

Influenza Surveillance Update 2008-09 Season

National Vaccine Advisory Committee Meeting

February 5, 2009

Anthony Fiore, MD, MPH

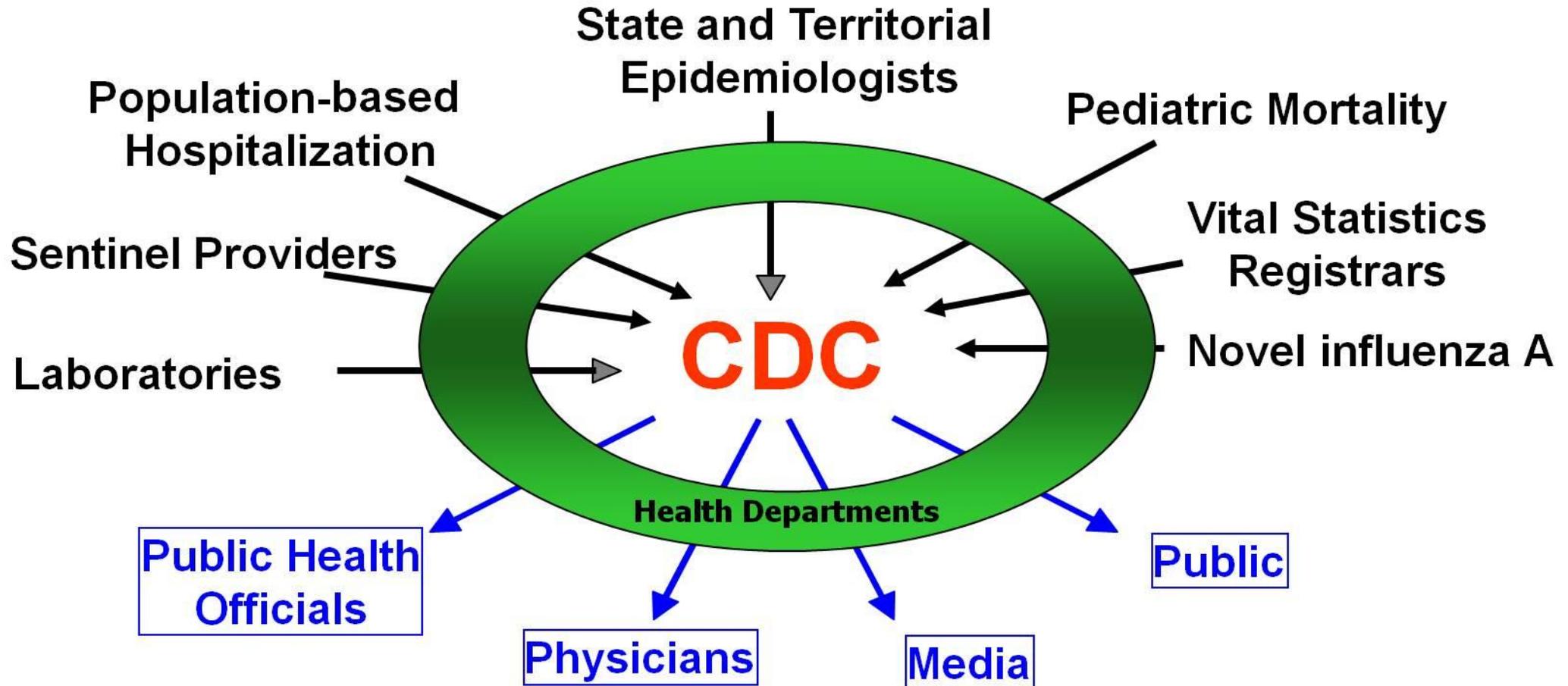
Influenza Division

National Center for Immunization and Respiratory Diseases

Centers for Disease Control and Prevention

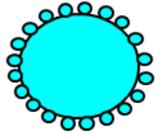


National Influenza Surveillance System



Weekly FluView available at: <http://www.cdc.gov/flu/weekly/fluactivity.htm>

Types of Influenza Surveillance



- Virologic



