

# Preventing the Spread of Influenza in Public Schools

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*Webinar Symposium Series on Public Health Preparedness*



# Preventing the Spread of Influenza in Public Schools



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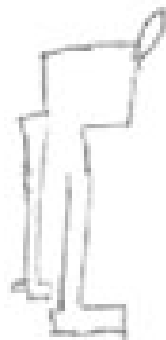
**“The fires of the epidemic are  
carried by healthy school-age  
children”**

Glezen, 1996

# "Germrs are Nasty"

Plus Germrs are NASTY  
and they can make you sick

Don't ever  
mess w/it  
Germrs



vs.



# Topics for Today

- Importance of collaboration
- Influenza in kids and schools
- Surveillance
- Pittsburgh Influenza Prevention Project
- Influenza Season 2007-2008
- New CDC Guidelines
- Looking to the Future

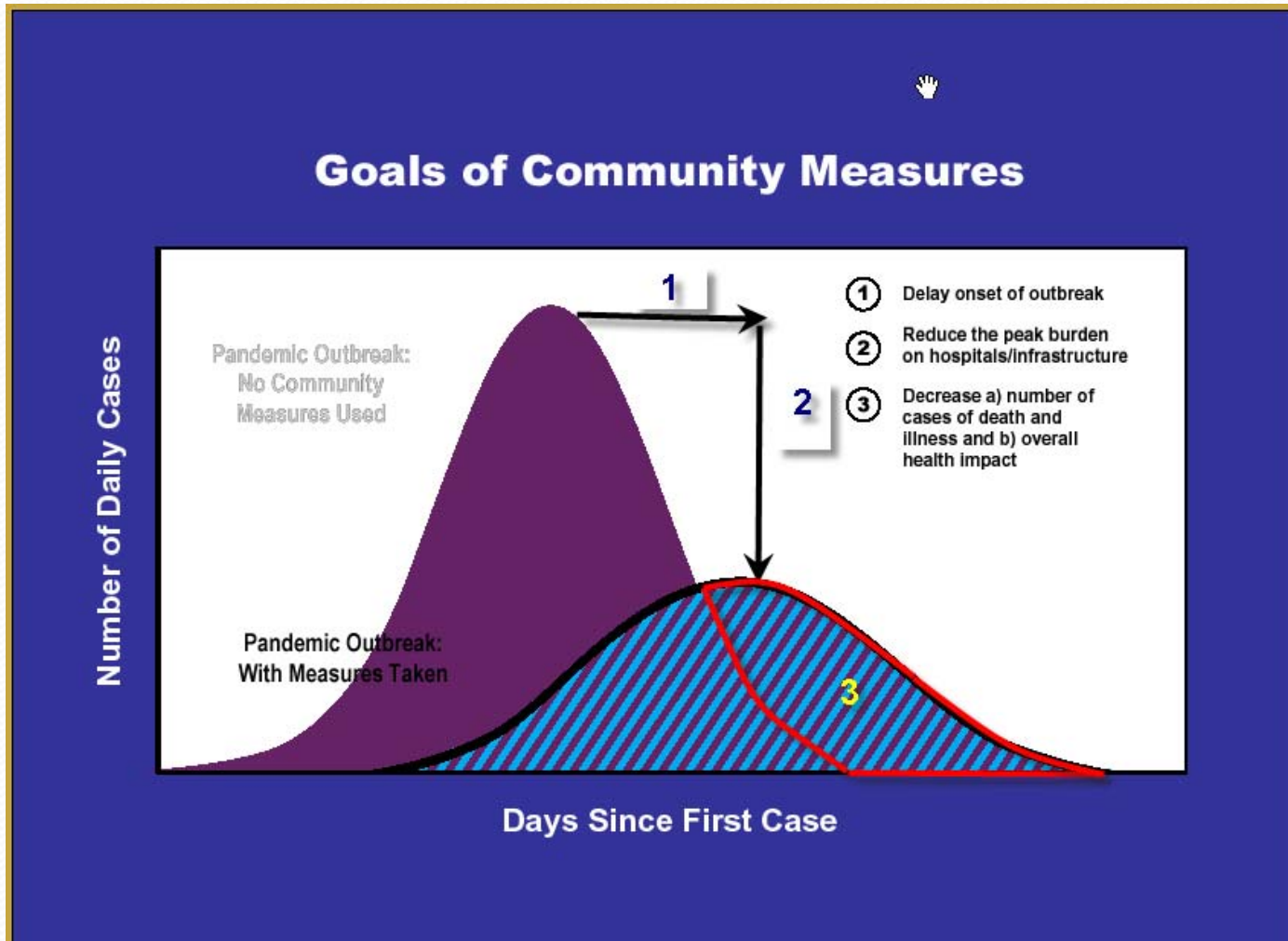


# Preventing influenza in K-5 schools

- Non-pharmaceutical interventions
- Immunization
- Prophylaxis
- School Closure

<b>School</b>			
<b>Child social distancing</b> –dismissal of students from schools and school-based activities, and closure of child care programs	Generally not recommended	Consider: ≤ 4 weeks	Recommend: ≤ 12 weeks
–reduce out-of-school contacts and community mixing	Generally not recommended	Consider: ≤ 4 weeks	Recommend: ≤ 12 weeks

# Pandemic Mitigation



# Spread of Influenza

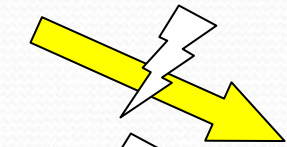
- Airborne
- Droplet
- Contact
  
- Temperature and humidity sensitive
  - “likes” cooler, drier settings

# Influenza Spread

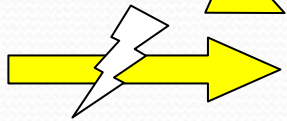
Exposure

**VEs**

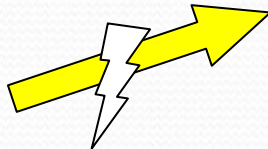
**Home**



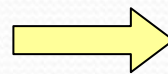
**School**



**Community**

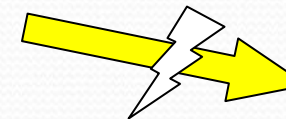
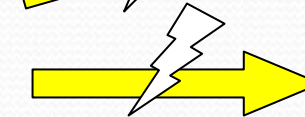


