Management and Prevention of Pediatric Influenza in Healthcare Settings

Clinician Outreach and Communication Activity (COCA) Webinar

September 18, 2014

Office of Public Health Preparedness and Response
Division of Strategic National Stockpile

Objectives

At the conclusion of this session, the participant will be able to accomplish the following:

- Discuss strategies to assist clinicians in preparing for the 2014-2015 influenza season.
- Identify approaches to reduce influenza disease burden in children.
- Describe how to leverage seasonal influenza action plans to address annual flu surge.

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The presentation will not include any discussion of the unlabeled use of a product or a product under investigational use.

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TODAY'S PRESENTER

Joseph Bresee, MD, FAAP
Chief
Epidemiology and Prevention Branch
Influenza Division
National Center For Immunization And Respiratory Diseases
Centers for Disease Control and Prevention

TODAY'S PRESENTER (2)

Henry (Hank) Bernstein, DO, MHCM, FAAP
Professor of Pediatrics
Hofstra North Shore – LIJ School of Medicine

TODAY'S PRESENTER (3)

Brent Kaziny, MD, FAAP
Assistant Professor
Baylor College of Medicine
Texas Children's Hospital

Update on influenza and influenza vaccine strain selection

September 2014

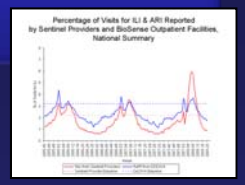
Joseph Bresee
Epidemiology and Prevention Branch
Influenza Division
National Center for Immunization and Respiratory Diseases
CDC

Agenda

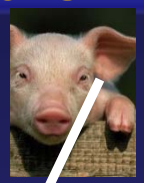
- Summary of US National surveillance systems
- Review of 2013-14 influenza season
  - Disease
  - Vaccine effectiveness
  - Program impact
- What we are watching this season
- How the virus strains are selected to be included in the flu vaccine each year

U.S. Influenza Surveillance System

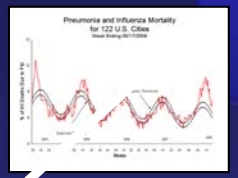
Syndromic Surveillance
ILINet



Novel Influenza A

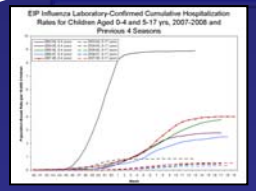


Mortality
122 Cities P&I
Ped. deaths

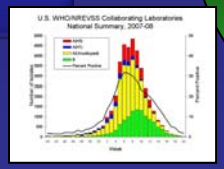


Geographic distribution
State & Terr.
Epi report

Hospitalization
FluSurvNet



Virologic Surveillance
NRVESS



State Health Depts.

CDC

Public Health Officials

Physicians

Media

Public

Weekly Survelliance Report

FLUVIEW

A Weekly Influenza Surveillance Report Prepared by the Influenza Division

CDC

2009-2010 Influenza Season Week 19 ending May 15, 2010

All data are preliminary and may change as more reports are received.

Synopsis:

During week 19 (May 9 - 15, 2010), influenza activity decreased in the U.S.

- 14 (0.9%) specimens tested by U.S. World Health Organization (WHO) and National Respiratory and Enteric Virus Surveillance System (NREVSS) collaborating laboratories and reported to CDC/Influenza Division were positive for influenza.
- All four subtyped influenza A viruses were 2009 influenza A (H1N1).
- The proportion of deaths attributed to pneumonia and influenza (P&I) was below the epidemic threshold.
- No influenza-associated pediatric deaths were reported.
- The proportion of outpatient visits for influenza-like illness (ILI) was 0.8%, which is below the national baseline of 2.3%. All 10 regions reported ILI below region-specific baseline levels.
- No states reported widespread or regional influenza activity. One state reported local influenza activity. Puerto Rico and 19 states reported sporadic influenza activity. The District of Columbia, Guam, and 30 states reported no influenza activity, and the U.S. Virgin Islands did not report.

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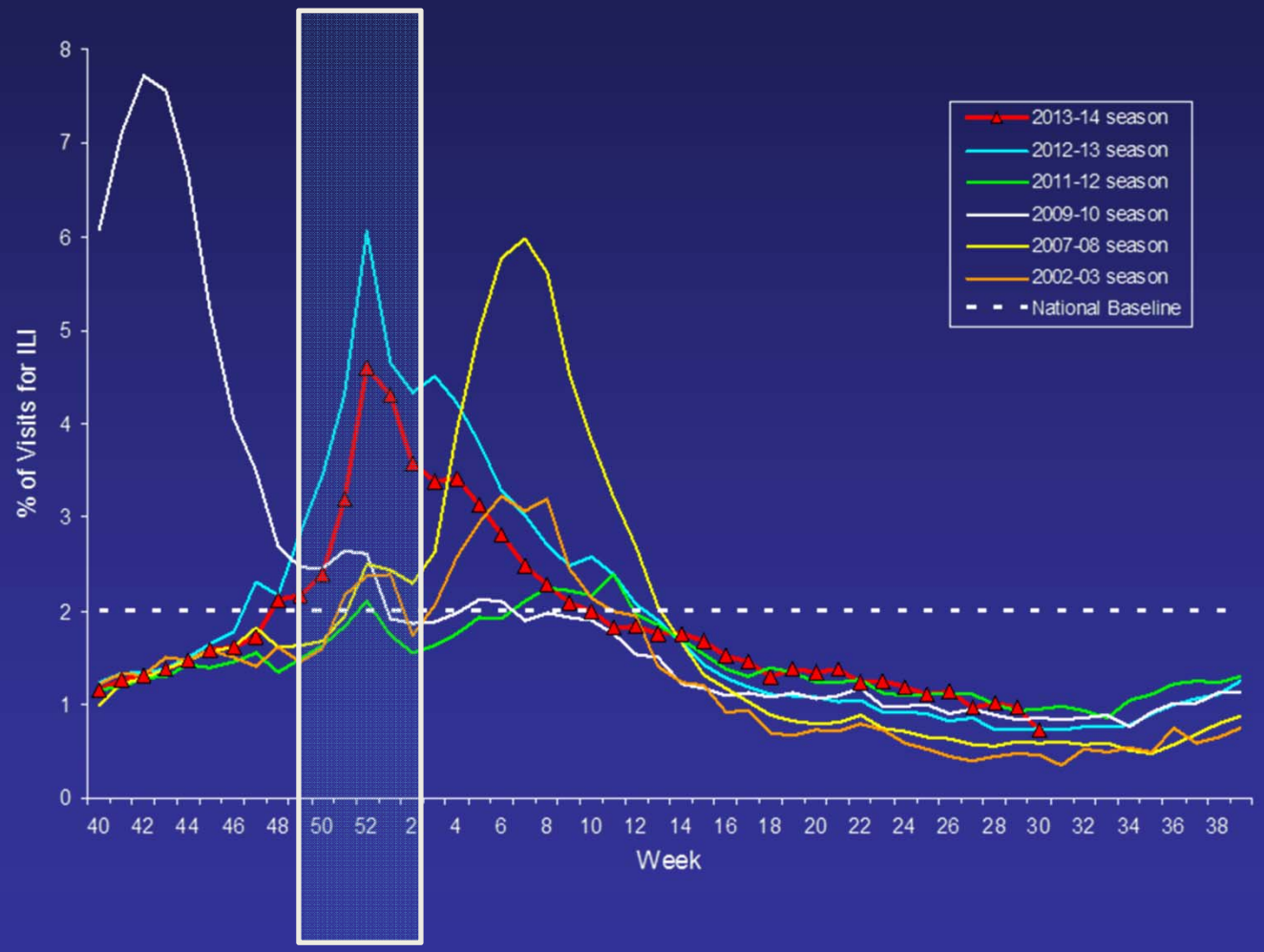
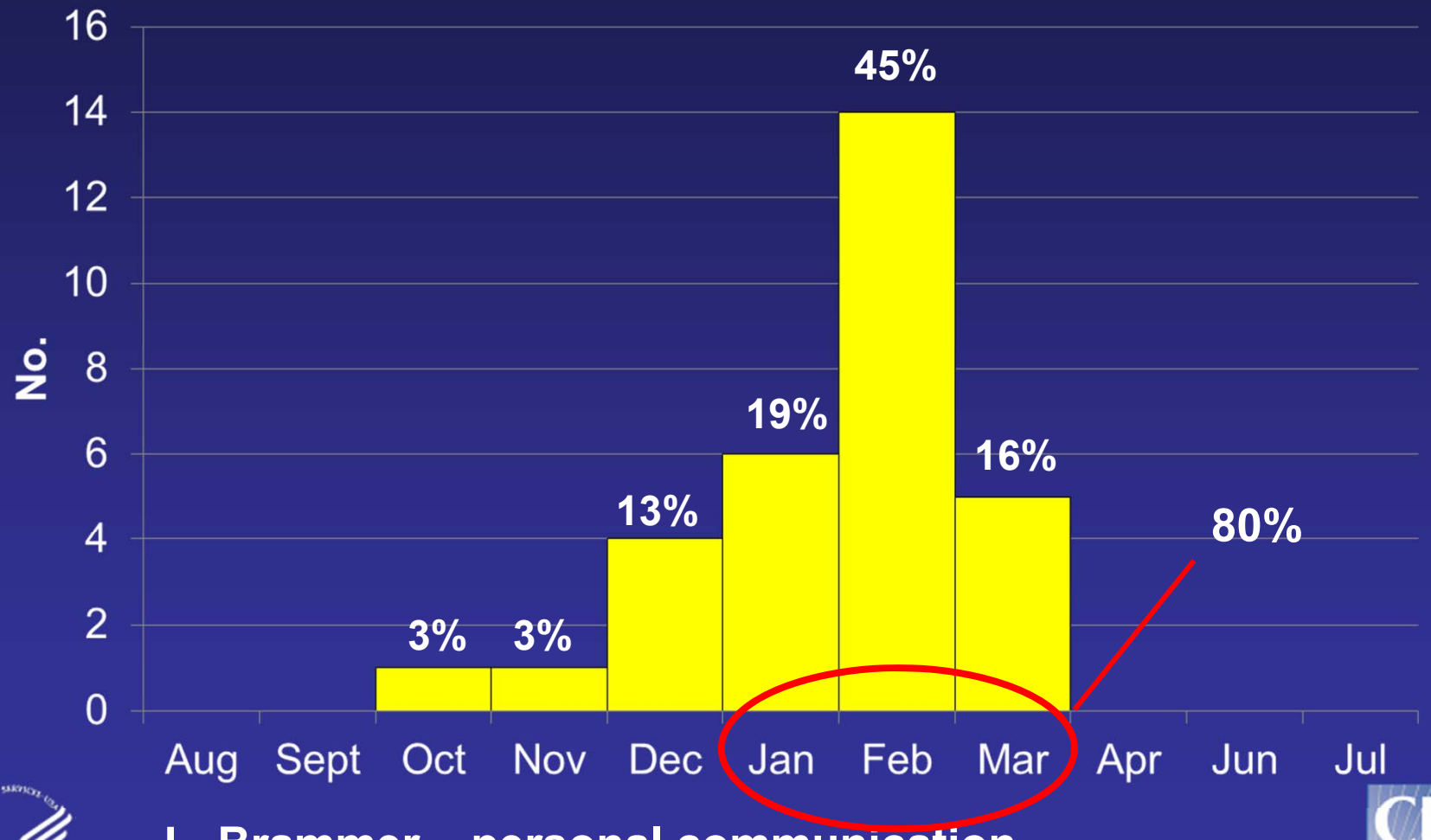
CDC Influenza Review

