

# Technical Challenges from the Public Health Practice Community

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# QUESTIONS

- How do we manage the increasing amount of data that is available?
- How do we integrate multiple data streams?
- How do we visualize and communicate information effectively?

# There is Always More Data

- What are the appropriate analytical methods???
- What do the data tell me???
- Diagnostic tools
  - In cases where statistical expertise is lacking, people may use methods that are convenient or familiar rather than those that are appropriate
- Access to standardized methods or people
  - Help evaluate a data stream based on the needs of the analysis (e.g. event detection vs. trend monitoring)
  - Help interpret the results of the method
- Support would go a long way towards alleviating the fear and wariness that people may feel towards analyzing their data.

# Seeing the Forest for the Trees

- The Forest
  - Event detection, event management, and situation awareness
    - Integrated dashboard/decision making tools
    - Practice and research
- The Trees
  - Increasing amount of data available electronically (data streams and data elements)
    - 10 years of syndromic surveillance data
      - ED, EMS, Prescription, OTC, School Health, School Absenteeism, Poison Control
    - Reportable disease information that includes approximately 70 diseases
    - Demographic data for NYC

# Challenges

- Actionable information vs. preparedness
  - Answers are needed in real time
    - E.g. Commissioner of Health, press conference, health policy
  - Communication to many levels
  - Understanding the data
- Little understanding of the interaction among data streams
  - Move together or opposite?
  - Impact of response efforts?
- Data are in silos
- Data are messy
- Data are multi-dimensional
  - Temporal, spatial, behavioral

# Example – novel H1N1 Influenza

- ED surveillance – ILI, Fever, Respiratory
- EMS calls
- Prescription medications – Tamiflu
- Over the counter medications – cold and flu remedies, analgesics (e.g. aspirin, tylenol)
- School nurse visits for ILI
- School absenteeism
- Lab confirmed influenza
- Regional information

# Data Challenges 1 – ED

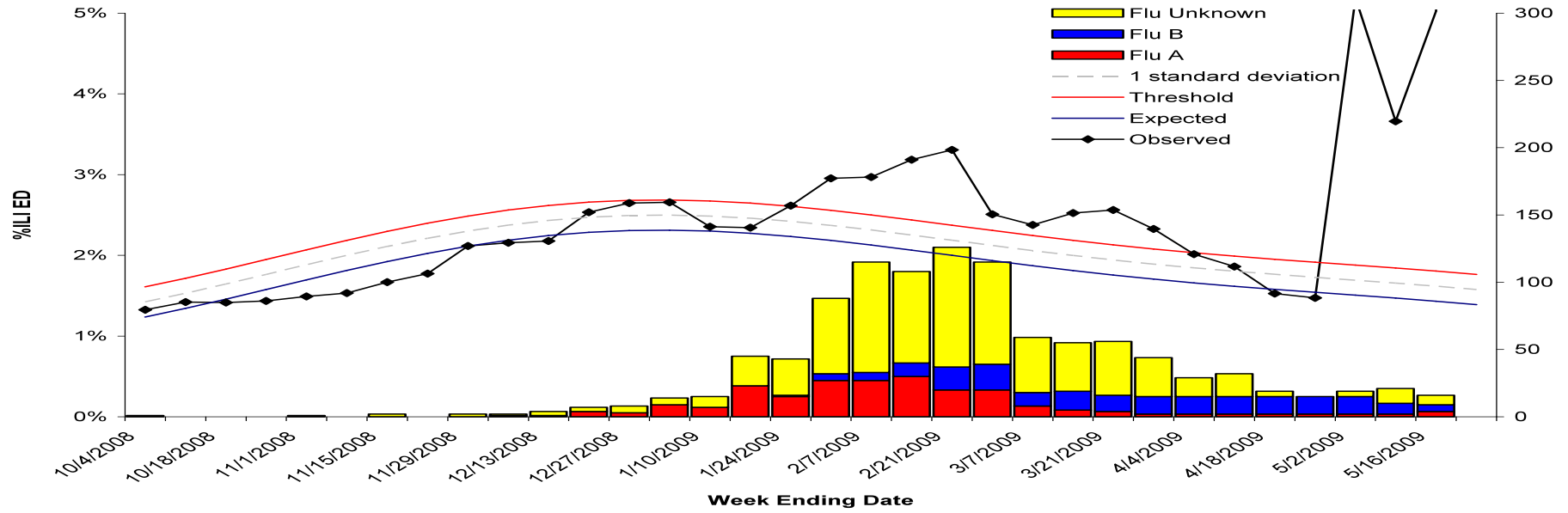
- ED Data Elements
  - Descriptive
    - Chief complaint
    - Zipcode/hospital/borough
    - Time/date of visit
  - Severity
    - Mode of arrival
    - Diagnosis code (~70% after 1 week)
    - Admit information (~70% after 1 week)
    - Measured temperature (5/50 hospitals)
- Integrating spatial, temporal, demographic and behavioral information