**Susceptible**



**Infectious**

**VEi**

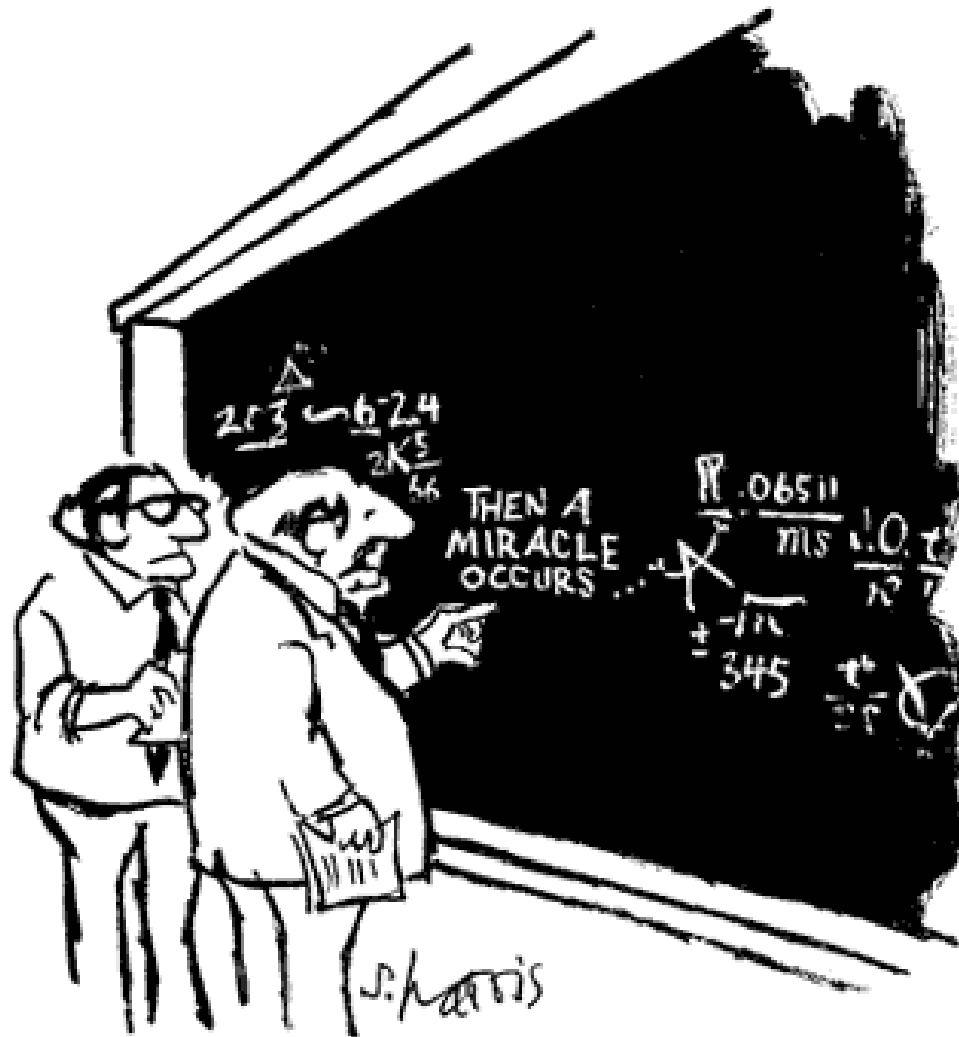


Transmission

**Home**

**School**

**Elsewhere**



"I think you should be more explicit here in step two."

# Influenza Surveillance in Schools

- Absenteeism
  - Any reason
  - Illness
  - Influenza-like illness
- Paper-based systems
- Electronic systems
  - Plus/minus syndromic surveillance

# Project SHARE

San Diego County School Health and Absenteeism Reporting Exchange

- Welcome to Project SHARE, an internet-based school surveillance system designed to enhance public safety by assisting the public health department and school districts throughout San Diego County in the early detection and identification of disease outbreaks or bioterrorism events.



PIPP is a prospective, controlled, randomized trial of the effectiveness of NPIs in controlling influenza and related illnesses in K-5 schools

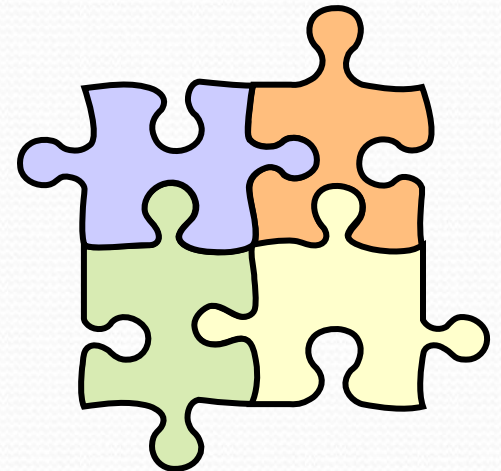
10 schools (K – 5)

3800 students in Pittsburgh



# Big Picture

- Funded by the Centers for Disease Control and Prevention (CDC)
- Part of an international effort to prepare for pandemic influenza
  - Non-pharmaceutical interventions (NPIs)
  - 8 sites around the world
  - Each site working on a different piece of the puzzle

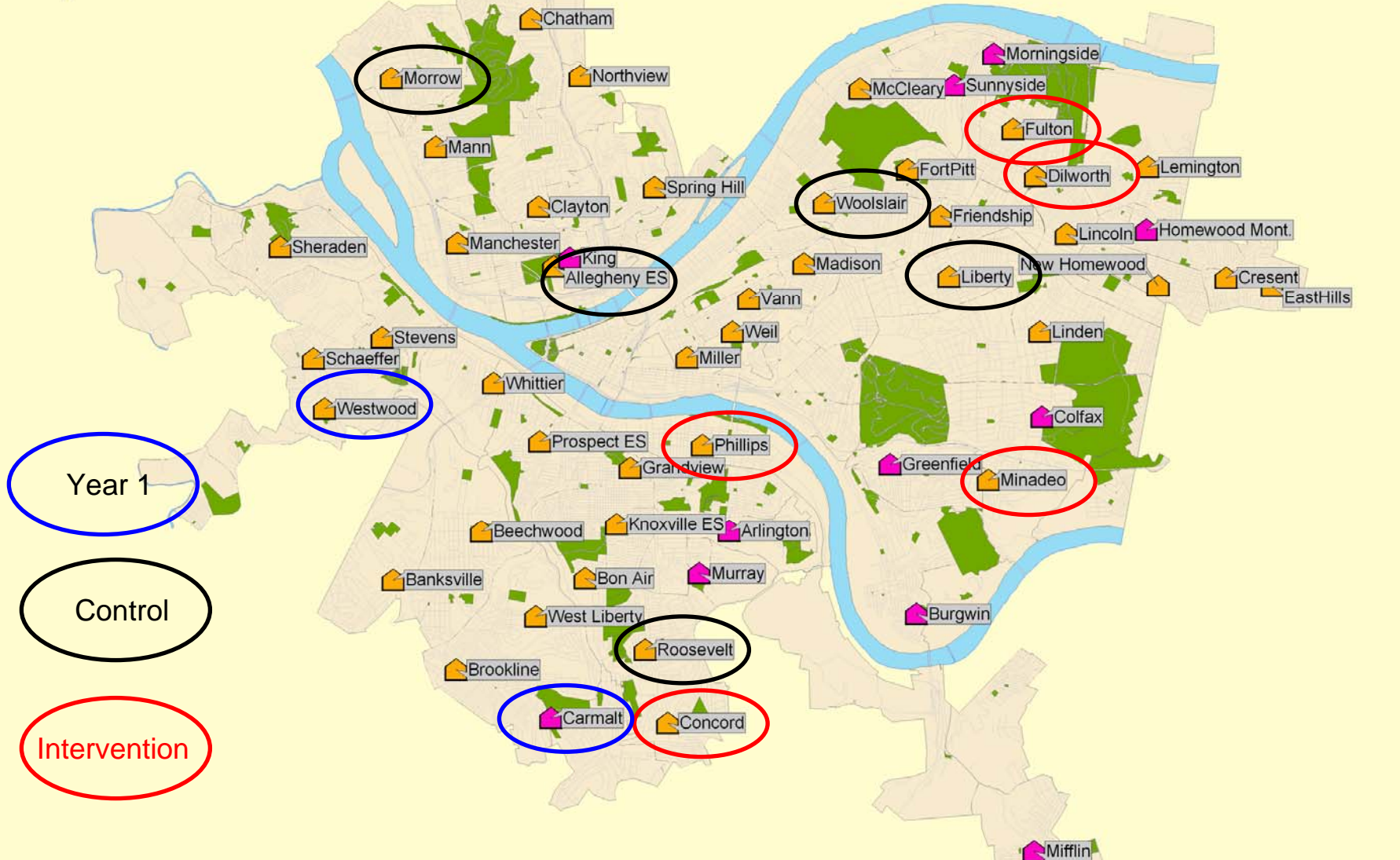




## During flu season:



- Reduce cases of influenza
- Reduce cases of ILI
- Reduce # of children absent due to illness
- Reduce absenteeism
- Assess intra-familial and intra-classroom spread
- Add to knowledge about flu pathogenesis and infectivity





