

# Public Engagement Project Pandemic Influenza

Medical Service Prioritization Issues

# Seasonal Flu

## (*Influenza*)



- Easily spread from human-to-human
  - New cases emerge 2-4 days after exposure
  - Infected may shed virus 1-2 days before symptoms
  - Some may not recognize or even have symptoms
- Symptoms: Cough, sore throat, runny nose, fever, headache, body aches
- Highest risk:
  - Infants, elderly, immunocompromised, pregnant women
- Vaccine must be developed annually

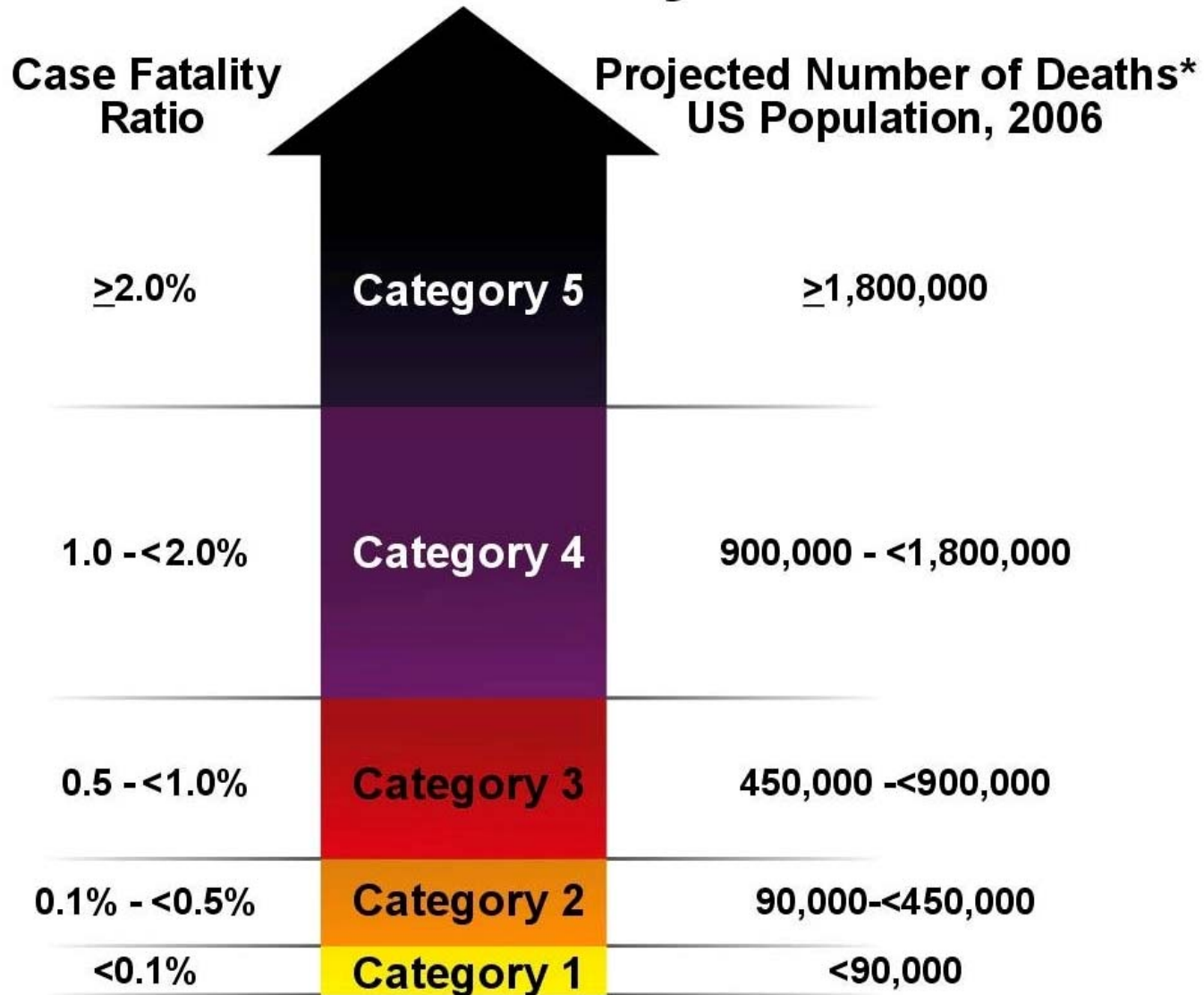
# Pandemic Influenza

- A new strain of influenza can evolve
  - when an avian virus mutates or changes
  - from a combination of an avian and human virus
- If the new strain infects humans and is able to spread easily from person to person:
  - humans would have little or no immunity
  - it would rapidly travel around the world and cause high levels of disease and death
- “Pandemic” = global outbreak of disease
  - occur naturally at variable intervals
  - are not always severe

# 20<sup>th</sup> Century Influenza Pandemics

- 1918-19: “Spanish flu” A (H1N1)
  - Most severe pandemic known
  - Spread around the globe in 4 - 6 months
  - 500 - 650,000 deaths in the U.S.
  - Ten times as many Americans died of influenza than died in World War I
  - Age-specific mortality: high in healthy 20 -40 year olds, as well as young children, elderly and pregnant women
- 1957-58 - “Asian flu” A (H2N2)
  - 70,000 deaths in the U.S.
- 1968-69 - “Hong Kong flu” A (H3N2)
  - 34,000 deaths in the U.S.

