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**ML** MIDDLESEX-LONDON  
HEALTH UNIT

# Influenza Update

**TACKLE – Infection Prevention and  
Control Education Day**

**Hellenic Community Centre  
October 3, 2013**

## Presentation Outline

- Influenza in Middlesex-London 2012- 2013
  - Hilary Caldarelli, Contract Epidemiologist
- What's new in Influenza Immunization
  - Bryna Warshawsky, Associate Medical Officer of Health

# Acknowledgements

- Alison Locker, Epidemiologist
- Tristan Squire-Smith, Manager,  
Infectious Disease Control Team
- Eleanor Paget, Public Health Nurse
- Sheila Montague, Public Health Nurse
- Infectious Disease Control Team
- Infection Control Practitioners in  
hospitals and long term care facilities

# Influenza in Middlesex-London

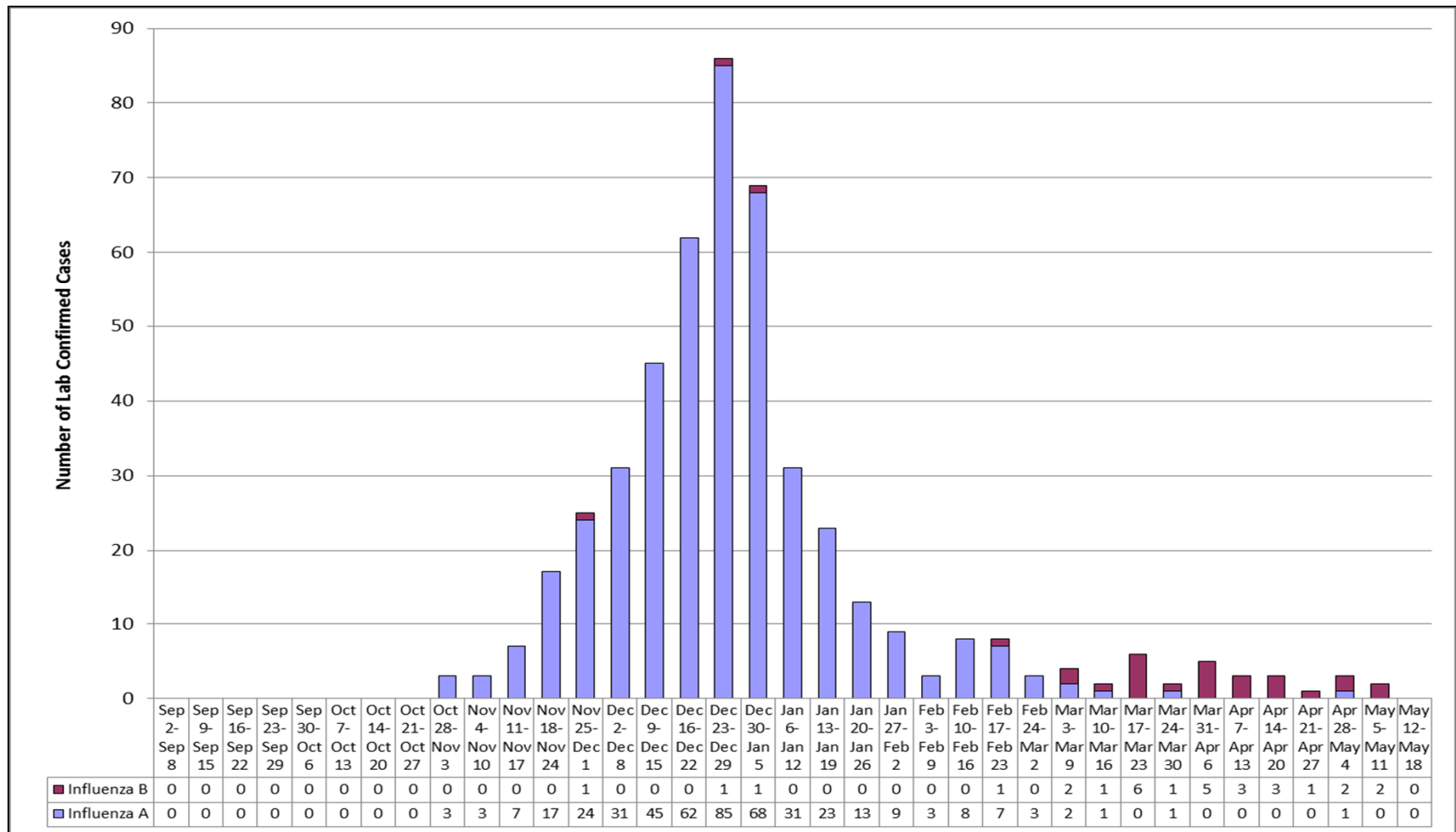
- Comparison of recent seasons
- Cases by week of illness onset (epi curves)
- By season
- Hospitalizations by age
- Immunization status of cases by age
- Outbreaks
- By season, facility type
- Nosocomial cases

## Influenza Statistics Overview, Middlesex-London

	2009- 2010	2010- 2011	2011- 2012	2012- 2013*
<b>Laboratory-confirmed cases</b>	391	276	106	<b>477</b>
<b>Hospitalizations</b>	92	161	34	<b>301</b>
<b>Deaths</b>	8	17	3	<b>26</b>
<b>Outbreaks</b>	2	28	6	<b>40</b>