SUMMARY OF 2013-14 INFLUENZA SEASON

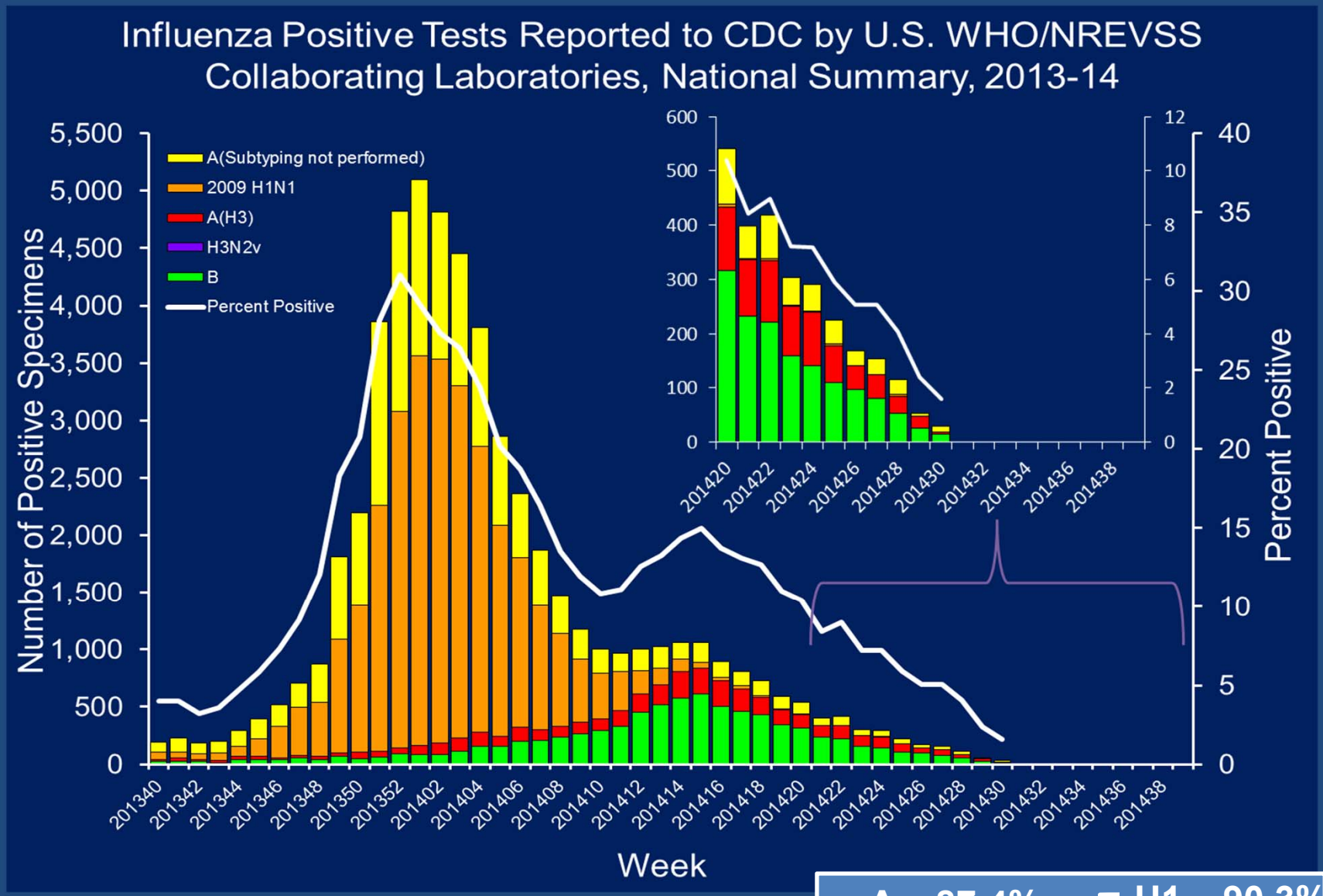
Percentage of Visits for Influenza-like Illness (ILI) Reported by the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet), Weekly National Summary, 2013-14 and Selected Previous Seasons



Timing of influenza season peaks in the US, 1982-2013 (n=31 seasons)



L. Brammer – personal communication



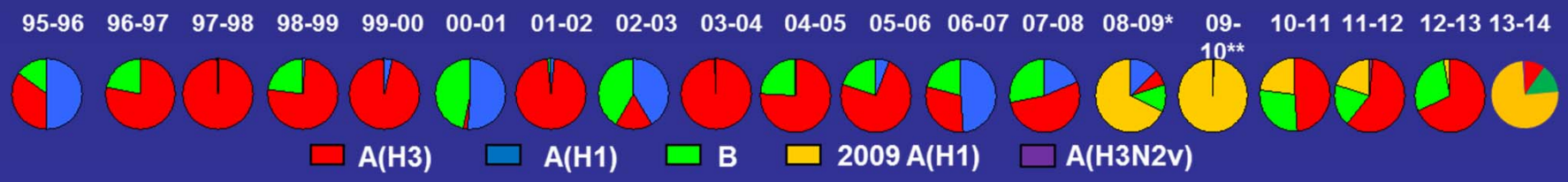
A – 87.4%
B – 12.6%

H1 – 90.3%
H3– 9.7%

Type/subtype distribution in the US, 1995-2014

Predominant (sub)types during last 19 influenza seasons:

- 6 (32%) – A(H1N1)
  - (2 during pH1N1 pandemic)
- 12 (63%) - A(H3N2)
- 1 - no dominant type/subtype
- 0 - B
  - 13 seasons had significant B circulation
    - 8 of last 9 non-pandemic seasons



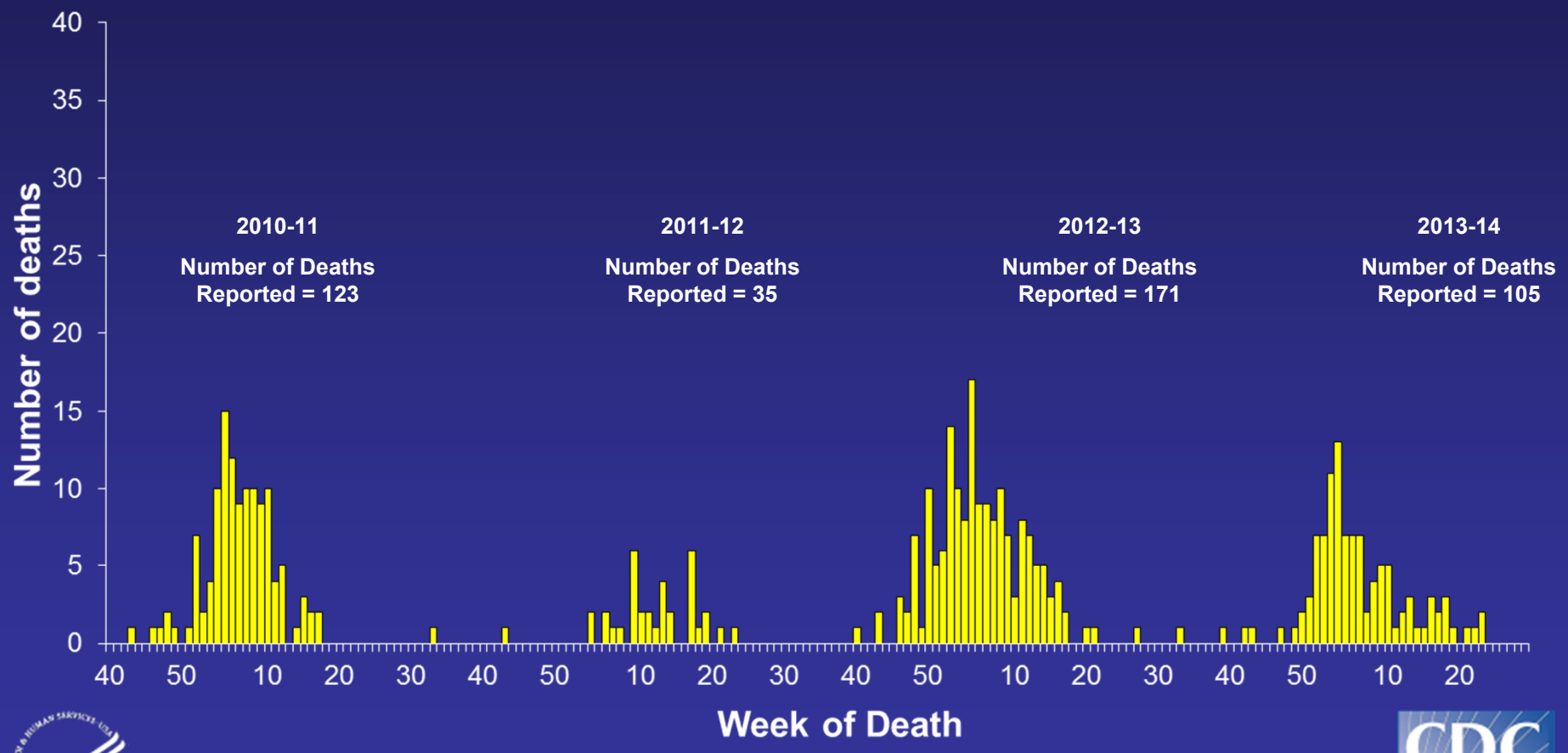
* 2008-09 season = wk 40, 2008 – wk 34, 2009

** 2009-10 season starts at wk 35, 2009

www.cdc.gov/flu

Influenza-Associated Pediatric Deaths by Week of Death: 2010-11 season to present

	Influenza A (2009 H1N1)	Influenza A (H3N2)	Influenza A (Subtype not Determined)	Influenza B	Influenza A and B Co-infection	Type not Determined	Total
# Deaths Since September 29, 2013	44	6	37	16	2	2	107



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CDC Influenza Vaccine Effectiveness

INFLUENZA VACCINE EFFECTIVENESS, U.S. 2013-14

Preliminary adjusted VE against A and B, 2013-14

Any influenza A or B virus	Influenza positive		Influenza negative		Vaccine Effectiveness			
					Unadjusted		Fully Adjusted*	
	N vaccinated /Total	(%)	N vaccinated/ Total	(%)	VE %	95% CI	VE %	95% CI
Overall	352/1134	31	2126/4041	53	60	53 to 65	**52**	**43 to 59**
Age Groups								
6m–8 y	50/164	30	490/907	54	63	47 to 74	**48**	**23 to 65**
9–17y	27/107	25	208/485	43	55	28 to 72	**57**	**28 to 74**
18–49 y	114/516	21	567/1440	39	56	45 to 65	**54**	**40 to 64**
50–64 y	96/251	38	469/734	64	65	53 to 74	**53**	**34 to 67**
≥65 y	65/96	67	392/475	83	56	28 to 73	**43**	**-1 to 67**

* Multivariate models adjusted for age group, sex, race/Hispanic ethnicity, health status, presence of a high risk condition, days between illness onset and specimen testing, and calendar time (2 week intervals based on MMWR week of illness onset) For the all ages models, age was represented as categories; age in years was used in age-stratified models. Persons with self reported vaccination that was unverified were excluded.

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Journal of Infectious Diseases Advance Access published May 14, 2014

MAJOR ARTICLE

Effectiveness of Influenza Vaccine Against Life-threatening RT-PCR-confirmed Influenza Illness in US Children, 2010–2012

Jill M. Ferdinands,[1,2] Lauren E. W. Olsho,[3] Anna A. Agan,[4] Niranjan Bhat,[5] Ryan M. Sullivan,[4] Mark Hall,[6] Peter M. Mourani,[7] Mark Thompson,[1] and Adrienne G. Randolph[4] on behalf of the Pediatric Acute Lung Injury and Sepsis Investigators (PALISI) Network

Objective:
Estimate VE against life-threatening influenza illness in children

Vaccine Effectiveness:
Analysis with Test-negative Controls
(n=44 cases, 172 controls)

	Odds Ratio (95% CI)	*P* Value	Vaccine Effectiveness (95% CI)
Full vaccination	0.26 (.09 to .81)	.02	74% (19% to 91%)
Partial vaccination	1.06 (.33 to 3.43)	.93	−6% (−243 to 67%)
No vaccination	Ref		
Female	0.31 (.13 to .75)	.01	
Log of age (mo)	1.76 (1.13 to 2.74)	.01	
History of moderate to severe chronic respiratory disorder	0.25 (.09 to .70)	.01	
History of cardiac disorder	8.64 (1.72 to 43.5)	.01	
Pre-influenza peak	0.79 (.26 to 2.42)	.68	
Peak influenza period	Ref		
Post-influenza peak	0.69 (.24 to 11.4)	.50	
Enrollment outside active recruitment period	3.09 (.32 to 30.3)	.33	
Days between onset and RT-PCR influenza testing	1.37 (1.07 to 1.77)	.01	
PRISM score (severity of illness at PICU admission)	1.08 (1.01 to 1.15)	.02	
Contact with a person with confirmed or suspected influenza	4.48 (1.76 to 11.4)	.002	

Season and race were not independent predictors of influenza positivity or confounders of the relationship between vaccination and influenza positivity and therefore were eliminated from the final model. Vaccination status was confirmed by medical record or immunization registry for cases and PICU controls.

Abbreviations: CI, confidence interval; PICU, pediatric intensive care unit; RT-PCR, reverse-transcription polymerase chain reaction; Ref, reference group.

