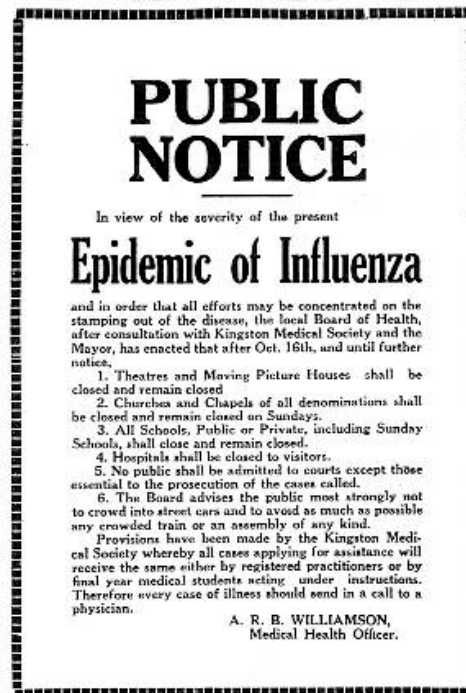




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The Greatest Threat in Our Lifetime?



What are you doing to get ready?



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Agenda

- Basic Planning Assumptions
- Past Threats
- The Pandemic Threat
- Public Health Law
- Modern Medicine
- Pandemic Economics
- What you can do...



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Planning Assumptions

- Business Continuity Planning generally has two assumptions:
 - Back to “business as usual” in 30 days or less
 - Go from the “affected” site to the “unaffected site” and resume business
- ***Neither apply with Pandemic Influenza***



Reuters



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But It's Only the Flu!



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Influenza - A Primer...

- Influenza is a *highly contagious* respiratory disease.
 - Historical accounts go back to Italy in the 16th century.
- During any given year, 10-20% of the world's population gets influenza.
 - Influenza is associated with 500,000 to 1,000,000 deaths worldwide each year.
- In unpredictable years (epidemic years) 25% of the population get it.
- In the US, annual seasonal influenza results in approximately 36,000 deaths and 114,000 hospitalizations.



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Course of Influenza in Adults



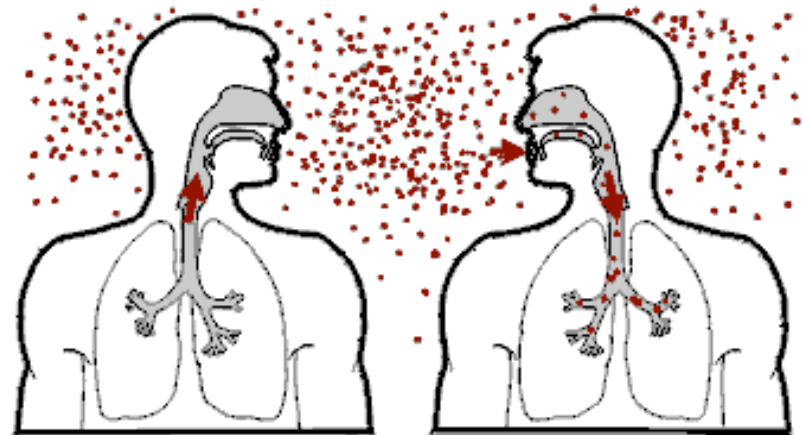
Day 0	Become infected
Day 1 - 4	Disease Incubation (average 2 days)
Day 1 - 6	Contagious (one day before symptoms to 5 days after symptom onset)
Day 2 - 9	Symptomatic (usual 2 - 5 days)
Day 4 to ?	Decreased energy (one week or more)



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How You Become Infected

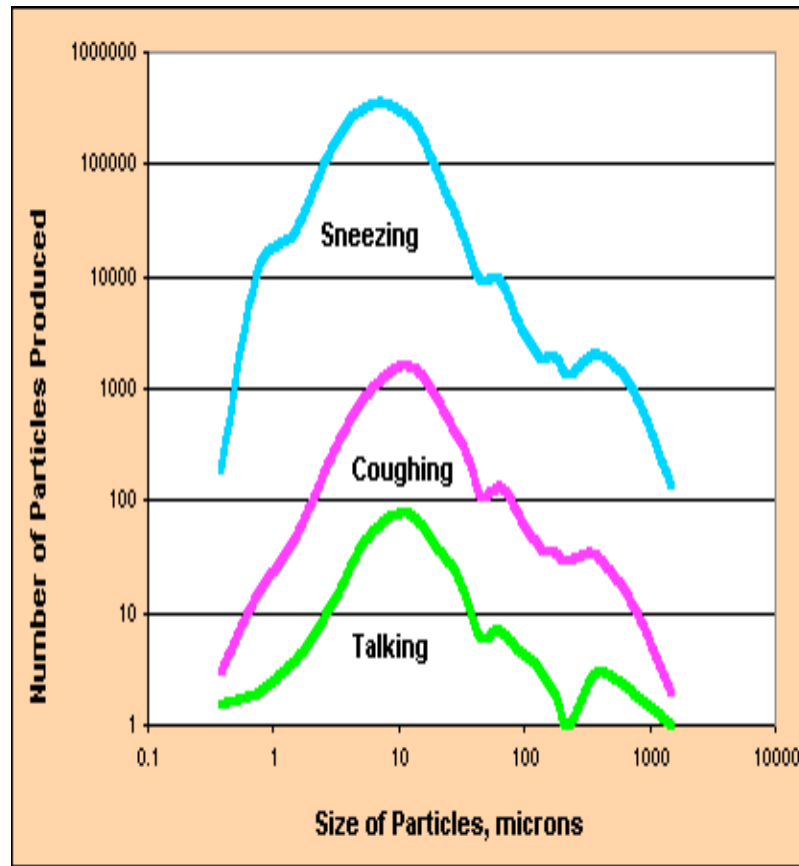
- Influenza is spread by droplet nuclei within 3 - 6 foot.
- When YOU breath, talk, cough or sneeze, tiny particles containing droplet nuclei are expelled into the air.
 - 1 - 5 microns in size.





