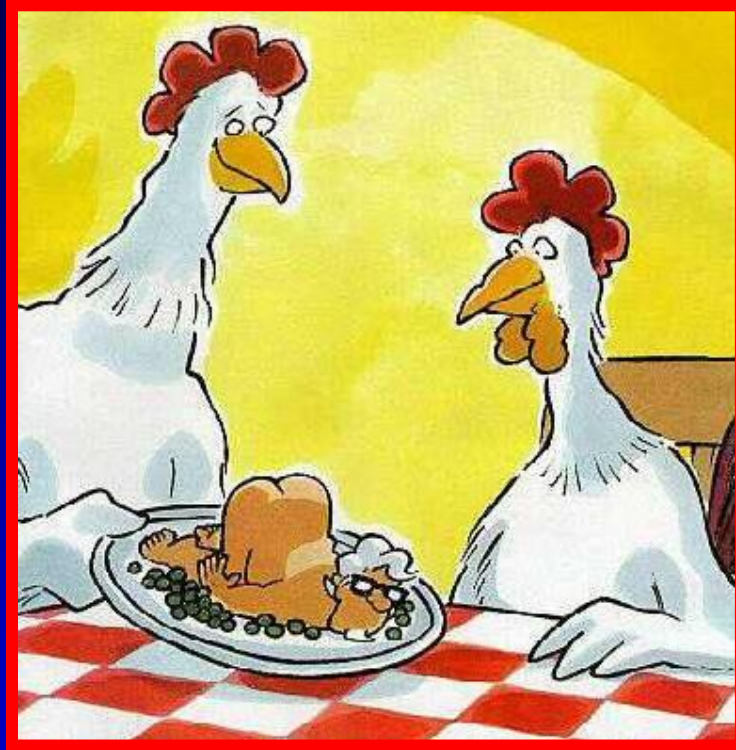


Influenza Pandemic (Un?)Preparedness



Louis M. Katz MD
Medical Director
Scott County Health Department

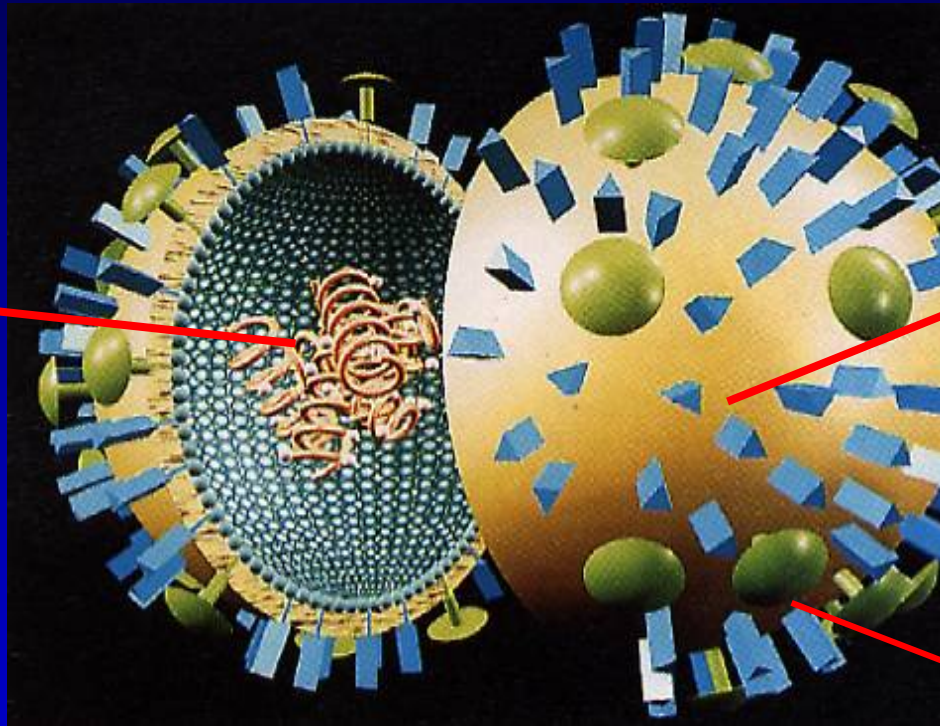
Human influenza types

- Type A
 - Epidemics and pandemics
 - Birds, animals (swine) → humans
 - All ages
- Type B
 - Milder epidemics
 - Humans only
 - Primarily affects children
- Type C
 - Never mind