- Morbidity



- Mortality



- Influenza Activity



- Novel influenza A virus infection



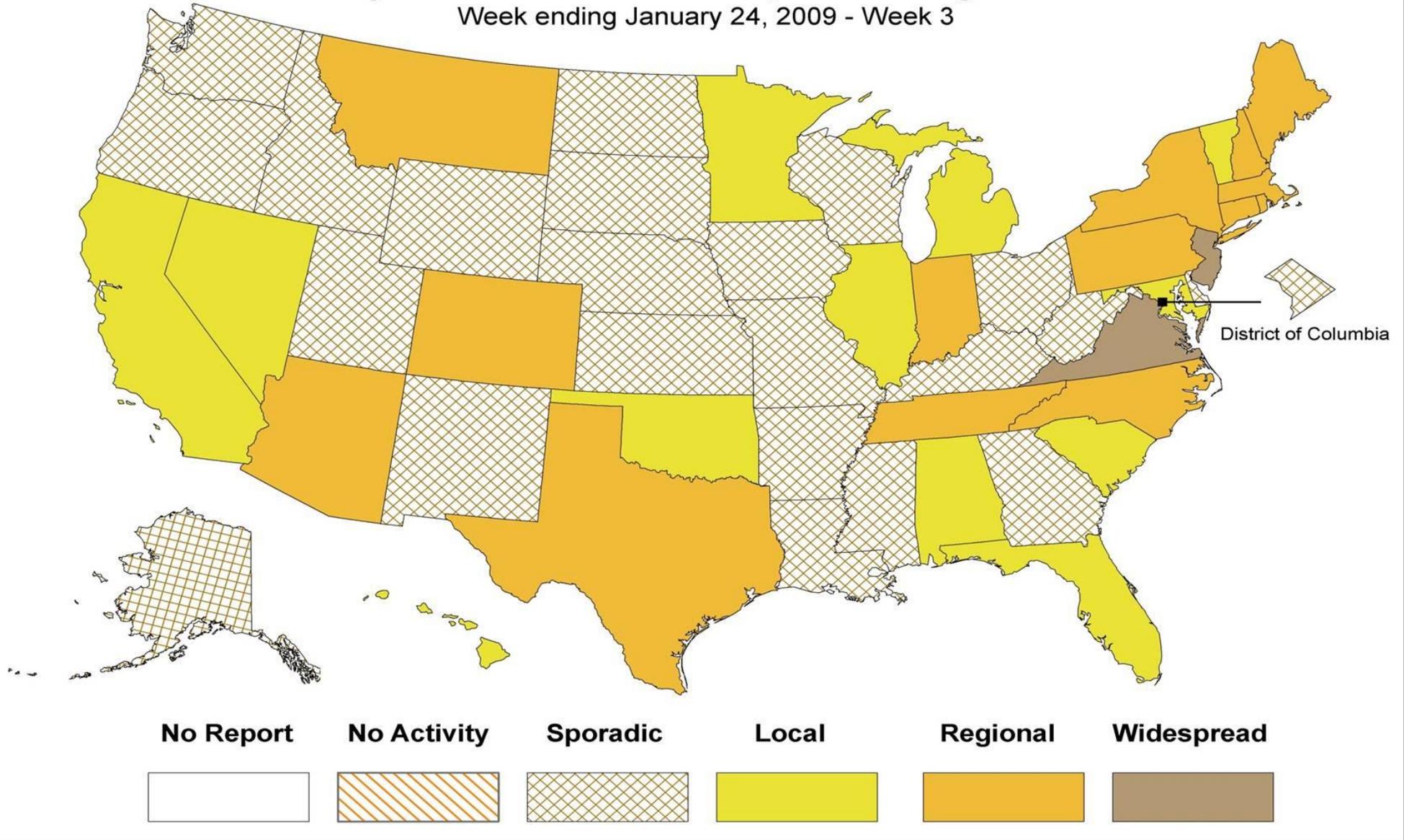
Influenza Activity Report

(State Epidemiologist's Report)

- Assessment of overall influenza activity at state level
 - None, sporadic, local, regional, widespread
 - Overall impression of virus circulation, outbreaks & illness
 - Only system reporting state-level data
- Allow local interpretation of surveillance data
- Measures geographic spread not intensity

