

Pandemic Influenza Preparedness and Response

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Presentation Objectives

- To increase understanding of...
 - The evolution of influenza pandemics and their impacts
 - Transmission of influenza viruses
 - Individual and community pandemic responses
 - National guidance on pandemic vaccination and antiviral drug use

Goal: knowledge-based pandemic
planning and preparedness

Annual and Avian Influenza

- Annual (seasonal) influenza
 - Fall/winter outbreaks cause ~36,000 annual U.S. deaths (90% occurring in older adults)
 - Annual vaccination as virus mutates (“antigenic drift”)
 - Partial immunity from prior disease or vaccination mitigates illness severity
- Avian influenza
 - Birds may carry all influenza A virus subtypes
 - Outbreaks occur in wild birds and domestic poultry
 - Rarely avian influenza viruses infect humans

Pandemic Influenza

- Emergence and spread of a new influenza virus subtype among people (“antigenic shift”)
 - Occurs due to genetic changes (mutation or reassortment) of an avian influenza virus
 - Efficient transmission between people
 - Increased rate and severity of illness because of no prior exposure or immunity – everyone is susceptible

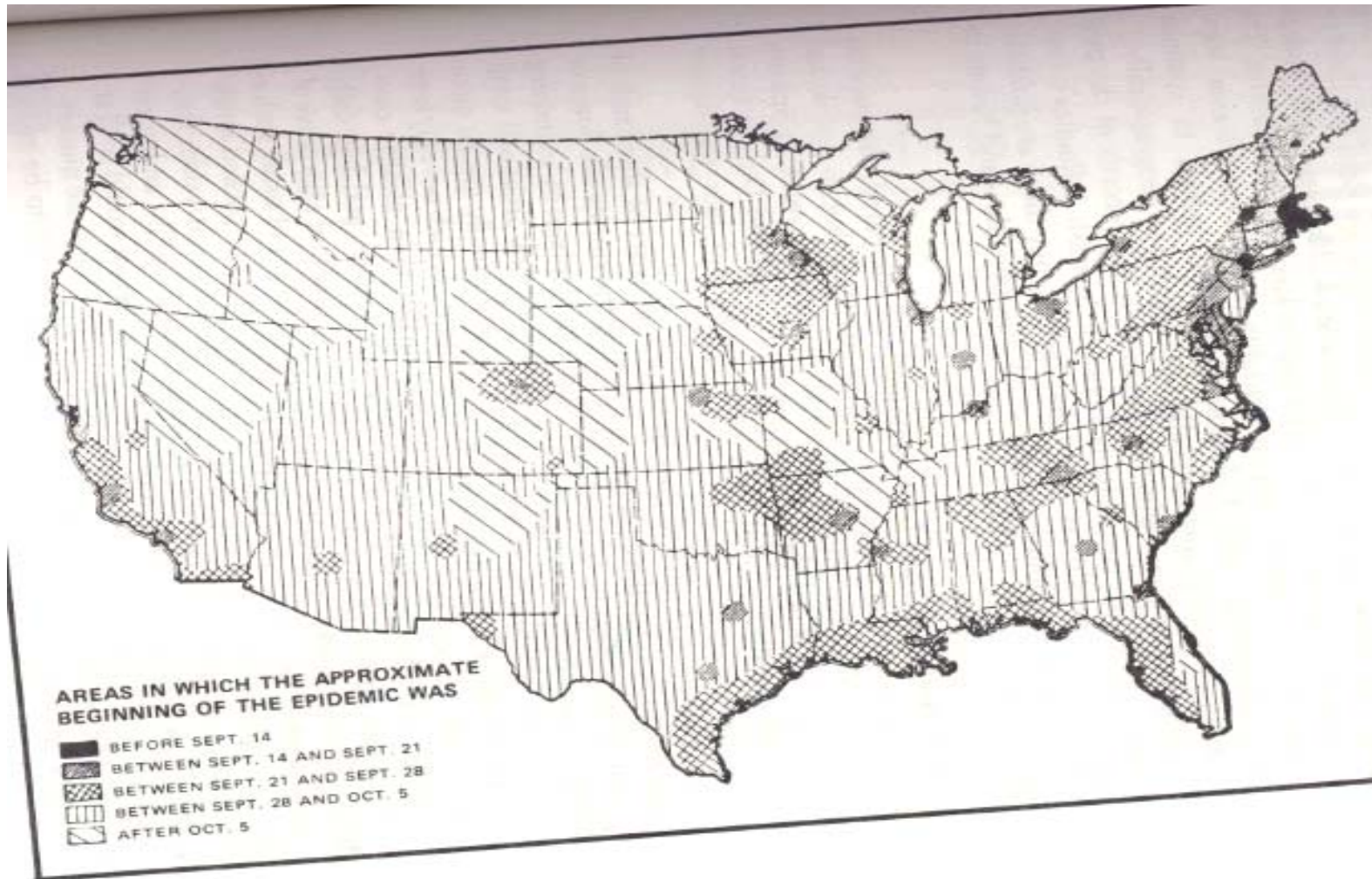
Pandemic Influenza in the U.S.

“...bodies were stacked like cord wood”

