H1N1: A Framework for Discussing Outbreaks of Illness in the Residential Campus Setting

Matthew L. Cartter, MD, MPH
Connecticut Department of Public Health
August 24, 2009

“It’s just the flu.”

“It is and it isn’t.”

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Preparing for the Flu

(Including 2009 H1N1 Flu)

A Communication Toolkit for Institutions of Higher Education

CDC

UA works to prevent flu virus from spreading

By Lydia Seabol Avant Staff Writer
Published: Thursday, August 20, 2009 at 4:17 p.m.

TUSCALOOSA | The number of flu cases at the University of Alabama has topped 50 in just the first week of school, and UA officials are taking extra precautions to try to keep the virus from spreading.

Dan Lopez / Tuscaloosa News
The number of flu cases at the University of Alabama has topped 50 in just the first week of school, and UA officials are taking extra precautions to try to keep the virus from spreading.

A flu hotline has been set up to answer questions about the flu. Face masks are being handed out at the Student Health Center and in the dorms, and professors are being asked to loosen their attendance policies for students who are sick.

At least 54 people have tested positive for the flu this week, said John Maxwell, director of the Student Health Center at UA. That number has grown since Tuesday, when that number was 21 known cases of flu, although it's not certain whether the cases are the H1N1 swine flu strain. The Centers for Disease Control has instructed health care providers to treat all cases as if they were the swine flu.

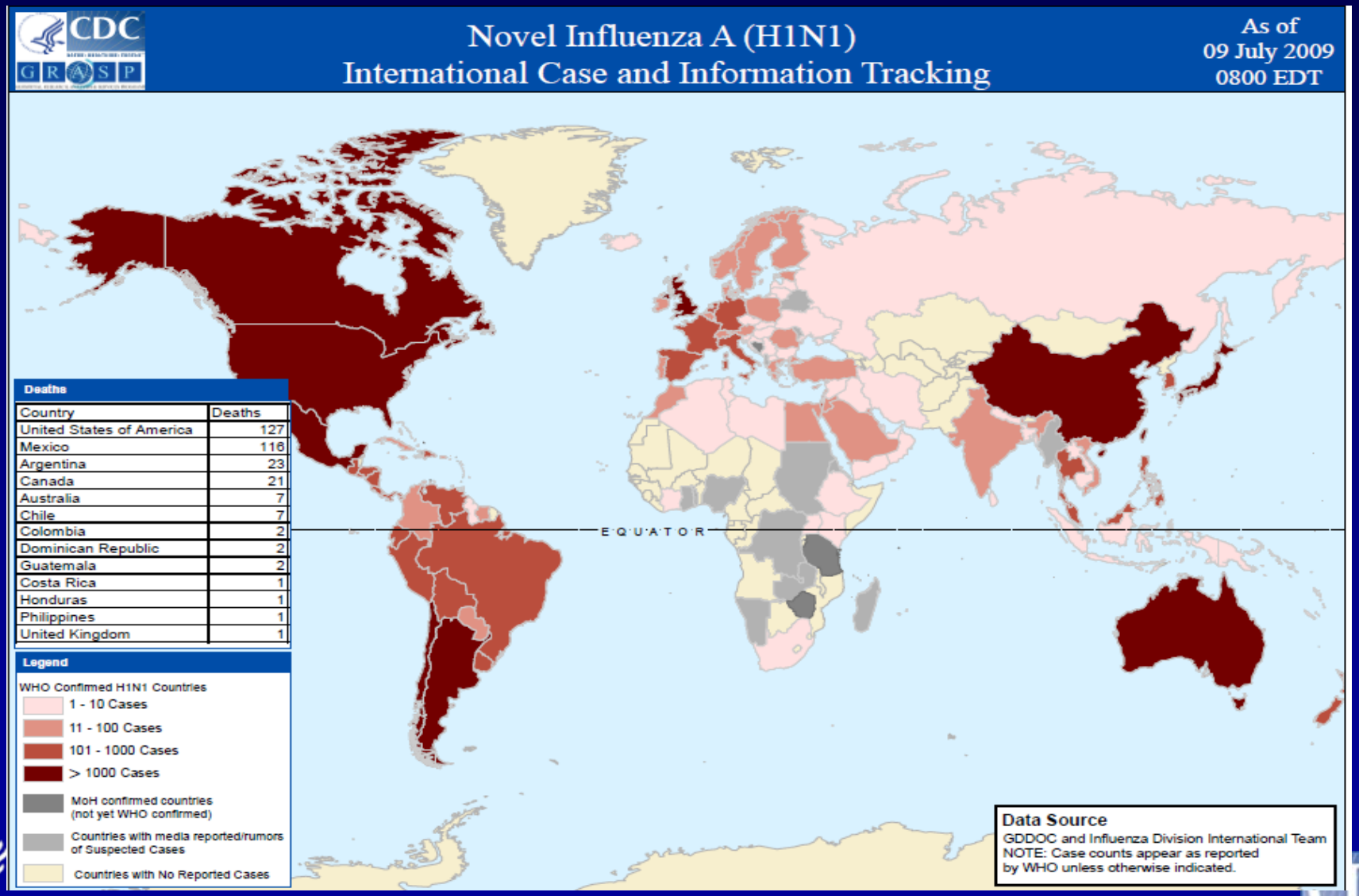
Epidemic: Occurrence of more cases of disease than expected in a particular area or among a specific group of people over a period of time

Pandemic: Epidemic occurring in a very wide area (several countries or continents) and usually affecting a large proportion of the population

Outbreak: Generally synonymous with epidemic, but may be smaller in scale

Cluster: Aggregation of cases in a given area over a period of time, without regard to whether the number of cases is more than expected

International Map
Pandemic H1N1 – 10 JUL 2009



www.cdc.gov/H1N1flu

H1N1 cases on the rise

Bangalore, Aug 18, DH News Service :

Over the past two days, no A(H1N1)-related deaths were reported from the City, but the number of people who tested positive for the contagious virus more than doubled on Tuesday.

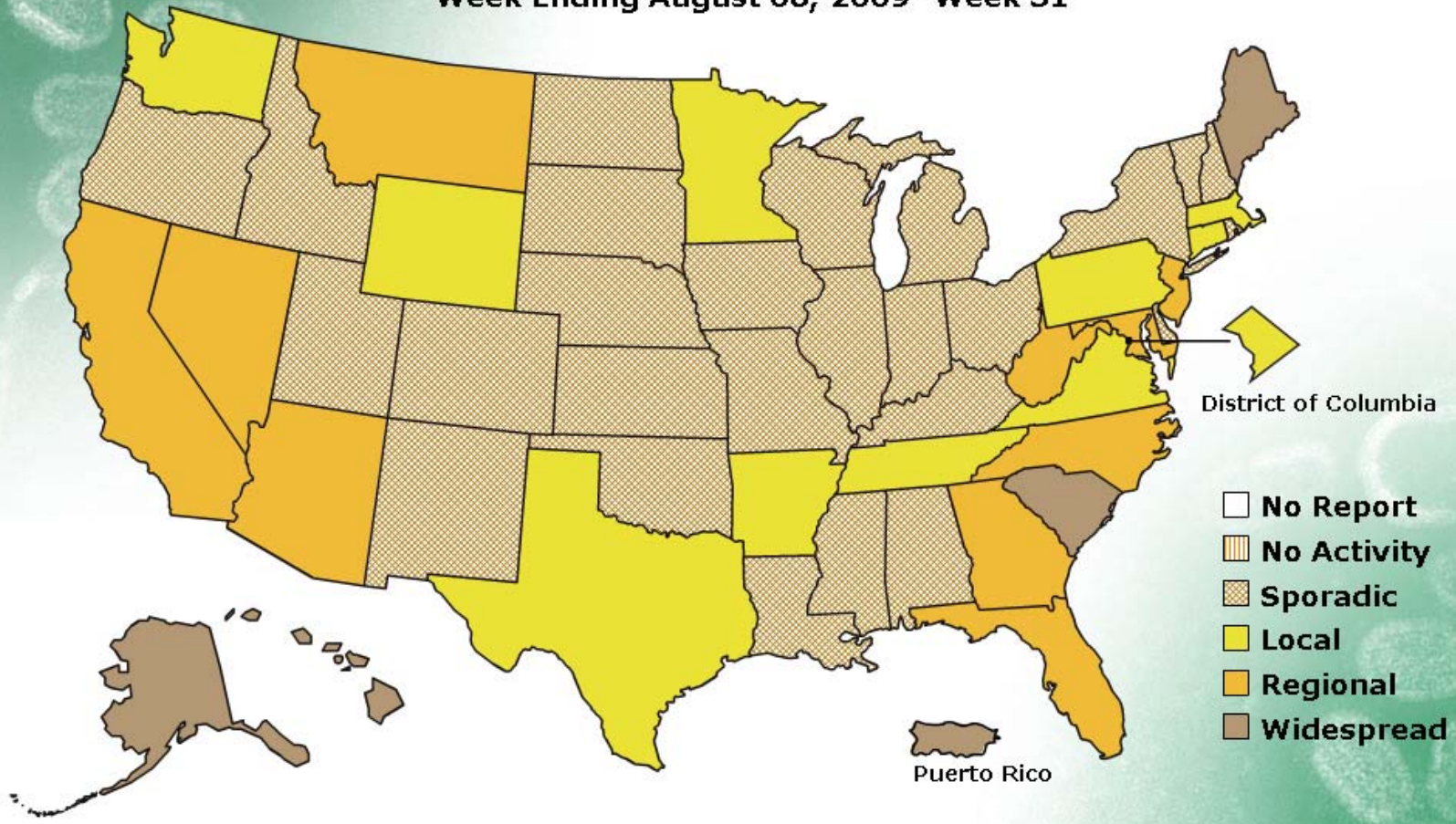
Authorities at the designated hospitals that tested the swab samples of some patients here and across the State confirmed that 22 persons were found carrying the A(H1N1) virus, taking the total number of positive cases to 194 with 834 categorised as “suspected”. Of the positive cases, all barring one were detected in hospitals across Bangalore with Udupi registering the remaining. As many as seven A(H1N1) positive cases were detected at the Rajiv Gandhi Institute of Chest Diseases (RGICD), while five were diagnosed at Sagar Apollo, followed by two each at the Command Hospital and Victoria. One case each was reported at M S Ramaiah, Pristine, Vydehi, Manipal and Shifa hospitals.

