Syndromic Surveillance

Multi-jurisdictional panel discussing syndromic surveillance at the local, provincial/state, and national level

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School Absenteeism Surveillance

Linda Cleroux
Eastern Ontario Health Unit

EOHU
Eastern Ontario
Health Unit

BSEO
Bureau de santé
de l'est de l'Ontario

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School absenteeism

- Trigger: 10% absenteeism

- Communication:
  - Annual meeting with 4 school boards
  - Letter included in principals' package

- Reporting:
  - Schools contact health unit

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Health Unit Response

- Obtains line listing
- Contacts students/parents to establish case definition
- Obtains consent to collect specimens
- Provides letter for parents

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School Response:

- Provides health unit with list of students
- Provides daily update on absenteeism rate
- Implements enhanced cleaning
- Distributes letter to parents

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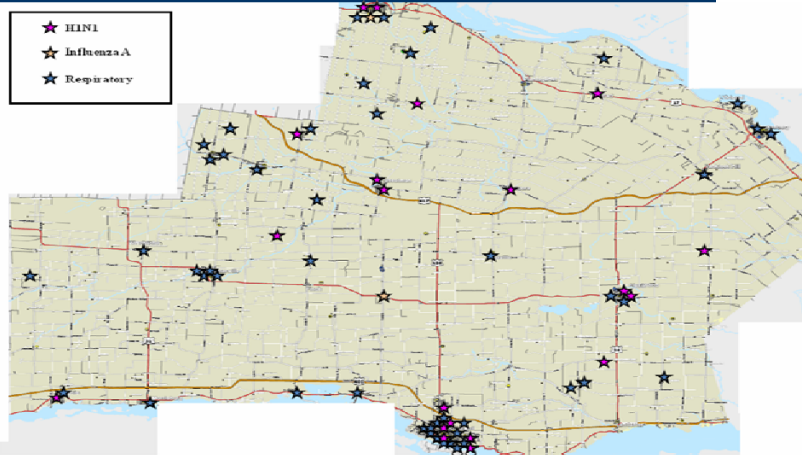

Impact on Public Health Services:

- Development of cleaning schedules and tools for school boards
- Education and information for parents
- Early identification and notification

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School Outbreaks

Emergency Department (ED) Surveillance at KFL&A Public Health

Adam van Dijk

KFL&A Public Health

Ontario

QΦ

Dedicated to enhancing the health and safety of Canadians through public health informatics

KFL&A
PublicHealth

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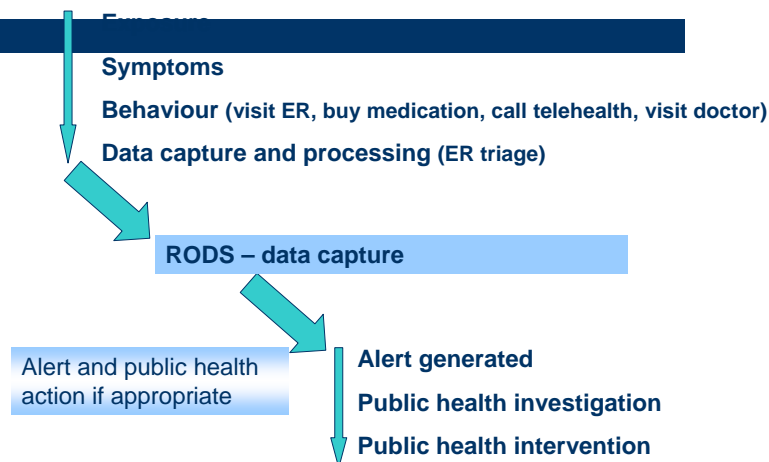
What is EDSS?

- Emergency Department Syndromic Surveillance
- Real-time ED visits and admissions from across Ontario
- Goal of syndromic surveillance
  - Enhance communication and collaboration
  - Improved response times
  - Situational awareness
  - Improved epidemiological analysis and outbreak detection

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Timelines of Detection

Exposure

Symptoms

Behaviour (visit ER, buy medication, call telehealth, visit doctor)

Data capture and processing (ER triage)

RODS – data capture

Alert and public health action if appropriate

Alert generated

Public health investigation

Public health intervention

What information do we collect?