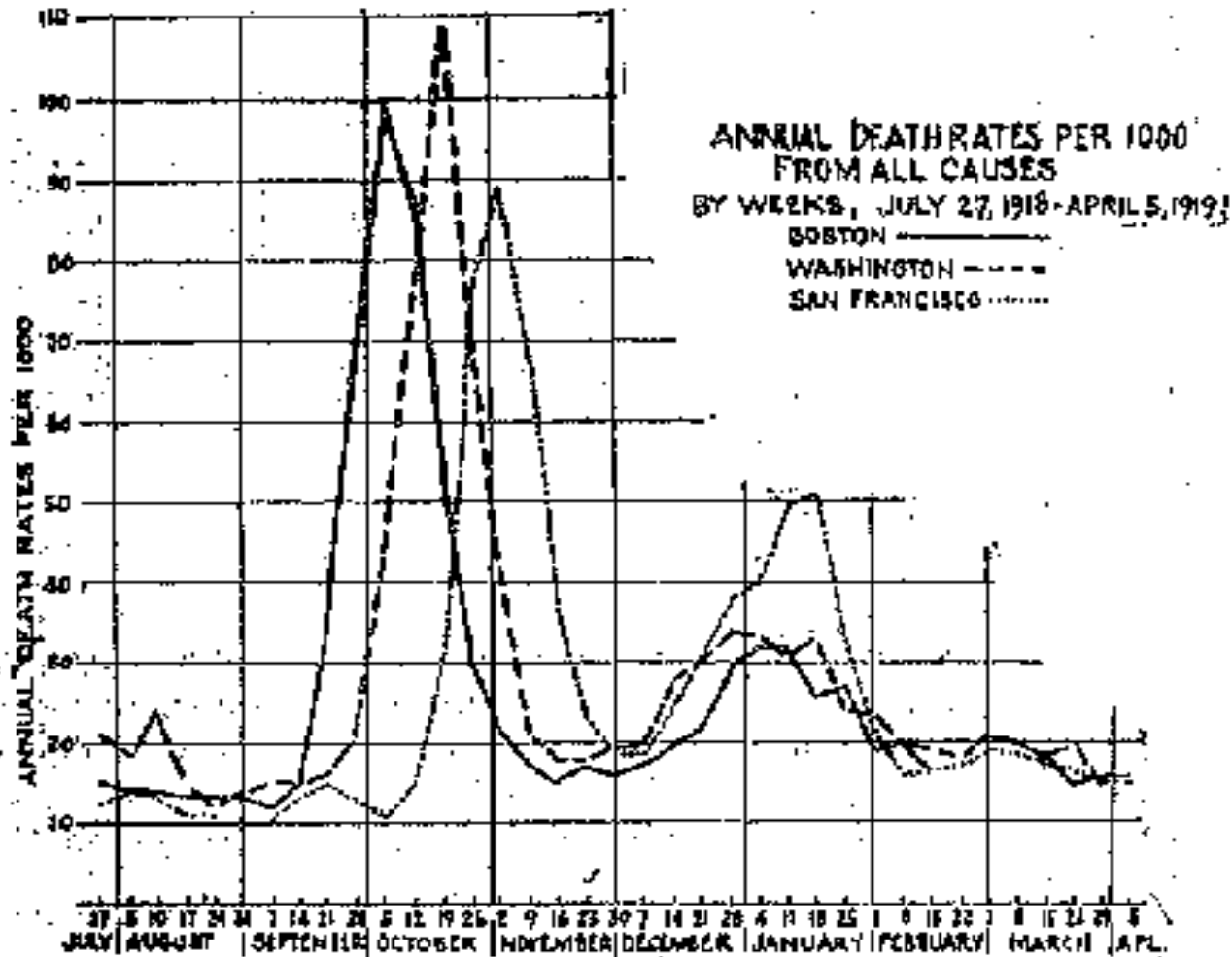
- 3 pandemics in the 20th century
 - 1918 (Spanish flu): >500,000 deaths
 - 1957 (Asian flu): ~70,000 deaths
 - 1968 (Hong Kong flu): ~34,000 deaths
- Disease occurs in “waves”
 - Rapid spread across the country
 - Community outbreaks occur nearly simultaneously
 - Disease waves in fall and winter (and spring in 1918)



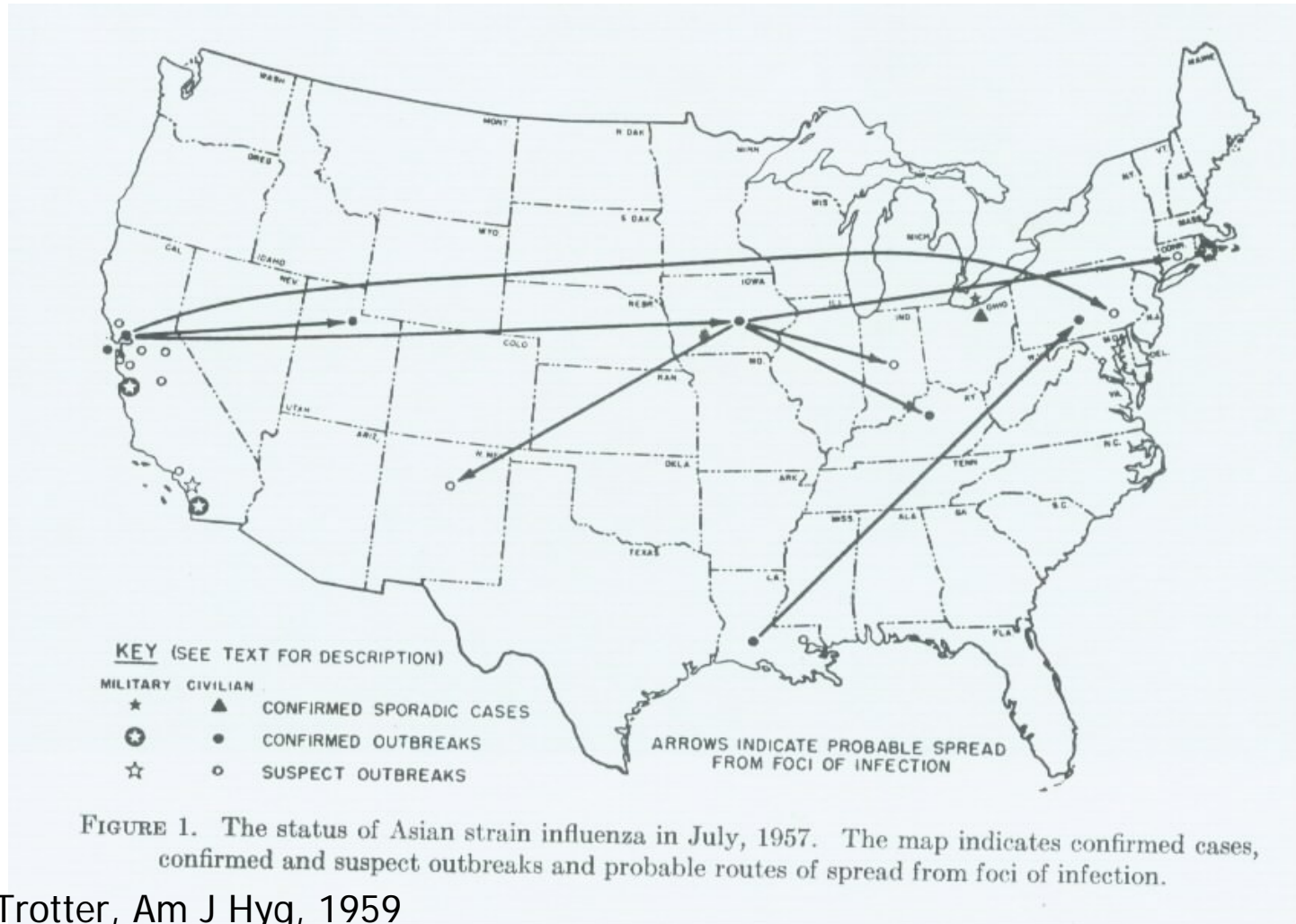
Pandemic Influenza Spread: Sept. to Oct., 1918