FLUVIEW

A Weekly Influenza Surveillance Report Prepared by the Influenza Division

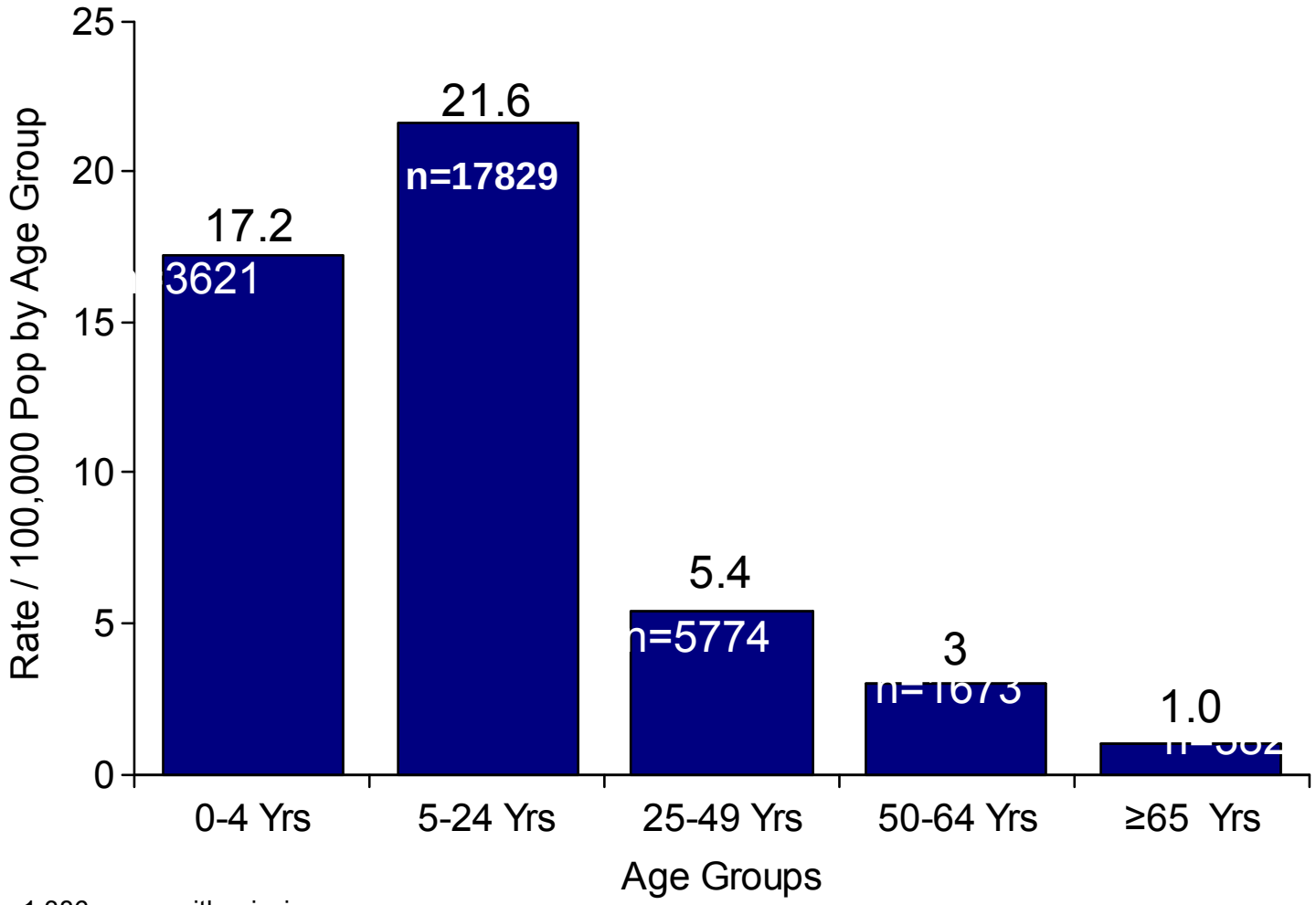
Weekly Influenza Activity Estimates Reported by State and Territorial Epidemiologists*

Week Ending August 08, 2009- Week 31



*This map indicates geographic spread and does not measure the severity of influenza activity.

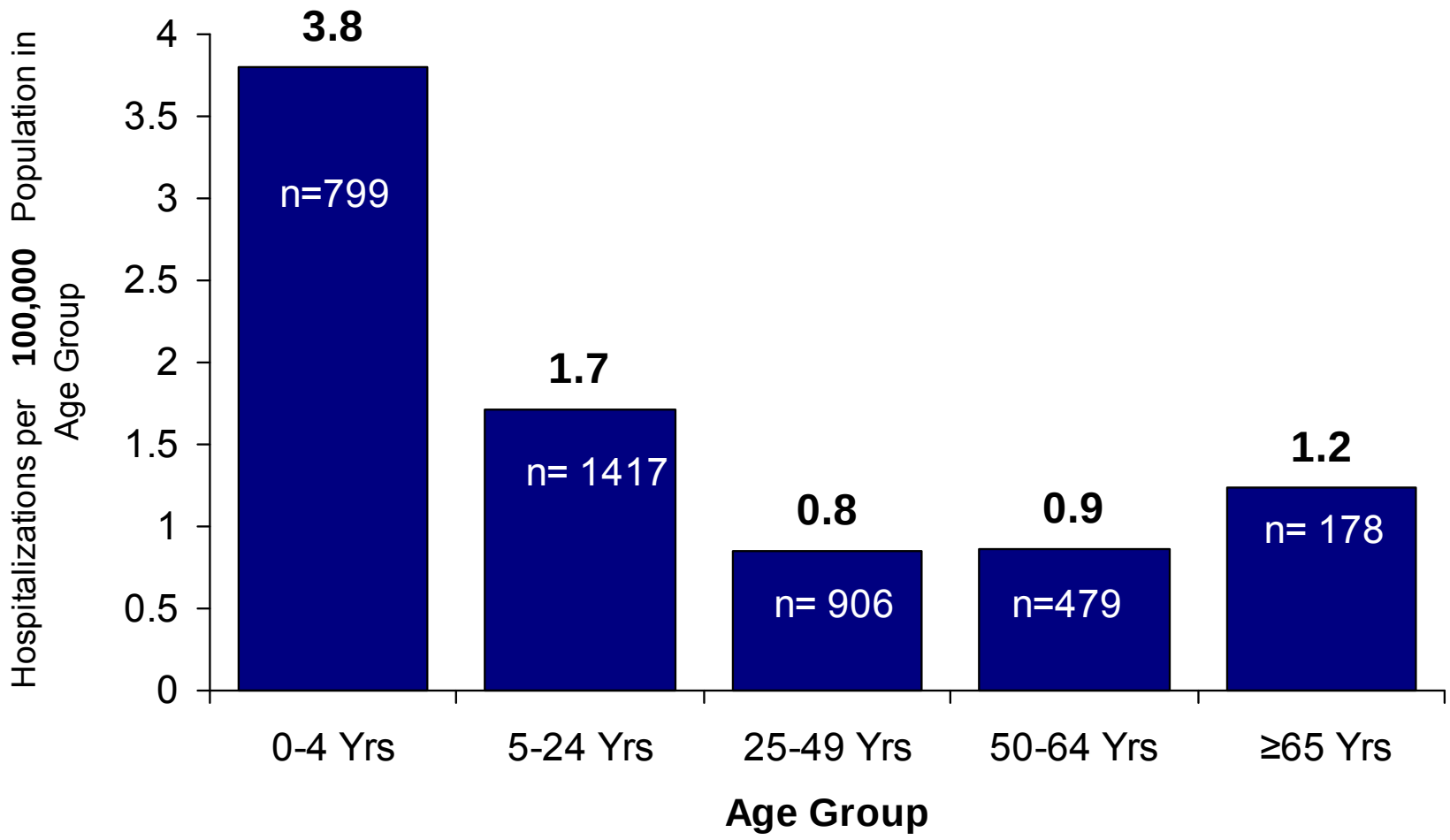
Epidemiology/Surveillance
Pandemic H1N1 Cases Rate per 100,000 Population by Age Group
As of 09 JULY 2009 (n=35,860*)



*Excludes 1,386 cases with missing ages.
Rate / 100,000 by Single Year Age Groups: Denominator source: 2008 Census Estimates, U.S. Census Bureau at:
http://www.census.gov/popest/national/asrh/files/NC-EST2007-ALLDATA-R-File24.csv

Epidemiology/Surveillance

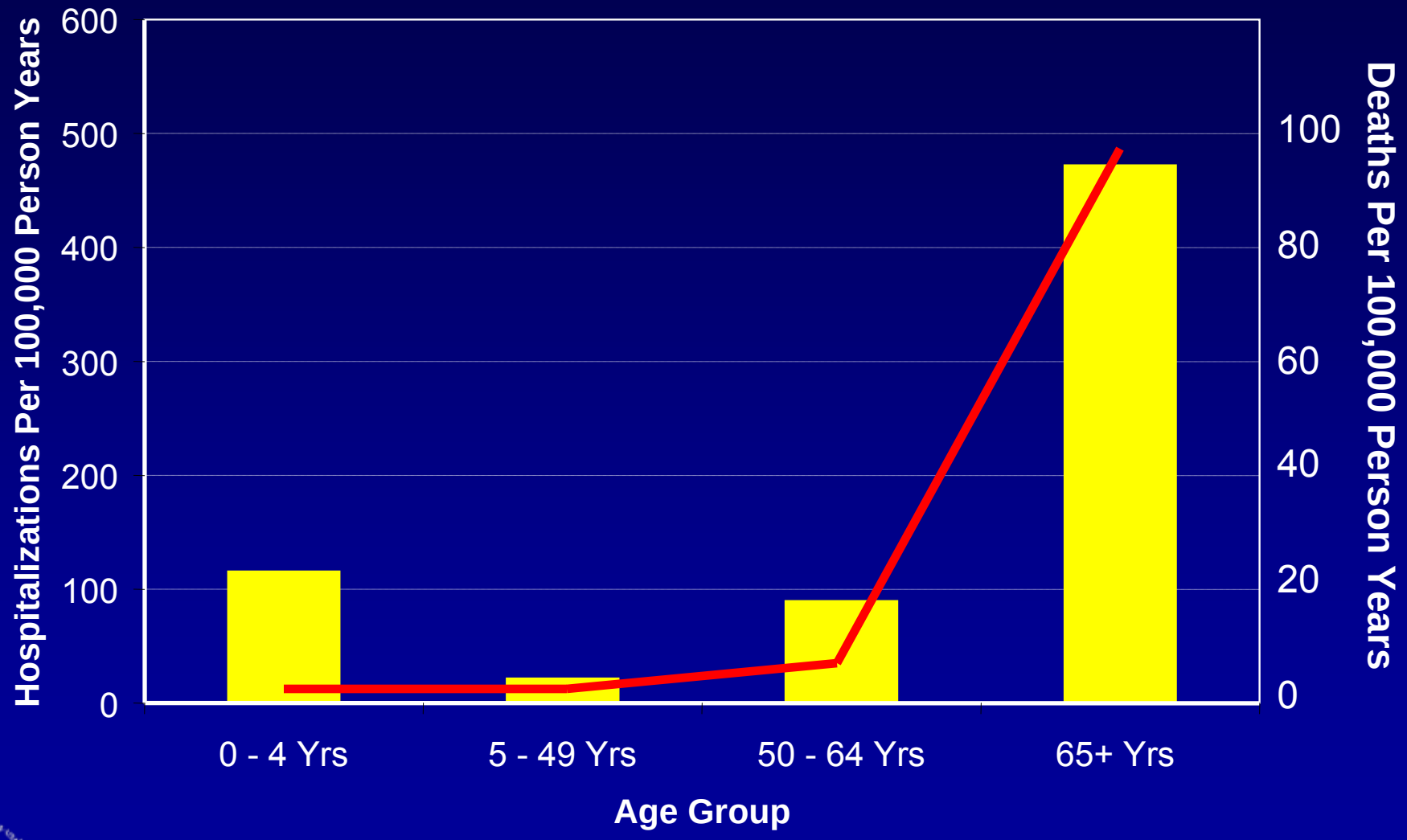
Pandemic H1N1 Hospitalization Rate per 100,000 Population by Age Group (n=3,779) as of 09 JULY 2009