Influenza A

- Incubation: 1-4 days (average 2 d.)
- Whole respiratory tract may be involved
- Abrupt onset fever, chills, malaise and muscle aches. Cough, sore throat, headache.
- Duration of severe symptoms: 3-7 days
- Large amounts of virus in secretions
- Virus shed for 2-8 days after onset
 - Virus detected up to 24 hours before onset
 - Viral shedding in children can persist for longer

Influenza A



8 segments of
– sense, single
stranded RNA

Hemagglutinin

A/Beijing/32/92 (H3N2)

Neuraminidase

Drift vs. Shift: Darwin lives

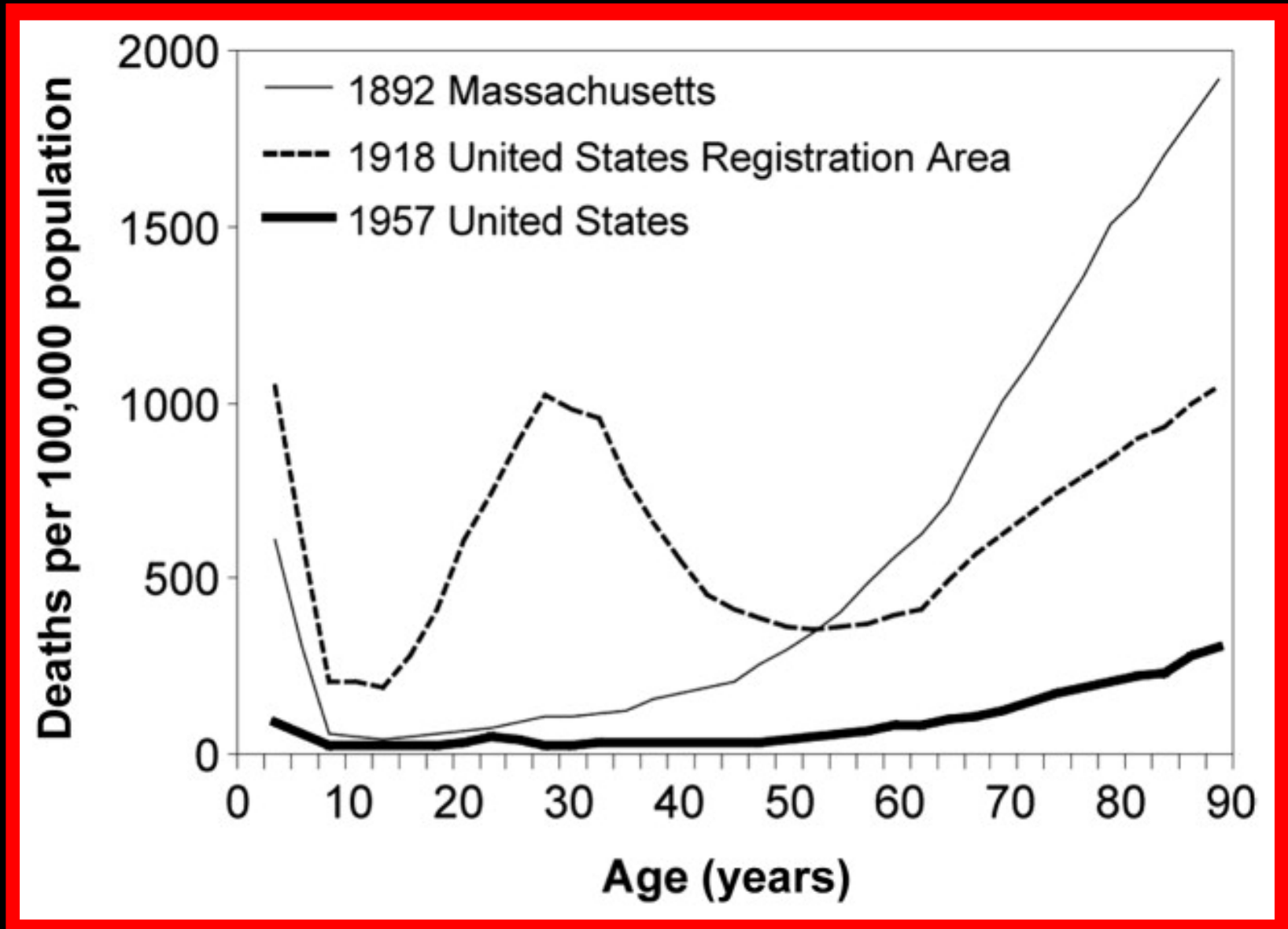
- Antigenic Drift – Annual Influenza
 - Mutations leading to small change
 - Selection for strains which encounter the least resistance
 - Some immunity, but need new influenza vaccine
- Antigenic Shift – Pandemic Influenza
 - Generally very big changes in an animal virus
 - Genetic reassortment of viral genes when two viral strains infect the same cell or direct jump from avian sources
 - New virus, minimal immunity

