



Successful Alerts and Responses: Real-time Monitoring of ED Chief Complaints and Investigation of Anomalies

CDC Public Health Preparedness Conference

February 23, 2005

Loren Shaffer, MPH

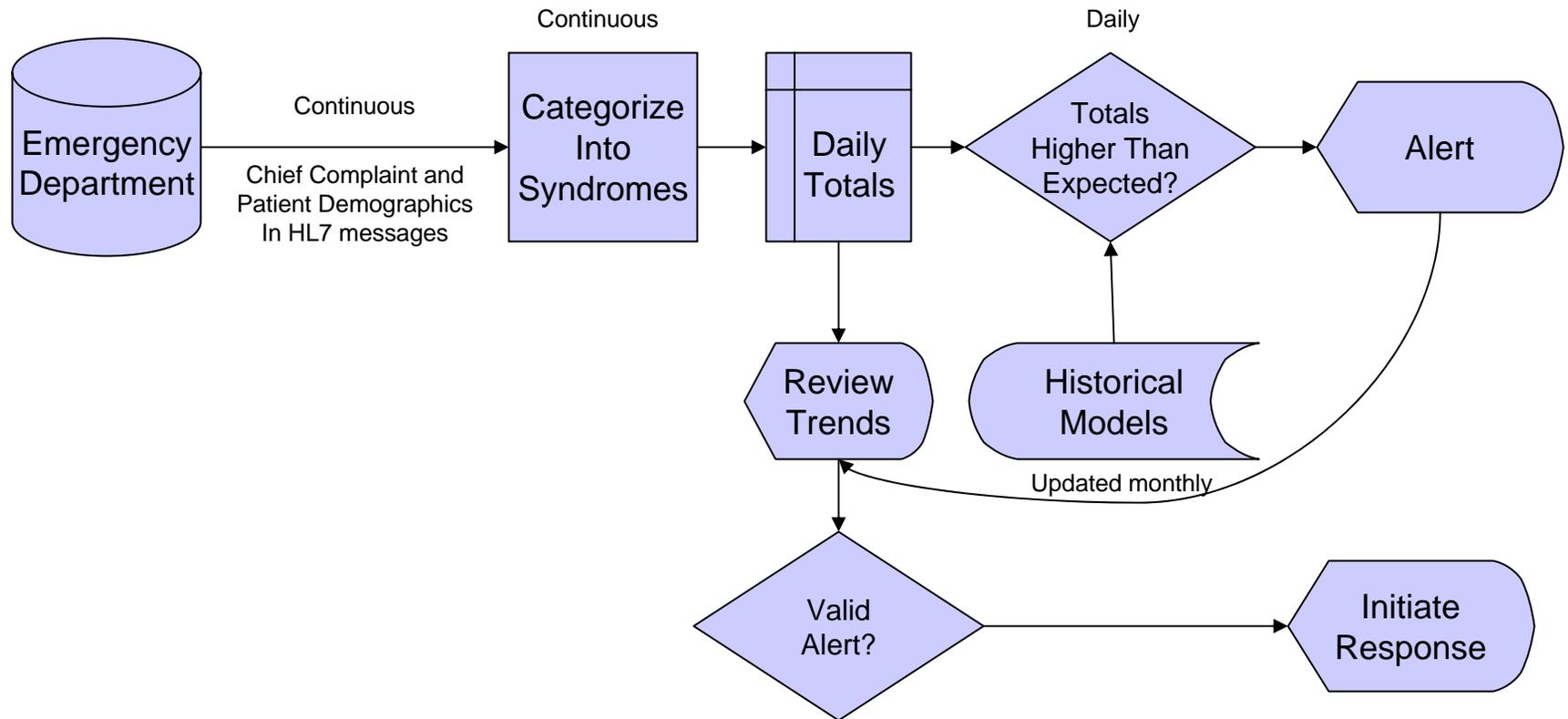
Ohio Department of Health

Real-time Outbreak and Disease Surveillance (RODS)