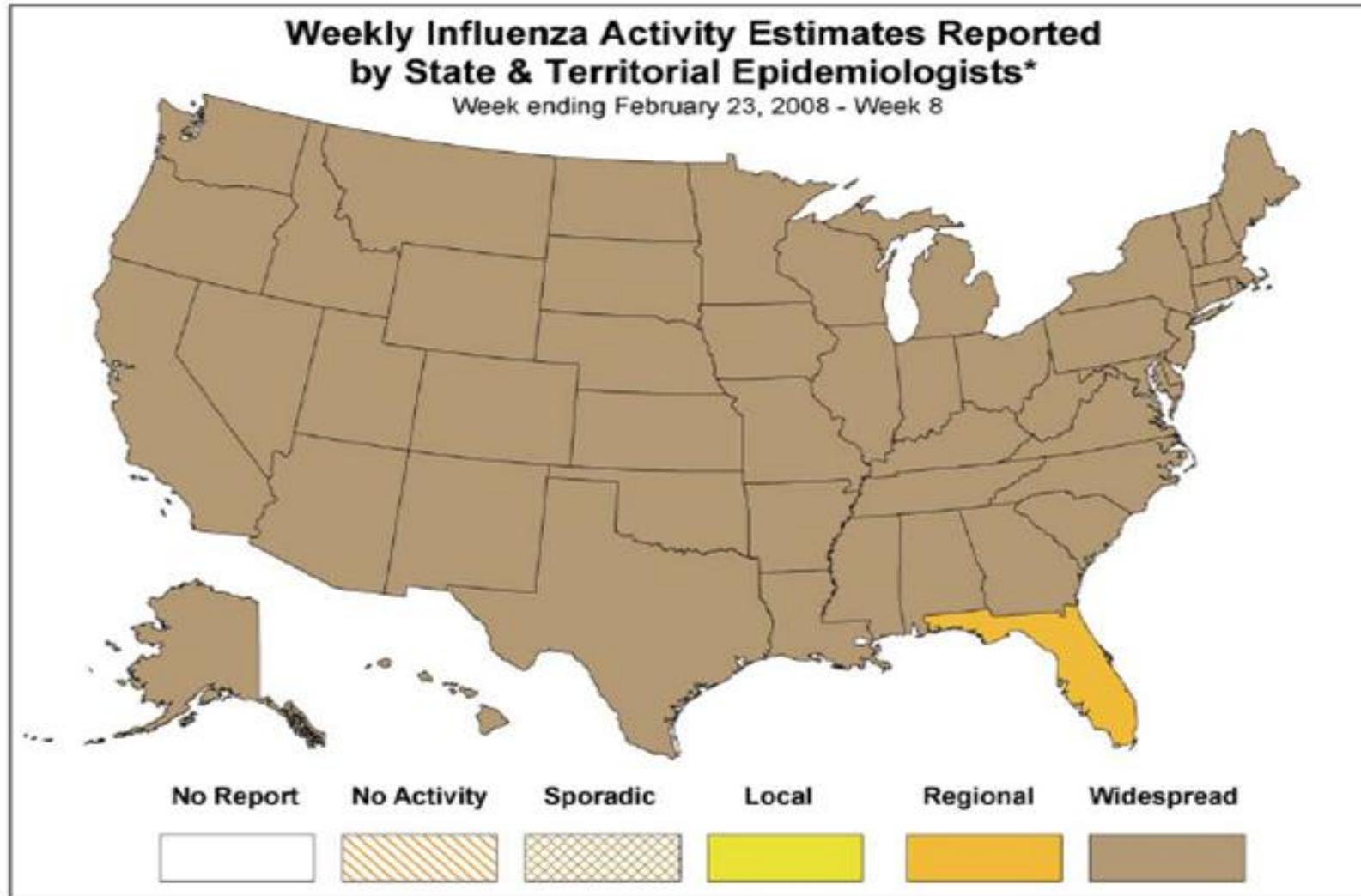
Weekly Influenza Activity Estimates Reported by State & Territorial Epidemiologists*

Week ending January 24, 2009 - Week 3



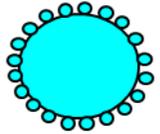
* This map indicates geographic spread & does not measure the severity of influenza activity

Peak week, 2007-08 influenza season



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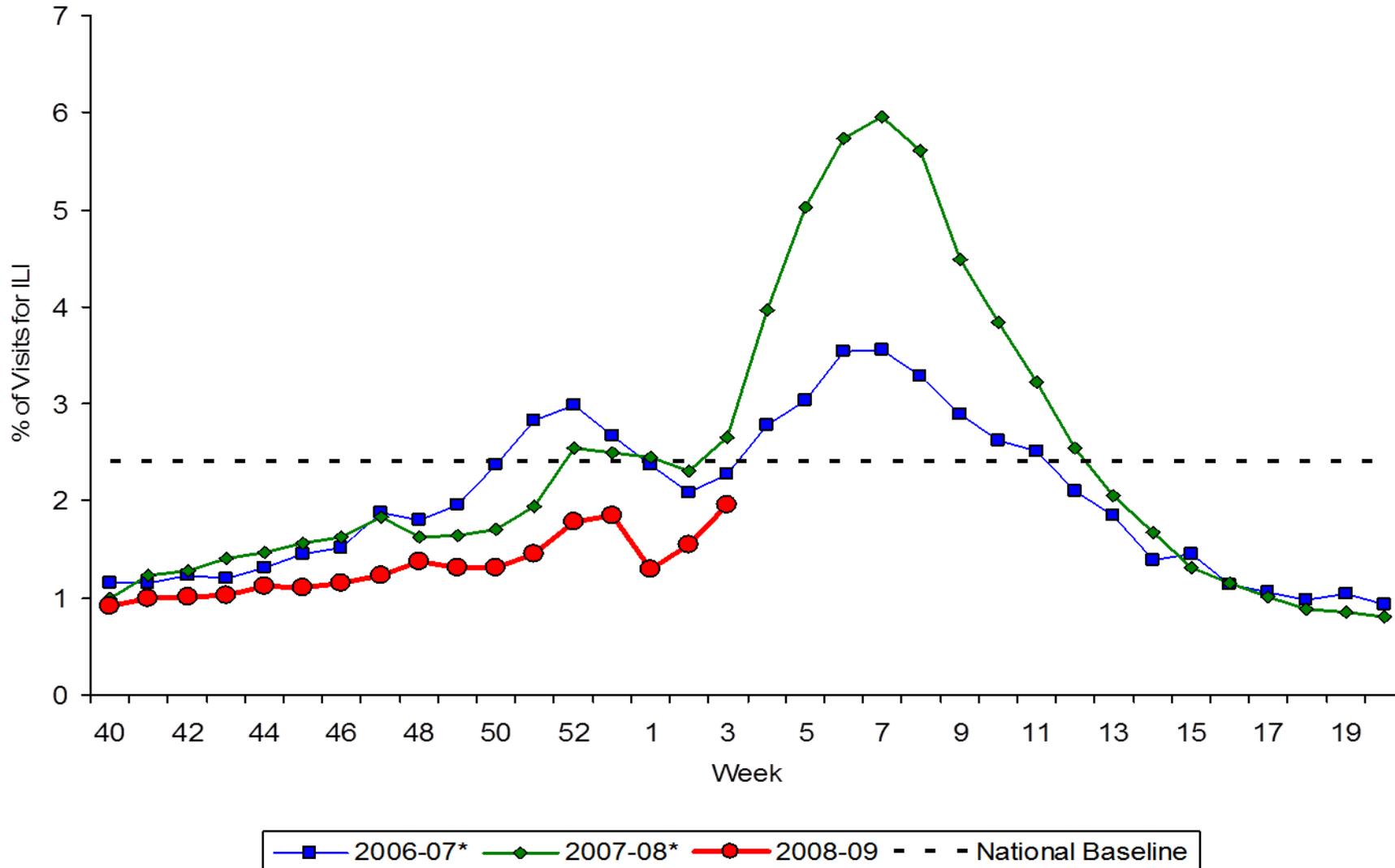
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Morbidity: Influenza-like Illness Surveillance in the U.S.

