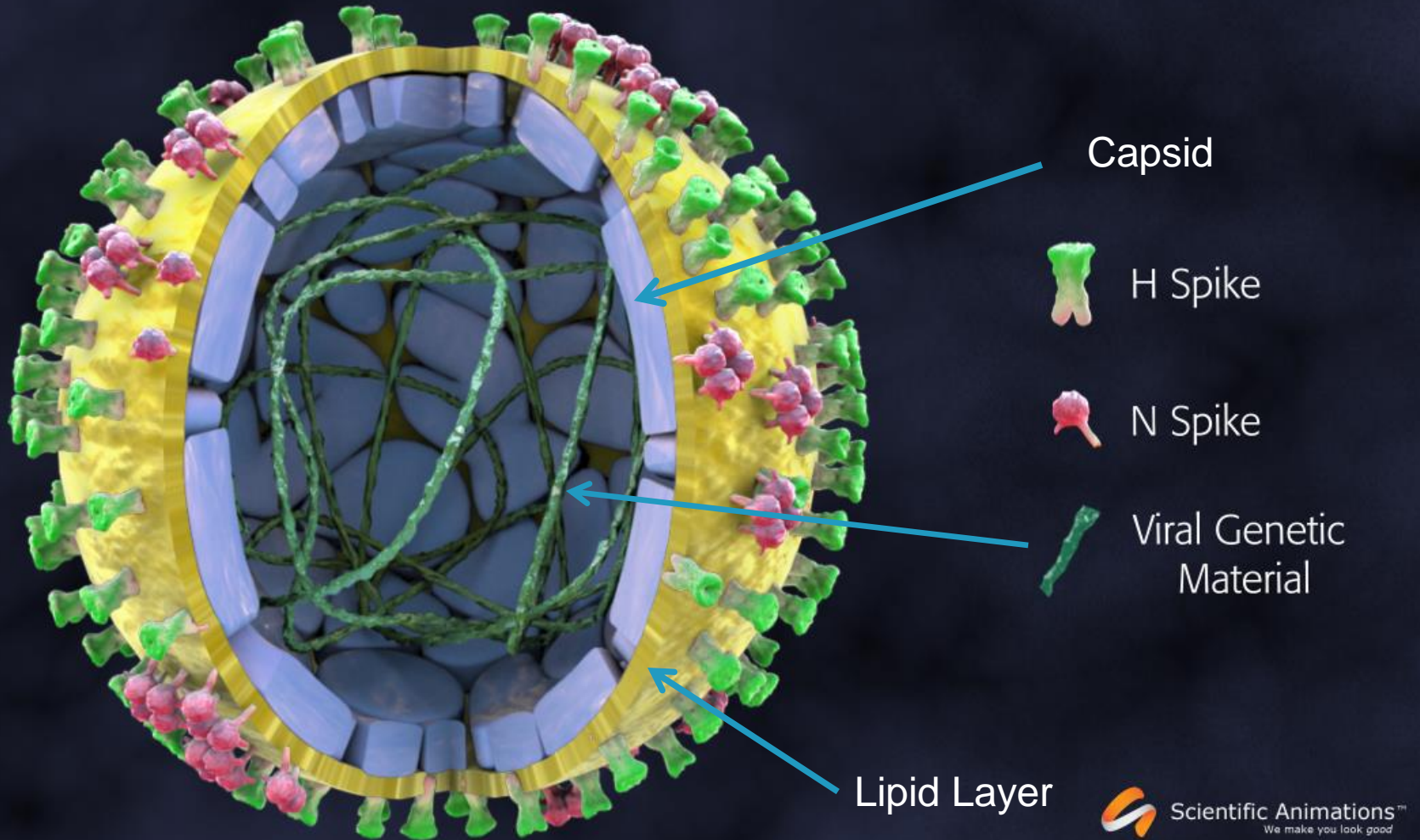


# About the Influenza Virus

# The A, B, C's of Influenza Virus

- Influenza comes in three basic types **A**, **B** and **C**; the categories tell us how dangerous the virus can be.
- All Influenza pandemics have come from Type **A**.
- Influenza **B** can make you just as sick as **A**, but has never triggered a worldwide pandemic.
- Influenza **C** causes the mildest disease.

# Influenza Virus



# What do the H's and N's Mean?

- **H** is hemagglutinin, and **N** is neuraminidase.
- **H** and **N** are protein spikes on the flu's surface that help it invade cells.
- The spikes come in 16 types for **Hemagglutinin** and 9 for **Neuraminidase** (144 varieties of flu, not all of them infective).
- Each flu takes one from the **N** group and another from the **H** group.

# Infective vs Infectious

- Infective: The capability of an organism to become infectious and produce an infection.
- Infectious: the process of a disease caused by entry into the body of organisms which grow and multiply there.

# Influenza Complexity

# Antigenic Drift

Influenza A viruses continuously undergo antigenic evolution.

Either *H* or *N* change in a particular strain.

This produces new strains, which trips up the immune system.

If *H* and *N* mutate, antibodies may no longer recognize them and bind to them.

This leaves the virus fully infective, which may cause flu epidemics.

# Antigenic Shift

Antigenic Shift  
may occur by:

Direct transmission of  
an avian virus from  
birds to humans.

Genetic re-assortment  
between an avian and  
a human virus.

Reintroduction of an  
old strain into a “new”  
population not familiar  
with it.

An influenza A virus  
with a *new HA* subtype  
is introduced into the  
human population.

This mechanism may  
produce global flu  
pandemics.



# Peek-a-Boo, I See You! <sup>(1)</sup>

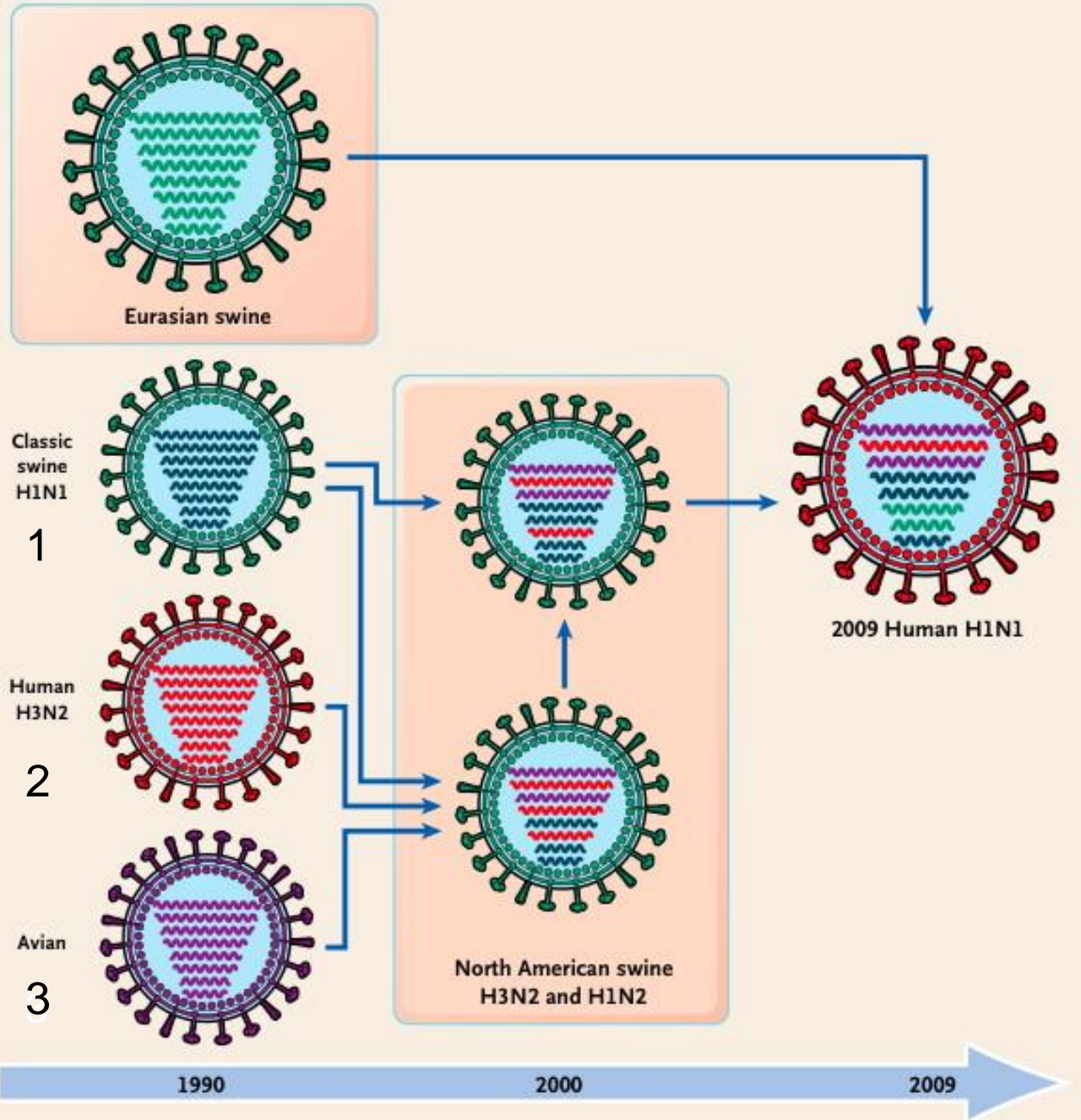
- A virus may remain hidden and then re-emerge as a pandemic virus when the population's immunity has waned.
- The virus that caused the Russian flu in 1977 turned out to be identical in all of its genes to the *H1N1* virus that caused a major epidemic in 1950.

# Peek-a-Boo, I See You! (2)

- In 1968, an *H3N2* virus emerged from Hong Kong to replace the *H2N2* virus. This pandemic resulted in 1-2 million deaths.
- The *H1N1* serotype re-surfaced in 1977.
- Currently, *H3N2*, *H1N1* and re-assortant *H1N2* viruses are circulating in the human population causing minimal epidemic disease.

