Influenza Activity Update

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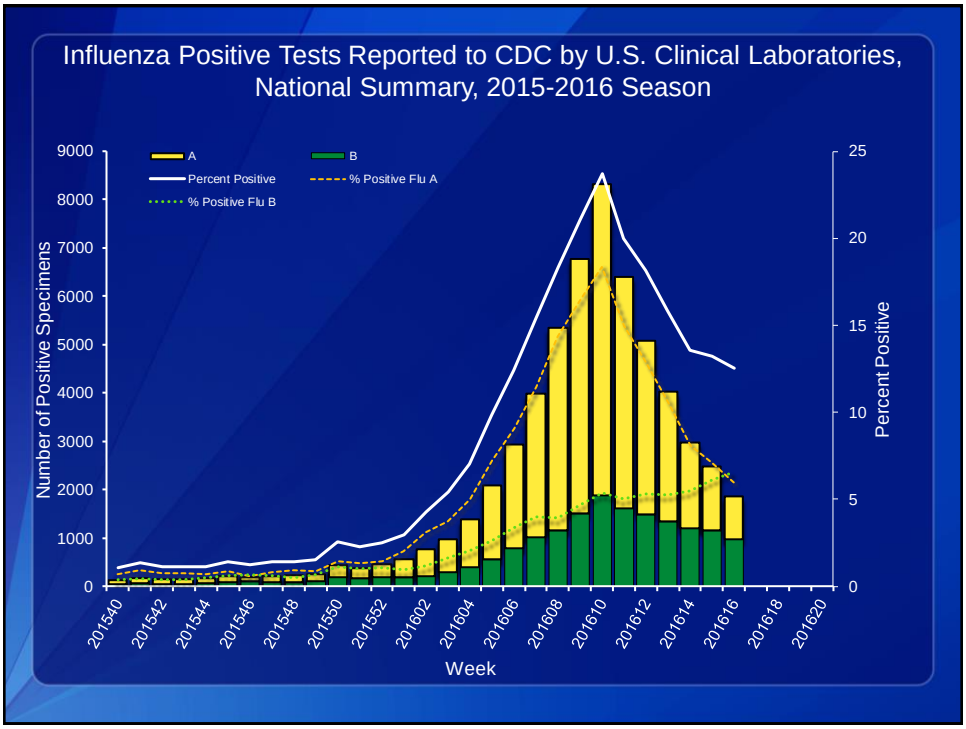
2016 National Adult Influenza Immunization Summit
May 12, 2016

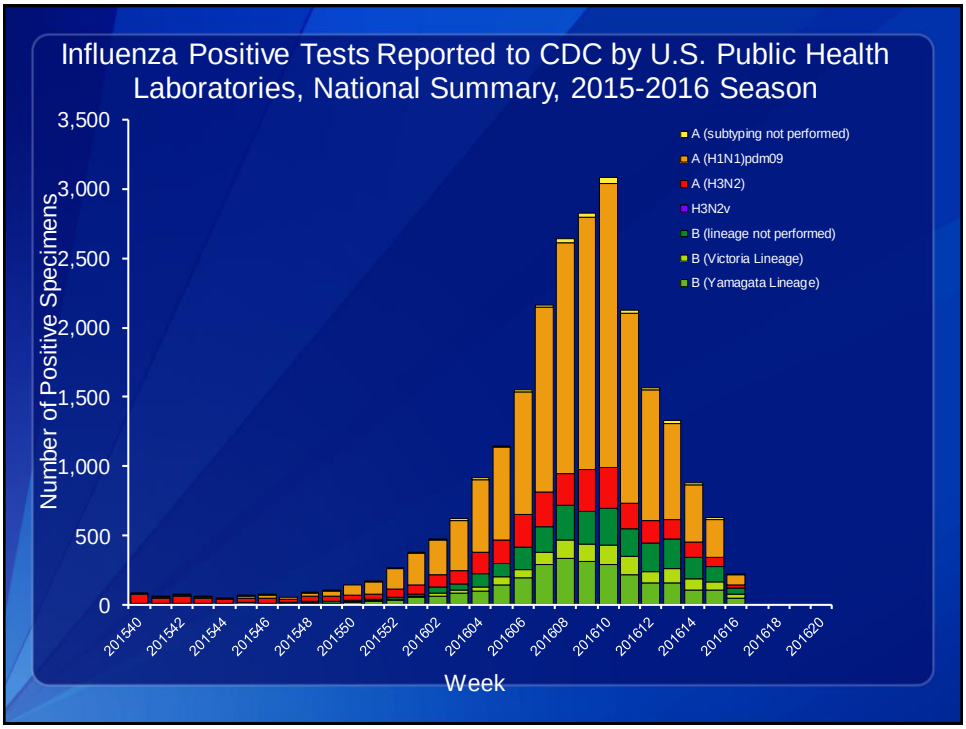
National Center for Immunization and Respiratory Diseases
Influenza Division