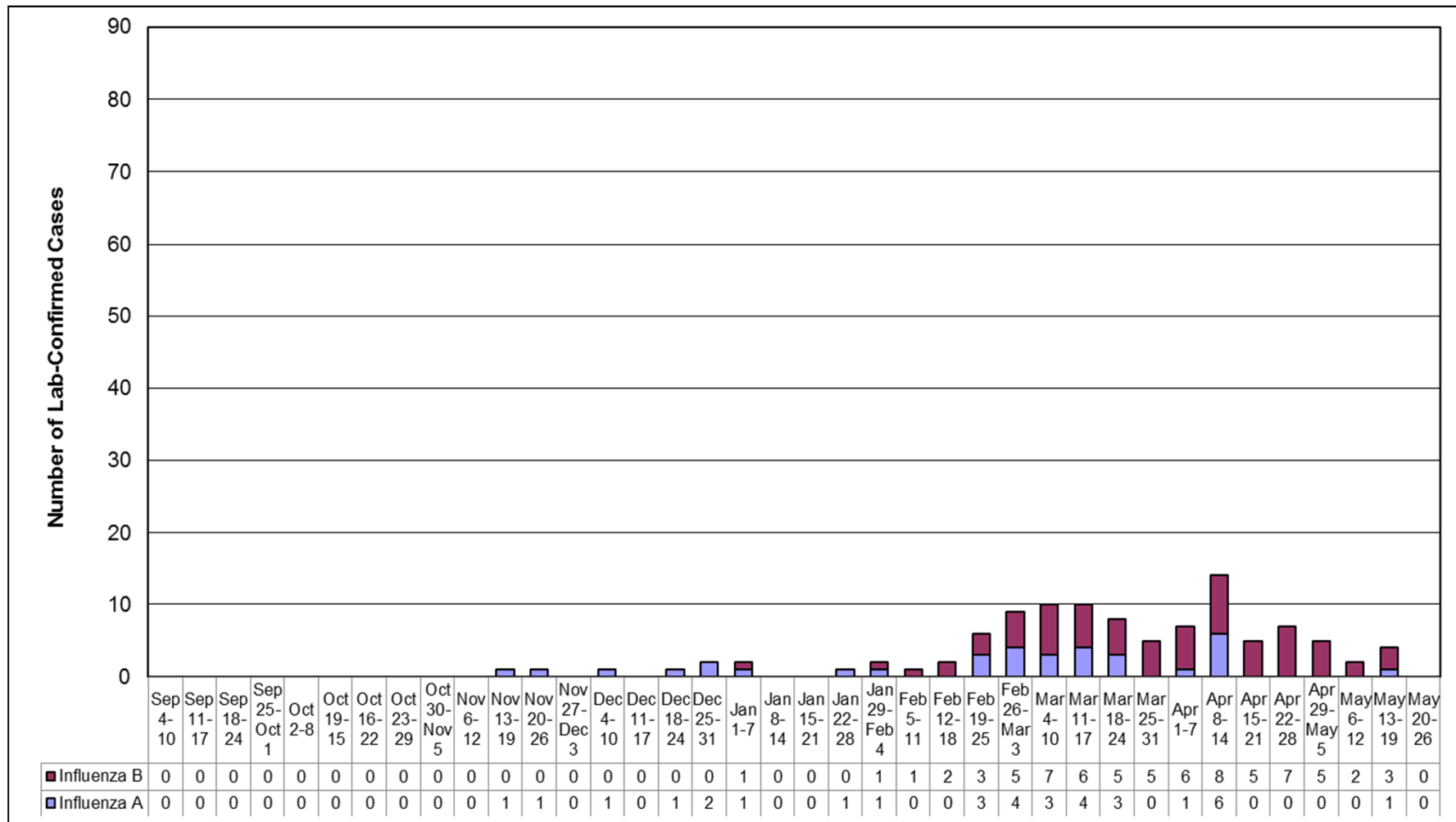
\* Season to date as of August, 2013

## 2012-2013 Influenza A & B Epi Curve (N=477)



Source: IDC Database, extracted September 4, 2013

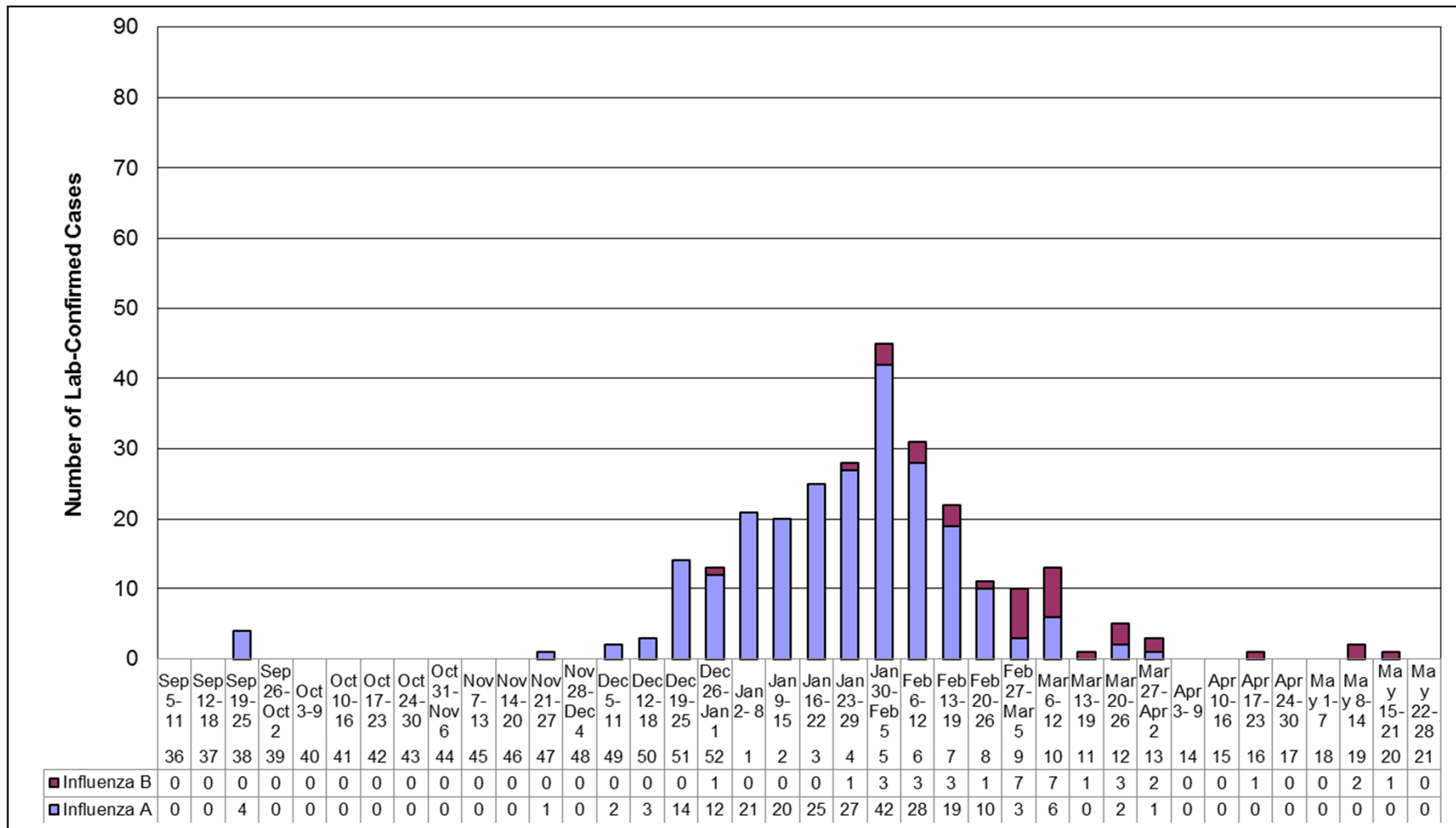
## 2011-2012 Influenza A & B Epi Curve (N=106)