### Elementary and K-8 Schools

2005 PPS Atlas & Data Factbook

-  Elementary Schools
-  K-8 Schools



- Community-based Participatory Research
- University – Public School – Public Health
- Surveillance System
- Notification System
- Testing System
- Intervention



# PIPP Year 2 (07-08)

- Intervention Year
  - Ten K-5 schools: five intervention and five control
  - Intervention Schools
    - WHACK and alcohol-based hand sanitizer
  - All Schools
    - Absentee and outbreak surveillance
  - Identification of ILI during flu season leads to:
    - Enrollment in testing protocol and home visit
    - Nasal swab testing for Flu A / B
    - Follow-up illness investigation if test positive

# Teamwork - PIPP





# W.H.A.C.K. THE FLU!

**W**ash or sanitize your hands often

**H**ome is where you stay when you are sick

**A**void touching your eyes, nose and mouth

**C**over your coughs and sneezes

**K**ee your distance from sick people



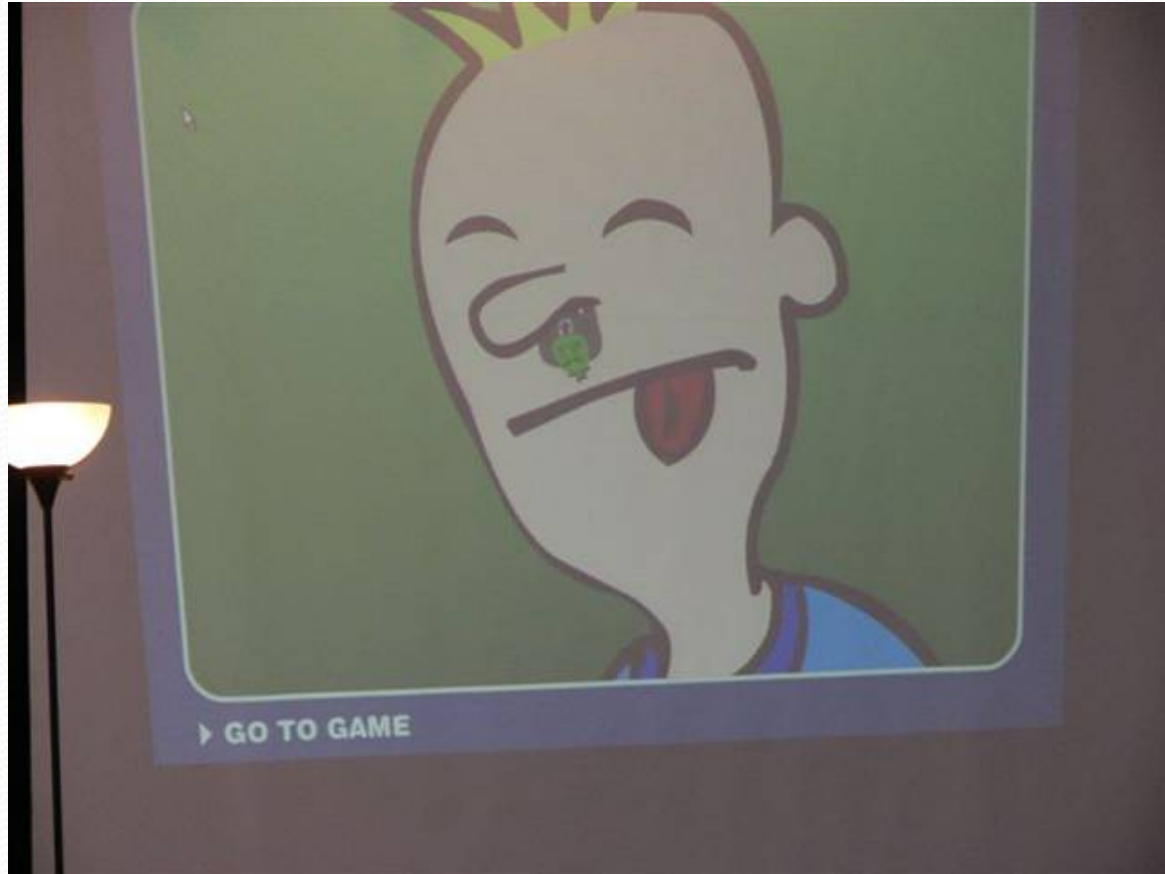
# WHACK - Details

- Educational
  - Influenza 101
- Behavioral – School
  - Hygiene
- Behavioral – Home
  - Isolation



# Influenza 101

- Short curriculum on germs and illness
  - Grade-appropriate
    - K-1, 2-3, 4-5
  - Link to science education
  - Help students understand the “invisible world” and relation to health
  - Provide context for behavior change