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Airborne Droplet Nuclei

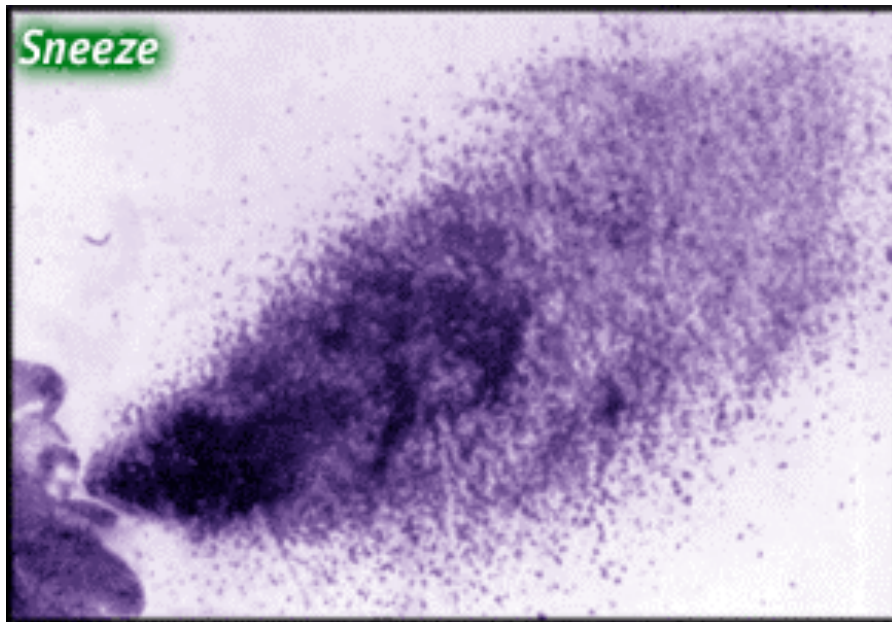


- Droplet nuclei can remain suspended in the air for *several hours*, depending on the environment.
- Talking for **five minutes** can generate 3000 droplet nuclei.
- Singing can generate 3000 droplet nuclei in **one minute**.



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Sneezing



- Sneezing generates tens of thousands of droplet nuclei which can spread up to 10 feet away.



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How Close is Close?



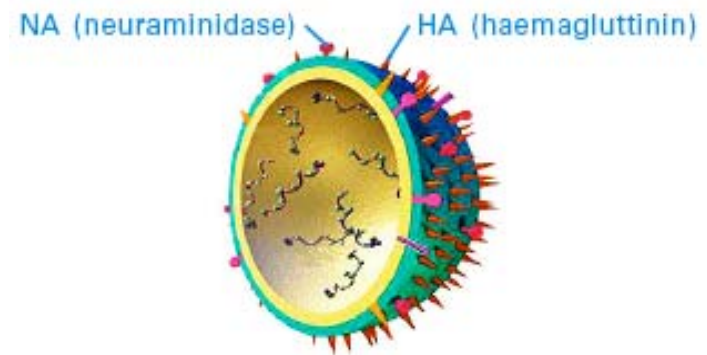
- What is considered to be “close personal contact” is 3 to 6 feet
- Take a moment now to look around you to see who you are sharing your droplet nuclei with!



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Influenza A - A Tutorial

- Influenza A has two subtypes determined by proteins on the outer surface of the virus
 - Hemagglutinin (H) – helps virus attach to respiratory cells (H 1 - 16).
 - Neuraminidase (N) – helps virus penetrate into the cells once it is attached (N 1 - 10).
 - 144 different H and N combinations
- An example a description of a subtype would be the H3N2 virus





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Influenza- A Microbial Chameleon

