Syndromic Surveillance in New York City

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Overview

- Assumptions & Definitions
- Assertions
- Future Directions

Assumptions

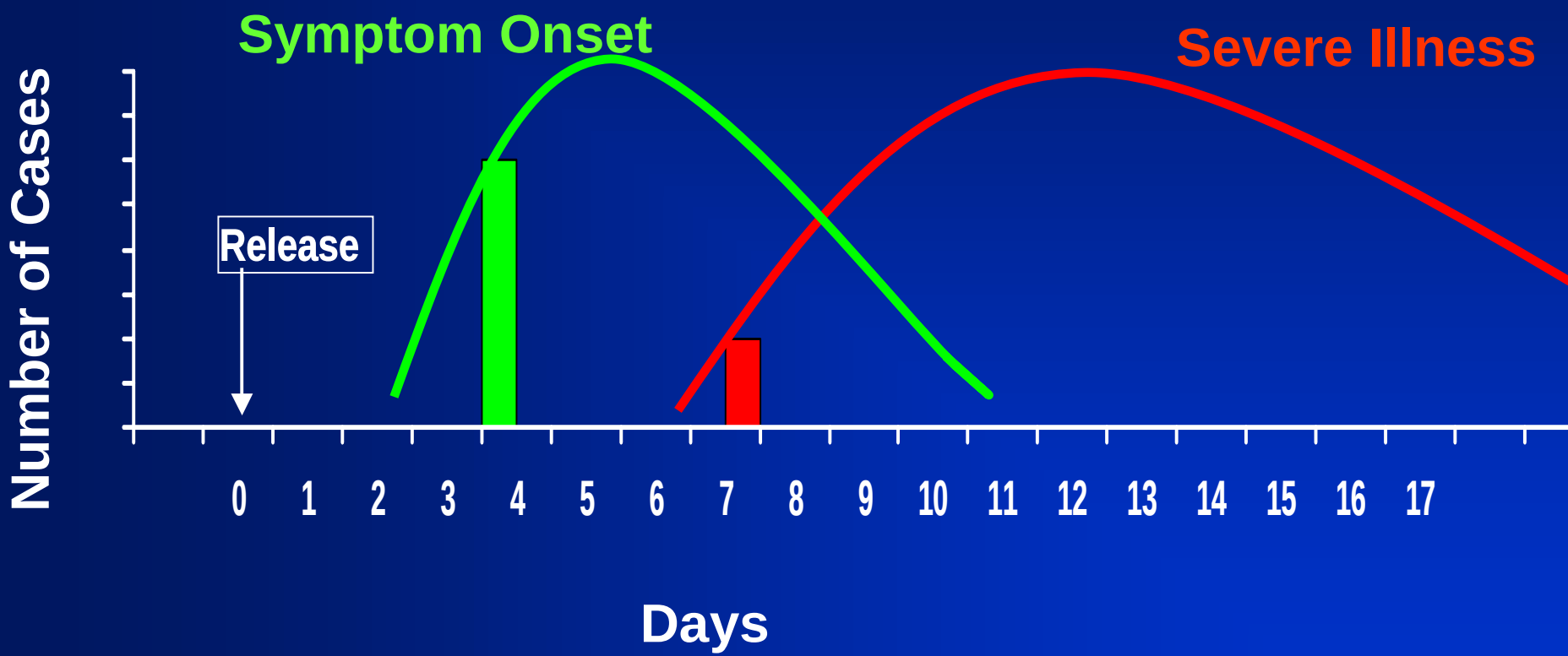
- Large-scale BT attacks are a real public health concern
- Early detection will save lives