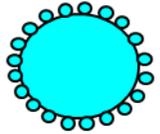
- ~2,400 physicians/clinics enrolled for the 2007-08 season
- Weekly reports
 - Total # of patient visits
 - # visits for influenza-like illness (ILI) by age group
 - ILI = fever \geq 100 F (38 C) and cough or sore throat, in absence of a known cause
 - Data weighted by state population for analysis
- Subset of specimens submitted for culture
 - Early, peak, and late season

Percentage of Visits for Influenza-like Illness (ILI) Reported by the US Outpatient Influenza-like Illness Surveillance Network (ILINet), National Summary 2008-09 and Previous Two Seasons



*There was no week 53 during the 2006-07 and 2007-08 seasons, therefore the week 53 data point for those seasons is an average of weeks 52 and 1.

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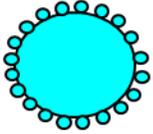
- Mortality



- Influenza Activity



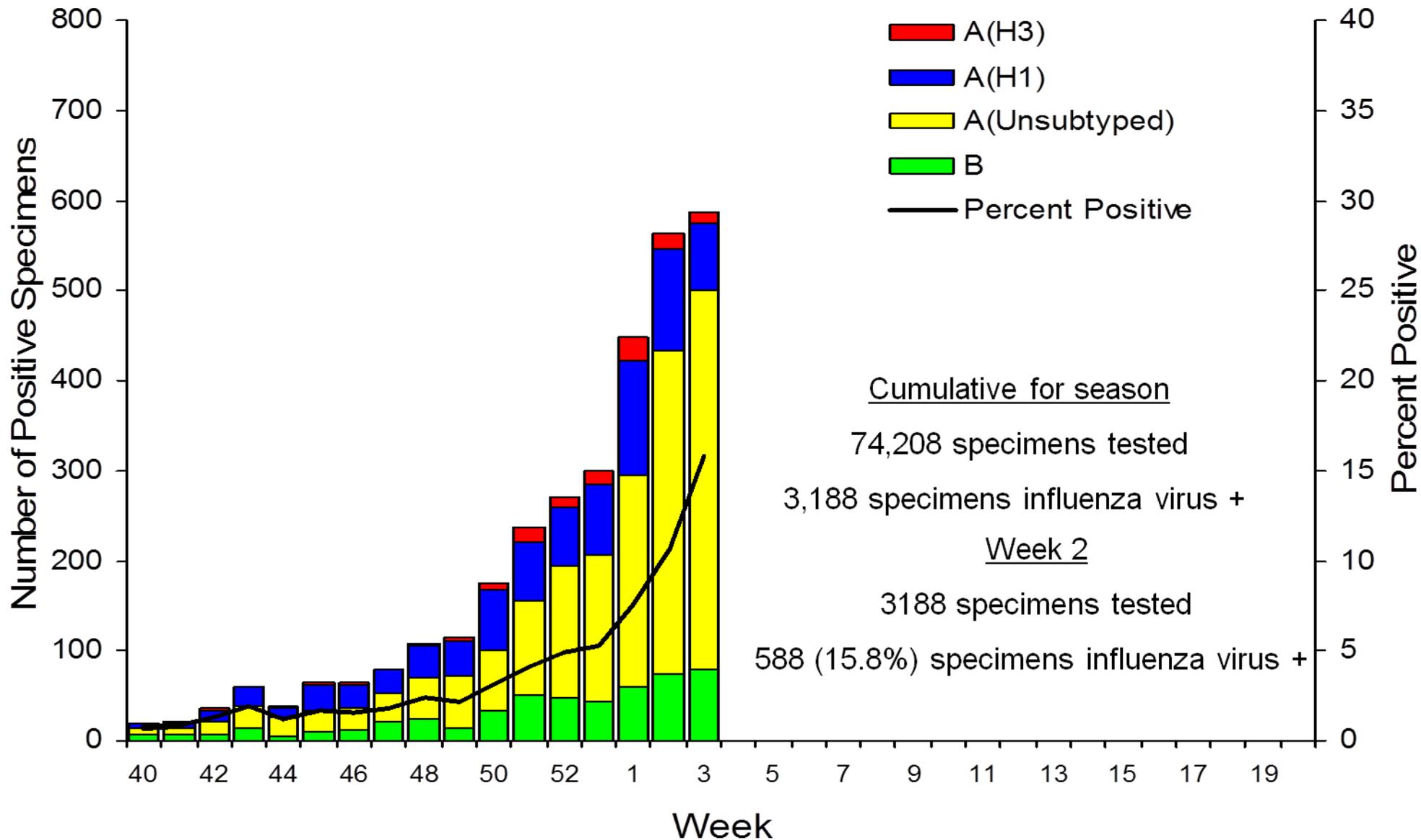
- Novel influenza A virus infection



Virologic Surveillance

- ~140 participating laboratories from two networks (WHO, NREVSS)
- Weekly reports
 - # specimens tested
 - # positive for influenza: type, subtype, age
- Analyzed weekly and included in weekly report of influenza activity Oct - May
 - National and regional level analysis
- Reported each week to WHO via FluNet
- US WHO labs submit subset of isolates to CDC strain surveillance lab
 - Detailed antigenic characterization
 - Sequencing of some isolates
 - Antiviral resistance testing

Influenza Positive Tests Reported to CDC by U.S. WHO/NREVSS Collaborating Laboratories, National Summary, 2008-09



Antiviral Resistance 2008

Neuraminidase inhibitor resistance:

- 162 of 165 influenza A (H1N1) viruses tested were resistant to oseltamivir.
 - All influenza A (H1N1) viruses were sensitive to zanamivir.
- All 37 influenza A (H3N2) viruses were sensitive to oseltamivir and zanamivir.
- All 67 influenza B viruses tested were sensitive to oseltamivir and zanamivir.

Summary of antiviral resistance 2008-2009

	Influenza Strains		
Antiviral	H1N1	H3N2	B
Adamantanes	Susceptible	~ 100%	~ 100%
Oseltamivir	~ 100%	Susceptible	Susceptible
Zanamivir	Susceptible	Susceptible	Susceptible

Interim Guidance for Use of Antivirals in the Treatment and Prevention of Influenza, 2008-09 Season*

*Adapted from Health Alert Network Advisory
issued December 19, 2008.