# Genetic Re-assortment

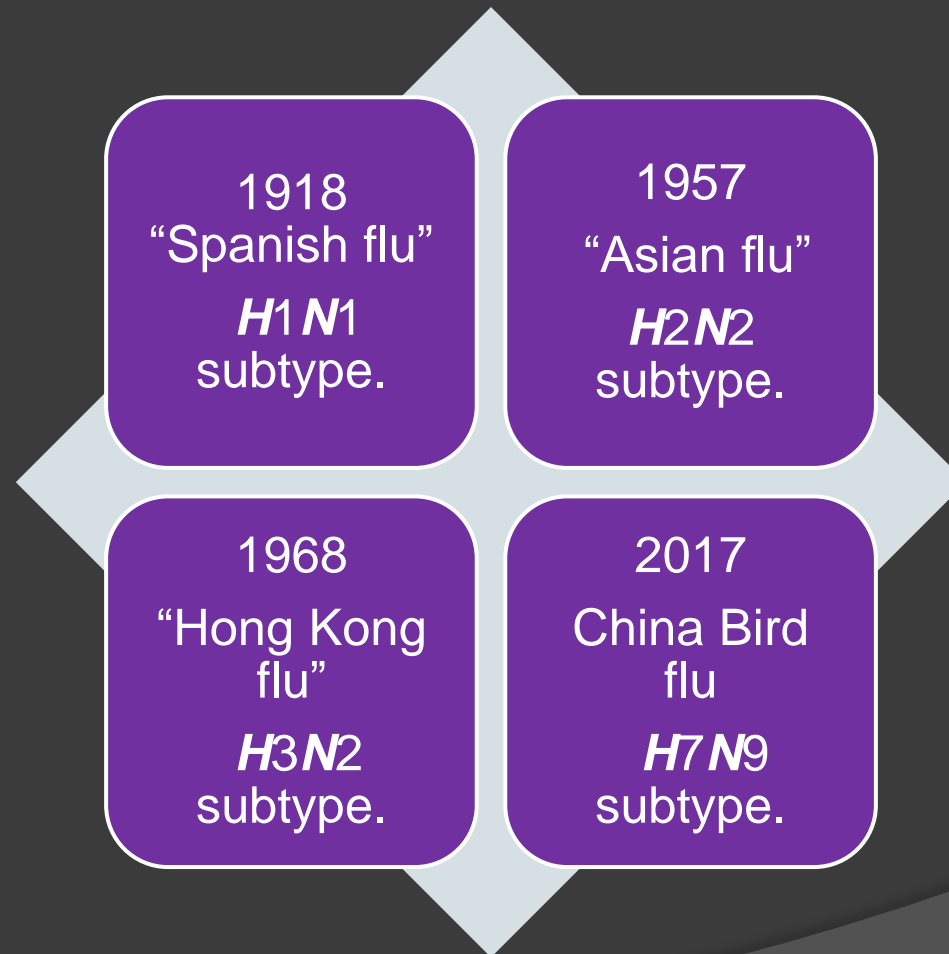
- May occur when a host cell is infected with 2 influenza A types simultaneously.
- In reassembly of viruses, the RNA segments get mixed together, making a 3<sup>rd</sup> viral strain with a unique combination of genes.
- Pigs can be infected by both human and avian influenza viruses.



## Flu Re-assortment

1. Swine
2. Human
3. Avian

# Flu Pandemics in 20<sup>th</sup> Century



1918 Pandemic

# 1. Spanish Flu

# World War I <sup>(1)</sup>

(1914-1918)

- One of the deadliest wars in history, with about 9M combatant deaths and 13M civilian deaths.
- The related 1918 influenza pandemic caused about 50M deaths worldwide.
- Also various genocides caused about another 50 Million deaths.

# World War I <sup>(2)</sup>

(1914-1918)

- ◉ In the summer of 1918, 10,000 men per day arrived at the Western Front for the American Expeditionary Force (AEF).
- ◉ During the war the U.S. mobilized over 4 million military personnel and suffered 65,000 deaths.
- ◉ Not included: ~45,000 who died of the 1918 Spanish Flu (30,000 before they even reached France).
- ◉ The war produced:
  - Dramatic expansion of the U.S. government.
  - Significant increase in the size of the U.S. Armed Forces.



# WW and WWI

## Woodrow Wilson and World War I

- ◉ German U-Boats sank 7 US merchant ships, so WW called to declare war on Germany.
- ◉ Congress voted on April 6, 1917.
- ◉ In some Army units, 80% died of Spanish flu.
- ◉ He ordered 250,000 more to be trained & sent.
- ◉ The “training and the sending” was killing them!

# WW and WWI (2)

## Woodrow Wilson and World War I

- ◉ Wanted above all to win the War.
- ◉ Restricted information to Americans.
- ◉ Sailors ordered to write home denying news about the flu.
- ◉ WW created Committee on Public Information to write and distribute thousands of articles re: America's greatness.
- ◉ Morale Law of 1917 punished with 20 years prison writing negative things about US government.

# Treaty of Versailles

Big 4: French PM Georges Clemenceau, Italian PM Vittorio Emanuele Orlando, British PM David Lloyd George, and US President Woodrow Wilson.

Met in 145 closed sessions to make all the major decisions, later to be ratified by the full assembly.

27 minor powers attended a weekly "Plenary Conference" to discuss issues but made no decisions.

52 commissions that made recommendations, many were incorporated into the final text.

# WW and WWI (3)

## Woodrow Wilson and World War I

- ◉ WW downplayed the flu and eventually fell victim to it.
- ◉ In Versailles for the Treaty, became ill and could not function adequately.
- ◉ French got their demands against Germany.
- ◉ Awarded the 1919 Nobel Peace Prize.

# 1918 Schoolyard Rhyme

I had a little bird,  
Its name was Enza.  
I opened the window  
And in flew Enza.

# The “Spanish Flu”

- ① Spain’s free press first reported on it in Madrid in May, 1918.
- ① Allies & the Central Powers had censors who withheld news of the flu to keep morale high.
- ① Public in US, Britain and France were told that everything was OK.

# What's in a Name?

In Senegal 'the Brazilian flu'.

In Brazil 'the German flu'.

In Poland 'the Bolshevik disease'.

In the US & Britain the 'Spanish lady'.

In Nigeria 'ifelunza'

In Germany 'pseudoinfluenza'.

In Freetown 'manhu' (what is it?).

In Spain 'Naples Soldier' or 'French Flu'.

# The “Spanish Flu” Goes...

- First cases in US Army Dunston training camp in Fort Riley, Haskell County, Kansas.
- Crowded conditions in camps and troop ships.
- Mix of carriers, exposures, defenses.
- Sick recruits took it on ships to Europe: Brest, Bordeaux, St. Nazaire, Valdahon, Paris, Spain,



# Troops and the 1918 Flu

- ⦿ Victims mostly healthy males in their 20's.
- ⦿ Recruits subject to unsanitary overcrowding.
- ⦿ The flu overstimulated healthy immune systems and turned them against the body.
- ⦿ “Cytokine storm” floods the infection site with immune cells produce severe inflammation.

# And Then it Comes Back...

- ⦿ All through the war in 1918, returning doughboys brought it back to US.
- ⦿ Boston, then New York, then inland to Philadelphia and towards the West Coast.
- ⦿ Government and the press downplayed the pandemic and played up US greatness.

# Mortality of the 1918 Flu

- 16-weeks between September and December 1918 were the deadliest.
- Possibly because virus mutated in Europe before troops came back.
- Returning soldiers partially immune, but locals were not.

# A-Ticket-A-Tasket, We Need a Casket

Casket companies could not keep up with the demand.

DC Commissioner hijacked 270 coffins bound for Pittsburgh and rerouted them to DC hospital with armed guard.

Gravediggers in Boston were seen dumping corpses out of caskets into graves to reuse the coffins.

The War Industries Board ordered casket makers to manufacture only plain caskets in limited sizes.

# Philadelphia Coffin Truck



# The Philadelphia Story (1)

Philadelphia resembled the plague-Infested Middle Ages with deaths approaching 1,000 a day.

Entire neighborhoods were draped in crepe on front doors to mark deaths inside.

A streetcar manufacturer, was asked to make 1,000's of rudimentary boxes in which to bury the dead.

Needed coffins arrived in the city under armed guard.

500 bodies crowded the 36-corpse city morgue.

The city opened 6 supplementary morgues and placed bodies in cold storage plants.

Some Philadelphia residents were tossed into mass graves.

# The Philadelphia Story (2)

Day and night a constant parade of wagons kept priests and the police busy collecting corpses draped in sack cloths and blood-stained sheets.

Bodies were left on porches and sidewalks and were piled on top of each other in the wagons with limbs protruding from underneath the sheets.

The parents of a small boy who succumbed to the flu begged the authorities to allow him to be buried in a wooden box that had been used to ship macaroni instead having him taken away in a wagon.



Philadelphia workers digging mass grave at St. Charles Borromeo Parish.