20th century Influenza A pandemics

all are not created equal

	Subtype	Origin	Viral Change	Est. US deaths	Shape of mortality curve	Populations at risk	Spread and crest
1918	H1N1	Kansas	Mutation from avian strain in HA	548,000	W	Well young adults	3 waves 1918-19, simultaneous around the world
1957	H2N2	Asia	Reassortment of 3 segments from avian strain	69,800	U or J	Infants and elderly	April 1957 Hong Kong, May Japan, June Chile, Oct. US with second wave Feb. 1958
1968	H3N2	China	Reassortment of 2 segments from H2N2	33,800	U or J	Infants and elderly	July 1968 Hong Kong, Dec. 68-Jan. 1969 US

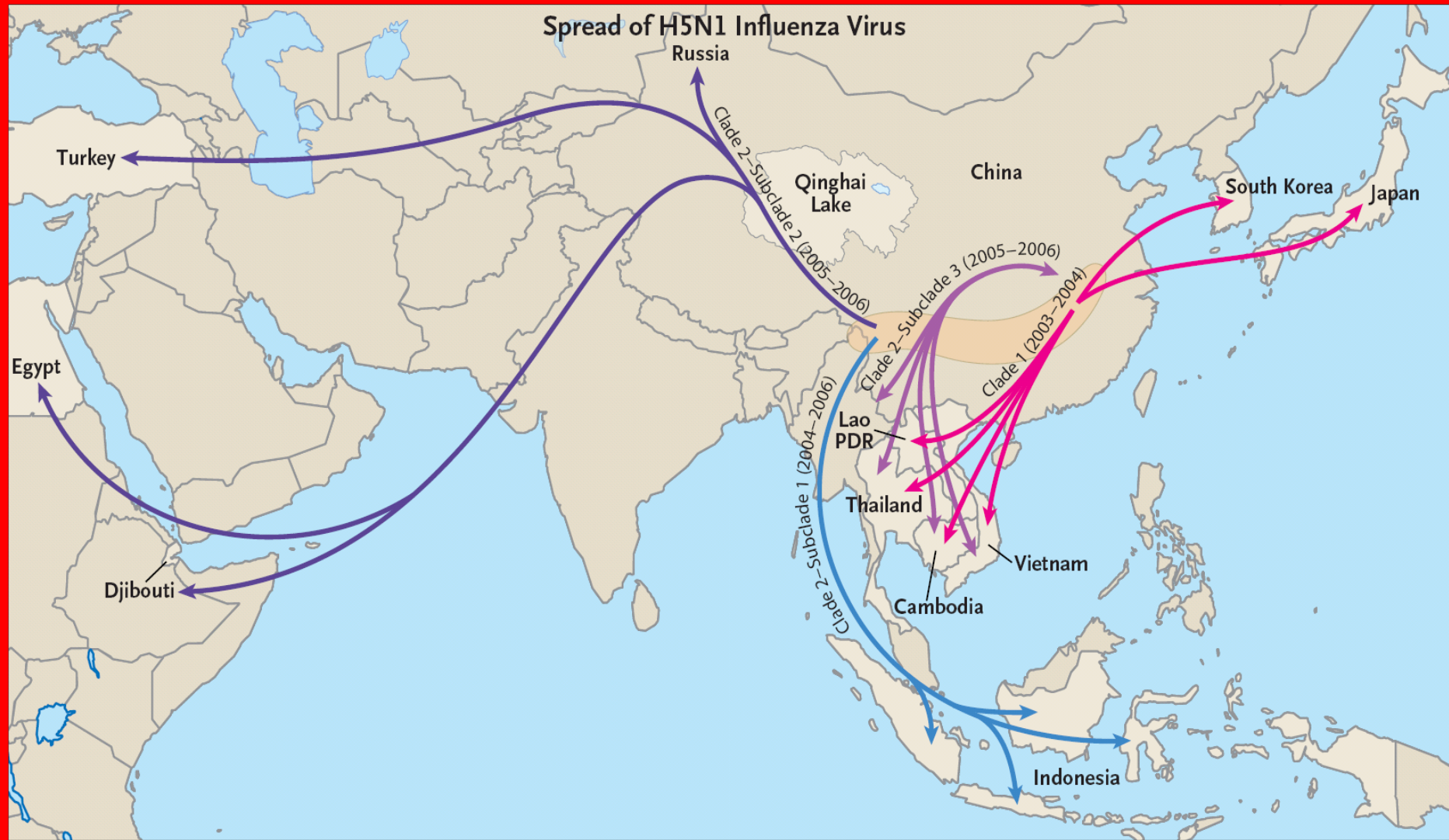
Mortality patterns in 3 pandemics



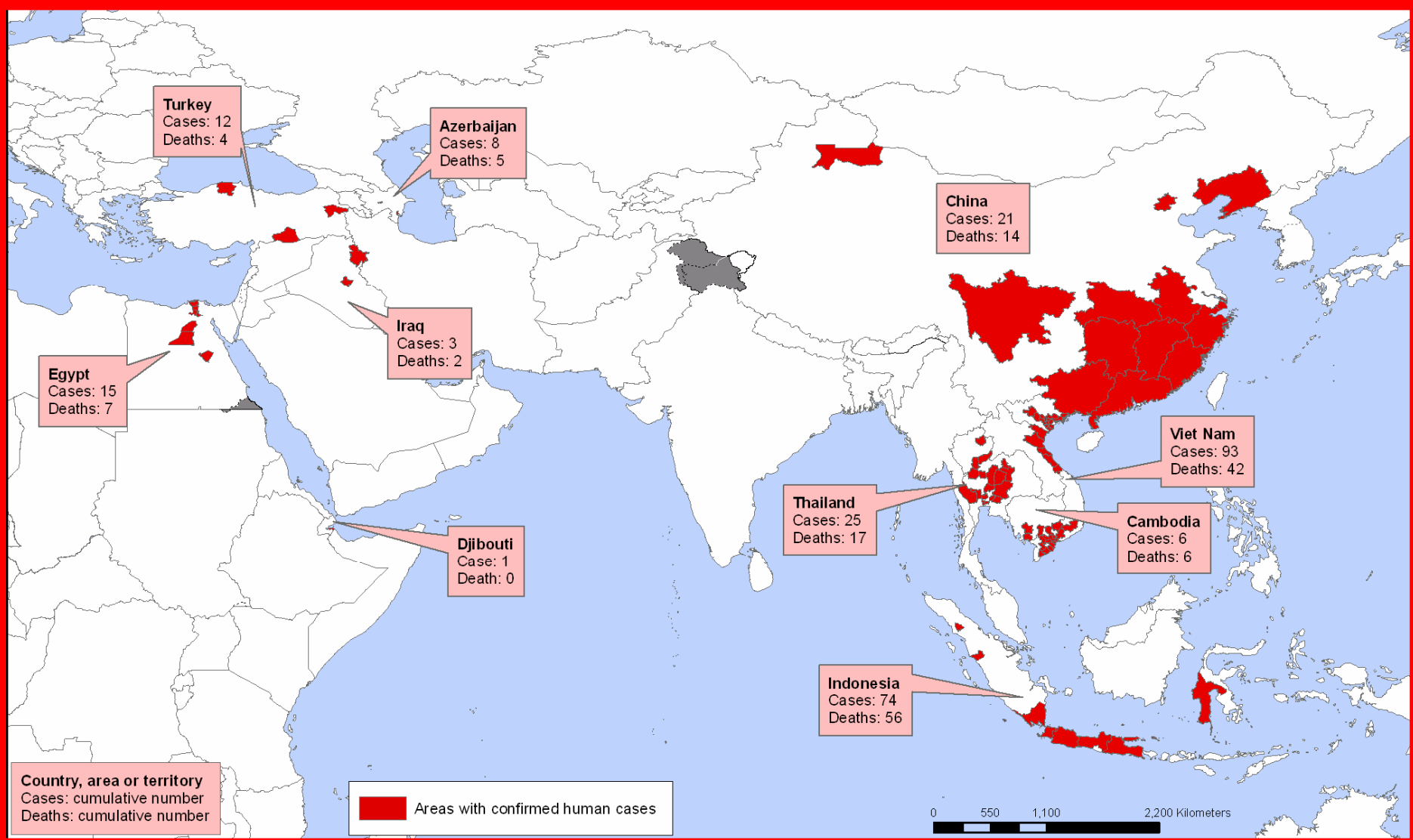
Influenza A (H5N1)