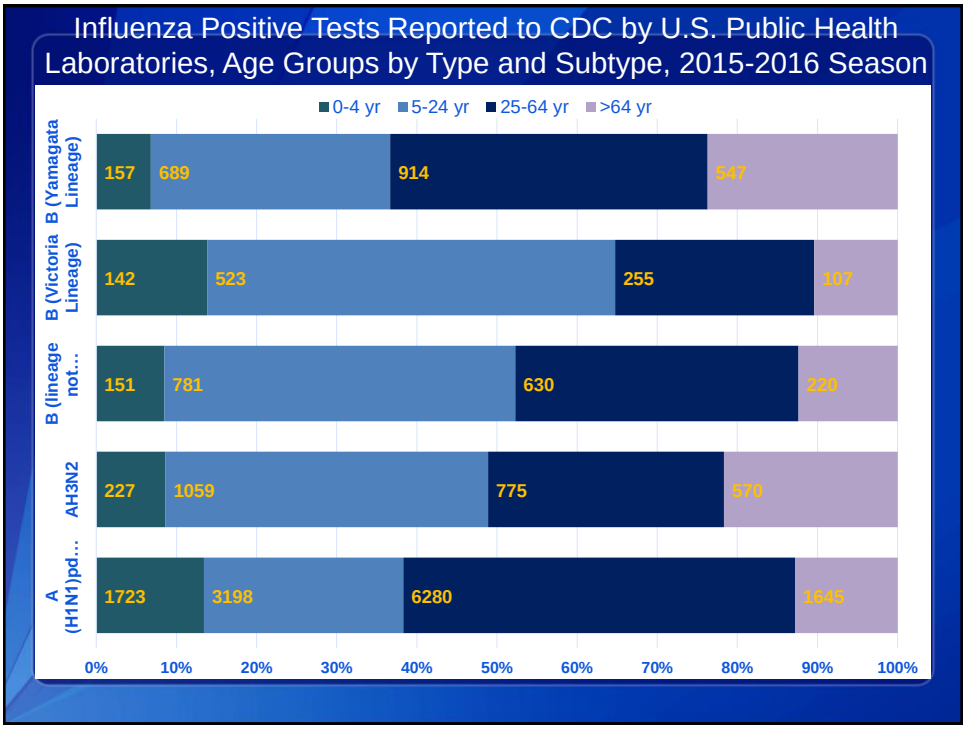
Surveillance Systems Overview

- **Virologic Surveillance**
- **Outpatient Illness Surveillance**
- **Hospitalization Surveillance**
- **Mortality Surveillance**
- **Summary of the Geographic Spread of Influenza**

VIROLOGIC SURVEILLANCE




Influenza Positive Tests Reported to CDC by U.S. Public Health Laboratories, National Summary, 2015-2016 Season
Number of Positive Specimens
3,500
3,000
2,500
2,000
1,500
1,000
500
0
A (subtyping not performed)
A (H1N1)pdm09
A (H3N2)
H3N2v
B (lineage not performed)
B (Victoria Lineage)
B (Yamagata Lineage)
201540
201542
201544
201546
201548
201550
201552
201602
201604
201606
201608
201610
201612
201614
201616
201618
201620
Week


Influenza Positive Tests Reported to CDC by U.S. Public Health Laboratories, Age Groups by Type and Subtype, 2015-2016 Season
0-4 yr
5-24 yr
25-64 yr
>64 yr
B (Yamagata Lineage)
157
689
914
547
B (Victoria Lineage)
142
523
255
107
B (lineage not...
151
781
630
220
AH3N2
227
1059
775
570
A (H1N1)pd...
1723
3198
6280
1545
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

Virus Characterization Influenza A Viruses October 1, 2015 – April 23, 2016

- **Influenza A Virus [1,189]**
  - All 744 characterized A (H1N1)pdm09 viruses matched the H1N1 component of the 2015-16 Northern Hemisphere vaccine
  - All 445 H3N2 viruses were genetically sequenced and belonged to genetic groups for which a majority of viruses antigenically characterized were similar to the H3N2 reference virus representing the 2015-2016 Northern Hemisphere vaccine component.
    - Of 193 H3N2 viruses also antigenically characterized, 185(95.9%) matched the H3N2 component of the 2015-16 Northern Hemisphere vaccine

Virus Characterization Influenza B Viruses October 1, 2015 – April 23, 2016

- **Influenza B Virus [588]**
  - All 359 influenza B/Yamagata-lineage viruses matched the influenza B/Yamagata-lineage component of the 2015-2016 Northern Hemisphere trivalent and quadrivalent influenza vaccines.
  - Of the 229 influenza B/Victoria-lineage viruses, 97.4% matched the influenza B/Victoria-lineage component of the 2015-2016 Northern Hemisphere quadrivalent influenza vaccines.

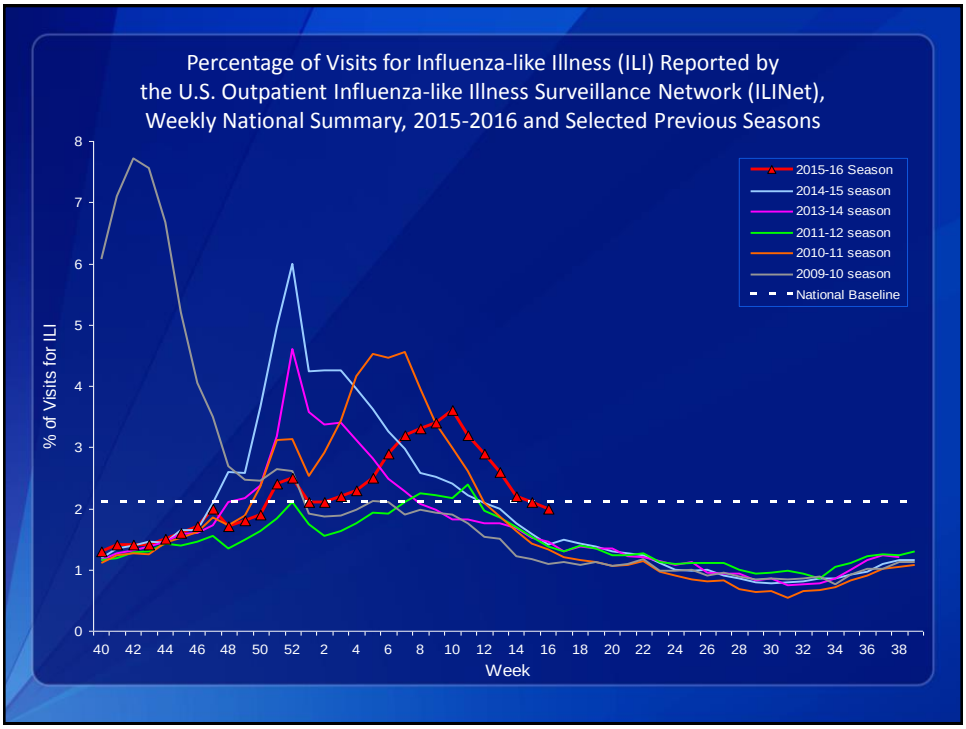
Antiviral Resistance
October 1, 2015 – April 23, 2016