1918-19 Influenza Pandemic: Death Rates in 3 Cities, Fall & Winter Waves

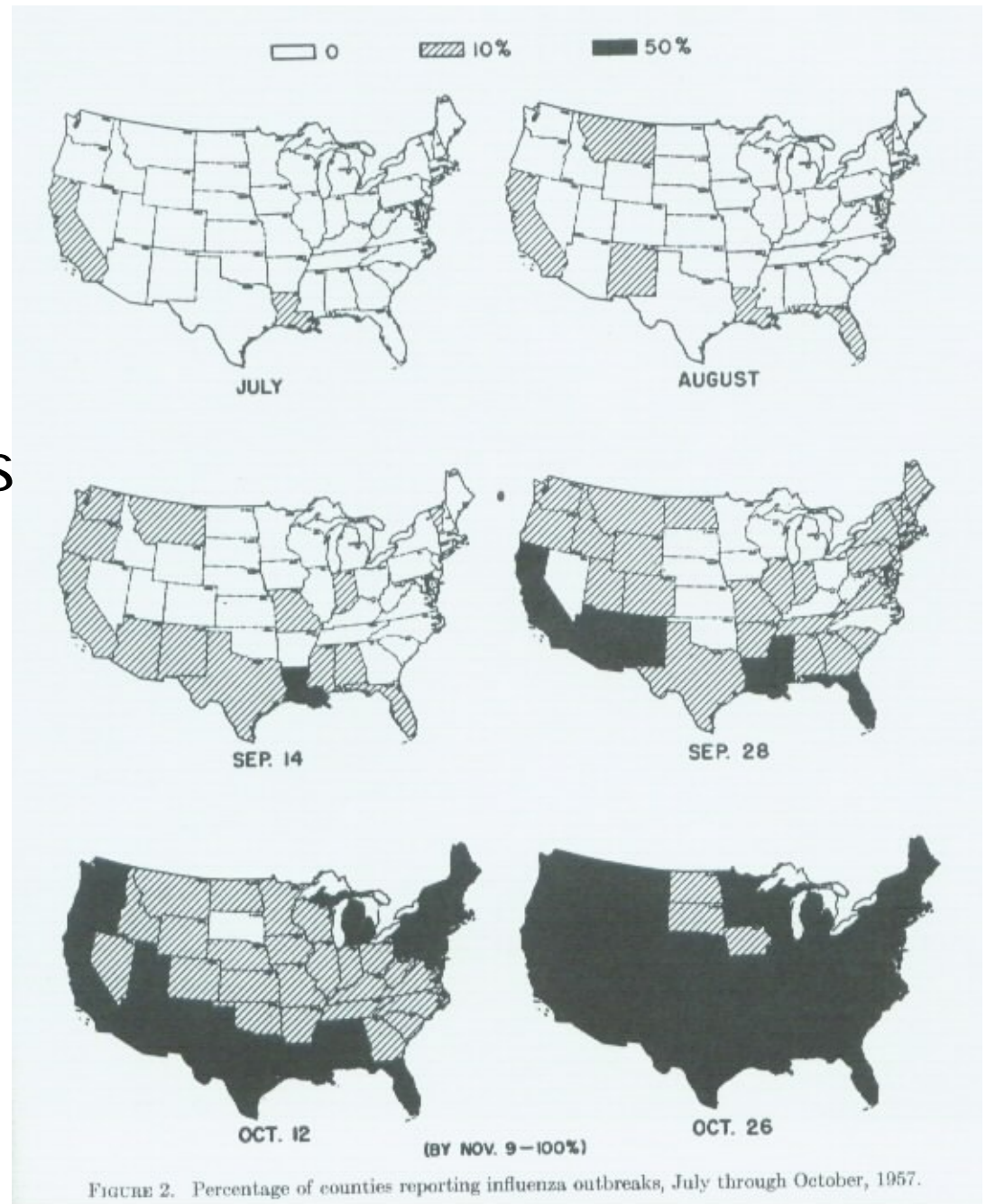


Asian Influenza in the U.S., July 1957



Percentage of counties per State reporting Influenza outbreaks, July – October, 1957

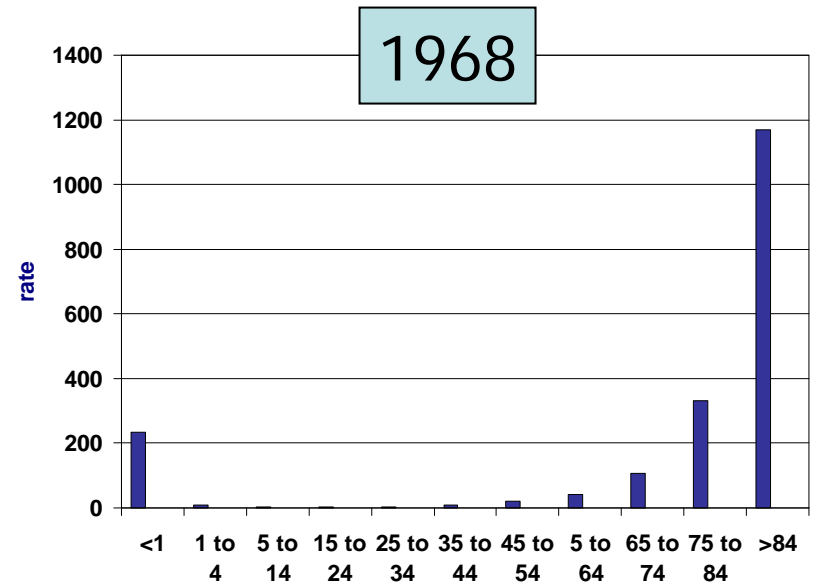
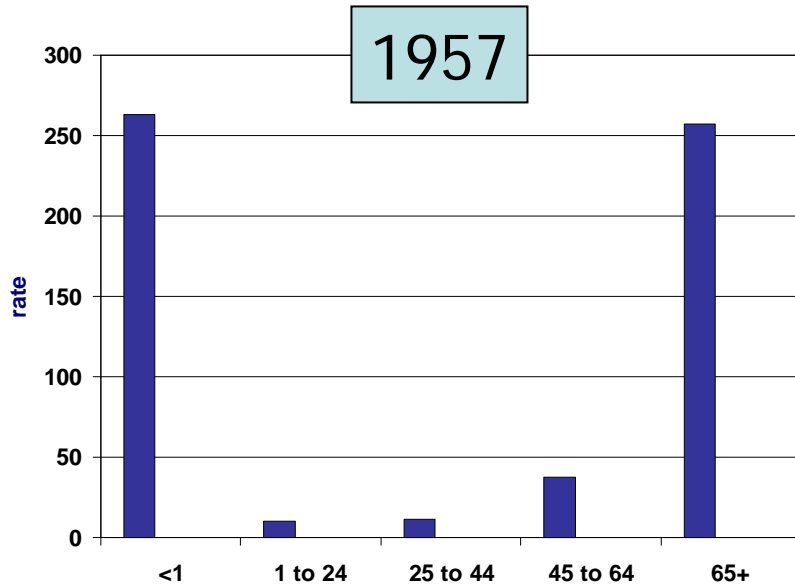
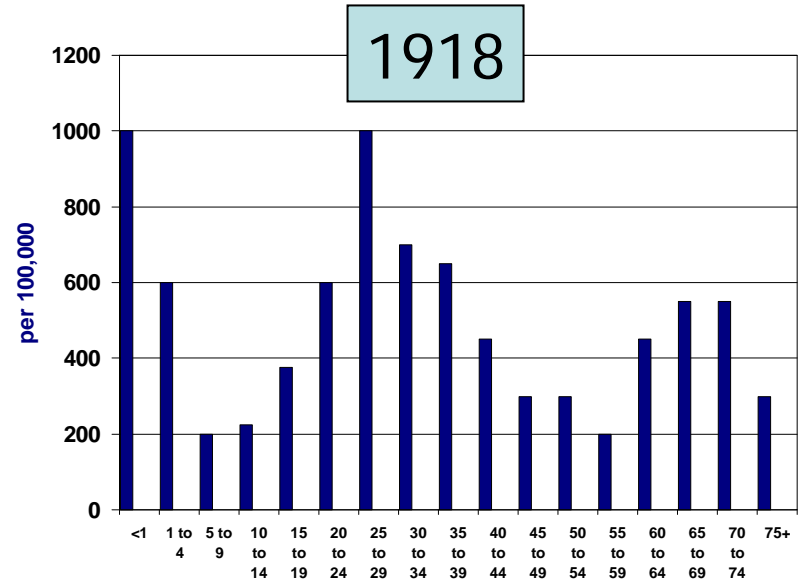
Ref: Trotter, Am J Hyg, 1959