# Philadelphia Mass Grave



# Collective Graves in Samoa



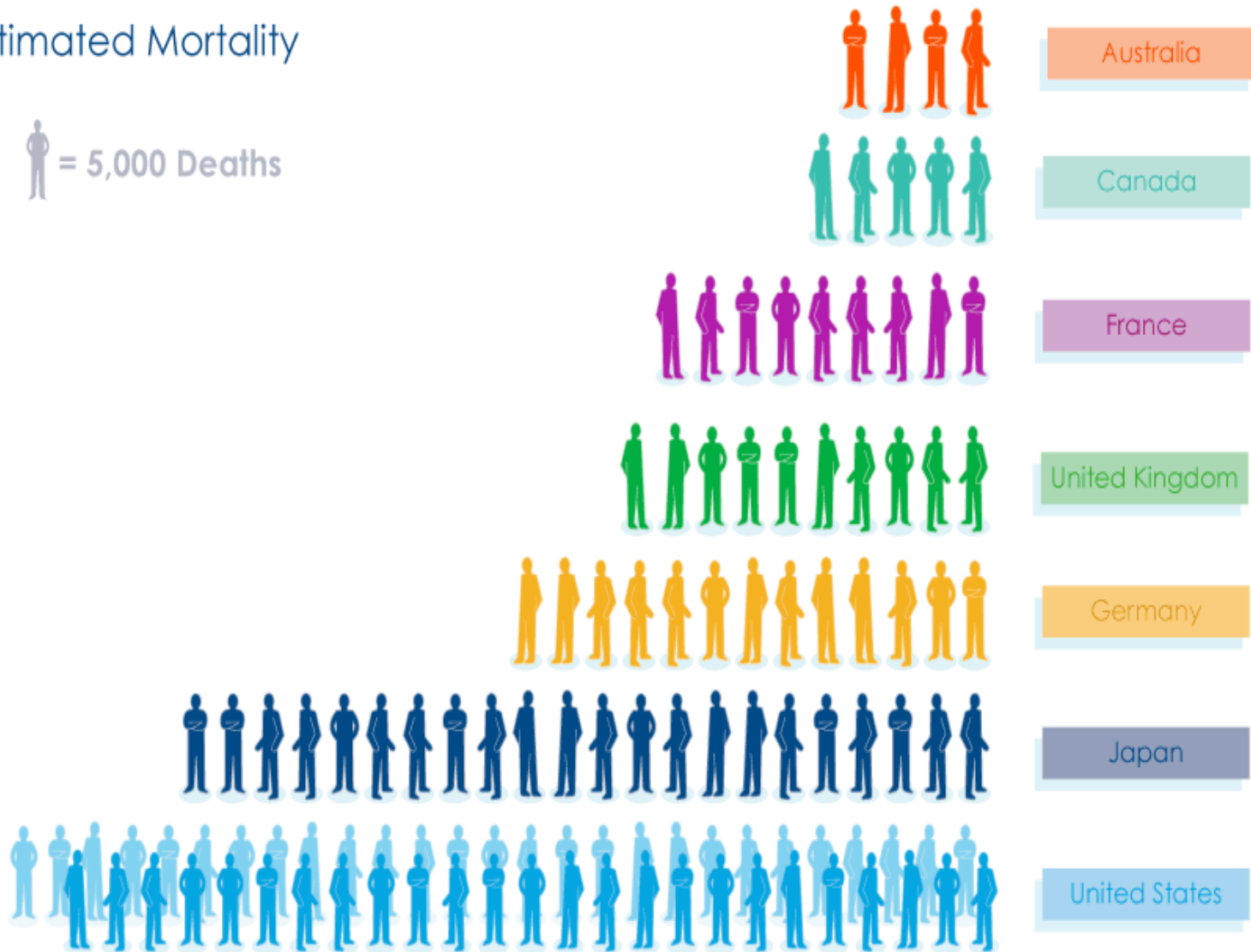
# Other Cities

- ⦿ Public funerals and wakes were banned in cities like Philadelphia and Chicago.
- ⦿ Iowa prohibited public funerals and even the opening of caskets.
- ⦿ Exceptions were made only for parents or wives identifying soldiers before burial.
- ⦿ Caskets could only be opened if family members used masks and refrained from touching the body.

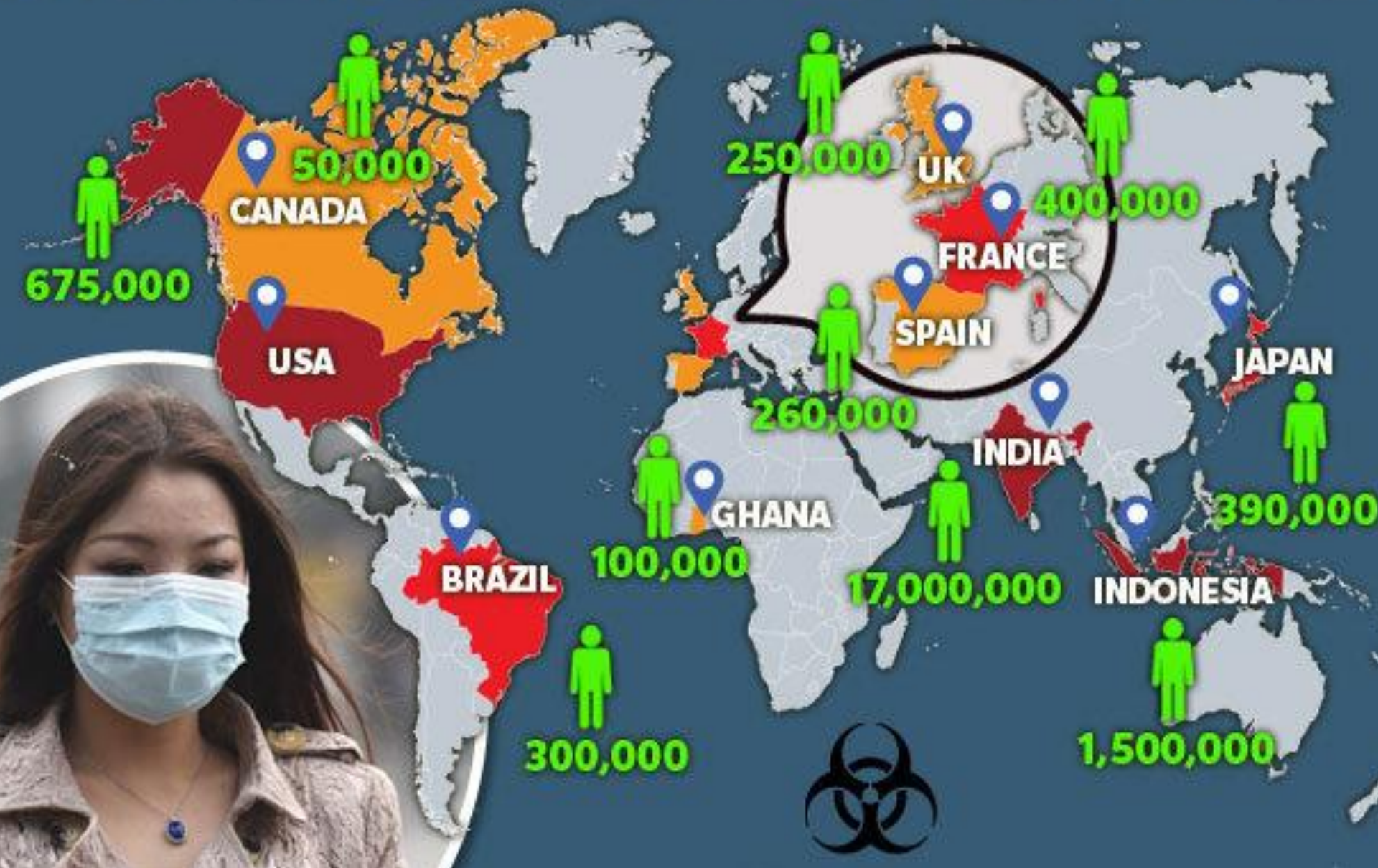
# 1918 Flu Pandemic

## Estimated Mortality

 = 5,000 Deaths



# SPANISH FLU GLOBAL DEATH TOLL



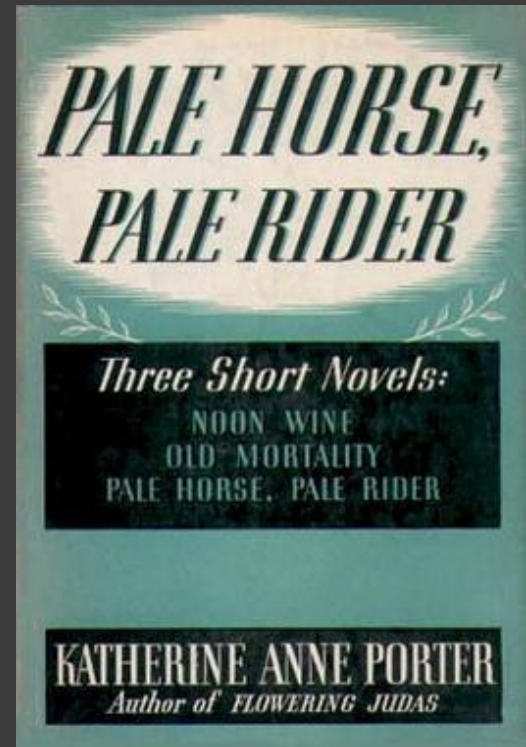
# Famous Ones Who Survived the Flu (1)

- ◎ **WALT DISNEY**
- ◎ **MARY PICKFORD**
- ◎ **DAVID LLOYD GEORGE**
- ◎ **FRANKLIN D. ROOSEVELT**
- ◎ **WOODROW WILSON**
- ◎ **KATHERINE ANNE PORTER**

# Katherine Anne Porter



1890-1980



# Famous Ones Who Survived the Flu (2)

- ◎ **HAILE SELASSIE I**
- ◎ **JOHN J. PERSHING**
- ◎ **EDVARD MUNCH**
- ◎ **LILLIAN GISH**
- ◎ **CLEMENTINE CHURCHILL**
- ◎ **ALFONSO XIII**



# The 1918 Flu

## Déjà Vu?

# 2020 OLLI Classroom Rhyme

The Spanish Flu,  
Is it Déjà Vu?  
All is old, nothing's new;  
I don't want to get blue,  
Neither do you!

