

# **Pandemic (2009) H1N1 Influenza Update**

**David Kirschke, MD**

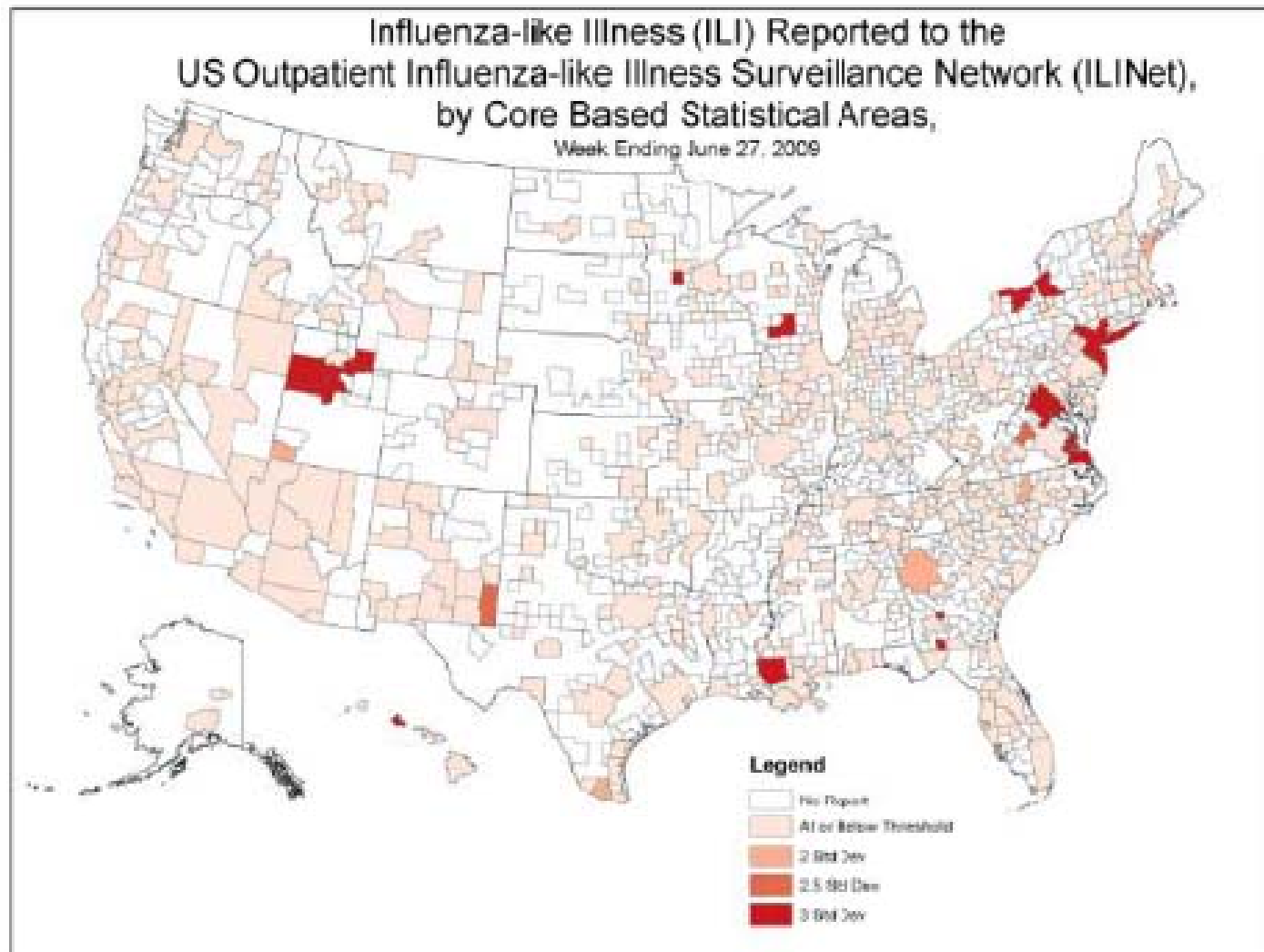
**Deputy State Epidemiologist**

**Tennessee Department of Health**

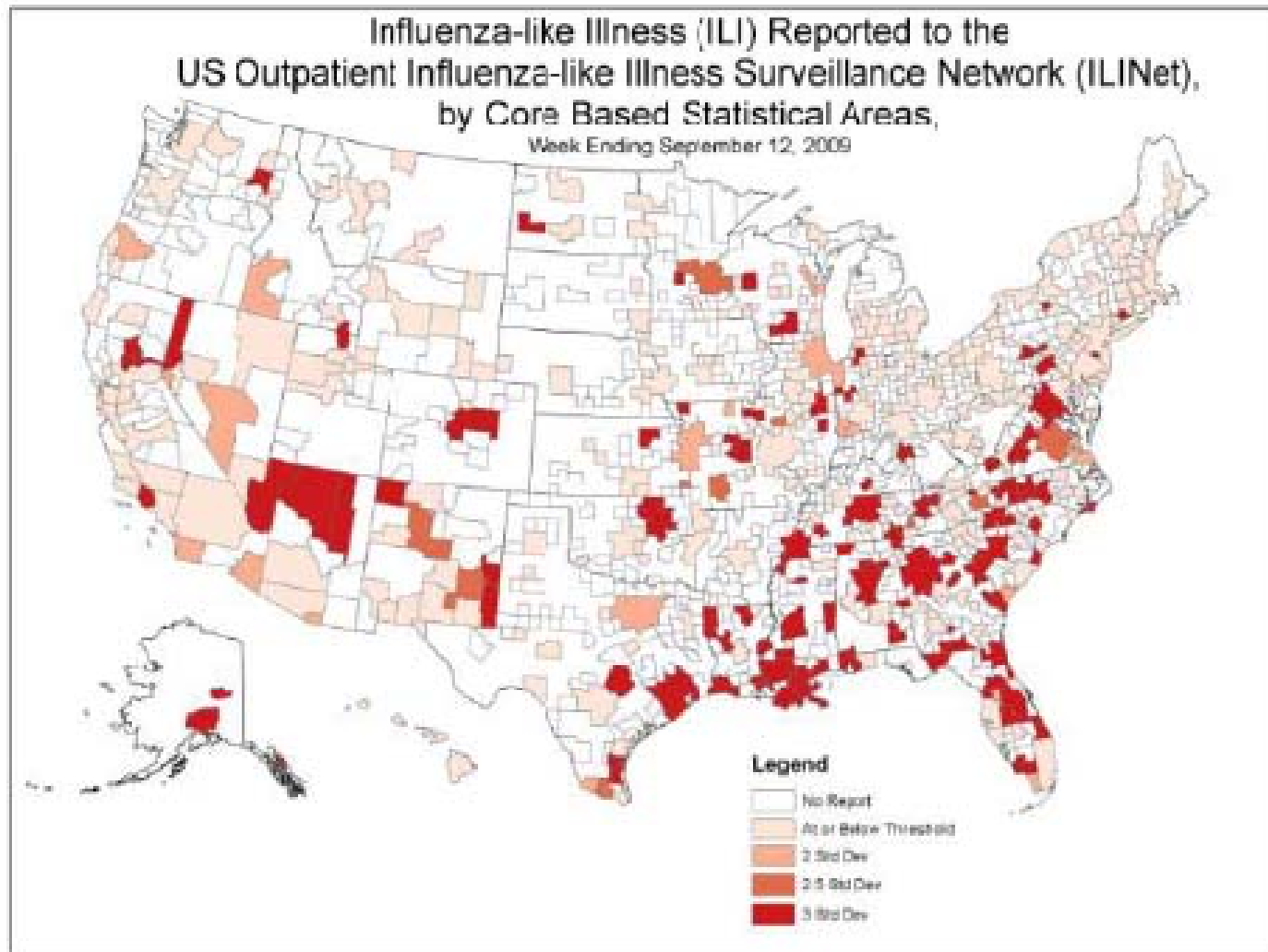
# **A funny thing happened while we were waiting for the bird flu pandemic...**

- On April 21, 2009, CDC reported that two recent cases of febrile respiratory illness in children in southern California had been caused by infection with genetically similar swine influenza A (H1N1) viruses. The viruses contained a unique combination of gene segments that had not been reported previously among swine or human influenza viruses in the United States or elsewhere.**