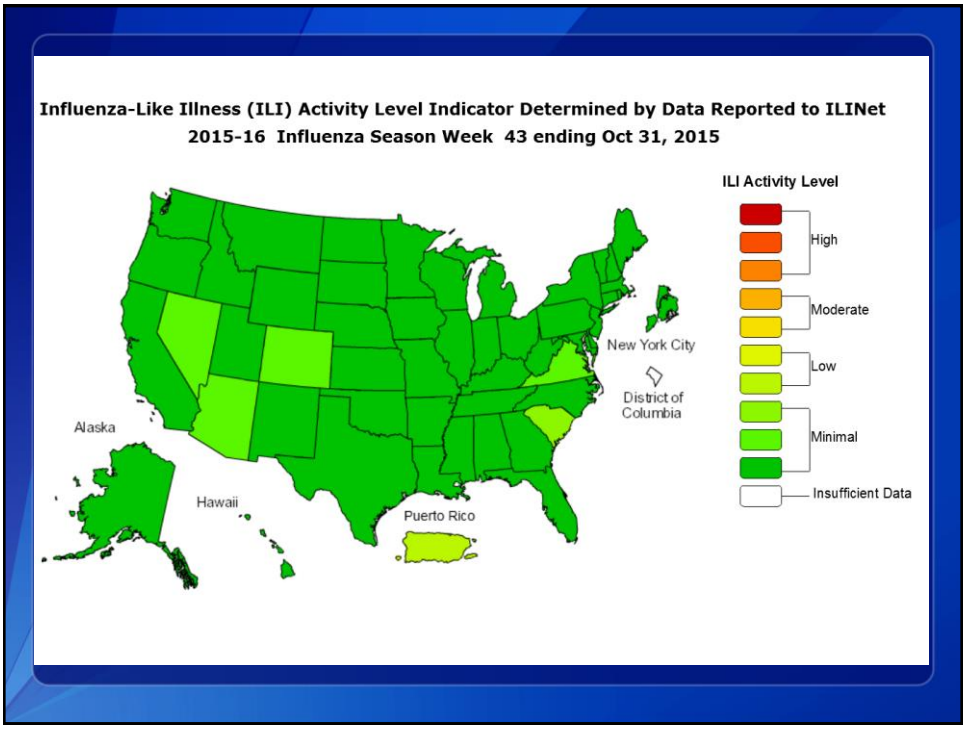
- **Antiviral Resistance**

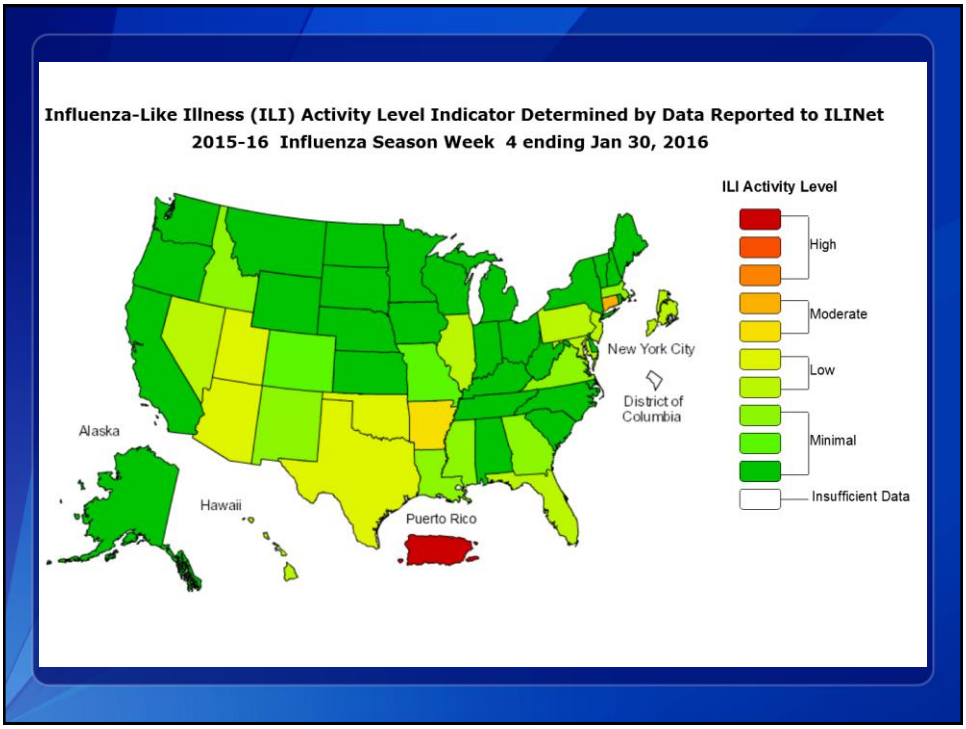
	Oseltamivir		Zanamivir		Peramivir	
	Virus Samples tested (n)	Resistant Viruses, Number (%)	Virus Samples tested (n)	Resistant Viruses, Number (%)	Virus Samples tested (n)	Resistant Viruses, Number (%)
Influenza A (H1N1)pmd09	1,699	13 (0.8)	830	0 (0.0)	1,699	13 (0.8)
Influenza A (H3N2)	577	0 (0.0)	577	0 (0.0)	510	0 (0.0)
Influenza B	850	0 (0.0)	850	0 (0.0)	850	0 (0.0)