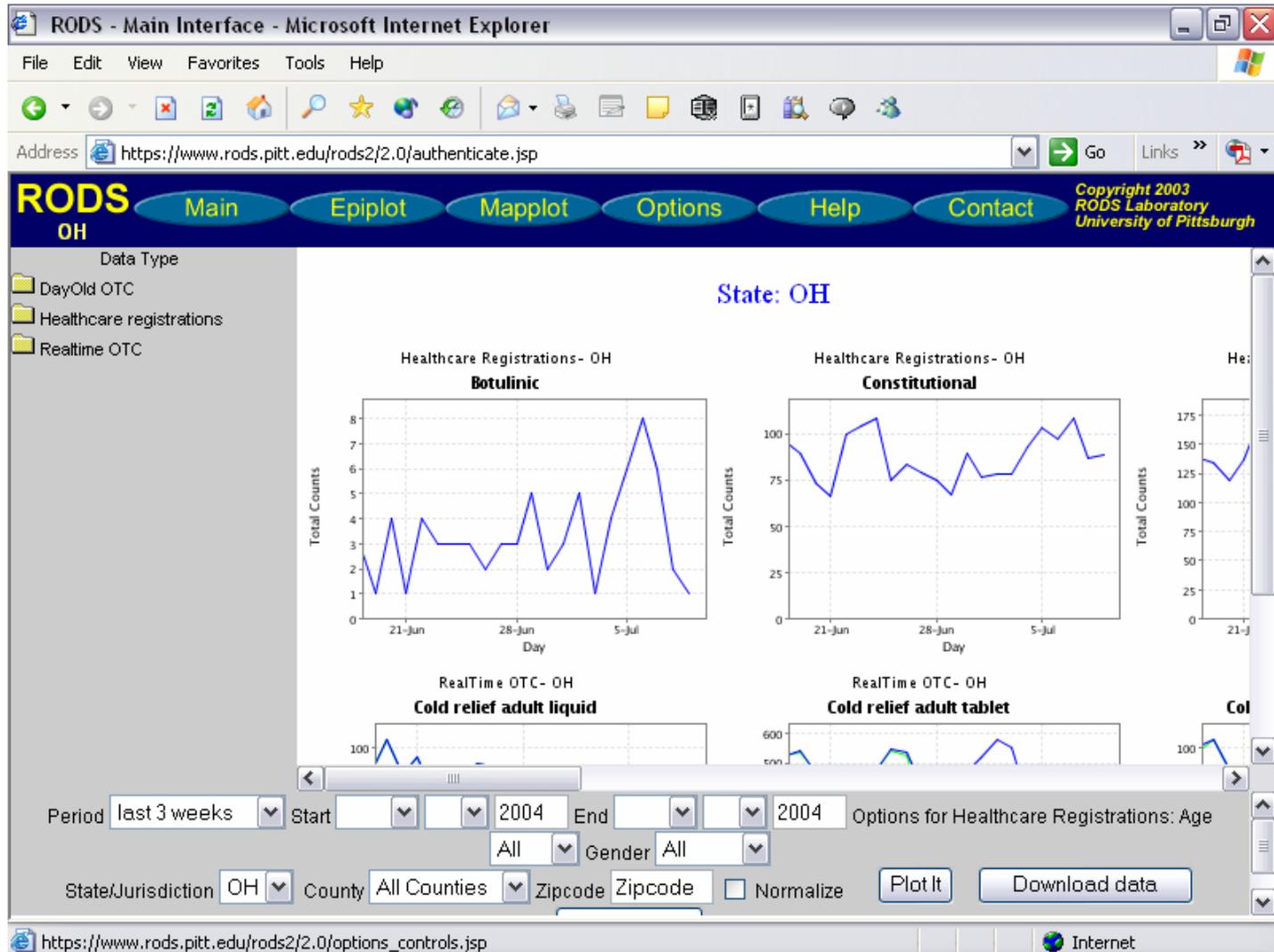
- Developed by team at the University of Pittsburgh led by Mike Wagner, MD, PhD
- Utilizes existing data (HL7 format) from hospital's registration database
- Interprets and maps free-text chief complaint into syndrome category
- Interprets and maps sales of over-the-counter medication
- Accessed by end user via the internet