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CDC's Influenza Vaccine Program Effectiveness

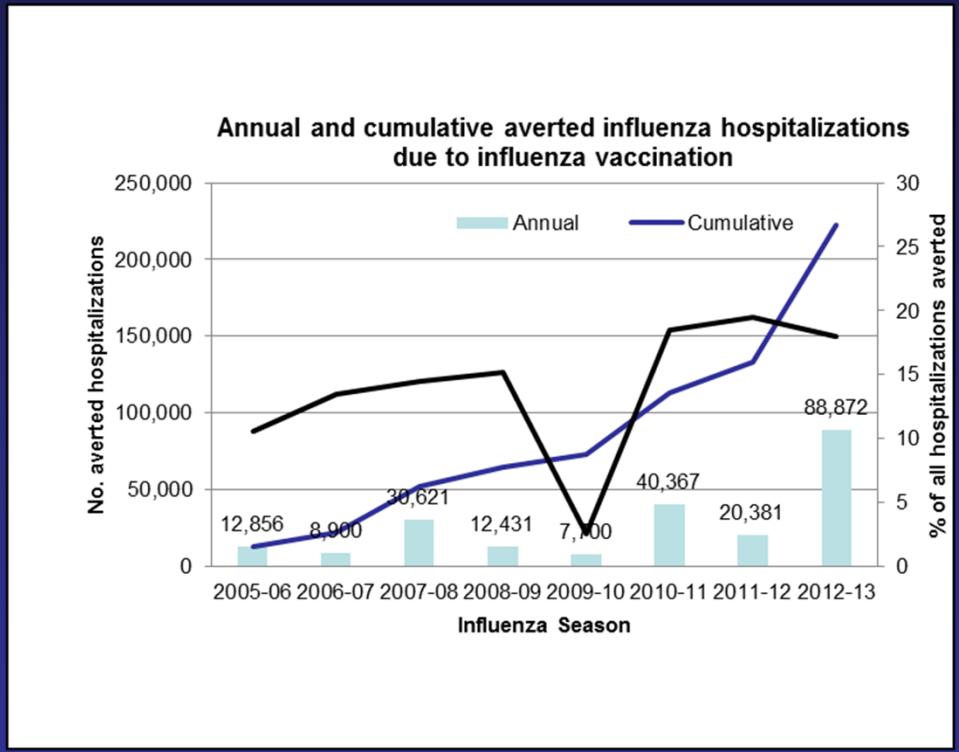
Summary of findings

Each year between 2005 - 2013, influenza vaccine prevented:

- **1.1 – 9.5 M cases**
- **440,000 – 4 M outpatient visits**
- **7,700 – 89,000 hospitalizations**
- **2.5-20% of influenza-associated health outcomes**

Among children <=19 yrs, in 2012-13, influenza vaccine prevented:

- **~3M cases**
- **1.8M outpatient visits**
- **~15,000 hospitalizations**



Sources: Kostova, Reed et al. PlosOne 2013; 8:e66312; Bresee, JS et al, MMWR 2013; 62:997-1000; CDC unpublished data

Other ongoing influenza issues

- Novel influenza A virus detection ands risk assessment
  - H7N9 – China
  - H3N2v – Midwest US
  - Others
- Track oseltamivir-resistant viruses
- New treatments
- “Universal” influenza vaccine development

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INFLUENZA VACCINE STRAIN SELECTION

Unique Features of Influenza Vaccines

- Immunity acquired from vaccination is "strain-specific"
  - Broadening cross-protection has remained a challenge
  - Multi-valent seasonal vaccines required
- Various influenza vaccine targets
  - seasonal viruses & unpredictable viruses with pandemic potential (e.g, H5N1, H9N2, H2N3, and H7N7 viruses)
- Each subtype/type rapidly changing
  - Annual vaccine updates required
- Small window of time to detect the emergence and spread of new influenza variants and to provide vaccine prior to disease
  - February – vaccine decisions
  - August – start of vaccination campaigns
  - November – increased seasonal activity

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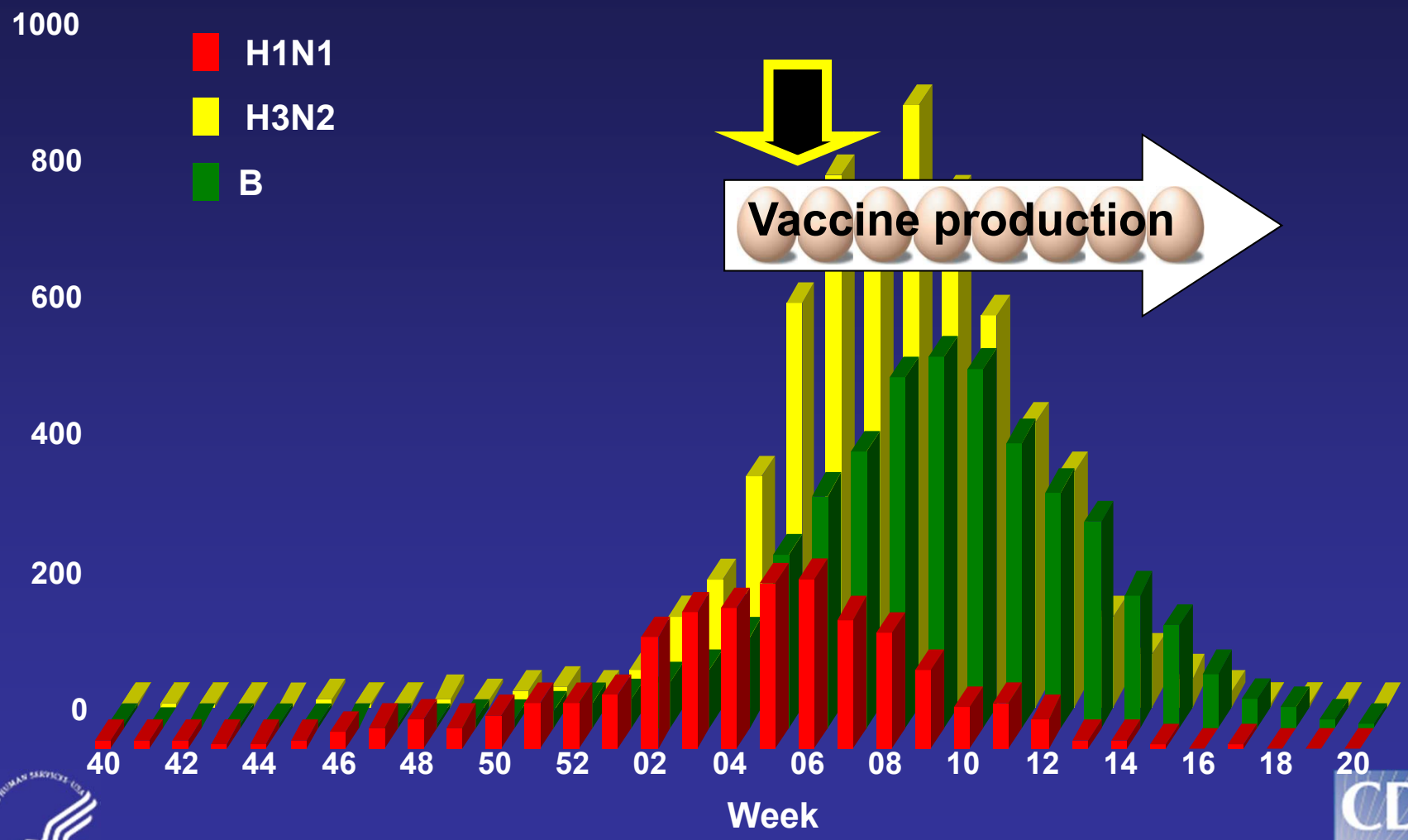
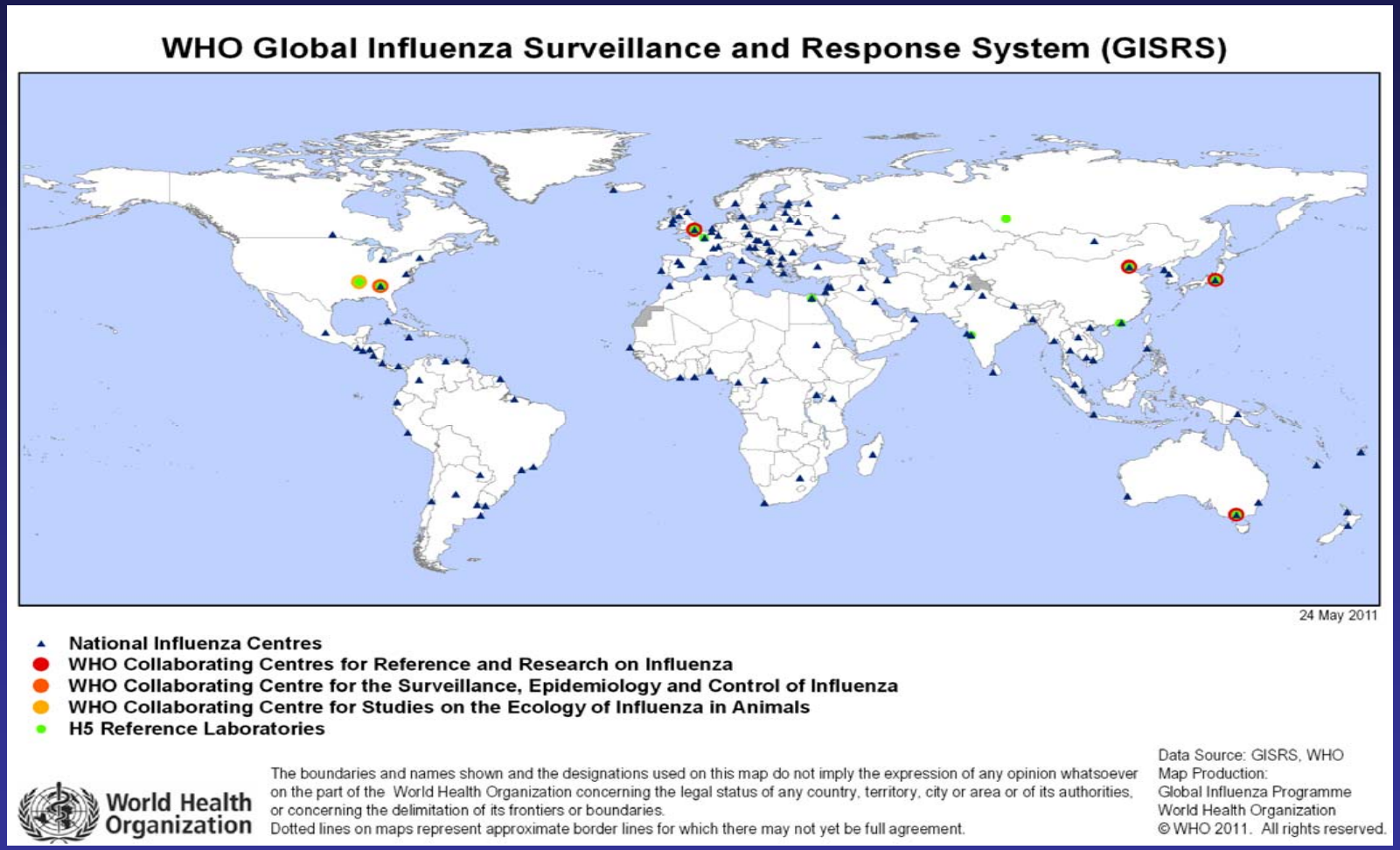
Time

Respiratory Specimens Positive for Influenza in the US and Vaccine Selection, 2007-08



WHO Global Influenza Surveillance and Response System (GISRS)



WHO's Global Influenza Surveillance and Response System (GISRS)

National Influenza Centers (NICs)
[136 Laboratories in 106 Countries]

- Detect and isolate influenza viruses
- Identify viruses and send to International Collaborating Center(s)
- Collect national virologic and epidemiologic information and report to WHO, HQ

International Collaborating Centers
[Atlanta, Beijing, London, Melbourne, Tokyo]

- Analyze influenza viruses received
- Provide data for annual vaccine strain recommendations
- Prepare and distribute candidate
- vaccine strains and reagents

World Health Organization
[Geneva]

- Collect information for the Weekly Epidemiological
- Record and WWW for distribution
- Make vaccine recommendations for NH and SH vaccines

Vaccine Manufacturers

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Considerations for New Vaccine Recommendations

- **Are there new antigenic variants?**
  - Antigenic and genetic characterization
- **Are new variants spreading?**
  - Monitoring Influenza activity and virus isolation nationally and globally
- **Are current vaccines able to induce antibodies to the new variants?**
  - Serological evaluation of vaccinated individuals
- **Can new variants be used for vaccine production?**
  - Egg isolates required with some exceptions
  - High growth reassortants required for vaccine production by manufacturers

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Summary

- Increasing data to demonstrate beneficial effect of vaccines (and antivirals) on reducing severe influenza
- Communication plan will increasingly focus on
  - Severe disease prevention
  - Annual program impact estimates
- Vaccine production is complex and time-sensitive because of annual requirements for updates.