Source: IDC Database, extracted June 5, 2012

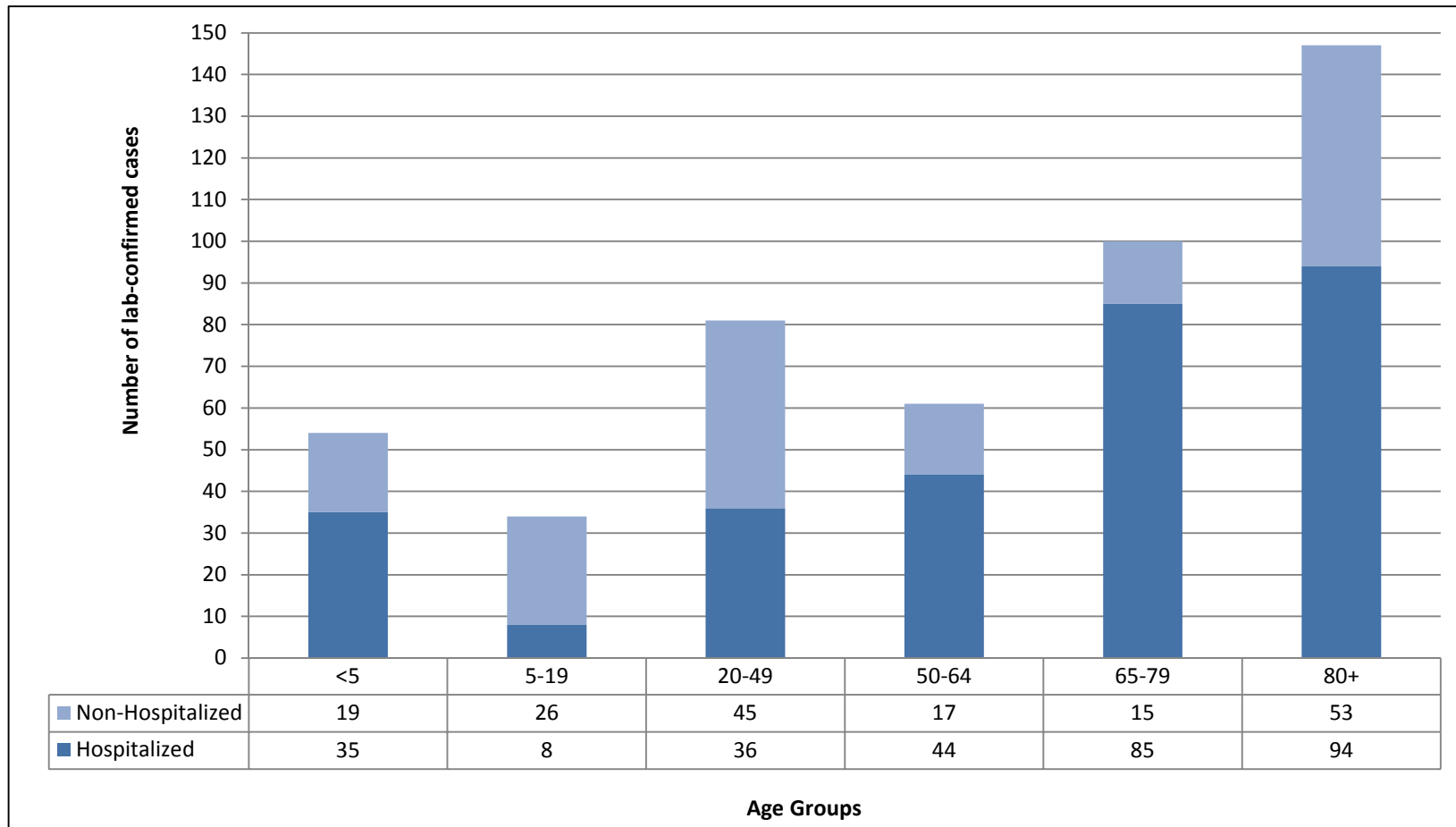


## 2010-2011 Influenza A & B Epi Curve (N=276)



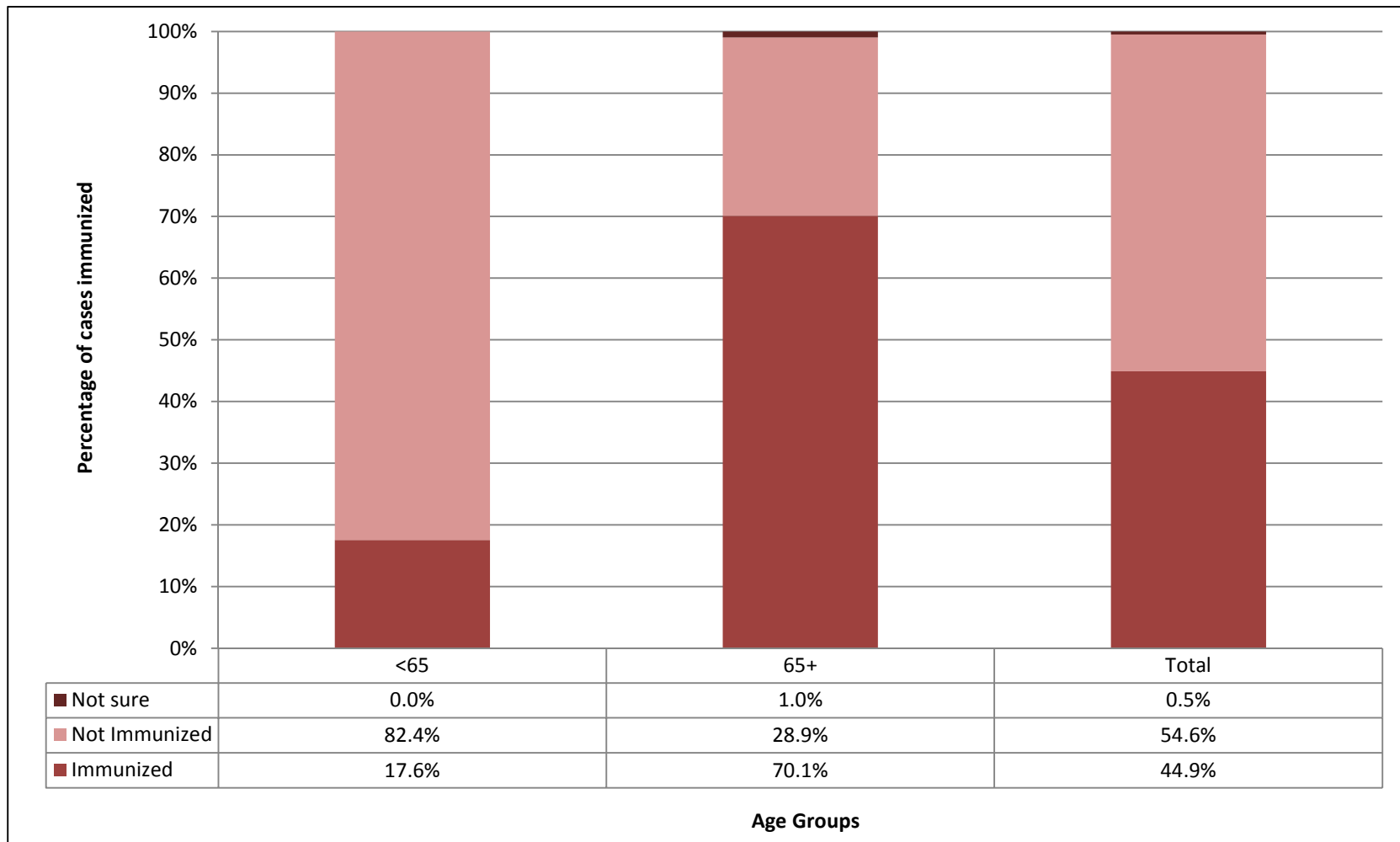
Source: IDC Database, extracted June, 2011