# Influenza Prevention Specialist



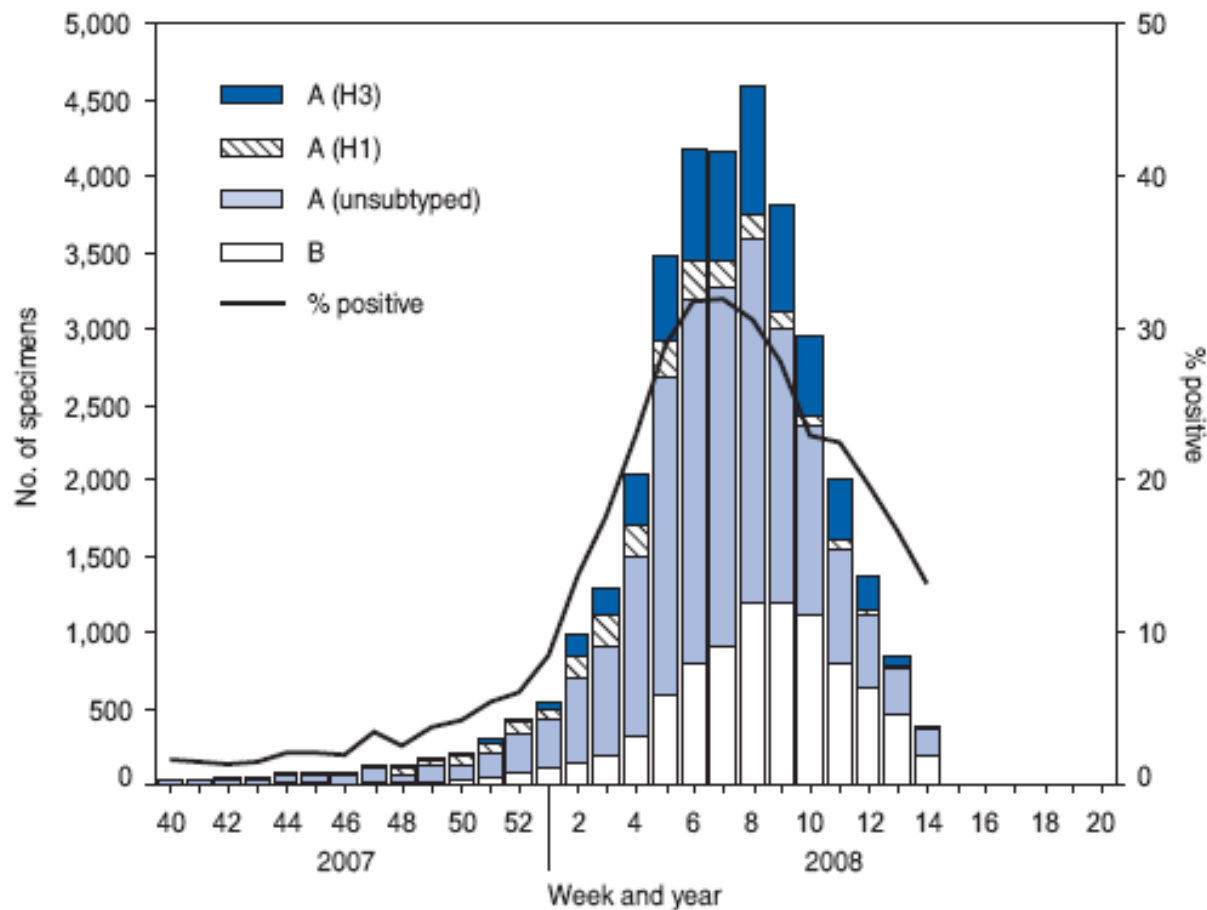
# Teaching and Training



# Results

- Flu season nationally
- Flu season statewide
- Flu season locally
- Flu season in the schools
- PIPP activities

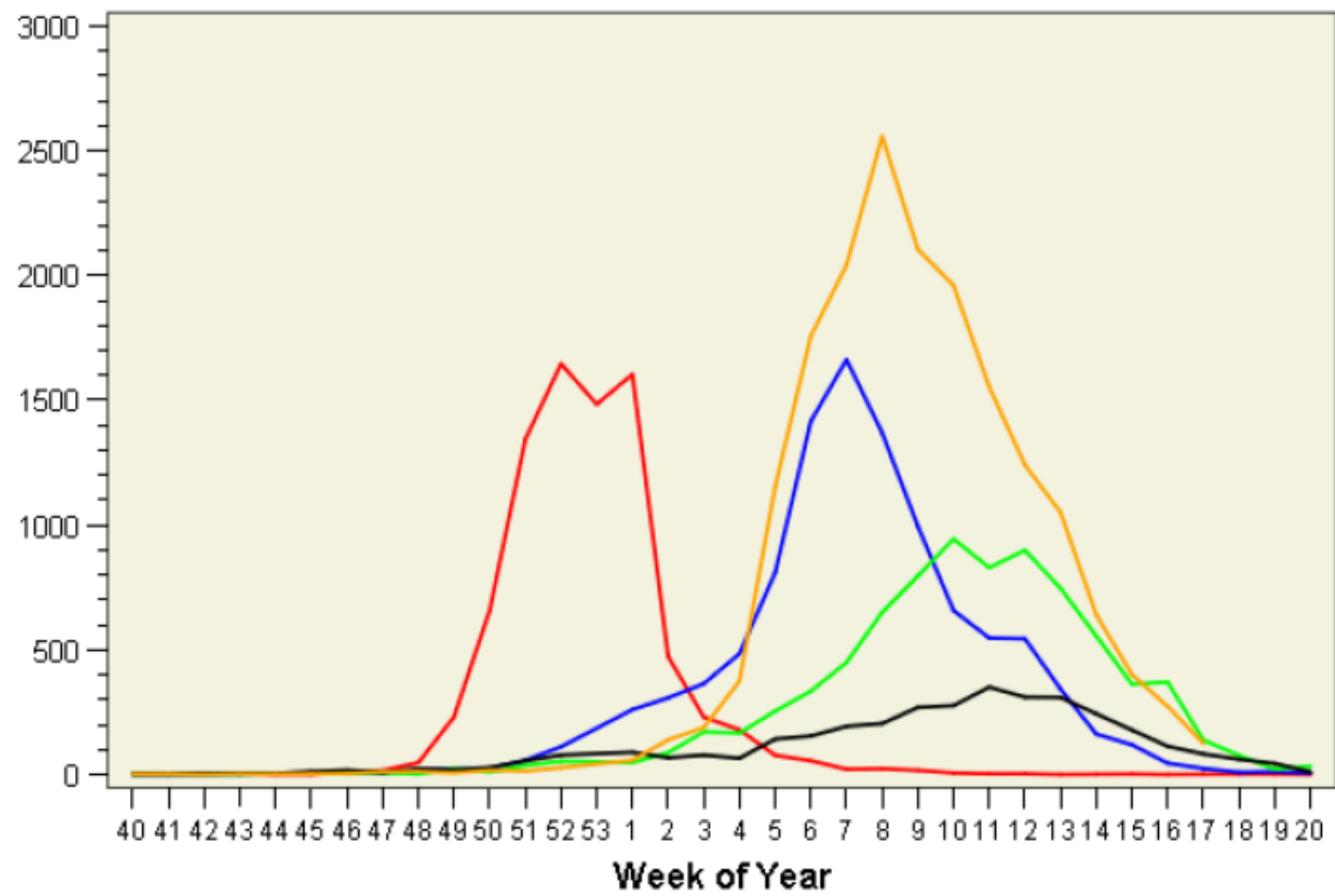
**FIGURE 1. Number\* and percentage of respiratory specimens testing positive for influenza reported by World Health Organization and National Respiratory and Enteric Virus Surveillance System collaborating laboratories, by type, week, and year — United States, September 30, 2007–April 5, 2008**



\* N = 34,380 (of 185,938 tested).