*Hospitalizations with unknown ages are not included (n=353)

*Rate / 100,000 by Single Year Age Groups: Denominator source: 2008 Census Estimates, U.S. Census Bureau at: http://www.census.gov/popest/national/asrh/files/NC-EST2007-ALLDATA-R-File24.csv

Influenza-Associated Hospitalizations Deaths By Age Group



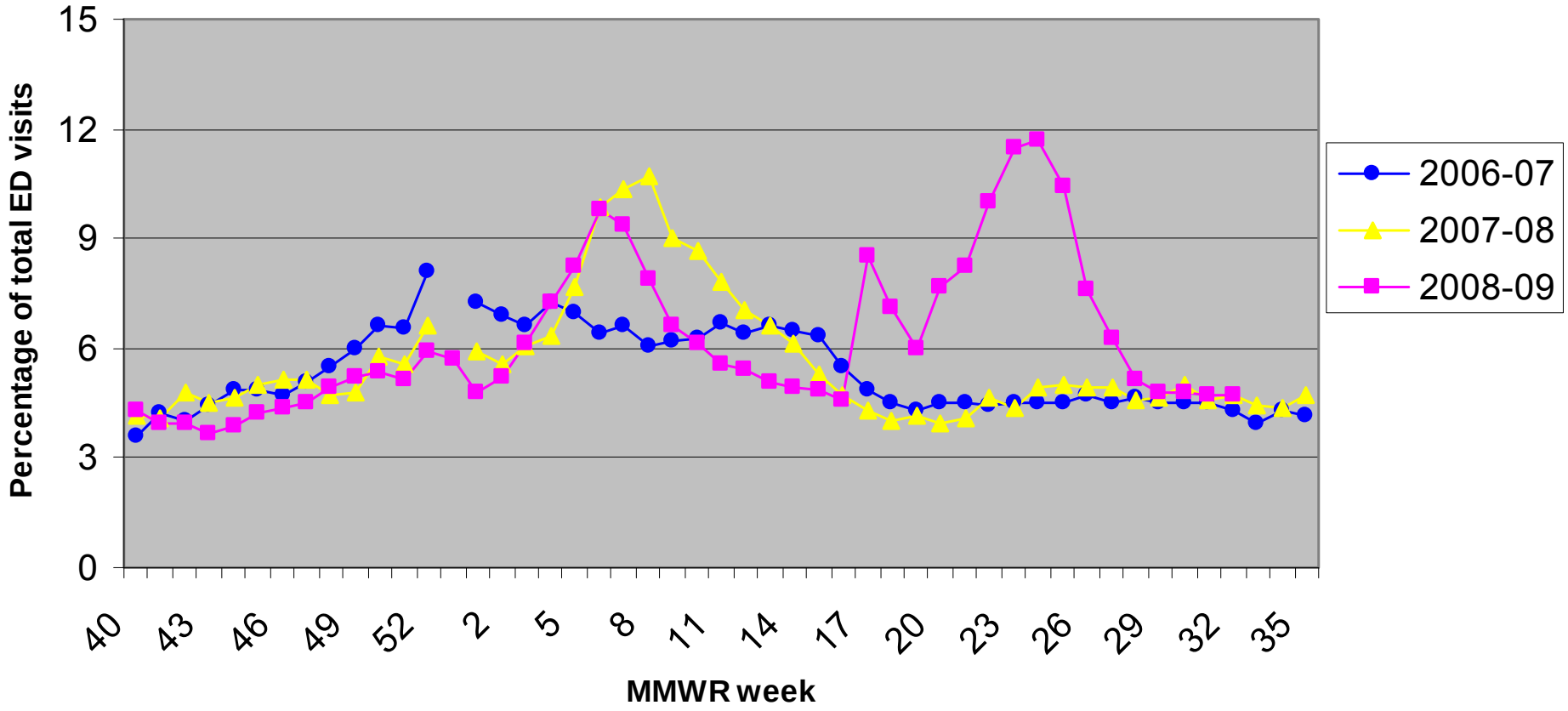
*Thompson WW, JAMA, 2004

www.cdc.gov/H1N1flu

As of 8/19/2009, 1,946 Connecticut residents who have tested positive for novel H1N1 influenza

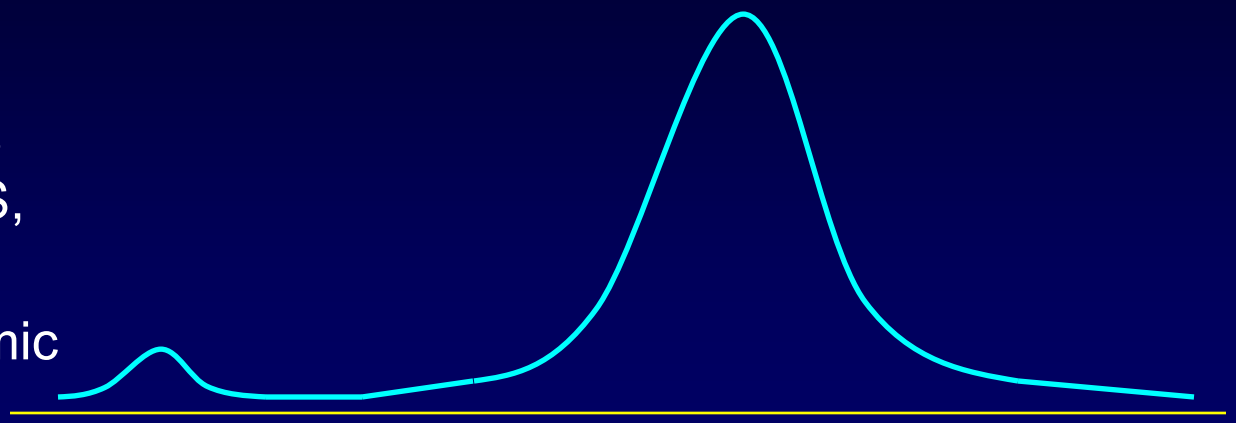
- Ages range from less than 1 to 93 years (median age 14 years)
- 50.8% are female, 47.2% are male and 2.0 % is sex unknown;
- 136 patients have been hospitalized for H1N1 related illnesses;
- 9 H1N1-related deaths: Hartford County 2, New Haven County 6, and New London County 1.
- Patients for whom home address is known are from the following counties: Fairfield (652), Hartford (352), Litchfield (30), Middlesex (27), New Haven (692), New London (64), Tolland (51), and Windham (21)

Connecticut Hospital Emergency Department Syndromic Surveillance (HEDSS) System: Percentage of total ED visits for "fever/flu" syndrome category, 2008-09 influenza season compared to past seasons, through MMWR Week 32 (week ending August 15, 2009)

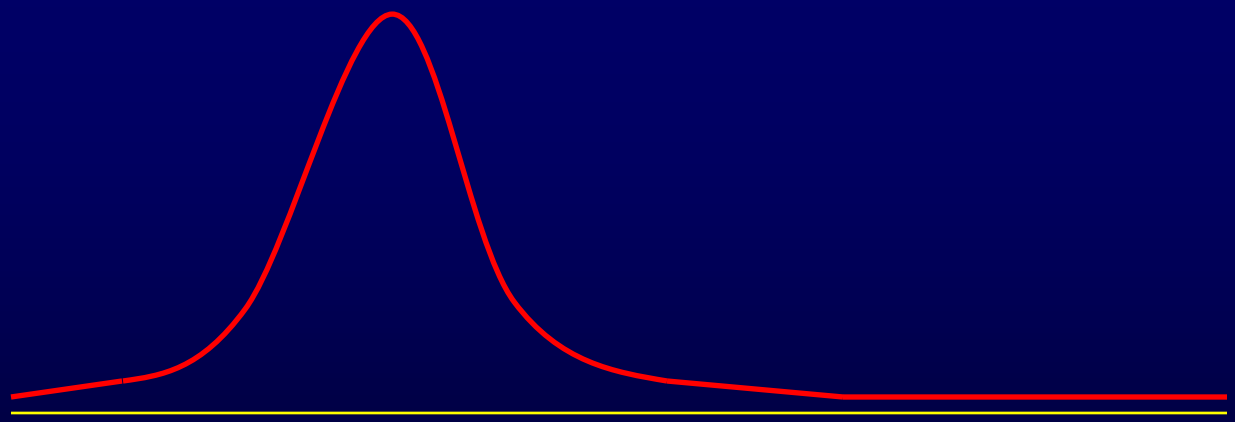


What's Next

- Disease likely persists through summer in US, expected surge in fall
- Severity of Fall epidemic difficult to predict
- Southern Hemisphere being monitored for subtypes, spread, and severity
- Vaccine being readied
- Surveillance continuing