Syndromic Surveillance Data Flow



RODS Navigation – EpiPlot Screen



RODS Navigation – Mapplot

RODS - Main Interface - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <https://www.rods.pitt.edu/rods2/2.0/authenticate.jsp> Go Links

RODS OH

Main Epiplot **Mapplot** Options Help Contact

Copyright 2003
RODS Laboratory
University of Pittsburgh

States
Water
Counties
Highways
Main Roads
Cities

Visits Total

Date 7 / 7 / 2004

Refresh Map

State/Jurisdiction OH

Note: Zipcode level views of states are available using the state selection control.
A schedule of how often the maps are updated can be found [here](#).

<http://www.health.pitt.edu/rods> Internet

RODS

Navigation – Chief Complaints

The screenshot displays the RODS web application interface within a Microsoft Internet Explorer browser window. The browser title is "RODS - Main Interface - Microsoft Internet Explorer" and the address bar shows "https://www.rods.pitt.edu/rods2/2.0/authenticate.jsp".

The application header includes the RODS logo, navigation tabs for "Main", "Epiplot", "Mapplot", "Options", "Help", and "Contact", and a copyright notice: "Copyright 2003 RODS Laboratory University of Pittsburgh".

The main content area features a table of chief complaints. The table has columns for date, time, age, gender, ID, and complaint. The "Respiratory" checkbox in the left sidebar is checked. Below the table, the text "Total Records: 376" is displayed.

The bottom of the interface contains search and filter controls, including dropdown menus for "All" and "Gender All", a "State/Jurisdiction" dropdown set to "OH", a "County" dropdown set to "All Counties", and a "Zipcode" field. There are also checkboxes for "Normalize" and buttons for "Plot It", "Download data", and "Get Cases".

Date	Time	Age	Gender	ID	Chief Complaint
2004-07-06	16:36:00.0	10	M	76549	EAR PAIN DIFF BREATHING
2004-07-06	16:22:00.0	70	M	43110	DIFFICULTY URINATING
2004-07-06	16:19:00.0	0	M	43227	SORE THROAT
2004-07-06	16:15:00.0	50	M	43123	SHORTNESS OF BREATH
2004-07-06	16:13:00.0	70	F	43203	SOB
2004-07-06	16:11:00.0	30	M	43213	SORE THROAT
2004-07-06	15:57:00.0	10	M	43224	WHEEZING
2004-07-06	15:50:00.0	0	F	43055	DIFFICULTY BREATHING
2004-07-06	15:49:00.0	20	F	43229	COLD
2004-07-06	15:48:00.0	0	F	43119	CROUP
2004-07-06	15:31:00.0	50	F	43232	CONGESTION CHEST
2004-07-06	15:28:00.0	10	F	43065	TROUBLE BREATHING
2004-07-06	15:21:00.0	70	M	43123	SHORTNESS OF BREATH
2004-07-06	15:19:00.0	20	M	43201	SORE THROAT EAR PAIN
2004-07-06	15:09:00.0	30	F	43068	SORE THROAT
2004-07-06	14:49:00.0	60	F	45229	SHORTNESS OF BREATH
2004-07-06	14:41:00.0	40	M	43302	DYSPNEA