Definitions

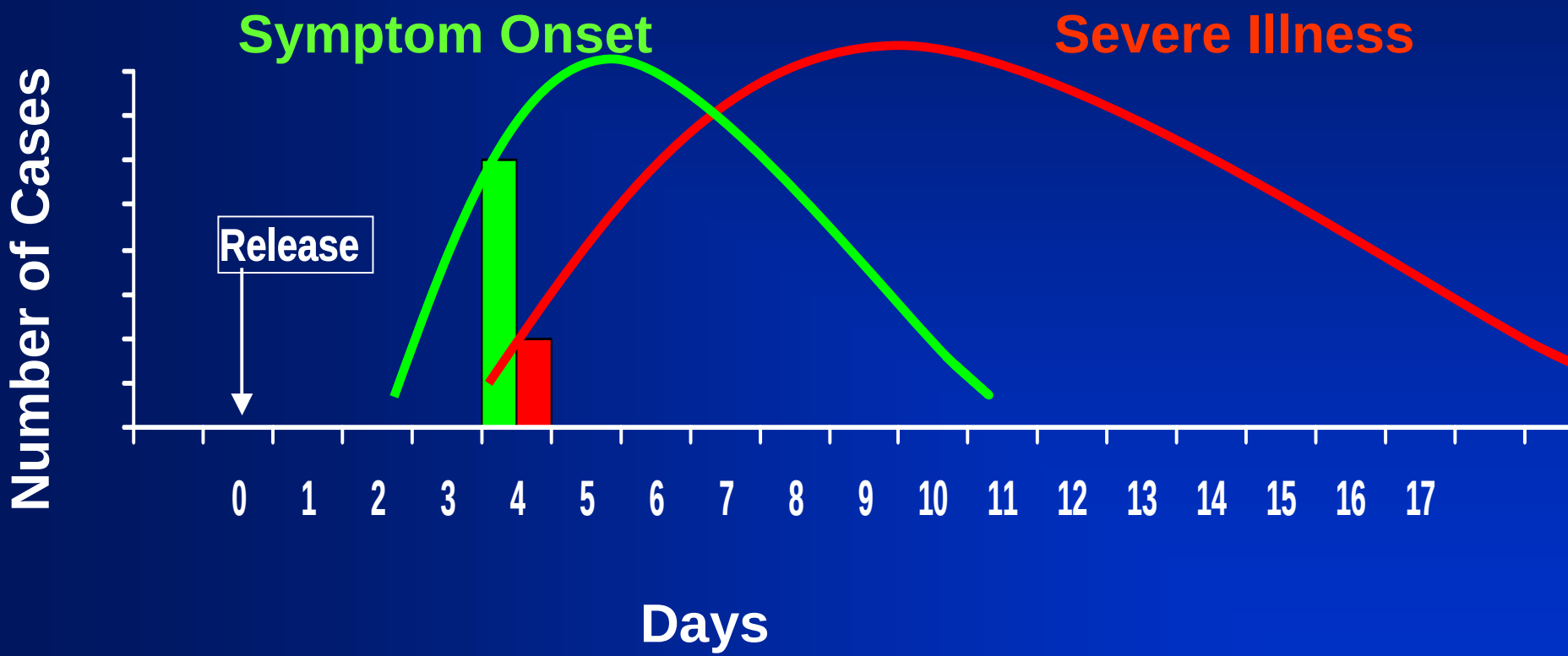
- **Traditional Surveillance**
  - **Relies on etiologic diagnosis**
- **“Syndromic” Surveillance**
  - **Surveillance for non-specific conditions or symptoms (e.g., flu-like, diarrheal)**
  - **“Prodromic” surveillance when harbinger of severe illness**

Assertion 1
Traditional and Syndromic Surveillance are Complementary

Rationale for Syndromic Surveillance



Physician Reporting



Which Scenario will happen?

- Depends on
  - agent
  - quality and quantity,
  - method of dispersion,
  - population characteristics
- Which scenario will occur is unknowable
- We should be prepared for both possibilities

Assertion 2
Existing electronic records should be used whenever possible

- No additional burden on busy clinicians
- Better data quality & completeness
- Not affected by waxing and waning interest
- Timely electronic transmission possible

“Drop-in” Surveillance after WTC

- **Best Case Scenario**
  - Experienced team
  - Minimalist survey instrument (“✓”)
  - Highly motivated ED and DOH staff
  - 30-50 EIS officers stationed in 15 hospitals
- **Results**
  - 75-85% completion rate
  - Numerous false alarms due to miscodes, data entry errors
  - Sustained for <30 days