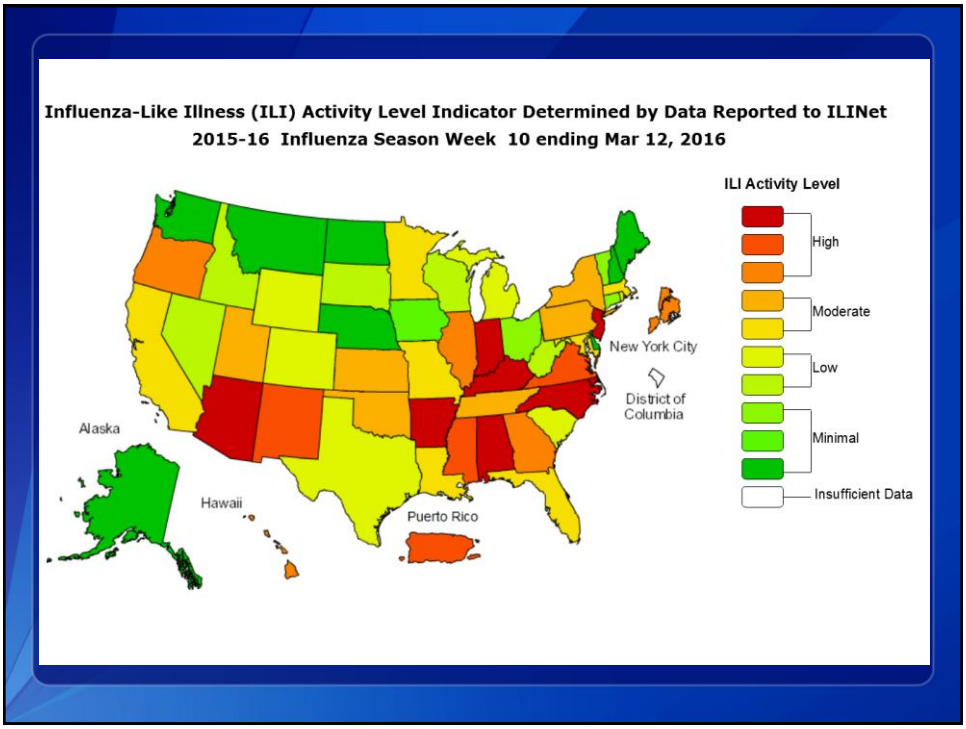
* Citations, references, and credits

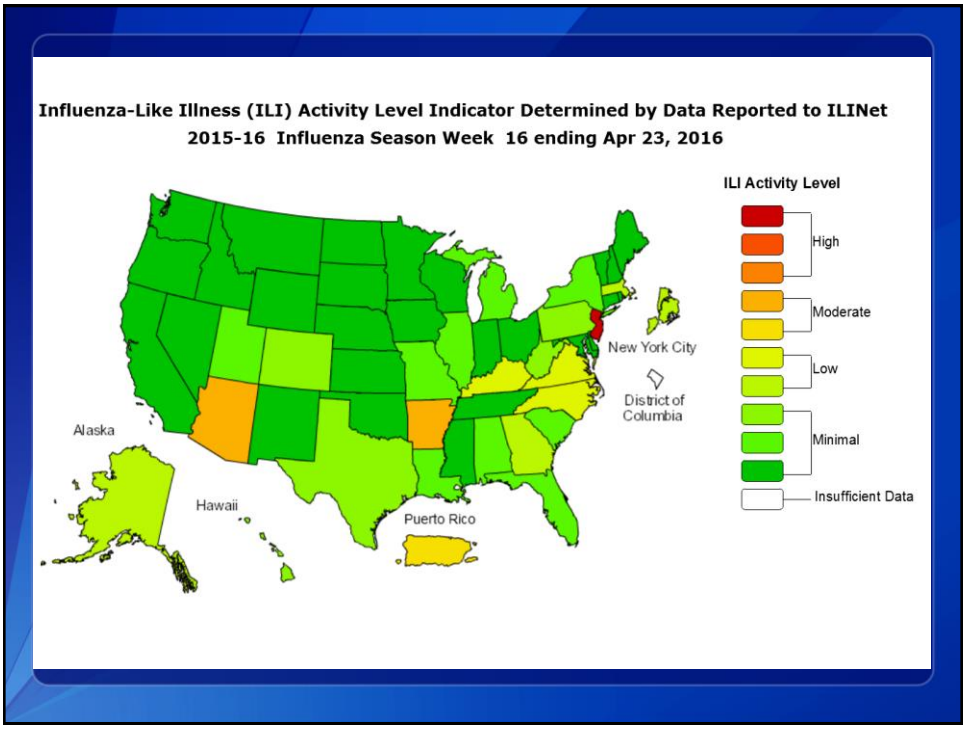
OUTPATIENT ILLNESS SURVEILLANCE


Percentage of Visits for Influenza-like Illness (ILI) Reported by the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet), Weekly National Summary, 2015-2016 and Selected Previous Seasons
% of Visits for ILI
Week
2015-16 Season
2014-15 season
2013-14 season
2011-12 season
2010-11 season
2009-10 season
National Baseline


Influenza-Like Illness (ILI) Activity Level Indicator Determined by Data Reported to ILINet
2015-16 Influenza Season Week 43 ending Oct 31, 2015
ILI Activity Level
High
Moderate
Low
Minimal
Insufficient Data
New York City
District of Columbia
Alaska
Hawaii
Puerto Rico