# Soldiers and Masks



*The U.S. Army 39th regiment wearing masks to prevent influenza in Seattle in December 1918.*

*Photo from Everett Historical/Shutterstock*



*Recruits wearing masks to prevent the spread of COVID-19 at Marine Corps Recruit Depot, San Diego, CA (MCRDSD) in April 2020.*

*Photo from Lance Cpl. Zachary T. Beatty/ Marine Corps*

Taylor, A. (2018, April 10). Photos of the 1918 Flu Pandemic. Retrieved from <https://www.theatlantic.com/photo/2018/04/photos-the-1918-flu-pandemic/557663/>

Snow, S. (2020, April 10). Marine drill instructors and recruits now training with skivvy shirt face masks. Retrieved from <https://www.marinecorpstimes.com/news/coronavirus/2020/04/10/marine-drill-instructors-and-recruits-now-training-with-skivvy-shirt-face-masks/>

# Mask-makers



**Women from the Red Cross making masks during the flu pandemic in 1918.**  
*Photo from Bettmann Archive/Getty Images*



Compiled by Alexandria Sneed

**1st Special Forces Group (Airborne) medical professionals and logisticians at Joint Base Lewis-McChord, WA manufacturing personal protective equipment on March 31, 2020.**  
*Photo from U.S. Army 1<sup>st</sup> Special Forces Group Public Affairs Office*

Little, B. (2020, May 6). When Mask-Wearing Rules in the 1918 Pandemic Faced Resistance. Retrieved from <https://www.history.com/news/1918-spanish-flu-mask-wearing-resistance>

U.S. Army. (2020, April 2). Soldiers make protective masks in fight against COVID-19. Retrieved from [https://www.army.mil/article/234223/soldiers\\_make\\_protective\\_masks\\_in\\_fight\\_against\\_covid\\_19](https://www.army.mil/article/234223/soldiers_make_protective_masks_in_fight_against_covid_19)

# PPE Then and Now (1)



Compiled by Alexandria Sneed

**A Red Cross nurse wearing a mask during the flu pandemic in 1918.**  
*Photo from Paul Thompson/FP, via Getty Images*

Bense, K. (2020, March 20). We Should All Be More Like the Nuns of 1918. Retrieved from <https://www.nytimes.com/2020/03/20/opinion/coronavirus-nuns.html>



**Respiratory Therapist Robertino Rodriguez wearing personal protective equipment during the COVID-19 pandemic in 2020.**  
*Photo from captain\_wolf82/Instagram*

Lakritz, T. (2020, April 9). Healthcare workers are taping photos of themselves to their protective gear to help put COVID-19 patients at ease. Retrieved from <https://www.insider.com/coronavirus-doctors-photos-over-protective-gear-2020-4>

# PPE Then and Now (2)



*A nurse taking the pulse of a patient in the influenza ward of the Walter Reed hospital in Washington, D.C., in November 1918.*

*Photo from Library of Congress via AP*

Compiled by Alexandria Sneed



*A nurse wearing personal protective equipment during the COVID-19 pandemic in 2020.*

*Photo from Shutterstock*

Taylor, A. (2018, April 10). Photos of the 1918 Flu Pandemic. Retrieved from <https://www.theatlantic.com/photo/2018/04/photos-the-1918-flu-pandemic/557663/>

Spetz, J. (2020, March 31). There Are Not Nearly Enough Nurses To Handle The Surge Of Coronavirus Patients: Here's How To Close the Gap Quickly. Retrieved from <https://www.healthaffairs.org/doi/10.1377/hblog20200327.714037/full/>

# Even the Phantom is Lonely



*A newspaper boy in front of a closed theater in 1918.  
Museum of History & Industry (MOHAI)*



*44<sup>th</sup> Street in New York City, NY in April 2020.  
Photo by Playbill Staff*

McCarty, E., Davis, B., Secaira, M., Weinberger, H., Lombard, E., Berger, K., & Sapna Cheryan &. (2020, May 18). Podcast: What the 1918 flu can tell us about life after COVID-19. Retrieved from <https://crosscut.com/podcast/changes-everything/1/3/podcast-what-1918-flu-can-tell-us-about-life-after-covid-19>

McPhee, R. (2020, April 8). Broadway Theatres Extend Shutdown as Coronavirus Outbreak Looms Over New York City. Retrieved from <https://www.playbill.com/article/broadway-theatres-extend-shutdown-as-coronavirus-outbreak-looms-over-new-york-city>

# New News are Old News

CHICAGO, TUESDAY, OCTOBER 8, 1918. PRICE TWO CENTS. Compiled by Alexandria Sheed

## Influenza Epidemic Closes Schools, Churches, Theatres

**DRUG STORES SWAMPED WITH "FLU" VICTIMS**      **HEALTH COMMISSIONER ISSUES PROCLAMATION ORDERING DRASTIC METHODS TO CHECK DISEASE SPREAD**      **NORTH END PUTS NEW PUNCH INTO WAR BOND DRIVE**

Trade at Pharmacies is Exceedingly Heavy; Clerks Are Worn Out by Hard Work.      Drastic measures, including the closing of all schools, churches, moving picture theaters, and the prohibiting of all public gatherings, until further notice were adopted today to check the spread of epidemic of Spanish influenza which is in evidence.

Workers Take Steps to Prevent North End from Lagging.      \*Mask law became effective.

| Date       | New Cases | Deaths |
|------------|-----------|--------|
| January 10 | 612       | 37     |
| January 11 | 365       | 43     |
| January 12 | 520       | 26     |
| January 13 | 363       | 44     |
| January 14 | 469       | 50     |
| January 15 | 510       | 46     |
| January 16 | 538       | 41     |
| January 17 | 619       | 39     |
| January 18 | 504       | 26     |
| January 19 | 490       | 16     |
| January 20 | 366       | 41     |
| January 21 | 170       | 19     |
| January 22 | 162       | 11     |
| January 23 | 118       | 11     |
| January 24 | 83        | 20     |
| January 25 | 35        | 9      |

## 100 Mask Slackers Held on Charge of Disturbing Peace

hundred persons had been arrested in San Francisco up to 11 o'clock last night for failing to wear influenza masks. Of this number ninety-two were registered at the City Prison and eight at the Southern Police Station.

## INFLUENZA MASKS PLAY BIG PART IN CURBING EPIDEMIC

SCENES AT THE SAN FRANCISCO HOSPITAL, YESTERDAY AFTERNOON WHEN NURSES STEWARDS AND SAUVAGES TOOK CARE OF PATIENTS. In the picture at upper left is shown Miss Marie Williams, nurse, holding little Eugene Downey of 128 Hyde street. On the right is Miss Bessie L. S. Tyler, each holding a pneumonia child. Below is Miss Clara Swanson, head of social service department at the hospital, holding Bruce Downey.

## THREE SHOT IN STRUGGLE WITH MASK SLACKER

**Blacksmith Strikes Health Inspector Striving to Enforce Order**

Two men and a woman were shot yesterday at Powell and Market streets when Henry D. Miller, an inspector in the city Health Department, discharged his revolver in a battle with James Wisner, a blacksmith, who refused to don a gauze influenza mask at the order of the health officer.

Wisner was one of the wounded, being shot in the arm and leg. Henry Appleton, 63 years old, 124 Belvedere street, was shot in the leg by one of the four bullets fired by Miller, and was a woman whose name could not be learned by the police, she having been shot at once to her home after learning her wound was slight.

The police report that Miller found Wisner standing at the corner of his duties, holding his arms and urging a crowd in the sidewalk with the mask. "They are in a market," he is reported to have said.

## MARKED DROP IN NEW CASES IS OBSERVED

Pneumonia Only Barrier to Successful Fight Against Spread Here

HUNDREDS INOCULATED

Entire State Looks to S. F. for Vaccine; Supplies of Serum Sent Out

Dr. H. H. Henshaw, chief of the health department, announced today that the marked drop in new cases of influenza observed here is due to the fact that the disease has been successfully fought against here by the use of the vaccine prepared by the health department.

## 100 M Held Dis

hundred persons had been arrested in San Francisco up to 11 o'clock last night for failing to wear influenza masks.

## False Statements as to Epidemic Made by Mayor Are Retuted

Mayor Ralph says that Mr. de Young paid nothing for the purchase of 60,000 masks by the Red Cross in fight against influenza.

Such a statement never came up in the Red Cross business meeting, and Mr. de Young never voted against anything that ever came up.

This great expenditure took up the matter of thousands of dollars before the Mayor seemed to know it existed. The Red Cross appropriated \$10,000 to fight it. Mr. de Young would have immediately met under a flag, including banners, to do all possible to prevent the epidemic and keep it within bounds.

**ACCURATE NARRATIVE OF PROCEEDINGS TAKEN WITH REFERENCE TO MASK APPOINTMENT BY RED CROSS**

The following work at a meeting of the Red Cross, the matter was taken up of approximately \$10,000, to be used exclusively for buying beds and necessary equipment for the tuberculosis ward of the San Francisco Hospital, which the Superintendent and Mayor Ralph had never taken the trouble to furnish. There were few minutes on this subject, and Mr. de Young simply inquired why it was necessary to spend so much money on furnishing a ward with a few hundred beds and the equipment needed. The answer was that they were buying expensive furniture because they thought the city would ultimately pay back the



Photos from San Francisco Chronicle Archive, San Francisco Examiner

Gilmore, N. (2020, May 6). The Mask Slackers of the 1918 Influenza Pandemic: The Saturday Evening Post. Retrieved from <https://www.saturdayeveningpost.com/2020/05/the-mask-slackers-of-the-1918-influenza/>

Hartlaub, P. (2020, May 8). Anti-Mask League: San Francisco had its own shutdown protests during 1918 pandemic. Retrieved from <https://www.sfchronicle.com/oursf/article/Anti-Mask-League-San-Francisco-had-its-own-15255495.php>

Sherman, A. (n.d.). Politifact - Yes, San Francisco residents formed Anti-Mask League during 1918 flu. Retrieved from <https://www.politifact.com/factchecks/2020/apr/24/facebook-posts/yes-san-francisco-residents-formed-anti-mask-leagu/>

Zimmerman, D. (2020, April 10). San Francisco forced people to wear masks during the 1918 Spanish flu pandemic. Did it help? Retrieved from <https://www.sfgate.com/coronavirus/article/1918-pandemic-masks-bay-area-california-15185425.php#photo-19182677>



# Lining up, Then and Now



Compiled by Alexandria Sneed

*Americans wait in line for flu masks on Montgomery Street in San Francisco, CA, USA in 1918.*

*Photo from Hamilton Henry Dobbin / California State Library*

Los Angeles Times. (2020, April 19). California lessons from the 1918 pandemic: San Francisco dithered; Los Angeles acted and saved lives. Retrieved from <https://www.latimes.com/california/story/2020-04-19/coronavirus-lessons-from-great-1918-spanish-flu-pandemic>



*Canadians wait in line to enter Walmart in Sault Ste. Marie, ON, Canada on April 24, 2020.*

*Photo by Darren Taylor/SooToday*

SooToday. (2020, March 24). Shoppers line up to enter stores due to virus concerns (9 photos). Retrieved from <https://www.sootoday.com/coronavirus-covid-19-sault-ste-marie-news/shoppers-line-up-to-enter-stores-due-to-virus-concerns-9-photos-2197114>