Pandemic Influenza Deaths by Age

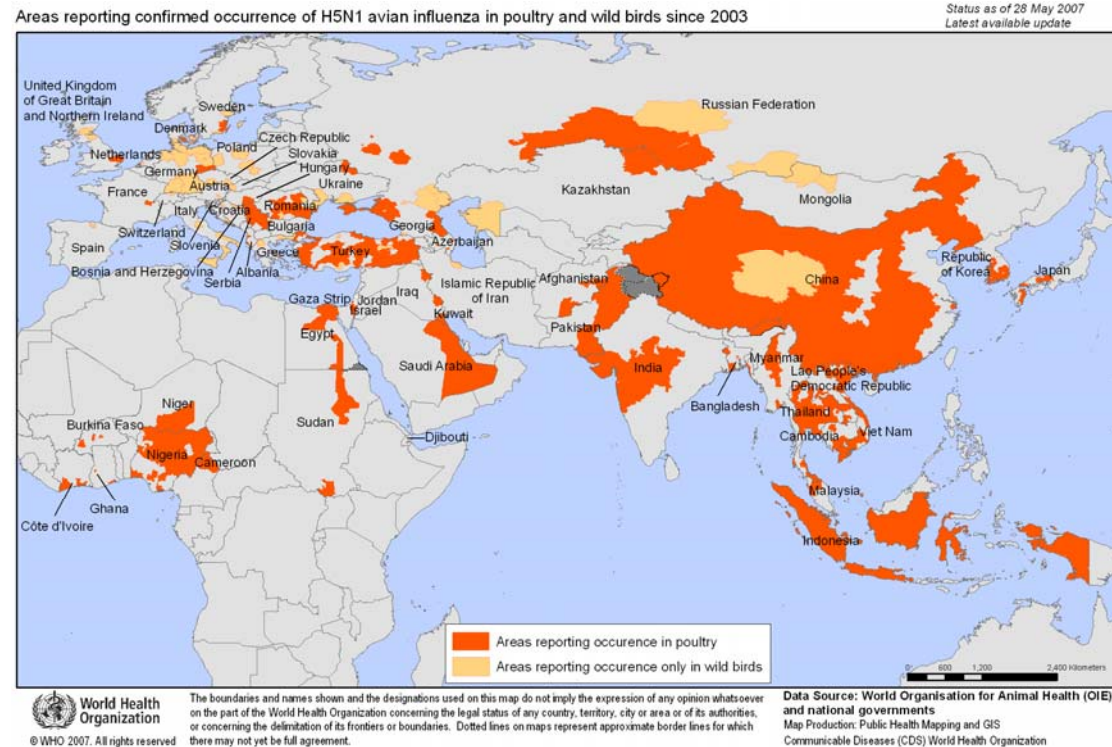
“W” shaped curve in 1918

“U” shaped curves in 1957 and 1968



The H5N1 Avian Influenza Threat

- Avian outbreaks in Asia since 1996
- Spread to Europe and Africa in 2006
- As of 2/12/08
 - 360 human cases
 - 226 deaths (63%)
 - Most cases in children and young adults
 - Highest death rate in children



Will H5N1 Cause the Next Pandemic?

- We don't know
- Continued circulation and spread of avian H5N1 infections increases risk
 - “The virus is always changing and mutations that make it more compatible with human transmission may occur at any time” (R.G. Webster, *NEJM* 2006)
- Other avian influenza A subtypes (H7N2, H7N3, H7N7, H9N2) also have caused human infections

Influenza Virus Transmission

- Respiratory

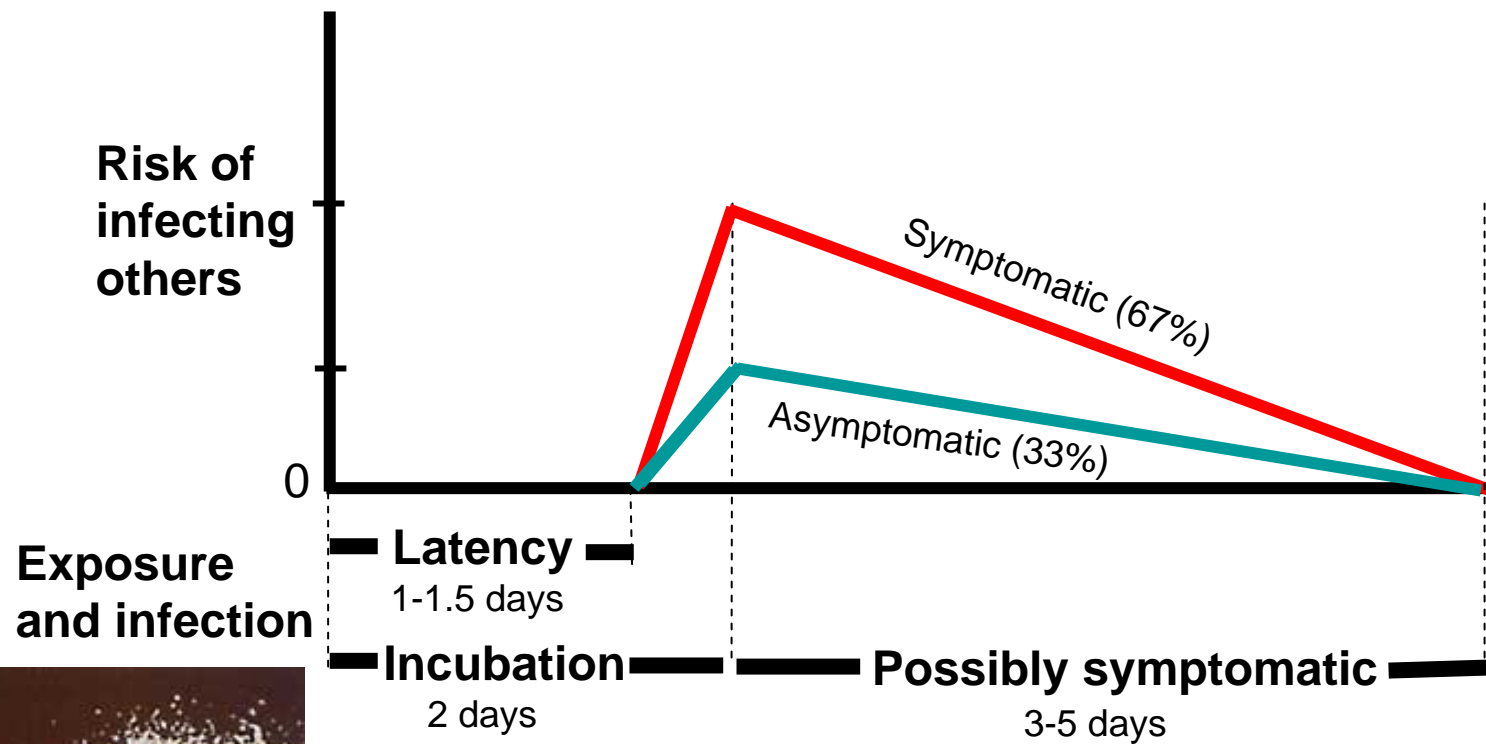
- Large droplets
- Small particle aerosols
- Close contact - within 6 ft - required for infection