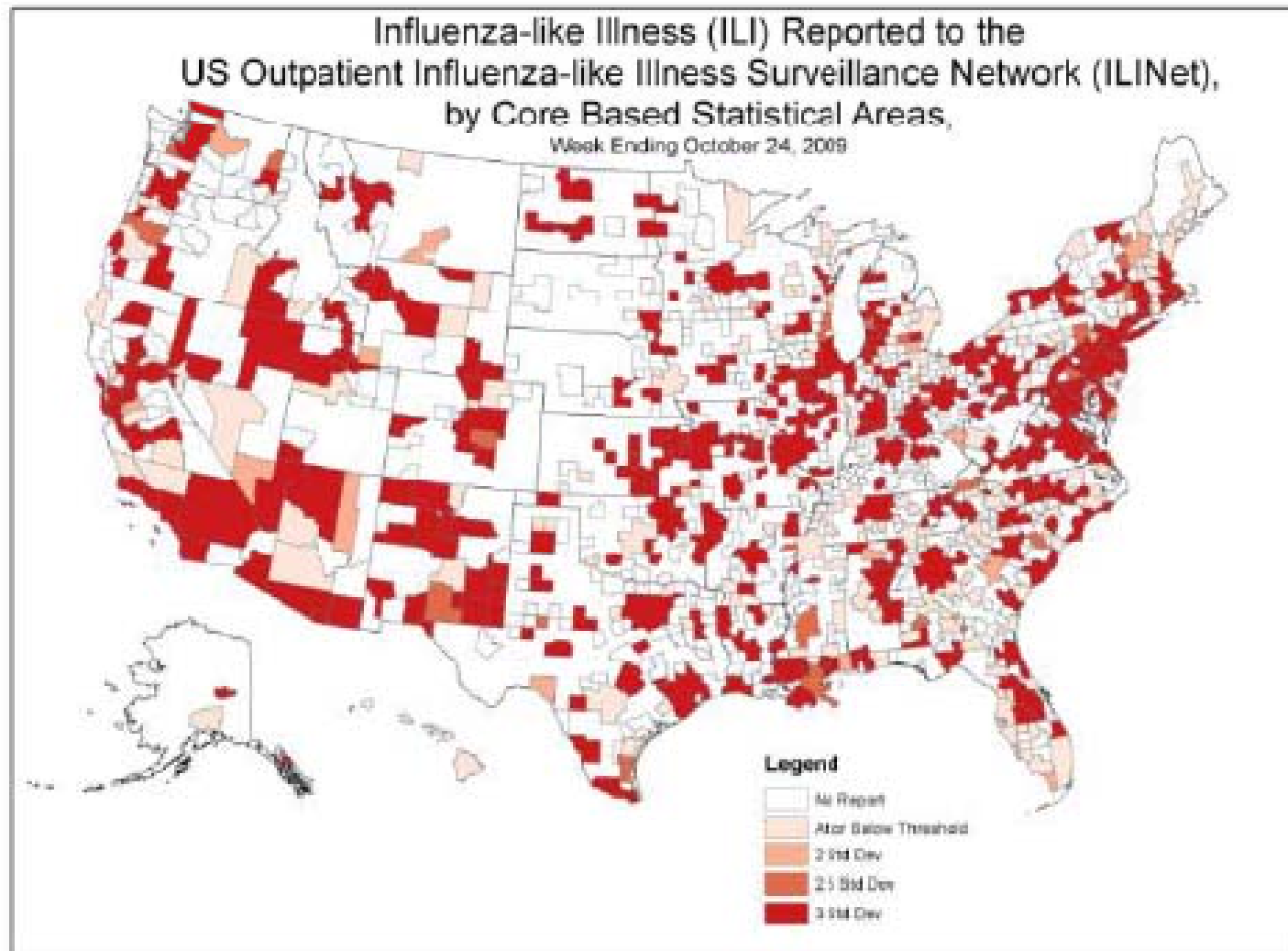
# Peak of the Spring/Summer pH1N1 Wave



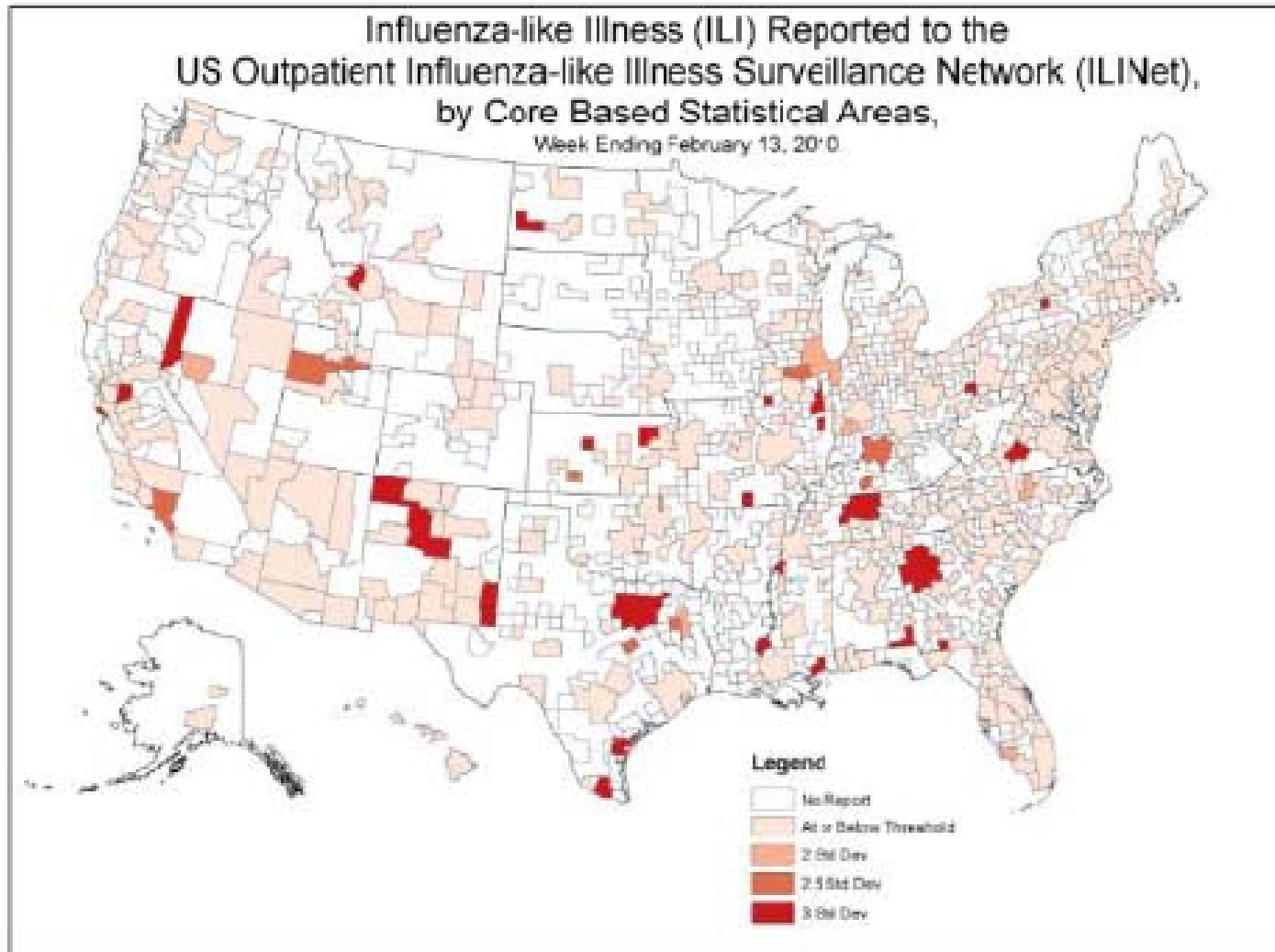
# Start of the Fall pH1N1 Wave



# Peak of the Fall pH1N1 Wave (ACIP October 2009)



# Low Level of ILI -- ACIP February 2010



# **Estimated Number of Pandemic H1N1 Case in US in 2009**

- **About 55 million (39 - 80 million) cases**
  - 18% (13-26%) of population
- **About 246,000 (173,000 - 362,000) 2009  
H1N1-related hospitalizations**
- **About 11,160 (7,880 - 16,460) 2009  
H1N1-related deaths**

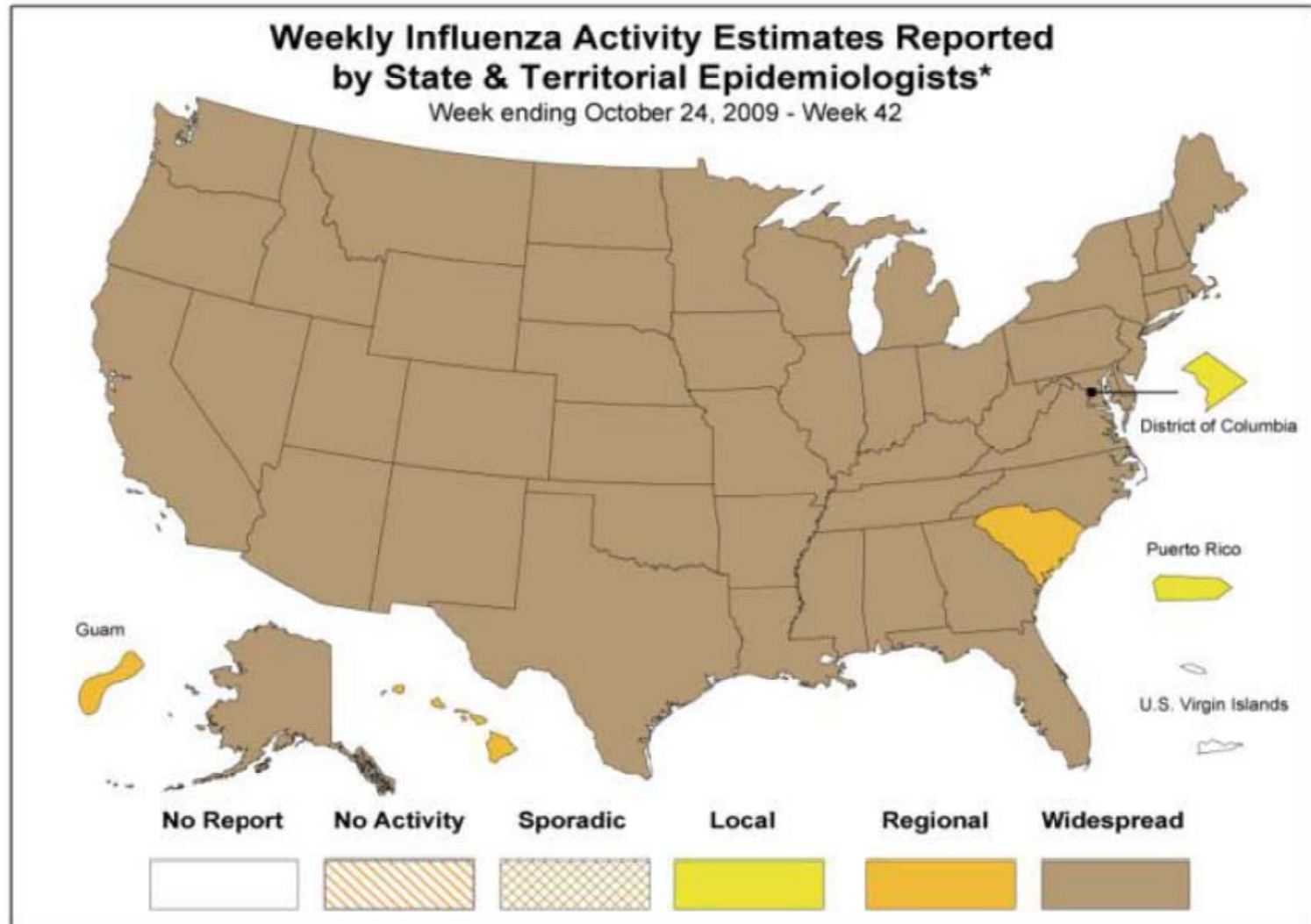
# Tennessee

- **57 lab-confirmed deaths**
  - 44 adults / 13 children
- **737 pneumonia and flu deaths**
- **Distributed 3 million doses of H1N1 vaccine**