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Influenza Recommendations 2014-2015

Henry H. Bernstein, DO, MHCM, FAAP

Associate Editor, Red Book Online
American Academy of Pediatrics
Professor of Pediatrics
Hofstra North Shore-LIJ School of Medicine

HOFSTRA NORTH SHORE-LIJ
SCHOOL of MEDICINE
AT HOFSTRA UNIVERSITY

Key Messages

- Everyone 6 months and older needs flu vaccine every year
- Vaccine strains are unchanged from last season
- Trivalent and quadrivalent influenza vaccines are available
- When readily available, LAIV should be considered for healthy children 2 – 8 years of age
- Dosing algorithm for children 6 months – 8 years reflects that vaccine strains have not changed
- Egg allergic children should be vaccinated

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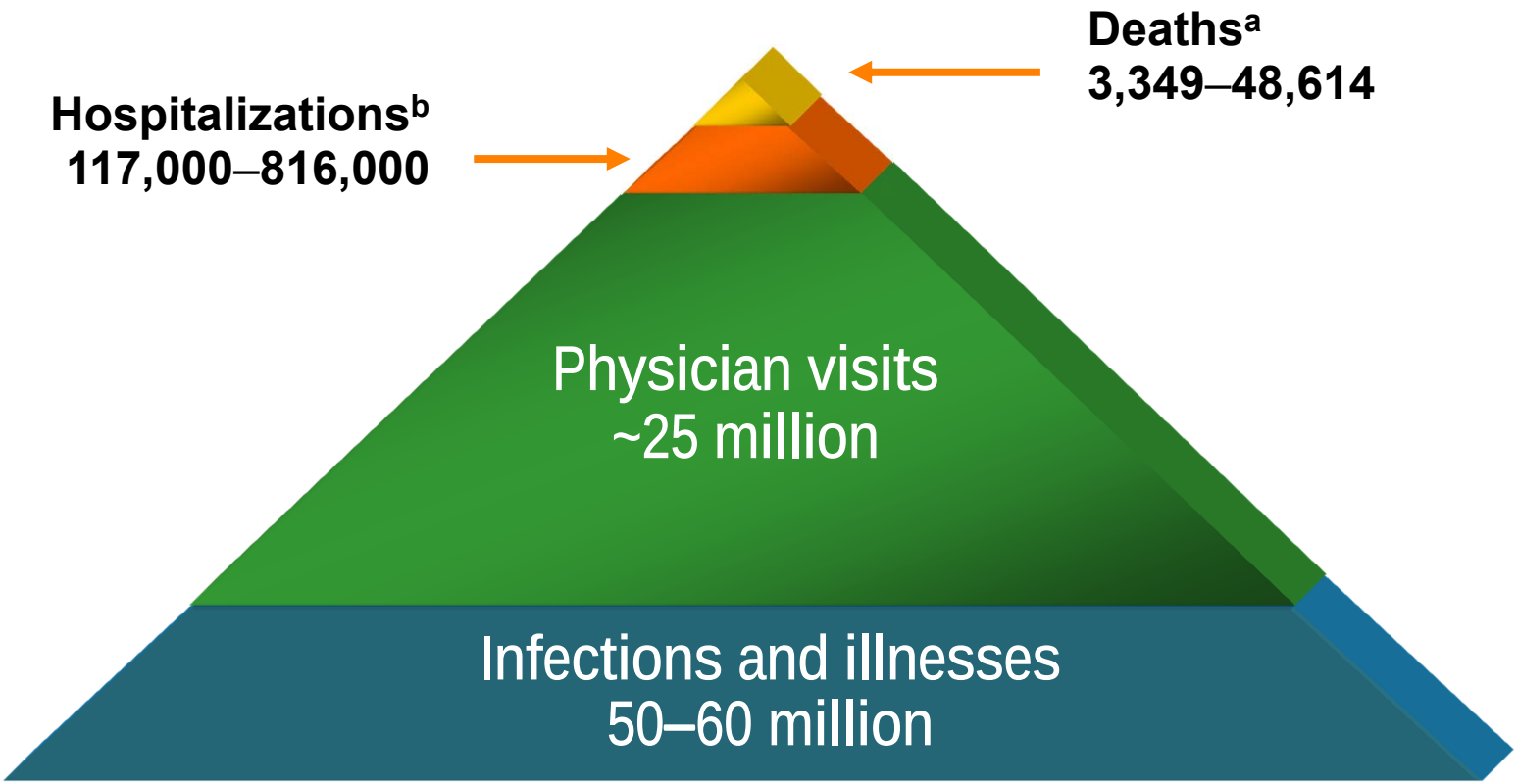
Estimated Vaccine-Preventable Disease Incidence and Deaths in the US

Disease	Annual Cases	Annual Deaths
Influenza[a,b]	61,000,000[c] ('09)	3,349–48,614 ('76– '07)
Pneumococcal disease, invasive (bacteremia & meningitis)[d]	42,000 ('07)	4,500 ('07)
HPV[e] (cervical cancer)	10,520 ('04)	3,900 ('04)
Hepatitis B[f]	4,519 ('07)	719 ('07)
Meningococcal disease[f]	1,077 ('07)	87 ('07)
Hepatitis A[f]	2,979 ('07)	34 ('07)
Varicella[f] (chickenpox)	40,146 ('07)	14 ('07)
Pertussis[f]	10,454 ('07)	9 ('07)

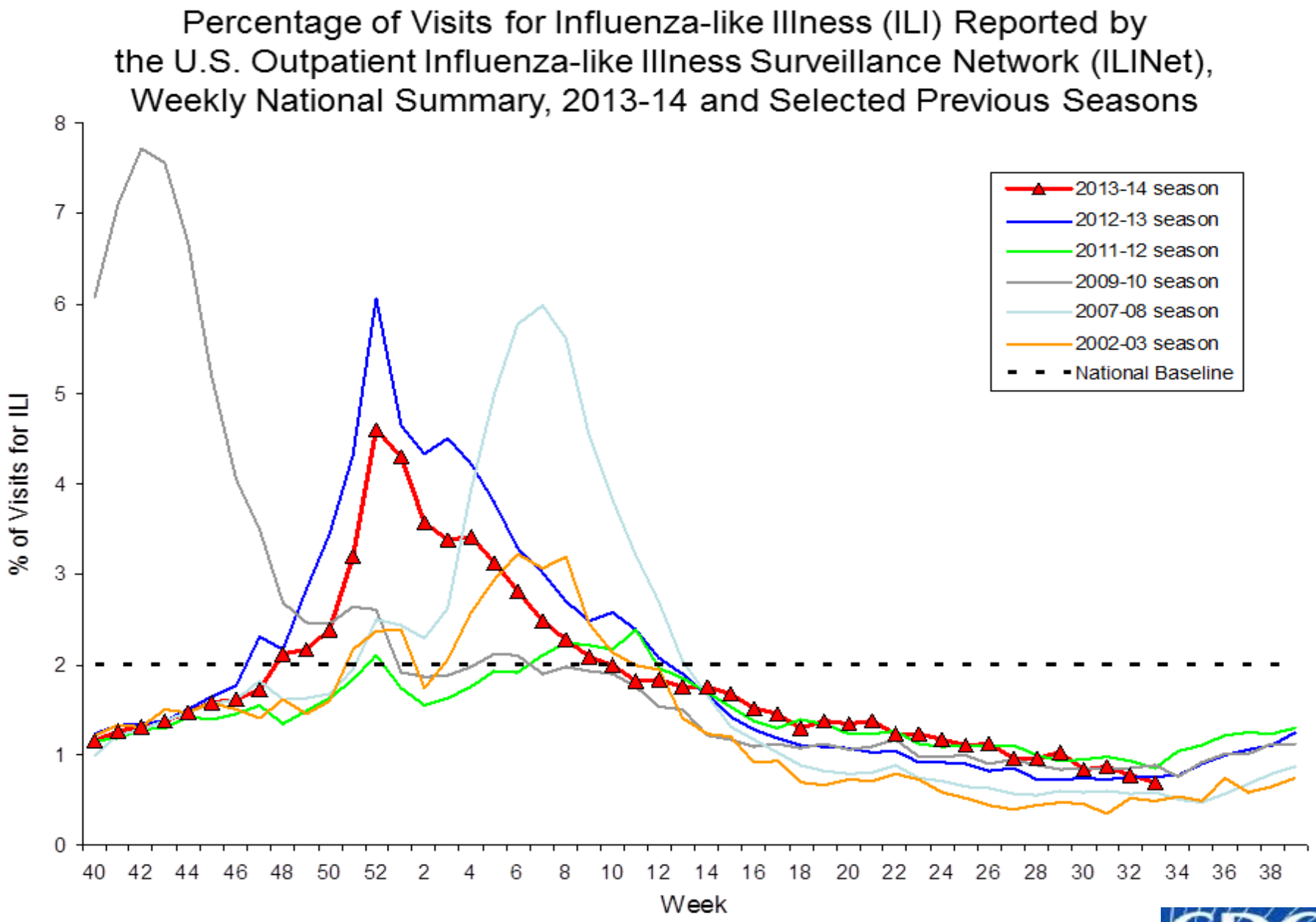
[a] CDC. Updated CDC Estimates of 2009 H1N1 Influenza Cases, Hospitalizations, and Deaths in the US. April 2009 – April 10, 2010. Available at cdc.gov/h1n1flu/estimates)2009_h1n1.htm.
[b] MMWR. 2010: 59 (22): 1057-62. [C] Data based on CDC estimates of 2009 H1N1 cases using statistical modeling.
[d] CDC. ABCs Report: *Streptococcus pneumoniae*, 2007 Available at http://www.cdc.gov/abcs/reports-findings/survreports/spneu04.html.
[e] American Cancer Society. Cancer Facts and Figures 2004. Available at cancer.org/downloads/STT/CAFF_finalPWSecured.pdf.
[f] CDC. *Pink Book*. 12th ed. Available at http://www.cdc.gov/vaccines/pubs/pinkbook/default.htm.

Influenza – How Does it Spread?

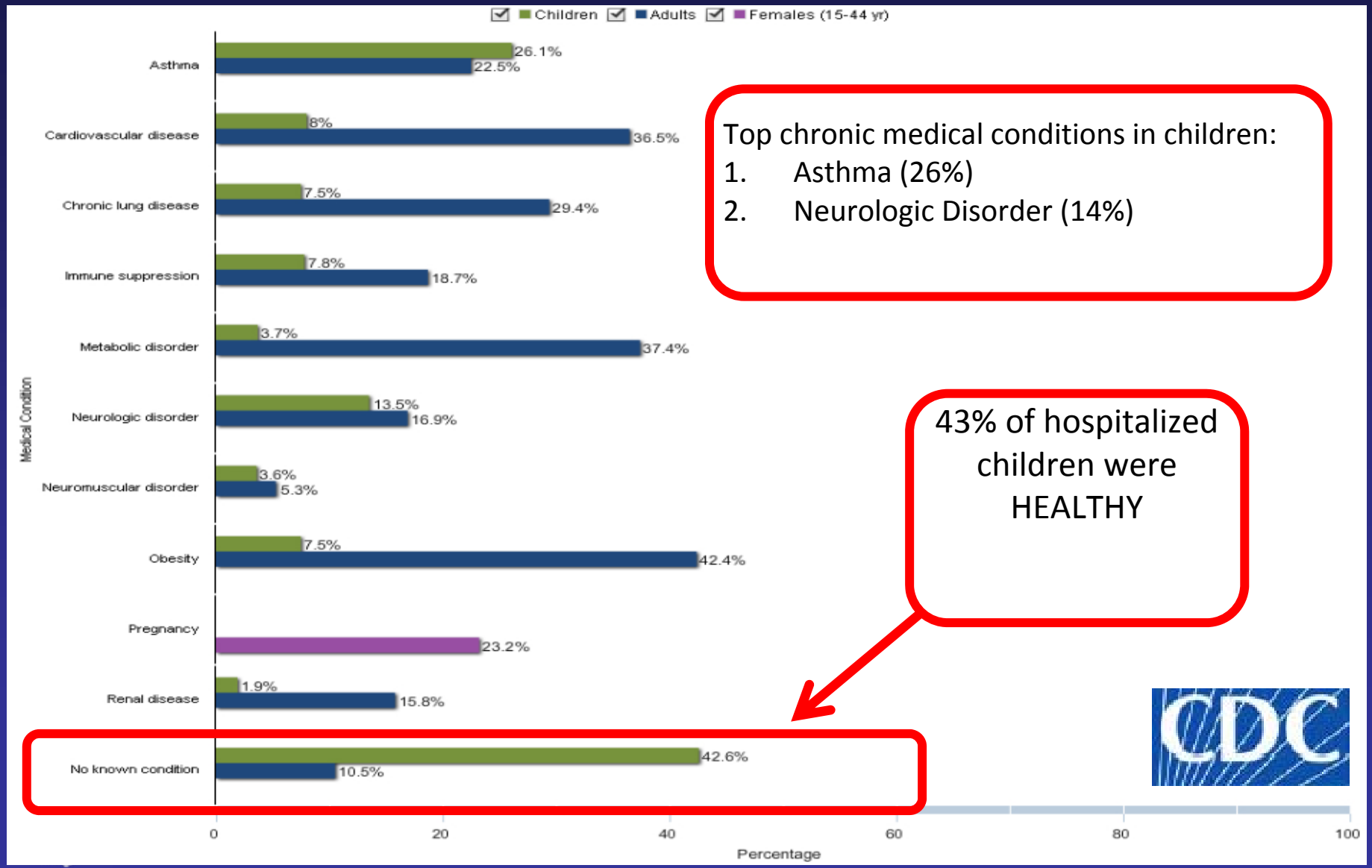
Influenza Disease Burden in the US in an Average Year



[a] *MMWR*. 2010: 59(22):1057–1062.
[B] All-cause hospitalization and mortality associated with influenza virus infection.
Thompson WW, et al. *JAMA*. 2003;289:179; Thompson WW, et al. *JAMA*. 2004;292:1333; Couch RB. *Ann Intern Med*. 2000;133:992; Patriarca PA. *JAMA*. 1999;282:75;ACIP. *MMWR*. 2004;53(RR06):1.