- **Real-time -** ED visits and admissions
    - Date and Time of Visit or Admission
    - Hospital
    - Age/Sex
    - Postal Code (5 digits)
    - Chief Complaint
    - Triage Score
    - Febrile Respiratory Illness **(FRI)** Screening results
- Syndromes: Gastroenteritis, Respiratory, Fever/ILI, Asthma, Derm-infectious, Neuro-infectious, Severe Infection, Other

Data Analysis

- Anomaly detection run 4x a day
    – Recursive least squares (RLS) and cumulative sum (CUSUM) algorithms
- Varying lengths of historic data
- GIS mapping (5 digit postal code)

- Simple descriptive stats.

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Resources

- IT manager

- Q-PHI Team
  - Director
  - Epidemiologist
  - many other collaborators

System Uses and Impacts to PH

- Daily checks of local data for reportable disease and outbreak surveillance
- System adapted for G8/G20 surveillance
- Impact felt during H1N1 (informed PH daily on ED surge capacity & signals were used to open assessment centers)
- Other uses include: heat surveillance, incident management, morality, upcoming wait time analysis

Telehealth Ontario

Morgan Barnes

Ministry of Health and Long-Term Care
Public Health Division

Ontario

Ontario

Telehealth Ontario

- Telehealth Ontario is a toll-free nursing helpline available to all residents of Ontario 24 hours a day, 7 days a week
- Nurses collect basic demographic and primary symptom information
- Calls are grouped into syndromes based on more than 400 guidelines
- Routinely monitor three disease syndromes - gastrointestinal, fever/ILI, respiratory

Telehealth Ontario

- Daily and weekly analysis of Telehealth call data for temporal and temporal-spatial clusters
- SaTScan (spatial, temporal and space-time scan statistics)
  - Space-time permutation scan statistic
  - Treats geographic location as second dimension
- The Early Aberration Reporting System (EARS - temporal analysis)
  - Positive 1-sided CUSUM calculation
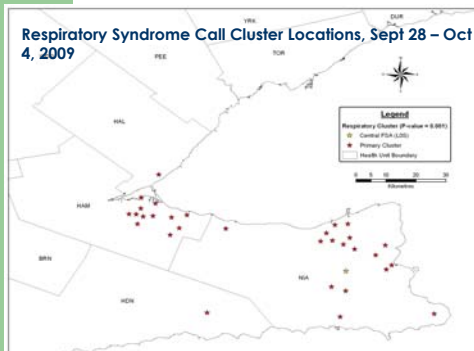 - Produces three types of flags (C1 – mild, C2 – medium, C3 – ultra)
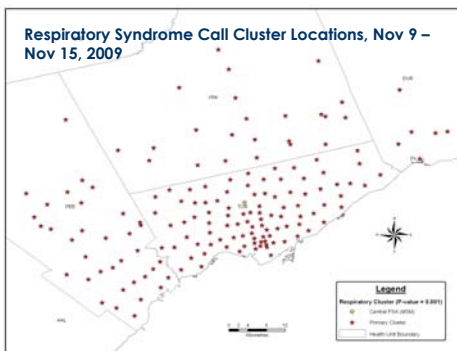
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Telehealth Ontario – pH1N1

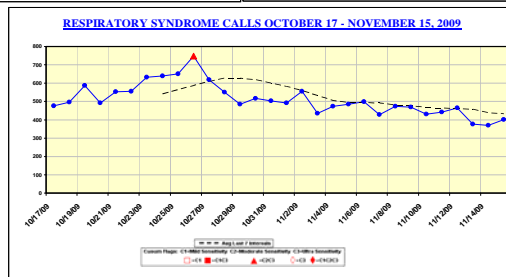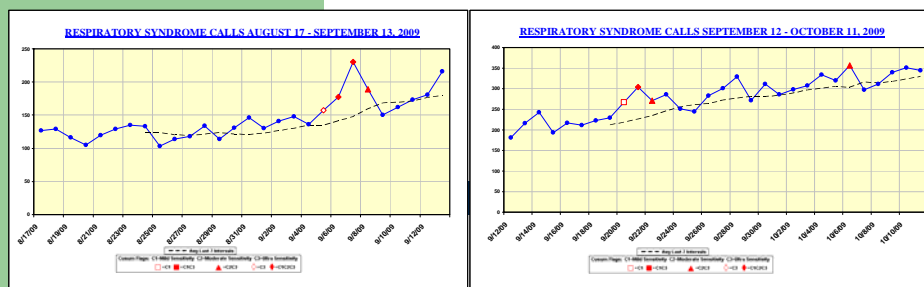Respiratory Syndrome Call Cluster Locations, Sept 28 – Oct 4, 2009