Northern Hemisphere



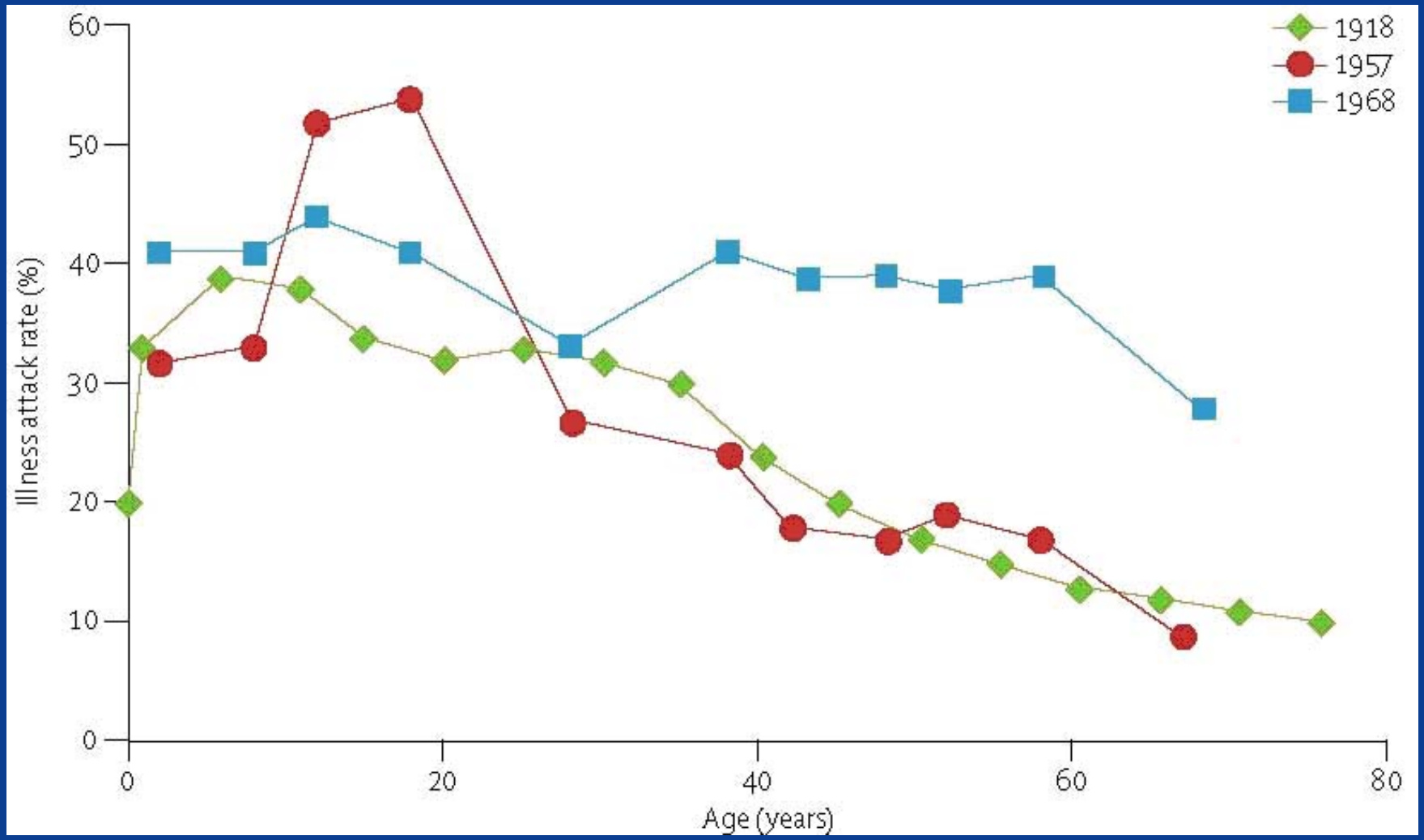
Southern Hemisphere

Hurricanes and Pandemic Severity

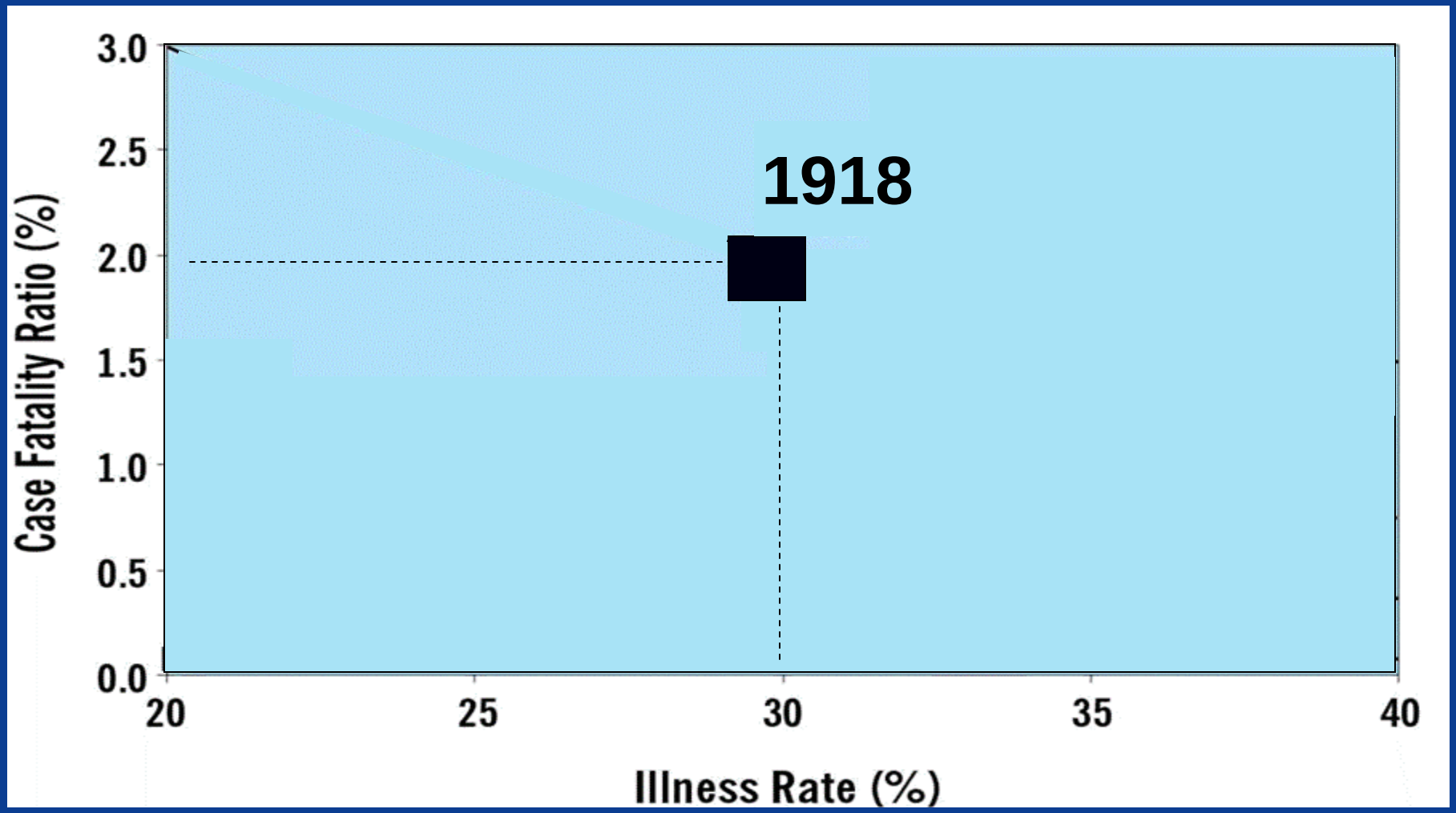
Influenza pandemics in last century

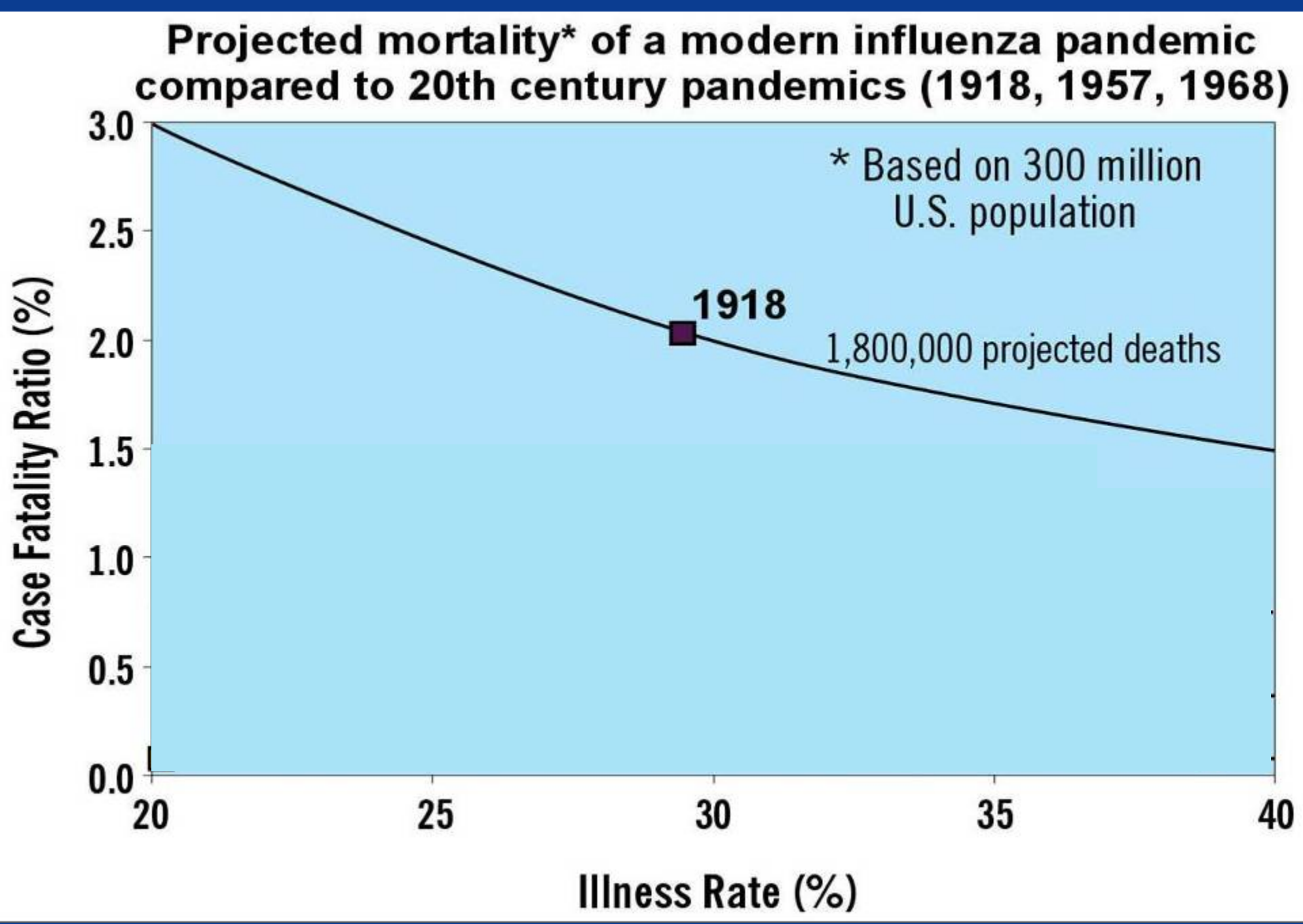
Year	Strain	Name	Number of confirmed human deaths (USA)	Global deaths
1918-19	H1N1	“Spanish” Flu	650,000	20-40 million
1957-58	H2N2	“Asian” Flu	70,000	1 million
1968-69	H3N2	“Hong Kong” Flu	34,000	1 million