## 2012-13 Influenza Hospitalizations by age, $n_h=302$ , Non-hospitalized, $n_{nh}=175$



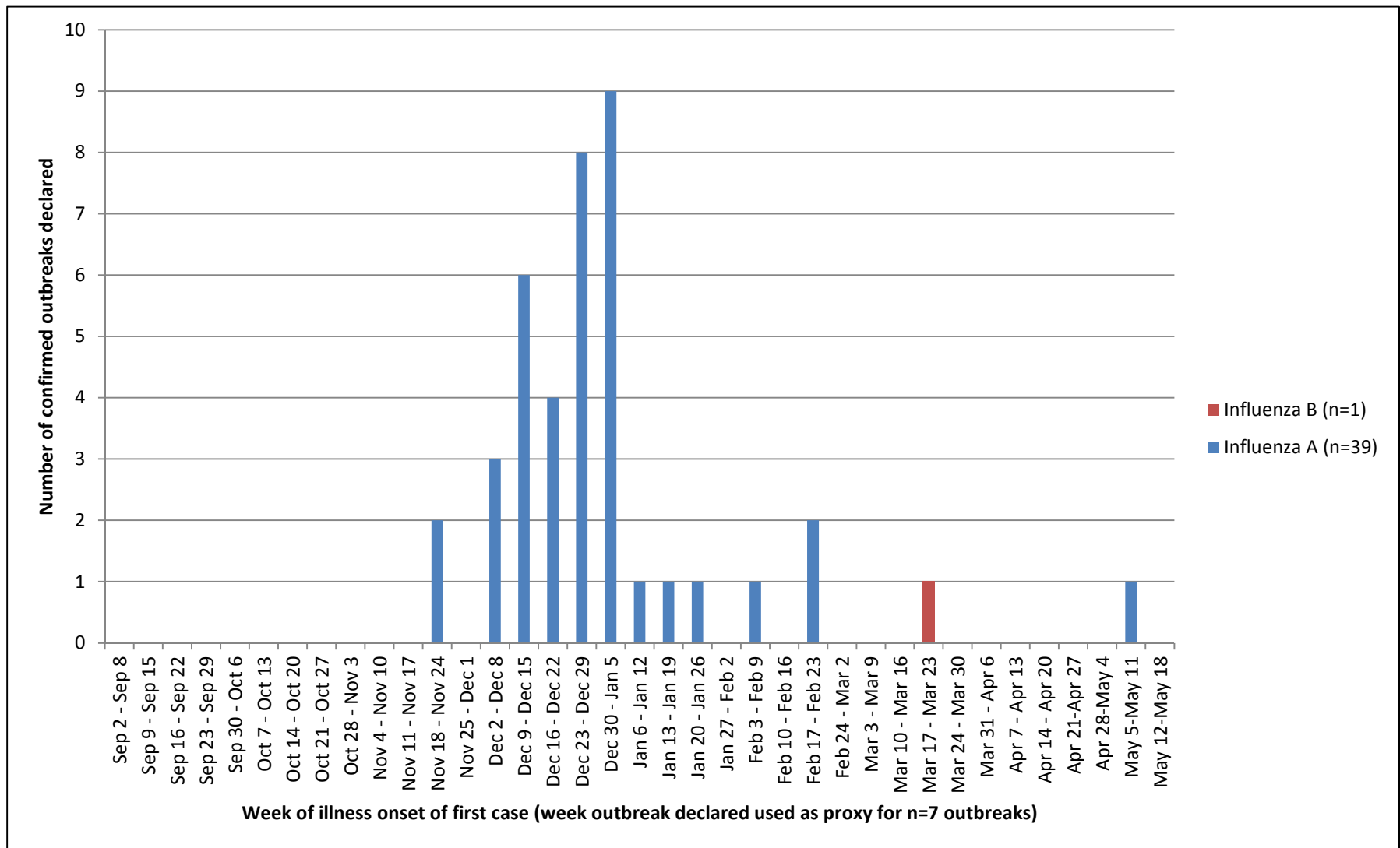
Source: IDC Database, extracted June 21, 2013