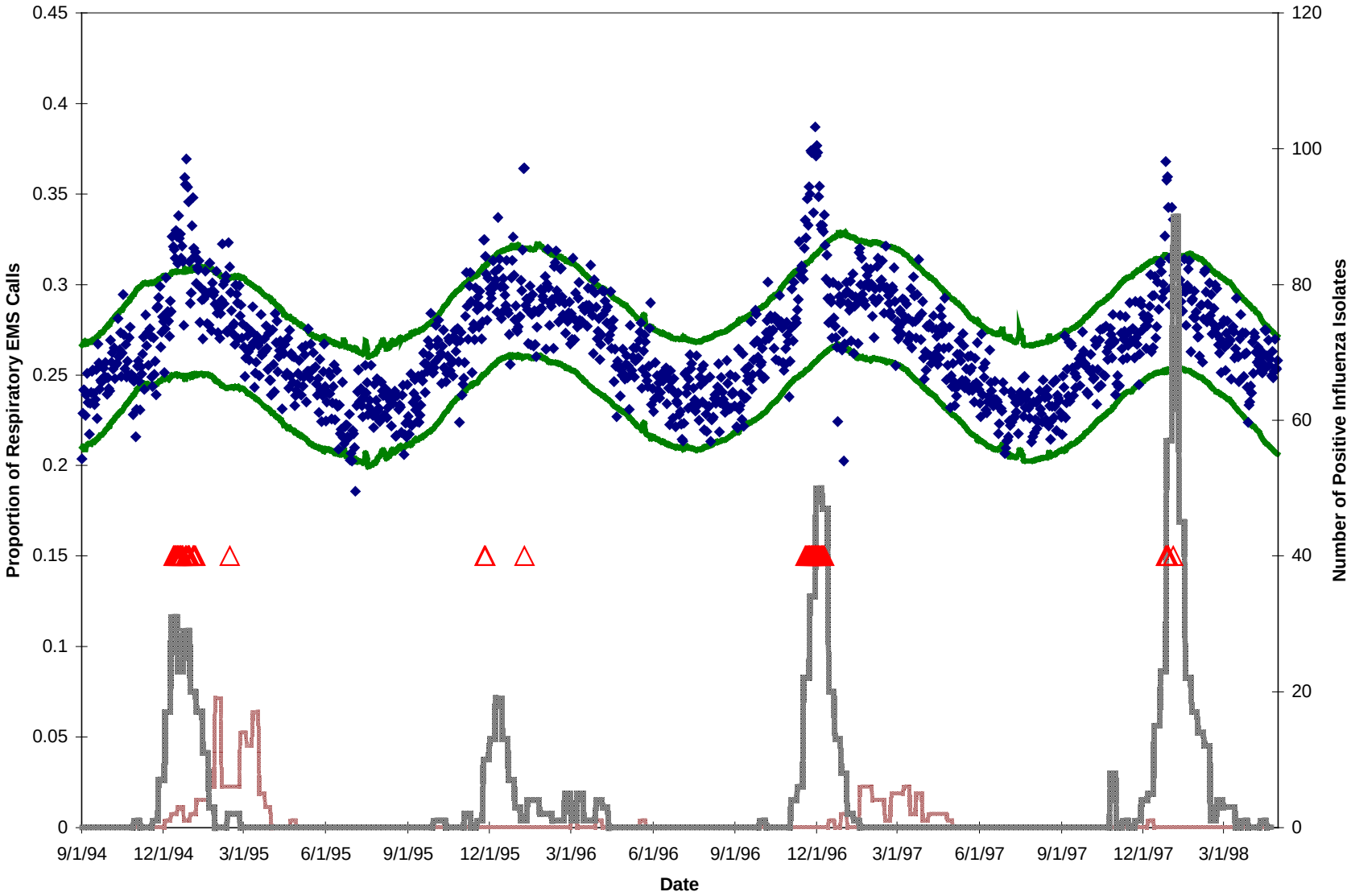
Potential Syndromic Surveillance Data Sources

- Day 1- feels fine
- Day 2- headaches, OTC Pharmaceutical Sales
- Day 3- develops cough- Nurse's Hotline
- Day 4- Managed Care Org : Absenteeism
- Day 5- Worsens- Ambulance Dispatch, ED Logs
- Day 6-
- Day 7-
- Day 8-

Traditional Surveillance

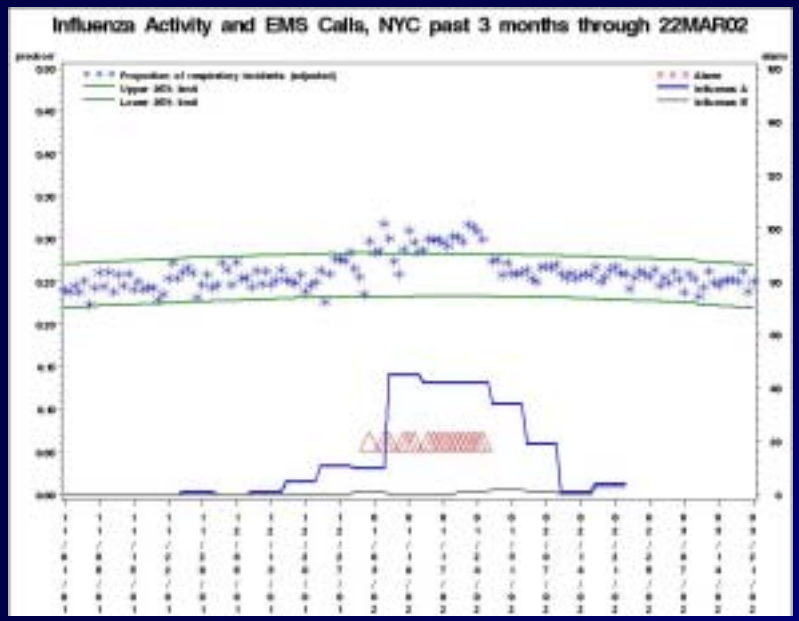
3) Syndromic Surveillance can provide a timely reflection of city-wide illness due to influenza