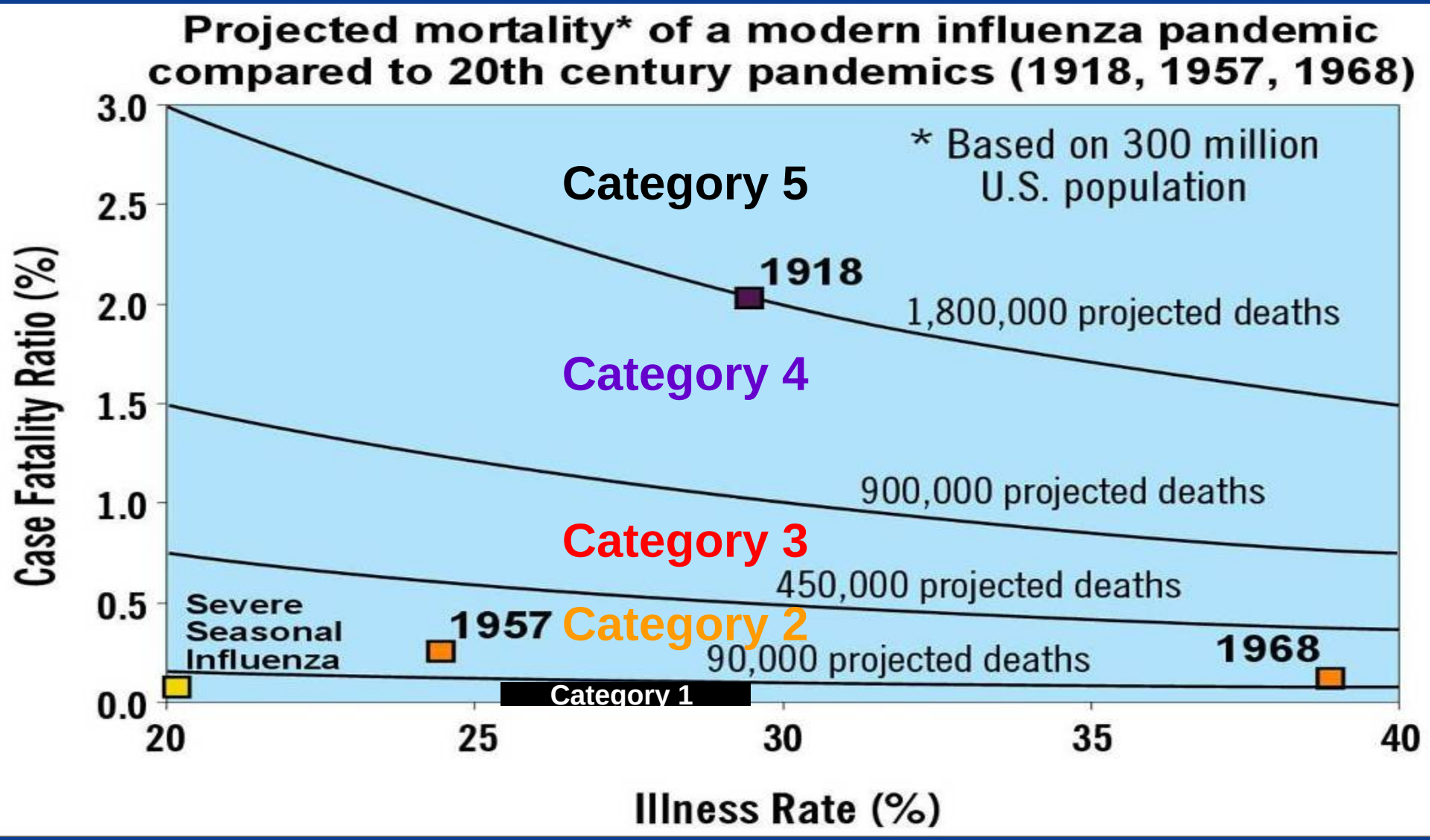
Illness attack rates in 1918, 1957, and 1968 pandemics



Pandemic Severity Index




Projected mortality* of a modern influenza pandemic compared to 20th century pandemics (1918, 1957, 1968)
* Based on 300 million U.S. population
1918
1,800,000 projected deaths
Case Fatality Ratio (%)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
20
25
30
35
40
Illness Rate (%)

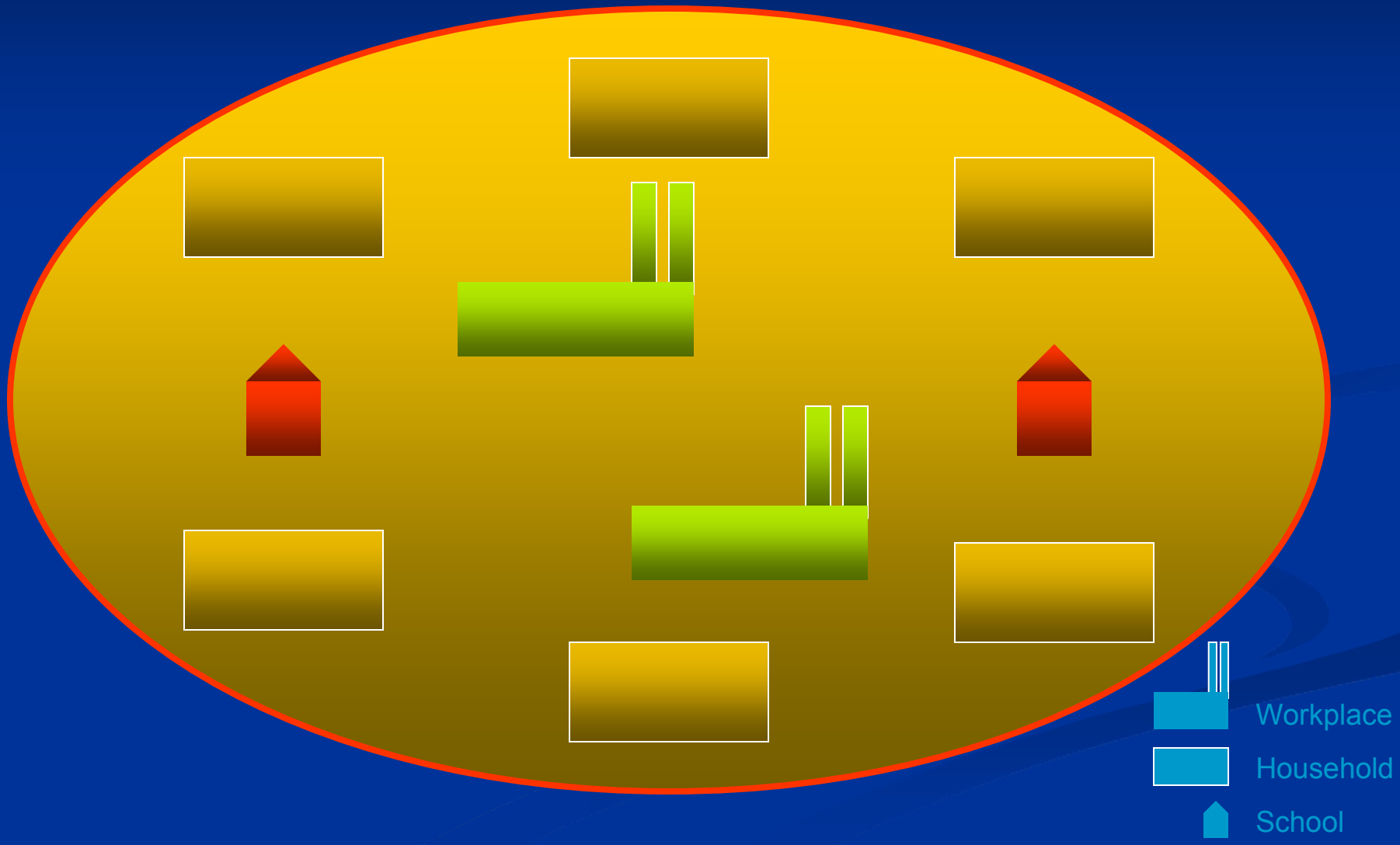

Projected mortality* of a modern influenza pandemic compared to 20th century pandemics (1918, 1957, 1968)
* Based on 300 million U.S. population
Category 5
1918
1,800,000 projected deaths
Category 4
900,000 projected deaths
Category 3
450,000 projected deaths
Severe Seasonal Influenza
1957
Category 2
90,000 projected deaths
1968
Category 1
Case Fatality Ratio (%)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
20
25
30
35
40
Illness Rate (%)

Most Likely Estimates of Potential Impact of an Influenza Pandemic with a 30% Illness Rate in CT

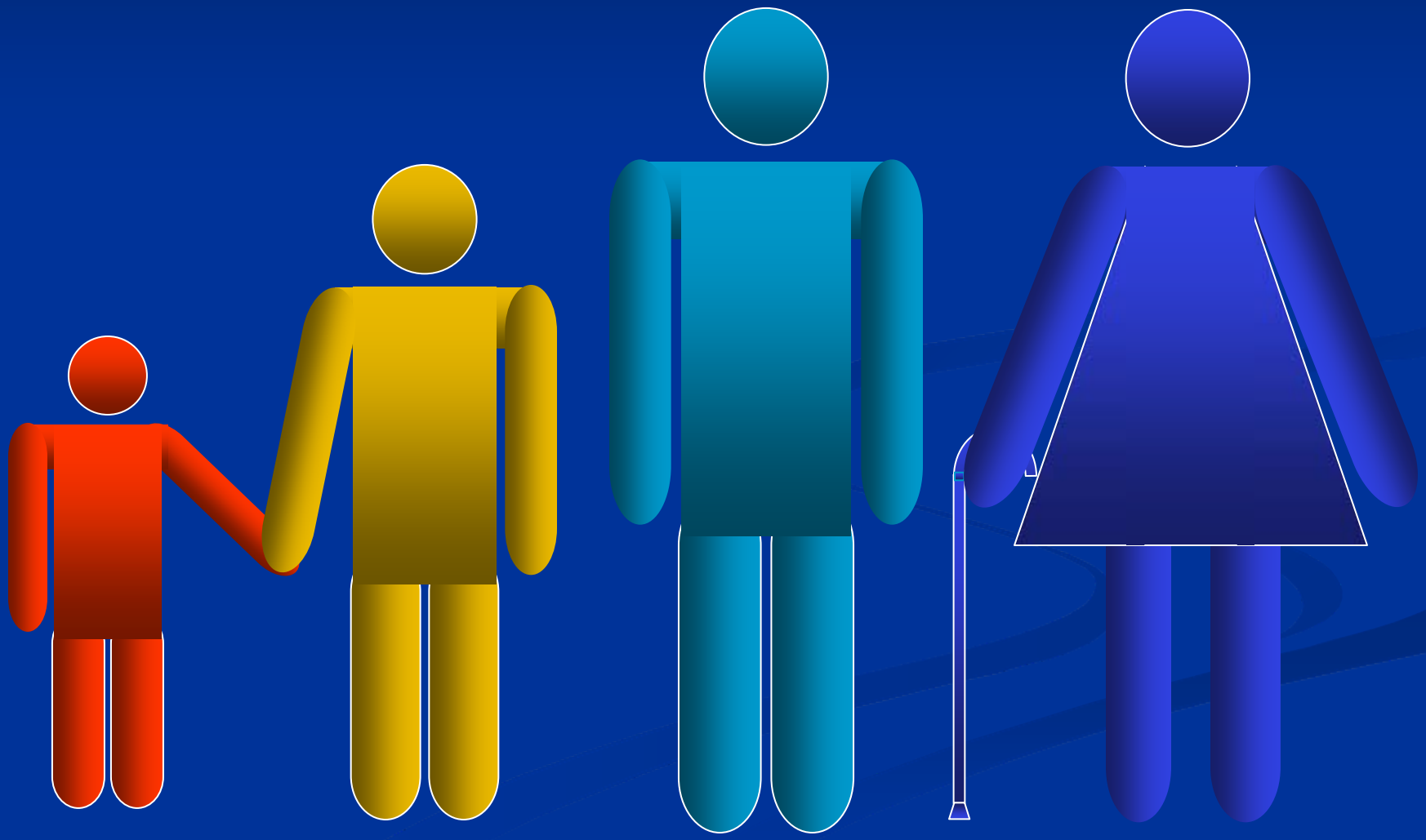
	Category 2 (1968-like)	Category 5 (1918-like)
Ill, No medical care	474,089	422,083
Outpatients	563,647	504,806
Hospitalizations	12,451	102,348
Deaths	2,902	23,852
Totals	1,053,089	1,053,089

