

Syndromic Surveillance in New York City

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Syndromic Surveillance team

Surveillance initiatives in New York City (NYC)

- Electronic laboratory reporting
- Community Health Surveys
- Communicable disease database
- SARS
- *Syndromic surveillance*

Objectives

- *Brief* overview of syndromic surveillance systems
- Results from first two years
- Usefulness
- Recommendations

Purpose of syndromic surveillance in NYC

- Detect outbreaks earlier
- Characterize size, spread, and tempo of outbreaks once detected
- Provide reassurance
- Monitor disease trends
- Multi-use: asthma, heat, poisonings

History of syndromic surveillance in NYC

1995 - Waterborne disease surveillance

1998 - EMS ambulance calls

2001 - Emergency departments

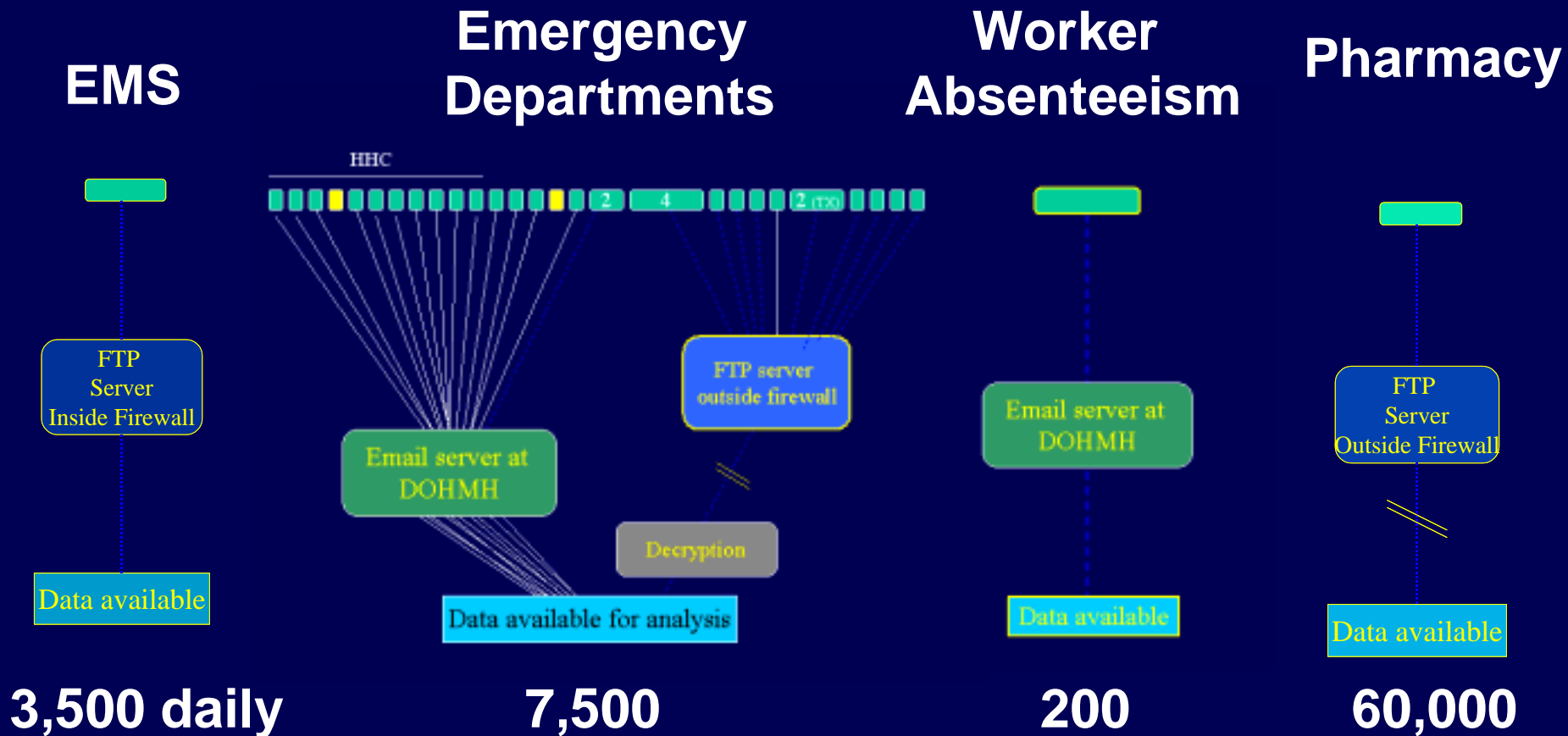
- Worker absenteeism

2002 - Pharmacy (NYC)

2003 - Evaluated school absenteeism data

- Pharmacy (RODS/NRDM)

Current data sources



EMS-911 calls

Date	Time	Call-type	Zip
09/06/99	13:09:19	SICK	10013
09/06/99	11:09:57	UNC	11220
09/05/99	09:09:12	SEIZR	10458
09/05/99	08:09:22	RESPIR	10025
09/04/99	11:09:52	ABDPN	11434