- Majority of human cases in children, almost all with exposure to ill poultry
- Typical flu, evolves in 2-5 days to diffuse pneumonia
- Case-fatality rate ~50%
- Person-to-person transmission very inefficient
- Endemic across Asia
- Spread to Kazakhstan, Russia, Romania, Turkey, Greece, Croatia, Ukraine, Western Europe
- Adapting to other mammals
- Ducks have tolerance to infection (spread)

Spread of H5N1 avian (HP) Influenza A



Human H5N1 through 11-13-06



Steps to a pandemic (distinct from “avian flu”)

1. Animal-to-human transmission
2. Any person-to-person transmission
3. Efficient person-to-person transmission

WHO pandemic phases (ref. to H5N1)

Interpandemic	Low risk of human cases	1
New virus in animals, no human cases	Higher risk of human cases	2
Pandemic alert	No or very limited human-to-human transmission	3
	Increased human-to-human transmission	4
New virus causing human cases	Significant human-to-human transmission	5
Pandemic	Efficient human-to-human transmission	6

Impact of pandemic influenza A in US

Characteristic	Moderate (1958/68)	Severe (1918)
Attack rate	90,000,000 (30%)	90,000,000 (30%)
Outpatient care	45,000,000	45,000,000
Admissions	865,000	9,900,000
ICU care	128,750	1,485,000
Ventilators	64,875	782,000
Deaths	200,000	1,903,000

*HHS Pandemic Influenza Plan. Nov. 2005. Estimates extrapolated from past pandemics in US. Estimates do not include potential impacts of interventions not available during 20th century.