# Trimming the Quarantine Mane



Compiled by Alexandria Sneed

*A barbershop in Chicago, IL circa 1918.*

*Chicago Sun-Times/Chicago Daily News Collection/Chicago History Museum/Getty Images*

Little, B. (2020, May 6). When Mask-Wearing Rules in the 1918 Pandemic Faced Resistance. Retrieved from <https://www.history.com/news/1918-spanish-flu-mask-wearing-resistance>



*A barbershop in Atlanta, GA on April 27, 2020.*

*Photo by Dustin Chambers Bloomberg via Getty Images*

Whyte, L. E., & Npr. (2020, May 12). As Georgia Lifts Restrictions, Its Hospitals May Be Unready For A COVID-19 Surge. Retrieved from <https://www.kpbs.org/news/2020/may/12/as-georgia-lifts-restrictions-its-hospitals-are/>

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Marfin, C. (2020, May 18). How long can the coronavirus live on various surfaces? Curious Texas investigates. Retrieved from <https://www.dallasnews.com/news/curious-texas/2020/05/15/how-long-can-the-coronavirus-live-on-various-surfaces-curious-texas-investigates/>

# First-Line Health Workers



***Nurses in Washington, D.C. wearing masks while carrying an influenza patient on a stretcher in 1918.***

*Photo from Library of Congress*



***Staff from Wyckoff Heights Medical Center in Brooklyn, New York City, NY bring in a patient on a gurney while wearing personal protective equipment on April 7, 2020.***

*Photo from AP Photo/John Minchillo*

Magill, J. (2020, March 27). 100 years ago, the Spanish flu pandemic tore through New Orleans in. Retrieved from <https://www.hnoc.org/publications/first-draft/100-years-ago-spanish-flu-pandemic-tore-through-new-orleans-three>

Associated Press. (2020, April 18). Virus-fueled conspiracy theories take aim at hospitals. Retrieved from <https://fox59.com/news/virus-fueled-conspiracy-theories-take-aim-at-hospitals/>

# Empty Schoolrooms



Compiled by Alexandria Sneed



*An empty room with tables and chairs in 1918.*

*Photo from "The Spanish Flu Was Deadlier Than WWI" via HISTORY*

*An empty classroom with desks and chairs in 2020.*

*Photo from Kyle Grillot/Reuters*

Little, B. (2020, May 6). Retrieved May 20, 2020, from <https://www.history.com/news/1918-spanish-flu-mask-wearing-resistance>

Al Jazeera. (2020, April 14). Lockdowns, closures: How is each US state handling coronavirus? Retrieved from <https://www.aljazeera.com/news/2020/03/emergencies-closures-states-handling-coronavirus-200317213356419.html>



Compiled by Alexandria Sreed



Neither snow nor rain nor heat nor gloom of night stays these couriers from the swift completion of their appointed rounds.

**A letter carrier in New York City, NY wearing a mask on October 16, 1918.**  
*Photo from National Archives*

**Mail carrier Oscar Osorio wearing a mask in Los Angeles, CA on April 29, 2020.**  
*Photo from VALERIE MACON/AFP via Getty Images*

Denver Post. (2016, June 13). The 1918 influenza outbreak: An unforgettable legacy. Retrieved from <https://www.denverpost.com/2009/04/30/the-1918-influenza-outbreak-an-unforgettable-legacy/>

Bauman, A., & Chakrabarti, M. (2020, May 20). Facing Privatization Battle And Economic Trouble, What's Next For The Postal Service? Retrieved from <https://www.wbur.org/onpoint/2020/05/20/economic-troubles-privatization-postal-service>

Nor some big bad Influenza!

# Garbage is Still Trash



**A street cleaner in New York wearing a mask in 1918.**

*Photo from Bettmann Archive*

Nevius, J. (2020, March 19). New York's built environment was shaped by pandemics. Retrieved from <https://ny.curbed.com/2020/3/19/21186665/coronavirus-new-york-public-housing-outbreak-history>



**A man collecting trash while wearing a mask in 2020.**

*Photo by Marco Bertorello/AFP/Getty Images*

Minter, A. (2020, March 23). The U.S. is unlikely to see a trash crisis like the one in 1918, but better safety guidelines and protective gear are needed to maintain collection. Retrieved from <https://www.bloomberg.com/opinion/articles/2020-03-23/coronavirus-outbreak-is-challenge-to-garbage-worker-safety>

# Children and Masks



*A child wears a mask in Starke, FL in 1918.  
Photo from State Archives of Florida*

*A child wears a mask in 2020.  
Photo from Etsy*

Calise, G. (2020, March 4). Long before coronavirus, Florida caught Spanish flu. How bad was it? Retrieved from <https://www.tampabay.com/news/health/2020/03/04/long-before-coronavirus-florida-caught-spanish-flu-how-bad-was-it/>

Magdirila, P. (2020, May 1). 20 Adorable and Stylish Face Masks for Kids. Retrieved from <https://walyou.com/20-adorable-and-stylish-face-masks-for-kids/>

# Wear a Mask, Wash Your Hands

**WEAR A MASK AND SAVE YOUR LIFE!**

The Emergency That Now Confronts Our City Is Beyond the Facilities of the Health Department

**The RED CROSS**

has come to the assistance of the Board of Health. Doctors and nurses can not be obtained to take care of the afflicted. You must wear a mask, not only to protect yourself but your children and your neighbor from influenza, pneumonia and death

**A GAUZE MASK IS 99% PROOF AGAINST INFLUENZA**

Doctors wear these. Those who do not wear them get sick. The man or woman or child who will not wear a mask now is a dangerous slacker.

**WEAR MASKS**

This statement was authorized at a meeting of the undersigned, who are convinced that it is the only way to stamp out the epidemic. You must do your part

**Alameda County Relief Committee**

County of Alameda Oakland Chapter American Red Cross Associated Charities  
 City of Oakland Oakland Clearing House Association Retail Dry Goods Association  
 Board of Health of Oakland Oakland Chamber of Commerce

**BEFORE EATING—**  
**When you come home from work—**  
**Whenever you come in from the street,**  
**—you must wash properly**

**Three times when washing your hands is of special importance**

**THE HEALTH SOAP**

**LIFEBODY SOAP**

**COVID-19 CORONAVIRUS DISEASE STOP THE SPREAD OF GERMS**

Help prevent the spread of respiratory diseases like COVID-19.

**Face Covering Do's and Don'ts:**

**DO:**

- Make sure you can breathe through it
- Wear it whenever going out in public
- Make sure it covers your nose and mouth
- Wash after using

**DON'T:**

- Use if under two years old
- Use surgical masks or other PPE intended for healthcare workers

**DO:**

- Avoid close contact with people who are sick.
- Cover your cough or sneeze with a tissue, then throw the tissue in the trash.
- Clean and disinfect frequently touched objects and surfaces.
- Wash your hands often with soap and water for at least 20 seconds.

**AVOID:**

- Touching your eyes, nose, and mouth.
- Staying home when you are sick, except to get medical care.

[cdc.gov/coronavirus](https://www.cdc.gov/coronavirus)

For more information: [www.cdc.gov/COVID19](https://www.cdc.gov/COVID19)

Newspaper clippings from 1918 that stress the importance of wearing a mask and hand washing (before the CDC was founded in 1946). Photo courtesy of MyHeritage.com

Haynes, S. (2020, March 27). Newspaper Ads on the Spanish Flu Echo Coronavirus Messaging. Retrieved from <https://time.com/5810695/spanish-flu-pandemic-coronavirus-ads/>

Current CDC (Centers for Disease Control and Prevention) guidelines for face coverings and stopping the spread of germs from the COVID-19 virus. Photo from CDC (current as of 5/20/2020)

CDC. (n.d.). Coronavirus Disease 2019 (COVID-19). Retrieved from <https://www.cdc.gov/coronavirus/2019-ncov/index.html>



# Gargling to Prevent FLU



# Feeding the Hungry



*Volunteers at a street kitchen in Cincinnati, OH serving food to children during the flu pandemic in the winter of 1918-1919.*

*Photo Courtesy of Spokesman-Review Archives*

Deshais, N., NWPB News, & NPR News. (2020, April 3). When The Pandemic Came To The Inland Northwest - 102 Years Ago. Retrieved from <https://www.nwpb.org/2020/04/03/when-the-pandemic-came-to-the-inland-northwest-102-years-ago/>



*Davina Garcia and others serving meals to students outside of Rowland Elementary School in Victoria, TX in March 2020.*

*Photo from Emree Weaver*

Douty, S. (2020, April 3). VISD opens food distribution sites. Retrieved from [https://www.victoriaadvocate.com/covid-19/visd-opens-food-distribution-sites/article\\_acfe563c-6d4a-11ea-bdb5-1b6a446e9111.html](https://www.victoriaadvocate.com/covid-19/visd-opens-food-distribution-sites/article_acfe563c-6d4a-11ea-bdb5-1b6a446e9111.html)

# Spray and Clean



***A public health worker carrying a spray pump filled with cleaning spray in March 1920.***

*Photo from Hulton-Deutsch Collection/Corbis/Getty Images*

Greenwood, G. (2020, March 25). Spanish Flu v coronavirus: how The Times reported the 1918 pandemic. Retrieved from <https://www.thetimes.co.uk/article/spanish-flu-v-coronavirus-how-the-times-reported-the-1918-pandemic-zn3rzztk9>



***A specialist spraying disinfectant to sanitize a street to prevent the spread of COVID-19 in Moscow on April 12, 2020.***

*Photo from Maxim Shemetov/Reuters*

Chung, E. (2020, April 18). Is spraying disinfectant in public spaces a good way to fight COVID-19? | CBC News. Retrieved from <https://www.cbc.ca/news/health/disinfectant-sprays-1.5536516>

# Anti-Masking Alive Again!

**ANTI-MASK MEETING**  
**TONIGHT (Saturday) JAN. 25**  
**DREAMLAND RINK**  
To Protest Against the Unhealthy Mask Ordinance  
Extracts will be read from State Board of Health Bulletin showing compulsory mask wearing to be a failure.  
**Eugene E. Schmitz and other interesting speakers.**  
Admission Free.