Influenza-like illness = RESPIR, DIFFBR, SICK, SICPED

Emergency Dept Chief Complaints

Age	Sex	Time	Chief Complaint	Zip
15	M	01:04	ASSAULTED YESTERDAY, RT EYE	11691
1	M	01:17	FEVER 104 AS PER MOTHER.	11455
42	F	03:20		11220
4	F	01:45	FEVER, COUGH	11507
62	F	22:51	ASTHMA ATTACK.	10013
48	M	13:04	SOB AT HOME.	10027
26	M	06:02	C/O DIFFICULTY BREATHING	
66	M	17:01	PT. MOTTLED AND CYANOTIC	10031

Respiratory = “RESP” or “COUGH” or “SOB” *etc.*

Statistical Analysis

- Citywide temporal trends
 - Serfling cyclical regression (3-year baseline)
 - Temporal scan statistic (2-week baseline)
 - CuSum (1-week baseline)
- Spatial clustering
 - Modified spatial scan statistic (Population based on area's recent past--2-week baseline)
 - by hospital and patient home zip code

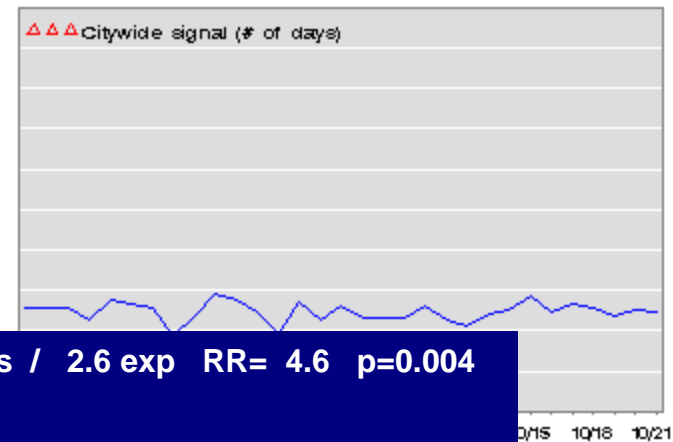
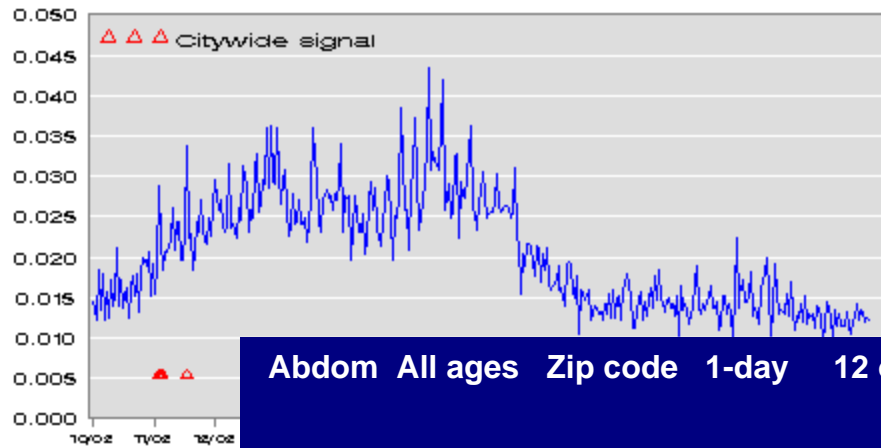
Daily Reports

NYC Emergency Department Surveillance

Citywide trends in the ratio of syndrome visits to other visits through Oct 21, 2003

Diarrrhea Syndrome, All ages, last 12 months

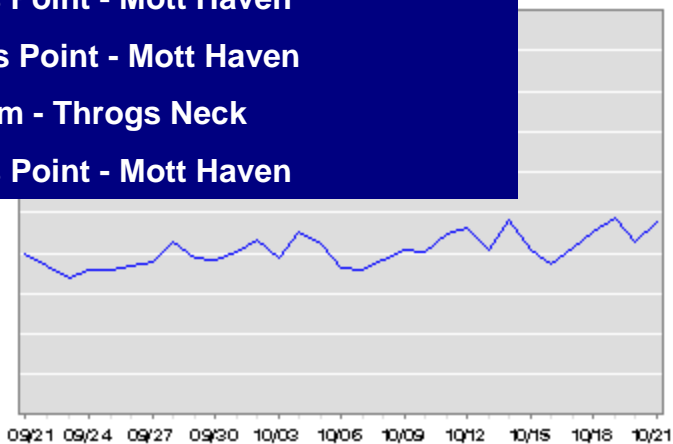
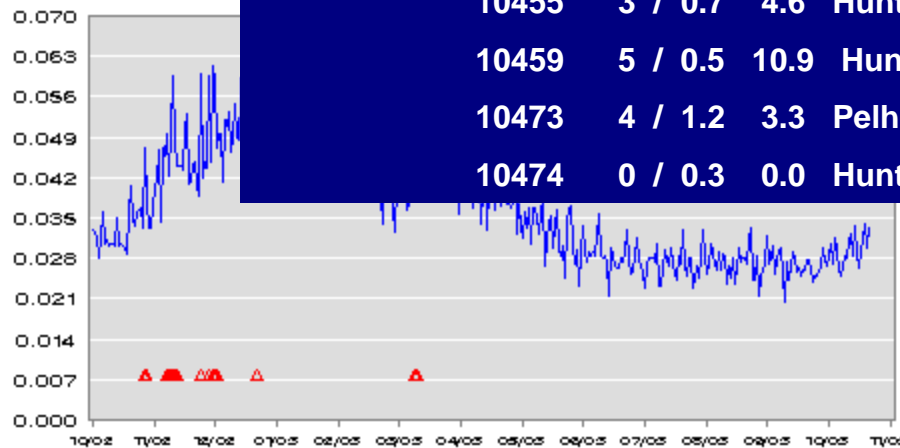
Last 30 days