Selected EMS calls and Influenza, 1994-98

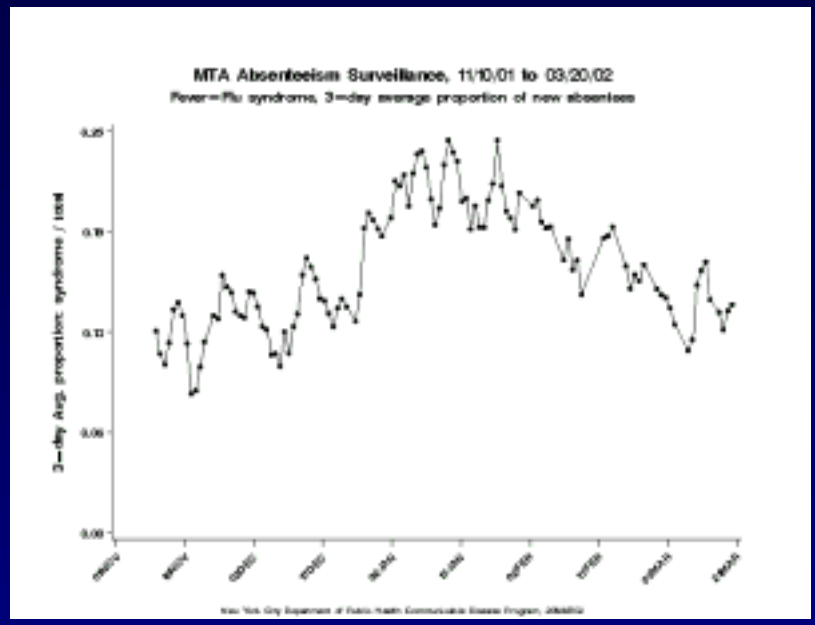


4) Multiple syndromic surveillance systems increase confidence in alarms

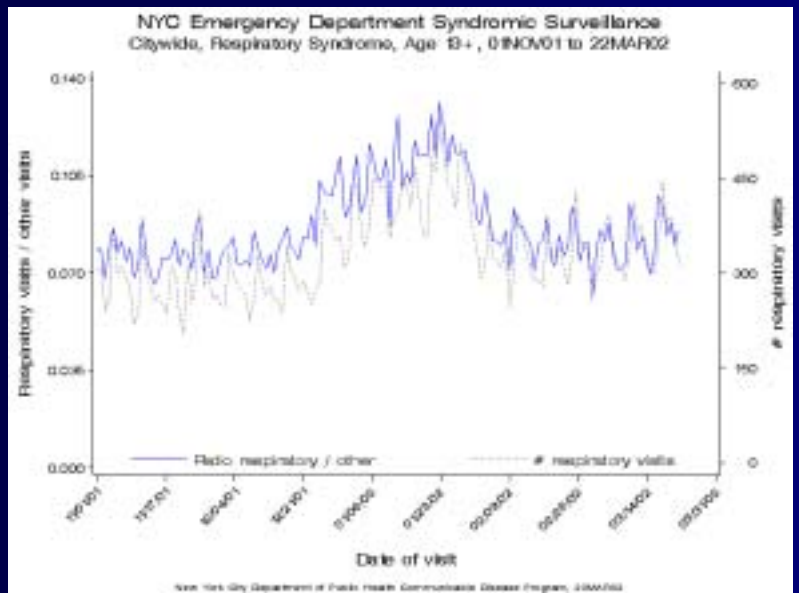
EMS calls



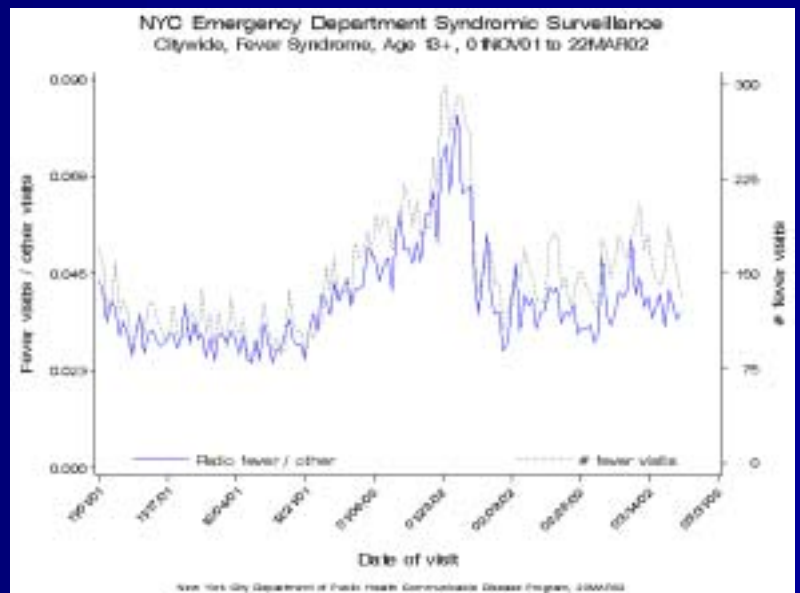
Subway worker- “flu”



