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## Évaluation à planifier, situation des états du Nord-Est américain

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## Syndromic Surveillance: Vermont and eastern border states

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- Evolution
- Current use
- Examples
- Evaluation
- Future Directions

## Syndromic surveillance milestones: U.S.

- Milwaukee, Wisconsin cryptosporidiosis outbreak 1993
- 2001: September 11 World Trade Center; October Anthrax bioterrorism attacks
- Huge funding influx 2002



## Development of systems in the U.S.

- Grant requirements: Early Event Detection
  - Focus on intentional release biological agent
- Independent development in states, counties and cities influenced by:
  - Existing surveillance and reporting requirements
  - Urban vs. rural
  - Existing infrastructure
    - Information technology status
    - Epidemiology staff



## Syndromic Surveillance Development in Vermont

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- Rural state, population ~630,000
  - 13 acute care hospitals
- Centralized state health department
- Syndromic surveillance in 2001:
  - Sentinel Influenza/Influenza-like illness (ILI)
- VT goal: low cost, sustainable system



## Syndromic Surveillance Development in Vermont

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- In-state use of multiple out-of-state systems with variety of data streams
  - BioSense (U.S. Department of Defense data)
  - Over-the-counter pharmacy (National Retail Data Monitor- NRDM)
  - Poison Center data review (2005-present)



## **VT EARS:** Vermont's Primary Syndromic Surveillance System

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- EARS: Early Aberration Reporting System
  - Statistical analysis & charting programs developed by CDC
  - Syndrome coding programs, data assimilation and management, and automation by VDH
  
- Emergency Department and unplanned hospital admissions data
  
- 6 Vermont hospitals participate
  - 80% of hospital beds



## VT EARS system

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- **Data entry in ED & Inpatient Admissions**
  
- **File transfer after midnight**
  
- **EARS runs automatically on VDH server**
  
- **Epidemiologist reviews output**
  
- **Email feedback to each hospital with output chart each am, Monday-Friday**



## VT EARS: Variables collected

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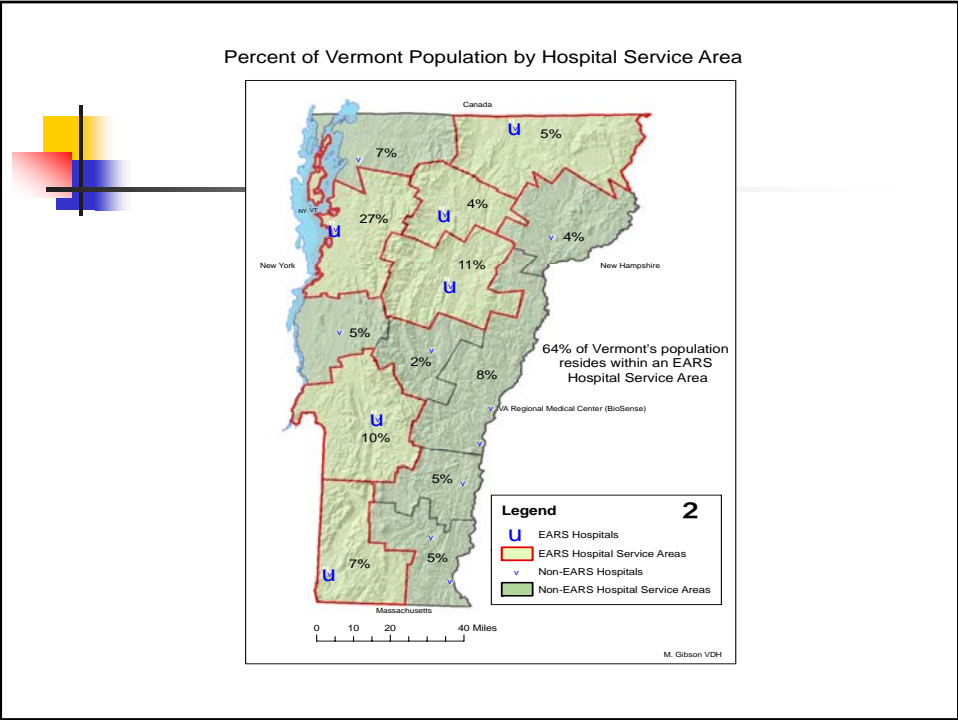
- Patient Demographics
- Clinical information
  - Chief complaint (all hospitals)
  - Impression and/or admission diagnosis (4 hospitals)
  - Patient type (inpatient or ED visit)
  - Patient disposition: discharged, transferred, admitted, expired, etc. (3 hospitals)
- Patient visit number
  - Can be decoded at hospital if needed