Available at

<http://www2a.cdc.gov/HAN/ArchiveSys/ViewMsgV.asp?AlertNum=00279>

Rationale: Interim Guidance for Use of Antivirals in the Treatment and Prevention of Influenza, 2008-09 Season

- Early season data indicates that oseltamivir-resistant H1N1 is the most commonly isolated virus thus far
 - Strain predominance typically changes as season progresses
- Clinicians need to know that oseltamivir alone might not effectively prevent or treat influenza

Interim Guidance for Use of Antivirals in the Treatment and Prevention of Influenza, 2008-09 Season: Key Points

- Local influenza surveillance data and laboratory testing can help with physician decision-making regarding the choice of antiviral agents for their patients
- Treatment with zanamivir or a combination of oseltamivir and rimantadine* is preferable in some situations
 - Influenza subtype likely to be H1 or unknown
- Oseltamivir-resistant H1N1 strains are antigenically similar or identical to the strains in the vaccine

*Amantadine acceptable in place of rimantadine

Strain Characterization, 2008-9 Season (FluView January 30, 2008)

CDC has characterized 229 viruses

- A (H1) [n=142]:
 - 100% - A/Brisbane/59/2007-like viruses (similar to vaccine strain)
 - Oseltamivir-resistant viruses are antigenically similar to vaccine strain
- A (H3) [n=35]
 - 100% - A/Brisbane/10/2007-like viruses (similar to vaccine strain)
- B [n=52]
 - 17 (33)% in B/Yamagata lineage (similar to vaccine strain)

Weekly FluView available at: <http://www.cdc.gov/flu/weekly/fluactivity.htm>

ACIP Influenza Vaccination Recommendation

Changes: 2000-2009

Before 2000:

Persons aged 65 or older

Persons with chronic medical conditions that make them more likely to have complications of influenza

Pregnant women in the second or third trimester

Contacts (household and out of home caregivers) of the above groups

Healthcare workers

2000: Adults 50 and older

2004: Children aged 6—23 months

Contacts (household and out of home caregivers) of children aged 0--23 months

Women who will be pregnant during influenza season

2006: Children aged 6—59 months

Contacts (household and out of home caregivers) of children aged 0—59 months

2008: **All children aged 6 months—18 years**

Assessing Impact: New Vaccination Recommendation for School-Aged Children and Adolescents