# Pandemic Severity Index



\* Assumes 30% Illness Rate

# Best Prevention: Pandemic Vaccine

- Current vaccine is stopgap measure
  - small quantity developed, based on avian flu strain
- Difficult to make matched vaccine before a human pandemic viral strain exists
- Production process is slow
  - 3-6 months until *first doses* are available
  - Longer until enough to cover all high-risk groups and general population
- Current huge research effort to develop better vaccines more quickly

# Proposed Prioritization of Vaccine

- Objectives drafted via Federal inter-agency workgroup with input from public, business and community organizations
- To protect:
  - Pandemic responders, including HCWs
  - Providers of essential community services
  - Children
  - Those with high risk of exposure on job
  - Homeland and national security

# Antiviral Supply

- Strategic National Stockpile (SNS) goal:
  - 25% of population
- King County goal:
  - 25% of population = 450,000 courses
  - 260,400 courses are anticipated thru SNS allocation
  - 190,000 courses purchased by King County
  - Will be used according to federal recommendations
- Healthcare facilities can purchase their own additional stockpiles



# Antiviral Medication

- Neuraminidase inhibitors currently appear to be effective against avian influenza A (H5N1), *but...*
  - effectiveness against a future pandemic strain is unknown
    - virus may develop resistance
  - optimal dose/duration of treatment for a pandemic virus not known

# Antiviral Medication: Challenges

- Limited supplies
  - need strategies for use of limited available drug
  - currently recommended primarily for treatment of ill persons requiring hospitalization and ill health care workers, other essential personnel, and persons at high risk for severe illness
  - if supplies permit, may be used for prevention
- Dispensing strategy
  - most effective when used within 48 hrs of onset of illness

# Proposed Antiviral Use

- Post-exposure prophylaxis (PEP)
  - HCWs with lower risk of exposure
  - Outbreak control
  - Household contacts of persons ill with flu
  - Severely immunocompromised
- Outbreak prophylaxis - 80 days (IND Emergency Use Authorization)
  - HCWs with frequent, high-risk exposure
  - Unique critical infrastructure workers

# “Community Strategy for Pandemic Influenza Mitigation in the United States”

- Isolation and treatment
- Voluntary home quarantine of members of households with influenza cases
- Closure of schools and daycare centers
- Social distancing (↓ social density)
  - Limit large group assembly
  - Alter workplace environments/ schedules
  - Decrease mass public transit

# Targeting Schools, Childcare and Children

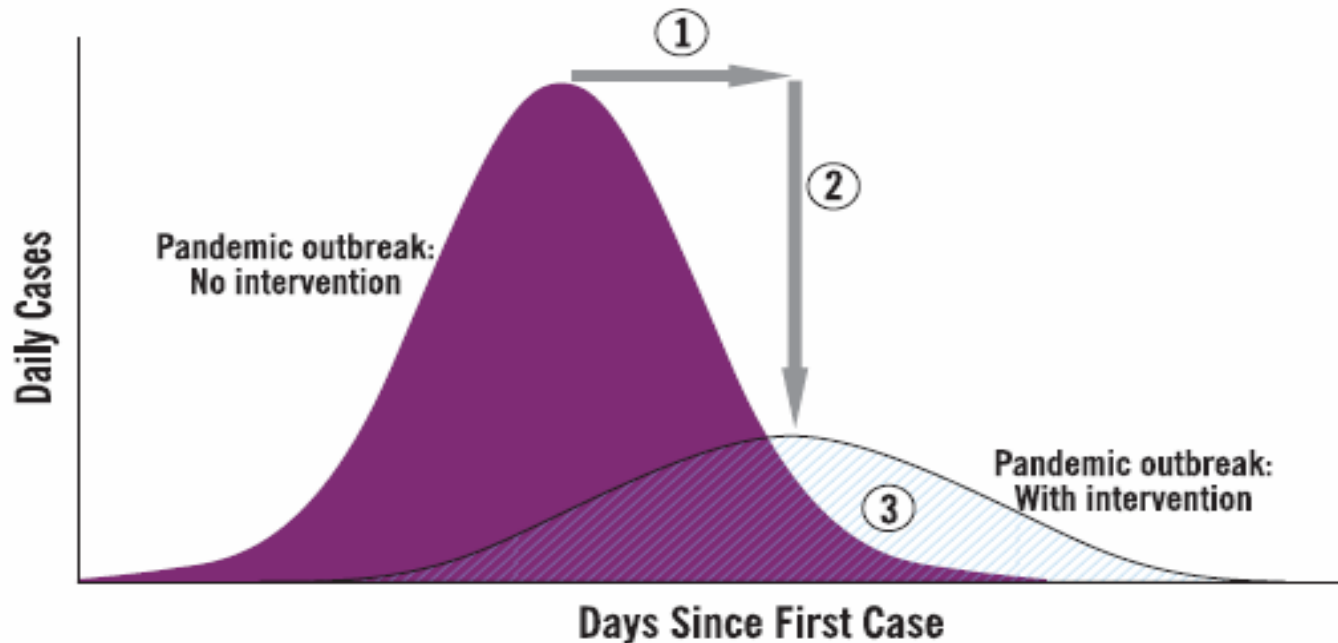
- Schools serve as amplification points
- Children play significant role in introducing influenza virus within households
  - More susceptible to infections than adults
  - More responsible for secondary transmission
    - Shed more influenza virus
    - Shed virus for a longer period
    - “not skilled in handling their secretions”