## 2012-13 Influenza Immunization Status, N=392



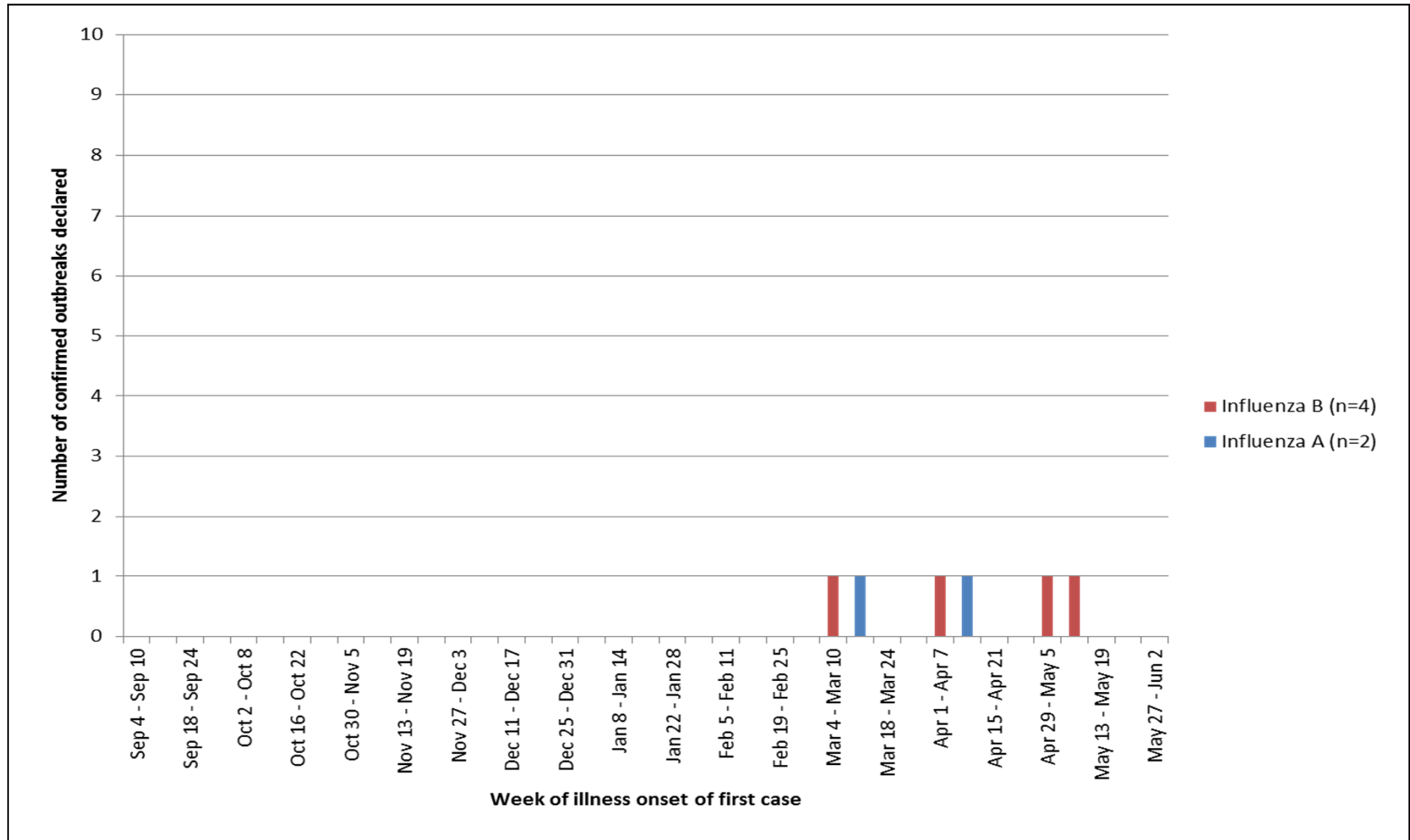
Source: IDC Database, extracted June 21, 2013

## 2012-2013 Confirmed Influenza Outbreaks (N=40)



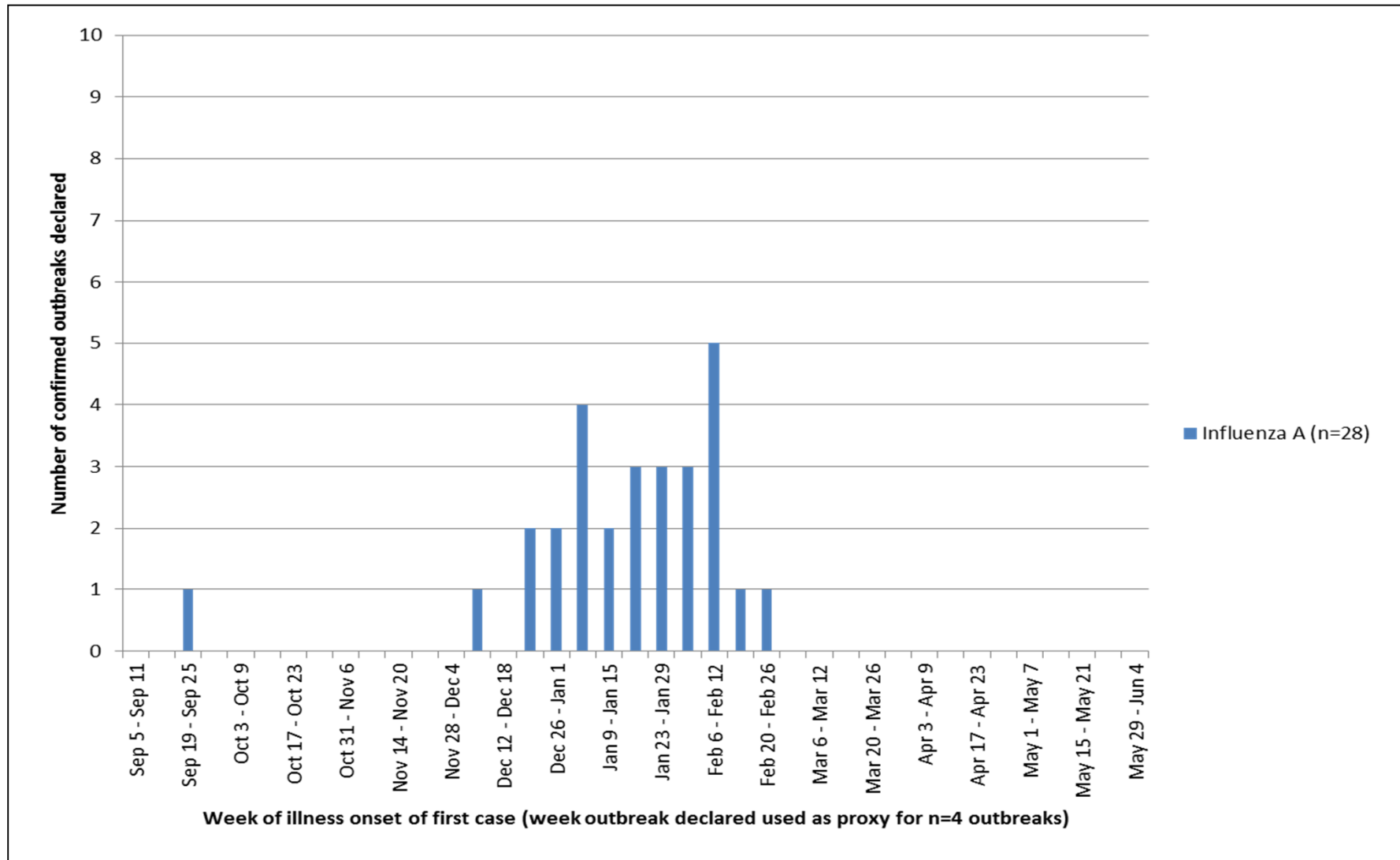
Source: IDC Database, extracted May 22, 2013