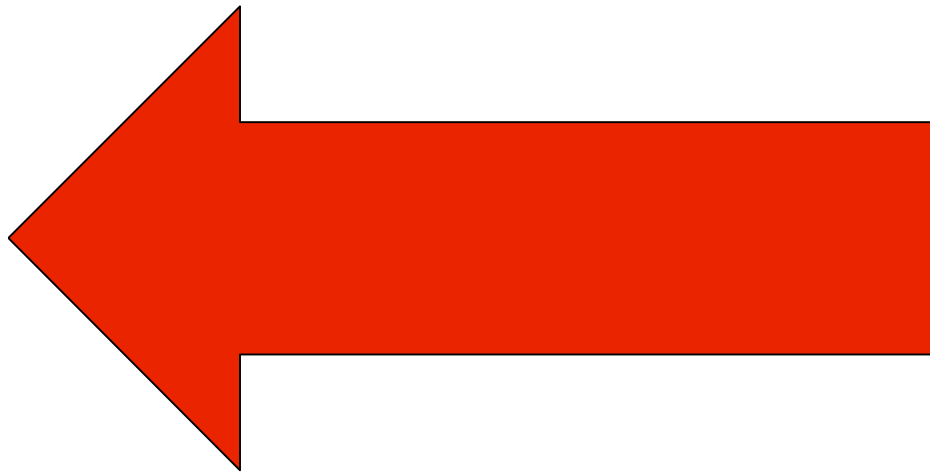
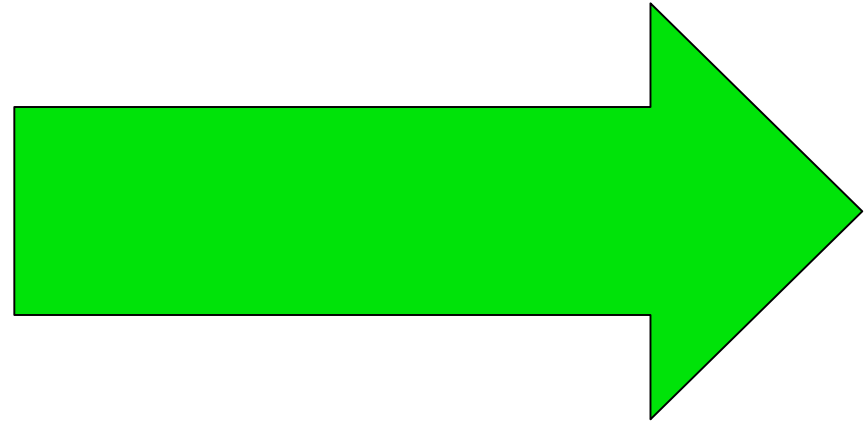
- Influenza has thrived over the millennia by adhering to one simple principal- **adapt or die**.
- If this constant process of genetic shuffling didn't occur, eventually many humans would become immune and the virus would die out.
- Most of us will experience repeated Influenza infections in our lifetime.
 - *Or...*why you got the flu shot and still got the flu!



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Antigenic **Drift** or **Shift**

- A subtle mutation within the **same** subtype.
 - Can be associated with epidemics.



- An entirely new subtype of virus emerges through either:
 - Recombination of human and animal antigens (often swine and/or avian).
 - Direct leap to humans



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1918 Spanish Flu The Great Killer



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Spanish Flu March 10, 1918

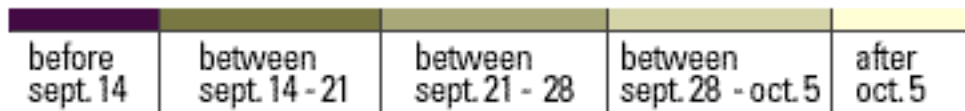
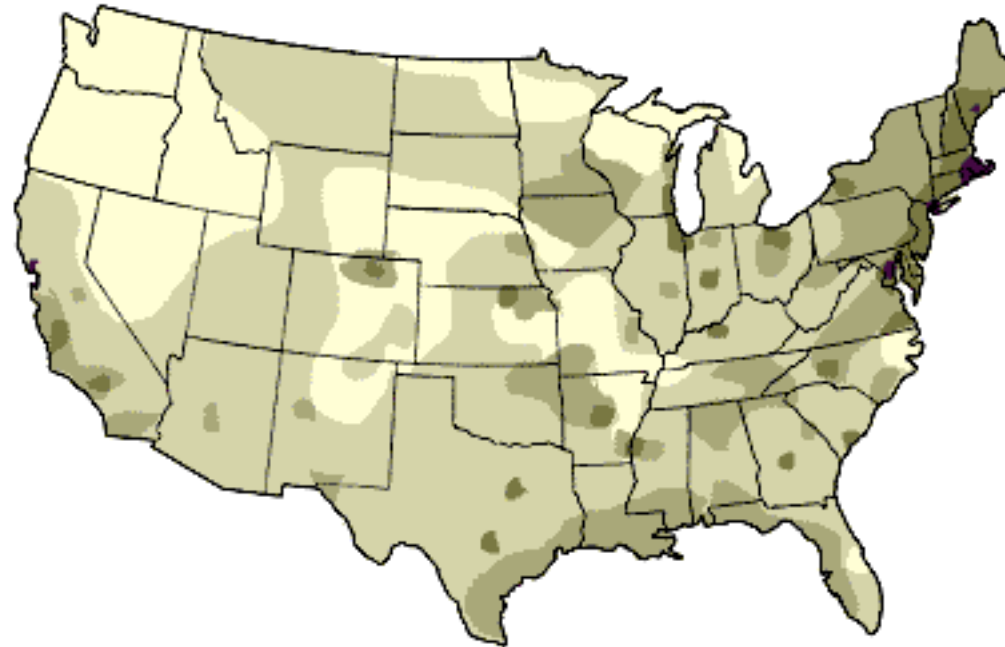