Role of Children & Schools

Transmission Occurs Where People Spend a Lot of Time Together

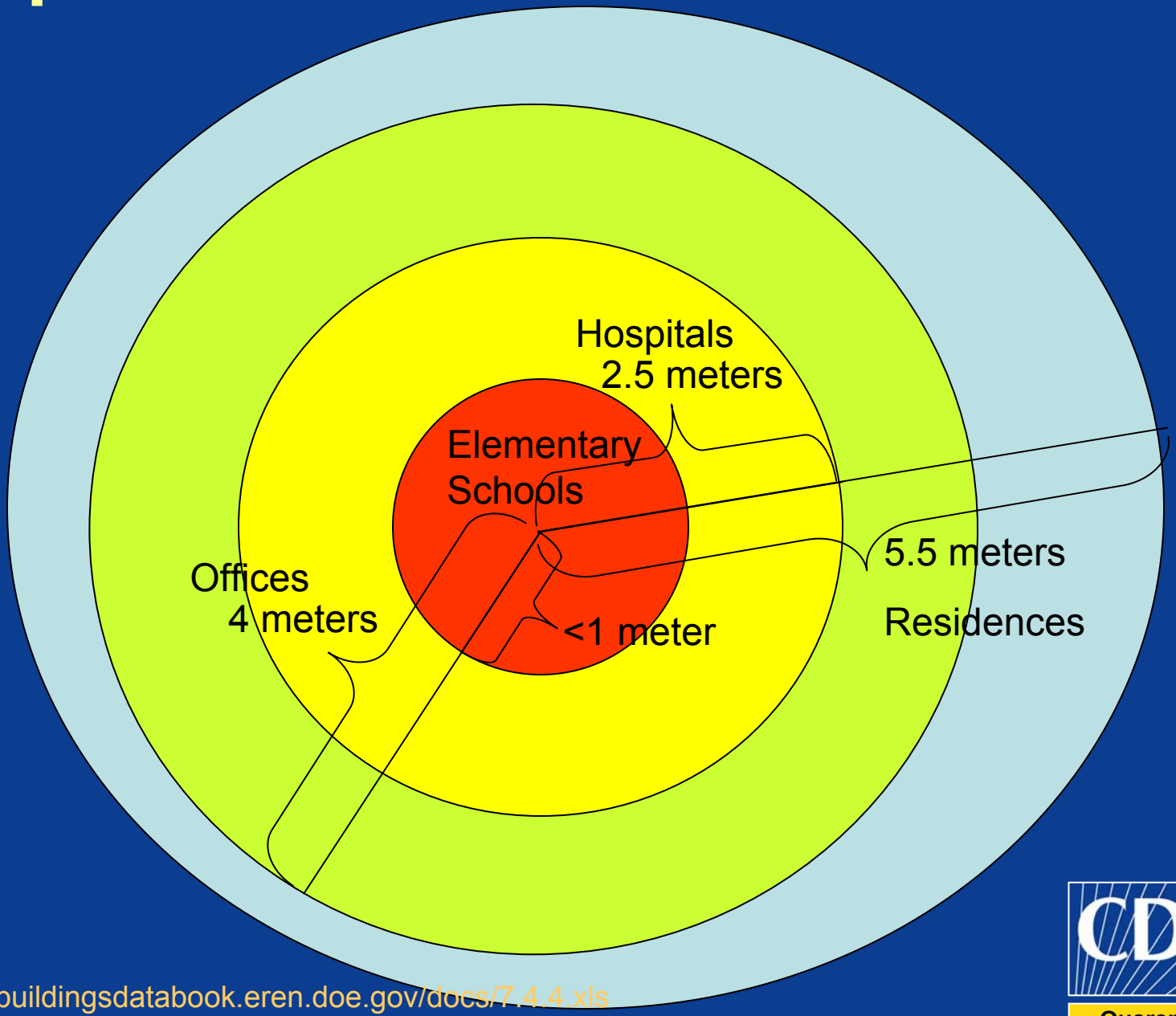


Children Both Vulnerable & Efficient Transmitters



ANYONE'S BIRTH
grocery for some treats
last year

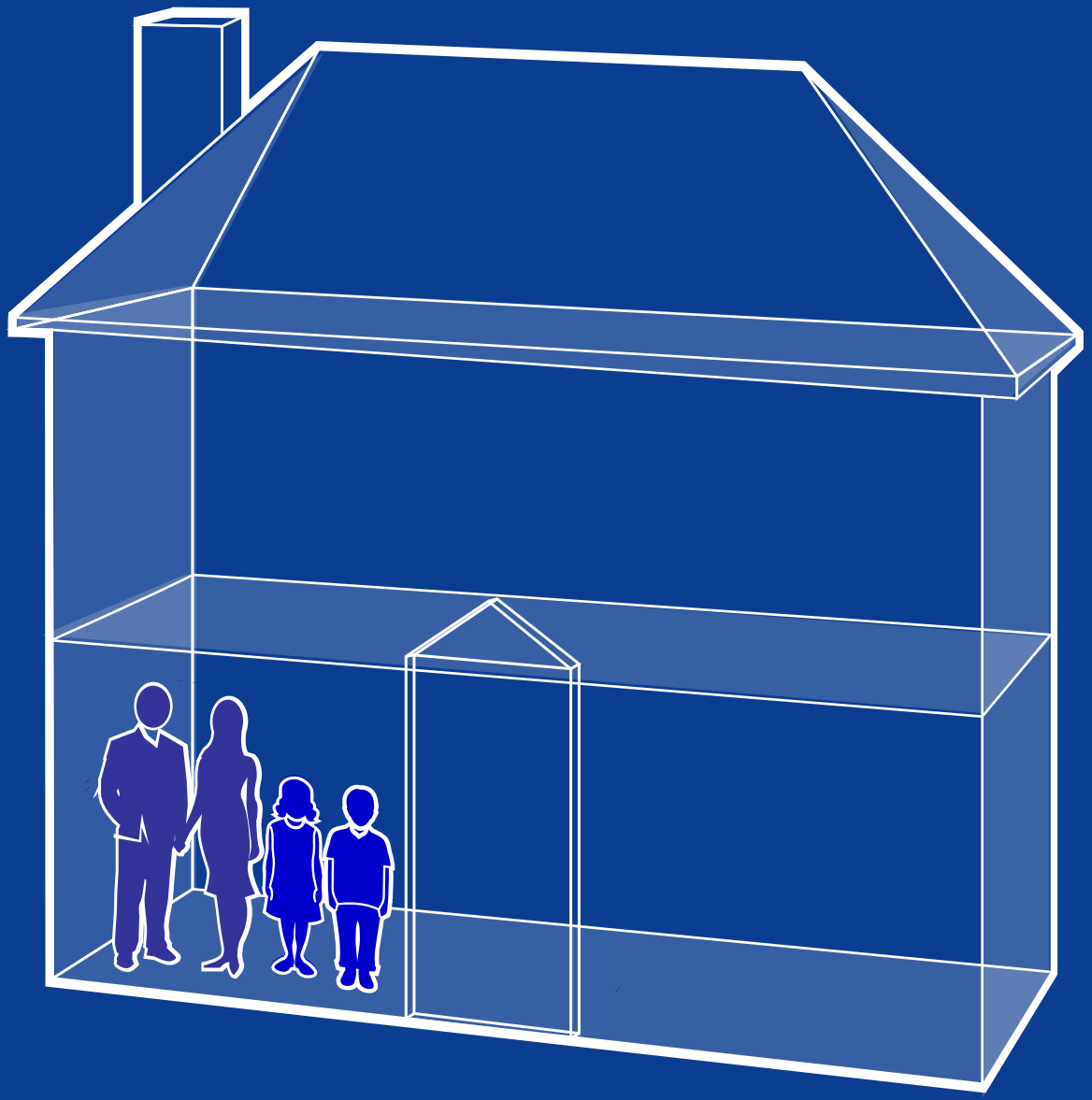
Workplace / Classroom Social Density



http://buildingsdatabook.eren.doe.gov/docs/7.4.4.xls

Quarantine

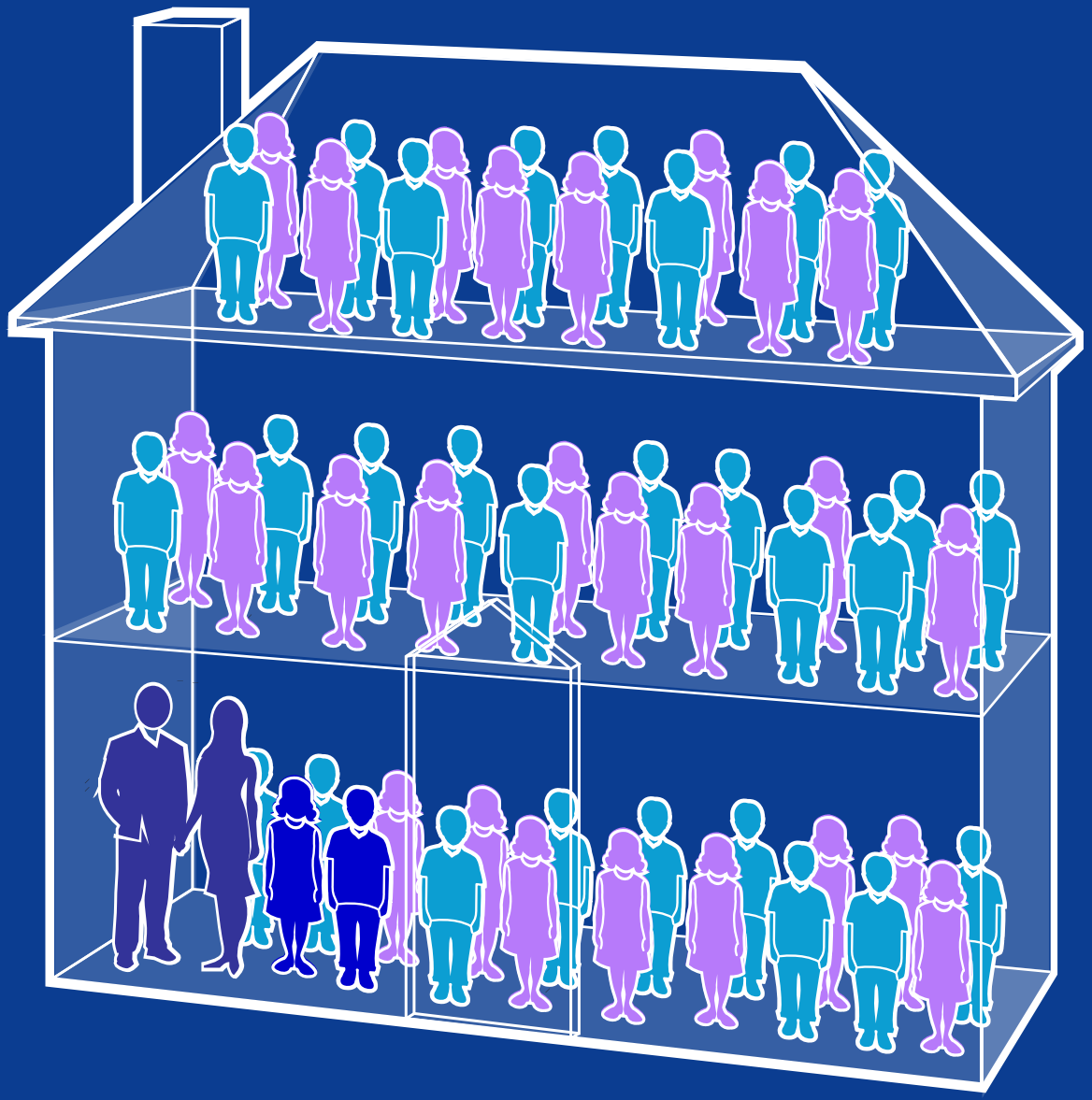
Spacing of people: If homes were like schools



*Based on avg. 2,600 sq. ft. per single family home

Quarantine

Spacing of people: If homes were like schools



*Based on avg. 2,600 sq. ft. per single family home

Quarantine

PUBLIC NOTICE

In view of the severity of the present

Epidemic of Influenza

and in order that all efforts may be concentrated on the stamping out of the disease, the local Board of Health, after consultation with Kingston Medical Society and the Mayor, has enacted that after Oct. 16th, and until further notice,

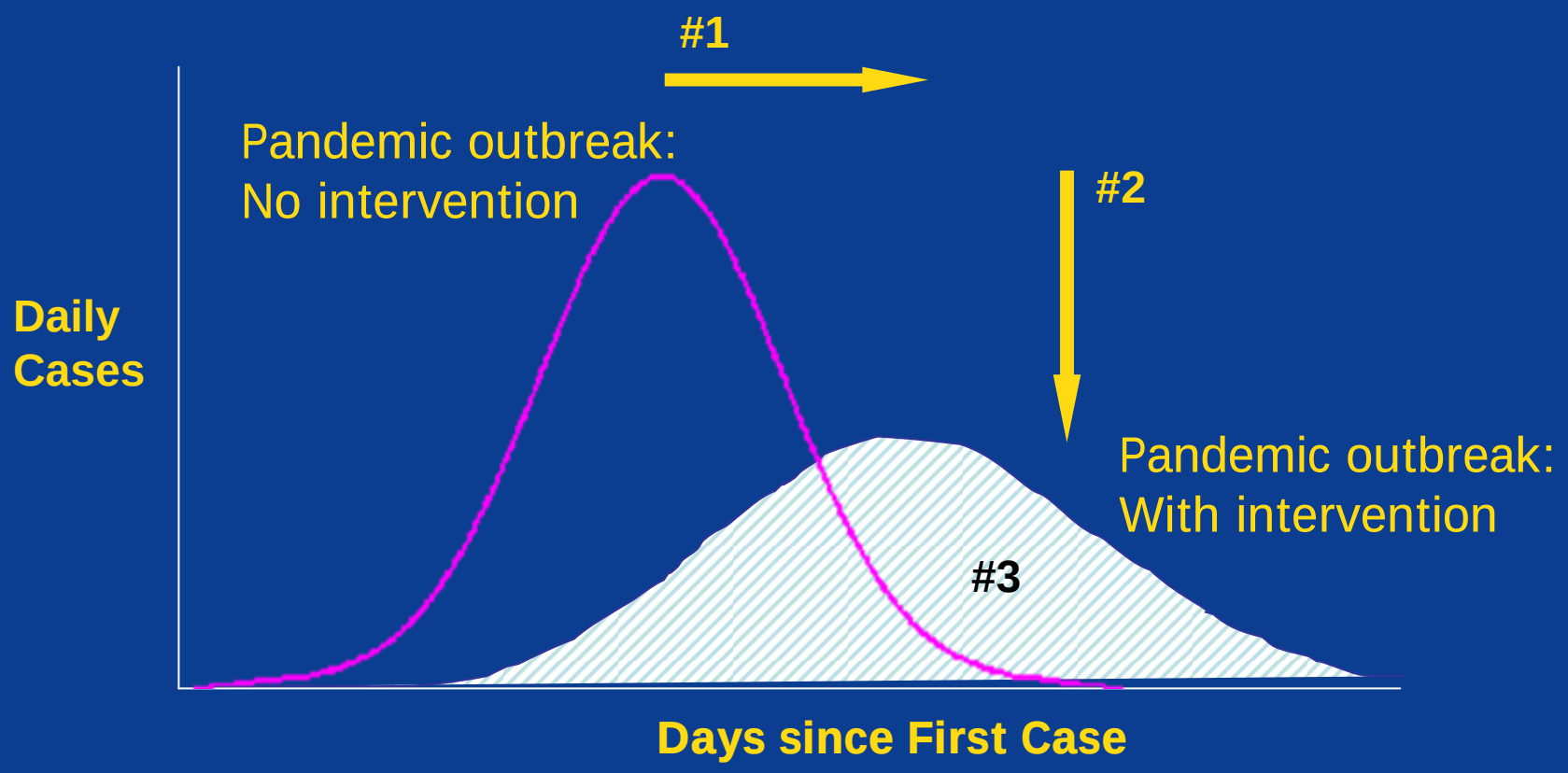
1. Theatres and Moving Picture Houses shall be closed and remain closed
2. Churches and Chapels of all denominations shall be closed and remain closed on Sundays.
3. All Schools, Public or Private, including Sunday Schools, shall close and remain closed.
4. Hospitals shall be closed to visitors.
5. No public shall be admitted to courts except those essential to the prosecution of the cases called.
6. The Board advises the public most strongly not to crowd into street cars and to avoid as much as possible any crowded train or an assembly of any kind.

Provisions have been made by the Kingston Medical Society whereby all cases applying for assistance will receive the same either by registered practitioners or by final year medical students acting under instructions. Therefore every case of illness should send in a call to a physician.

A. R. B. WILLIAMSON,
Medical Health Officer.

Community-Based Interventions

1. Delay disease transmission and outbreak peak
2. Decompress peak burden on healthcare infrastructure
3. Diminish overall cases and health impacts



Tools in Our Toolbox

- **Pandemic Vaccine**
  - likely unavailable during the first wave of a pandemic
- **Antiviral medications**
  - Quantities
  - Distribution logistics
  - Efficacy / Resistance
- **Social distancing and infection control measures**

Community Strategies by Pandemic Flu Severity (1)

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

Community Strategies by Pandemic Flu Severity (2)

	Pandemic Severity Index		
Interventions by Setting	*1*	*2 and 3*	*4 and 5*
Workplace/Community **Adult social distancing**			
–decrease number of social contacts (e.g., encourage teleconferences, alternatives to face-to-face meetings)	**Generally not recommended**	**Consider**	**Recommend**
–increase distance between persons (e.g., reduce density in public transit, workplace)	**Generally not recommended**	**Consider**	**Recommend**
–modify, postpone, or cancel selected public gatherings to promote social distance (e.g., stadium events, theater performances)	**Generally not recommended**	**Consider**	**Recommend**