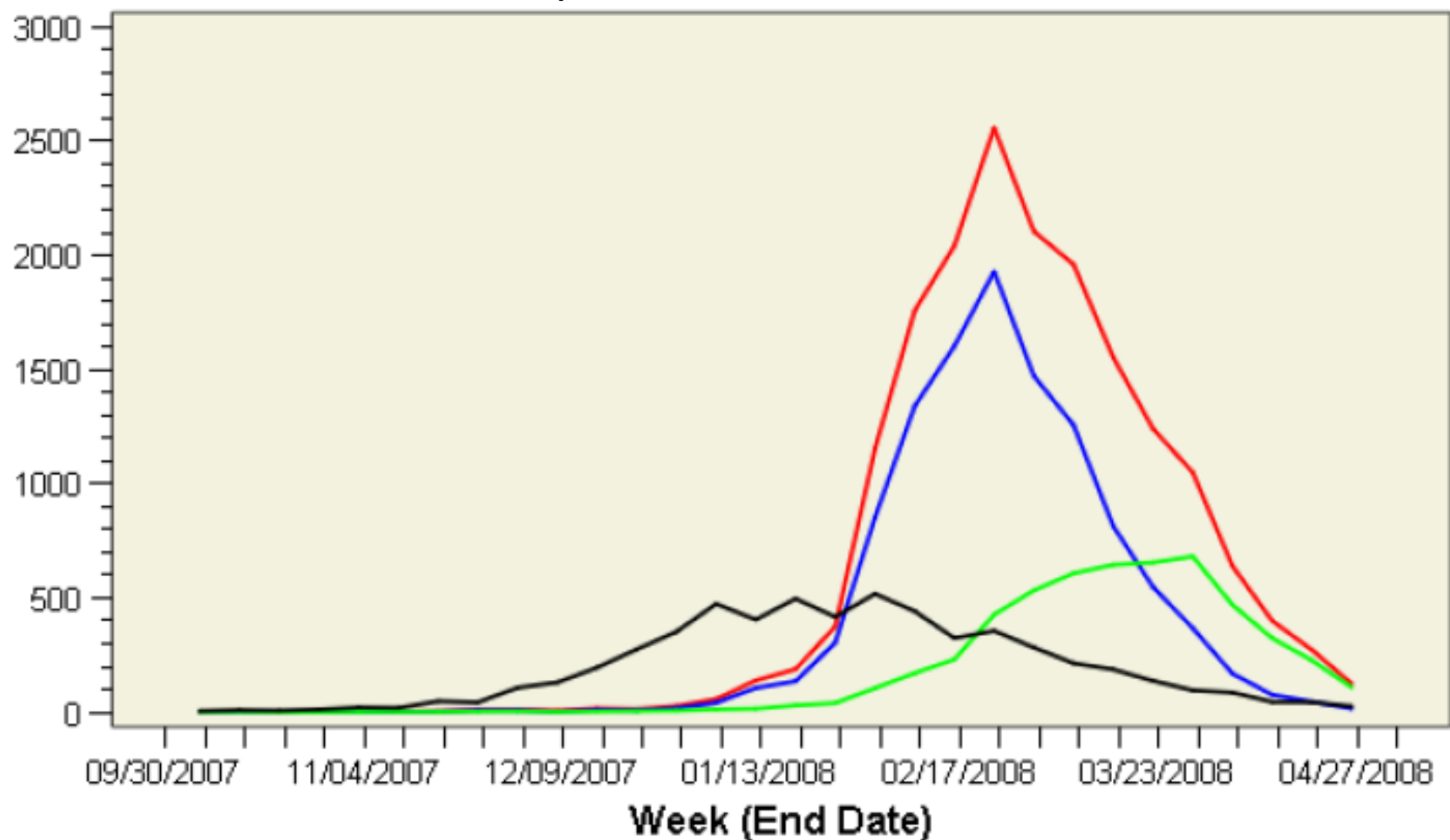
Number of Cases

Pennsylvania



Influenza Season — 2003-2004 — 2004-2005 — 2005-2006 — 2006-2007 — 2007-2008

# Number of Cases Pennsylvania

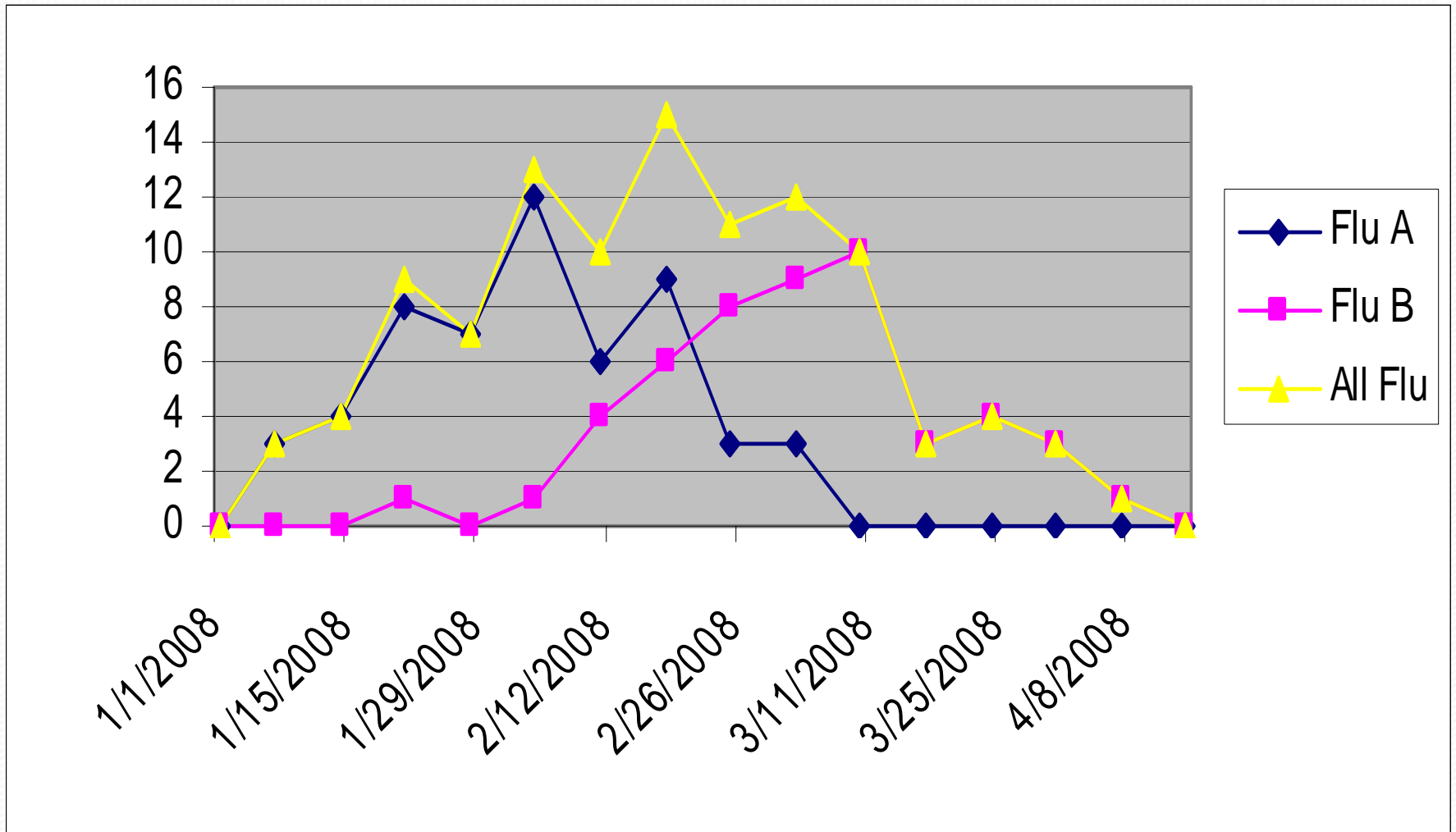


- Total Number of Patients Testing Positive for Influenza
- Influenza A
- Influenza B
- RSV