- The virus first manifested on March 10 at Camp Riley, Kansas.
- With WWI in progress it moved around the globe with ease.
- It affected young people in the prime of their life, often killing them within a day.
 - Average age - 20-29 years old



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Approximate beginning of the epidemic, 1918



Source: *America's Forgotten Pandemic - The Influenza of 1918 - 1989*



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Spanish Flu 1918-1919

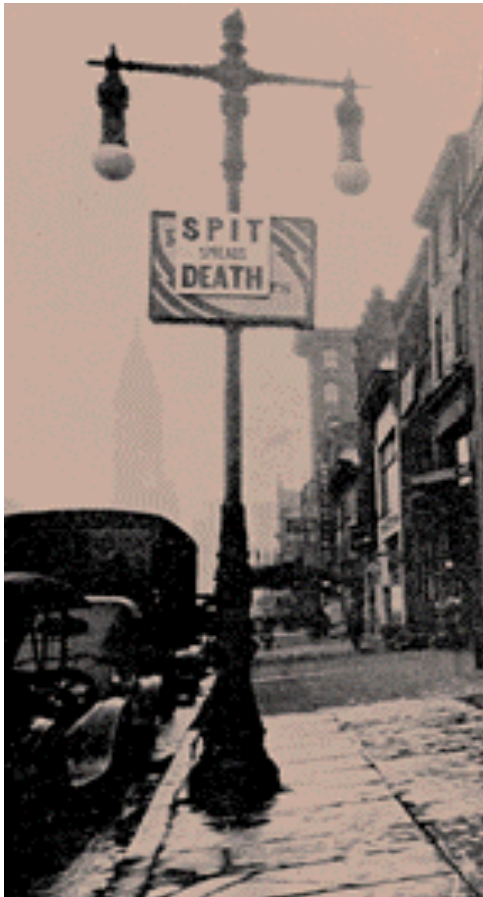
- United States cities experienced:
 - City quarantines
 - Required masks while on the street
 - Severe shortage of nurses (up to 75%)
 - Shortage of caskets
 - Mass burials
 - School closures
 - Business closures
 - Panic and widespread fear





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October 1918



- Some of what was happening in October 1918
 - 851 New Yorkers die of influenza in a single day.
 - In Philadelphia, the city's death rate for one single week is 700 times higher than normal.
 - The crime rate in Chicago drops by 43 percent.
 - October 1918 turns out to be the deadliest month in the nation's history as 195,000 Americans fall victim to influenza.



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Worldwide Tolls

- Entire Inuit villages in Alaska completely wiped out.
- 20% of the population died in Western Samoa (7,500).
- 1 out of every 20 citizens in Ghana died over 60 days between September 1 and November 1.





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The Toll of Spanish Influenza

- 50 million deaths worldwide
 - Global numbers range from 50 - 100 million
 - (17 million in India alone)
 - World population 1.75 billion
- 550,000 deaths in the United States
 - Total death toll in Philadelphia 13,000 with 150,000 cases





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1957 & 1968 Pandemics



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1957 and 1968 Pandemics

- Asian Flu 1957
 - In May 1957 - the World Health Organization (WHO) reported a new H2N2 subtype from Singapore.
 - Infection rates were reported to range from 20% to 70%.
 - Death toll 70,000 excess mortality. World population was 2.75 billion
- Hong Kong Flu 1968
 - In mid July 1968 a new subtype - H3N2 emerged in Hong Kong.
 - Mortality rates were similar in magnitude to those caused by Asian influenza. Age-specific mortality was highest for those over the age of 65 years.
 - Death toll 31,000 excess mortality. World population was 3.65 billion



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Why less deaths in 1957 & 1968?

- Less virulent viruses.
 - Caused by recombination - human flu viruses that acquired 2 or 3 key genes from bird flu virus strains.
- Antibiotic treatment for secondary infections.
- Improved supportive care.



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1918 - The Deadly One



- The 1918 virus acted much differently from the “ordinary” human flu viruses.
 - Scientists now believe the 1918 strain was probably **entirely** a bird flu virus that adapted to function in humans
 - Just like today’s H5N1
 - The 1918 virus was a **direct leap** from birds to humans.
 - Just like the current H5N1.

Journal of Nature October 2005



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Today's Threat



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Current Human Death Toll

- These summary of cases and deaths is as of September 18, 2006
 - Indonesia 65/49 - 9+ clusters (76.7%)
 - Vietnam 93/42 (45.2%)
 - Thailand 24/16 (63.6%)
 - Cambodia 6/6 (100%)
 - China 21/14 (66.7%)
 - Turkey 12/4 (33.3%)
 - Iraq 2/2 (100%)
 - Azerbaijan 8/5 (62.5%)
 - Egypt 14/6 (38.5%)
 - Djibouti 1/0 (0%)
 - Total 246 cases/144 deaths
 - 58.5% fatality
- The total number of cases/deaths includes only WHO laboratory confirmed cases.