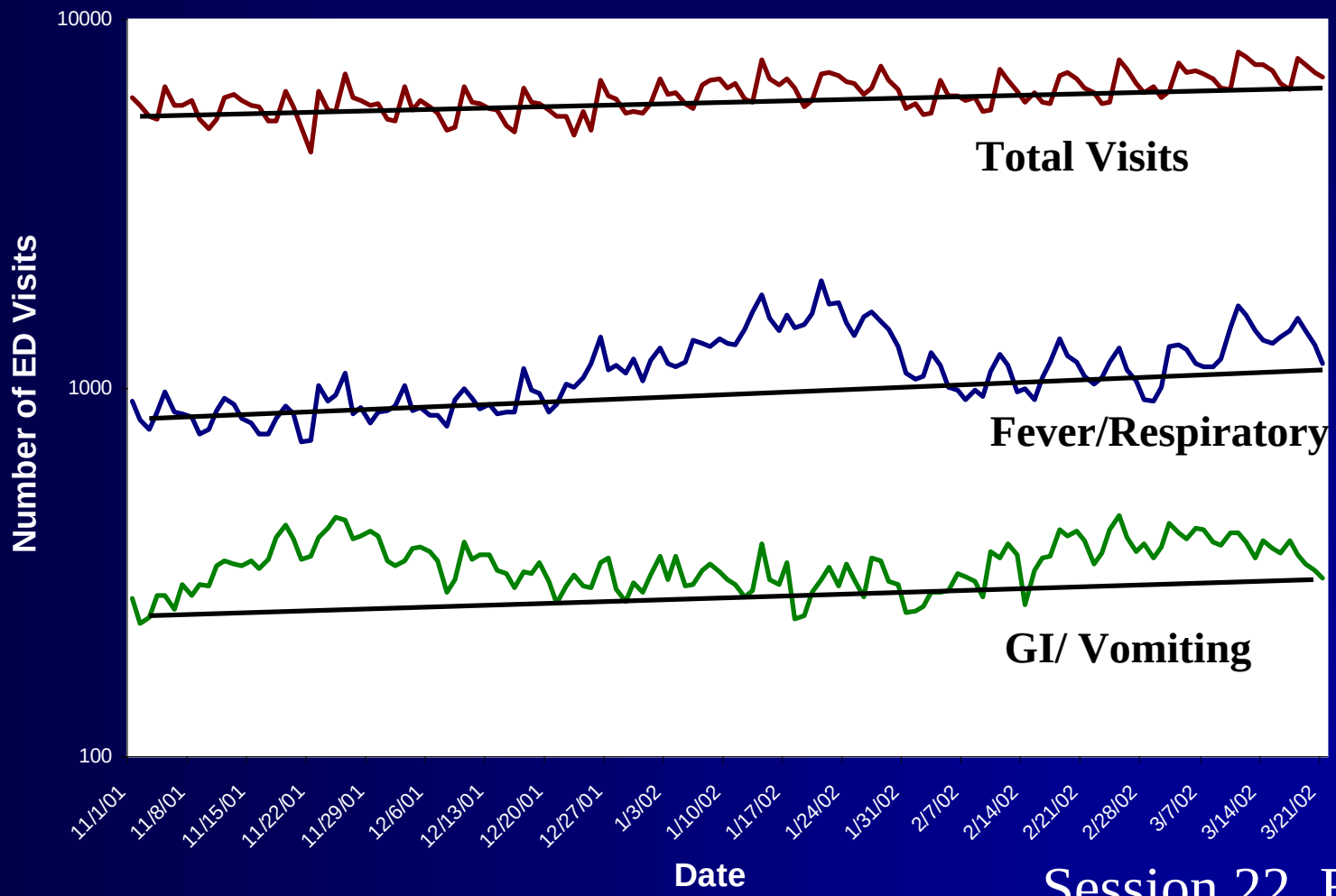
ED respiratory visits



ED “flu syndrome” visits



5) Denominator Surveillance is Less Sensitive than Syndromic



Session 22 Board 33

6) Evaluation is Critical

- Strengths and weaknesses of data sources must be understood
- Testing against influenza is first step
- Need simulation models and "spiked" validation datasets

2200 ED charts reviewed for ILI
Those brought in by EMS were

Characteristic	Ambulance N=64 (%)	Walk-in N=458 (%)
Age*:		
0-18	28 (43)	346 (70)
18-64	24 (38)	93 (18)
65+	**12 (19)**	**10 (2)**
Chest Pain*	**14 (22)**	**35 (8)**
Shortness of Breath*	**19 (30)**	**38 (8)**
Had CXR*	**30 (48)**	**83 (19)**
Had Blood Culture**	**19 (31)**	**40 (9)**
x Pneumonia**	**13 (22)**	**48 (11)**
Admitted*	**20 (33)**	**29 (7)**
	48 hours	**48 hours**