Percentage of Visits for Influenza-like Illness (ILI) Reported by the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet), Weekly National Summary, 2013-14 and Selected Previous Seasons
% of Visits for ILI
0
1
2
3
4
5
6
7
8
40 42 44 46 48 50 52 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38
Week
2013-14 season
2012-13 season
2011-12 season
2009-10 season
2007-08 season
2002-03 season
National Baseline

Selected underlying medical conditions in patients hospitalized w/ influenza 2013-2014

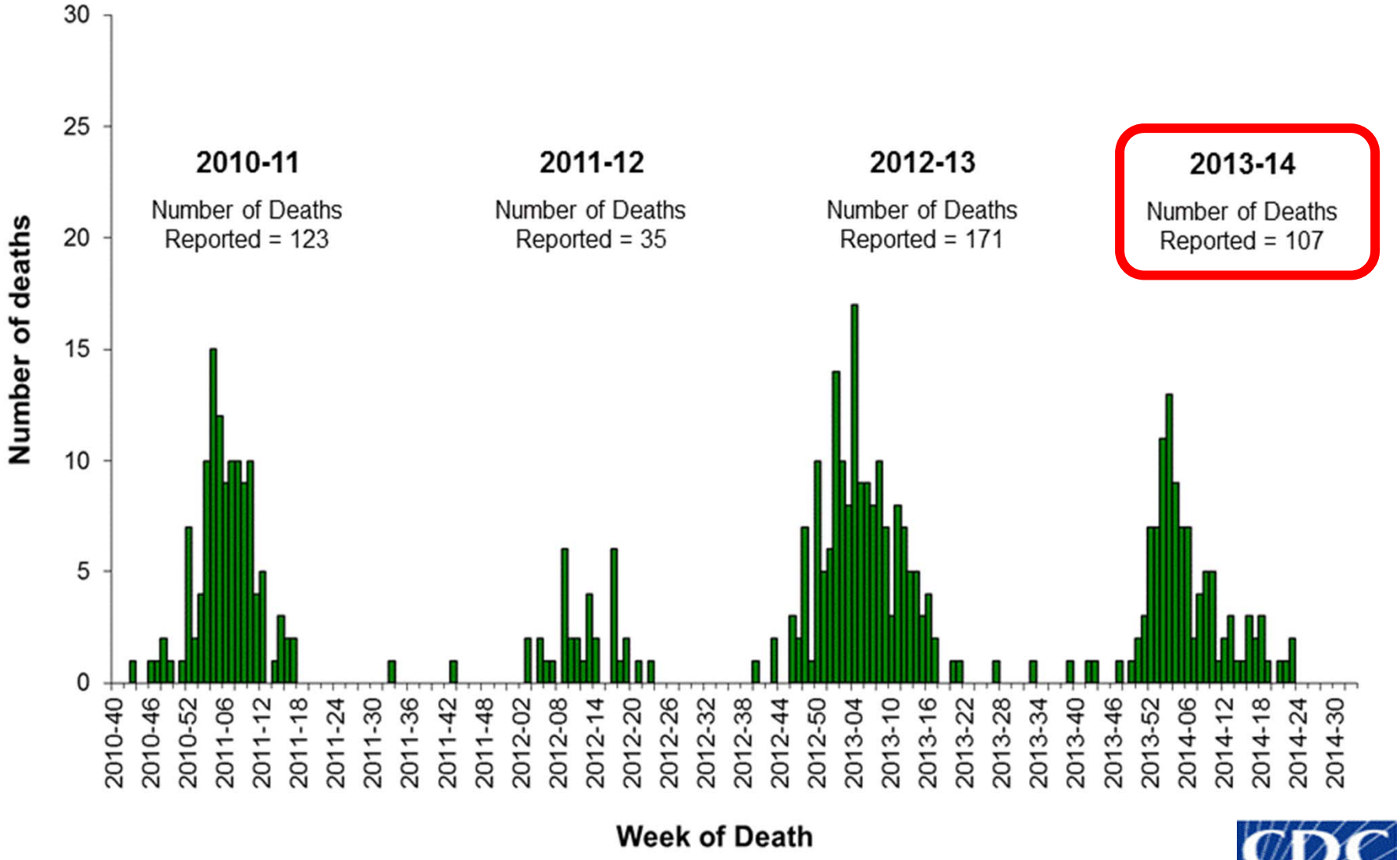


Top chronic medical conditions in children:

1. Asthma (26%)
2. Neurologic Disorder (14%)

43% of hospitalized children were HEALTHY

Number of Influenza-Associated Pediatric Deaths by Week of Death: 2010-11 season to present



2013-14 US Influenza Season (compared with 2012-2013)

- Influenza A (pH1N1) most common strain
- ↓ outpatient visits for ILI
- ↓ rates of hospitalizations
- ↓ deaths from pneumonia and influenza

MMWR. 2014: 63(22);483-490

2014-15 Seasonal Influenza Vaccine Strains

Trivalent

- A/California/7/2009 (H1N1)-like virus
- A/Texas/50/2012 (H3N2) virus
- B/Massachusetts/2/2012-like virus (B/Yamagata lineage)

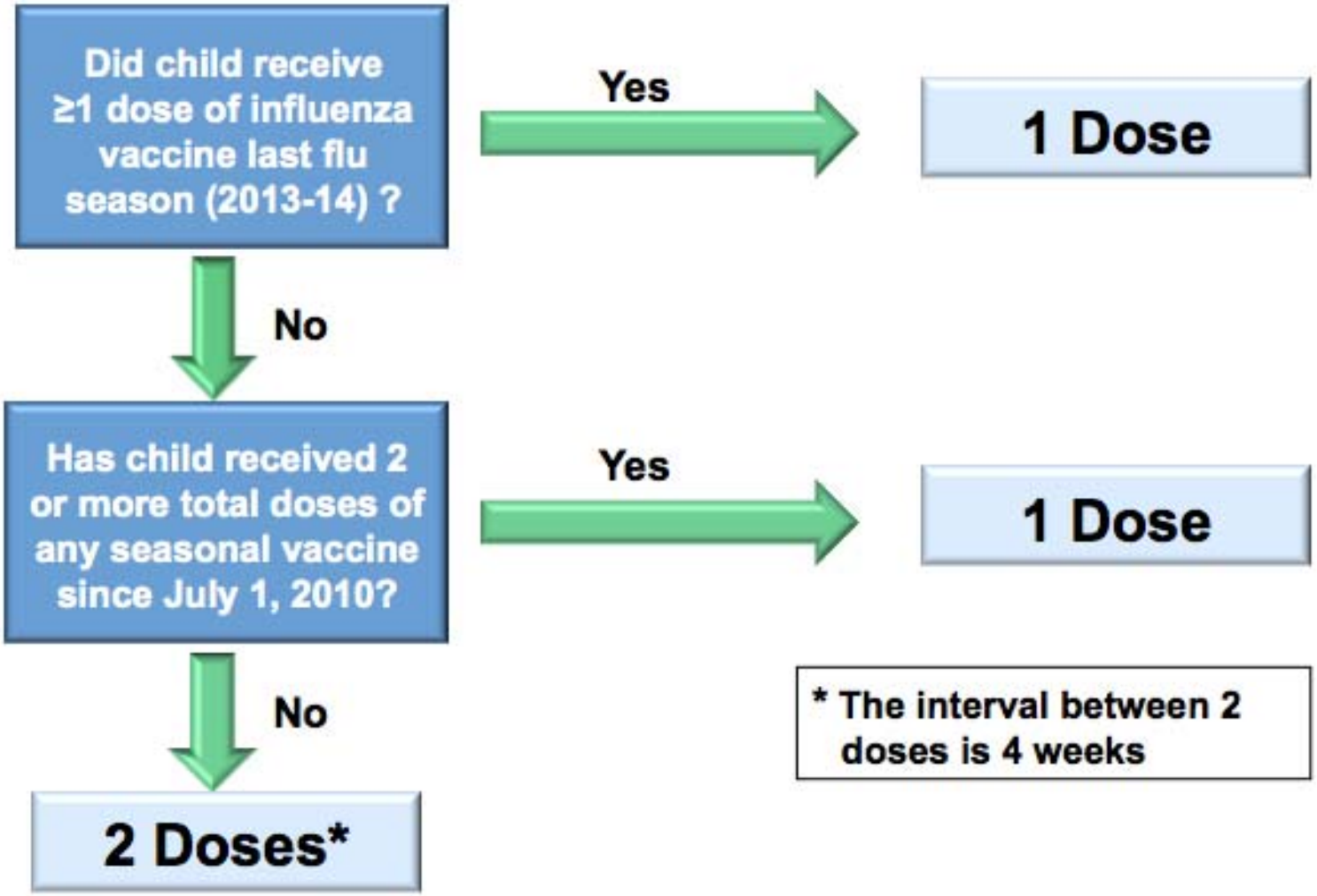
Quadrivalent

- Adds B/Brisbane/60/2008-like virus (B/Victoria lineage)

All strains are unchanged from last season

<u>All people</u> 6 months of age and older should get flu vaccine every year

Number of Seasonal Influenza Doses for Children 6 Months – 8 Years



Special Populations to Reach

Children

Health Care Personnel

Household Contacts of High Risk Children and All Children <5

Pregnant Women

LAIV vs. IIV

- ↑ relative efficacy of LAIV vs. IIV among younger children
- Consider LAIV for healthy children 2 – 8 years of age when available
- Use IIV when LAIV is not readily available
- Do not delay vaccination waiting for LAIV

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GRADE Analysis

- Quality of evidence (high to very low)
- Strength of recommendation (strong/weak)
- Balance of health benefits and risks
- Value judgments to be transparent
- Resource allocation/health economics

CDC. New Framework (GRADE) for Development of Evidence-Based Recommendations by the Advisory Committee on Immunization Practices. MMWR. 2012;61(18):327.

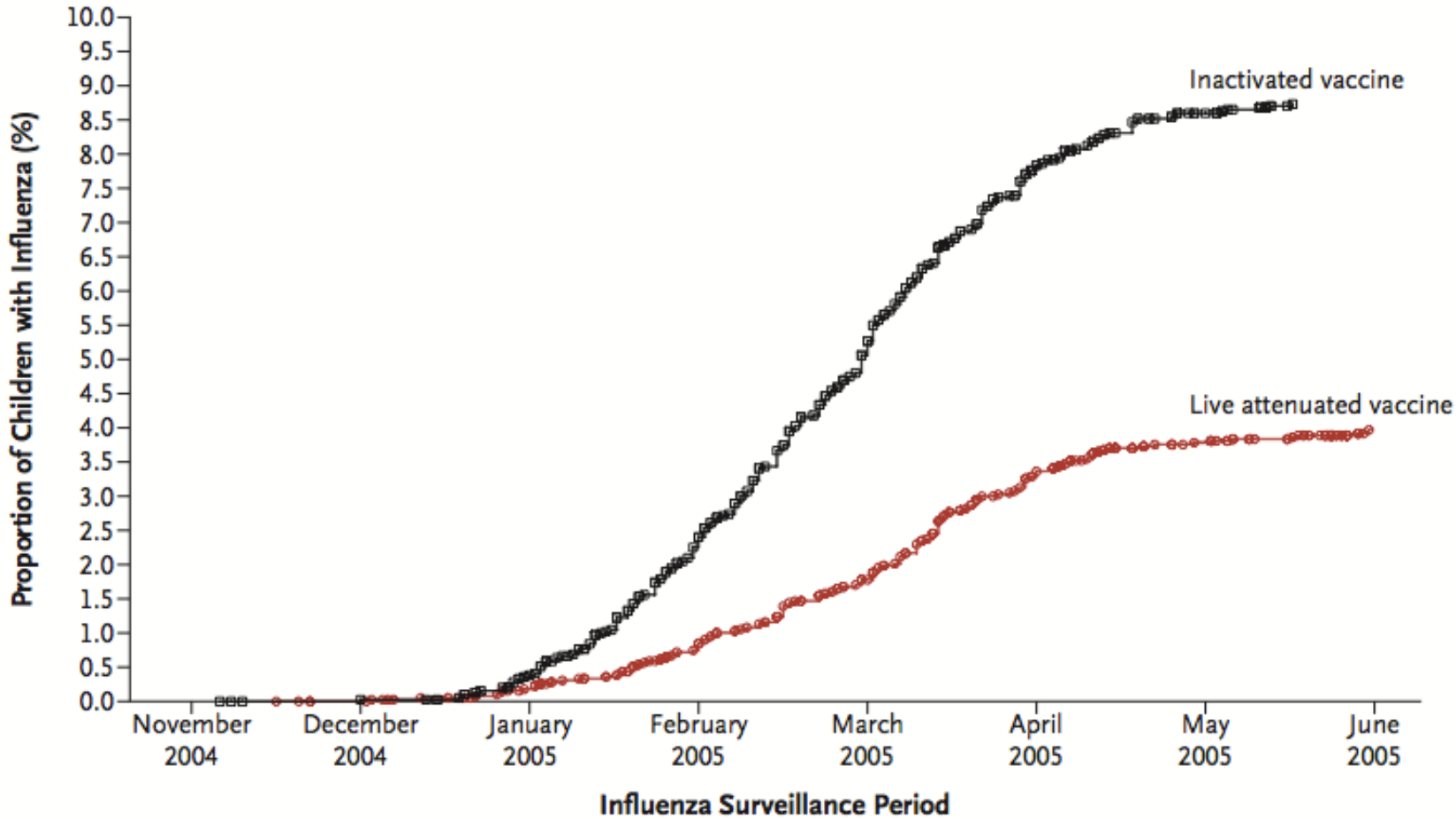
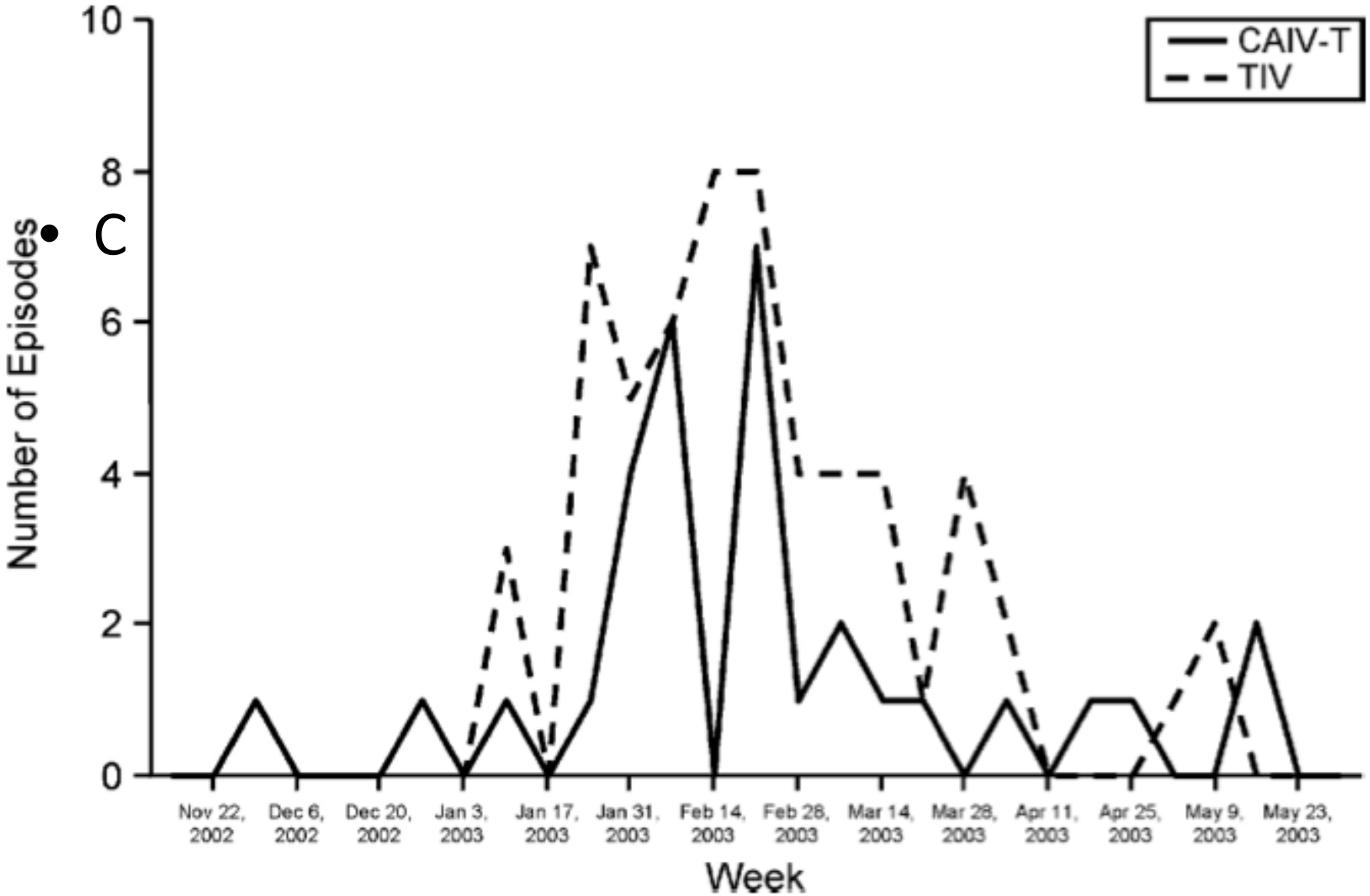