# How severe was it?

- **Influenza-like illness rates reached record high in October 2009**

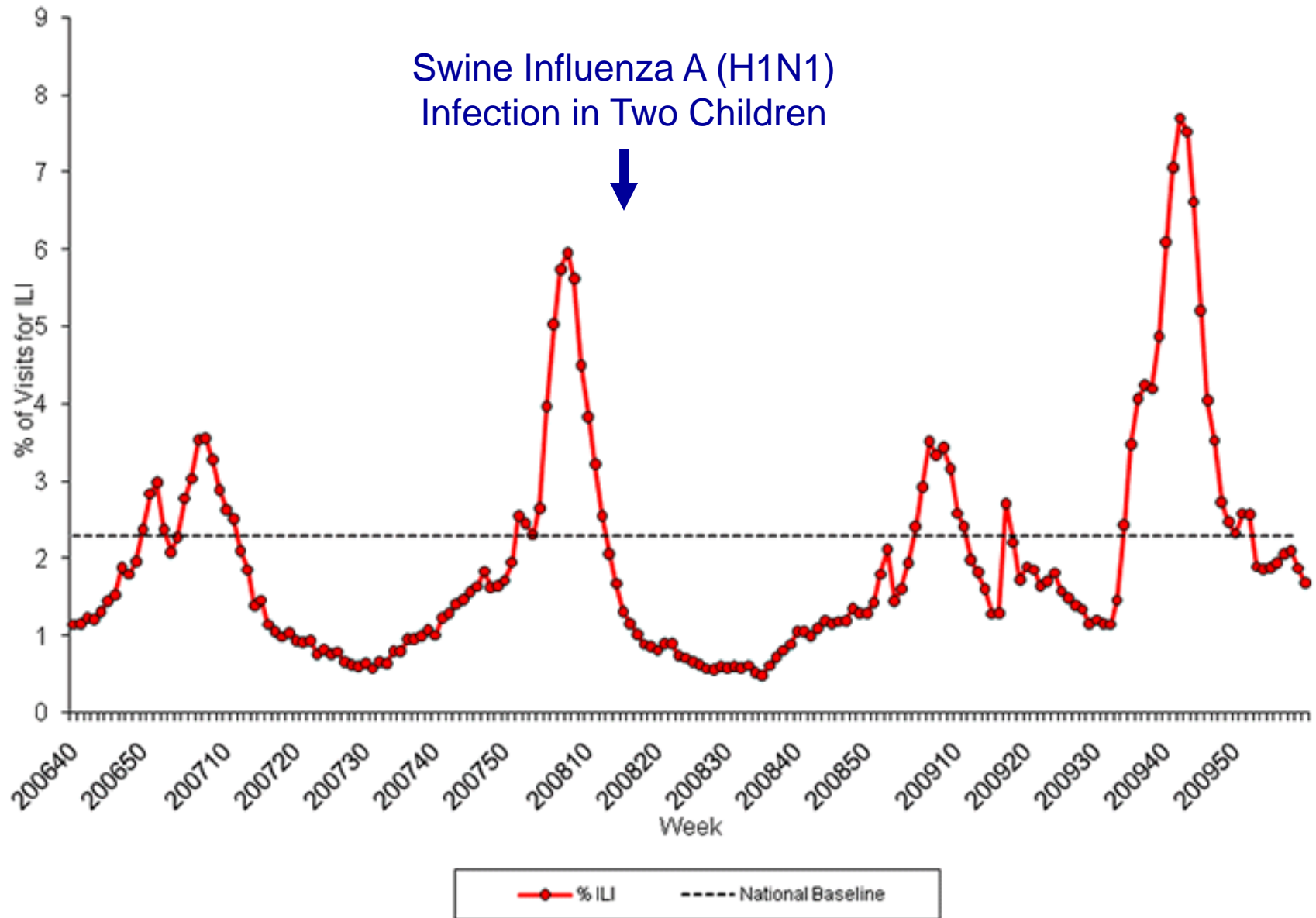
# ACIP October 2009



\* This map indicates geographic spread & does not measure the severity of influenza activity



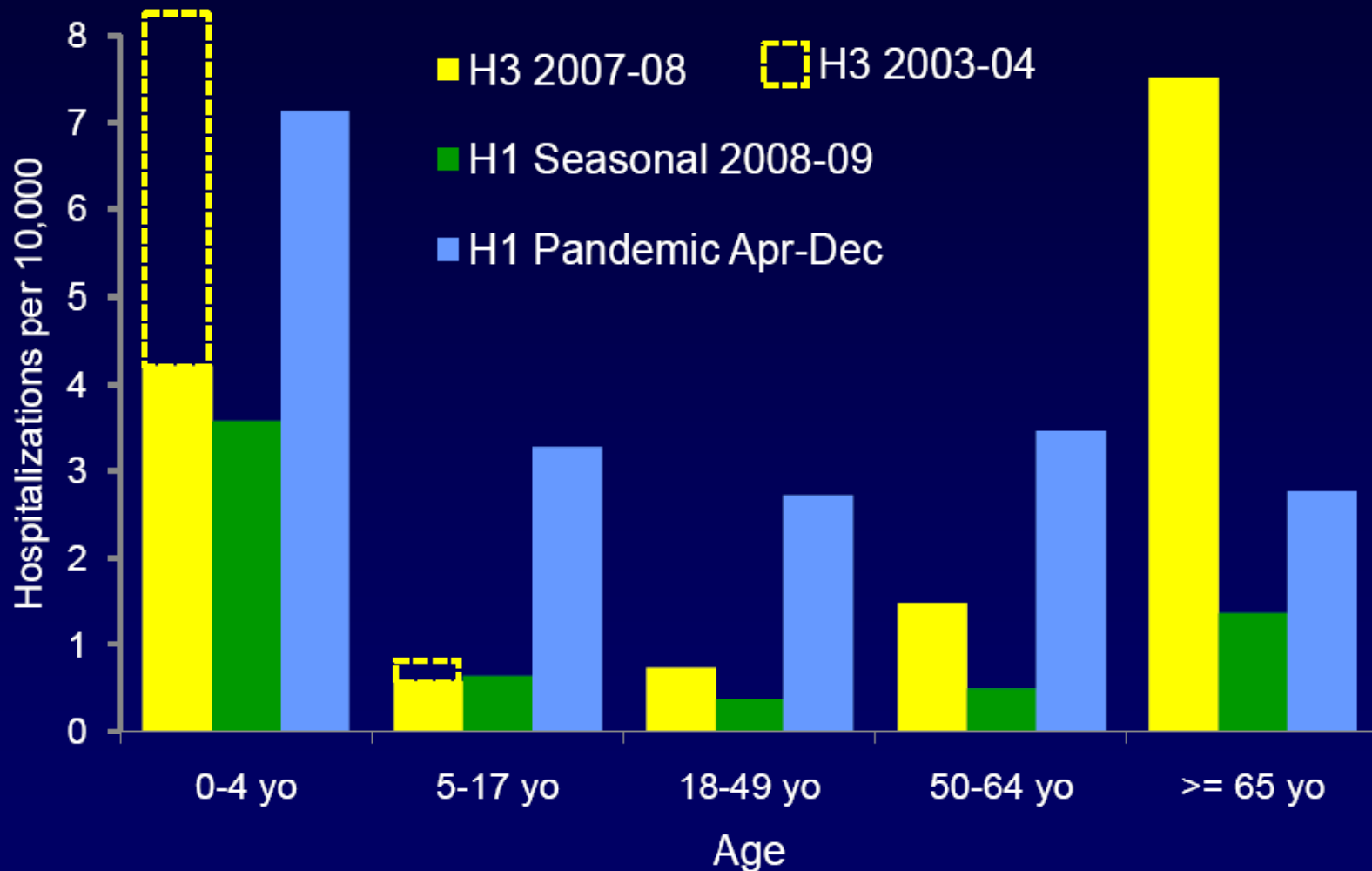
# Percent of Patients with Influenza-like Illness



# How severe was it?

- **Influenza-like illness rates reached record high in October 2009**
- **Excess hospitalizations in persons aged 5-64**

# Hospitalizations for H3, Seasonal H1, and Pandemic H1 Emerging Infections Program



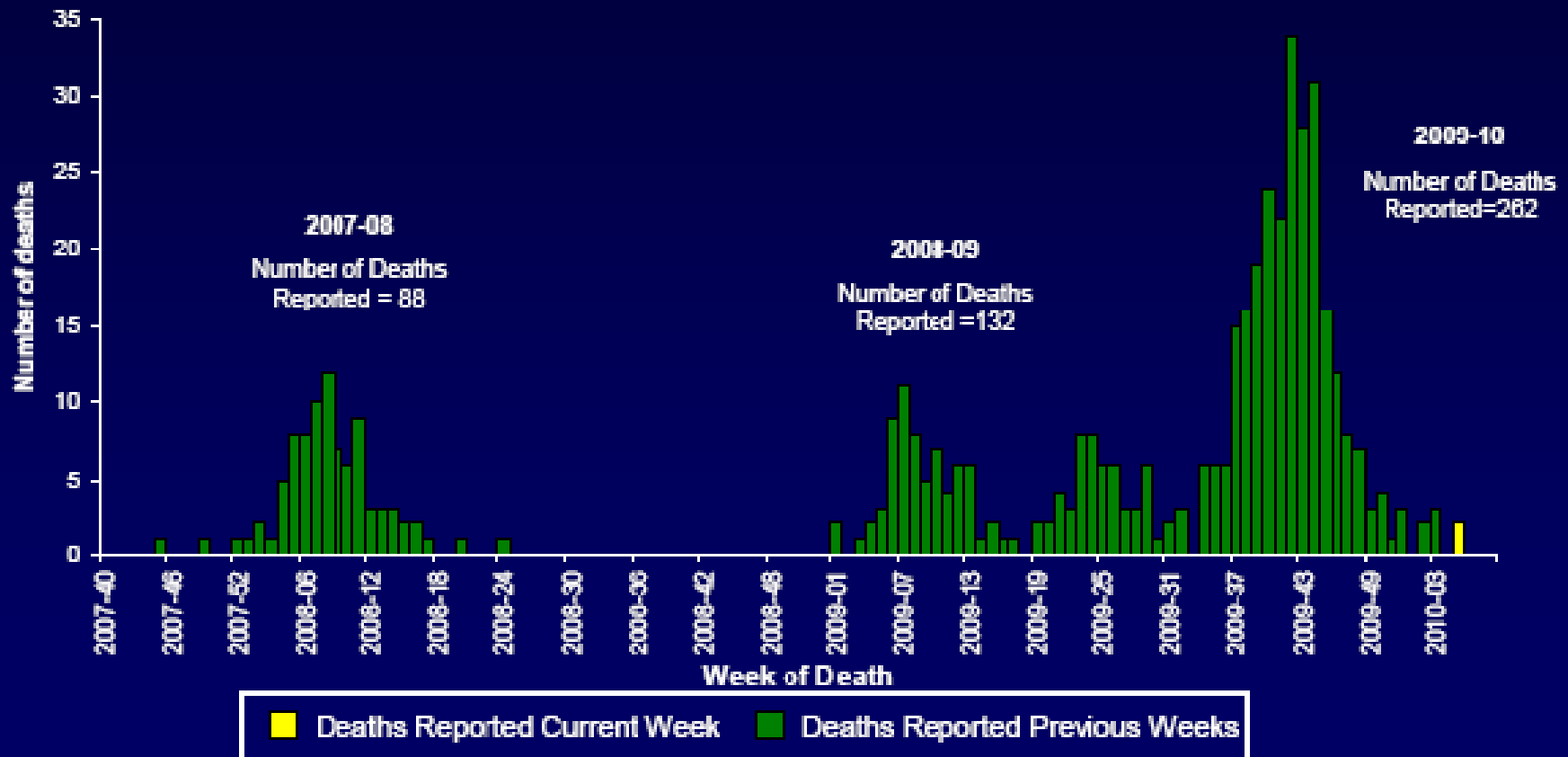
# How severe was it?