- Contact

- Hand contact with secretions & transfer to nose or mouth
- Limited virus survival time on surfaces (hours) and hands (minutes)



Natural History of Seasonal Influenza Infection



Exposure and infection



National Pandemic Planning Assumptions (absent an effective response)

- National impacts
 - 90 million persons ill
 - 40% children, 20% young adults, 10-15% older adults
 - 9.9 million hospitalized
 - 1.8 million deaths
- Community impacts
 - Outbreaks 6 – 12 week duration
 - Healthcare system overwhelmed, other services threatened
 - Worker absenteeism up to 40% from illness, caring for children or ill family members, and fear of infection

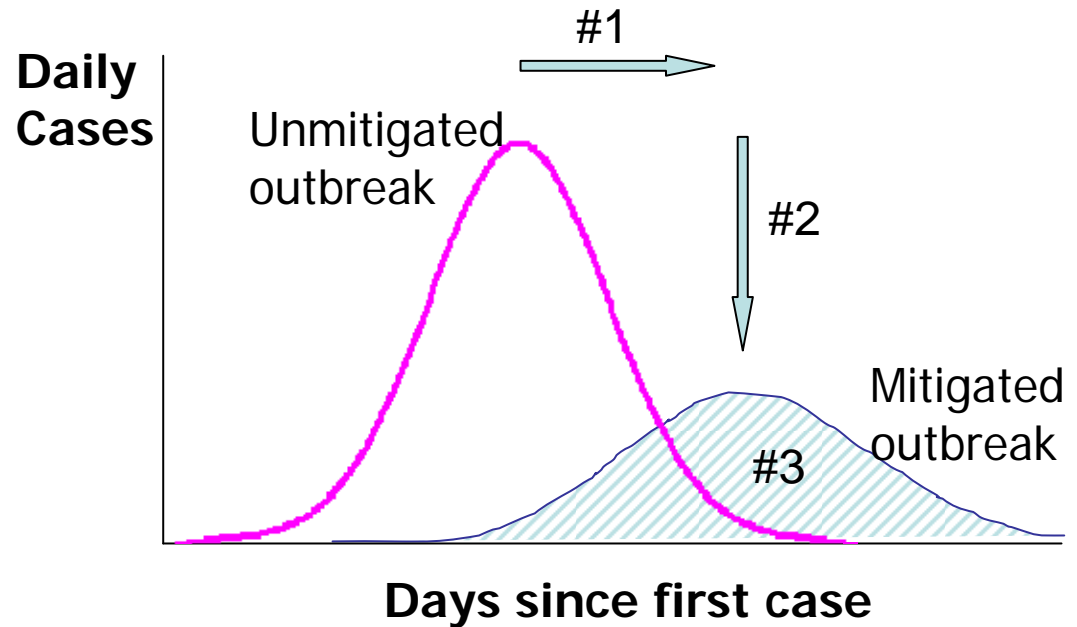
Pandemic Influenza Response Goals and Strategies

Goal	Strategy
1. Delay U.S. outbreaks and slow pandemic spread	<ul style="list-style-type: none">• International response to first disease outbreaks• Screening at U.S. borders
2. Reduce health impacts	<ul style="list-style-type: none">• Planning/preparedness by organizations & businesses<ul style="list-style-type: none">- Healthcare surge capacity- Maintain essential functions
3. Reduce societal and economic impacts	<ul style="list-style-type: none">• “Community mitigation”• Hygiene and infection control• Antiviral drug use• Vaccination

Community Mitigation

- Objectives

- Delay outbreak (1)
- Diminish peak burden (2)
- Decrease overall illness (3)



- Strategy

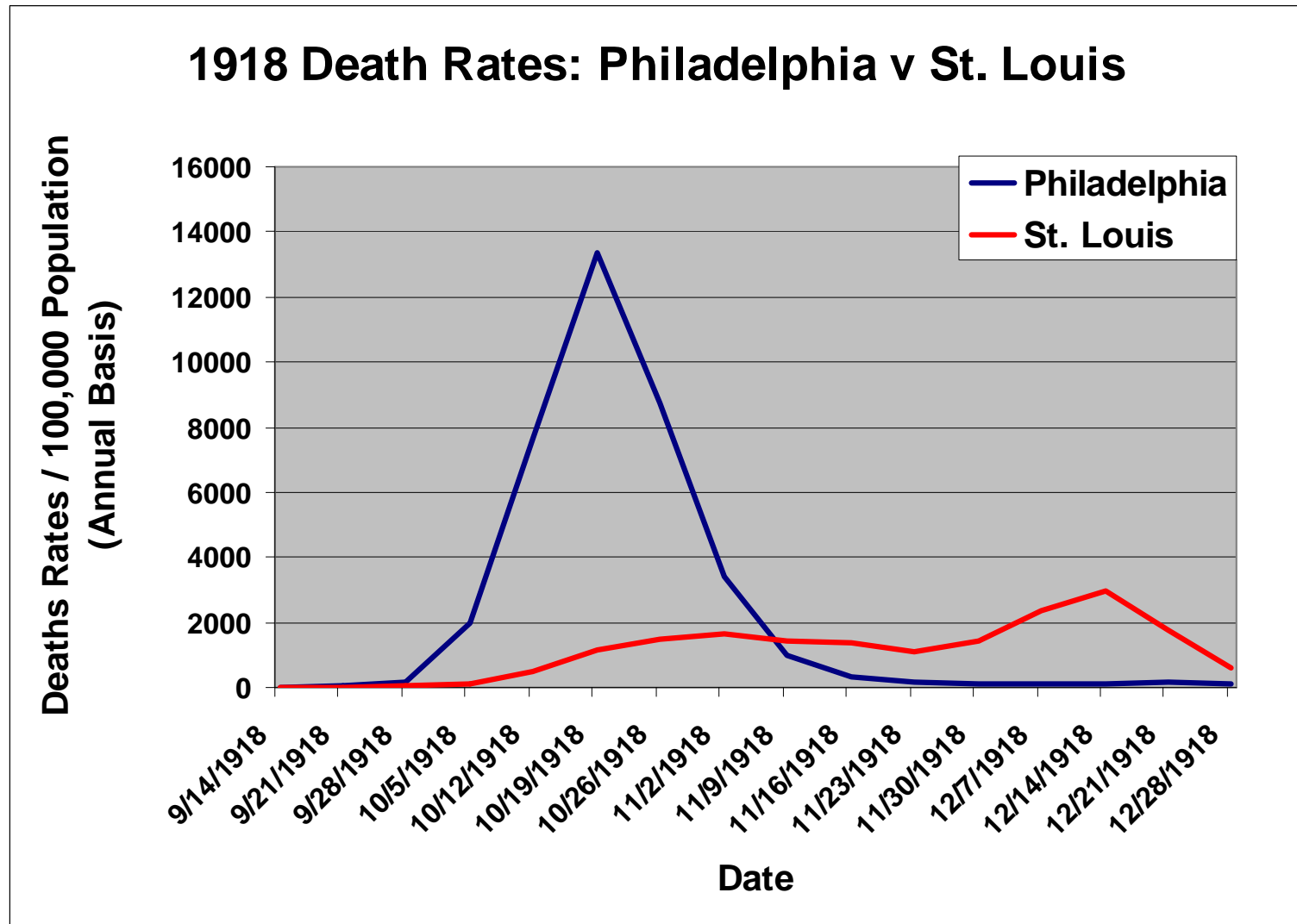
- Reduce close contacts between people that may lead to transmission of infection