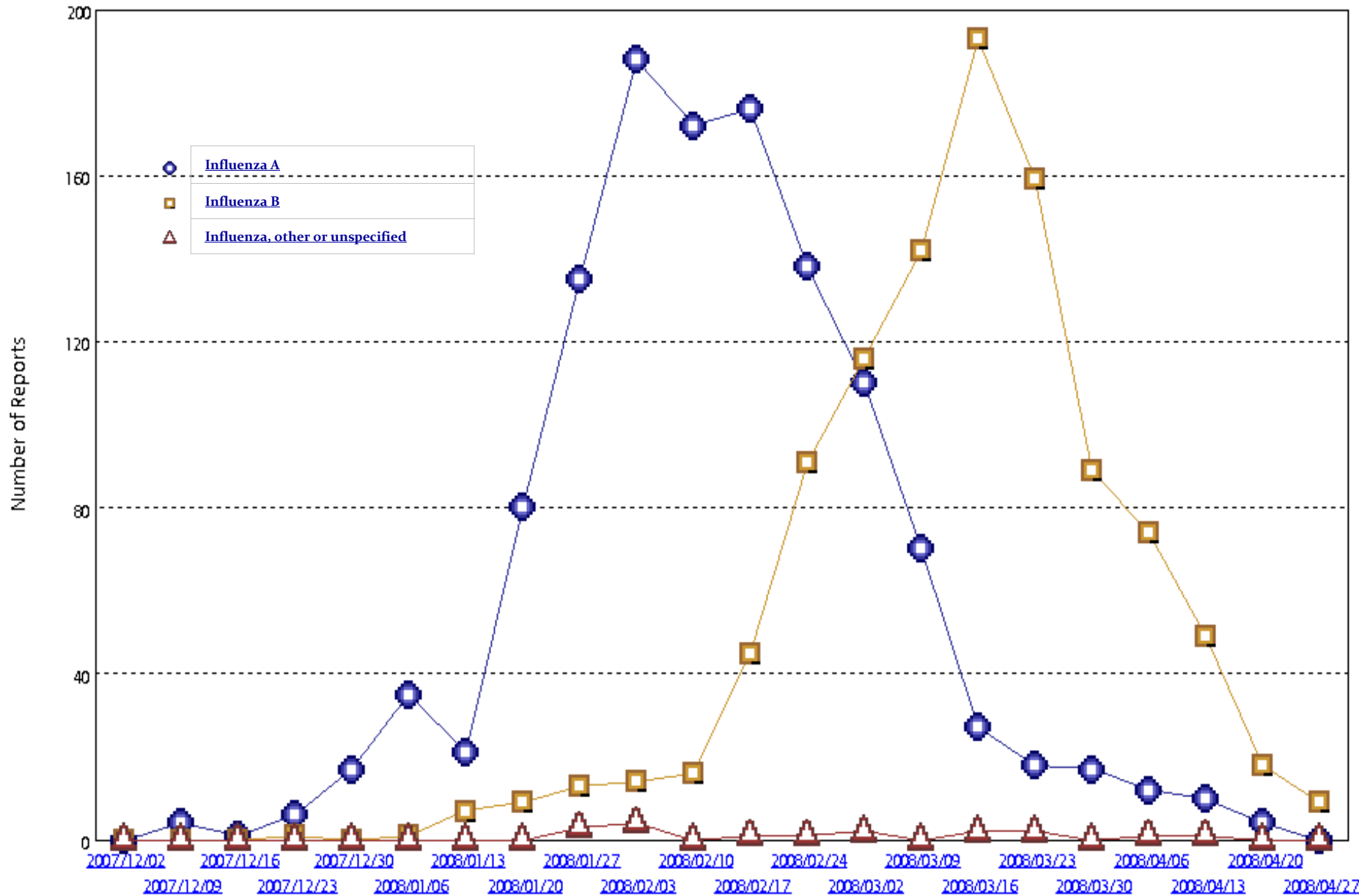
# PIPP Flu Season 2008

- Total Absences = 8600
- Calls Made = 7600
- Contacted = 2500
- 1100 ill
- 300 ILI
- 287 Tested
- 105 Influenza
  - 55 Influenza A
  - 50 Influenza B

# PIPP 2008: Flu A, B, & Total



Influenza Reports 2007-2008 Allegheny County

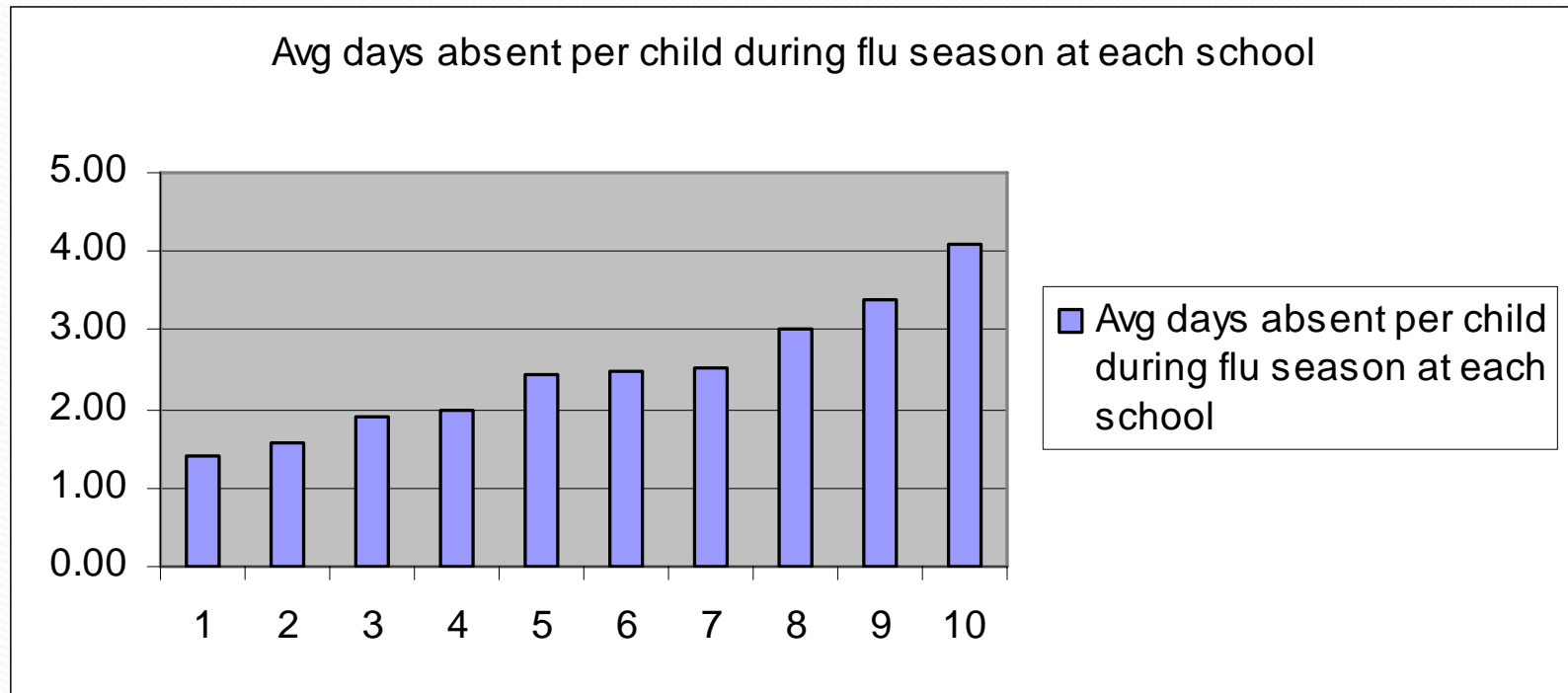


# Results (preliminary)

2007-2008 influenza season:

- Reduced absenteeism
- Reduced illness (in general)
- Reduced influenza-like illness
- Other information pending

# Absenteeism during Flu Season by school



# “Community” Samples

- Advantages and Disadvantages



# PIPP Laboratory Testing

- Rapid Flu Test (A and B)
- PCR (A – H<sub>1</sub> & H<sub>3</sub>, and B)
- Respiratory Panel
  - 15 common viruses
- Full genome sequencing
  - JCVI (former TIGR)

# Student Public Health Epidemic Response Effort



- SPHERE responsibilities included: phone calls, data entry, and illness investigations
- 21 different students volunteered for approximately 140 hours (total)
  - Range: 2 to 20 hours/student
- > 1000 phone calls made leading to 40 Influenza-like illnesses found
- > 35 illness investigations completed

# Influenza – Pharmacologic

- Medication
  - Resistance
- Vaccination
  - New recommendations
  - IM vs. Intra-nasal