# Data Challenges 2 - School

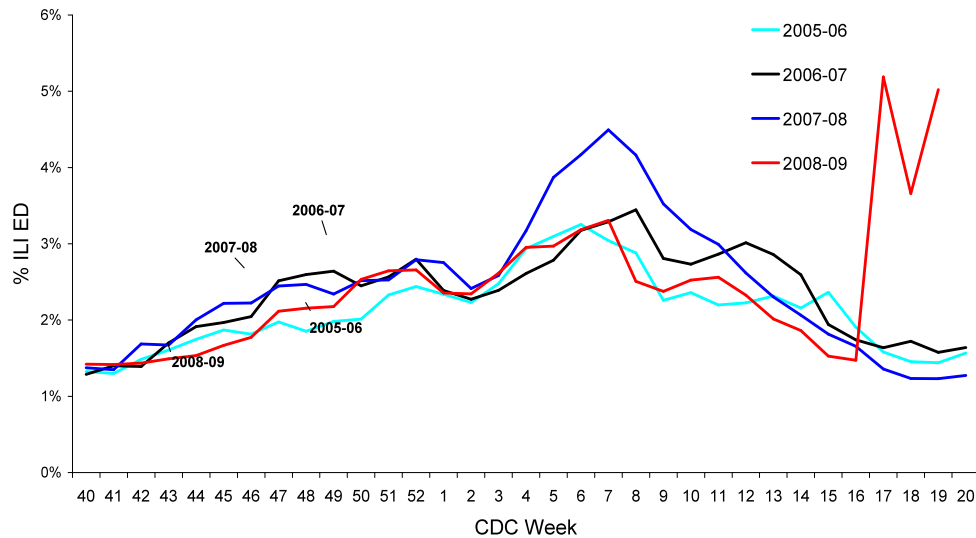
- School Data Elements
  - Enrollment
  - Reason for visit
  - Absenteeism
  - Catchment
- Variability in reporting
  - By school
  - By day
- Integrating data and modeling



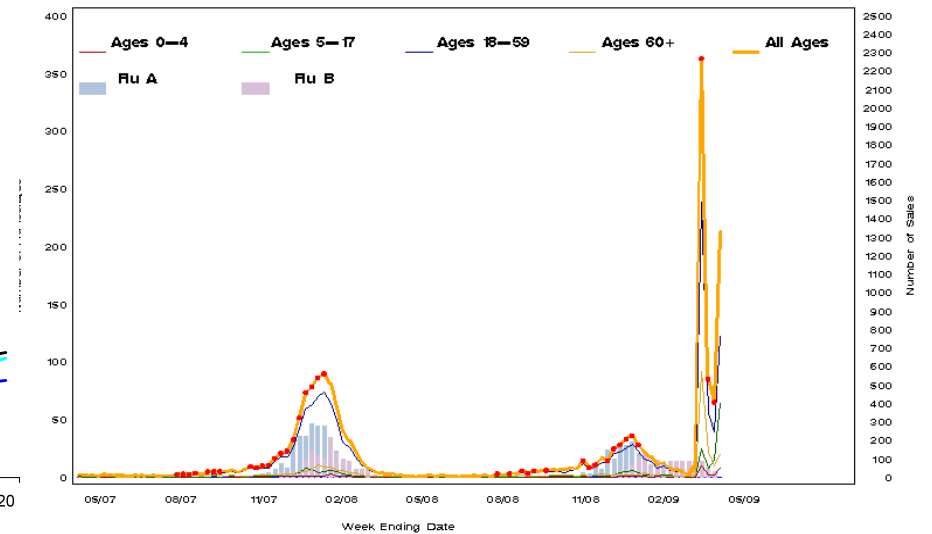
### Weekly influenza-like illness (ILI), all ages emergency department (ED) visits in New York City Week ending May 23, 2009 (2009-20)



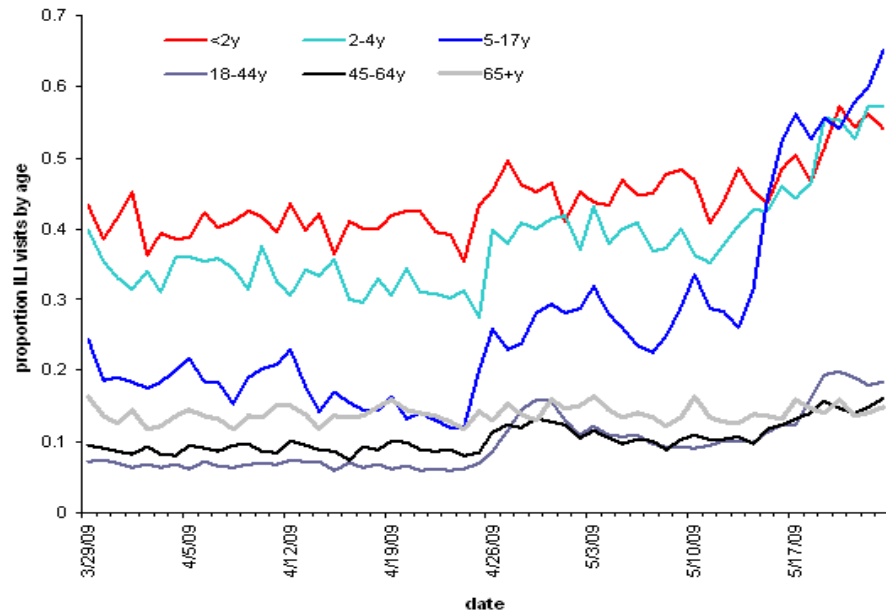
### Weekly influenza-like illness (ILI), all ages, by influenza season emergency department (ED) visits in New York City 2005-06 through 2008-09 (Week ending May 23, 2009)