Figure 1. Kaplan–Meier Curves for the Time to the First Culture-Confirmed Report of Influenza in the Two Vaccine Groups.

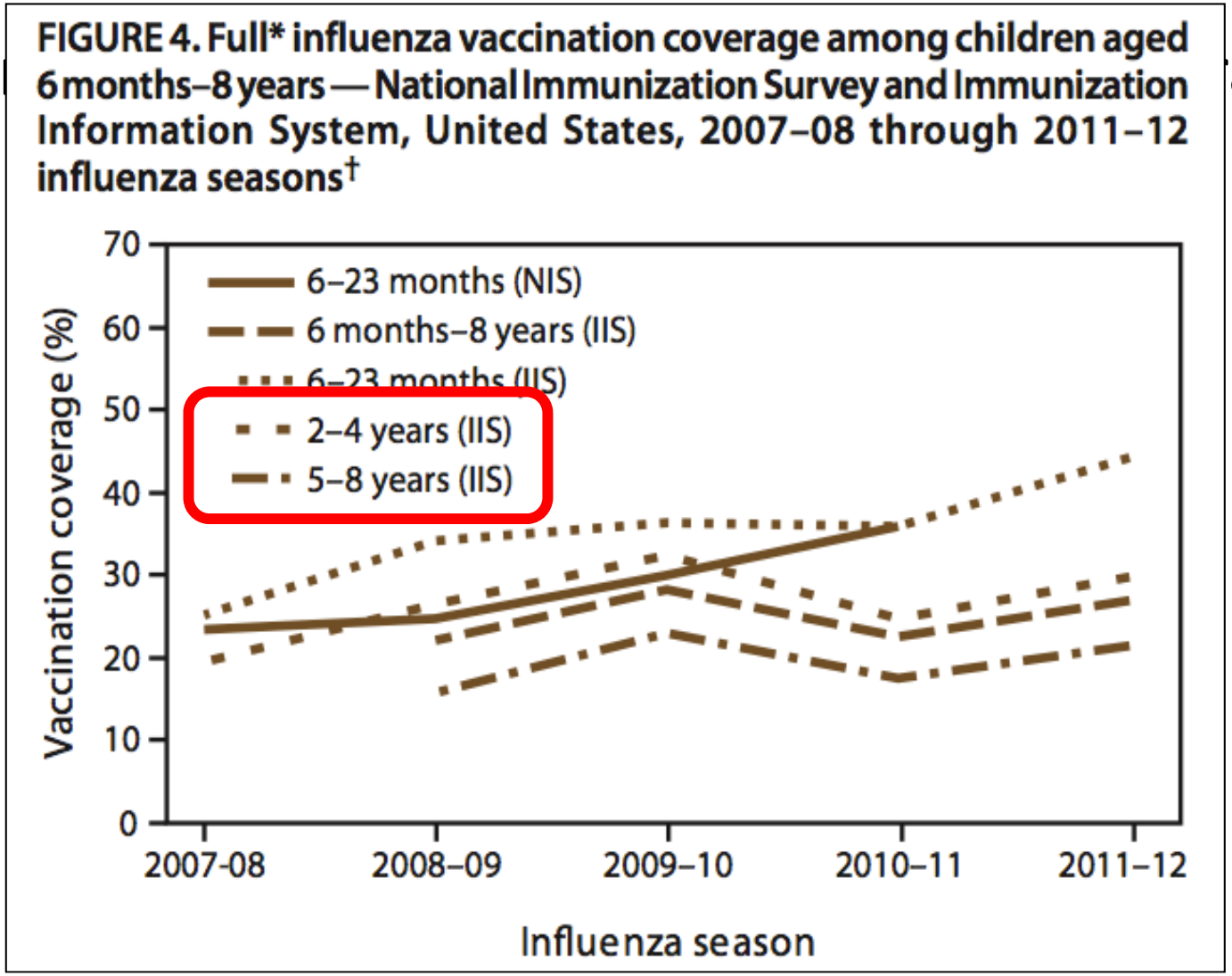
Belshe RB, et al. Live attenuated versus inactivated influenza vaccine in infants and young children. N Engl J Med. 2007 Feb 15;356(7):685-96.



- C

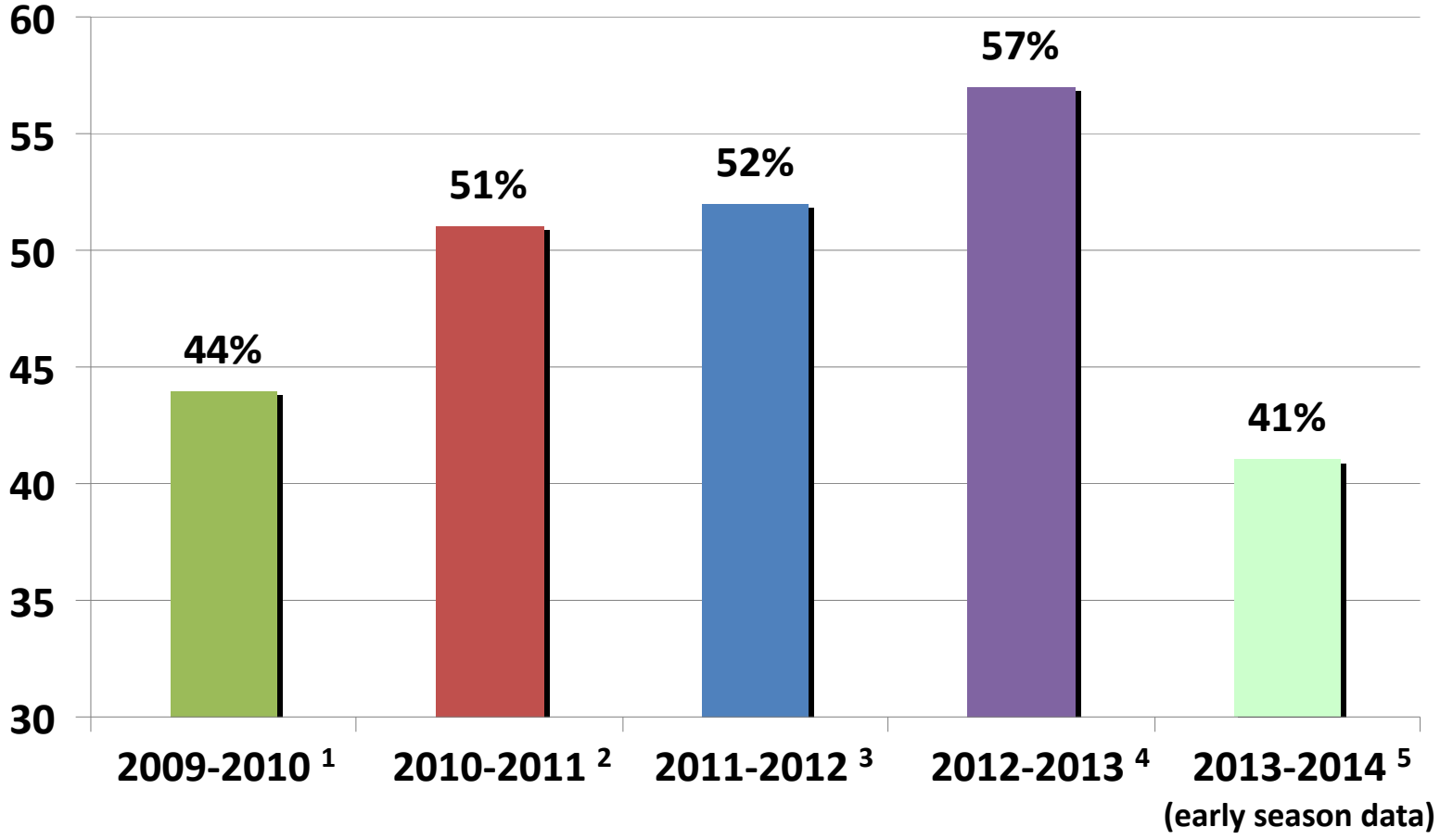
Ashkenazi S, et al. Superior relative efficacy of live attenuated influenza vaccine compared with inactivated influenza vaccine in young children with recurrent respiratory tract infections. Pediatr Infect Dis J. 2006 Oct;25(10):870-9.