## EARS Syndrome Categories

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- Respiratory
  - Subcategories: cough, pneumonia, dyspnea, etc
- Gastrointestinal
- Neurological
- Fever
- Rash
- Sepsis
- Shock/coma/death
- Reportable diseases (including BT Agents)



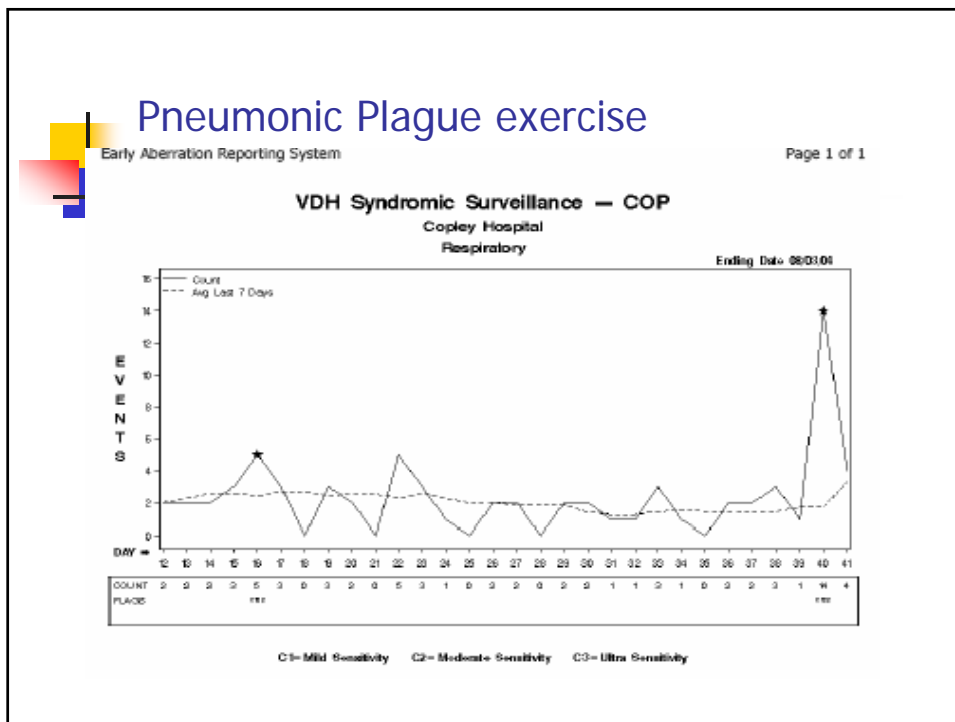
- ## EARS evaluation 2003-2005
- 2003-2005: Detection of outbreaks
    - No outbreak detected first in EARS
    - Did detect visit pattern changes (proxy outbreaks)
  
  - 2005 outbreaks investigated: did any show up in EARS?
    - 22 infectious disease outbreak investigations;
    - 5 with a reportable disease and at least one hospitalization

		GI Flag After Teen Party: Totals						
ALL	Syndrome	Day 1 01/23/06	Day 2 01/24/06	Day 3 01/25/06	Day 4 01/26/06	Day 5 01/27/06	Day 6 01/28/06	Day 7 01/29/06
ALL	s_fever	2	4	1	1	0	1	3
	s_fevrash	0	0	0	0	0	0	0
	s_fevresp	0	3	0	0	0	1	2
	s_gi	4	1	3	1	0	3	10 *C1C2C3*
	s_neuro	0	0	0	2	0	0	1
	s_rash	0	0	2	0	1	3	1
	s_reportable	0	0	0	0	1 *C1C2C3*	0	0
	s_resp	6	11	15	9	9	12	8
	s_sepsis	0	0	0	0	0	0	0