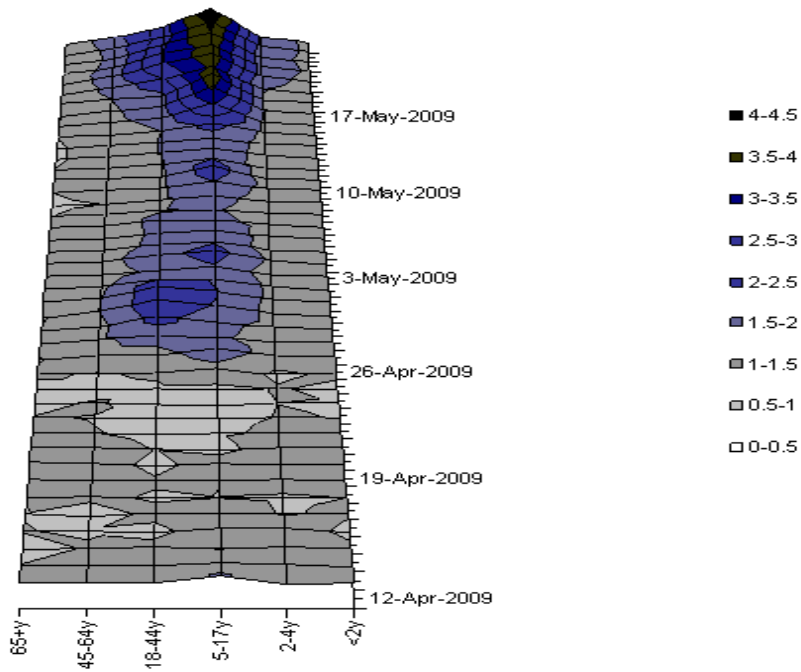
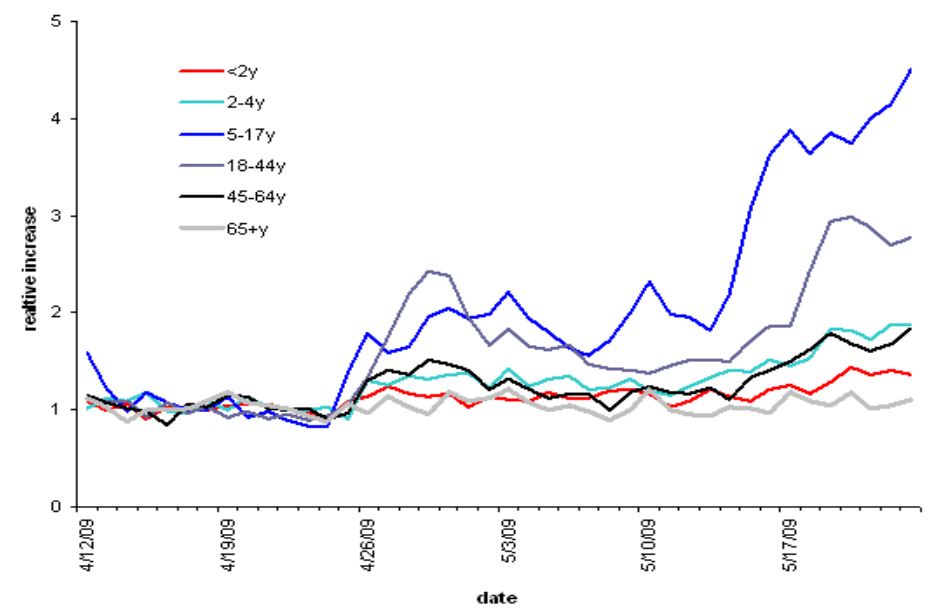
### Weekly NYC Tamiflu Sales and Signals May 2007 to week ending 05/23/09



**%ILI in ISDS DiSTRIBuTE - NYC**



**Relative Increase %ILI in ISDS DiSTRIBuTE - NYC**



# Visualizations

- Multi dimensional
- Modular
- Adaptable
- Integrated
- Spatial and temporal
- Easy to understand
- Easy to reproduce
- Easy to share and compare

# Acknowledgements

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