Reuters / Nir Elias



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Indonesia - The Hot Spot



- 18,108 islands (6,000 inhabited)
- 242 million people
- Jakarta - 12 million people
- 47 cases with 38 fatalities so far in 2006 (65/49) 76.7% fatality.
- 9+ significant family clusters
 - One family cluster in North Sumatra resulting in 7 deaths
 - 3 weeks from index case to the last death (2 times maximum incubation)

The Jakarta Post quoted several local health experts as saying that “the government was not disclosing how widespread the disease was or how many times human-to-human transmission might have occurred.”
NY Times 6.16.06



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H5N1 and the Victims

- Age was reported for 116 human H5N1 influenza cases. According to these data:
 - 50 percent of cases occurred in individuals 16 years or younger
 - 75 percent of cases were 29 years or younger
 - 90 percent of cases were 39 years or younger
- Good news - infects deep in the lungs therefore more difficult to transmit to others.





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Wild Bird Vs. Poultry



- Controversial issue
 - Poultry is the primary reservoir.
 - H5N1 lives in soil and bird feces for 30 days.
 - Wild birds are often infected from domestic birds.



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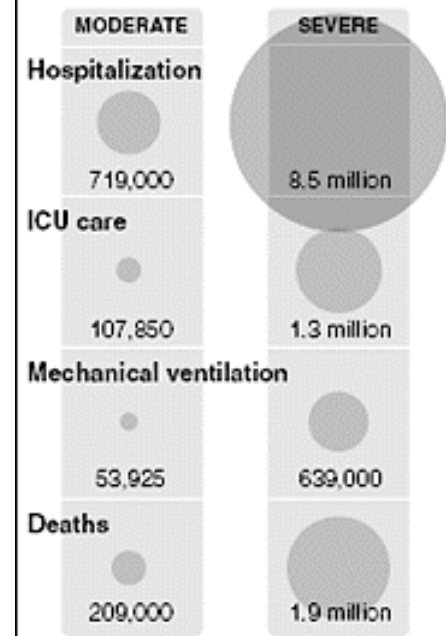
Health Care Predictions

Location	Deaths	Hospitalizations	# of Cases
United States	541,433	2,358,089	66,914,573
California	60,875	273,090	8,067,075

Source- *Trust for Americas Health*
<http://healthyamericans.org/reports/flu/>

Predicting a Pandemic

According to estimates by the Department of Health and Human Services, a flu pandemic could cause 90 million people in the United States to become ill and half of those to seek outpatient care. More serious effects would depend on how virulent the flu virus is.



Note: The projections are based in part on past flu pandemics. The moderate case approximates the virulence of the 1958 or 1968 flus, which killed 70,000 and 34,000 in the United States, respectively. The severe case approximates the 1918 flu, which killed about 500,000.



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“We’re due. Its not a matter of if, but **when** this will happen. I am far more afraid of a flu pandemic than I am of SARS.”

*Albert Osterhaus
WHO Scientist
Wall Street Journal
May 29, 2003*



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SARS

- Severe Acute Respiratory Syndrome is a coronavirus **not** Influenza A.
- Nov 2002 - July 2003
 - 29 countries, 8098 cases, 774 deaths, 35-50 median age, overall 9% fatality.
- Droplet spread, 3 feet, person-to-person contact.
- 2-10 day incubation, 2-3 week duration of illness.
- Recently discovered to come from the Horseshoe Bat





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Public Health Law and Quarantine



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Public Health Law - Quarantine

An executive order of the president limits quarantine to nine diseases:

- Cholera
- Diphtheria
- Infectious tuberculosis
- Plague
- SARS
- Smallpox
- Yellow fever
- Viral hemorrhagic fevers like Ebola
- Influenza caused by new strains that could cause a pandemic.



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Powers of Public Health Authority

- Public health authority required during a state of public health emergency to **use every available** means to prevent transmission of infectious disease.
- Examples of powers given to public health authorities include:
 - **Close, direct, evacuate** or decontaminate **any facility** that is reasonably believed to endanger the public health.
 - **Control or limit egress** to and from any affected public area, the movement of persons within the area, and the occupancy of the premises therein.
 - **Perform physical examinations** and/or tests as necessary for the diagnosis or treatment of individuals.
 - **Vaccinate** persons as protection against infectious or contagious disease.
 - **Collect specimens** from both living and deceased persons.
 - **Treat** persons exposed to or infected with disease.
 - **Isolate or quarantine** individuals or groups of individuals – including those who refuse medical examination, testing, or vaccination.



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Los Alamos Model of Pandemic Flu Spread



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Pandemic Flu Spread

- Simulation conducted by researchers at the Los Alamos National Laboratory in New Mexico, the University of Washington, and the Fred Hutchinson Cancer Research Center in Seattle.
- Simulation of a pandemic flu outbreak in the continental United States,
 - Introduced by the arrival of 10 infected individuals in Los Angeles
 - Spread of infection through 281 million people over the course of 180 days.
 - Without vaccination, antiviral drugs, or other mitigation strategies, the entire nation becomes infected within a few months
 - A significant fraction of infected people (33 percent in the model) never develop clinical symptoms, although they are themselves infectious.