# Resistance to medication

- Adamantanes
    - H<sub>1</sub>N<sub>1</sub>: 11%
    - H<sub>3</sub>N<sub>1</sub>: 99.6%
    - B: Adamantanes are not effective against B
  - Oseltamivir (Tamiflu)
    - H<sub>1</sub>N<sub>1</sub>: 10% (US) (up from <1% last year)
      - All same clonal variant
      - Rate in Europe is > 20%, with some countries >50%
    - H<sub>3</sub>N<sub>1</sub>: 0%
    - B: 0%
  - Zanamivir
    - All sensitive
- [www.cdc.gov/flu/about/qa/antiviralresistance.htm](http://www.cdc.gov/flu/about/qa/antiviralresistance.htm)

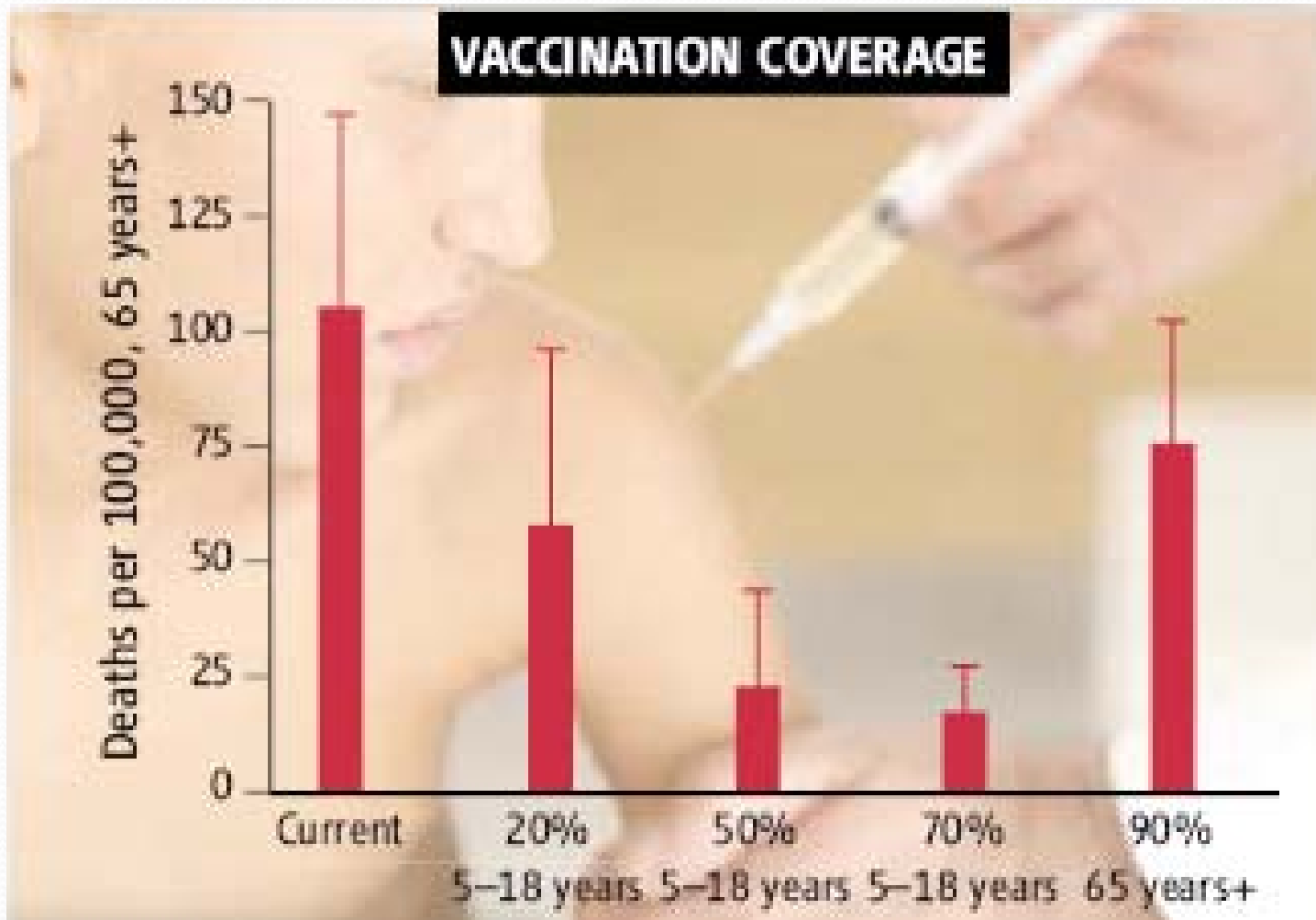
# Vaccine Mis-fit in 07-08

- H1: 31% of US samples do not match the vaccine
- H3: 78% of US samples do not match the vaccine
- B: 96% of US samples do not match the vaccine
  
- **Composition of the 2008-09 Influenza Vaccine**
  - A/Brisbane/59/2007-like (H1N1)
  - A/Brisbane/10/2007-like (H3N2)
  - B/Florida/4/2006-like viruses.
  
- All have been changed from the 2007-08 Northern Hemisphere vaccine formulation.

# New Considerations

- New CDC/ACIP Guidance
  - <http://www.cdc.gov/vaccines/recs/provisional/downloads/flu-3-21-08-508.pdf>
- Reality that mass vaccination of school children and the evaluation of that process helps prepare for pandemics
- Possibility that immunization of kids may be the best way to protect adults
  - Japan study
  - Halloran and Longini

# Halloran and Longini, 2006



# Tecumseh Study: 1968

- Vaccine administered in schools in November
- 92% of elementary school kids
- 75% high schoolers
- 86% overall
- 3159 actual doses
- 5% of vaccinees had serology; 95% had 4-fold rise
- Flu season early – mid-Nov through early Jan