Older

Sicker

Tested More

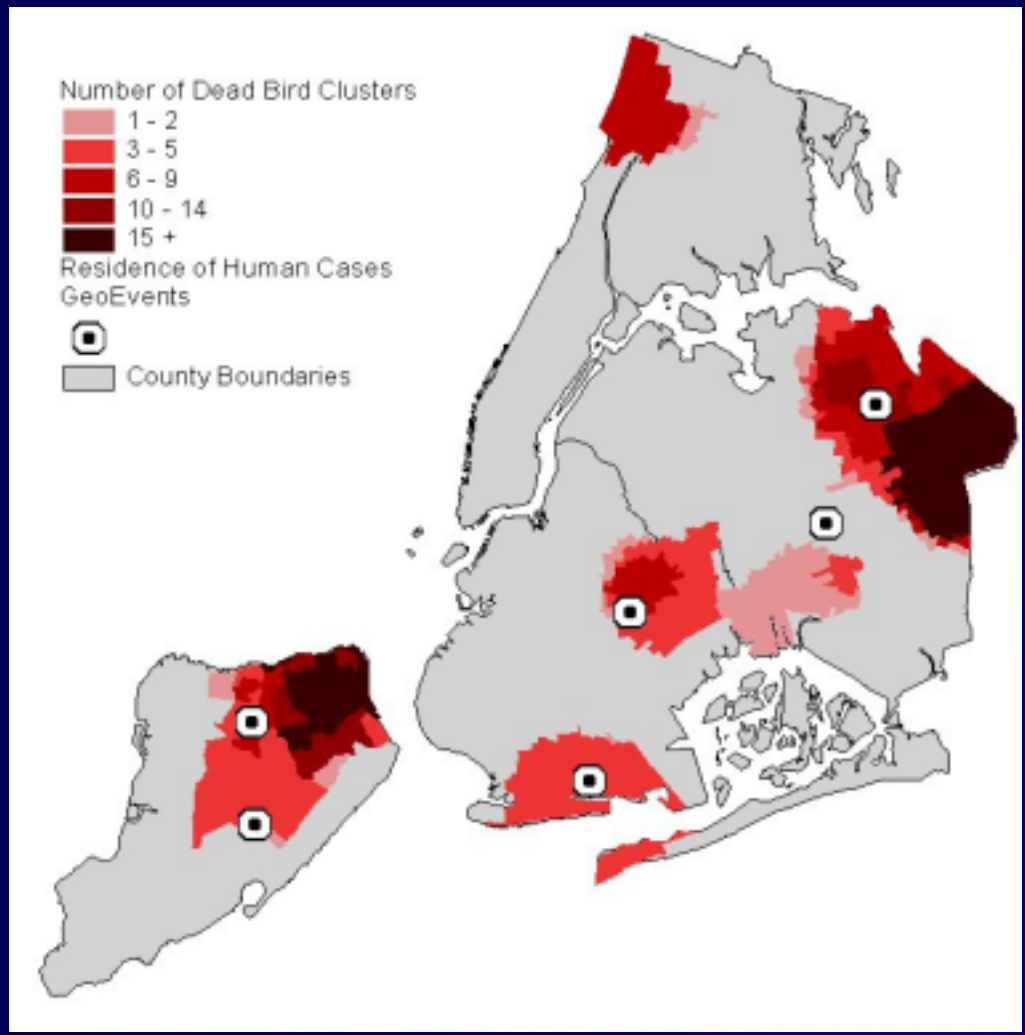
Admitted More

But time since onset was the same

7) Space… The Final Frontier

- Space-time cluster detection could increase sensitivity and timeliness of alarms
- Methods not well established, can adapt from cancer cluster experience (SaTScan)