–modify workplace schedules and practices (e.g., telework, staggered shifts)	**Generally not recommended**	**Consider**	**Recommend**

THE CASE FOR KENO

When it comes to gambling in Connecticut, the "horses are already out of the barn ..." **Stan Simpson, Page A2**

Hartford Courant.com

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SWINE FLU AND THE SCHOOLS

To Close, Or Not To Close?

Virus Poses Tough Choices For Officials At End Of Academic Year

By ARIELLE LEVIN BECKER
alevinbecker@courant.com

The early days of the swine flu outbreak brought a rash of school closings.

Then, with signs that the virus was milder than initially feared, schools reopened and the closures stopped.

Now the H1N1 virus is doing what flu viruses usually do: spread. So far, 480 state residents have had confirmed cases of the virus. Most have been mild, though one person died and five others were hospitalized.

And this week, schools began closing again — an elementary school in Hamden where more than 15 percent of the pupils had flu-like symptoms, and a middle school in Wolcott where more than 200 students were absent.

ON THE WEB
For more information about the swine flu, visit
courant.com/swineflu

It's not yet clear whether school closings will remain relatively rare or whether more will close before summer break begins. As the end of the school year approaches, closures could become more problematic, with finals, graduations and 180-day requirements to contend with.

While Wolcott and Hamden closed schools this week, West Hartford and New Haven kept schools open after being affected by swine flu because local health and school officials did not forecast problems.

That, in part, reflects changes in the reasons schools are closing. While state and federal officials

TOUGH, A4

ANIMAL SCIENCE

GROUNDED

Closure of schools during an influenza pandemic

Simon Cauchemez, Neil M Ferguson, Claude Wachtel, Anders Tegnell, Guillaume Saour, Ben Duncan, Angus Nicoll

In response to WHO raising the influenza pandemic alert level from phase five to phase six, health officials around the world are carefully reviewing pandemic mitigation protocols. School closure (also called class dismissal in North America) is a non-pharmaceutical intervention that is commonly suggested for mitigating influenza pandemics. Health officials taking the decision to close schools must weigh the potential health benefits of reducing transmission and thus case numbers against high economic and social costs, difficult ethical issues, and the possible disruption of key services such as health care. Also, if schools are expected to close as a deliberate policy option, or just because of high levels of staff absenteeism, it is important to plan to mitigate the negative features of closure. In this context, there is still debate about if, when, and how school closure policy should be used. In this Review, we take a multidisciplinary and holistic perspective and review the multiple aspects of school closure as a public health policy. Implications for the mitigation of the swine-origin influenza A H1N1 pandemic are also discussed.