- **Influenza-like illness rates reached record high in October 2009**
- **Excess hospitalizations in persons aged 5-64**
- **Influenza-associated pediatric deaths reports doubled**

# Epidemiology/Surveillance

## Number of Influenza-Associated Pediatric Deaths by Week of Death: 2007-08 season to present

Date	2009 H1N1	Influenza A – Unknown Subtype	Seasonal Flu	Total
# Deaths Since August 30, 2009	217	44	1	262
# Deaths Since April 26, 2009	277	47	2	326



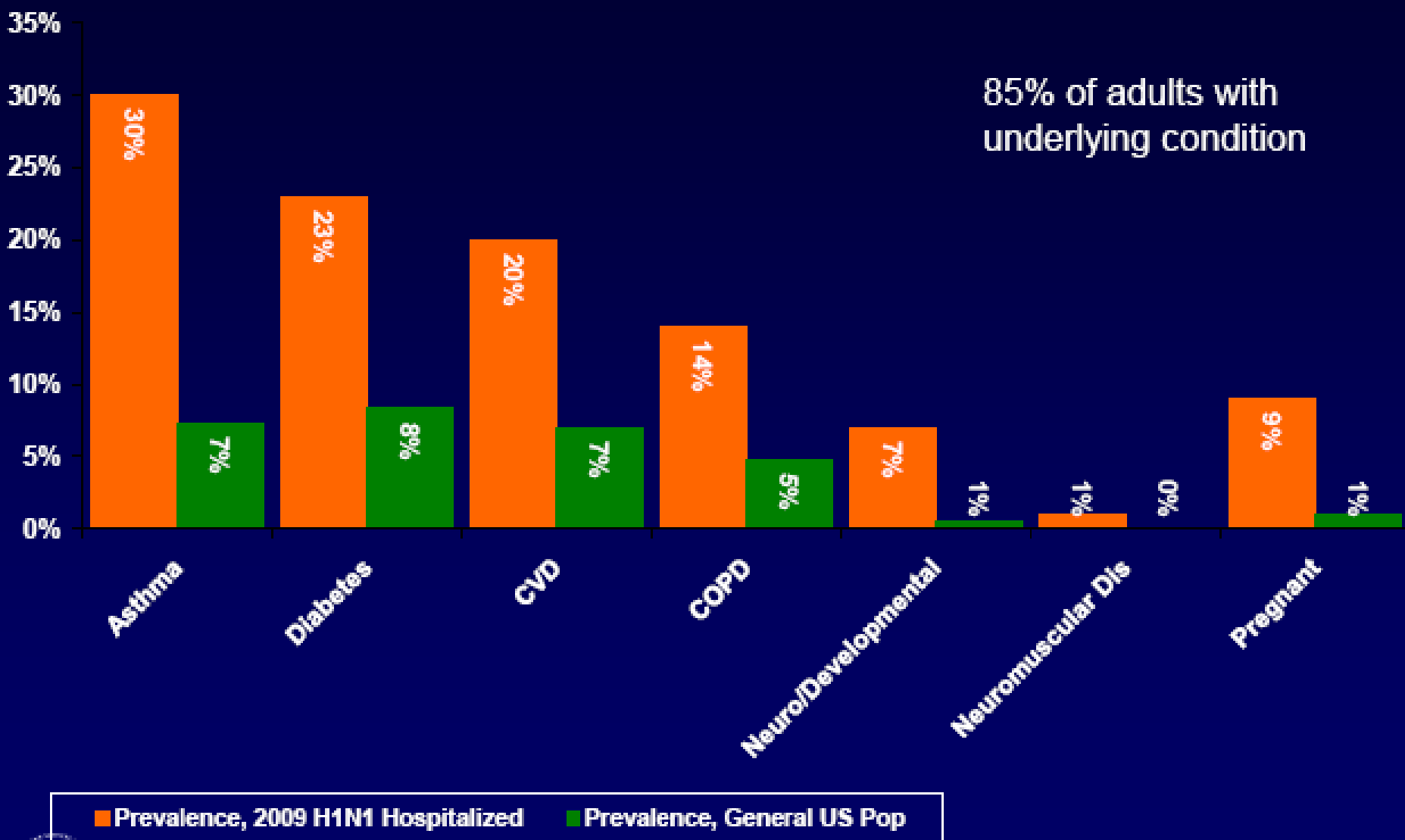
# How severe was it?

- **Influenza-like illness rates reached record high in October 2009**
- **Excess hospitalizations in persons aged 5-64**
- **Influenza-associated pediatric deaths reports doubled**
- **Pregnant women at high risk of complications**

# 2009 H1N1 Hospitalizations

## Frequency of Underlying Conditions in Adults

EIP April 15, 2009 – February 16, 2010 (n=4,987)



# The Public Health Response

Science



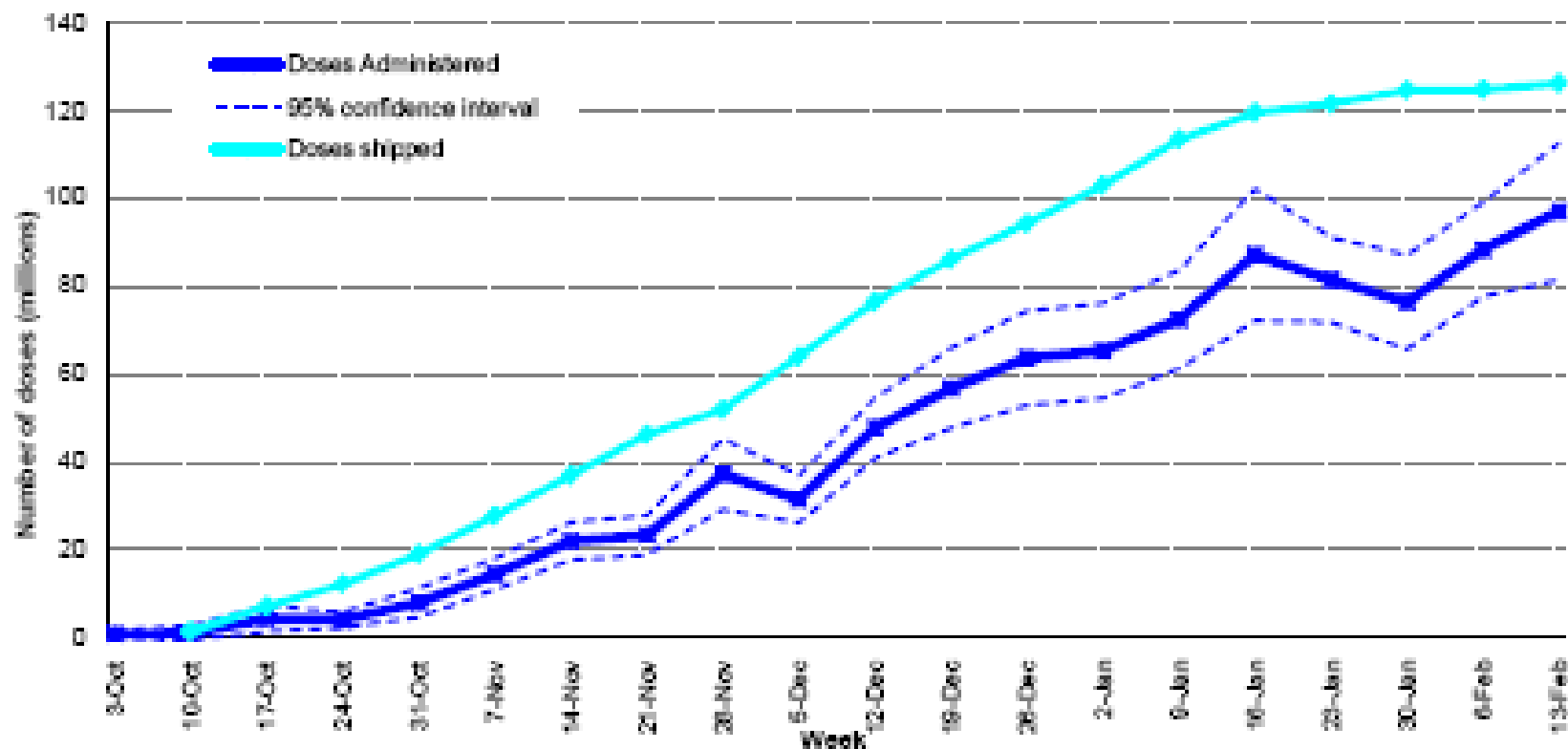
## Virus of the Year: The Novel H1N1 Influenza

- “Scientists characterized the new virus and distributed tests to detect it at record speed, sharing findings nearly in real time.”

- SCIENCE VOL 326 18 DECEMBER 2009

# Estimated Cumulative Numbers of H1N1 Doses Administered (NHFS) and Shipped, October - February

Figure 1. Estimated cumulative doses of Influenza A (H1N1) 2009 monovalent vaccine administered among persons aged  $\geq 6$  months through February 13, 2009 -- United States, National H1N1 Flu Survey (NHFS)



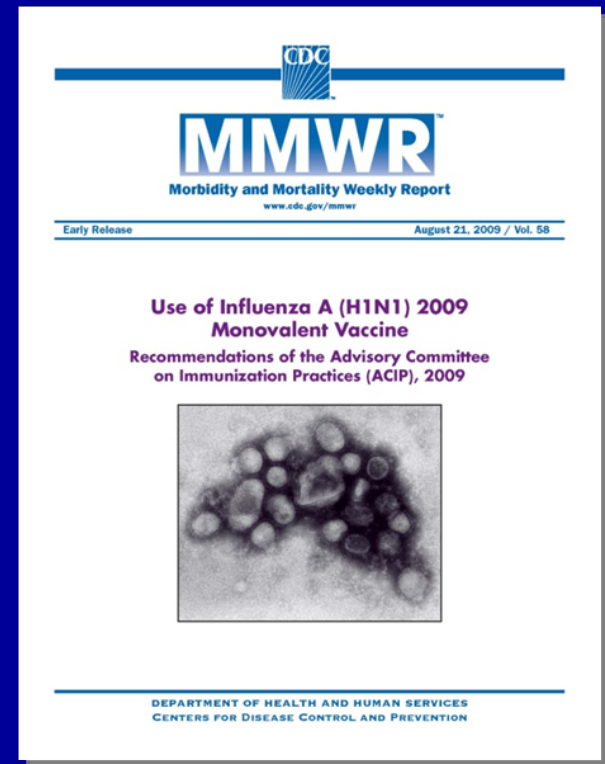
By February 13, an estimated cumulative total of 97 million H1N1 doses (95% CI 81 to 112) had been administered to 86 million persons (95% CI 75 to 97).