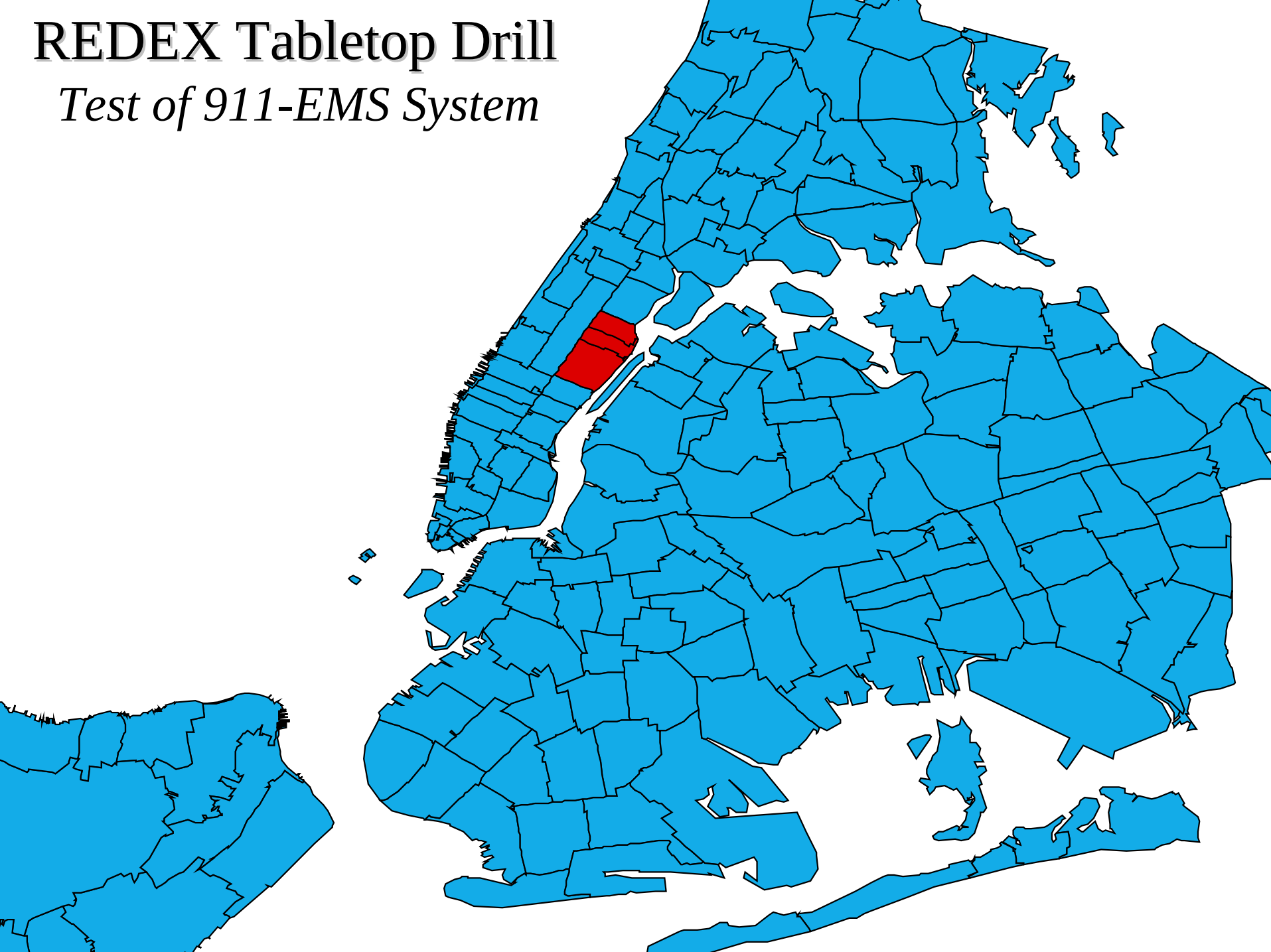
West Nile Virus Activity Through September 2001