## 2011-2012 Confirmed Influenza Outbreaks (N=6)



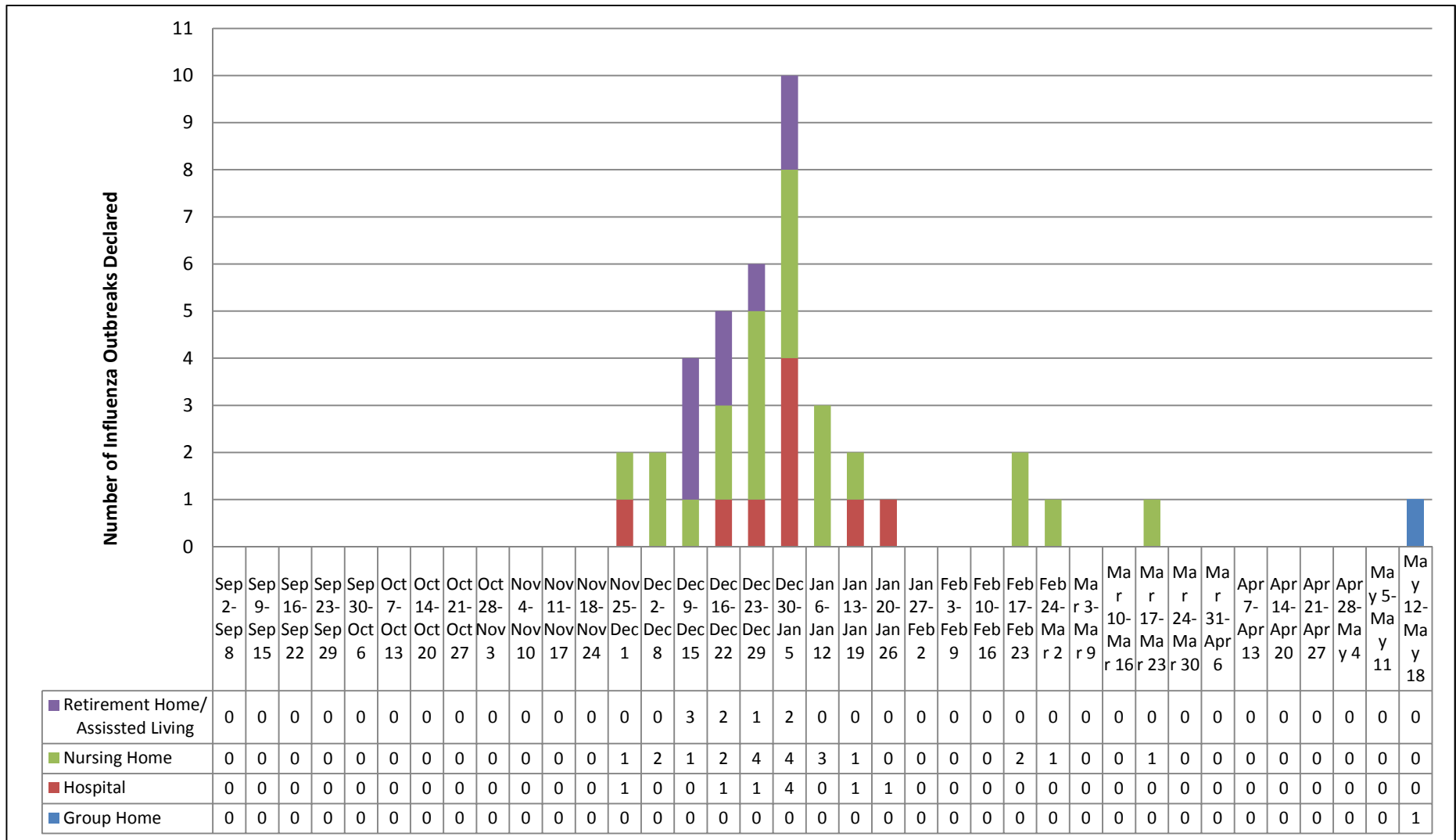
Source: IDC Database, extracted April 23, 2013

## 2010-2011 Confirmed Influenza Outbreaks (N=28)



Source: IDC Database, extracted April 23, 2013

## 2012-2013 Confirmed Influenza Outbreaks (N=40), by setting



Source: IDC Database, extracted May 22, 2013

## Nosocomial Influenza Infections

- Any lab confirmed influenza infections that were diagnosed **more than** 72 hours after admission to an acute care inpatient unit are considered to be nosocomial
- 34 cases out of 477 met this definition (7%), all from London acute care settings
- 21 of the 34 nosocomial cases (62%) were associated with the nine hospital outbreaks
- 13 of the 34 nosocomial cases (38%) were not considered part of an outbreak



## What's New in Influenza Immunization

- Recent NACI changes
  - Egg allergy
  - Preferential intranasal vaccine for children
  - Upcoming reviews
- Quadrivalent vaccines
- Vaccine effectiveness
- Age specific vaccines
- New methodologies for making flu vaccine
- H7N9 influenza
- Changes in when to call the coroner

# Recent NACI Changes

## Egg allergy

## Egg Allergy – 2011-2012

- No longer a contraindication for trivalent inactivated influenza vaccine based on several studies
  - Still is for FluMist
- Very small amount of egg protein in vaccine < 1.2 micrograms / ml

## Egg Allergy – 2011-2012

- Lower risk for severe allergic reactions
  - Localized hives, gastrointestinal symptoms
  - Vaccinate at usual; keep 30 minutes
- Higher risk of severe allergic reactions
  - Generalized hives or respiratory or cardiovascular reactions, or poorly controlled asthma with egg allergy
  - Graded vaccination
    - 10 % of the dose; wait 30 minutes; give remaining 90% of dose; keep 30-60 minutes