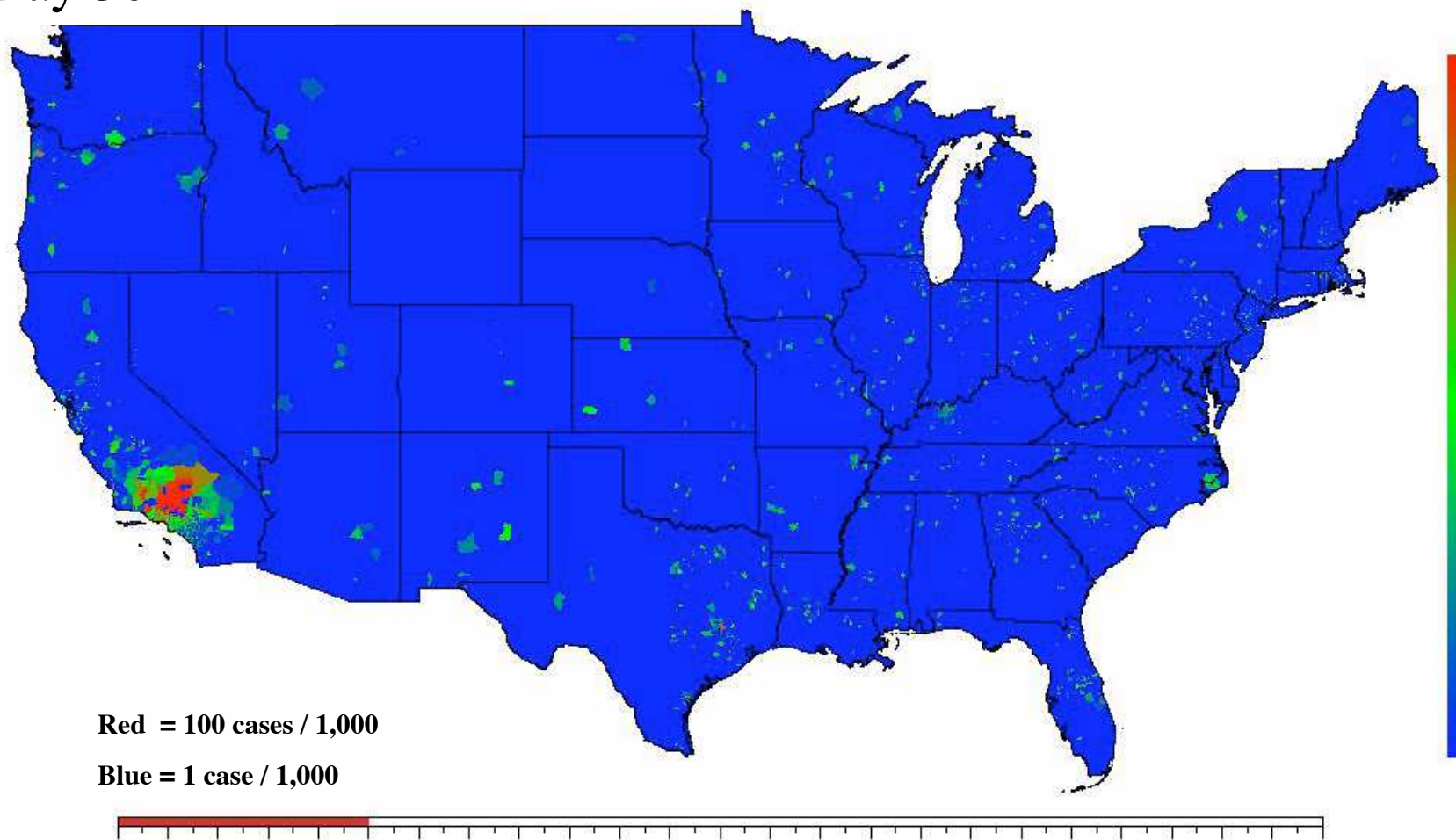
Source: “Mitigation Strategies for Pandemic Flu”, by Germann, Kadau, Longini and Macken. Proceedings of the National Academy of Science online April 3-7.



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Los Alamos Model: Pandemic Flu Spread