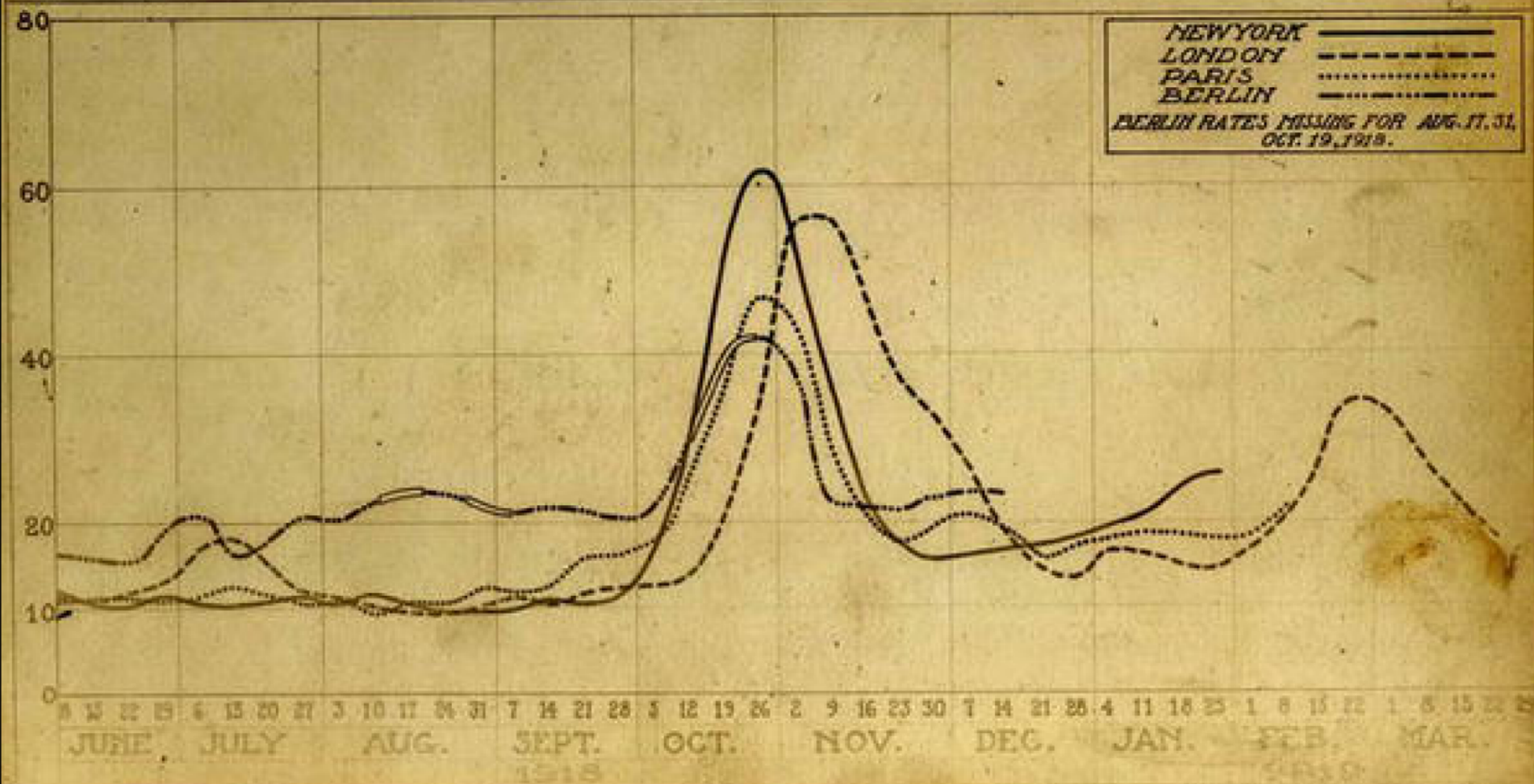
Pandemic planning assumptions

- Outbreaks occur simultaneously throughout US
 - Overwhelming demand on the healthcare system
 - No “outside” help
- 35-45% absenteeism in all sectors at all levels
 - Public service, public safety
 - Healthcare personnel
 - Just-in-time economy
 - Critical utilities
- Order and security disrupted for months, not hours or days (e.g. 9/11, or Katrina)
- On multiple news outlets 24/7