Components of Community Mitigation

- Isolate cases & voluntary quarantine of case households
- Dismiss children from schools and close childcare centers
- Cancel public gatherings
- “Social distancing” in communities and at workplaces



Pandemic Influenza Mortality, 1918: Philadelphia and St. Louis



Hygiene Measures

- Objectives: reduce the spread of secretions and reduce the chance of becoming infected due to contact with infected secretions
- Approaches
 - Cover coughs and sneezes
 - Wash hands

IMPORTANT NOTICE TO ALL PATIENTS

Please tell staff immediately if you have flu symptoms

Flu symptoms include fever, headache, tiredness, dry cough, sore throat, nasal congestion and body aches.



1

Cover Your Cough and Sneeze

- Use a tissue to cover your mouth and nose when you cough or sneeze.
- Drop your used tissue in a waste basket.
- You may be asked to wear a mask if you are coughing or sneezing.

and



2

Clean Your Hands

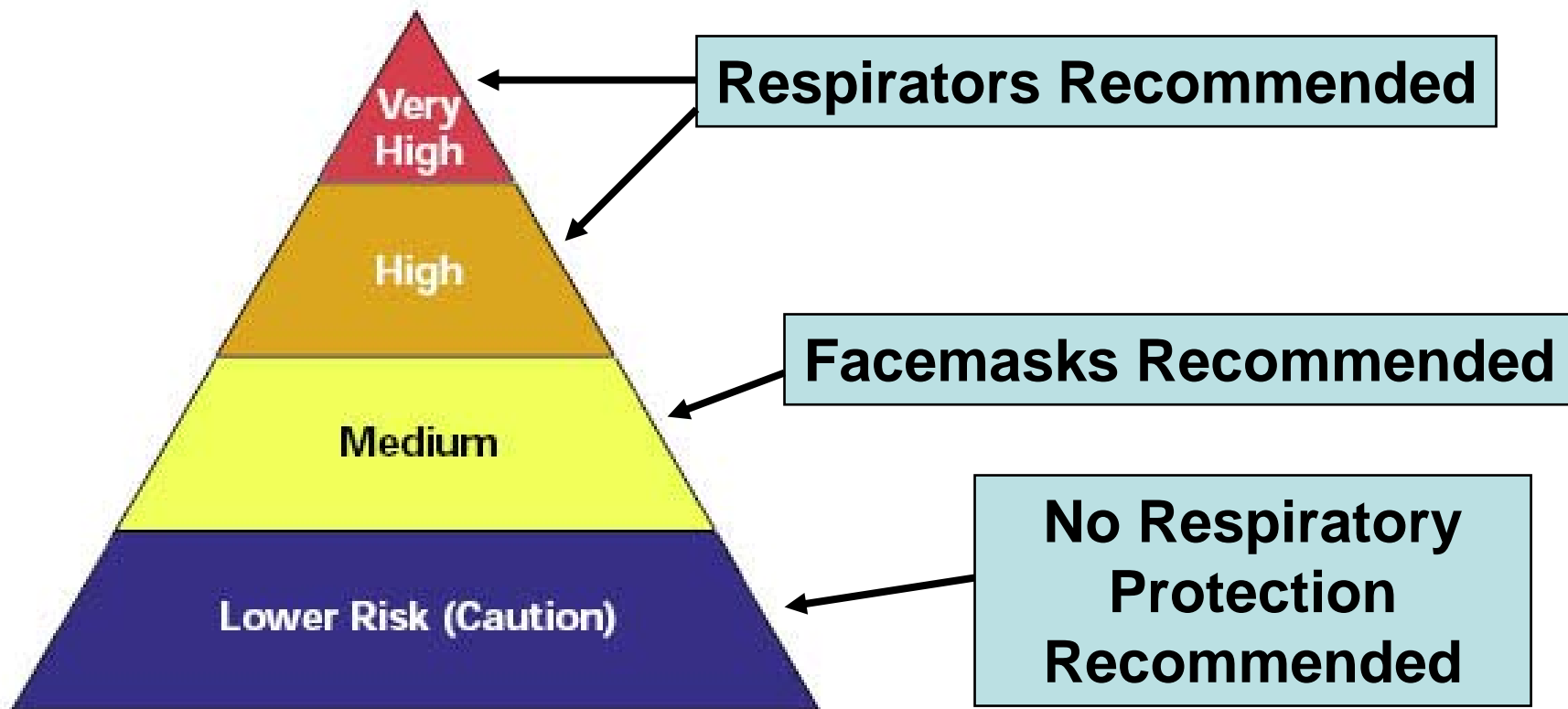
- Wash your hands with soap and warm water or clean with gels or wipes with alcohol.
- Cleaning your hands often keeps you from spreading germs.



Use of Facemasks and Respirators

- Facemasks (“surgical masks”)
 - Loosely fitting
 - Trap large particles (from the wearer and others)
 - Recommended when close contact (within 6 feet) in crowded settings with *people not expected to be sick* cannot be avoided
- Respirators
 - “N95” or higher (see NIOSH designation on the package)
 - Tightly fitting
 - Trap large particles and filter out small ones
 - Recommended when in close contact with someone *known to have pandemic influenza*

Occupational Risk Pyramid for Pandemic Influenza



Antiviral Drug Strategies and Impacts

- Prescription medications
 - Oseltamivir (Tamiflu) and zanamivir (Relenza)
 - Can be prescribed, purchased, and stockpiled before a pandemic
- Drug use strategies and impacts
 - Treatment
 - Reduces illness duration – greater impact if started early
 - Reduces complications and hospitalization
 - Reduces death
 - Prophylaxis (preventive use)
 - Prevents ~70% - 90% of illnesses if given before or within 48 hrs after exposure to an ill contact

Types of Antiviral Prophylaxis and Proposed Guidance

- “Outbreak” prophylaxis
 - Daily use of an antiviral drug for the duration of a community pandemic outbreak
 - Recommended for healthcare workers & emergency services providers
 - Should be considered by employers for other essential workers as part of a comprehensive pandemic plan
- “Post-exposure” prophylaxis (PEP)
 - Use of an antiviral drug once daily for 10-days after exposure to a pandemic case
 - Will reduce infections in households and communities but approach to implementation unclear