Su age



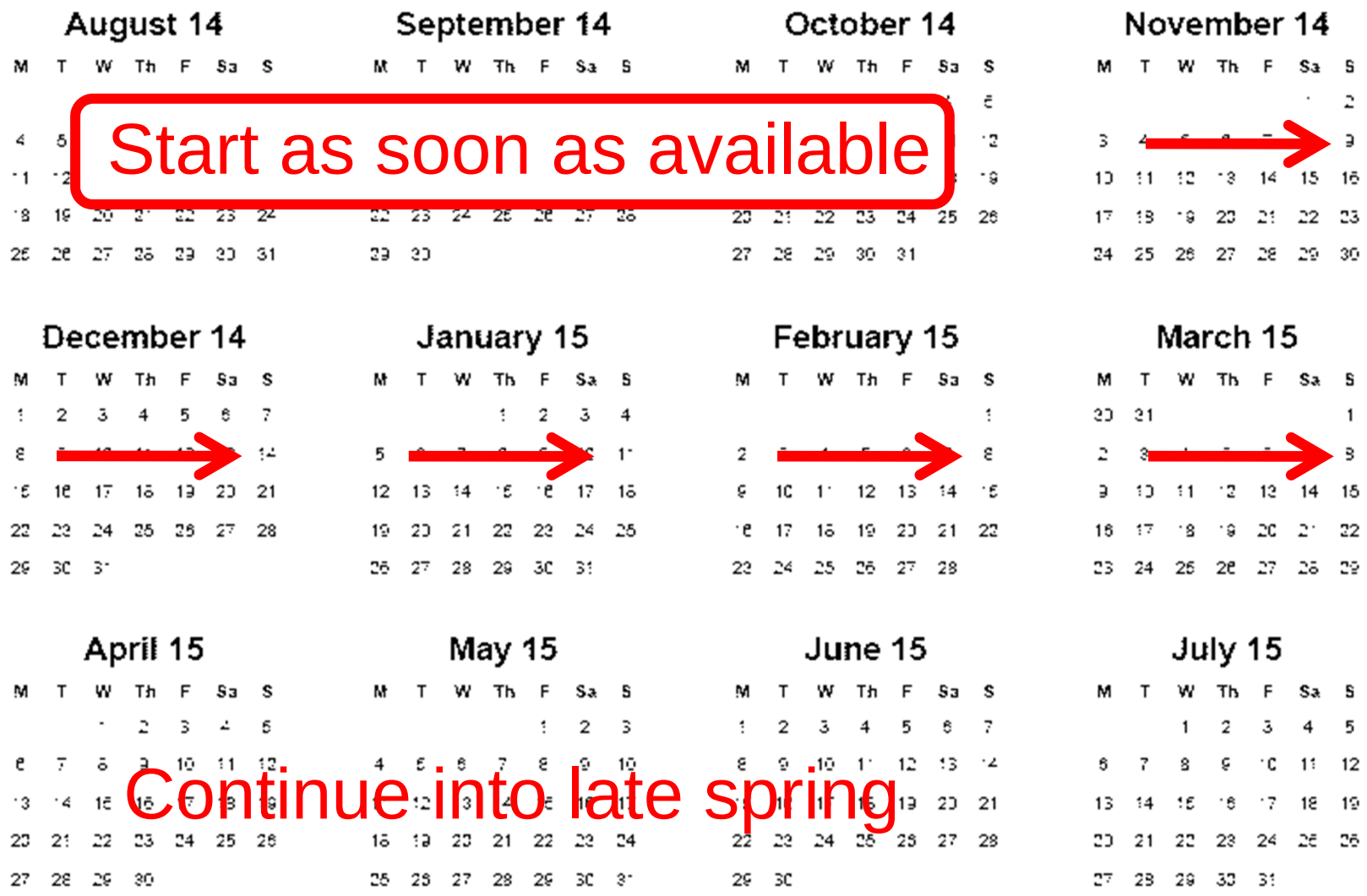
Centers for Disease Control and Prevention (CDC). Surveillance of influenza vaccination coverage--UnitedStates, 2007-08 through 2011-12 influenza seasons. MMWR Surveill Summ. 2013 Oct25;62(4):1-28.

Influenza Vaccine Coverage for Children 6 Months to 17 Years



[1] BRFSS and National 2009 H1N1 Flu Survey estimates, 2009–10. Online at: http://www.cdc.gov/flu/professionals/vaccination/coverage_0910estimates.htm.
[2] BRFSS and NIS estimates, 2010–11. Online at: http://www.cdc.gov/flu/professionals/vaccination/coverage_1011estimates.htm
[3]NIS estimates, 2011-2012. Online at http://www.cdc.gov/flu/professionals/vaccination/coverage_1112estimates.htm:
[4]NIS estimates, 2012-2013. Online at http://www.cdc.gov/flu/fluvaxview/coverage-1213estimates.htm
[5]Early NIS estimates, 2013-2014. Online at http://www.cdc.gov/flu/fluvaxview/nifs-estimates-nov2013.htm

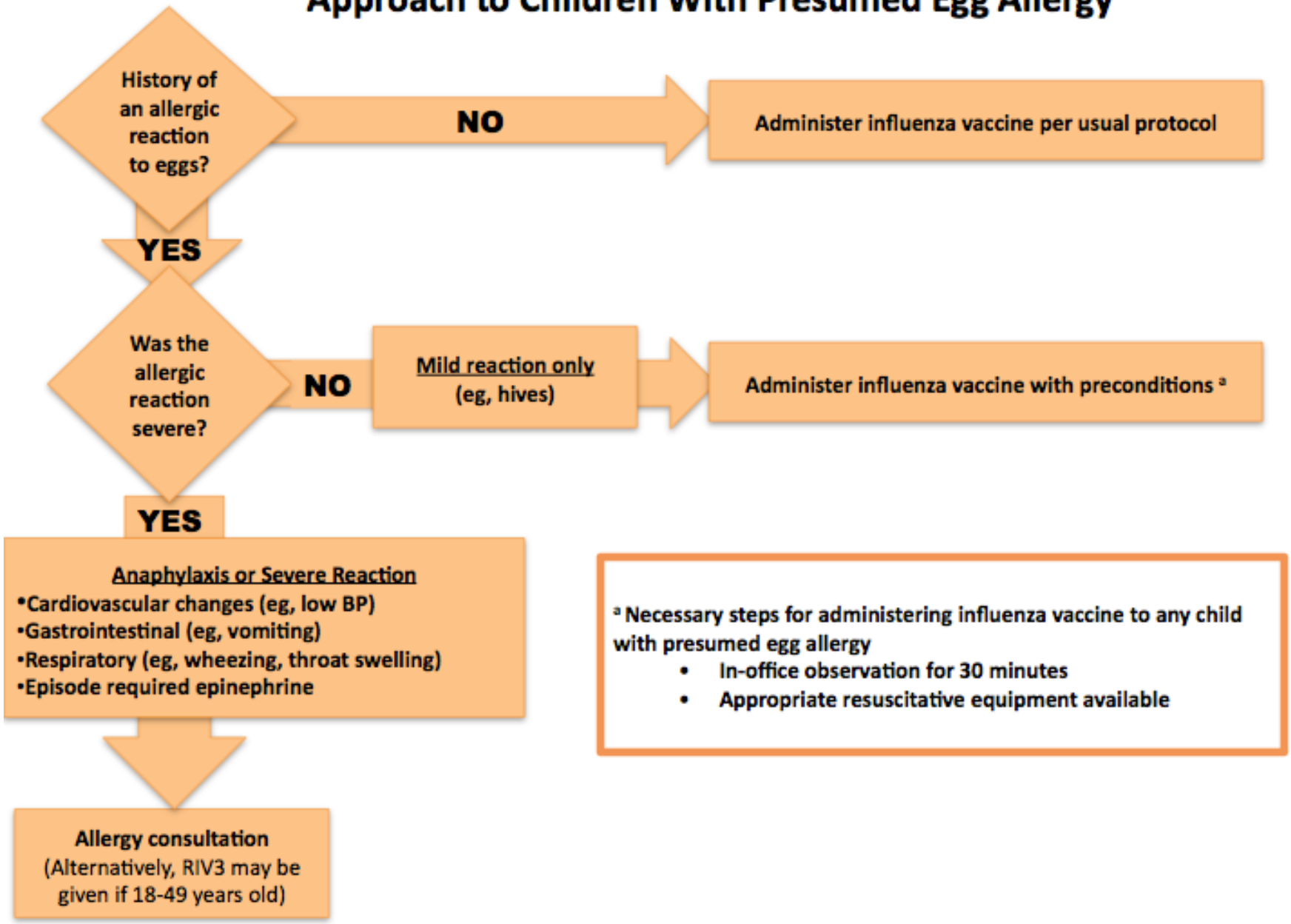
Offer Vaccine Throughout Year



Make Vaccine Easily Accessible

- Alert families via e-mails, texts, or patient portals
- Create influenza clinics
- Extend office hours during peak vaccination periods
- Administer vaccine during both well and sick visits
- Immunize parents, adult caregivers, and siblings
- Work with other institutions or alternative care sites

Approach to Children With Presumed Egg Allergy

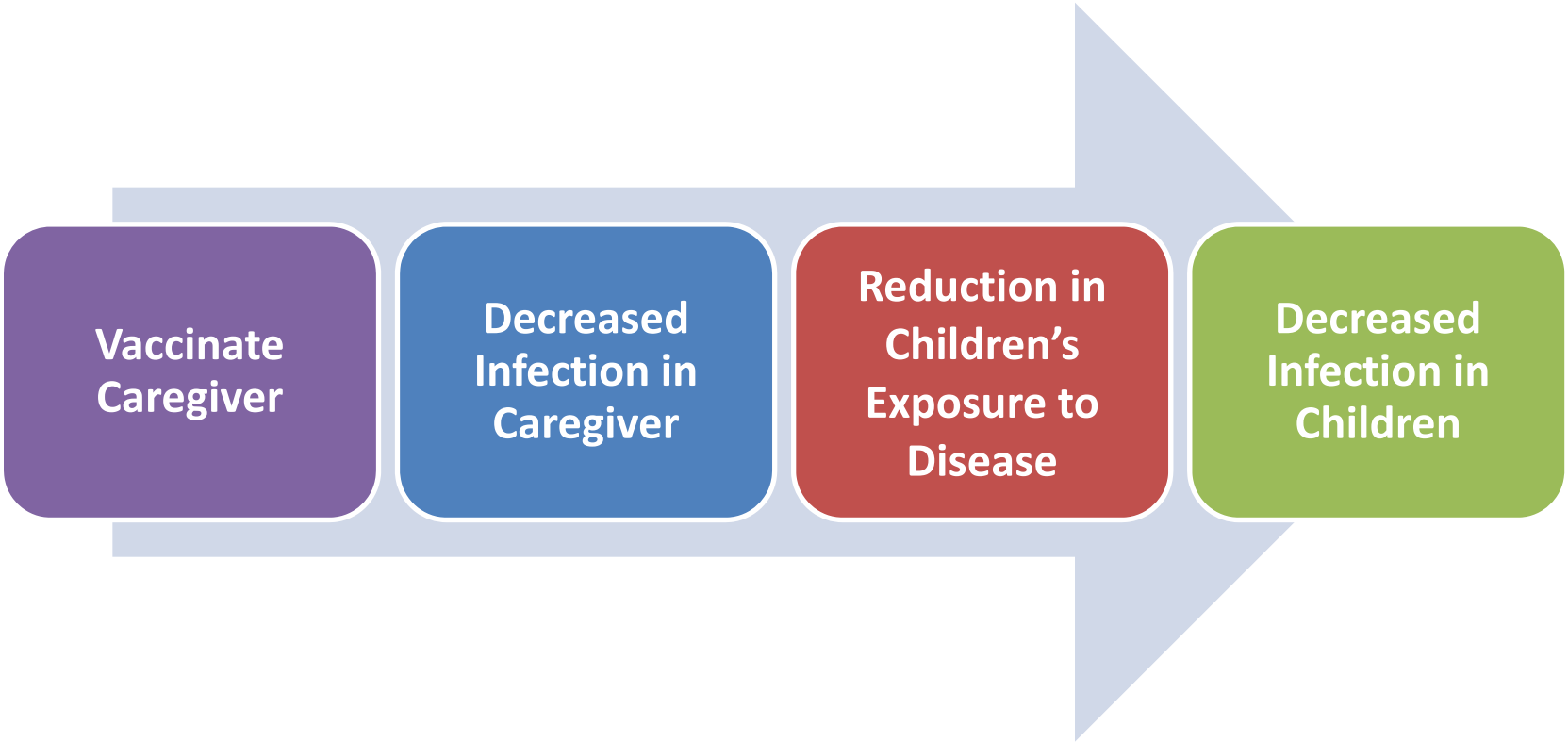


[a] Necessary steps for administering influenza vaccine to any child with presumed egg allergy

- In-office observation for 30 minutes
- Appropriate resuscitative equipment available