Day 50



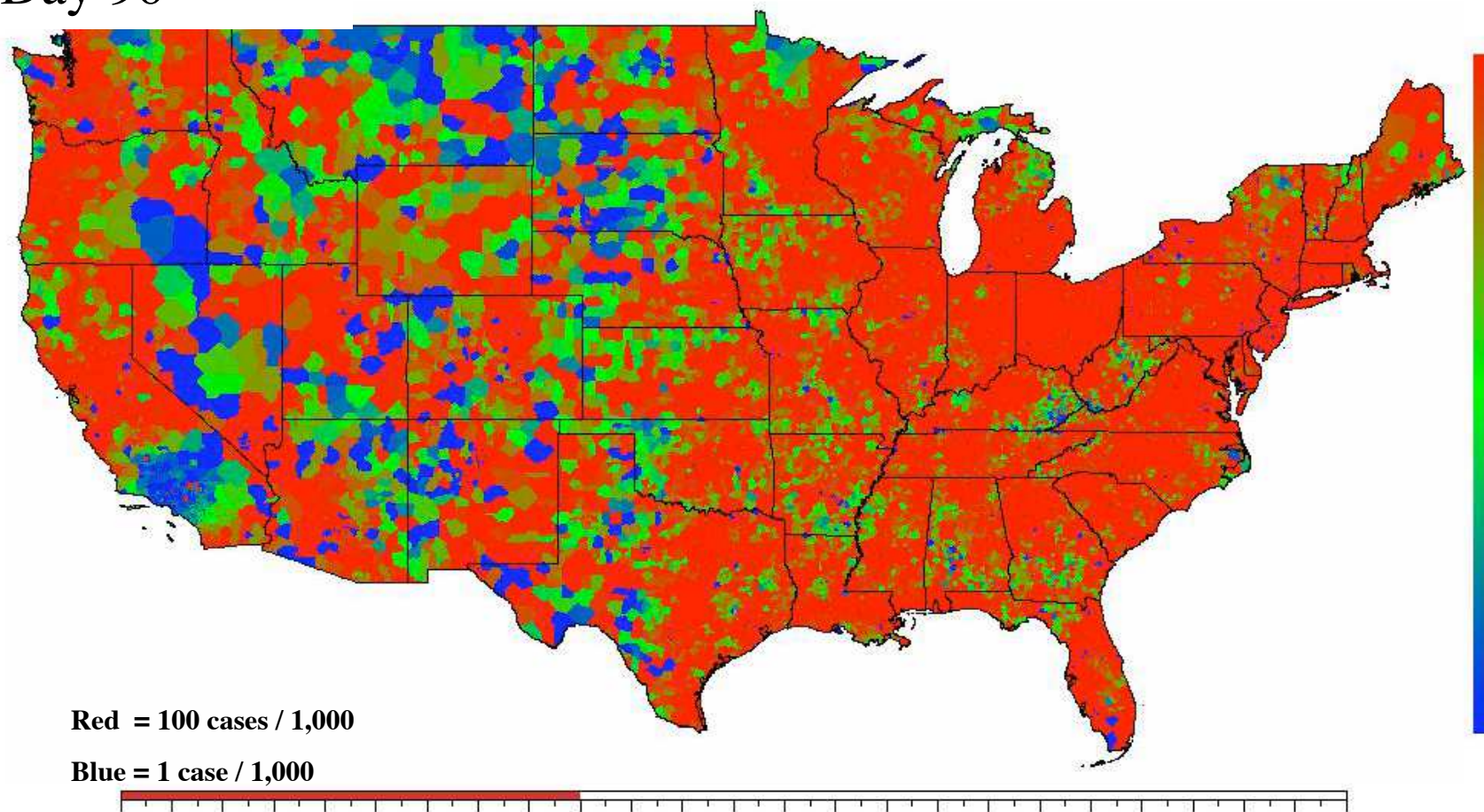
Source: "Mitigation Strategies for Pandemic Flu", by Germann, Kadau, Longini and Macken. Proceedings of the National Academy of Science online April 3-7. September 2006 www.ems-solutionsinc.com



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Los Alamos Model: Pandemic Flu Spread

Day 90



Source: "Mitigation Strategies for Pandemic Flu", by Germann, Kadau, Longini and Macken. Proceedings of the National Academy of Science online April 3-7. September 2006 www.ems-solutionsinc.com



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Speed of the Spread of Flu Is Linked to Airline Travel

- Researchers compared timing and number of flu deaths in 122 American cities with the volume of airline travel during the same period for each flu seasons, 1996 to 2005.
- Found that changes in the rate of spread and timing of peak mortality correlated with yearly fluctuations in monthly airline passenger volume.
- This effect was *particularly pronounced* after the Sept. 11 attacks, with the temporary flight ban in the United States and airline travel volume was lower than in any other season from 1996 to 2005.
 - In most years, the peak date for influenza mortality in the United States occurs within two days of Feb. 17. But in 2002, the peak date was almost two weeks later, on March 2.

PLoS Medicine



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What Can Modern Medicine Do?

Antivirals

- Tamiflu (Oseltamivir) approved 1999
 - Neuraminidase (N) inhibitor, preventing the virus from penetrating the respiratory cells.
 - Made from the Chinese anise star plant (can also be produced artificially)
 - Used during the “regular flu” season especially for the elderly.
- Some H5N1 cases have already exhibited drug resistance to Tamiflu.
- Roche able to produce 80 million doses now, estimate 400 million by end of 2006. US stockpile 21 million doses.
 - Ethical, moral and legal issues for companies who decide to use it.
 - How much would be enough?





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Vaccines

- Grown in eggs (current cellular production is only in the experiment phase).
- Takes 8-10 months to produce.
- Often takes two doses to confer complete immunity (given over 30 day period).
- Manufacturers worldwide can only produce 250 - 300 million doses at a rate of 5 million a week
 - Enough to vaccinate just 1 percent of the U.S. population a week.

Mayo Clinic.com



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Economic Impact



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Possible Economic Impacts

- Severe impact to airlines, tourism and hospitality industry.
- May trigger foreclosures, bankruptcies and credit restrictions.
- Collapse of the housing market.
- Health care system strained to the breaking point.
- Insurance industry would have a huge increase in medical claims.
- Rampant decline in spending. High unemployment.
- Flight to gold and other “safer investments.”