## NACI Changes – Egg Allergy

- Now recommending 0.5 ml for all
- Mild reactions such as hives
  - regular clinics
- Anaphylaxis with respiratory or cardiovascular symptoms
  - appropriate expertise and equipment to manage respiratory or cardiovascular compromise.
- Observe for 30 minutes

# Influenza Vaccine Allergy

- Previous discussion applies to egg allergy
- Influenza vaccine allergy still a contraindication

# Recent NACI Changes

## Preferential Intranasal Vaccine for Children

## Flumist – 2011-2012

- Live attenuated, intranasal vaccine
- 0.1 ml in each nostril (total 0.2 ml)
- Ages 2-59 years who are not immunocompromised
- NACI made preferential recommendations for children 2-17 years of age based on better efficacy in these children
- Re-looking at data regarding older children



# FluMist Implementation

- Limited use so far
- Not publicly funded in Ontario
- Cost about \$20.00 per dose
- Not available at our clinics

# **NACI Changes**

## **Upcoming Reviews Based on Different Age Groups**

## Age expansion

- 2012-2013 – NACI recommended adding children 2 to < 5 years to high risk groups, as well as those who have close contact with them
- Based on elevated risk of hospitalization and outpatient visit and that source of community transmission
- Currently undertaking review of healthy:
  - 5 to 18 year olds
  - 19 to 64 year olds

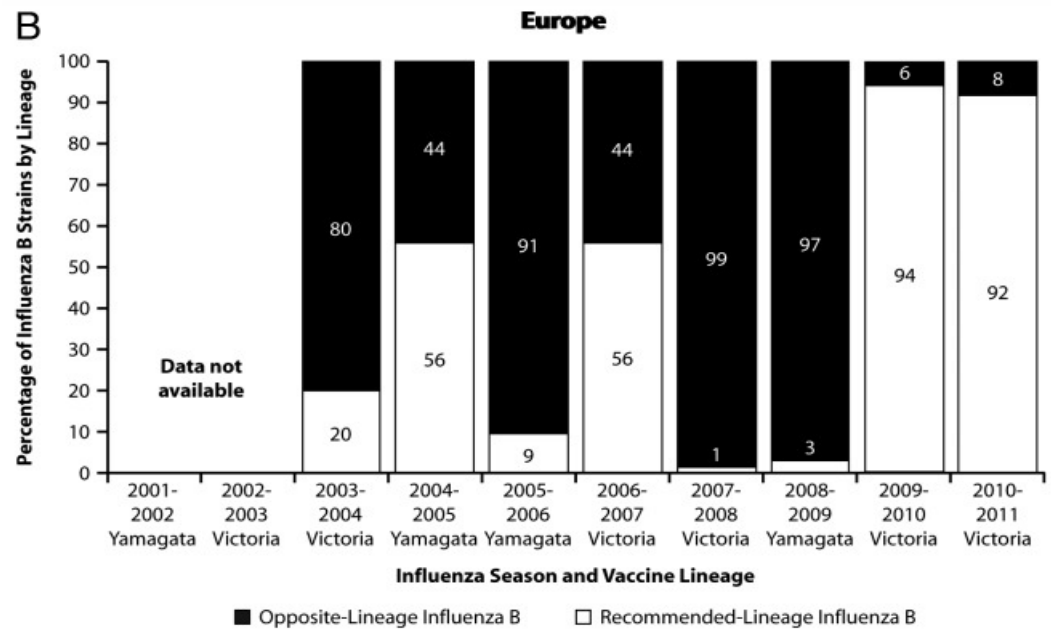
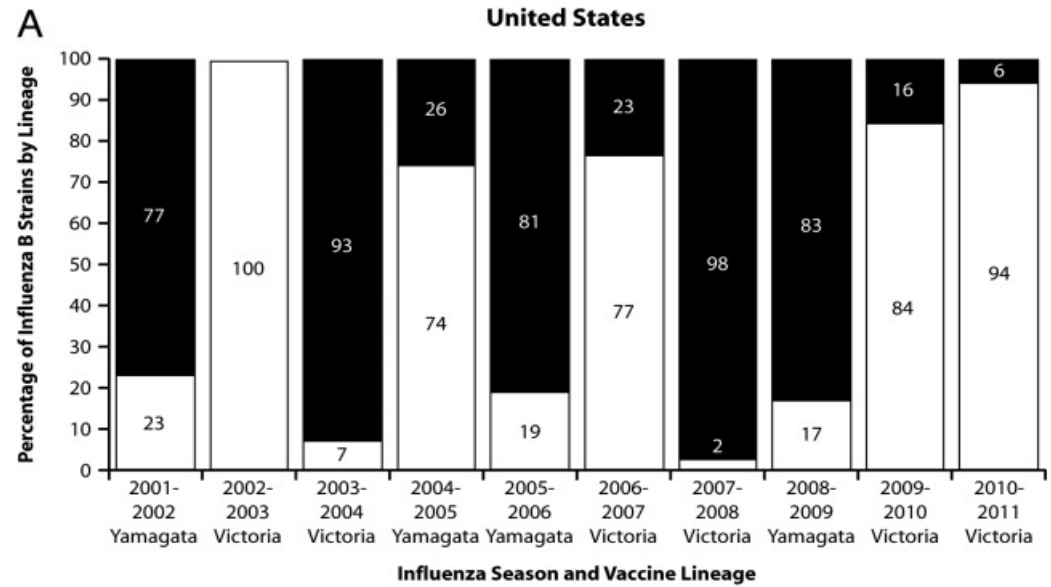
# Quadrivalent Vaccines

## Quadrivalent Vaccines

- Contain H1N1, H3N2 and 2 B strains
- Live attenuated version and inactivated version available in the US
- Likely will be available in Canada next influenza season

# Influenza B

- Affects all age groups, but mostly older children and adolescents
- Range from 1-44% of positive samples in 10 year period in US; average 24%
- 2 lineages have circulated globally:
  - B/Yamagata
  - B/Victoria
- 5 of 10 years, mismatch between vaccine and predominant circulating strain



## This year's vaccine

- A/California/7/2009 (H1N1)-like virus,
- A/Victoria/361/2011 (A/Texas/50/2012)
- B/Massachusetts/2/2012–like (Yamagata lineage) virus.
  
- In US, Quadrivalent influenza:
  - B/Brisbane/60/2008–like (Victoria lineage) virus.