- Vaccine coverage
 - registries, NIS (infant, toddler, teen)
- Disease surveillance
 - hospitalizations - Emerging Infection Program sites (ongoing)
- Rapid vaccine effectiveness estimates expanded to 4 sites
- CDC consultation on assessing direct impact and potential indirect (community) impact

Supporting Implementation: New Vaccination Recommendation for School-Aged Children and Adolescents

- Funding of research studies
 - Assessing school-placed vaccination programs
 - Improving office-based influenza vaccination of children
- Increased focus on enrolling “alternative” (beyond usual office-based clinician) vaccination providers/sites into VFC

Thank you

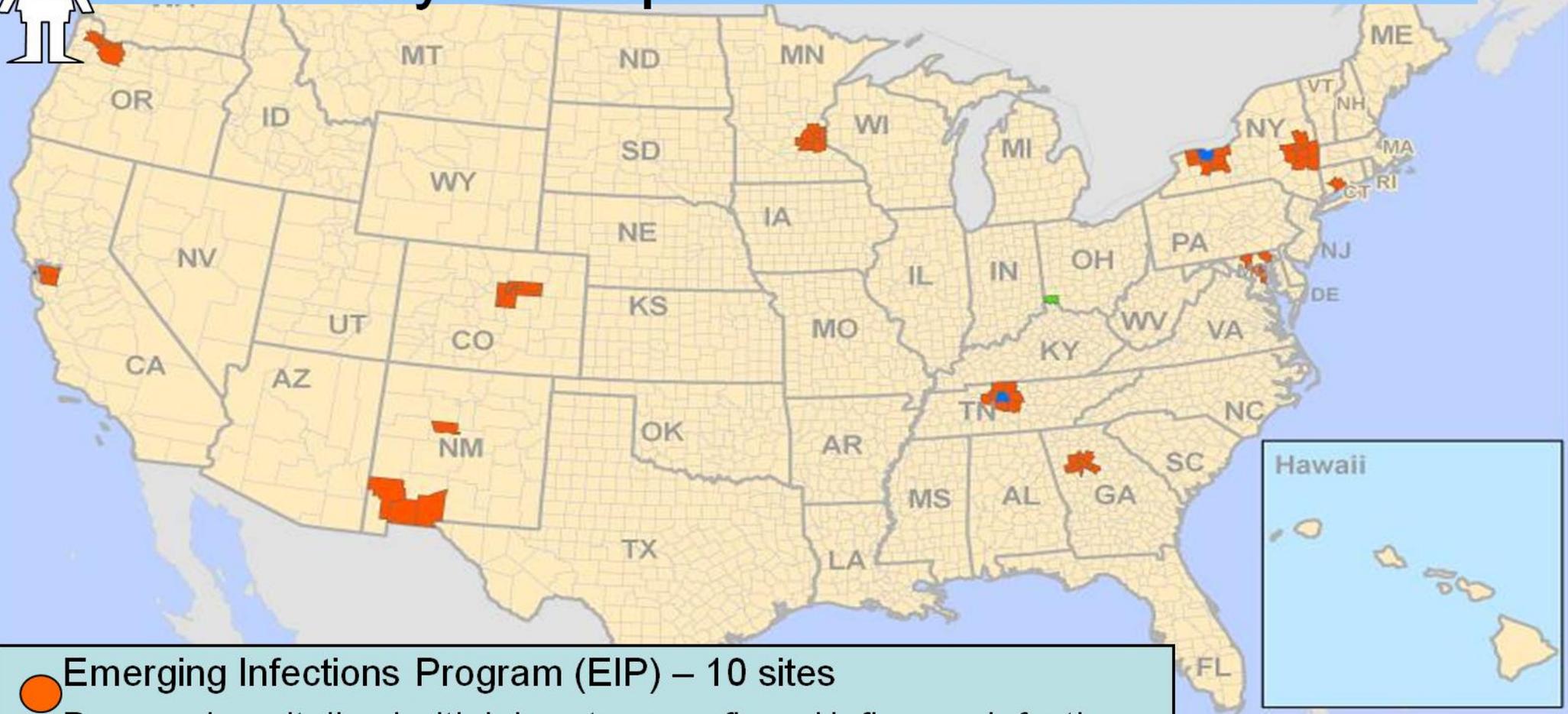
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Extra slides