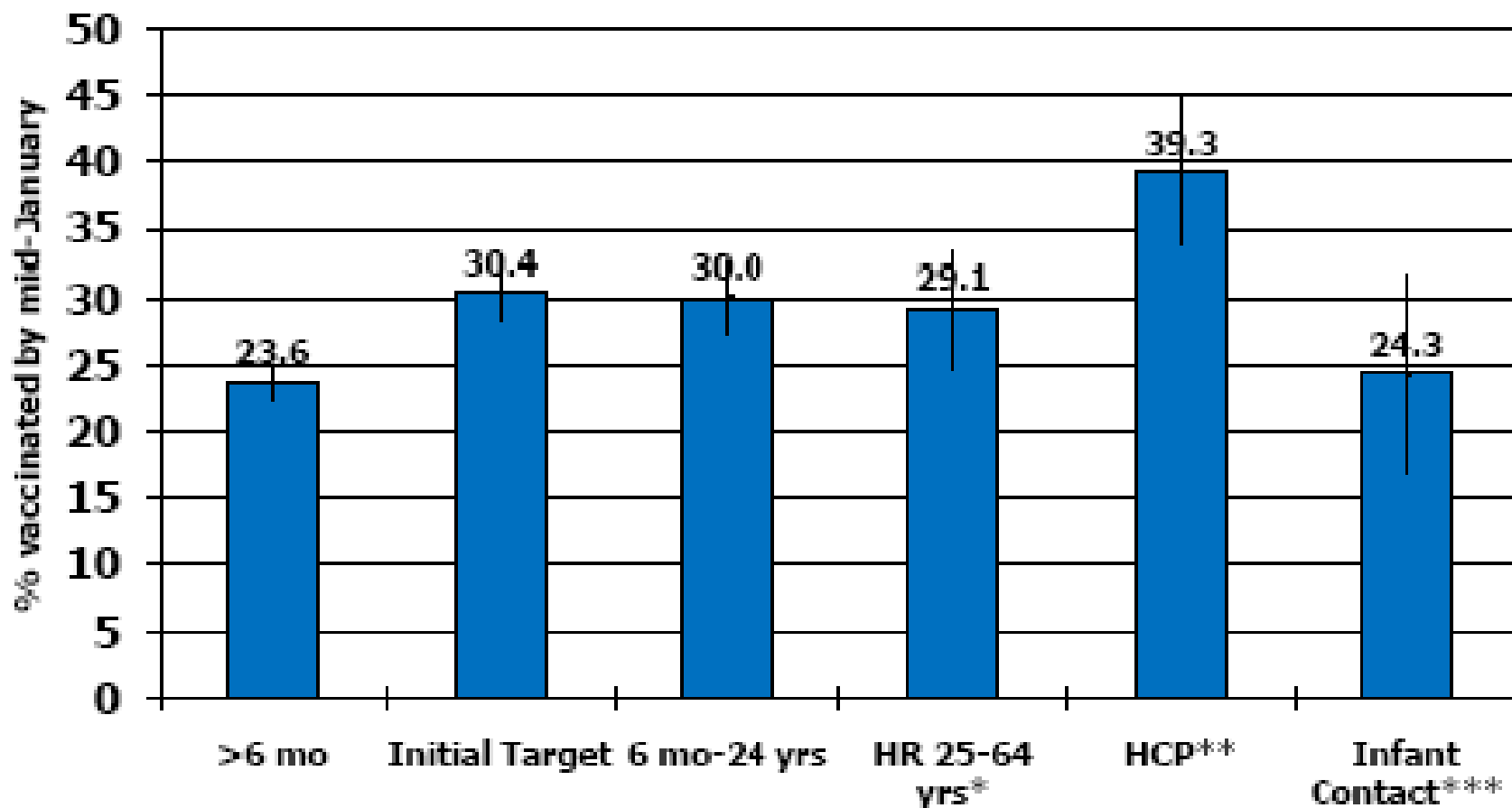
# ACIP Recommendations

July 29, 2009

- Health care providers and EMS
- Pregnant women
- People who live with/care for infants < 6 months
- All persons 6 months through 24 years
- All persons 25-64 with other medical risk factors



# H1N1 Vaccination Coverage by mid-January, NHFS, December 27 – January 30 Initial Target Groups



\*High risk conditions include current asthma, other lung condition, heart condition, diabetes, kidney condition, sickle cell or other anemia, neurologic or neuromuscular condition, liver condition, or a weakened immune system caused by a chronic illness or related medicines.

\*\* Persons reporting they work in a healthcare facility or provide direct patient care as part of routine work.

\*\*\* Persons with regular close contact with a child aged <6 months and not a HCP

Initial target group sample size: 16,135 children and adults, including 43 pregnant women



# Vaccine Coverage\*

- **Tennessee 18.3%**
  - Adults 14.2%
  - Children 30.6%
  - HCP 35.8%
- **National 13.6%**
  - Adults 9.2%
  - Children 27.6%
  - HCP 22.3%

**\*Results from the National 2009 H1N1 Flu Survey (NHFS) and the Behavioral Risk Factor Surveillance System (BRFSS) survey**

Centers for Disease Control and Prevention

**MMWR**

Morbidity and Mortality Weekly Report

Early Release / Vol. 59

January 15, 2010

## Interim Results: Influenza A (H1N1) 2009 Monovalent Vaccination Coverage – United States, October–December 2009

In July 2009, the Advisory Committee on Immunization Practices (ACIP) issued recommendations for use of the influenza A (H1N1) 2009 monovalent vaccine. (1) Recognizing that the vaccine supply would not be ample immediately but would grow over time, ACIP identified 1) initial target groups, consisting of approximately 160 million persons, and 2) a limited vaccine subset of the target groups, initially estimated at 42 million persons (and more recently estimated at 62 million persons), to receive first priority while the 2009 H1N1 vaccine supply was limited. (1) ACIP recommended expanding vaccination to the rest of the population as vaccine supplies increased. To estimate 2009 H1N1 vaccination coverage to date for the 2009–10 influenza season, CDC analyzed results from the National 2009 H1N1 Flu Survey (NHFS) and the Behavioral Risk Factor Surveillance System (BRFSS) survey, conducted during December 27, 2009–January 2, 2010, and December 1–27, 2009, respectively. The results indicated that, as of January 2, an estimated 20.3% of the U.S. population (61 million persons) had been vaccinated, including 27.9% of persons in the initial target groups and 37.5% of those in the limited vaccine subset. An estimated 29.4% of U.S. children aged 6 months–18 years had been vaccinated. Now that an ample supply of 2009 H1N1 vaccine is available, efforts should continue to increase vaccination coverage among persons in the initial target groups and to offer vaccination to the rest of the U.S. population, including those aged ≥65 years (2).

To provide both timely estimates of 2009 H1N1 vaccination coverage and reliable estimates of coverage in priority populations (e.g., the initial target groups and the limited vaccine subset\*),

\*Initial target groups include pregnant women, persons who live with or provide care for infants aged <6 months, health-care and emergency medical services personnel, children and young adults aged 6 months–24 years, and persons aged 75–84 years who have medical conditions that put them at higher risk for influenza-related complications. The limited vaccine subset includes pregnant women, persons who live with or provide care for infants aged <6 months, health-care and emergency medical services personnel who have direct contact with patients or infectious material, children aged 6 months–4 years, and children aged 75–84 years who have medical conditions that put them at higher risk for influenza-related complications.

CDC used two separate surveys, NHFS and BRFSS. NHFS is a new survey, scheduled to operate from October 2009 through June 2010 to track 2009 H1N1 and seasonal influenza vaccination coverage nationally on a weekly basis. NHFS is a random-digit-dialed telephone survey based on a rolling weekly sample of respondents with landline and cellular telephones. Monthly targets were set to achieve approximately 4,889 completed interviews from landline households and 1,111 from cellular-only or cellular-only households, or approximately 6,000 interviews in all. To determine influenza vaccination status, respondents were asked whether they (or their child) had received "an H1N1 flu vaccination" since September, and if so, in which month.† The NHFS estimates presented in this report show the percentage of respondents interviewed during the week of December 27, 2009–January 2, 2010, who reported receiving vaccine from October 1, 2009 to the date of interview. Unvaccinated NHFS respondents also were asked: "How likely are you to get an H1N1 flu vaccination between now and June 2010?"

Because the weekly sample sizes from NHFS are not large enough for reliable estimation of vaccination coverage among persons in individual initial target groups, CDC also used BRFSS, which collected vaccination coverage data for most of the initial target groups on a monthly basis. BRFSS conducts state-based, random-digit-dialed telephone surveys of the noninstitutionalized U.S. population aged ≥18 years to determine the prevalence of health conditions and health risk behaviors. Since 2001, BRFSS has included questions on seasonal influenza vaccination in its core survey. To determine 2009 H1N1 vaccination coverage, BRFSS respondents in

†Respondents were asked: "Since September 2009, have you had an H1N1 flu vaccination? There are two types of H1N1 flu vaccinations. One is a shot and the other is a spray, mist or drop in the nose. How many H1N1 vaccinations does your household have? During what month did you receive (you/your first/your child's) vaccine? Was this a shot or the spray in the nose? During what month did you receive your second H1N1 flu vaccine? Was this a shot or the spray in the nose?"

The landline sample was augmented with a sample of children aged <18 years identified during screening for the National Immunization Survey. Additional NHFS information is available at [http://www.cdc.gov/infl/h1n1\\_surveys/index.htm](http://www.cdc.gov/infl/h1n1_surveys/index.htm) and [http://www.cdc.gov/mmwr/data/h1n1\\_flu\\_survey.pdf](http://www.cdc.gov/mmwr/data/h1n1_flu_survey.pdf).