Respiratory Syndrome Call Cluster Locations, Nov 9 – Nov 15, 2009

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Telehealth Ontario

- Advantages:
  - Sensitive, cost-effective, timely, province-wide coverage, historical baseline available
  - Easily adapted during special events (e.g., G8/G20)
- Disadvantages:
  - Lacks specificity
  - Difficult to interpret flags/clusters without other surveillance data
- Response to alerts
  - Alert health units where a significant syndrome cluster is detected
  - Incorporate findings into comprehensive surveillance reports and analyses
- Enhances situational awareness but infrequently used as a direct trigger for public health action

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Syndromic Surveillance of Medicaid Over-the-counter (OTC) and Prescription Medication Sales – New York State

Charlene Weng

New York State Statistical Unit

NEW YORK STATE

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NEW YORK STATE

NYSDOH's Electronic Syndromic Surveillance System

- System started operating in 2005.
- Currently has two data streams.
  - Hospital emergency department visits data stream
  - Medicaid OTC and prescription medication sales data stream
- Automated, electronic system
  - Automated process
  - Data in electronic format
  - Alerts generated by automated SAS program

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Medicaid OTC and prescription medication sales

- Data are received each morning from the NYSDOH Office of Medicaid Management's data warehouse.
- Data include all Medicaid claims submitted by the pharmacies that dispensed the medications to Medicaid enrollees (excluding bulk reimbursements from nursing homes, hospitals, etc.)
- Received data are aggregated by zip code, gender, age group of the patients who received the medications, and are grouped into 18 drug categories.
- As of 2010, the NYS Medicaid Program provides health insurance for roughly 35% of the population in New York City and 5% - 25% of the 57 county population in the rest of the state. As a result, this data will vary in its representativeness of a county's overall prescription rate.

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18 Drug Categories

1. Analgesics, narcotic
2. Analgesics, nonnarcotic
3. Antacids
4. Antiasthmatic medications
5. Cephalosporins, first- and second-generation
6. Cephalosporins, third- and fourth-generation
7. Fluoroquinolones
8. Macrolides
9. Penicillin G and Ampicillins
10. Penicillinase-resistant, extended spectrum and penicillin combinations
11. Tetracyclines
12. Antidiarrheal medications
13. Antihistamines
14. Cough, cold, and allergy medications
15. Electrolyte mixtures
16. Herpes agents
17. Influenza agents
18. Systemic and topical nasal products

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Data volume and timeliness

Medicaid Claims per Day	Aggregated Records per Day
54685	20552

Data Submission Time Lag (Pharmacy Service date v.s. Claim date)	Percent	Cumulative Percent
No Lag (same day submission)	93.2	93.2
1-5 Days Lag	4.2	97.4
6-10 Days Lag	0.5	97.9
More than 10 Days Lag	2.1	100

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Data analysis

- Analysis is done at the county and regional levels.
- Signals are generated by CuSum statistic.
- Automated SAS program is used.
- Results are displayed in tables and graphs.

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Data access and availability

- Data access is restricted to NYS state, region, local health department staff and participating hospital emergency department staff.
- Available data to system users include individual drug category counts, signals (CuSum analysis results) and long-term and short-term trend graphs by drug category, county and region.

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Responses to signals generated

- NYS local health departments monitor signals in their own jurisdiction.
- Syndromic surveillance staff checks signals on daily basis for the state.
- If a potential outbreak is observed, syndromic surveillance staff will forward the alert to NYSDOH Bureau of Communicable Disease Control (BCDC) investigation group.
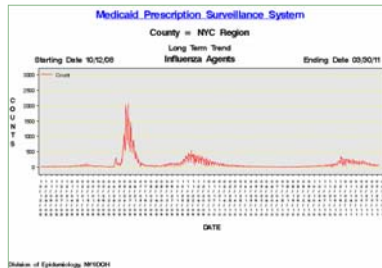- BCDC investigation group will follow up and conduct field investigations.