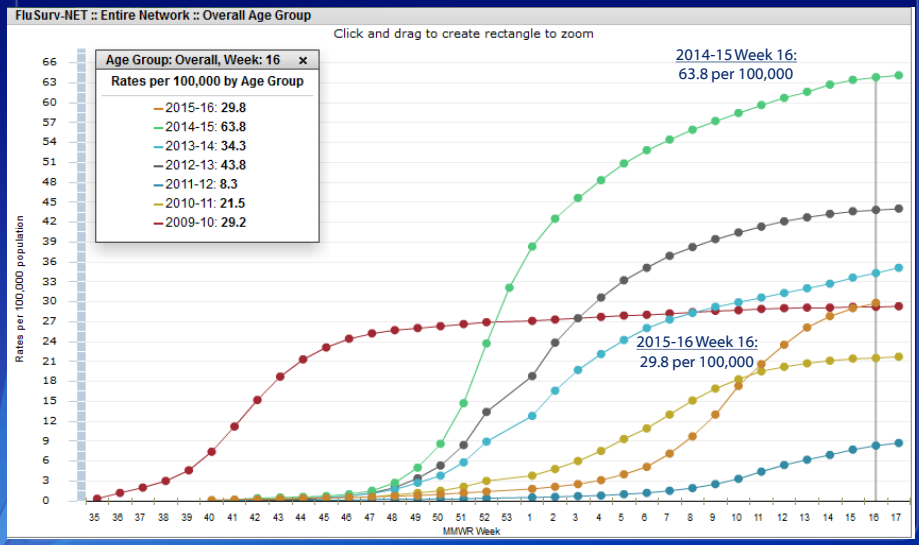

Influenza-Like Illness (ILI) Activity Level Indicator Determined by Data Reported to ILINet
2015-16 Influenza Season Week 4 ending Jan 30, 2016
ILI Activity Level
High
Moderate
Low
Minimal
Insufficient Data
New York City
District of Columbia
Alaska
Hawaii
Puerto Rico


Influenza-Like Illness (ILI) Activity Level Indicator Determined by Data Reported to ILINet
2015-16 Influenza Season Week 10 ending Mar 12, 2016
ILI Activity Level
High
Moderate
Low
Minimal
Insufficient Data
New York City
District of Columbia
Alaska
Hawaii
Puerto Rico

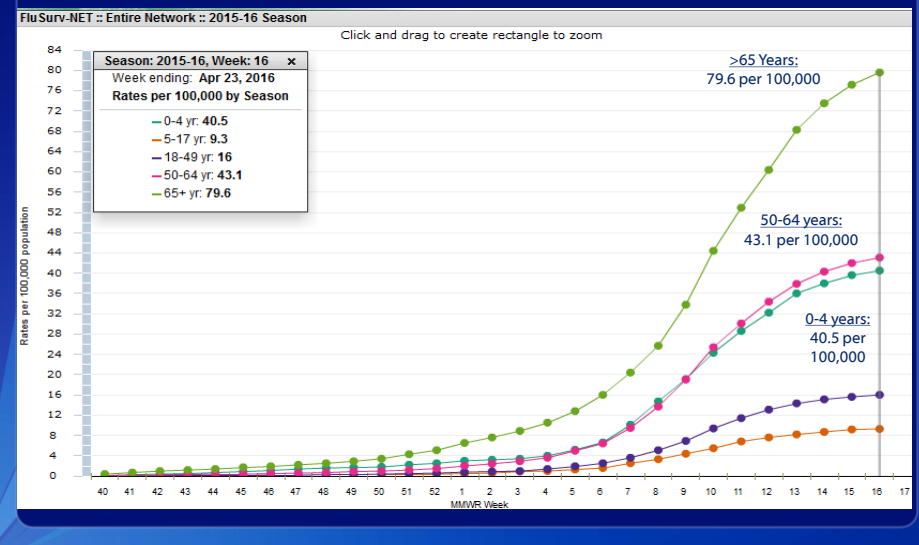


HOSPITALIZATION SURVEILLANCE

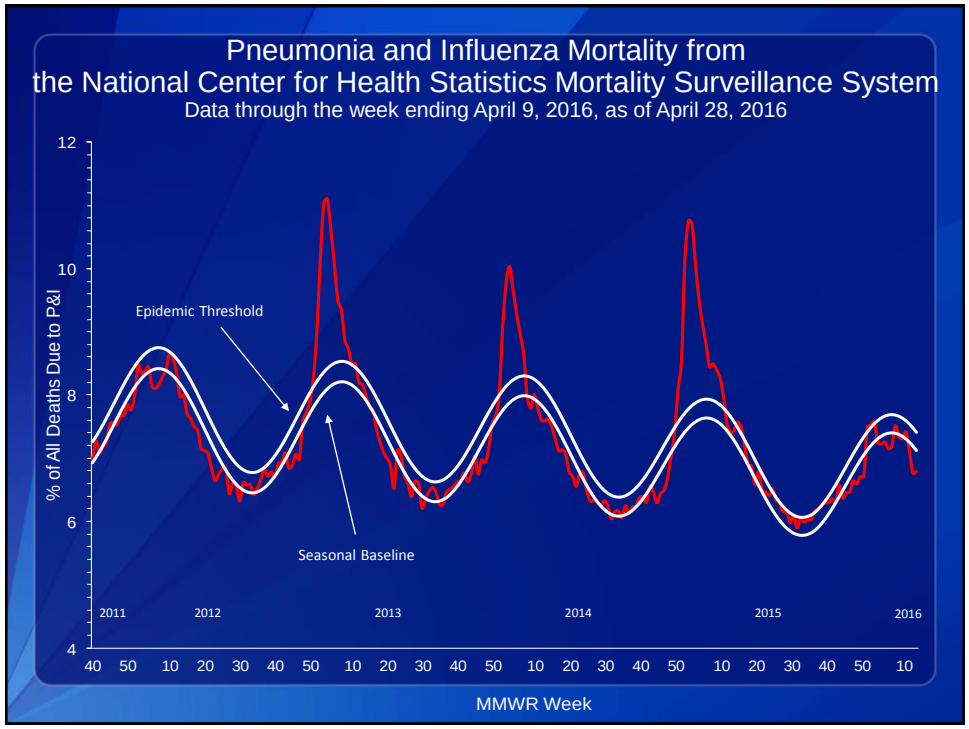
Laboratory-Confirmed Influenza Hospitalizations Cumulative rates by Season as of April 23, 2015