Pandemic Influenza Vaccine

- Cannot be made until after the pandemic begins
 - Specific to the virus that causes the pandemic
 - Vaccine development will take ~20 weeks so vaccine may or may not be available when outbreaks begin to occur in the U.S.
 - Once vaccine is developed, how quickly it is made depends on our production capacity
- HHS is investing over \$1 billion to increase U.S.-based vaccine production, and in advanced development of new production methods, new vaccines, and new adjuvants

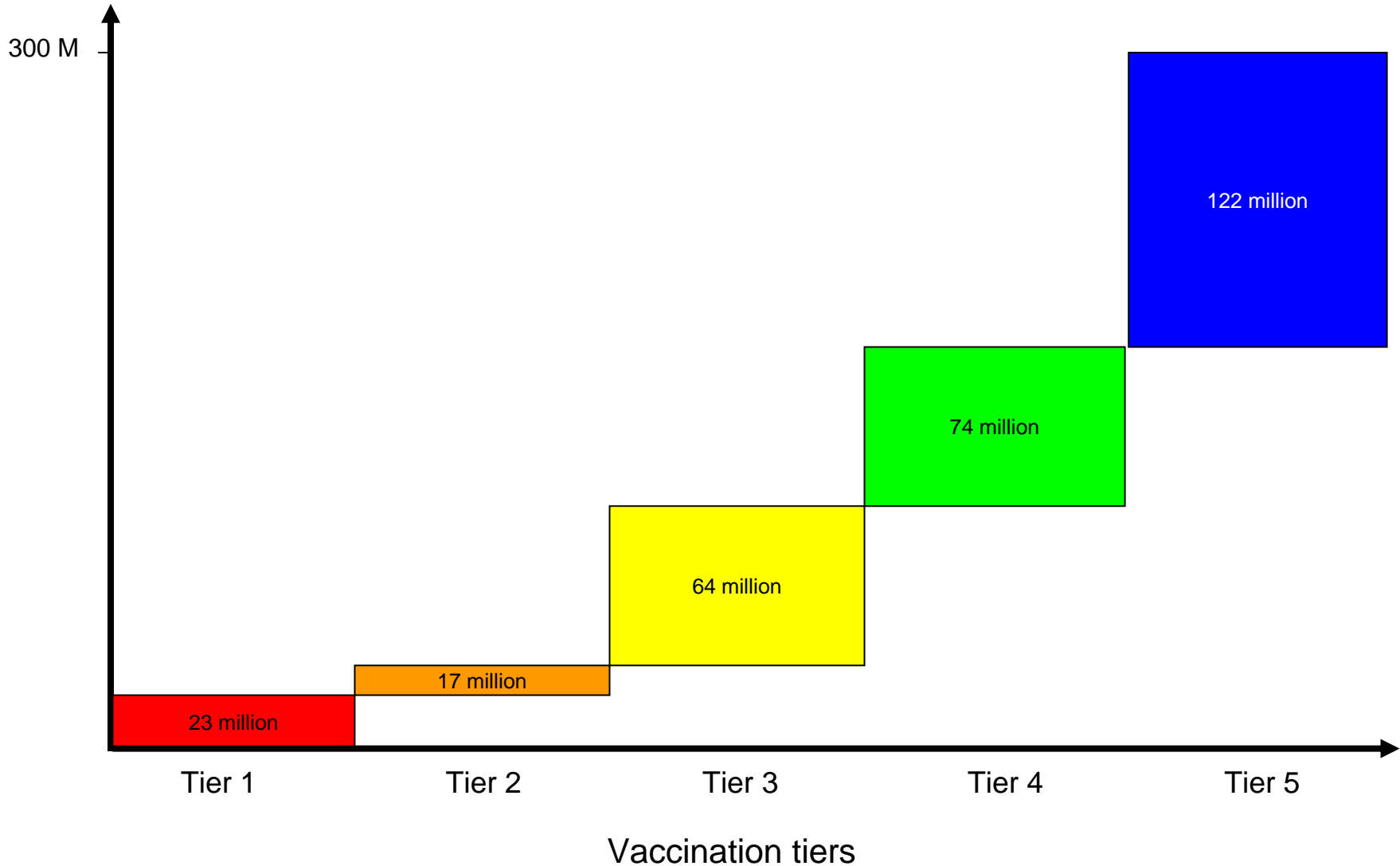
Pandemic Vaccine Prioritization

- Vaccine will become available incrementally so supply will be prioritized
- Ultimate goal is to vaccinate all persons who want to be vaccinated
- Draft guidance on prioritization
 - Guidance developed with substantial input from the public and other stakeholders
 - Key values include protecting essential services, persons at high risk due to their job, and protecting children
 - Balances use of vaccine among critical occupations and vulnerable population

Value of Pandemic Vaccination Goals: Public (Las Cruces, Nassau Co.) and Stakeholder (DC) Meeting Results

Vaccination goal: To protect...	Las Cruces	Nassau County	D.C.
People working to fight pandemic & provide care	6.7	6.0	6.8
People providing essential community services	5.9	5.7	6.5
People most vulnerable due to jobs	5.8	5.6	5.9
Children	5.9	5.7	4.9
People most likely to spread virus to unprotected	5.3	5.3	4.6
People protecting homeland security	4.6	5.2	4.7
People most likely to get sick or die	4.5	4.8	4.8
People most likely to be protected by the vaccine	4.5	5.1	4.0
People keeping pandemic out of the U.S.	4.3	5.3	3.3
People providing essential economic services	3.0	4.2	4.5