INFLUENZA PANDEMIC

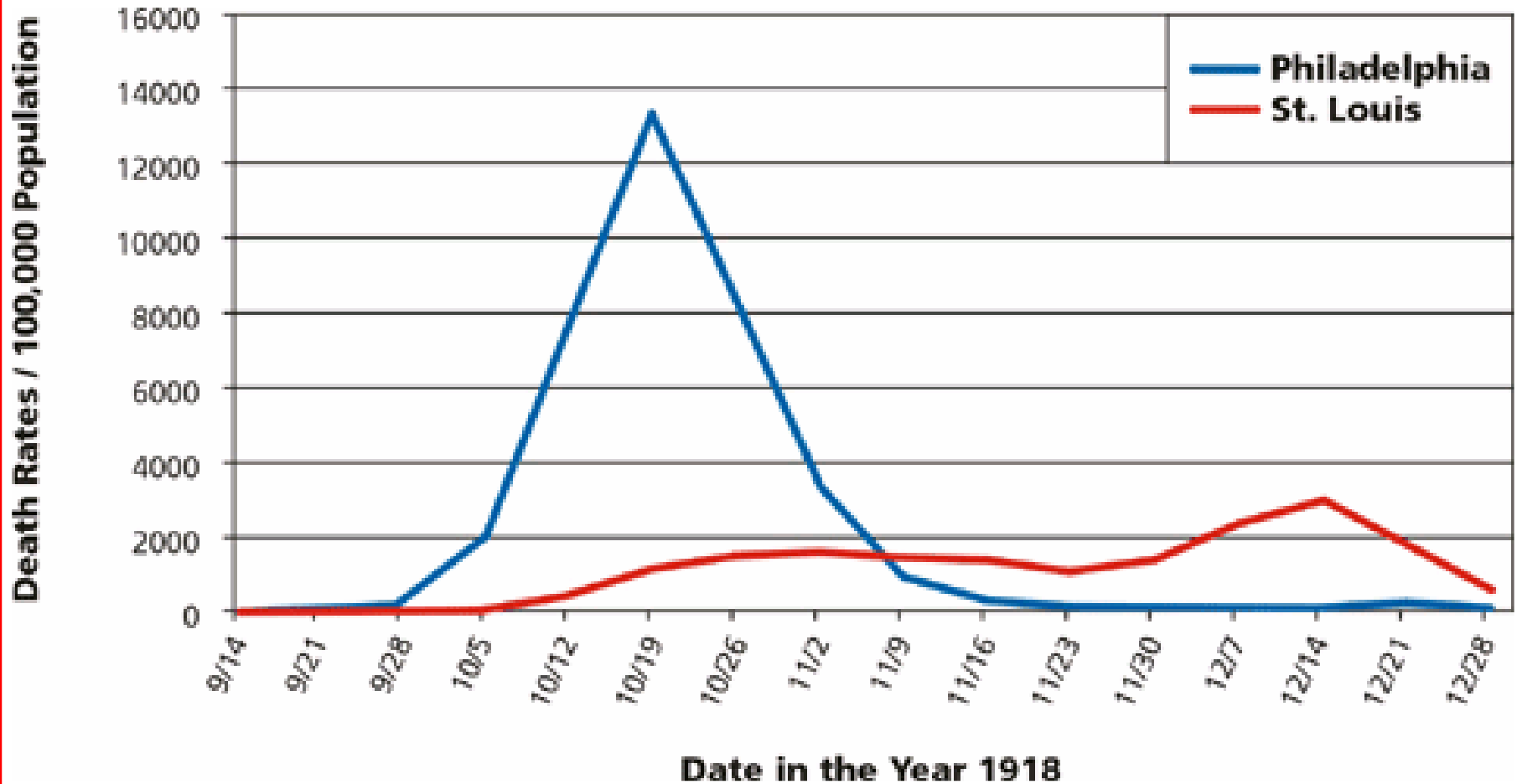
MORTALITY IN AMERICA AND EUROPE DURING 1918 AND 1919

DEATHS FROM ALL CAUSES EACH WEEK
EXPRESSED AS AN ANNUAL RATE PER 1000



What can we do??

Social distancing in 1918 (maybe)



Cumulative US incidence/100 population) with various interventions

Reproductive rate (R_0)	1.6	1.9	2.1	2.4
No intervention	32.6	43.5	48.5	53.7
Unlimited targeted prophylaxis	0.06	4.3	12.2	19.3
Dynamic vaccination	0.7	17.7	30.1	41.1
School closure	1.0	29.3	37.9	46.4
Travel restriction	32.8	44.0	48.9	54.1
DV, SD, SC, TR	0.04	0.2	0.6	4.5

Elements of a pandemic plan

- Authority, command and control
- Surveillance
- Vaccine management
- Antiviral agents
- Emergency response, surge capacity
- Communications
- Continuity of operations

Vaccine (conventional wisdom)

- Not available for 4 to 6 months
 - Not necessarily true
- Must be matched to strain
 - Grossly oversimplified
- Will become available in allotments, with number of doses dependent on potency
- When available, distribution will be prioritized
- It is likely that much of the pandemic experience will occur prior to availability

Antiviral medications

- Drug likely to be distributed to states *pro rata*
- Need 45 doses of oseltamivir for 6 wks of prophylaxis vs. 10 doses for 1 course of treatment
- Priority for access will be determined state-by-state
 - Risk/benefit
 - Ethical considerations

Expand and enhance annual influenza vaccination

- Enhance infrastructure
- Expand expertise implementing large vaccination clinics
- Develop trained cadre of volunteers
- *Enhance demand to enhance supply*
- Don't forget pneumococcal vaccine

Communicating prevention to public:
it's the big chunks



Prevention for the public

- Frequent hand hygiene, teach children (right!)
 - Use antibacterial hand cleaner particularly after contact w/ public surfaces (e.g. shopping carts)
 - Keep your hands away from your face
- Cough etiquette
 - Cover mouth, avoid exposing others
- Unknown utility of PPE vs. public expectations
- If you get sick, stay home from school/work
- Stay ≥ 3 feet from anyone coughing/sneezing
- Get an annual flu shot

Public preparedness (duct tape?)