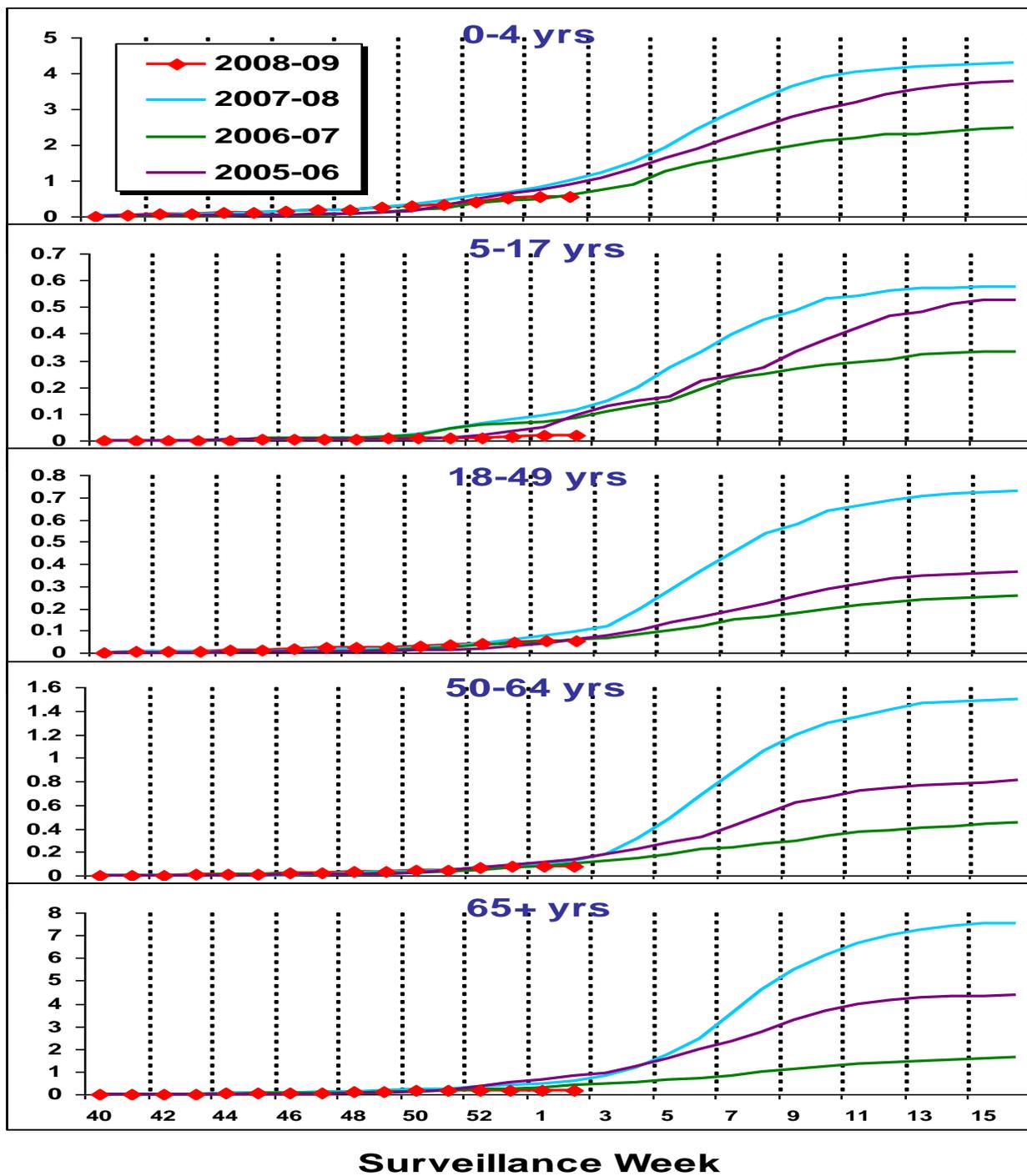
Morbidity: Hospitalization Surveillance



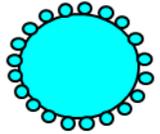
-  Emerging Infections Program (EIP) – 10 sites
Persons hospitalized with laboratory-confirmed influenza infection
-  New Vaccine Surveillance Network (NVSN) – 3 sites
Children <5 yrs hospitalized with laboratory-confirmed influenza infection
-  Both EIP and NVSN



Rate per 10,000 Population
(note: scales differ between age groups)