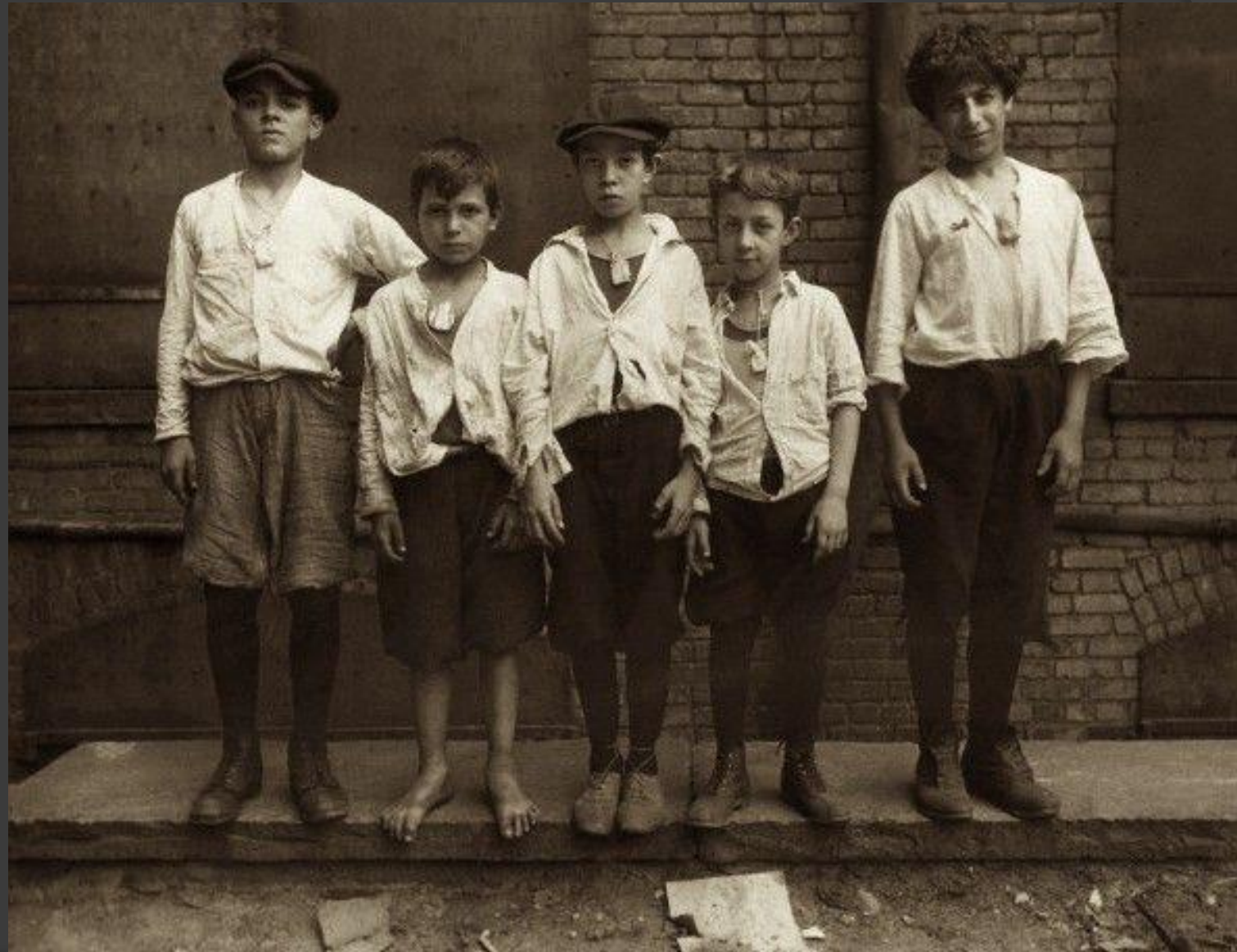
**ANTI-MASK MEETING.**  
At the Anti-Mask League mass meeting last night at Dreamland Rink resolutions were passed denouncing the mask ordinance as contrary to the desires of a majority of the people.  
Nearly 2,000 persons attended the meeting and though the hall was nearly half occupied, a fair sum was realized in a collection which was taken up by a crew of fifty ushers.

*Anti-Mask League meetings in San Francisco, CA during the flu pandemic in 1918.*  
*Photos from San Francisco Chronicle Archives, San Francisco Examiner*



*People protesting wearing masks and stay-at-home orders in Harris County, TX and Indianapolis, IN in April 2020.*  
*Photos from Melissa Phillip/Houston Chronicle, SOPA Images/LightRocket Via Getty Images*

# Children Wearing Camphor Bags



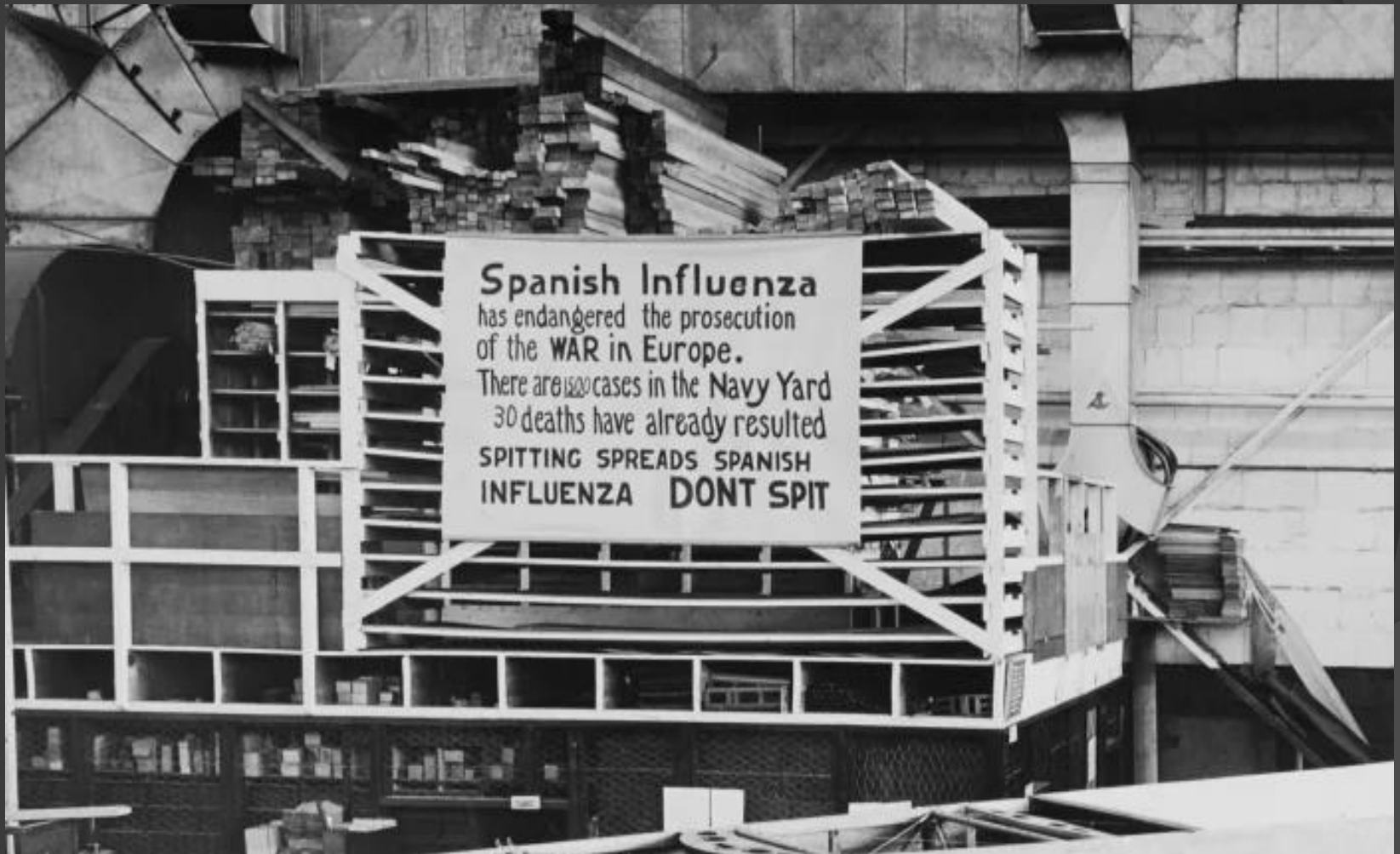
Don't  
Kiss  
Me !



# Spanish Flu prevention?



# Don't Spit !





# Spanish Flu Pandemic



**Policemen in Seattle,  
WA.** December 1918

(Masks made by the Red Cross)

National Archives at College Park, Maryland, US.

# And People Stayed at Home

And people stayed at home  
And read books  
And listened  
And they rested  
And did exercises  
And made art and played  
And learned new ways of being  
And stopped  
And listened more deeply  
Some meditated, some prayed  
Some met their shadow  
And people began to think  
differently  
And people healed.

And in the absence of people who  
Lived in ignorant ways  
Dangerous, meaningless and  
heartless  
The earth also began to heal  
And when the danger ended  
And people found themselves  
They grieved for the dead  
And made new choices  
And dreamed of new visions  
And created new ways of living  
And completely healed the earth  
Just as they were healed.

Catherine O'Meara, 2020

The Basics

The Seven Pandemics

## 2. Cholera

# Morbidity and Mortality <sup>(1)</sup>



- Infects 3M to 5M people yearly worldwide and kills 28K to 120K according to WHO.
- ~80 % of infected people don't get symptoms and the infection resolves on its own.
- ~20% develop cholera, get massive diarrhea, vomiting, and leg cramps; untreated mortality ~60%.
- A person may make **3 to 5 gal.** of painless rice-water diarrhea a day, becomes dehydrated, and loses electrolytes.

# Mechanism of Disease

- ⦿ The vibrio multiplies massively.
- ⦿ Attaches to the intestinal mucosa with a pilus.
- ⦿ Joins with other vibrios to blanket the wall.
- ⦿ Secretes enterotoxin that extracts water and electrolytes from the upper GI tract.
- ⦿ Pumps it into the lumen where the fluid and electrolytes are excreted as diarrheal fluid.