Abdom All ages Zip code 1-day 12 obs / 2.6 exp RR= 4.6 p=0.004

Details:	Zip	Obs / Exp	RR	UHF Neighborhood
	10455	3 / 0.7	4.6	Hunts Point - Mott Haven
	10459	5 / 0.5	10.9	Hunts Point - Mott Haven
	10473	4 / 1.2	3.3	Pelhem - Throgs Neck
	10474	0 / 0.3	0.0	Hunts Point - Mott Haven

Vomiting S



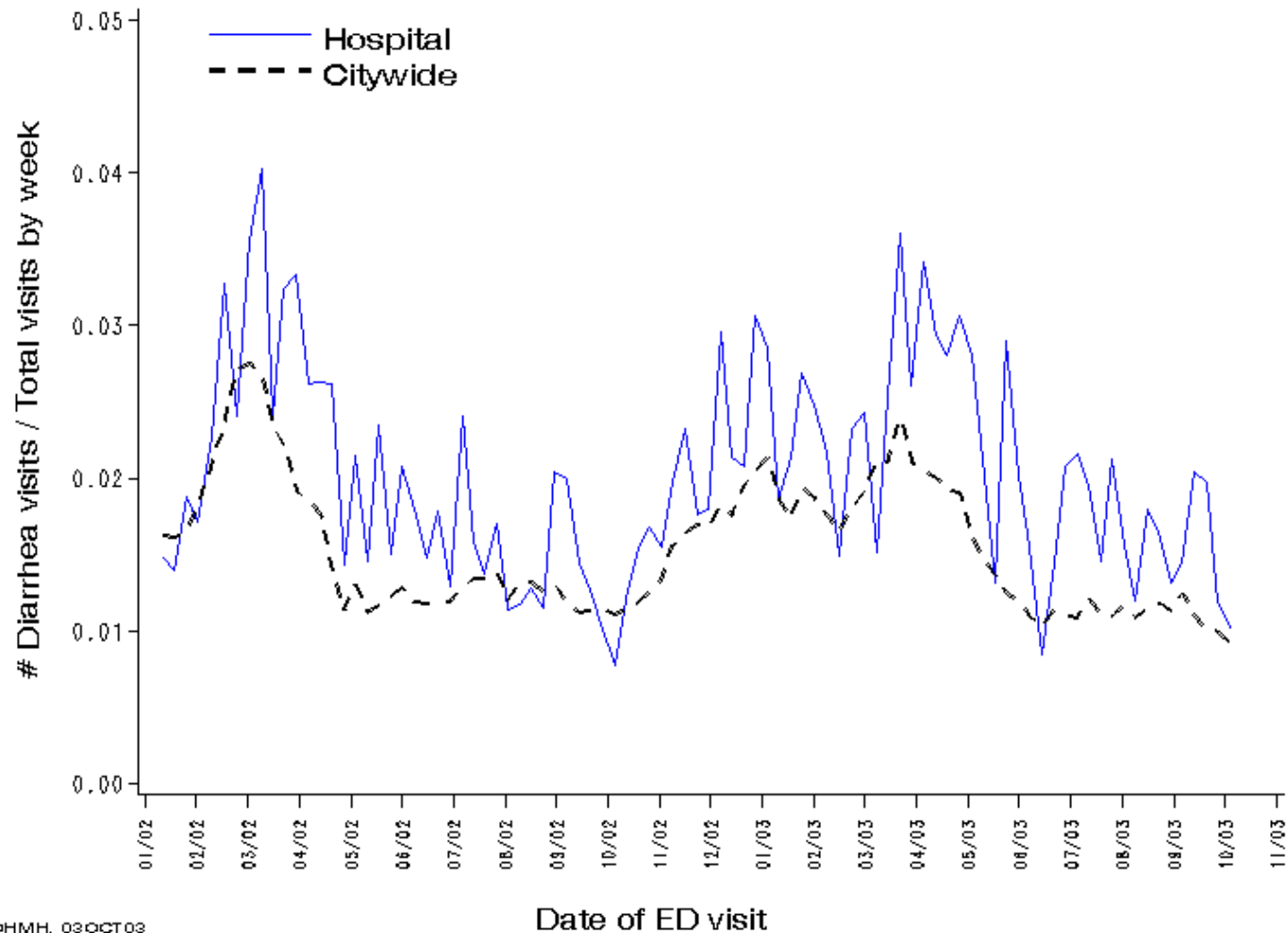
Date of ED visit