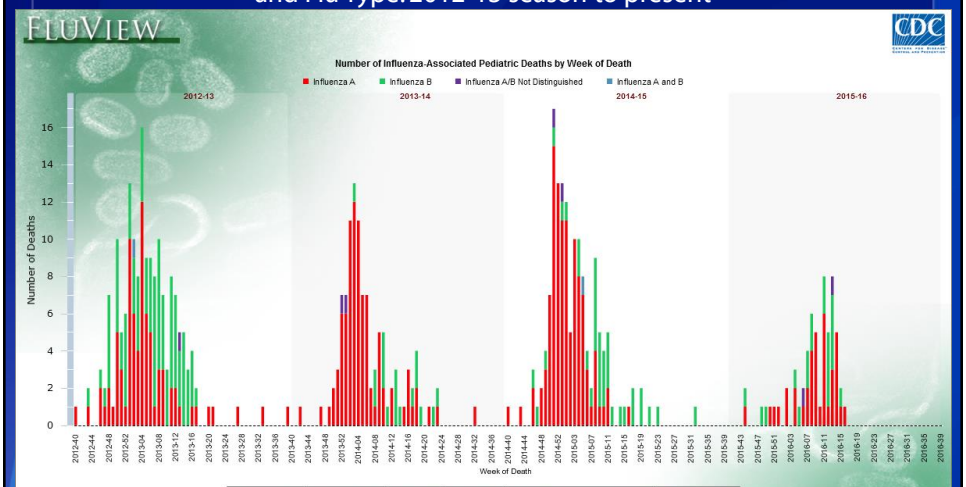
Laboratory-Confirmed Influenza Hospitalizations Preliminary Cumulative rates by Age as of April 23, 2015



MORTALITY SURVEILLANCE



Number of Influenza-Associated Pediatric Deaths by Week of Death and Flu Type: 2012-13 season to present



Season	Total Deaths	Influenza A	Influenza B	Influenza A/B Not Distinguished	Influenza A and B
2012-13	171	79	88	1	1
2013-14	111	90	17	2	0
2014-15	148	109	35	2	1
2015-16	60	38	20	2	0

Influenza Activity Summary 2015-16

- **The 2015-16 season has been moderate**
  - Activity peaked in early March
    - Increase in the percent of patient visits for ILI in late December may have been influenced in part by a reduction in healthcare visits during the holidays, as seen in previous seasons
  - Influenza A (H1N1) viruses predominated
  - According to the influenza-associated hospitalization rates, adults 65+ were the most adversely affected, followed by adults of 50-64 years and children of <5

ACKNOWLEDGEMENTS

Lynnette Brammer
Lenee Blanton
Krista Kniss
Desiree Mustaquim
Andrea Steffens
Ashley Fowlkes
Julie Vilanueva
Natalie Kramer
Taylor Hudalla
Michael Jhung
Carrie Reed
Alicia Fry
Anna Bramley
Shika Garg
Jessica Cohen
Charisse Nitura
Sofia Arriola
Joseph Bresee
Daniel Jernigan
Jackie Katz
Larissa Gubareva
Terri Wallace
Xiyan Xo
David Wentworth
Rebekah Schicker

THANK YOU

www.cdc.gov/flu

The findings and conclusions in this presentation are those of the author and do not necessarily represent the views of the Centers for Disease Control and Prevention

EXTRA SLIDES

U.S. INFLUENZA VIROLOGIC SURVEILLANCE

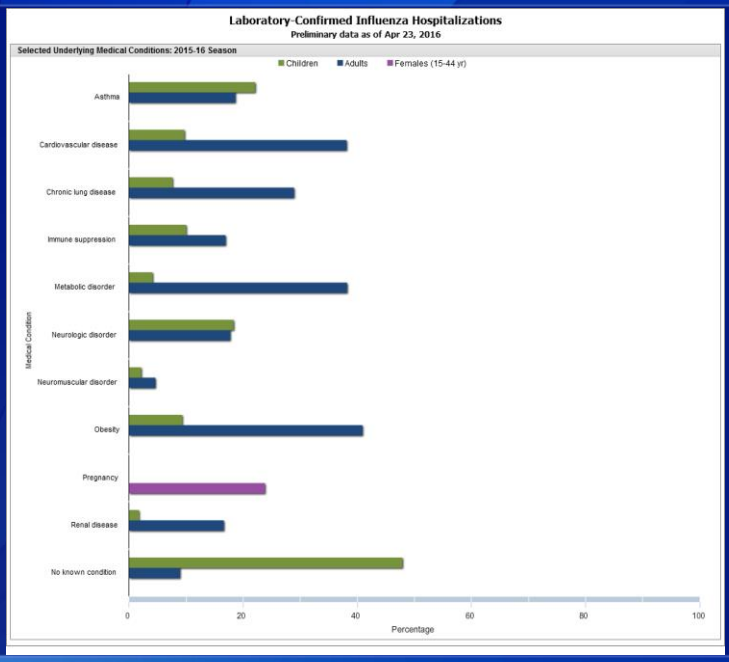
- Comprised of WHO and NREVSS collaborating labs including both public health and clinical labs
  - WHO collaborating labs
    - Primarily state public health labs, DOD labs
  - NREVSS labs
    - Hospital/clinical labs
- Weekly reports – separated by clinical and public health labs
  - Number of specimens tested
  - Number of positive for influenza by type
    - Public Health labs provide subtype and age group distribution when available
- Subset of influenza viruses are sent to CDC for further characterization

OUTPATIENT INFLUENZA-LIKE ILLNESS SURVEILLANCE NETWORK (ILINET)

- ~2,000 providers reported for the 2015=16 season
  - Includes physicians/Facilities from all 50 states, DC, NYC, Chicago, U.S. Virgin Islands, and Puerto Rico
- Weekly Reports
  - Total number of patient visits
  - Number of visits for influenza-like illness (ILI) by age group
    - ILI = fever ≥ 100 °F (37.8 °C) and cough and/or sore throat, in absence of a known cause other than influenza
    - Age groups include 0-4 years, 5-24 years, 25-49 years, 50-64 years, and ≥ 65 years
- Respiratory specimens are submitted to state lab for testing