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
Centers for Disease Control and Prevention  
[www.cdc.gov/mmwr](http://www.cdc.gov/mmwr)



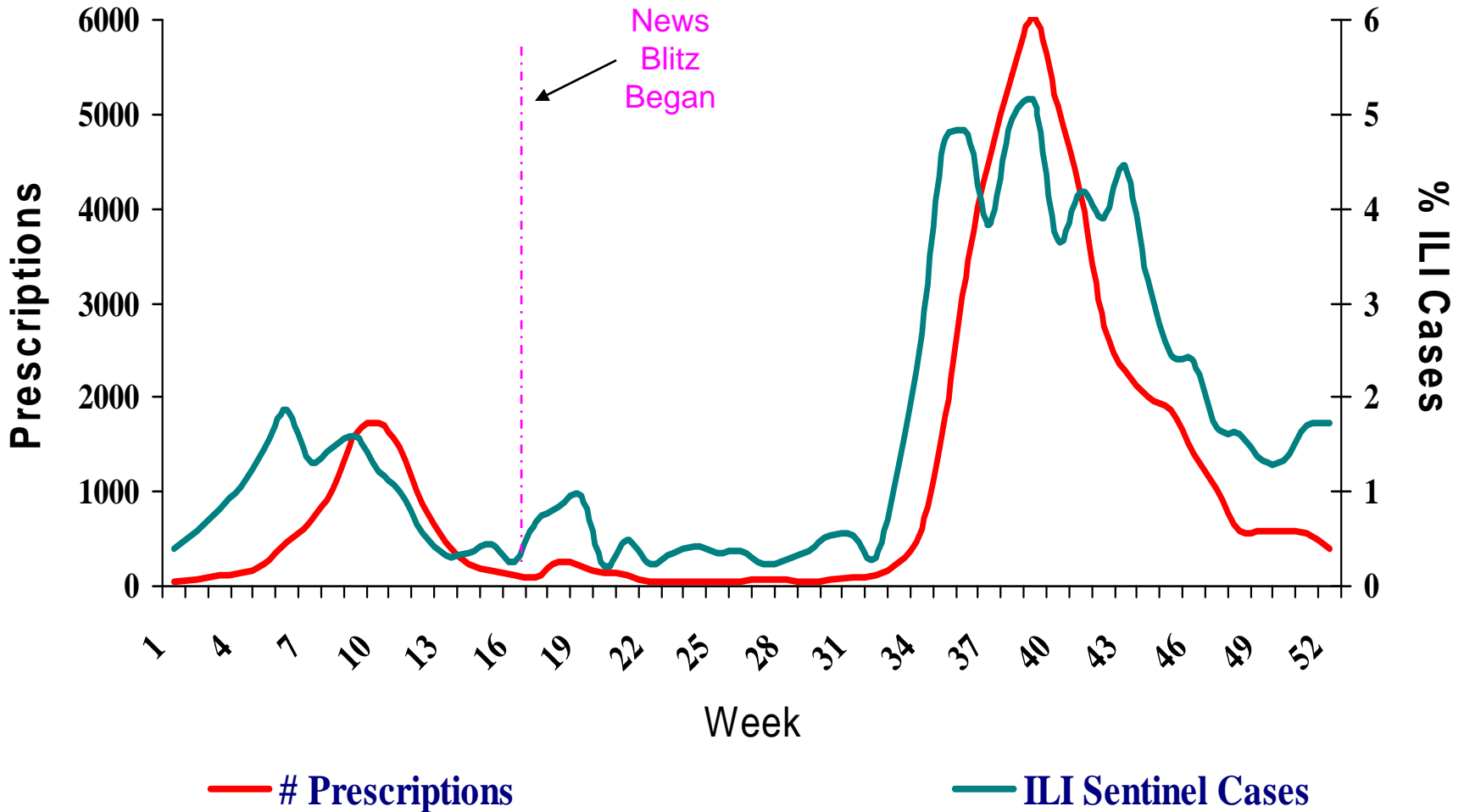
# Monitoring Vaccine Safety

- **Adverse Event Reporting**
  - Vaccine Adverse Events reporting System (VAERS) <http://vaers.hhs.gov/> (1-800-822-7967)
- **Vaccine Safety Datalink (VSD)**
  - Network of managed care organizations representing approximately 3% of the U.S. population
- **Active surveillance for Guillain Barre Syndrome through the Emerging Infections Program**



# Reported Influenza-Like Illness and TennCare Antiviral Prescription Reimbursements

Calendar Year - 2009



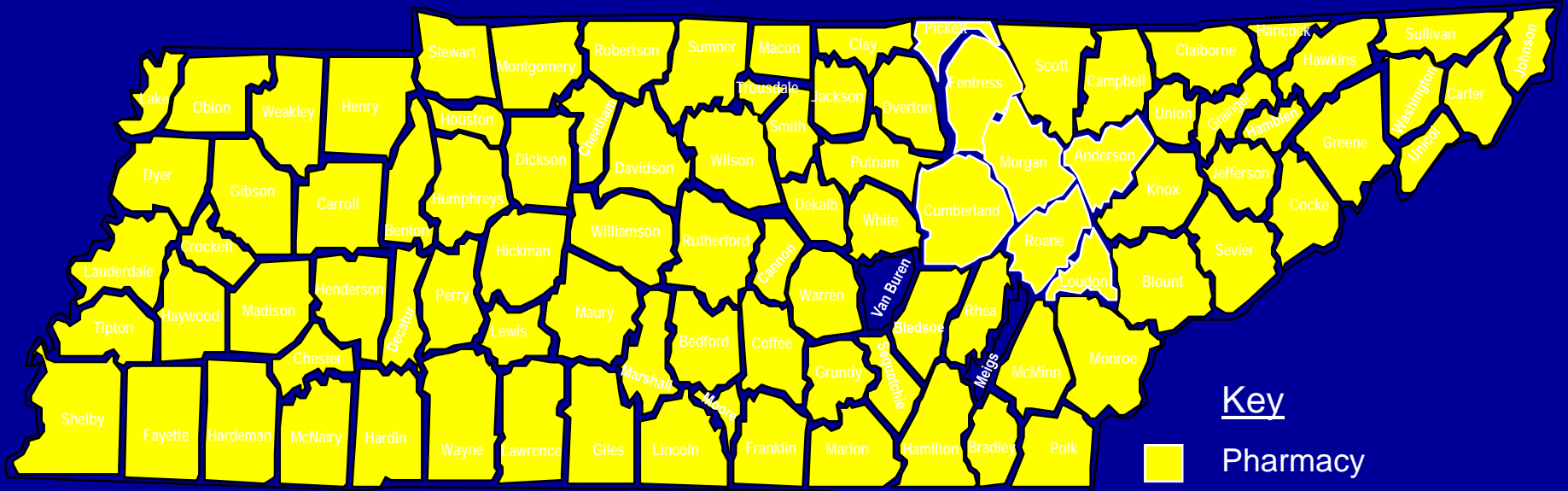
Source: TennCare Reimbursement Data and TN Sentinel Provider Network

# Powerful Rest And Fluids Industry Influencing Doctors' Treatment Of Colds



- **JANUARY 9, 2009**
- **WASHINGTON—A two-year investigation conducted in five major cities has exposed a widespread campaign by the formidable Rest and Fluids industry to infiltrate thousands of doctors' offices and dictate how they treat minor illnesses.**



# Tennessee Antiviral Distribution Network



### Key

-  Pharmacy
-  No Pharmacy

Coverage: 93 yellow counties (98%)

284 Pharmacies



# **H1N1 flu starting third outbreak in East Tennessee**

**WVLT-TV**

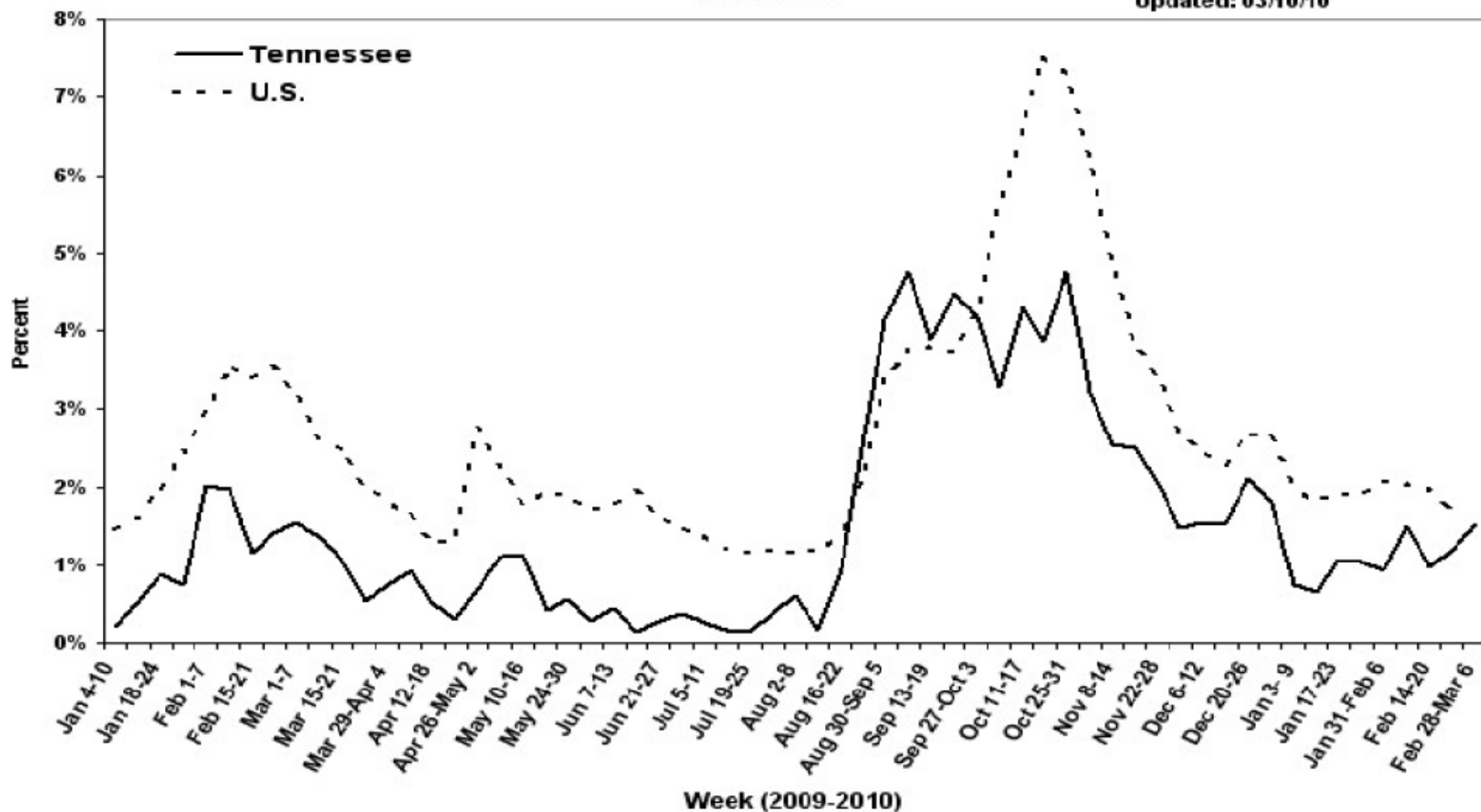
**Knoxville, TN**

- **If you haven't gotten your H1N1 flu shot, it's probably time you think about heading to the doctor's office.**