# Cholera in the US (2)

- ◎ New York had outbreaks in
  - 1832: 3,515 dead,
  - 1849: 5,000 dead
  - 1866: 1,137 dead
- ◎ Cincinnati: 8,000 dead.
- ◎ Chicago: 3,500 dead.
- ◎ New Orleans: 3,000 dead.
- ◎ Total US dead: ~150,000.

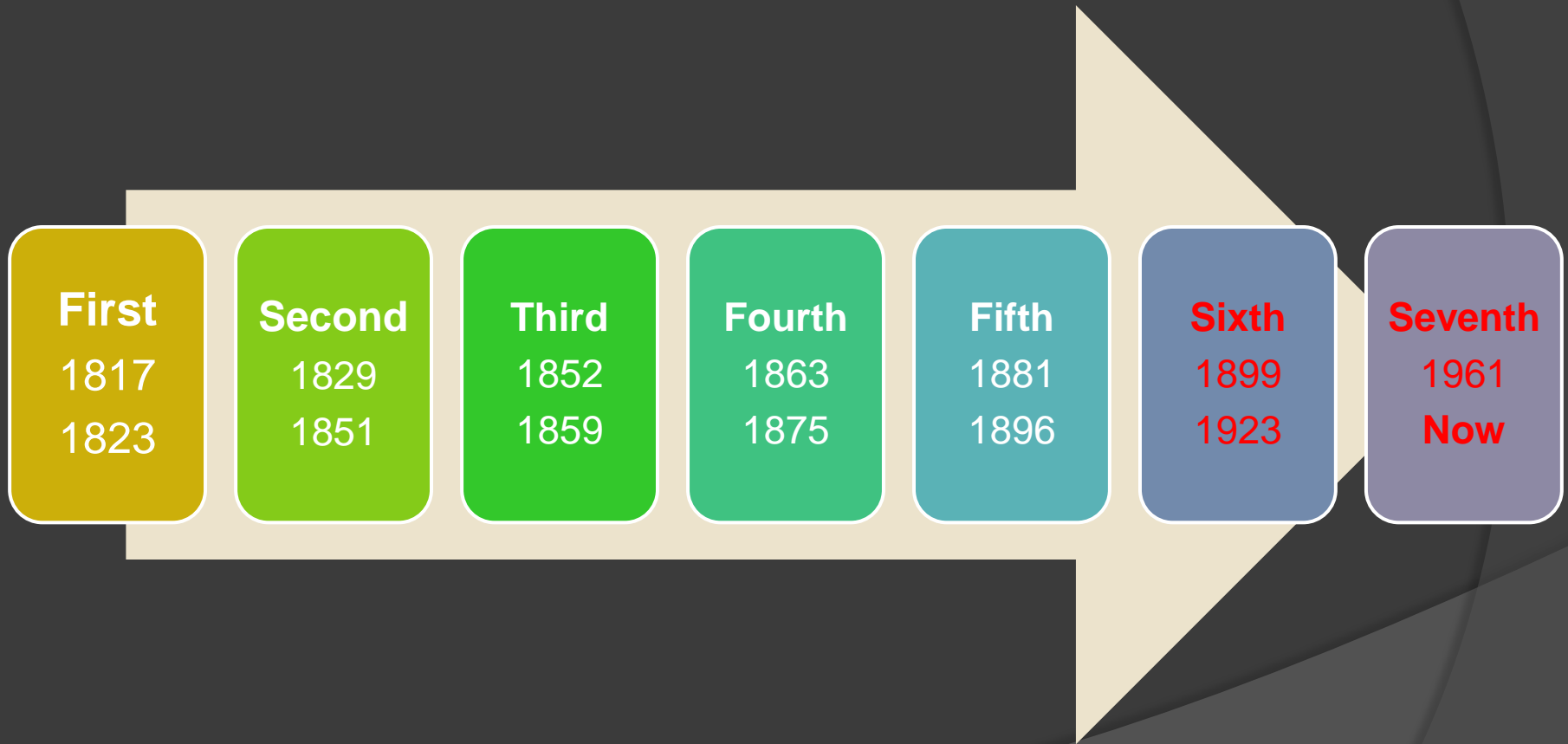
# Cholera in the US <sup>(3)</sup>

- During the California Gold Rush, it followed the California, Mormon and Oregon Trails.
- 6K to 12K are believed to have died on their way to Utah and Oregon in 1849–1855.
- Cholera claimed more than 150,000 victims in the US between 1832 and 1849.

# Cholera Pandemics



# Cholera Pandemics



# Cholera in 20<sup>th</sup> Century

| Location   | Dates               | Mortality           |
|--|---------------------|---------------------|
| Europe, Asia, Africa (6 <sup>th</sup> )  | 1899-1923           | >800,000 *          |
| Egypt  | 1947                | 10,277 *            |
| Indonesia, Asia, India, Africa, USSR, Japan, Italy (El Tor) (7 <sup>th</sup> ) | 1961-1975 (ongoing) | >5,000 *            |
| Bangladesh   | 1991                | 8,410-9,432 *       |
| Latin America  | 1991-1993           | 24                  |
| Nigeria  | 2001                | 400+                |
| South Africa   | 2001                | 139                 |
| Luanda (Angola)  | 2006                | 1,200+              |
| Ethiopia   | 2007                | 684                 |
| Iraq   | 2007                | 10                  |
| Chad   | 2008                | 115                 |
| Zimbabwe   | 2088-2009           | 4,293 *             |
| Haiti (Ogawa strain)   | 2010-2019           | 10,075 *            |
| Yemen  | 2016-present        | 3,886 (Nov 2019) ** |
| India  | 2008                | 115                 |

# The “Jump”

- ⦿ Crossing of the species barrier
- ⦿ *Vibrio cholerae* live in copepods in sea water.
- ⦿ Sundarbans wetlands in Bay of Bengal get salty tides and ocean floodwaters.
- ⦿ People of Ganges delta call it *moryxy*.
- ⦿ People in contact with contaminated waters.

# 3. Asian Flu

# Asian Flu (1)

- In 1957, an *H2N2* virus appeared in China.
- Recombinant of avian (geese) and human.
- The “Asian flu” swept through the population killing 1-2M people worldwide.
- Spread quickly in US with returning sailors.

# Asian Flu (2)

- June 1957, reached the US, with initially few infections.
- US Navy personnel at destroyers docked at Newport NAS and new military recruits.
- First wave peaked in October and affected children returning to school.
- Second wave, in January and February 1958, was more pronounced among elderly people and so was more fatal.

# Asian Flu (3)

- Number of deaths peaked week ending October 17 with 600 in England & Wales.
- Vaccine was available that month in the UK.
- Its rapid deployment helped contain the pandemic.

# Asian Flu (4)

- ⦿ Case fatality rate was approximately 0.67%.
- ⦿ 3% complication rate and 0.3% mortality in UK.
- ⦿ Could cause pneumonia by itself.
- ⦿ May have infected as many as or more people than the 1918 Spanish flu, but lower mortality due to:
  - The vaccine.
  - Improved health care.
  - Antibiotics to manage opportunistic bacterial infections. contributed to a lower mortality rate.



# Asian Flu (5)

- ⦿ Caused many infections in children, spread in schools, and led to many school closures.
- ⦿ Virus was rarely fatal in children.
- ⦿ Most deadly in pregnant women, the elderly, and those with pre-existing heart and lung disease.

# Asian Flu (6)

- ⦿ Estimates of deaths worldwide vary:
  - UK government estimates between one and four million.
  - US CDC estimates 1.1 million.
- ⦿ In the US about 70,000 to 116,000 deaths.
- ⦿ In the UK, about 33,000 people died.
- ⦿ In Germany, around 30,000 people died.

# 1957 Flu Virus

- In the 1960s the human *H2N2* strain went through a series of slight *antigenic drifts*.
- These minor genetic modifications produced periodic epidemics.
- Through *antigenic shift*, the 1957 flu virus became a brand new influenza A subtype.
- This was *H3N2*, which gave rise to the 1968 flu pandemic (Hong Kong flu).