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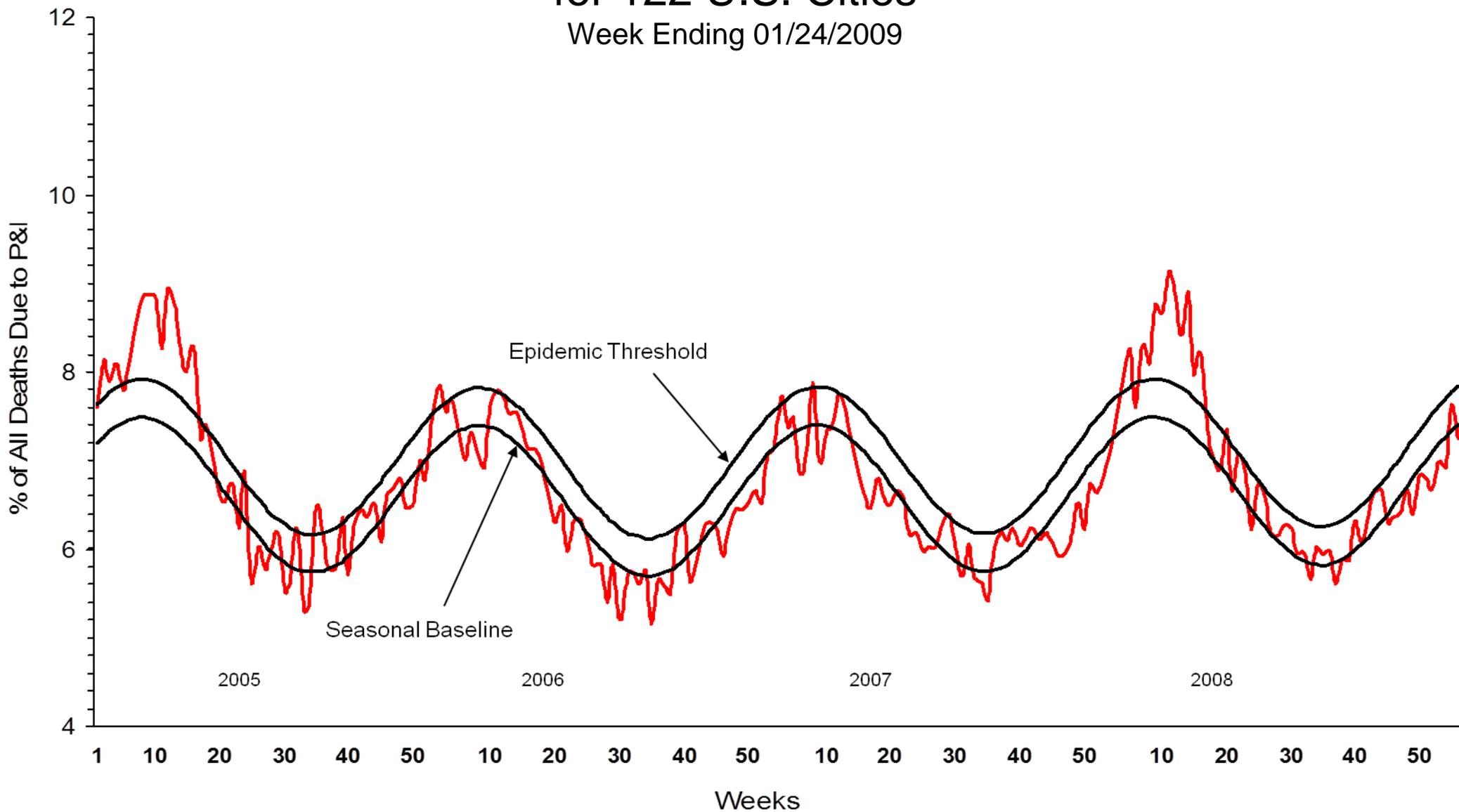


122 Cities Mortality Reporting System

- Purpose:
 - monitor P&I related mortality in a timely manner
- Weekly reports from vital statistics offices in 122 US cities
 - Total # of death certificates filed
 - # with pneumonia or influenza listed anywhere
- ~ 1/4 of US deaths
- Timely
 - Reporting lag 1-2 weeks

Pneumonia and Influenza Mortality for 122 U.S. Cities

Week Ending 01/24/2009



Influenza-Associated Pediatric Mortality

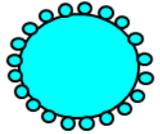
Case Definition

- Death resulting from a clinically compatible illness that was confirmed to be influenza by an appropriate laboratory or rapid diagnostic test
- Age <18 years
- With no period of complete recovery between the illness and death

Influenza Associated Pediatric Mortality 2009-09 Season and Previous Seasons

- **Since 2004, total ranged from 46 deaths in 2004-05 to 87 deaths in 2008-09**
- **As of January 23, 2009, received 2 reports of influenza-associated pediatric deaths during 2008-09 season**

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Novel Influenza A Virus Infections

- Influenza A virus subtypes that are different from the currently circulating human subtypes (A/H1 and A/H3)
- Novel influenza virus infections may signal the beginning of an influenza pandemic
- Since starting reporting, novel influenza reports have increased
- Swine influenza virus infection being identified more frequently than before

INTERIM GUIDANCE FOR USE OF ANTIVIRALS IN THE TREATMENT AND PREVENTION OF INFLUENZA, 2008-09 SEASON: SCENARIOS

Rapid antigen or other laboratory test	Predominant virus(es) in community	Preferred medication(s)	Alternative (combination antiviral treatment)
1. Not done, <u>or</u> 2. Negative, but clinical suspicion for influenza	H1N1 or unknown	Zanamivir	Oseltamivir + Rimantadine*
1. Not done, <u>or</u> 2. Negative, but clinical suspicion for influenza	H3N2 or B	Oseltamivir <u>or</u> Zanamivir	None

*Amantadine can be substituted for rimantadine but has increased risk of adverse events. Human data are lacking to support the benefits of combination antiviral treatment of influenza; however, these interim recommendations are intended to assist clinicians treating patients who might be infected with oseltamivir-resistant influenza A (H1N1) virus.

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Positive A	H3N2 or B	Oseltamivir <u>or</u> Zanamivir	None

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Positive A/B	H1N1 or unknown	Zanamivir	Oseltamivir + Rimantadine*
Positive A/B	H3N2 or B	Oseltamivir <u>or</u> Zanamivir	None
Positive B	Any	Oseltamivir <u>or</u> Zanamivir	None

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Influenza Strains by type/subtype over time, USA, 2007-08