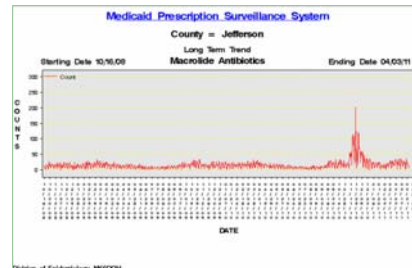**The Great Lakes Border Health Initiative**

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Successful stories

2009 H1N1 influenza pandemic*

Medicaid Prescription Surveillance System
County = NYC Region
Long Term Trend
Influenza Agents
Starting Date 10/12/08   Ending Date 03/30/11

Division of Epidemiology, NYSDOH

2010 Pertussis outbreak in Jefferson county

Medicaid Prescription Surveillance System
County = Jefferson
Long Term Trend
Macrolide Antibiotics
Starting Date 10/16/08   Ending Date 04/03/11

Division of Epidemiology, NYSDOH

* Currently we are working on adding flu vaccination data element.

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ILI Surveillance for FluWatch

Brian Winchester

Centre for Immunization and Respiratory Infectious Disease
Public Health Agency of Canada

Public Health
Agency of Canada   Agence de la santé
publique du Canada

Canada

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FluWatch

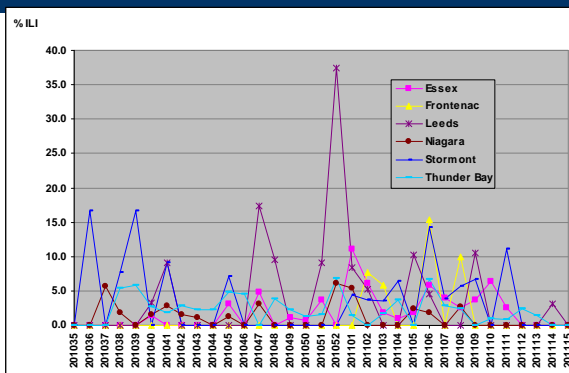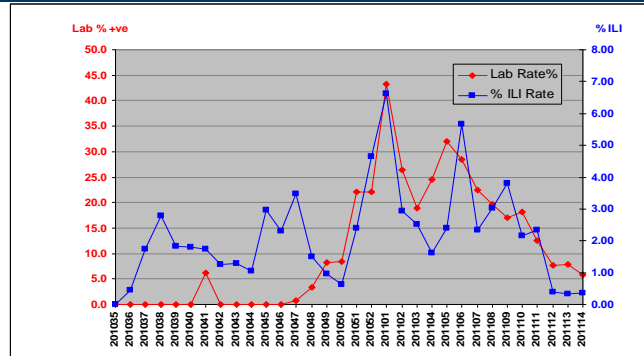## Ontario ILI Surveillance

- Approx. 200 sentinel physicians in Ontario;
  - 10-12 sentinels in US border region
- One day per week, physicians report:
  - # patients seen and # ILI cases, by age-group
- Forms sent/received by automated fax system, read by OCR & verified manually
- Data reported weekly (for previous week)
- Data collection and processing = 1 day of staff time per week

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ILI Rate for Selected Border Regions of Ontario

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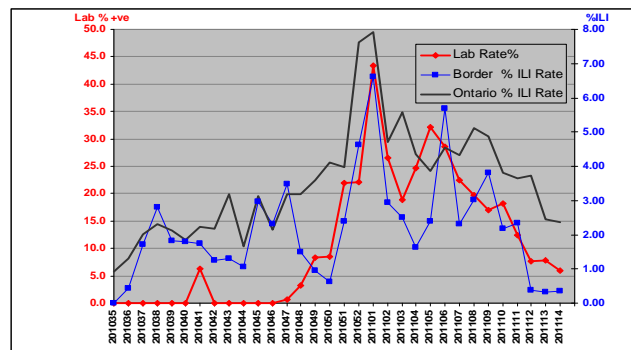Indiana • Michigan • Minnesota • New York • Ohio • Ontario • Pennsylvania • Wisconsin

ILI Rate for Selected Border Regions & % of Lab Positive Specimens

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ILI Rate for Selected Border Regions & % of Lab Positive Specimens & ILI Rate for All Regions in Ontario

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Discussion

- Regional ILI data is noisy.
- Recruitment of additional volunteer sentinel physicians is ongoing, but a slow process.
- Additional reporting process now offered for sentinels to report online (secure server).

http://www.phac-aspc.gc.ca/fluwatch/index-eng.php

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Questions???