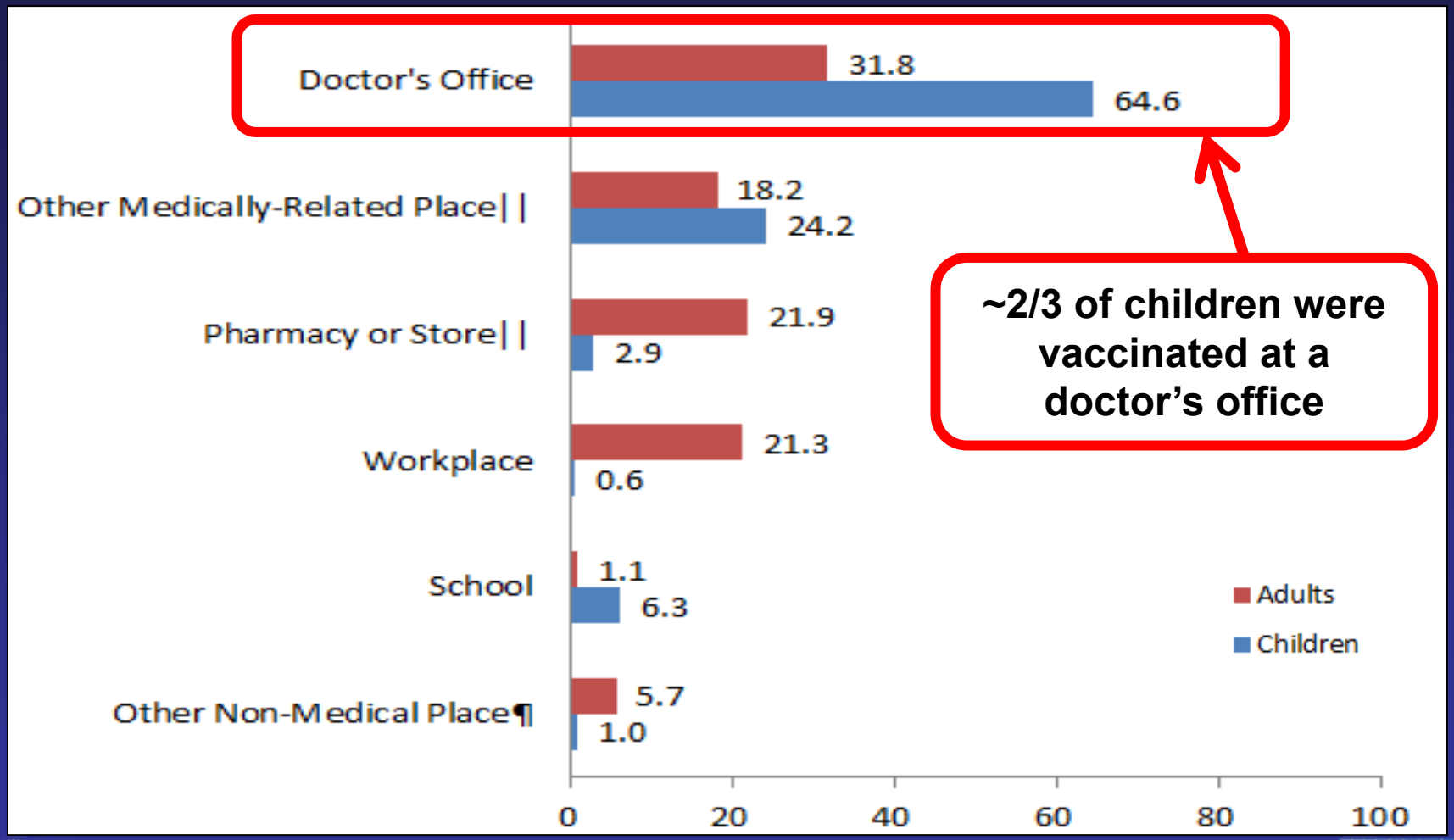
Does Cocooning Make Sense?

Vaccination strategy which aims to protect children from disease by immunizing caregivers:



Place of Vaccination for Children and Adults

Early 2013-14 season, National Flu Survey



‡ includes hospitals, clinics or health centers, local health departments, and other.

Source: CDC. Available online at: http://www.cdc.gov/flu/fluvaxview/nifs-estimates-nov2013.htm

	Antiviral Medications		
Expected 2014–2015 Viruses	Adamantanes (Amantadine/Rimantadine)	Oseltamivir (Tamiflu)	Zanamivir (Relenza)
Seasonal influenza A (H1N1) virus (derived from 2009 pandemic)	Resistant	Susceptible	Susceptible
Seasonal influenza A (H3N2) virus	Resistant	Susceptible	Susceptible
Seasonal influenza B virus (either lineage)	Resistant	Susceptible	Susceptible

Oseltamivir Dosing for Term and Preterm Infants Younger Than 1 Year

Age	Treatment (mg/kg/dose po BID x 5 days)	Chemoprophylaxis (mg/kg/dose po QD x 10 days)
Term 0 to <9	3.0	• 3.0 for infants 3 - 8 mo • Not recommended for infants <3 mo
Term **9 to <12 mo**	**3.5**	**3.5**
Preterm	**Varies based on postmenstrual age***	**Not recommended**

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Key Messages(2)

- Everyone 6 months and older needs flu vaccine every year
- Vaccine strains are unchanged from last season
- Trivalent and quadrivalent influenza vaccines are available
- When readily available, LAIV should be considered for healthy children 2 – 8 years of age
- Dosing algorithm for children 6 months – 8 years reflects that vaccine strains have not changed
- Egg allergic children should be vaccinated

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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Seasonal Flu Surge and the Emergency Department

Brent D. Kaziny, MD, MA

Assistant Professor

Department of Pediatrics

Section of Emergency Medicine

Baylor College of Medicine

Texas Children's Hospital

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Why Should We Care?

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H1N1

- **2009 H1N1 Flu Pandemic**
- Spread from outbreak in Mexico
- CDC H1N1 estimates:
  - 59 million Americans contracted H1N1
  - 265,000 hospitalized
  - 12,000 deaths

H1N1 and Children

- Children age 0-24: **72.6%** of cases
- Children age 0-24: **56.4%** of hospitalizations

- 2/3rds of the 300 children <18 yo who died had underlying pulmonary or neurological conditions

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Disaster Planning and Children

- Significant need to improve level of pediatric preparedness in the US
- 2008 survey by the CDC[1]:
  - Only 32.4% of hospitals had guidelines for increasing pediatric surge capacity
  - Only 34% of hospitals had plans for reunification of children with families
  - Only 42.6% of hospitals had a tracking system for accompanied and unaccompanied children

[1]Niska, R, et al. *Hospital Preparedness for Emergency Response: United States, 2008*. National Health Statistics Reports. Number 37, March 24, 2011.

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Disaster Planning and Children

- AAP Opinion Poll – October 2010[2]
- Telephone survey conducted by Marist College Institute for Public Opinion
  - 1,030 US residents > 18 yo
  - Opinions remained consistent across various demographics, including region, household income, education, age, race, gender and political party
- Majority of people surveyed supported giving higher priority to children and their needs over adults

[2]Marist College Institute for Public Opinion, American Academy of Pediatrics, National Survey, October 2010

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Planning Prior to the Surge

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Preparing the Institution

- Influenza vaccination among health care workers (HCW)
  - Currently only about 2/3rds of HCWs[3]
- Strategies for improving vaccination rates[4]
  - Improving education for HCW
  - Improving ease of delivery
- Working with HCW who refuse to vaccinate[5]

[3] *Influenza vaccination coverage among health-care personnel: 2011-12 influenza season, United States.* MMWR. 2012 Sep 28;61:753-7.

[4] Chen, S, et al, *Factors influencing uptake of influenza A (H1N1) vaccine amongst healthcare workers in a regional pediatric centre: Lessons for improving vaccination rates,* Vaccine, Vol 30, Issue 2, Jan 2012, 493-497.

[5] Feemster, et al, *Employee designation and health care worker support of an influenza vaccine mandate at a large pediatric tertiary care hospital,* Vaccine, Vol 29 Iss 9, Feb 2001, pages 1762-1769.

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Preparing the Institution[6]

- Plan to work without all your available staff
  - Anticipate 20-50% absenteeism
- Protect your HCWs
  - Promote hand hygiene and use of PPE
  - Have PPE available

[6]CDC: Medical Offices And Clinics Pandemic Influenza Planning Checklist
Available at: http://pandemicflu.gov/professional/pdf/medofficesclinics.pdf

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Preparing Those at Risk

- Current vaccination rates among at-risk populations
  - >50%, but needs to be improved upon[7]
- Improving current rates of vaccination among our at-risk populations
  - Using ED encounters to remind parents to vaccinate
- Strategies for improved vaccination rates

[7]http://www.cdc.gov/vaccines/acip/meetings/downloads/slides-oct-2013/03-Influenza-Singleton.pdf

Preparing Our Primary Care Partners

- Identify networks of primary care physicians (PCPs)
  - Both within and outside your home hospital network
- Share CDC and AAP information regarding:
  - Strategies for testing
  - Strategies for treating
  - When to refer to the ED
- Share with PCPs patient and parental expectations for their ED visit should they be referred

Preparing Outside Hospitals

- For the children's hospital in the region:
  - Share similar information regarding testing and treatment strategies as released via CDC and AAP
- For the general hospital in the region:
  - Find a contact either in the ED or in Infectious Disease (ID) at the children's hospital that can share with you the latest information regarding these topics and disseminate them to your staff

Building Coalitions

- Ideally, this works best through preexisting coalitions of hospitals throughout the region
- Such coalitions can prove beneficial in multiple settings (mass casualty, pandemic, etc.) but the seasonality and annual nature of flu surge is a good testing ground for these relationships

Monitoring the Coming Surge

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Create an Advance Warning System

- The Big Picture
  - The CDC "Flu View" site[8]

[8]http://www.cdc.gov/flu/weekly/fluactivitysurv.htm

Create an Advance Warning System (2)

- Your Region
  - Use these above mentioned networks of PCPs and Hospitals
  - Buoys out in the water
  - Flu tests being sent and Oseltamivir prescriptions in the community

Create an Advance Warning System (3)

- Your Hospital
  - Random surveillance testing as Flu season approaches
    - Testing patients presenting to the ED in triage at no charge to the patient, choose random days (i.e. every Tuesday)
  - Follow testing being done through your hospitals lab
  - Monitor percentage of positive tests in an attempt to predict surge

Create an Advance Warning System

- Your Hospital
  - The National Emergency Department Overcrowding Scale (NEDOCS)
  - A real-time early warning sign
  - Shows state of overcrowding
  - Has been validated in general EDs[9]

[9]Hoot, N et al, *An Early Warning System for Overcrowding in the Emergency Department,* AMIA Annu Symp Proc. 2006; 2006: 339–343

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Scalable Surge Response

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Changes to Patient Flow

- Identify ways to restructure current resources to allow for improved efficiency and patient throughput[10]
  - Triage based screening tools
  - Separate waiting rooms for patients with influenza-like illness (ILI)
  - Streamlined charting for patients with ILI
  - Discharge videos reviewing flu basics

[10]Fagbuyi, D, et al, *A Rapid Medical Screening Process Improves Emergency Department Patient Flow During Surge Associated With Novel H1N1 Influenza Virus,* Annals of Emergency Medicine, Vol. 57, Issue 1, Jan. 2011, Pg 52-59.

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Increasing In-House Support

- Surge Staffing
  - Have additional staffing available (if possible)
  - Identify triggers for activating these additional resources
    - Hospital-specific metrics

Coalition Support

- Needs to work as a “two way street”
  - The children’s hospital should provide assistance with patient care remotely as influx of more ill patients may flood outside facilities
  - This could be via telemedicine programs and/or pre-surge educational modules
  - The community hospital must recognize the stress placed on the children’s hospital and attempt to buffer the specialty facility from those “worried-well” and non-critical patients

Massive Response

- Mobile Pediatric Emergency Response Team (MPERT) Model
  - Creation of an additional resource (clinical area, mobile ED, etc)[11]
  - Requires significant resources
  - Families and caregivers are both amendable to care in a non-traditional setting[12]

[10]Cruz, et al, *Outside the Box and Into Thick Air: Implementation of an Exterior Mobile Pediatric Emergency Response Team for North American H1N1 (Swine) Influenza Virus in Houston, Texas,* Annals of Emergency Medicine, Vol 55, Iss 1, Jan 2010, Pg 23-21.

[11]Laso, C, et al, *Mobile Pediatric Emergency Response Team: Patient Satisfaction During the Novel H1N1 Influenza Outbreak,* Academic Emergency Medicine, Vol. 19, No. 3, March 2012, 274-279.

Available Resources

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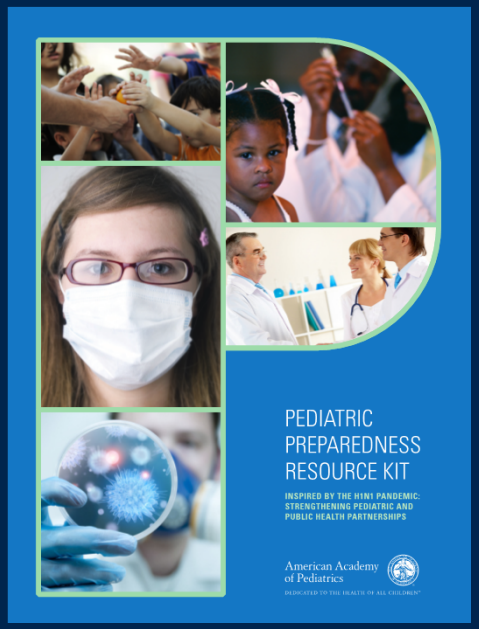
Pediatric Preparedness Resource Kit

- Available online as a PDF at:
  - http://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/Children-and-Disasters/Documents/PedPreparednessKit.pdf



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References

- Three day workshop presented by the CDC
- Multiple children's hospitals applied
- Primary Children's Medical Center/ University of Utah selected
- Significant focus on coalition building
- More information and lessons learned to come…

Thank you!

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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

References (2)

- Niska, R, et al. *Hospital Preparedness for Emergency Response: United States, 2008*. National Health Statistics Reports. Number 37, March 24, 2011
- Marist College Institute for Public Opinion, American Academy of Pediatrics, National Survey, October 2010
- *Influenza vaccination coverage among health-care personnel: 2011-12 influenza season, United States.* MMWR. 2012 Sep 28;61:753-7.
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- http://www.cdc.gov/vaccines/acip/meetings/downloads/slides-oct-2013/03-Influenza-Singleton.pdf
- http://www.cdc.gov/flu/weekly/fluactivitysurv.htm
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  - "Click" the Q&A tab at the top left of the webinar tool bar
  - "Click" in the white space
  - "Type" your question
  - "Click" ask
- **On the Phone**
  - Press Star (*) 1 to enter in the queue to ask a question
  - State your name
  - Listen for the operator to call your name
  - State your organization and then ask your question

Thank you for joining!
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