Session 56
Board 63

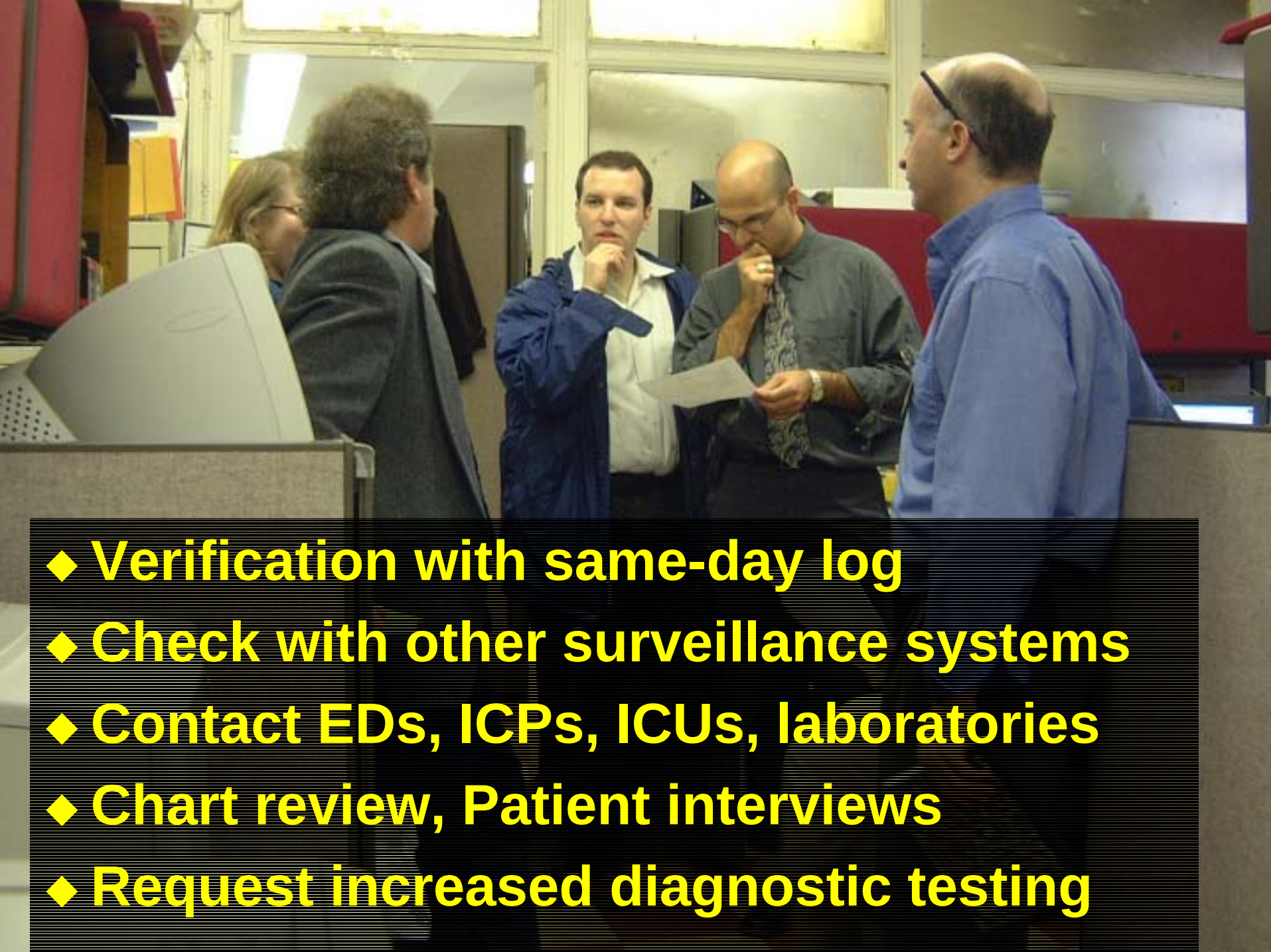
REDEX Tabletop Drill

Test of 911-EMS System



8) If we aren't going to investigate alarms, then we shouldn't be looking

- Syndromic surveillance provides non-specific signal (smoke detector)
- Rapid epi & clinical investigation needed to rule in or rule out BT (365 days/ year)



- Verification with same-day log
- Check with other surveillance systems
- Contact EDs, ICPs, ICUs, laboratories
- Chart review, Patient interviews
- Request increased diagnostic testing

Syndromic surveillance is best run by health departments

Future Directions

- More evaluations
- More data sources
- Enhanced diagnostics
- Simulation models and validation datasets
- Better cluster detection software
- More meetings!

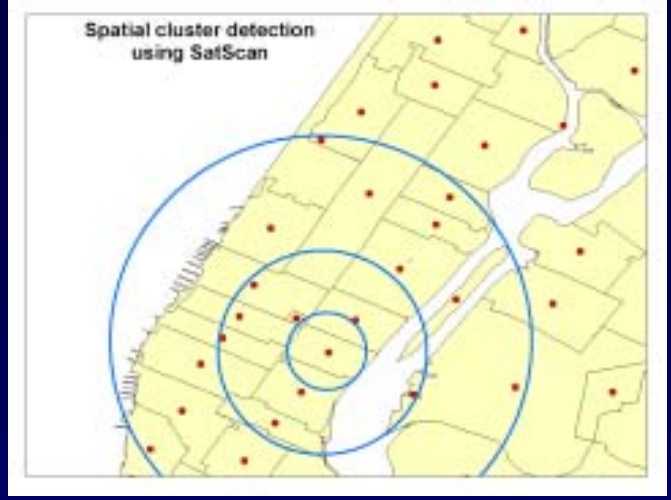
Syndromic Surveillance Workshop & Conference

Sponsored by the
New York Academy of Medicine and the
New York City Department of Health

September 23-24, 2002

New York City

Spatial Scan Statistic



- Developed by Martin Kulldorff
- Flexible windows in time and space
- Calculates Likelihood Ratio
- Probability through Monte Carlo simulations
- Controls for multiple comparisons

More concerning

Sustained increase

Multiple hospitals

Multiple syndromes

Multiple systems

High number of cases

Geographic clustering

Less concerning

One-day increase

Single hospital

No other evidence

Low number of cases

Diffuse increase across city

PUBLIC HEALTH RESPONSE

- **Verification with same-day log**
- **Check with other surveillance systems**
- **Contact EDs, ICPs, ICUs**
- **Chart review, Patient interviews**
- **Request increased diagnostic testing**

Hypothetical Case History

- Day 1- feels fine
- Day 2- headaches, fever- buys Tylenol
- Day 3- develops cough- calls nurse hotline
- Day 4- Sees private doctor: “flu”
- Day 5- Worsens- calls ambulance
  seen in ED

- Day 6- Admitted- “pneumonia”
- Day 7- Critically ill- ICU
- Day 8- Expires- “respiratory failure”