Investigation

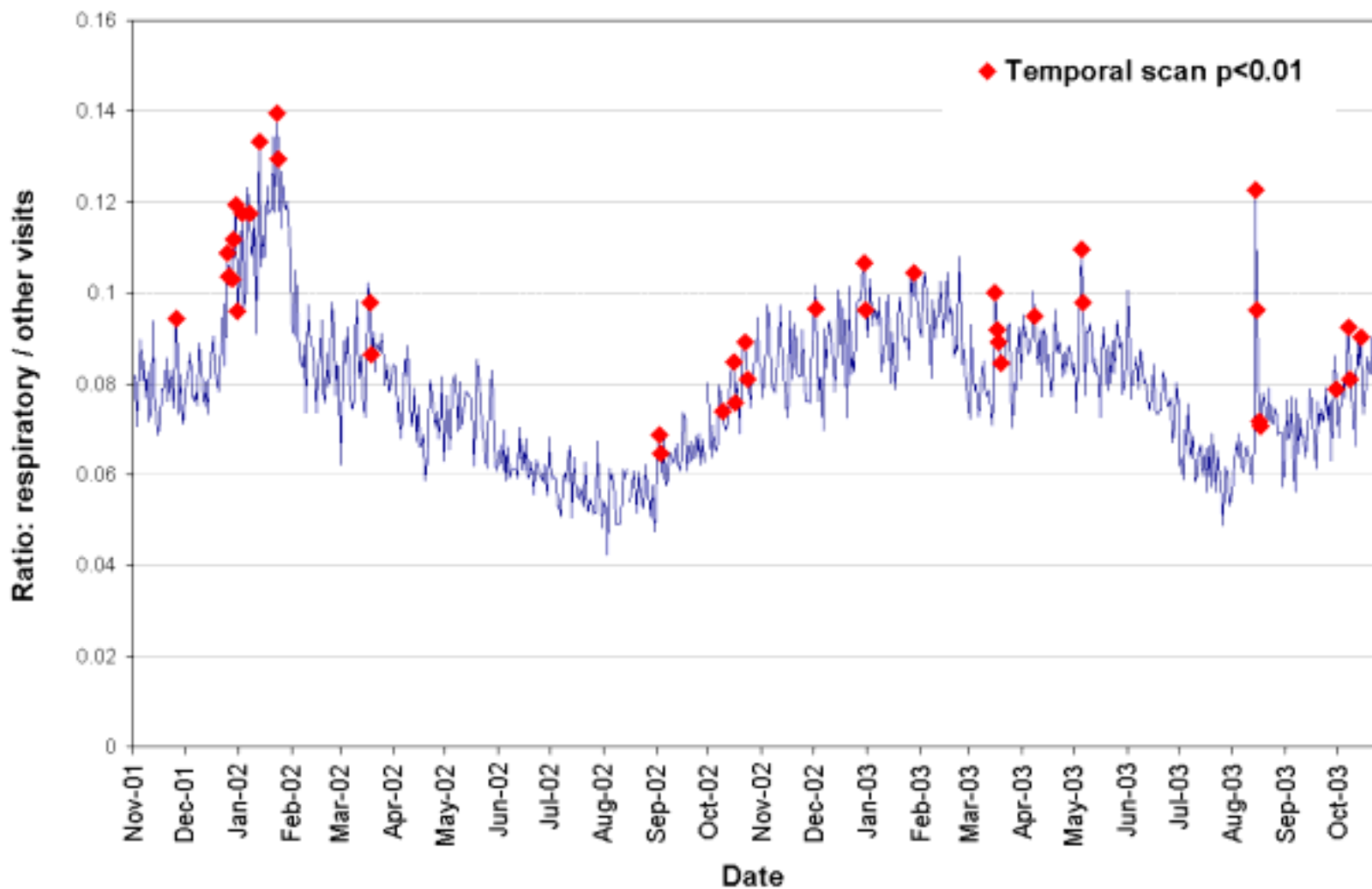
- Key Questions
 - True increase or natural variability?
 - Outbreak requiring public health intervention or self-limited illness?
- Available Methods
 - “Drill down” [ED log line list]
 - Call clinicians / laboratories
 - Chart reviews
 - Patient follow-up
 - Increased diagnostic testing