INFLUENZA HOSPITALIZATION SURVEILLANCE NETWORK (FLUSURV-NET

- Population-based, laboratory-confirmed influenza related hospitalizations in children younger than 18 years (since 2003-04 season) and adults (since 2005-06 season)
- Network covers over 70 counties in the 10 Emerging Infections Program (EIP) states (CA, CO, CT, GA, MD, MN, NM, NY, OR, and TN) and three additional states (MI, OH, and UT)
- Data gathered are used to estimate cumulative age-specific hospitalization rates on a weekly basis, and describe characteristics of persons hospitalized with severe influenza illness



VACCINATION STATUS AMONG INFLUENZA ASSOCIATED PEDIATRIC DEATHS

- **A total of 60 influenza-related pediatric deaths were reported to CDC during the 2015-16 season thus far**
  - Of these 60 deaths, 54 had known vaccination history
    - Three were ineligible due to age
    - Six were fully vaccinated*
    - 45 were unvaccinated

* Fully Vaccinated: received one or two doses (depending on age and prior vaccination history) of influenza vaccine in the current season at least two weeks prior to illness onset

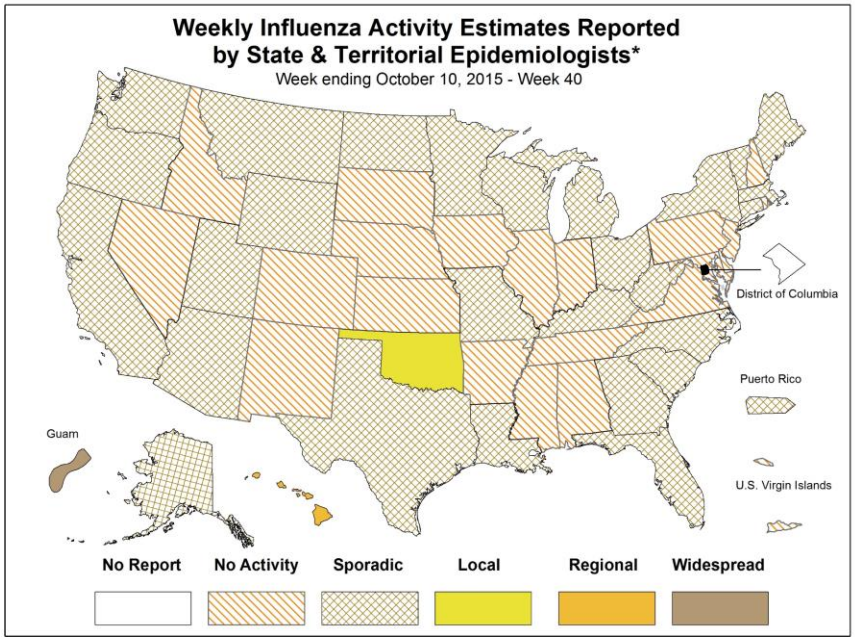
2016-17 influenza Season
U.S. Influenza Vaccine Composition

- **H1N1**
  - A/California/7/2009 (H1N1)pdm09-like virus
- **H3N2**
  - A/Hong Kong/4801/2014 (H3N2)-like virus
- **Influenza B**
  - Victoria (trivalent and quadrivalent): B/Brisbane/60/2008-like (B/Victoria lineage) virus
  - Yamagata (quadrivalent): B/Phuket/3073/2013-like (B/Yamagata lineage) virus
- **This represents a change in the influenza A (H3) component and a change in the B lineage included in the trivalent vaccine compared with the 2015-16 influenza vaccine**