C1 --> Mild Sensitivity C2 --> Moderate Sensitivity C3 --> Ultra Sensitivity

Note: Only records with Non-Missing values for ALL Event and Date are analyzed

Produced on 30JAN2006



## Holiday Weekend Gastrointestinal Cluster: Line List

Day 1			Day 2		
Age	Sex	City	Age	Sex	City
1	M	Cambridge	1	F	Burlington
2	F	Colchester	19	F	Burlington
3	F	Essex Junction	20	M	Essex Junction
18	F	Burlington	22	F	Univ Of Vermont
20	F	Burlington	83	M	North Hero
21	M	Burlington	<b>Day 3</b>		
22	M	South Burlington	Age	Sex	City
32	M	Burlington	1	F	Starksboro
57	M	Grand Isle	18	M	Burlington
63	F	Burlington	19	F	Burlington
75	F	Grand Isle	23	M	Burlington

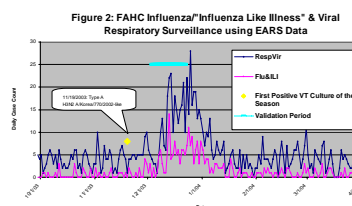
## 2005 Outbreak Investigations with Hospitalized Patients

Disease	Hospital-ized /cases	Categorized by EARS?	VT EARS flag?	Investigation comment
Group A Strep	3/3	No	No	artifact
Cyrtosporidiosis	1/3	No	No	
Salmonella	1/3	No	No	Multi-state
Legionellosis	3/3	Yes (respiratory)	No	artifact
Salmonella	4/10	1 (GI)	No	



## EARS: Influenza/ILI Validation

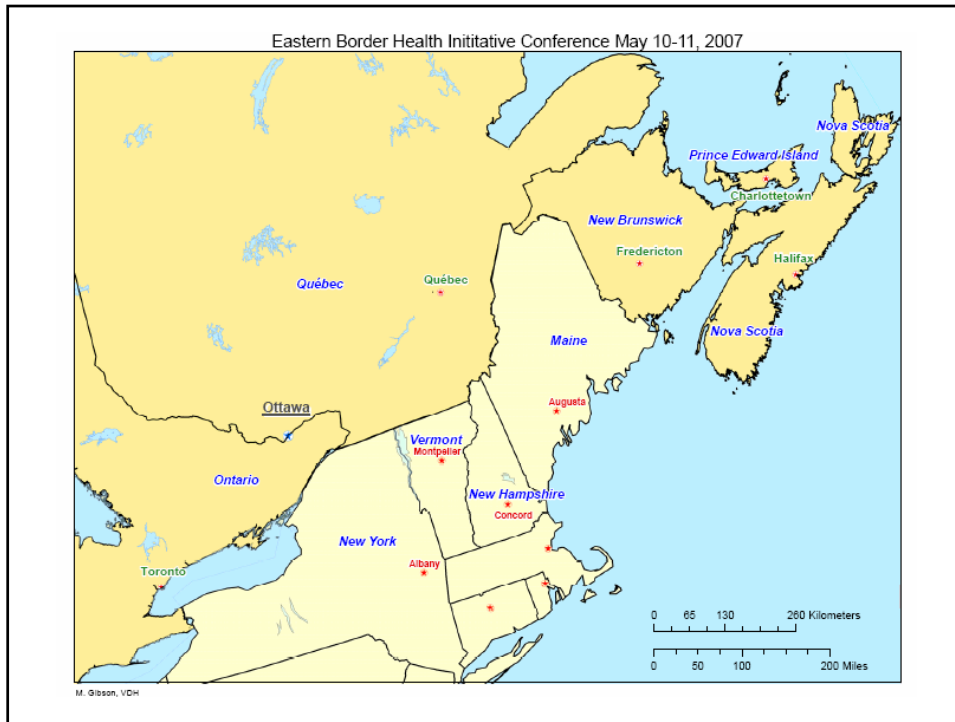
- Ability of EARS codes to detect influenza
  - EARS vs. manual record review
  - Sensitivity and specificity
  - Led to modification of coding
- Accuracy for prediction of influenza disease burden
  - EARS vs. Discharge data