Quarterly reports

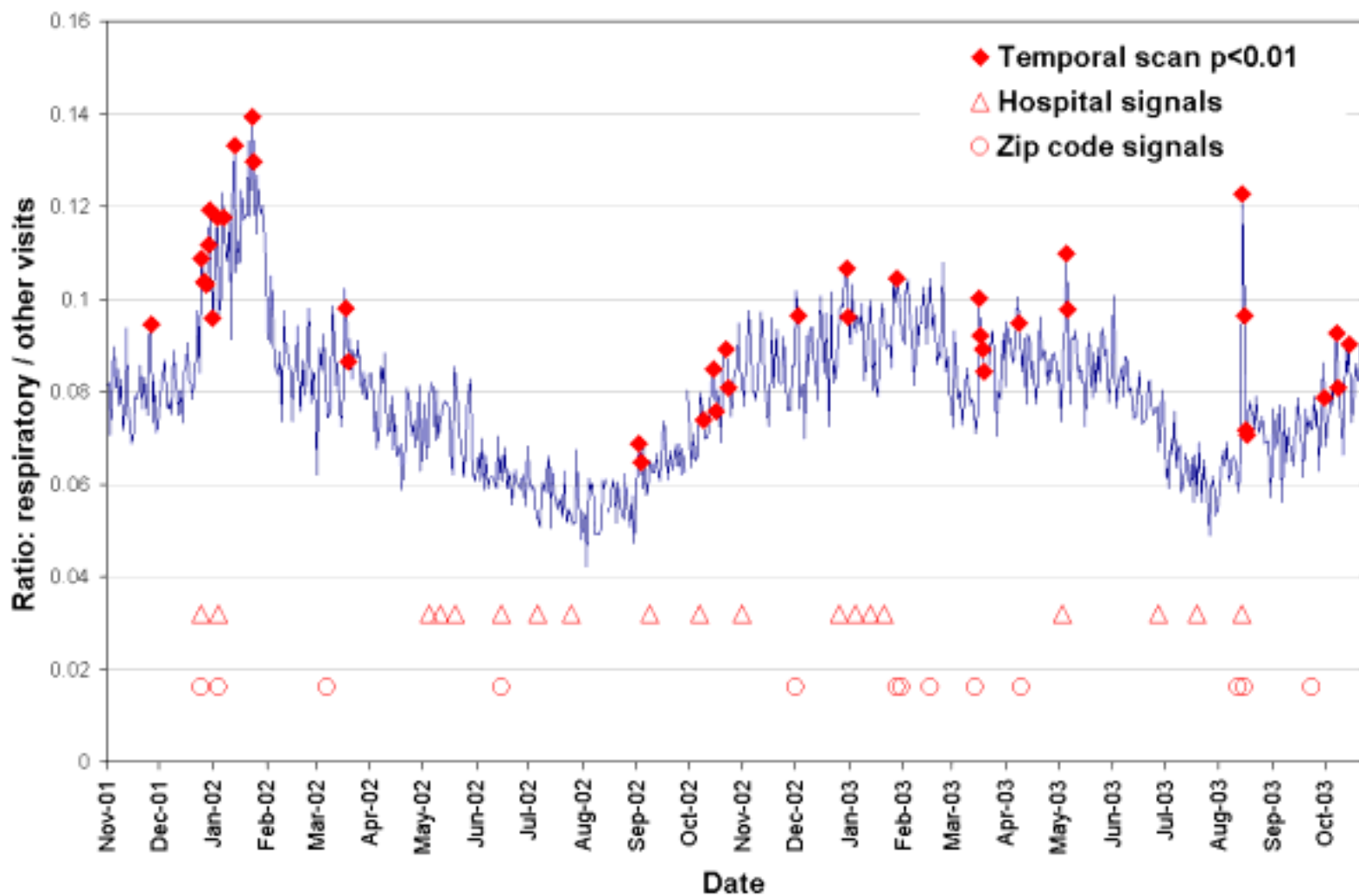
NYC Emergency Department Surveillance
Hospital and Citywide, Diarrhea Syndrome, Age 13+