An Investors Guide to Avian Flu - BOM



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Supply Chain Disruption

- Border and port closures leading to subsequent trade disruptions.
- Just-in-Time -“JIT” may create an environment of less goods and services as the movement of goods is impacted.
- Shortages of goods may result in panic buying behavior.





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Economic Forecasts



- World Bank estimates “hit” to economy 1 - 2 **TRILLION**.
- Asian Development Bank - “Asia could lose \$282 Billion, 6.5 GNP, trigger worldwide recession.”
- Bank of Montreal - “A dramatic slow down in the economy equal to that of the Great Depression.”
- Nottingham University - UK to suffer a 8.5 drop in GNP with a mild pandemic.



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Any Good News?

- If you ever doubted it...what we do as BCP professionals is absolutely critical!
- A viable and current business continuity program is essential and vital for the success of your organization.



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Protecting Yourself & Your Family



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What Can You Do To Protect Yourself?



- Don't worry... at least overly anyway!
- WASH your hands.
- If sick, stay home.
- Avoid touching your eyes, ears and mouth.
- Get a flu shot.
- Stock up! Practice personal preparedness, have enough basic supplies at home for a week.



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Can You Eat Poultry?

- No evidence that *properly cooked* poultry or eggs are sources of infection.





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Bird Watching? Bird Feeders?

- Absolutely!
- Watch wild birds from a distance.
- Don't handle dead birds.
- Clean bird feeders well with water and bleach (1-9 solution).





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“How To” Hand Washing

1. Wet hands with **warm water**.
2. Apply a generous amount of **soap** & lather hands well.
3. Rub hands together for **20 seconds**, paying special attention to the areas between fingers & under nails.
4. Rinse hands thoroughly with warm water.
5. Dry hands with a disposable towel
6. Use the disposable towel to turn off the faucet & open the door.





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What is 20 seconds?

- Songs suggested by the CDC or “approved” to sing while washing for 20 seconds include...
 - Twinkle, Twinkle Little Star

OR

 - Happy Birthday

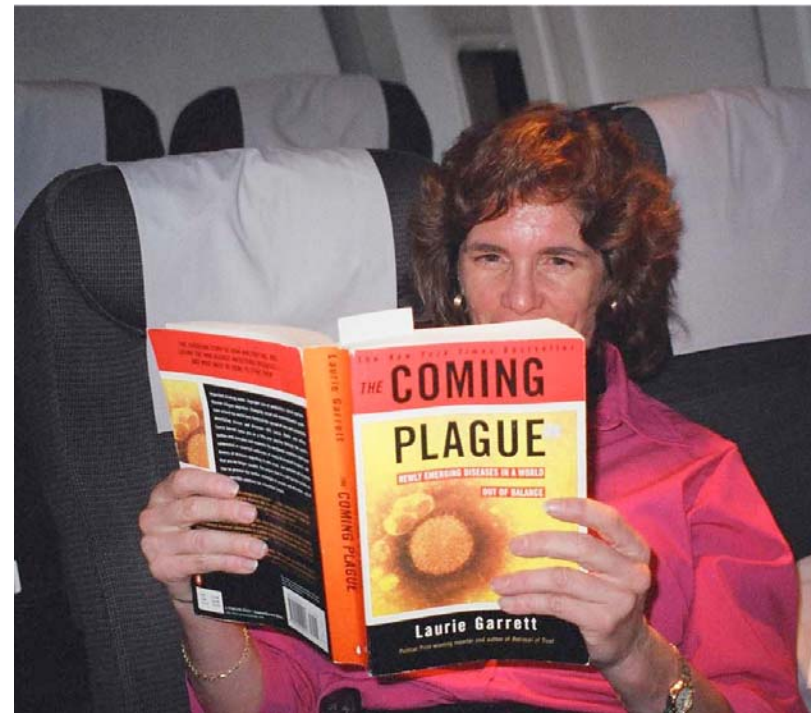
- Twinkle, twinkle, little star,
- How I wonder what you are.
- Up above the world so high,
- Like a diamond in the sky.
- Twinkle, twinkle, little star,
- How I wonder what you are!



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Background Reading...

- Sign up for ProMed - www.promedmail.org
- Dr. Sherry Cooper, BOM
- The Monster At Our Door, Mike Davis, 2005
- The Great Influenza: The Epic Story of the Deadliest Plague In History, John Barry 2004
- The Coming Plague, Laurie Garrett
- Influenza 1918- The Worse Epidemic in American History, Lynette Iezzoni
- Epidemic and Peace, Alfred Crosby
- Man And Microbes: Disease and Plagues in History and Modern Times, Arno Karlen
- Viruses, Plagues, and History, Michael B. A. Oldstone
- Flu, Gina Kolata
- Plagues and Peoples, William H. McNeill
- Influenza 1918: The American Experience, Andrea Kalin VHS





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Incredible Opportunity

- We have an incredible opportunity to plan...
 - We don't know **when** the pandemic will occur.
 - We don't know **how** “**bad**” it will be.





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Do Something!

- NOW!
- Begin preparation today for you, your family and your business.





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Thank You!

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