FIG. 1

TOTAL SCHOOL ABSENTEEISM IN TECUMSEH AND ADRIAN, MICHIGAN

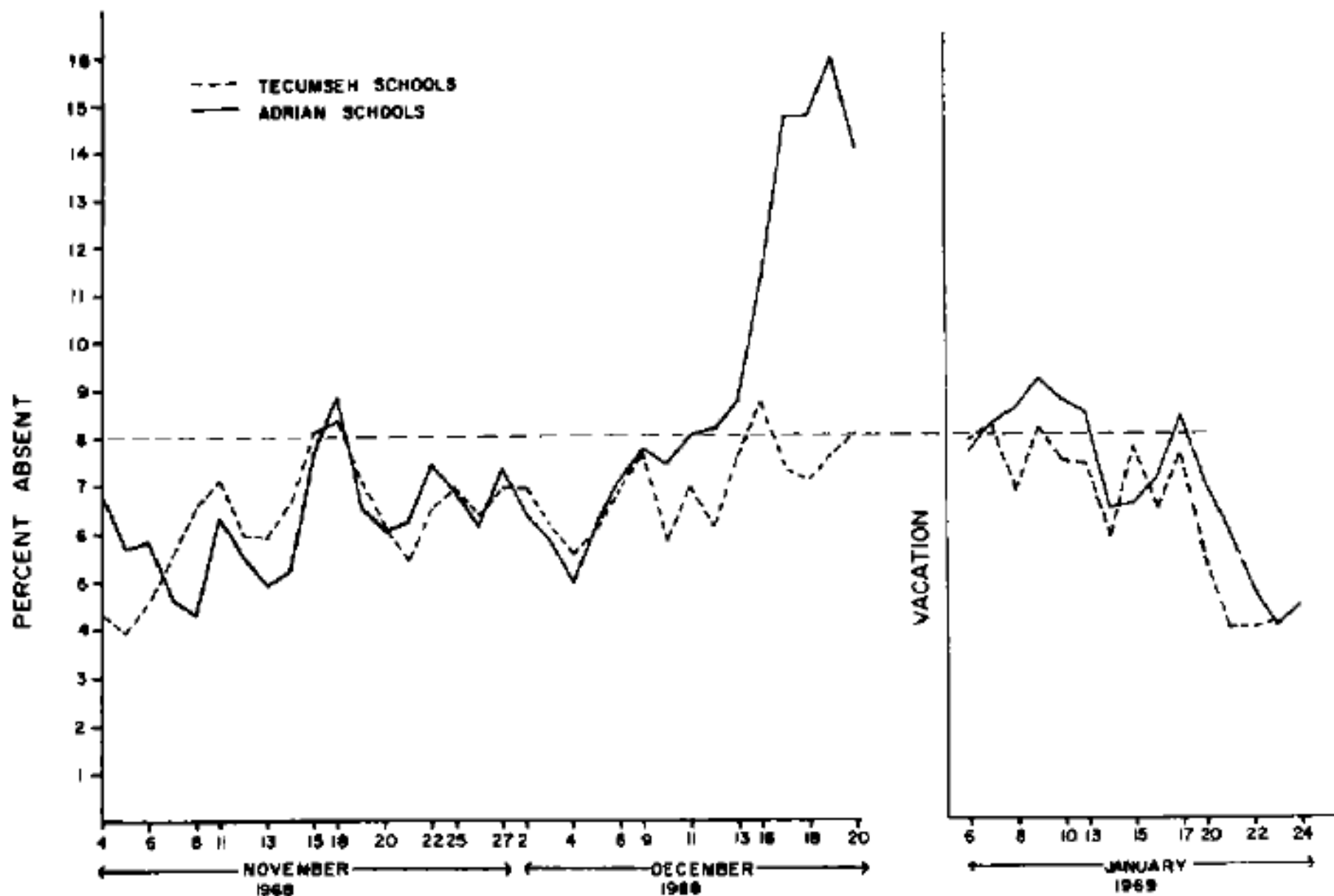
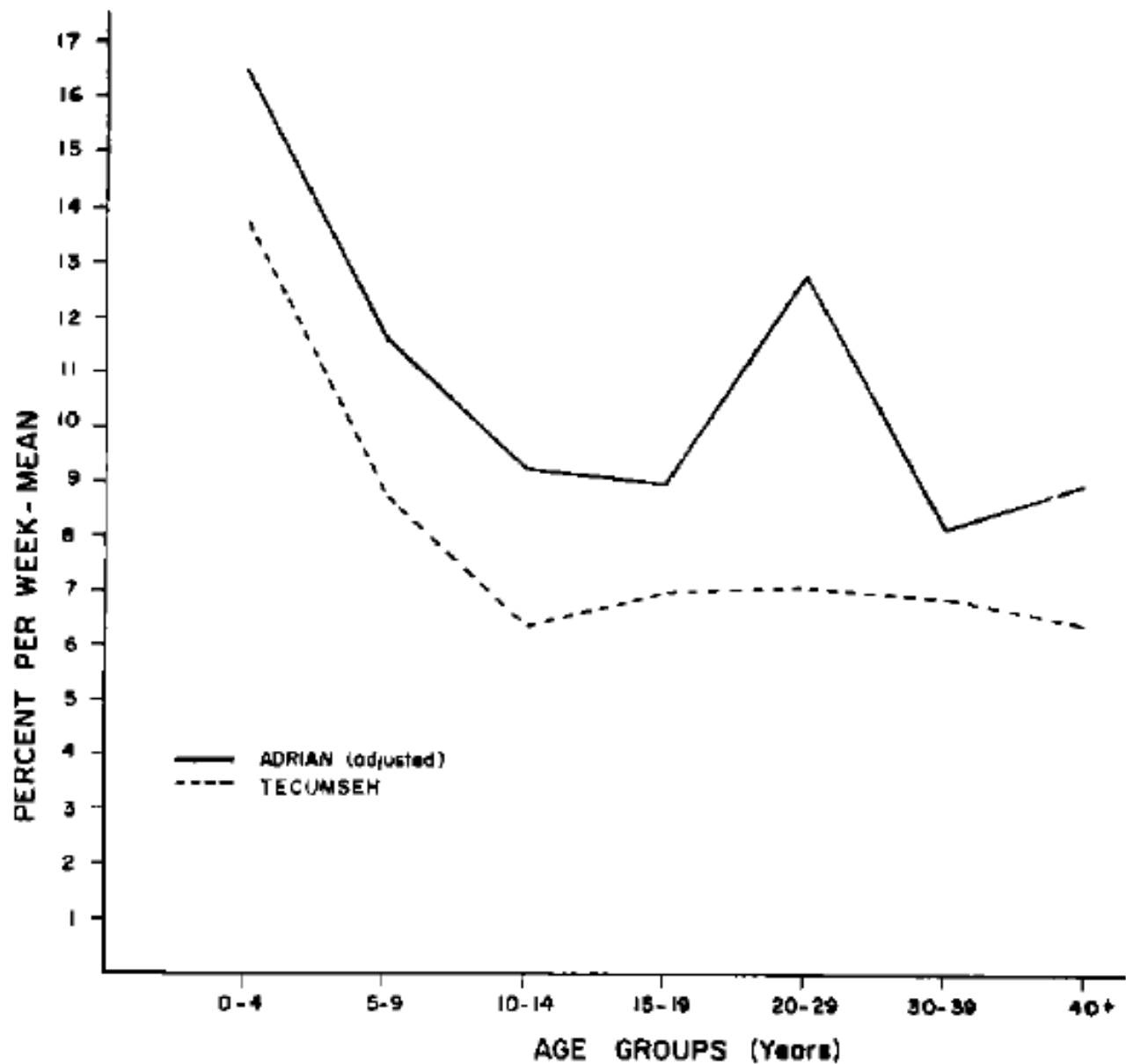


FIG. 4

AGE-SPECIFIC RATES OF RESPIRATORY ILLNESS IN TECUMSEH AND ADRIAN, MICHIGAN, DURING THE INFLUENZA PERIOD

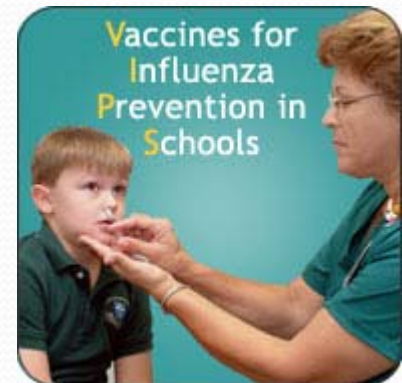


# Influenza Vaccination

- 40% of kids eligible for VFC
  - Medicaid, uninsured, underinsured, AI/AN
- 60% of kids w/ health insurance
  
- Kids without risk factors
  - < 13%
- Kids with risk factors
  - 29% (CDC estimate)

# School-based Immunization

- Intra-nasal vaccine
- Coordinated effort
- Linked to surveillance
- Implemented with insurers on board
- Creative financing
- Stable and repeatable year after year





# Leadership

Don't pray for the day when we finally solve our problems. Pray that we have the freedom to continue working on the problems the future will never cease to throw at us.

- John Gardner, "On Leadership"



# Thank You!

For further information or questions about this presentation please contact:

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