ED Respiratory Syndrome Visits Nov 2001 – Oct 2003



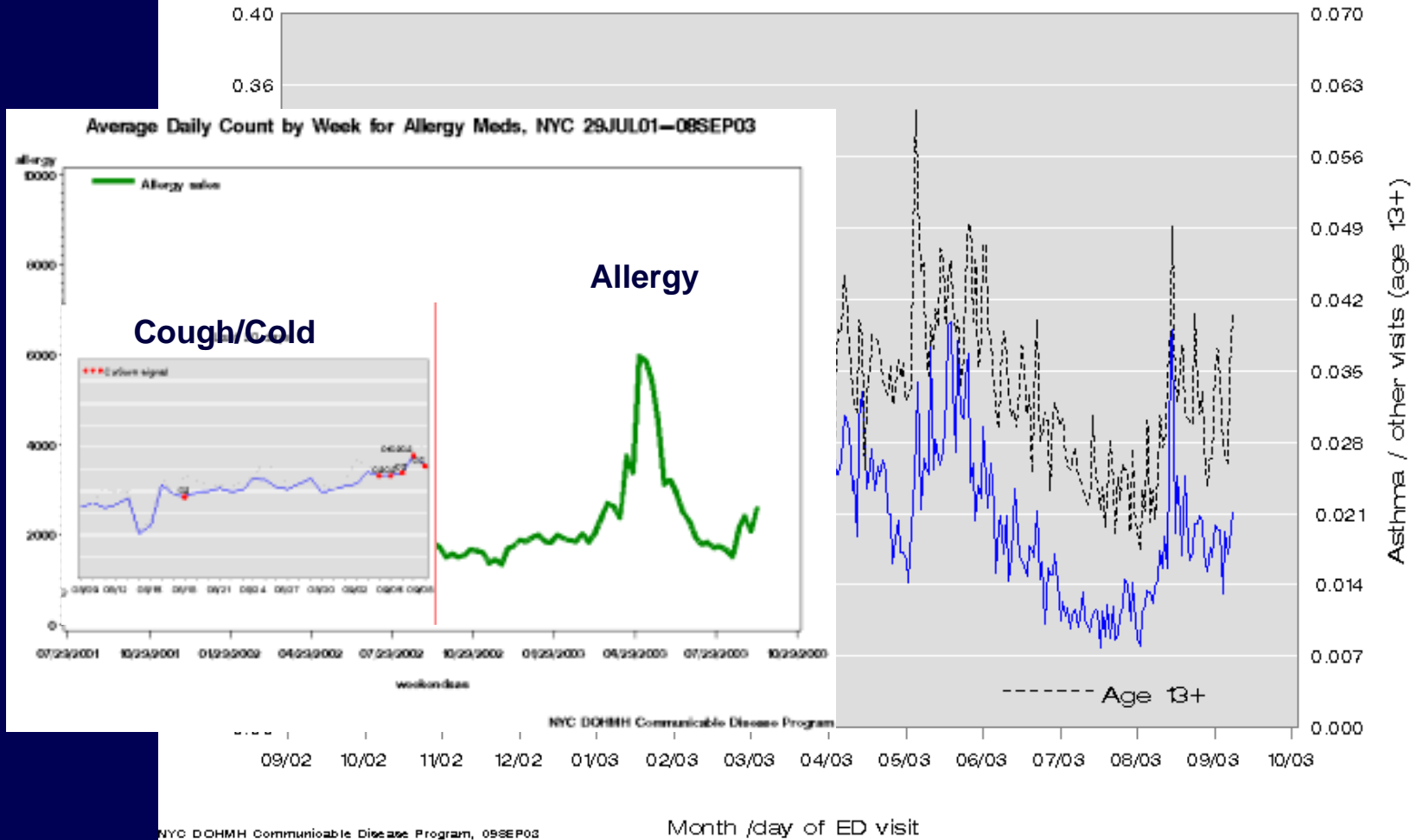
ED Respiratory Syndrome Visits Nov 2001 – Oct 2003