Vaccination tiers for a severe pandemic

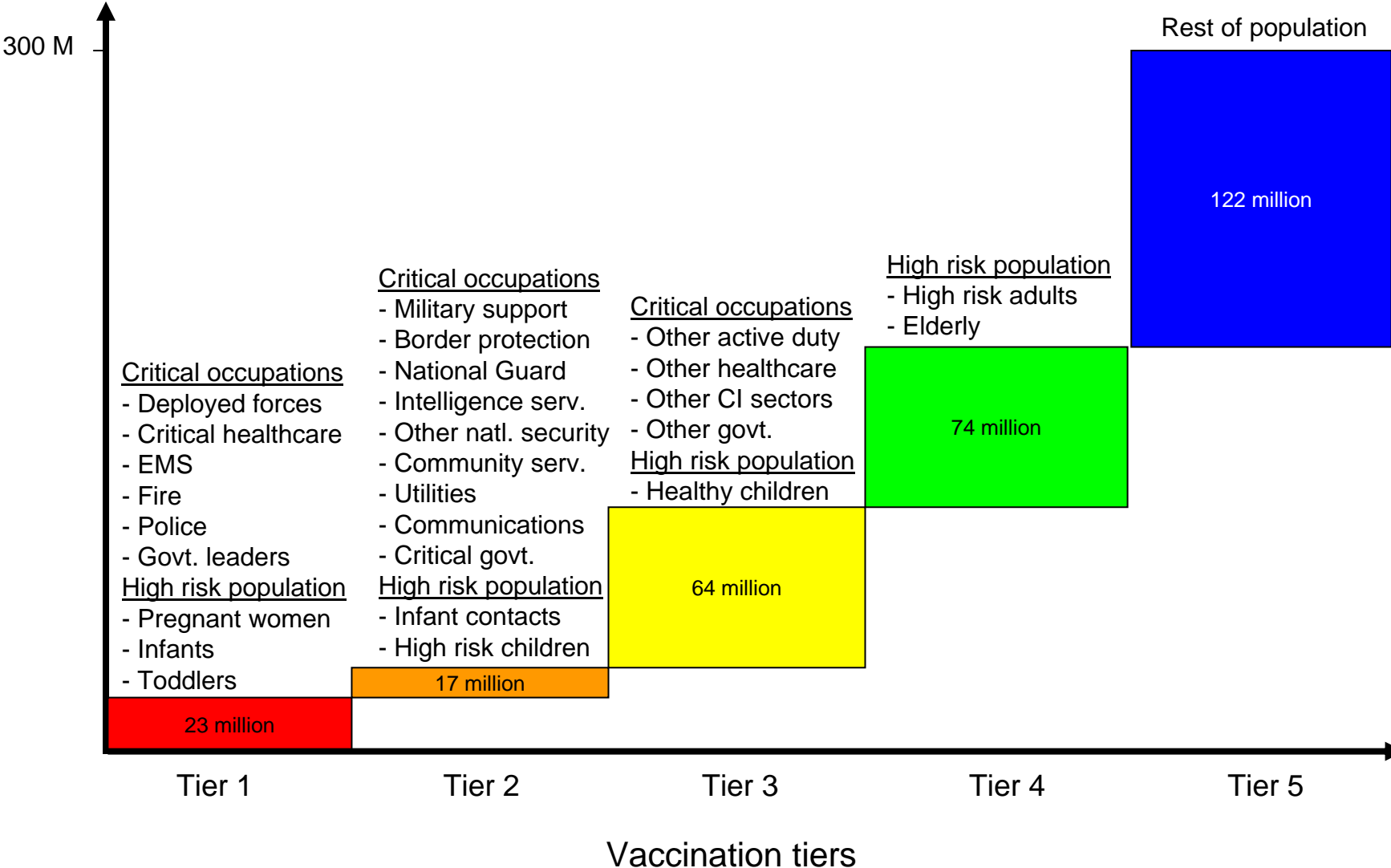


Draft target groups for pandemic vaccination by pandemic severity

- Tier 1
- Tier 2
- Tier 3
- Tier 4
- Tier 5
- Not targeted

Category	Target group	Est. number	Severe	Moderate	Less severe
Homeland and national security	Deployed and mission critical pers.	700,000			
	Essential support & sustainment pers.	650,000			
	Intelligence services	150,000			
	Border protection personnel	100,000			
	National Guard personnel	500,000			
	Other domestic national security pers.	50,000			
Other active duty & essential suppt.	1,500,000				
Health care and community support services	Public health personnel	300,000			
	Inpatient health care providers	3,200,000			
	Outpatient and home health providers	2,000,000			
	Health care providers in LTCFs	800,000			
	Community suppt. & emergency mgt.	600,000			
Other important health care personnel	500,000				
Critical infrastructure	Emergency Medical Service, Law enforcement, Fire services personnel	2,000,000			
	Mfrs of pandemic vaccine & antivirals	50,000			
	Key government leaders	50,000			
	Electricity, Natural gas, Communications, Water personnel	1,900,000 to 4,400,000			
Critical government personnel					
	Transportation, Food and agriculture, Banking and finance, Pharmaceutical, Chemical sector, Oil, Postal and shipping personnel	1,400,000 to 3,500,000			
General population	Pregnant women	3,100,000			
	Infants & toddlers 6–35 mo old	10,300,000			
	Household contacts of infants < 6 mo	4,300,000			
	Children 3–18 yrs with high risk cond.	6,500,000			
	Children 3–18 yrs without high risk	58,500,000			
	Persons 19–64 with high risk cond.	36,000,000			
Persons ≥65 yrs old	38,000,000				
	Healthy adults 19–64 yrs old	121,800,000			

Draft Vaccination Tiers for a Severe Pandemic, 10/07



Vetting the Draft Guidance with the Public and Stakeholders

- Presentations to ACIP and NVAC
- Public engagement meetings
 - Milwaukee, WI
 - Hendersonville, NC
- Stakeholders meeting
 - Washington, DC
- Web dialogue
- Request for comments posted in the *Federal Register* and at www.pandemicflu.gov

Overall Agreement with the Guidance by the Public and Stakeholders

	Polling results (% Agree or Strongly Agree)			
	Milw	Hend	Web	Stake
Overall agreement with goals of the guidance		93%		74%
Agree with targeting children before older adults	82%	91%	76%	83%
General agreement with draft guidance	58%	79%	80%	83%

Potential Revisions to the Draft Pandemic Vaccine Prioritization Strategy

- For Healthcare and Community Support Services occupations, the Stakeholders supported a higher priority for mortuary and death services personnel
 - 56% Strongly agree to agree
 - 35% Disagree to strongly disagree
- Other suggestions for this sector
 - Prioritize pharmacists in a higher tier (77% agree)
 - Prioritize a greater proportion of workers in long-term care facilities (54% agree)

Pandemic Planning and Preparedness

- Protect workforce to maintain essential services and reduce absenteeism
 - Most effective strategy includes multiple interventions
 - Emphasize hand hygiene and cough etiquette
 - Change work practices to reduce close contacts
 - Use “engineering controls” and respiratory protection as appropriate
 - Consider antiviral prophylaxis as part of a comprehensive plan
- Respiratory protection and antiviral strategies require purchase and stockpiling before the pandemic to assure availability

For More Information...

- See www.pandemicflu.gov

- Planning documents
- Community mitigation guidance
- Planning checklists
- Toolkits and other materials

PandemicFlu.gov **AvianFlu.gov**

Get Informed. Be Prepared.

One-stop access to U.S. Government avian and pandemic flu information. Managed by the Department of Health and Human Services.

Pandemic Flu Home

- General Information
- Where You Live
- Frequent Questions (FAQs)
- Planning & Response
- Monitoring Outbreaks
- Health & Safety
- Tests, Vaccines, Medications, & Masks
- Bird & Animal Issues
- Global Activities
- Economic Impacts
- Travel

Understanding Flu Terms

Flu terms defined — Seasonal flu, avian flu, and pandemic flu are not the same.

News

- North American Plan for Avian and Pandemic Influenza **Recommendations and Laboratory Procedures for Detection of Avian Influenza A(H5N1) Virus in Specimens from Suspected Human Cases** [Revised Recommendations>>](#)
- Aug 30 — \$75 Million in Supplemental Funding Released to States [News Release>>](#)
- Aug 21 — North American Plan for Avian and Pandemic Influenza Released [Plan \(PDF - 3 MB\)>>](#) [Fact Sheet \(PDF - 240 KB\)>>](#)
- Aug 15 — WHO Updates Clinical Management of Human Infection with Avian Influenza A (H5N1) Virus [More>>](#)

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Nations With Confirmed Cases H5N1 Avian Influenza

Where you live

- Updates on avian influenza – see WHO website
 - http://www.who.int/csr/disease/avian_influenza/en