- As best you can, keep a supply of canned and dried food in the home
- Develop a home emergency plan and put together a kit
- Talk with your healthcare provider about having more than a 30-day supply of needed medications
- Maintain general good health and habits

Challenges 1

- Effective surveillance for early recognition
- Operational continuity with 40% absenteeism
 - Business in general
 - Health care
 - Hy-Vee, Iowa Light and Power, Starbucks
 - Constitutional governance
- Coping with economic disruption
- Implementation/enforcement of social distancing
 - School closure
 - Event cancellation
 - Sheltering

Challenges 2

- Surge capacity for serious illness does not exist in US healthcare
- Workforce support to deal with stress and pressure of 1918–like event

Challenges 3

- Public buy-in for realistic planning
 - Low-tech prevention
 - Vaccine and antiviral priorities
 - Managing expectations
- Effective communication (despite the media?) during the pandemic
- Social cohesion at neighborhood level
- Acceptance and remediation of eroded public health infrastructure

Challenges 4:

The just-in-time supply-chain economy

Preparedness
(public health) = Excess
capacity = Waste

BUSINESS PANDEMIC INFLUENZA PLANNING CHECKLIST



In the event of pandemic influenza, businesses will play a key role in protecting employees' health and safety as well as limiting the negative impact to the economy and society. Planning for pandemic influenza is critical. To assist you in your efforts, the Department of Health and Human Services (HHS) and the Centers for Disease Control and Prevention (CDC) have developed the following checklist for large businesses. It identifies important, specific activities large businesses can do now to prepare, many of which will also help you in other emergencies. Further information can be found at www.pandemicflu.gov and www.cdc.gov/business.

1.1 Plan for the impact of a pandemic on your business:

Completed	In Progress	Not Started	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Identify a pandemic coordinator and/or team with defined roles and responsibilities for preparedness and response planning. The planning process should include input from labor representatives.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Identify essential employees and other critical inputs (e.g. raw materials, suppliers, sub-contractor services/products, and logistics) required to maintain business operations by location and function during a pandemic.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Train and prepare ancillary workforce (e.g. contractors, employees in other job titles/descriptions, retirees).
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Develop and plan for scenarios likely to result in an increase or decrease in demand for your products and/or services during a pandemic (e.g. effect of restriction on mass gatherings, need for hygiene supplies).
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Determine potential impact of a pandemic on company business financials using multiple possible scenarios that affect different product lines and/or production sites.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Determine potential impact of a pandemic on business-related domestic and international travel (e.g. quarantines, border closures).
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Find up-to-date, reliable pandemic information from community public health, emergency management, and other sources and make sustainable links.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Establish an emergency communications plan and revise periodically. This plan includes identification of key contacts (with back-ups), chain of communications (including suppliers and customers), and processes for tracking and communicating business and employee status.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Implement an exercise/drill to test your plan, and revise periodically.

1.2 Plan for the impact of a pandemic on your employees and customers:

Completed	In Progress	Not Started	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Forecast and allow for employee absences during a pandemic due to factors such as personal illness, family member illness, community containment measures and quarantines, school and/or business closures, and public transportation closures.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Implement guidelines to modify the frequency and type of face-to-face contact (e.g. hand-shaking, seating in meetings, office layout, shared workstations) among employees and between employees and customers (refer to CDC recommendations).
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Encourage and track annual influenza vaccination for employees.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Evaluate employee access to and availability of healthcare services during a pandemic, and improve services as needed.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Evaluate employee access to and availability of mental health and social services during a pandemic, including corporate, community, and faith-based resources, and improve services as needed.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Identify employees and key customers with special needs, and incorporate the requirements of such persons into your preparedness plan.

www.pandemicflu.gov



Surveillance: bird flu hits PV trailer park!