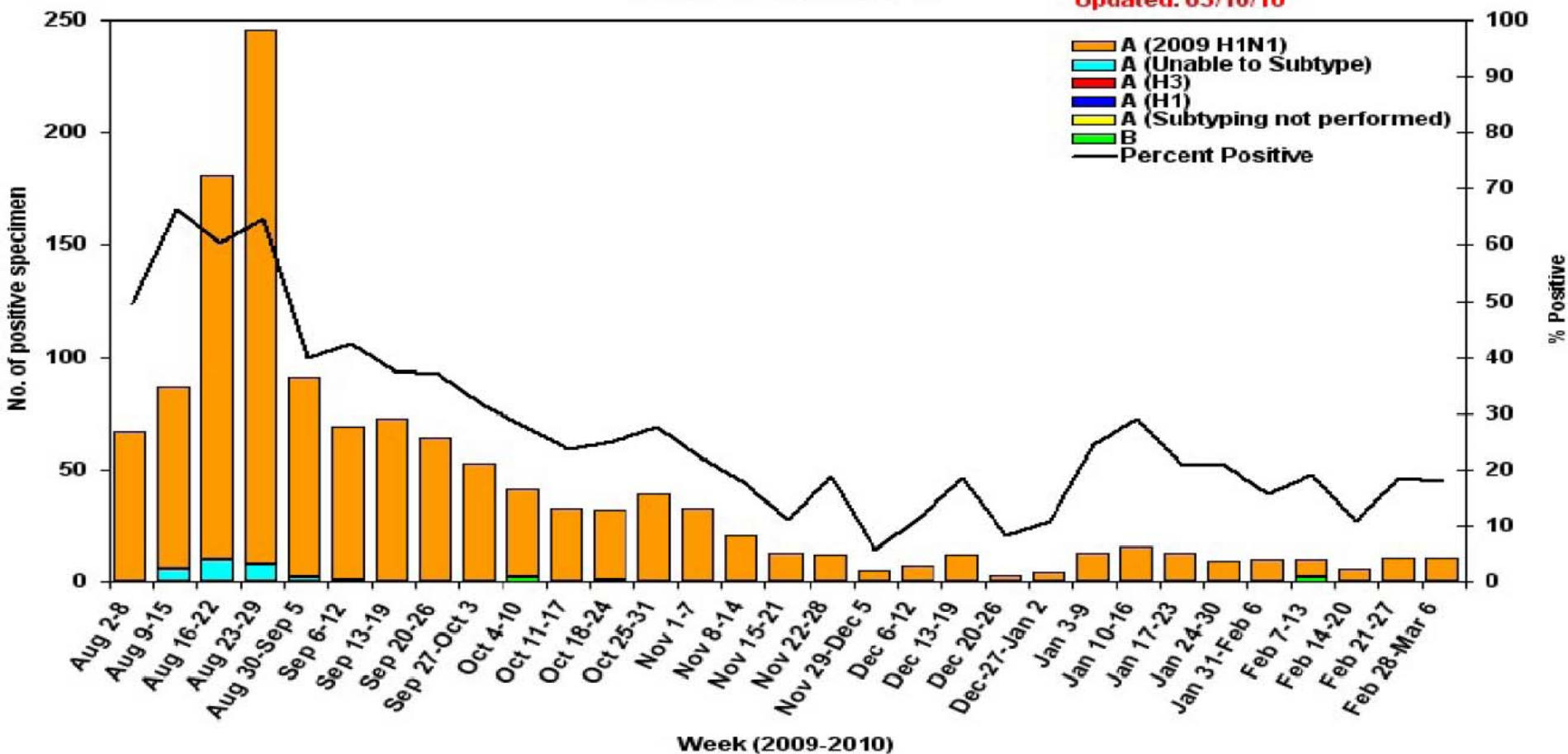
**Percentage of Outpatient Visits Reported by the U.S. and Tennessee Outpatient Influenza-like Illness Surveillance Network (ILINet) as Influenza-like Illness, 2009-2010**

Updated: 03/10/10



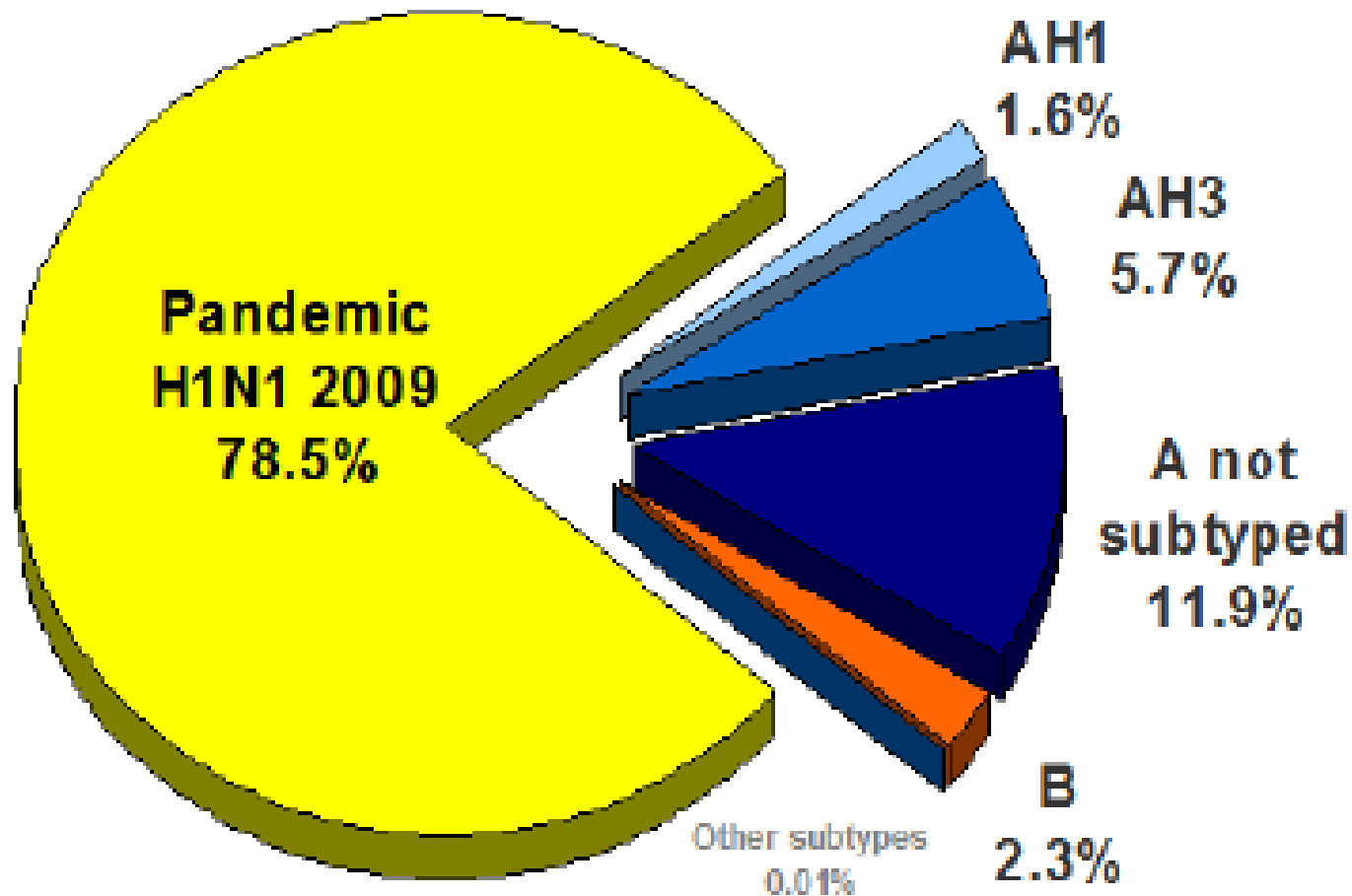
## Influenza Positive Tests Submitted to TN Dept. of Health Laboratory Services, Tennessee, 2009-10

Updated: 03/10/10



# Percentage of Influenza Viruses reported to the Global Influenza Surveillance Network by Types/Subtypes

(From 1st September 2009 to 30th January 2010)



# WHO Recommendations for the 2010-11 Northern Hemisphere Influenza Season

---

It is recommended that vaccines for use in the 2010-10 influenza season contain the following:

- an *A/California/7/2009* (H1N1)-like virus
- an *A/Perth/16/2009* (H3N2)-like virus
- a *B/Brisbane/60/2008*-like virus