Lancet Infect Dis 2009; 9: 473–81

MRC Centre for Outbreak Analysis and Modelling, Department of Infectious Disease Epidemiology, Imperial College London, London, UK (S Cauchemez PhD, Prof N M Ferguson FMedSci); **Secrétariat Général de la Défense Nationale, Paris, France** (C Wachtel PhD); **National Board of Health and Welfare, Stockholm, Sweden** (A Tegnell MD); **Chargé de mission auprès du délégué interministériel à la lute contre la grippe aviaire, Paris, France** (G Saour); **European Centre for Disease Prevention and Control, Stockholm, Sweden** (B Duncan LLM, Prof A Nicoll MB ChB); **and London School of Hygiene and Tropical Medicine, London, UK** (A Nicoll)

Introduction

On June 17, 2009, 85 countries had officially reported 39 620 cases of swine-origin influenza A H1N1 virus infection to WHO,[1] including 167 deaths. On June 11, 2009, WHO raised the level of influenza pandemic alert from phase five to phase six, officially declaring that a pandemic had began while at the same time stating it was of moderate severity, noting that most infected people, including children, had a mild self-limiting disease.[2] In this context, health officials around the world are carefully

need preparation (panel 2). Communication of the policy to the public also poses challenges, especially in a context where some countries (or even regions within a country) might close schools proactively, others perhaps only reactively, and some not at all. But since historical experience is that many schools close during pandemics just because of high levels of illness-related absenteeism, it would seem sensible for all countries to at least have plans for reactive closure.

School closure during a pandemic has been discussed

Types of School Closure

- School Closure - Closing of a school and sending of all the children and staff home
- Class dismissal - A school remains open with administrative staff, but most children stay home
- Reactive closure - Closure of a school when many children, staff, or both are experiencing illness
- Proactive closure - Closure of a school or class dismissal before substantial transmission among the school children

Is School Closure Effective in Reducing the Impact of Flu Pandemics?

- Early and prolonged school closure can substantially ease the burden on saturated hospitals by reducing the number of cases at the peak of the pandemic.
- Intervention is unlikely to have a major impact on the total number of cases, is associated with high social and economical costs, and can potentially disrupt health care systems and other key services.
- The final decision to close schools for prolonged periods should carefully consider the severity of the pandemic.

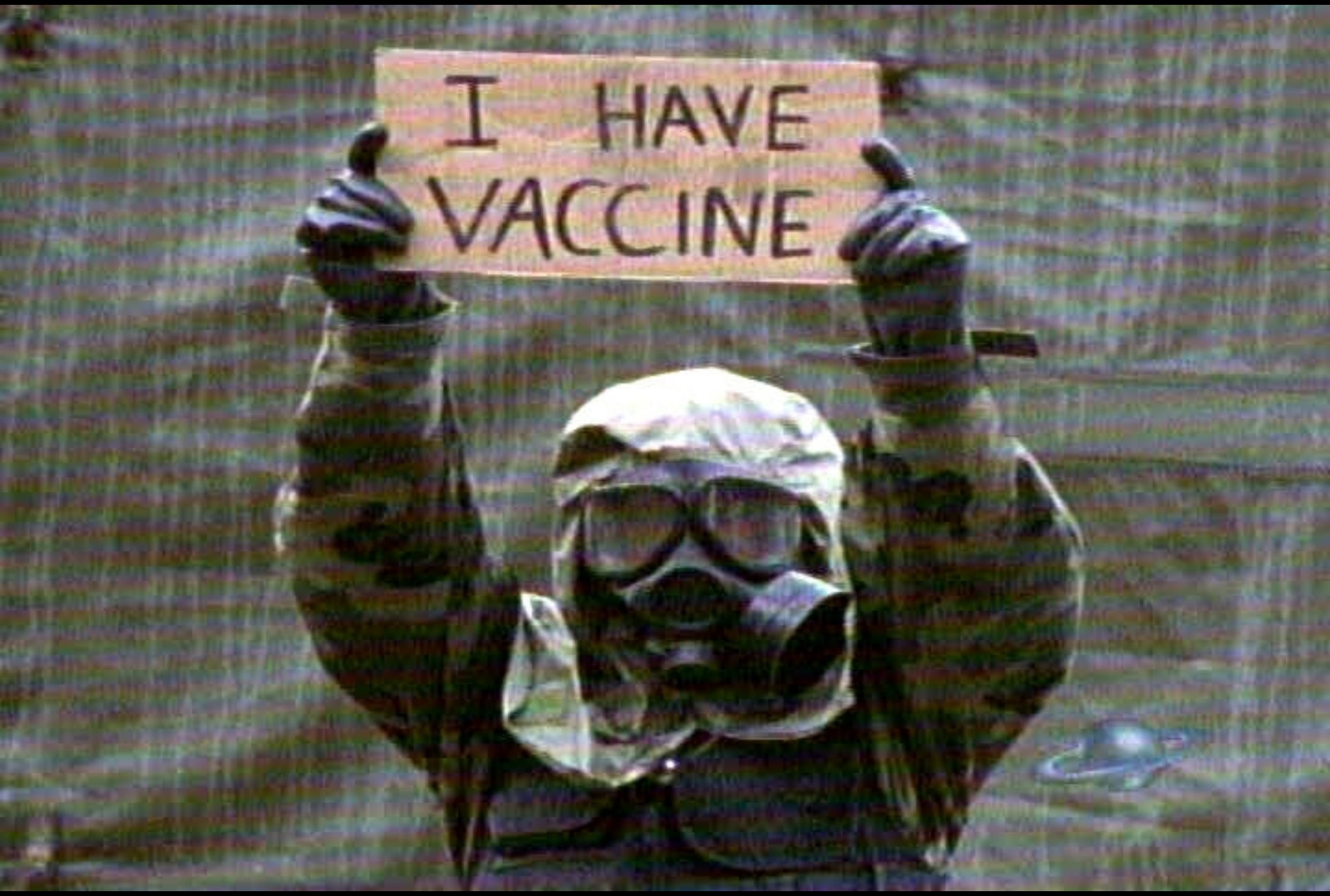
Why Princeton was spared

The University lost no one in the deadly 1918 flu pandemic, providing lessons to consider 90 years later

By Mark F. Bernstein '83
Published in the December 17, 2008, issue

Sometime on Thursday, Sept. 5, 1918, a young man enrolled in the Navy paymaster's school on Princeton's campus reported sick with an upper respiratory infection. At the height of World War I, much of the campus had been transformed into a military camp; the paymaster's school, which trained clerical officers, was housed at the Graduate College. We do not know the young man's name — he simply is mentioned in a report — but he was diagnosed with influenza and placed in isolation.

Members of Princeton's Student Naval Training Corps march on campus. From the Princeton Bric-a-Brac published in 1919.

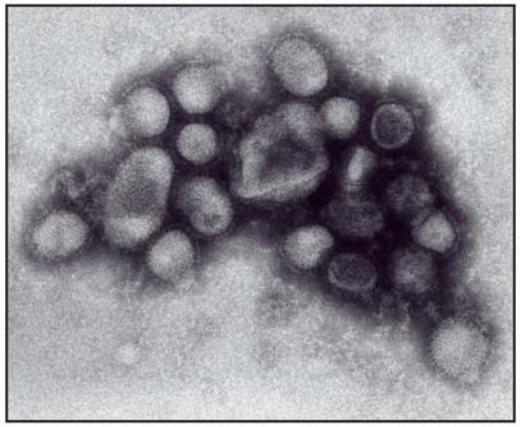

I HAVE
VACCINE

MMWR™
Morbidity and Mortality Weekly Report
www.cdc.gov/mmwr

Early Release August 21, 2009 / Vol. 58

Use of Influenza A (H1N1) 2009 Monovalent Vaccine

Recommendations of the Advisory Committee on Immunization Practices (ACIP), 2009



DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION

Vaccine purchase, allocation, and distribution

- Vaccine procured and purchased by US government
- Vaccine will be allocated across states proportional to population
- Vaccine will be sent to state-designated receiving sites: mix of local health departments and private settings

Vaccine planning assumptions:

- Vaccine available starting mid-October
- Initial amount: 40, 80, or 160 million doses over one month period
- Subsequent weekly production: 10, 20 or 30 million doses
- 2 doses required
- Preservative free single dose syringes for young children and pregnant women

Vaccine planning assumptions:

Populations to plan for:

Students and staff (all ages) associated with schools (K-12) and children (age >6 m) and staff (all ages) in child care centers

- Pregnant women, children 6m-4yrs, new parents and household contacts of children <6 months of age
- Non-elderly adults (age <65) with medical conditions that increase risk of influenza
- Health care workers and emergency services personnel

Delivery model

Public health-coordinated effort that blends vaccination in public health-organized clinics and in the private sector (provider offices, workplaces, retail settings)

Private sector providers who wish to administer H1N1 vaccine will need to enter into an agreement with public health in order to receive vaccine

Public Health planning efforts

- Reaching out to private providers (defined broadly) to assess interest in providing H1N1 vaccine
- Retail sector, pharmacists may be involved
- Planning large scale clinics
  - Especially important for school-age children given limited private sector capacity

Issues for administration in provider offices

- Storage capacity
- Administering according to recommended age groups
- Reporting doses administered early on
- Insurance reimbursement for administration

Monitoring vaccine coverage

- Initially, states will be required to report doses administered on a weekly basis
- Transition to assessment via population surveys (BRFSS, NIS)

Monitoring vaccine safety

- Vaccine Adverse Event Reporting System (1-800-822-7967, http://vaers.hhs.gov/contact.htm) for signal detection
- Network of managed care organizations representing approximately 3% of the U.S. population, the Vaccine Safety Datalink (VSD) to test signals.
- Active surveillance for Guillain Barre Syndrome through states participating in Emerging Infections Program.

nature

www.nature.com/nature

Vol 459 | Issue no. 7243 | 7 May 2009

Between a virus and a hard place

Complacency, not overreaction, is the greatest danger posed by the flu pandemic. That's a message scientists would do well to help get across.

Damned if you do, damned if you don't. The emergence of a new, swine-flu-related H1N1 strain of influenza in people in North America, with sporadic cases elsewhere in the world, has left the US Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia, and the World Health Organization (WHO) in Geneva in an unenviable position.

For more than a week now, these two agencies have been holding daily media briefings to keep the world informed about the rapidly unfolding story. There is ample reason for concern: a new flu virus has emerged to which humans have no immunity, and it is spreading from person to person. That has happened only three times in the past century. The pandemics of 1957 and 1968 were mild in most of falsely reassuring officialese that has too often accompanied past crises. As Peter Sandman, a risk-communication consultant based in Princeton, New Jersey, aptly puts it: "Anyone who's paying attention gets it that we just don't know if this thing is going to fizzle, hang in abeyance for months, disappear and then reappear, spread but stay mild, replicate or exceed the 1918 catastrophe, or what. The reiteration of uncertainty and the insistence on what that means — e.g., advice may change; local strategies may differ; inconsistencies may be common — has been almost unprecedentedly good."

"The risk is not hyping the pandemic threat, but underplaying it."