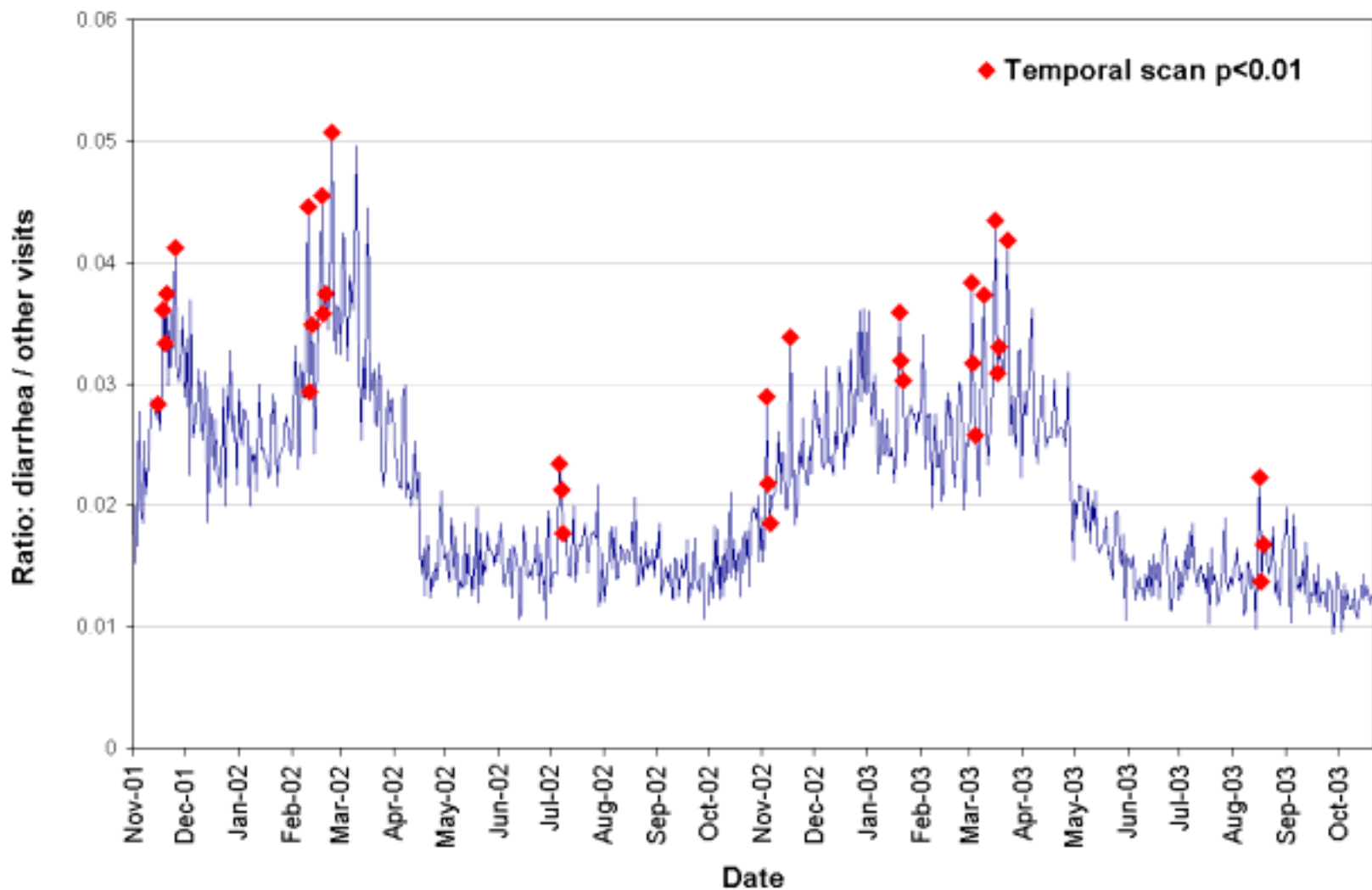
Allergy and Asthma

NYC Emergency Department Surveillance

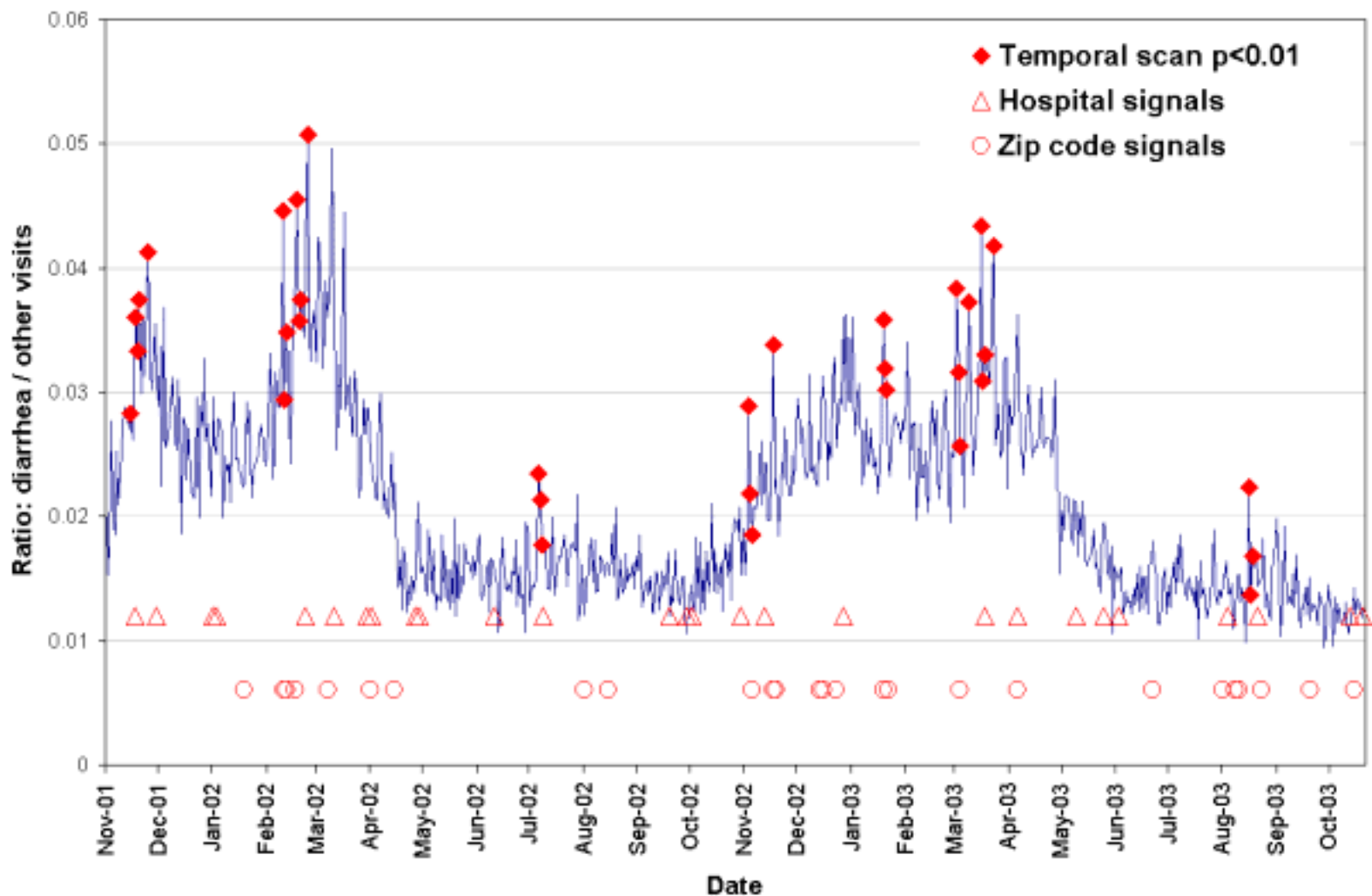
Citywide, Asthma Syndrome, by age group, Sep 1, 2002 to Sep 8, 2003