## EARS development 2006

- Ability to rapidly create codes for different syndromes
- Expanded use for environmental events
  - Used: tire burn surveillance





## Syndromic Surveillance Systems: Eastern Border States

	New York	New Hampshire	Maine
Hospital Emergency Dept	<b>State System</b> <ul style="list-style-type: none"> <li>Electronic Chief complaint</li> </ul>	<b>Vendor</b> <ul style="list-style-type: none"> <li>Electronic chief complaint</li> </ul>	Developing EARS
Pharmacy data (NRDM: national retail data monitoring)	<ul style="list-style-type: none"> <li>Medicaid Prescription</li> <li>Dropped NRDM</li> </ul>	<ul style="list-style-type: none"> <li>Dropped NRDM</li> <li>Limited in-state system</li> </ul>	Limited NRDM
Other	Multiple local systems: <ul style="list-style-type: none"> <li>911 (emerg. Calls)</li> <li>Ambulance run</li> <li>Schools</li> </ul>	<ul style="list-style-type: none"> <li>Death Certificate</li> <li>School aggregate reports</li> </ul>	

**Recruitment of Hospitals with Emergency Departments\*  
for Electronic Reporting of Chief Complaint Data  
NYSDOH, Electronic Syndromic Surveillance System**

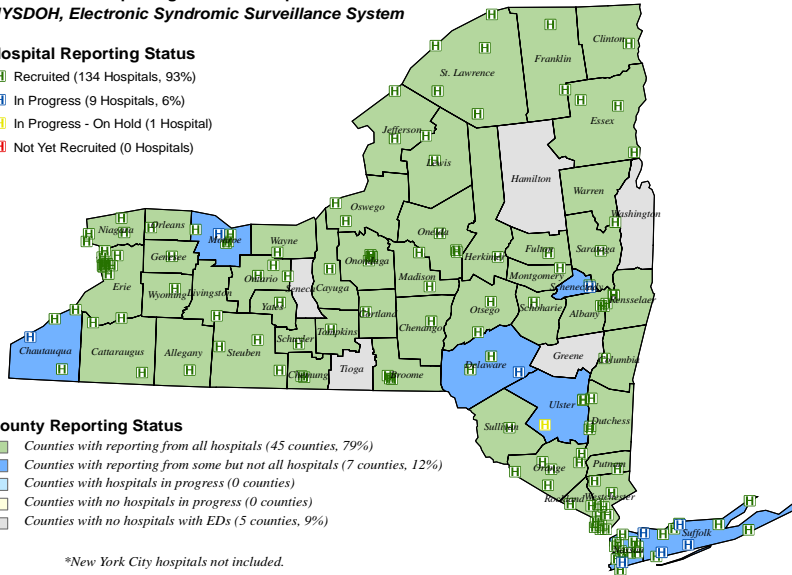
**Hospital Reporting Status**

- Recruited (134 Hospitals, 93%)
- In Progress (9 Hospitals, 6%)
- In Progress - On Hold (1 Hospital)
- Not Yet Recruited (0 Hospitals)

**County Reporting Status**

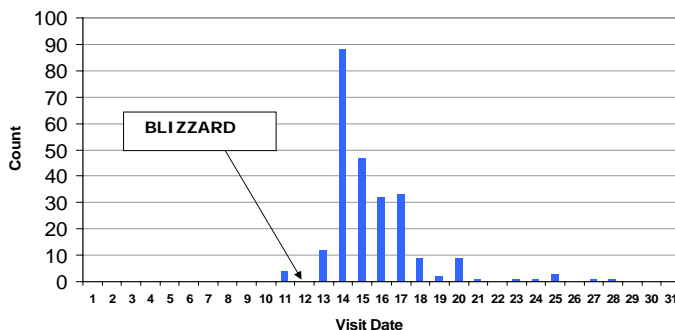
- Counties with reporting from all hospitals (45 counties, 79%)
- Counties with reporting from some but not all hospitals (7 counties, 12%)
- Counties with hospitals in progress (0 counties)
- Counties with no hospitals in progress (0 counties)
- Counties with no hospitals with EDs (5 counties, 9%)