# Rationale: “Buy Time”

Figure 1.

## Goals of Community Mitigation

- ① Delay outbreak peak
- ② Decompress peak burden on hospitals / infrastructure
- ③ Diminish overall cases and health impacts



# Community Strategies by Pandemic Flu Severity

Interventions by Setting	Pandemic Severity Index		
	1	2 and 3	4 and 5
<b>Home</b> <b>Voluntary isolation</b> of ill at home (adults and children); combine with use of antiviral treatment as available and indicated	<b>Recommend</b>	<b>Recommend</b>	<b>Recommend</b>
<b>Voluntary quarantine</b> of household members in homes with ill persons (adults and children); consider combining with antiviral prophylaxis if effective, feasible, and quantities sufficient	<b>Generally not recommended</b>	<b>Consider</b>	<b>Recommend</b>
<b>School</b> <b>Child social distancing</b> –dismissal of students from schools and school-based activities, and closure of child care programs	<b>Generally not recommended</b>	<b>Consider:</b> ≤ 4 weeks	<b>Recommend:</b> ≤ 12 weeks
–reduce out-of-school contacts and community mixing	<b>Generally not recommended</b>	<b>Consider:</b> ≤ 4 weeks	<b>Recommend:</b> ≤ 12 weeks

# Social & Economic Impacts

- Report by Trust for America's Health
  - U.S. economy could lose 3 weeks productivity
    - Workers ill
    - Workers caring for family members
    - Workers unable to report to work
- Additional examples of impact: -
  - Schools: daycare function & feeding programs
  - Basic needs of quarantined individuals
  - Paid sick leave?
  - Impact on infrastructure: utilities, water, food supply, emergency response systems, etc.



# Severe Pandemic: Healthcare System Considerations

- 25-30% population infected (40% children)
  - 10% of community ill at any one time
- Healthcare facilities would be overwhelmed
  - Shortage of hospital beds
  - Shortage of hospital staff
  - Shortage of ventilators, O2 and other supplies
  - Continued demand for non-pandemic-related healthcare services
- Non-traditional healthcare sites could be necessary
  - Alternate care facilities
  - Increased home care, including palliative care

# Estimated Deaths, Outpatient Medical Visits and Hospitalizations in King County

<u>Attack Rate</u>	<u>Deaths</u>	<u>Outpatient Visits</u>	<u>Hospitalizations</u>
35%	809-11,500	249,916 - 466,642*	24,436 - 57,216**

KC staffed beds: 4242 – 33% (absenteeism) = 2842

Estimated max. KC bed capacity: 119,369 bed-days (6 weeks)

Estimated need: 98,000-228,000 patient-days (if 4 day stay)

\*Based on CDC's FluAid pandemic modeling software and HHS National Pandemic Influenza Preparedness Plan; estimates for 6-week period

\*\*Extrapolated from CDC: Melzer, and HHS National Pandemic Preparedness Plan

# National Mandate:

## Pandemic Influenza Implementation Plan

- ...it will be necessary for hospitals, medical providers, and oversight agencies to maximize hospital bed surge capacity, and triage and treat patients in a manner that affords each the best chance of survival and recovery within the limits of available resources.
- In all cases, the goal should be to provide care and allocate scarce equipment, supplies, and personnel in a way that saves the largest number of lives.
- Planning should therefore include thresholds for altering triage algorithms and otherwise optimizing the allocation of scarce resources.