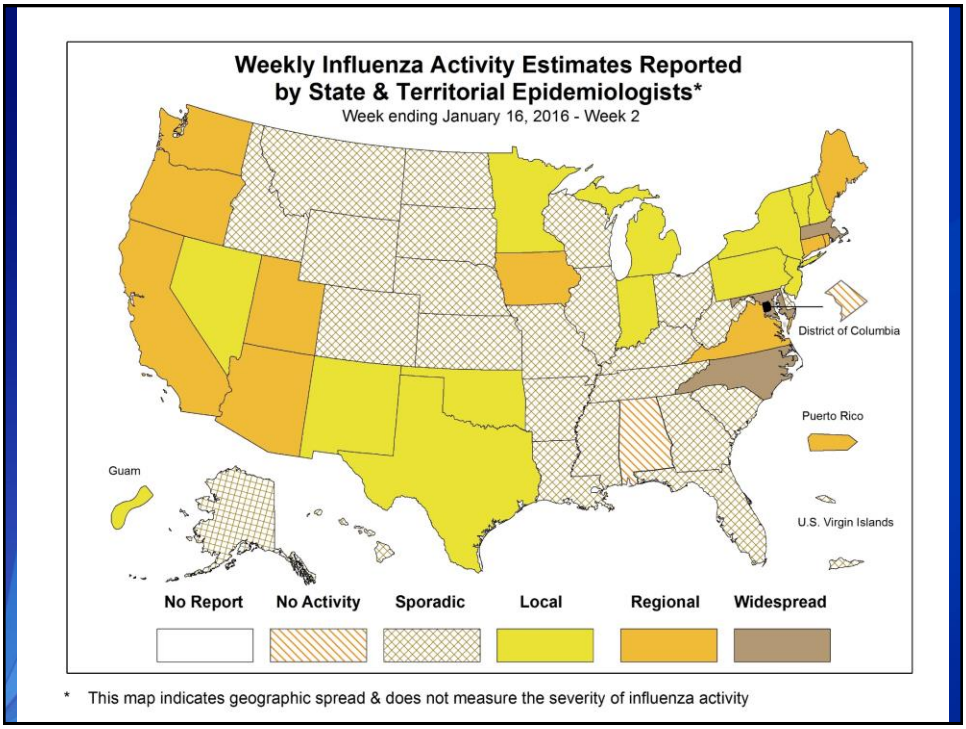
Vaccination Effectiveness

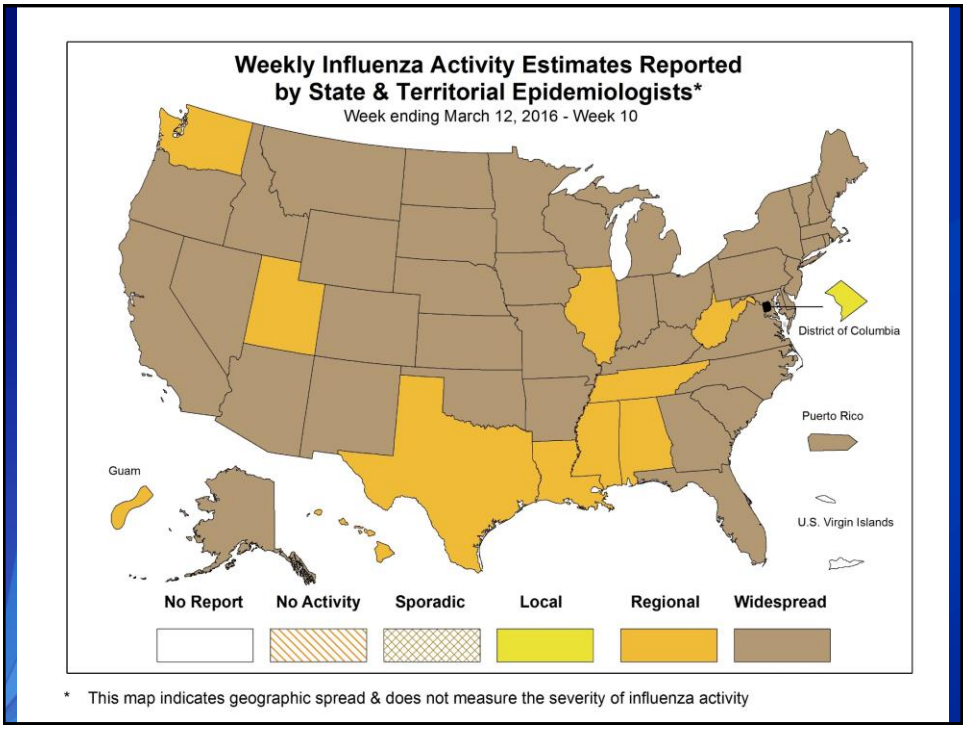
- **In late February, CDC reported flu vaccine effectiveness of nearly 60% this season**
- **There were sufficient data to calculate some specific VE estimates:**
  - 51% VE against the H1N1 viruses responsible for most flu illness this season
  - 76% VE against all influenza B viruses
  - 79% VE against the B/Yamagata lineage of B viruses

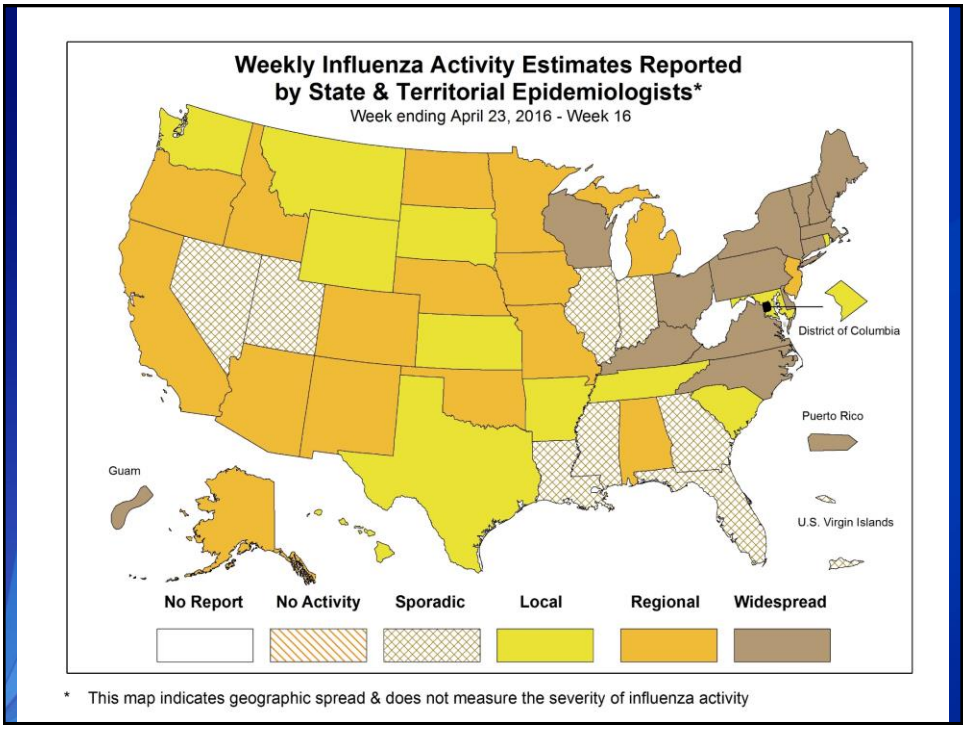
SUMMARY OF GEOGRAPHIC SPREAD OF INFLUENZA



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


Weekly Influenza Activity Estimates Reported
by State & Territorial Epidemiologists*
Week ending January 16, 2016 - Week 2
District of Columbia
Puerto Rico
Guam
U.S. Virgin Islands
No Report
No Activity
Sporadic
Local
Regional
Widespread
* This map indicates geographic spread & does not measure the severity of influenza activity


Weekly Influenza Activity Estimates Reported
by State & Territorial Epidemiologists*
Week ending March 12, 2016 - Week 10
District of Columbia
Puerto Rico
Guam
U.S. Virgin Islands
No Report
No Activity
Sporadic
Local
Regional
Widespread
* This map indicates geographic spread & does not measure the severity of influenza activity


Weekly Influenza Activity Estimates Reported by State & Territorial Epidemiologists*
Week ending April 23, 2016 - Week 16
District of Columbia
Puerto Rico
Guam
U.S. Virgin Islands
No Report
No Activity
Sporadic
Local
Regional
Widespread
* This map indicates geographic spread & does not measure the severity of influenza activity