\*New York City hospitals not included.  
Updated as of 9/25/2007

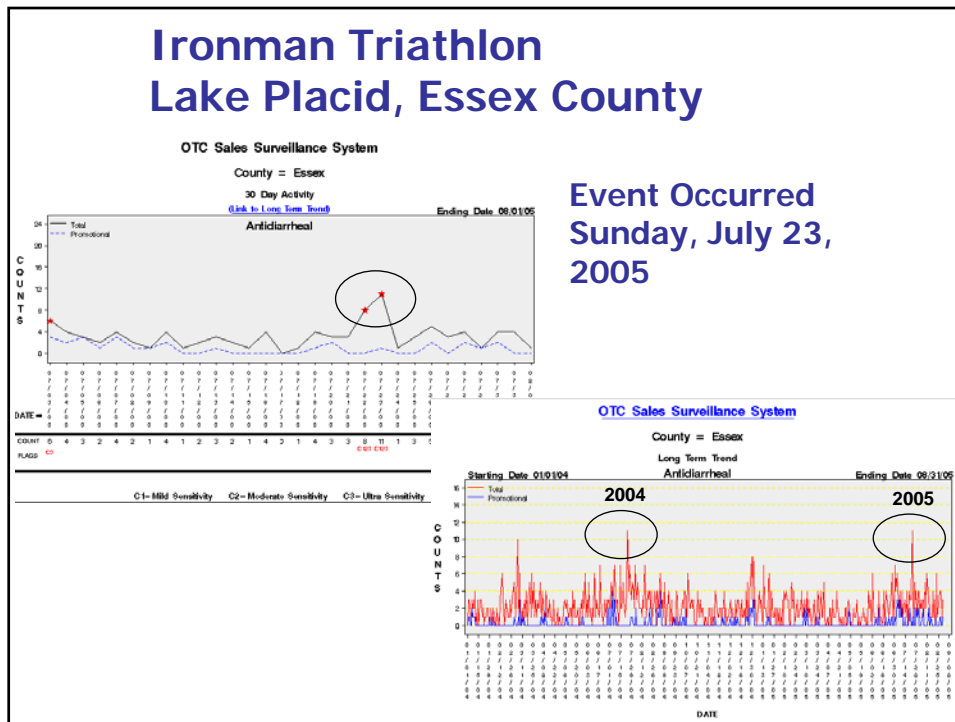


## October, 2006 WNY Snowstorm: New York State Over 300,000 without Electricity

**Visits to Erie Co. EDs, Oct 1 - 31, 2006,  
with CO Exposure Mentioned in Chief Complaint**



## Ironman Triathlon Lake Placid, Essex County



## Syndromic Surveillance: Evaluation

- Primary purpose: detection of outbreaks
  - Intentional or naturally occurring
  - Structure for monitoring short-term, high profile events
  
- Does it detect outbreaks?
  - Potential to detect some outbreaks / visit pattern changes
  - "Disappointing"- (if this is your only use)



## Syndromic Surveillance: Use today

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- Situational awareness
  - Monitoring disease activity
  - Reassurance (what's not occurring)
- Dual use:
  - Data pipeline with Emergency Departments
  - Adapt as needed for different emergencies
  - Ability to detect individual cases
- Increased use for environmental events



## Future influences

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- Technological advancements
  - Move toward electronic medical records
  - Integrating multiple systems
- Changes: federal grant requirements
  - Pandemic and All-Hazards Preparedness Act
  - "Real Time Disease Detection" and Poison Centers
- Federal funding?



## Acknowledgements

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