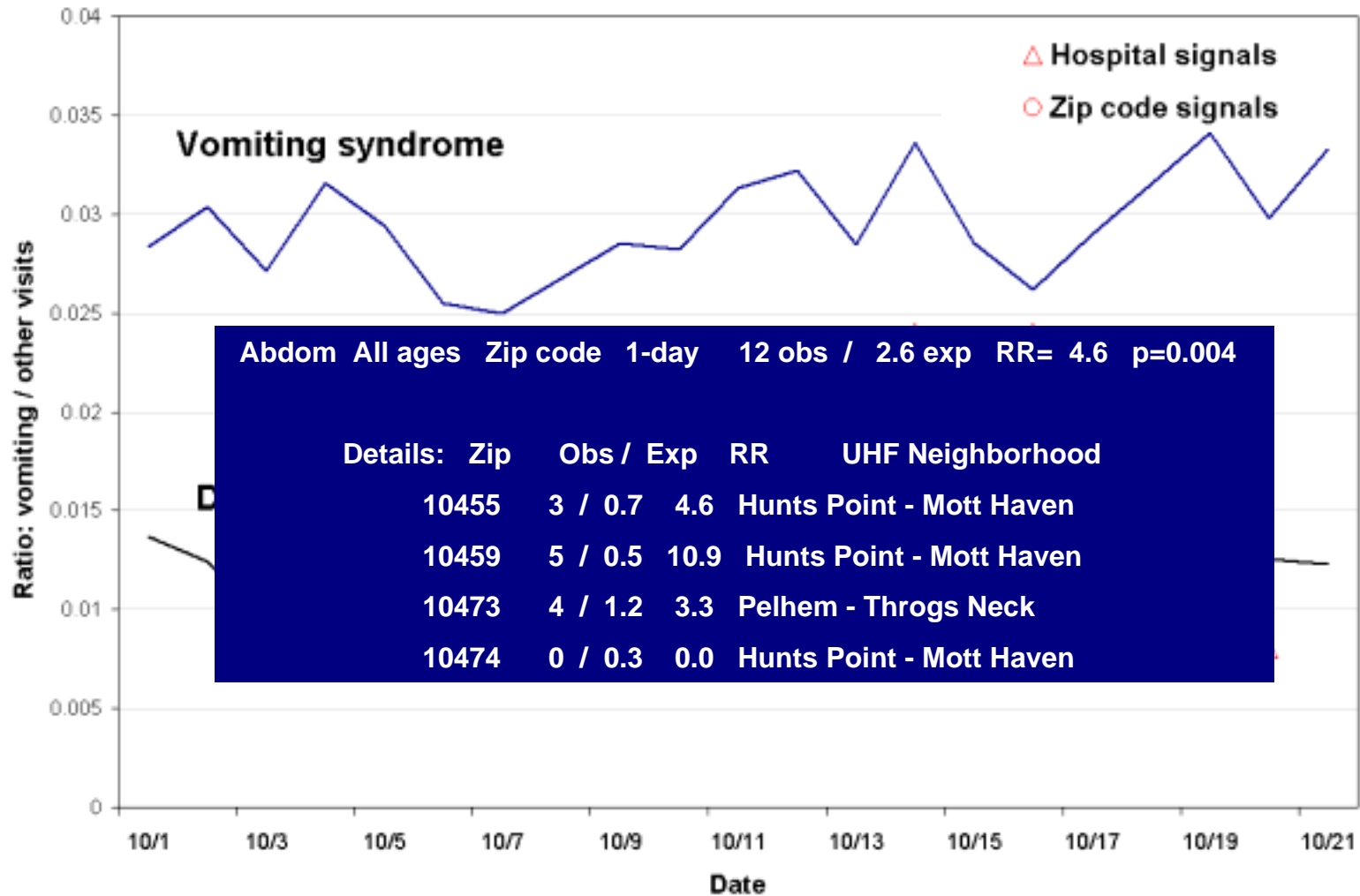
ED Diarrhea Syndrome Visits Nov 2001 – Oct 2003



ED Diarrhea Syndrome Visits Nov 2001 – Oct 2003



ED Diarrhea and Vomiting Syndrome October 2003



Summary of citywide temporal signals

- Some clear seasonal patterns evident
- Sharp spikes associated with known events
- Difficult to investigate
- Used to reinforce public health messages (influenza, viral GI, heat wave, blackout)

Summary of spatial signals

- Respiratory and Fever-flu
 - 52 hospital signals
 - 36 patient home zip signals
- Diarrhea and Vomiting
 - 56 hospital signals
 - 49 patient home zip signals
- No discrete disease outbreaks identified prospectively based on these investigations
- Early indicator of seasonal citywide increase? (e.g. Autumn viral GI)

Is It Worth the Effort?

- Costs
 - Implementation costs can be modest
 - Operational costs=time of public health staff, investigations, IT personnel, clinical staff
- Benefits
 - Possibility of huge benefit if early detection
 - Characterization
 - Strengthening traditional surveillance
 - Dual use

Est. Annual Operating* Costs

EMS, ED, Pharmacy, Absenteeism

- Personnel \$100,000 per year
 - ½ FTE Research Scientist
 - ¼ FTE field staff
 - 1/8 FTE medical staff
- Other costs \$15,000 per year
- MIS, Hospitals, Support staff
- Opportunity costs
 - Less attention to analysis of traditional surveillance data
 - Competes with other work (e.g. SARS,ECLRS)

*Does not include costs of developing systems

Useful?

- Reassurance during Anthrax outbreaks
- Earliest indication of community-wide influenza during 2001-2002 season
- Monitoring trends in cigarette sales and Rx for tobacco cessation aids
- First warning of community-wide increases in viral GI illness Nov 2002 and Nov 2003???

Conclusions

- Keep syndromic in perspective
- More data not always better but clear value in ED chief complaint surveillance
- Multiple systems helpful because no single stream is specific
- Here to stay

Acknowledgements

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