1968-1969

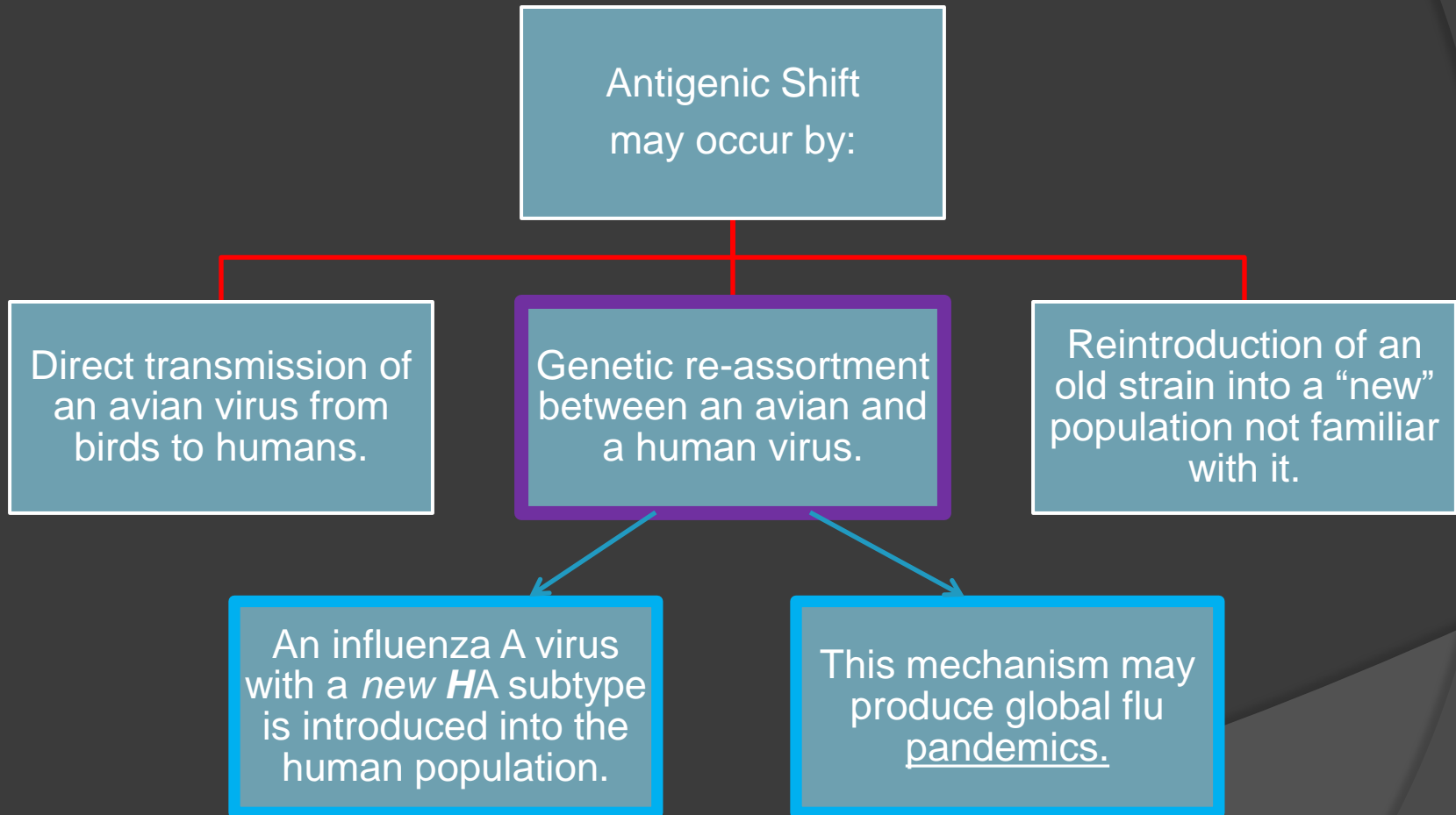
# 4. Hong Kong Flu

# The Hong Kong Flu Pandemic <sup>(1)</sup>

(1968-1969)

- **H3N2 Influenza A** virus converted by antigenic shift from **H2N2**.
- The subtype contained genes from avian influenza viruses.
- Arose in pigs co-infected with avian and human viruses.

# Antigenic Shift (H2N2 to H3N2)



# The Hong Kong Flu Pandemic <sup>(2)</sup> (1968-1969)

First instance 13 July, 1968 in Hong Kong.

Began in Mainland China before it spread to Hong Kong?

End of July 1968, outbreaks in Vietnam and Singapore.

September 1968 reached India, Philippines, northern Australia, and Europe.

October 1968 entered California carried by troops returning from Vietnam.

Widespread in the US in December, 1968.

Reached Japan, Africa, and South America by 1969.

# The Hong Kong Flu Pandemic <sup>(3)</sup>

## (1968-1969)

- CDC estimates total worldwide mortality at 1M from July 1968 to winter 1969-70.
- Estimated US deaths about 34K-100K.
- Most excess deaths were in 65 & older.



# The Hong Kong Flu Pandemic <sup>(4)</sup> (1968-1969)

- Hong Kong flu shared internal genes and the *Neuraminidase* with the *H2N2* 1957 Asian flu.
- Residual antibodies to the *Neuraminidase* or internal proteins may have resulted in far fewer casualties than other pandemics.

# Basic Reproduction Number <sup>(1)</sup>

- ⦿ The *basic reproduction number* of the flu in this period was estimated at **1.80**.
- ⦿ *Basic reproduction number*,  $R_0$  of an infection is the expected number of cases directly generated by one case in a population where all individuals are susceptible to the infection.
- ⦿ if  $R_0$  is  $<1$ , the outbreak will die out
- ⦿ If  $R_0$  is  $>1$ , the outbreak will expand.

# Influenza by Numbers

| Name           | Subtype                  | R <sub>0</sub> | Deaths (Est.)           | Fatality (Est.) | Severity |
|----------------|--------------------------|----------------|-------------------------|-----------------|----------|
| Spanish 1918   | H1N1                     | 1.8            | 17 M - 100 M            | 3-8%            | 5        |
| Asian 1957     | H2N2                     | 1.65           | 1 M - 4 M               | <0.2%           | 2        |
| Hong Kong 1968 | H3N2                     | 1.8            | 1 M - 4 M               | <0.1%           | 2        |
| 2009 Pandemic  | H1N1/09                  | 1.46           | 550 K                   | 0.01%           | 1        |
| Seasonal       | H1N1-H3N2<br>Influenza B | 1.28           | 290K – 650K<br>Per year | <0.1%           | 1        |

# Basic Reproduction Number <sup>(2)</sup>

- ⦿  $R_0$  cannot be modified through vaccinations or changes in population susceptibility.
- ⦿ It can be modified by non-pharmacological interventions like physical distancing.
- ⦿ Other public policy or social interventions like handwashing, masking, surface disinfection or barrier strategies may modify  $R_0$ .

The “Sleep Sickness”

# Encephalitis Lethargica

“I would not have imagined it *possible* for such patients to exist; or if they existed, to remain undescribed.”

**OLIVER SACKS**

# Encephalitis Lethargica (1)

The  
Forgotten  
Epidemic

Von  
Economo's  
disease.

Called  
*nona*:  
"the living  
dead".

Patients  
fell asleep  
indefinitely.

World  
pandemic  
in early  
20th  
Century.

About 1.6  
Million  
deaths  
1915-1926.

Affected  
5M with  
mortality  
40%.

Not  
comatose,  
just would  
not wake.

# Encephalitis Lethargica (2)

- ⦿ Between 1750 and 1800, France & Germany experienced minor epidemics of "*coma somnolentum*".
- ⦿ Features of Parkinson, including hyperkinetic hiccough, myoclonus, chorea, and tics.
- ⦿ In 1890 in Italy, after the influenza epidemic of 1889–1890, a severe epidemic of somnolent illnesses (nicknamed the "Nona") appeared.
- ⦿ For the few survivors of the Nona, Parkinsonism and other sequelae developed in almost all cases



# Encephalitis Lethargica (3)

- ⦿ Attacks the brain, leaving some victims in a statue-like condition, speechless and motionless.
- ⦿ Between 1915 and 1926 an epidemic of EL spread around the world.
- ⦿ A third of affected died in the acute stages.
- ⦿ Many survivors never returned to their pre-morbid vigor.

# Encephalitis Lethargica (4)

- EL most virulent between October 1918 and January 1919.
- The pandemic disappeared in 1927 as abruptly and mysteriously as it first appeared.
- The great EL pandemic coincided with the 1918 influenza pandemic.
- It is likely that the influenza virus potentiated the effects of the encephalitis virus or lowered resistance to it in a catastrophic way.

# Encephalitis Lethargica (5)

“They would be conscious and aware – yet not fully awake; they would sit motionless and speechless all day in their chairs, totally lacking energy, impetus, initiative, motive, appetite, affect or desire; they registered what went on about them without active attention, and with profound indifference. They neither conveyed nor felt the feeling of life; they were as insubstantial as ghosts, and as passive as zombies.”

Oliver Zachs, 1990, Awakenings

# Plague

# The Plague in 20<sup>th</sup> Century

| Location       | Dates     | Type               | Mortality |
|----------------|-----------|--------------------|-----------|
| San Francisco  | 1900-1904 | Bubonic            | 119       |
| Sydney         | 1900      | Bubonic            | 103       |
| India          | 1903      | Bubonic            | 22        |
| Fremantle      | 1903      | Bubonic            | 4         |
| Manchuria      | 1910-1911 | Pneumonic          | 60,000 ** |
| China          | 1910      | Bubonic            | 40,000 ** |
| Los Angeles    | 1924      | Pneumonic          | 30        |
| China          | 1946      | Bubonic            | Unknown   |
| Western Sahara | 1984      | Bubonic            | 64        |
| India          | 1994      | Bubonic +Pneumonic | 56        |
| Algeria        | 2003      | Bubonic            | 1         |
| Madagascar     | 2008      | Bubonic            | 20        |
| Madagascar     | 2014      | Bubonic            | 292       |

# Polio

# Polio in 20<sup>th</sup> Century

| Location                | Dates     | Mortality |
|-------------------------|-----------|-----------|
| United States           | 1916      | 7,130 *   |
| Australia               | 1937      | Unknown   |
| United States           | 1948-1952 | 9,000 *   |
| Staphorst (Netherlands) | 1971      | 5         |

# Dengue Fever



# Dengue Fever in 20<sup>th</sup> Century

| Location                    | Dates        | Mortality |
|-----------------------------|--------------|-----------|
| Central America             | 2000         | >40       |
| Indonesia                   | 2004         | 658       |
| India                       | 2006         | >50       |
| Pakistan                    | 2006         | >50       |
| Philippines                 | 2006         | 1,000 *   |
| Puerto Rico, D.R., Mexico   | 2007         | 183       |
| Brazil                      | 2008         | 67        |
| Cambodia                    | 2008         | 407       |
| Philippines                 | 2008         | 172       |
| Bolivia                     | 2009         | 18        |
| Queensland                  | 2009         | 18        |
| Peshawar                    | 2017         | 69        |
| Asia-Pacific, Latin America | 2019-present | 3,930 *   |

# Yellow Fever

# Yellow Fever in 20<sup>th</sup> Century

| Location       | Dates     | Mortality |
|----------------|-----------|-----------|
| Sudan          | 1940      | 1,627     |
| Ethiopia       | 1960-1962 | 30,000 ** |
| Oju (Nigeria)  | 1986      | >5,600 ** |
| Mali           | 1987      | 145       |
| Angola & Congo | 2016      | 498       |

# Recap of Session 5

- Review of Definitions.
- The “Big 4” of the 20<sup>th</sup> Century.
- The Influenza Virus and its quirks.
- Spanish Flu Pandemic of 1918.
- Asian Flu Pandemic of 1957.
- Hong Kong Flu Pandemic of 1968.
- The Cholera Pandemics.
- Encephalitis Lethargica.

# FREQUENTLY ASKED QUESTIONS

**THANK YOU**