**Thank you**

**David Kirschke, MD**

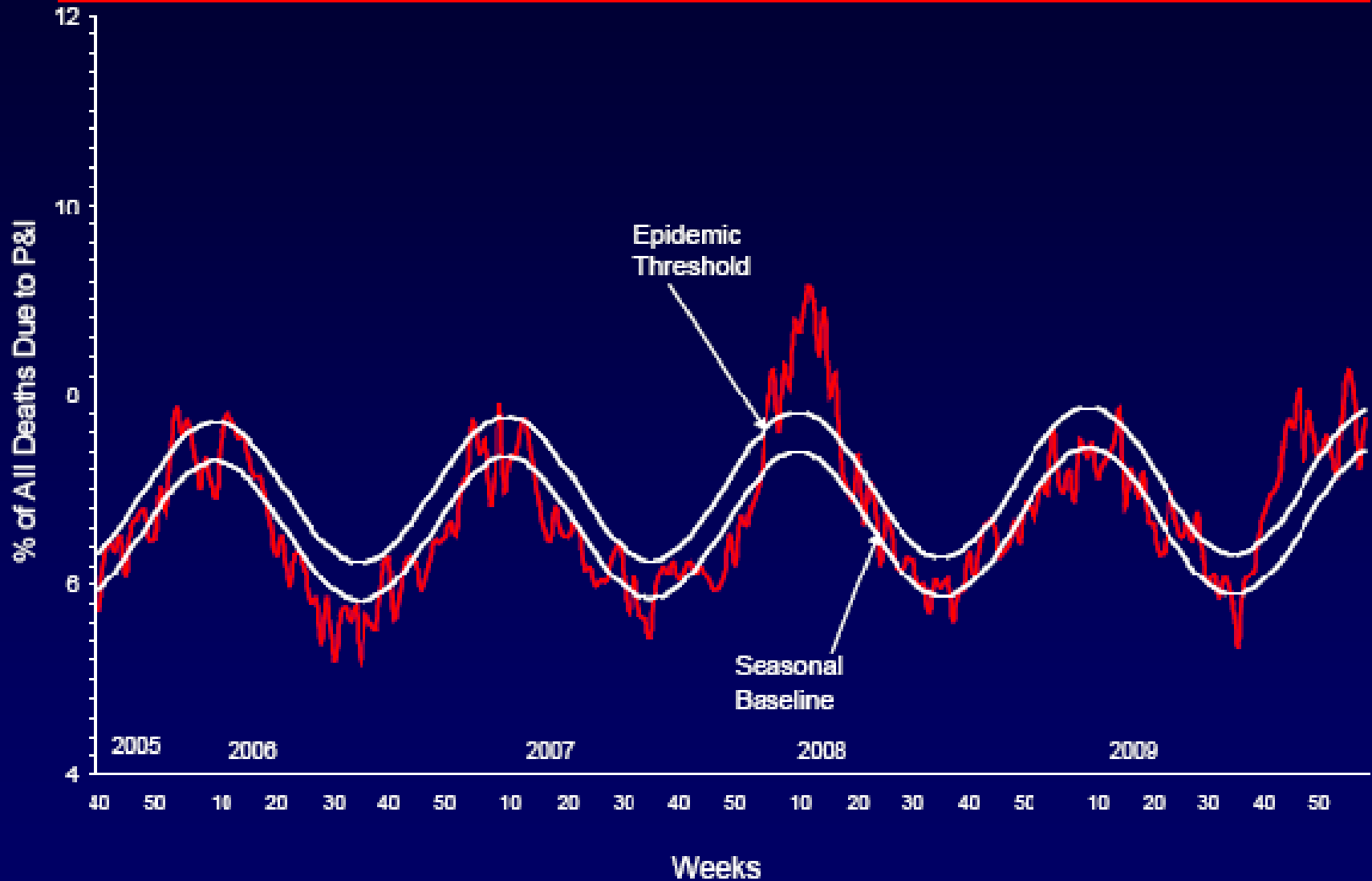
**Deputy State Epidemiologist**

**david.kirschke@tn.gov**

# Obama's Declaration Of Swine Flu Emergency Prompts Pro-Swine-Flu Republican Response

- **OCTOBER 28, 2009**
- **WASHINGTON**—Claiming that the president was preying on the public's fear of contracting a fatal disease last week when he declared the H1N1 virus a national emergency, Republican leaders announced Wednesday that they were officially endorsing the swine flu. "Thousands of Americans—hardworking ordinary Americans like you and me—already have H1N1," Republican National Committee chairman Michael Steele said during a press conference. "Now Obama wants to take that away from us. Ask yourself: Do you want the federal government making these kinds of health care decisions for you and your family?" Other prominent Republicans opposing Obama's declaration of emergency include Louisiana governor Bobby Jindal, who urged residents of his state to continue not washing their hands, and radio host Rush Limbaugh, who made a point of dying of the virus during his show on Wednesday.

***Pneumonia and Influenza Mortality for 122 U.S. Cities -Week Ending 13 FEB 2010***



# Who is at risk?

---

## Risk groups have not changed since the spring wave

- Children and adolescents still remain at the highest risk for acquisition
- Hospitalizations are highest in young children and decline with age
- Deaths increase with age but only up to 50-64 year old age group and then drop off in 65+ age group
- The majority of those who die and adults who are hospitalized have underlying conditions, including pregnancy

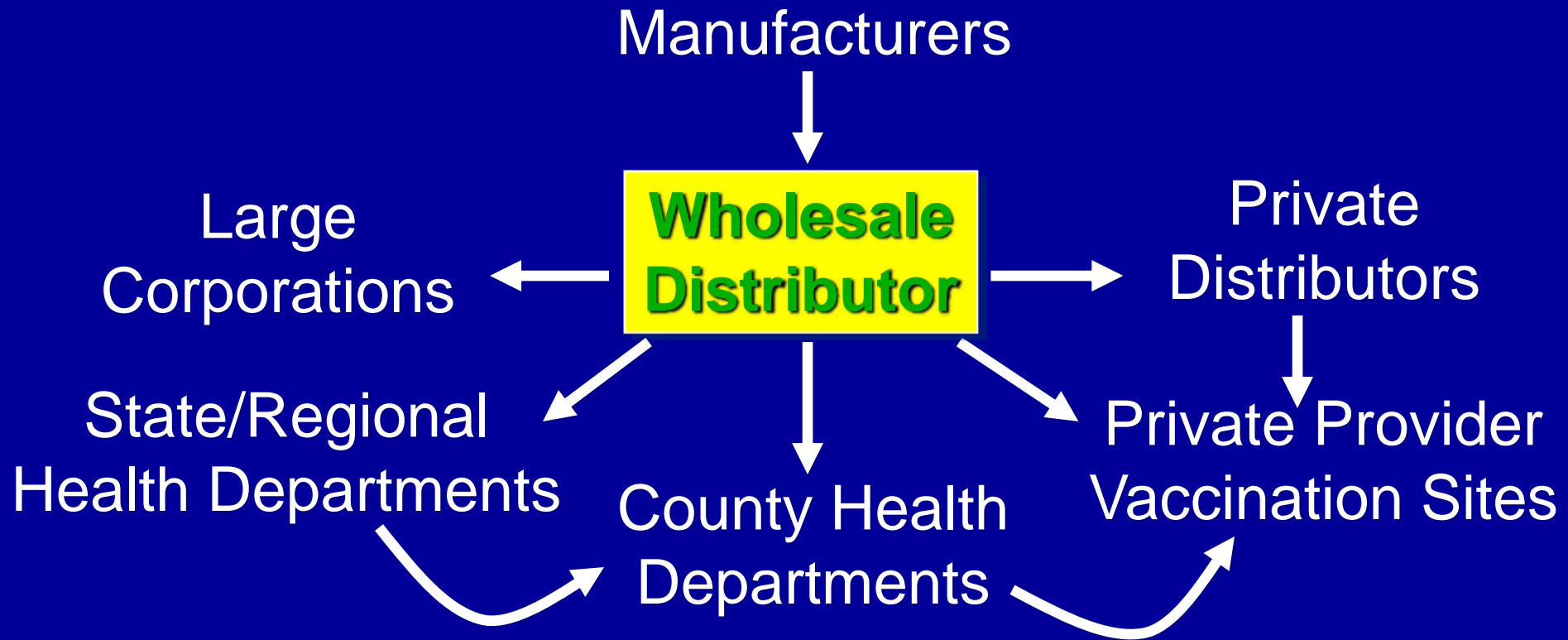
# Conclusions

---

- H1N1 was widespread over most of the US and incidence has declined in recent weeks
- ILI Net rates were higher in October than they have been in any influenza season since surveillance began
  - BRFSS - 10% of adults and >20% children reported ILI in October
- Hospitalizations are highest in the youngest children and decline with age, excess hospitalizations are highest in the 5-17 year old age group
- Deaths are lowest in the youngest children and increase with age but only up to 50-64 year old age group -- deaths decline in 65+ age group
- The majority of those hospitalized from flu have underlying conditions
  - Asthma is common among those hospitalized
  - Neurologic disorders are common among children dying from influenza
  - Pregnant women are at high risk for severe outcome
- Racial ethnic disparities in severe outcomes persist and are under investigation

# Centralized Vaccine Distribution

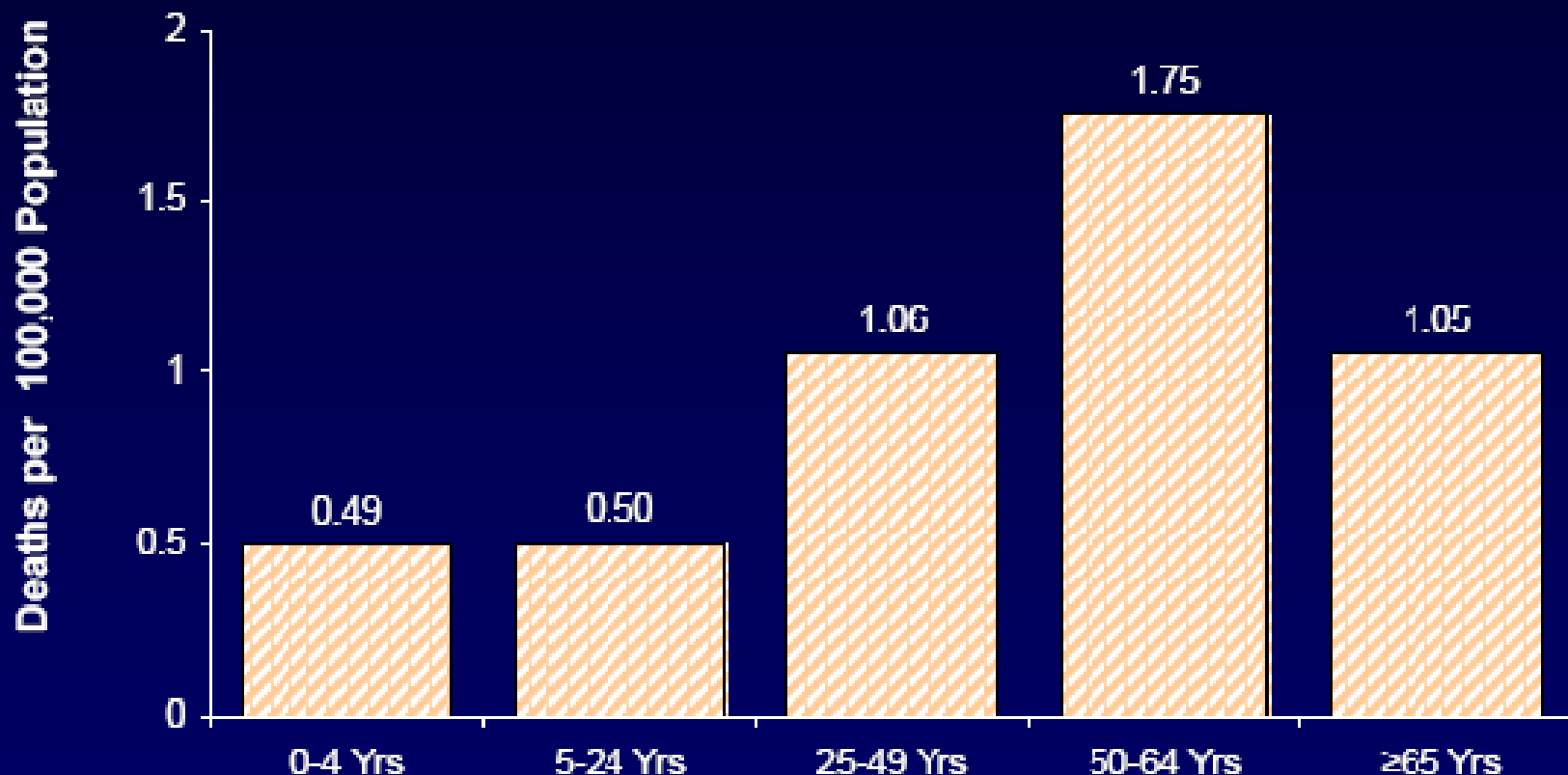
---



**Epidemiology/Surveillance**  
**Aggregate Hospitalizations and Deaths Reporting Activity (AHDRA)**  
**2009-H1N1 April through February 13, 2010**

---

Cumulative Lab-Confirmed Death Rate by Age Group (n=2,559)\*



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

**Percentage of Outpatient Visits Reported by the U.S. and Tennessee Outpatient  
Influenza-like Illness Surveillance Network (ILINet) as Influenza-like Illness,  
2009-2010**

Updated: 02/05/10