# Vaccine Effectiveness

# Vaccine Effectiveness Controversy

- Osterholm Review:
  - Assessed 31 studies
  - TIV pooled efficacy 59% (95 % CI - 51-67%) in 18-65 year olds
    - No TIV studies met inclusion criteria for other ages
  - LAIV pooled efficacy 83% (95% CI - 69-91%) for 6 months to 7 year olds
    - No LAIV studies met inclusion criteria for older ages

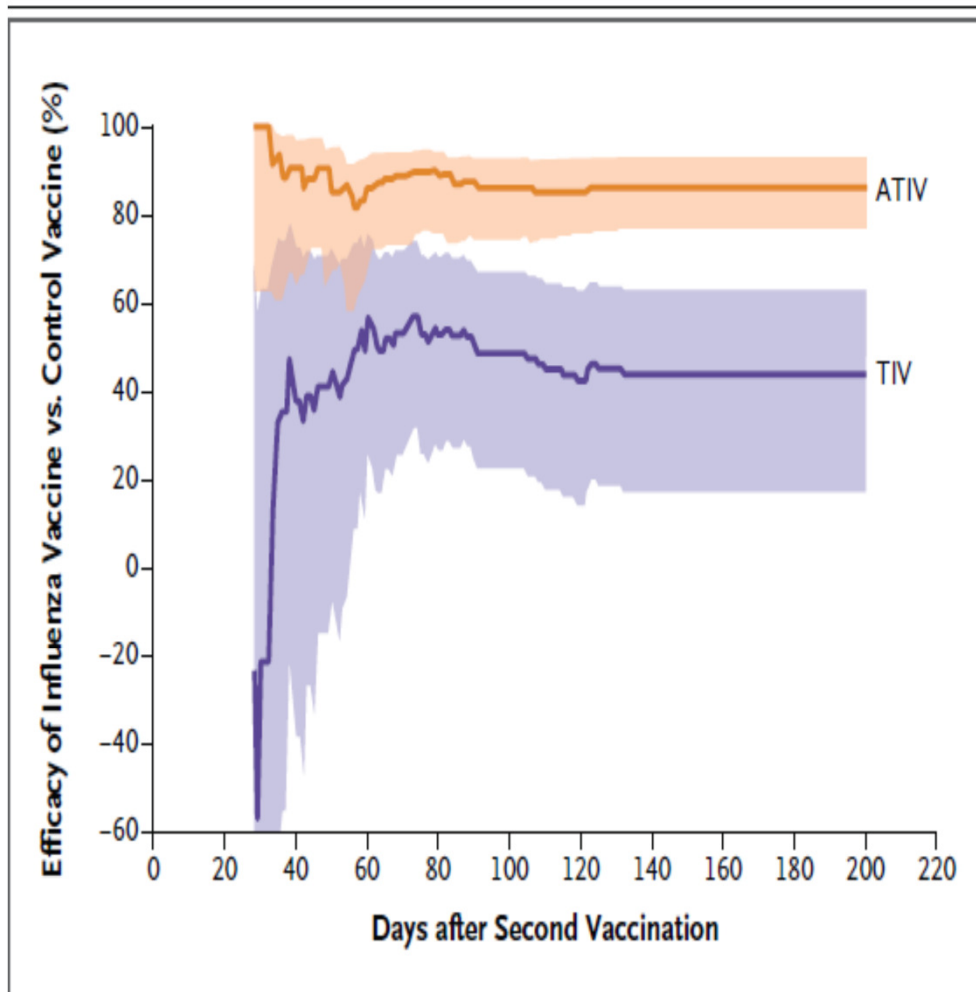
# CDC Vaccine Effectiveness Estimates for Outpatient Visits

- Overall effectiveness 56% (CI = 47%-63%)
- A (H3N2) 47% (CI = 35%–58%)
  - 58% for persons aged 6 months–17 years;
  - 46% for persons aged 18–49 years;
  - 50% for persons aged 50–64 years, and
  - 9% for persons aged ≥65 years
- B 67% (CI = 51%–78%)
  - 64% to 75% across age groups.

# Age Specific Vaccines

## Trying to get better efficacy

- FluMist (live, intranasal)
  - Better in children, but to what age?
- Fluvad (MF59 adjuvanted vaccine)
  - May have better immunogenicity, uncertain if better efficacy and effectiveness in elderly
  - Better efficacy in children
- Intanza (intradermal vaccine) and Fluzone (high dose - 60 micrograms)
  - May have better immunogenicity, uncertain if better efficacy and effectiveness



**Figure 2.** Efficacy of Influenza Vaccines versus Control Vaccine over Time. The cumulative efficacy of ATIV and of TIV, as compared with control (non-influenza) vaccine, is shown. The data are for efficacy against all viral strains over time after the second dose of vaccine in children 6 to less than 72 months of age. Shaded areas represent 95% confidence intervals.

**Fluad**

**TIV without adjuvant**

**Fluad (MF59 adjuvant) in children 6 to 72 months**

# New Methodologies for Making Flu Vaccine

# Flucelvax

- Cell-culture based vaccine (Novartis)
- Available in US for 18 years of age and over
- Not grown in egg; so very little egg protein



# FluBlock

- Recombinant hemagglutinin Vaccine (Protein Science)
- Available in US for 18 to 49 years
- Put hemagglutinin gene into baculovirus
- Highly specific to insect cells
- Infect insect cells with virus
- Incubate in ~48-72 hours
- Purify resulting protein

# FluBlock

- Uses larger amounts of hemagglutinin per strain (45 micrograms per strain)
- No egg
- From gene to production in 21 days
- Pandemic solution

# H7N9 Influenza

## H7N9 Influenza

- 136 cases, 44 deaths since February 2013
- All arose in Eastern China
- Middle aged and elderly men
- Believed to be attributed to contact with live bird markets; Limited person to person spread
- Under control due to culling birds in live bird markets and/or seasonal factors
- Candidate influenza vaccine viruses available

# Changes in When to Call the Coroner

## Used to Notify the Coroner

- Every death via electronic Institutional Patient Death Record (IPDR)
- Called if met Section 10 of Coroners Act
- Called if every 10<sup>th</sup> death in long-term care facility
- Called if death during an outbreak

## Now Notify the Coroner

- As of September 16, 2013:
  - Still fill out the Institutional Patient Death Record
  - Still notify if meets Section 10 of Coroners Act
- Coroner does not need to be notified of:
  - Deaths during outbreak
  - Every 10<sup>th</sup> death

# Health Unit Needs to be Notified

- Health Unit should be notified of all deaths during an outbreak (whether obviously outbreak related or not)
- Staff member will discuss situations of concern with on-call physician
- Will decide if need to notify the coroner e.g.
  - Cluster of deaths
  - Need assistance determining the cause of the outbreak