Ohio's Approach



HC
↓
CEO

Local Health Departments

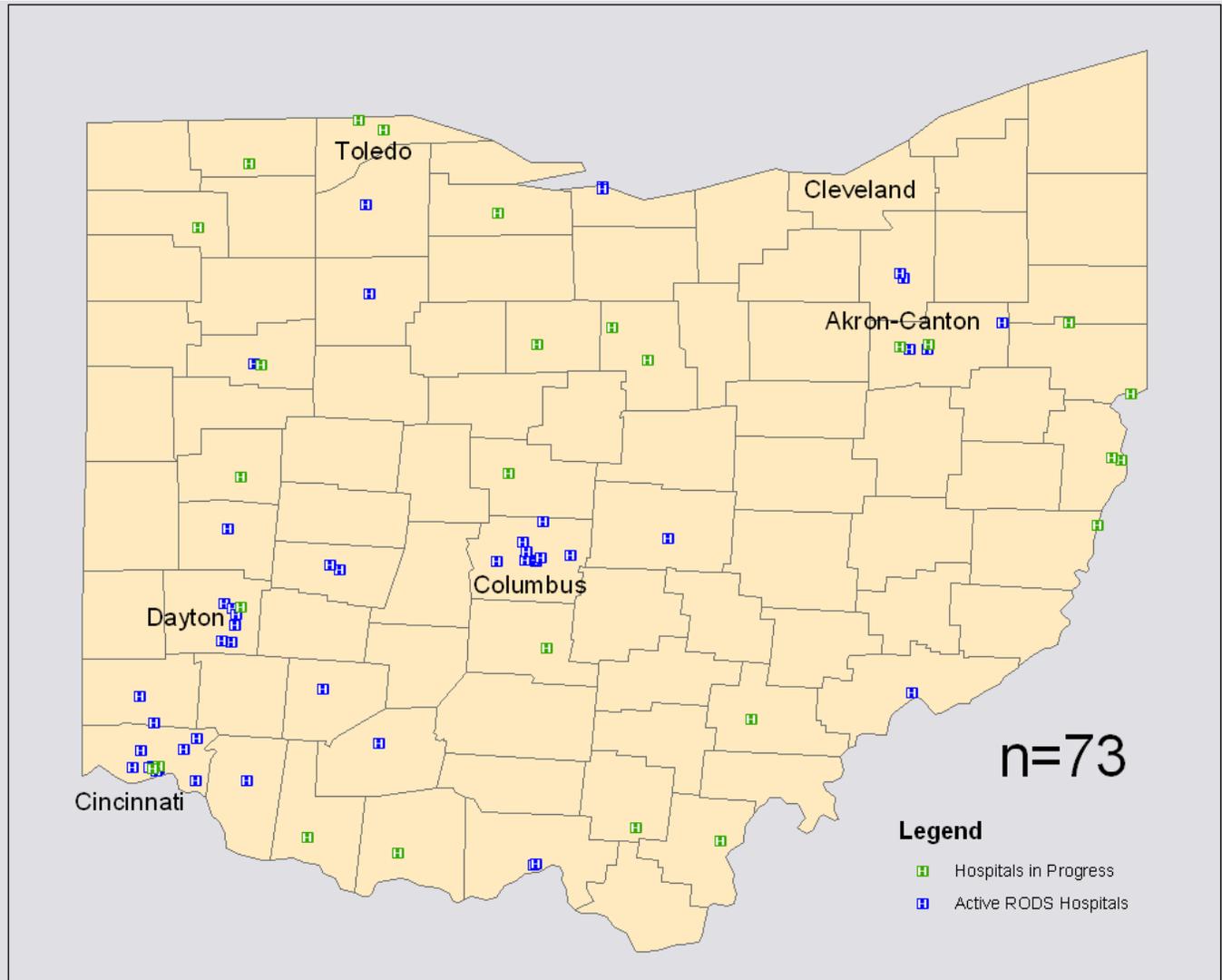
Hospitals

Epi
↓
ICP

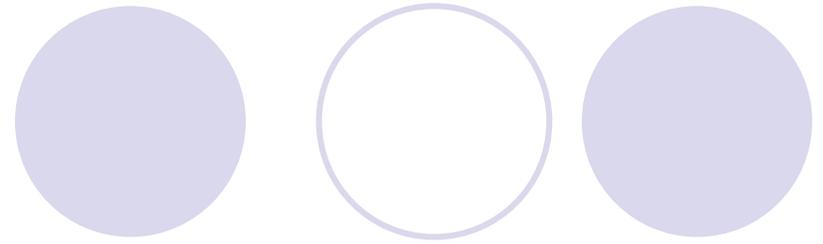
Some Bottom Lines (Incentives) for Hospitals

- Cost for RODS installation paid for by ODH with HRSA grant money
- Minimal configuration time - via telephone with assistance of RODS engineers
- Runs in background – No additional duties for ED or IT personnel
- Data are secure and “de-identified” – patient privacy is maintained
- HIPAA compliant
- JCAHO Standards

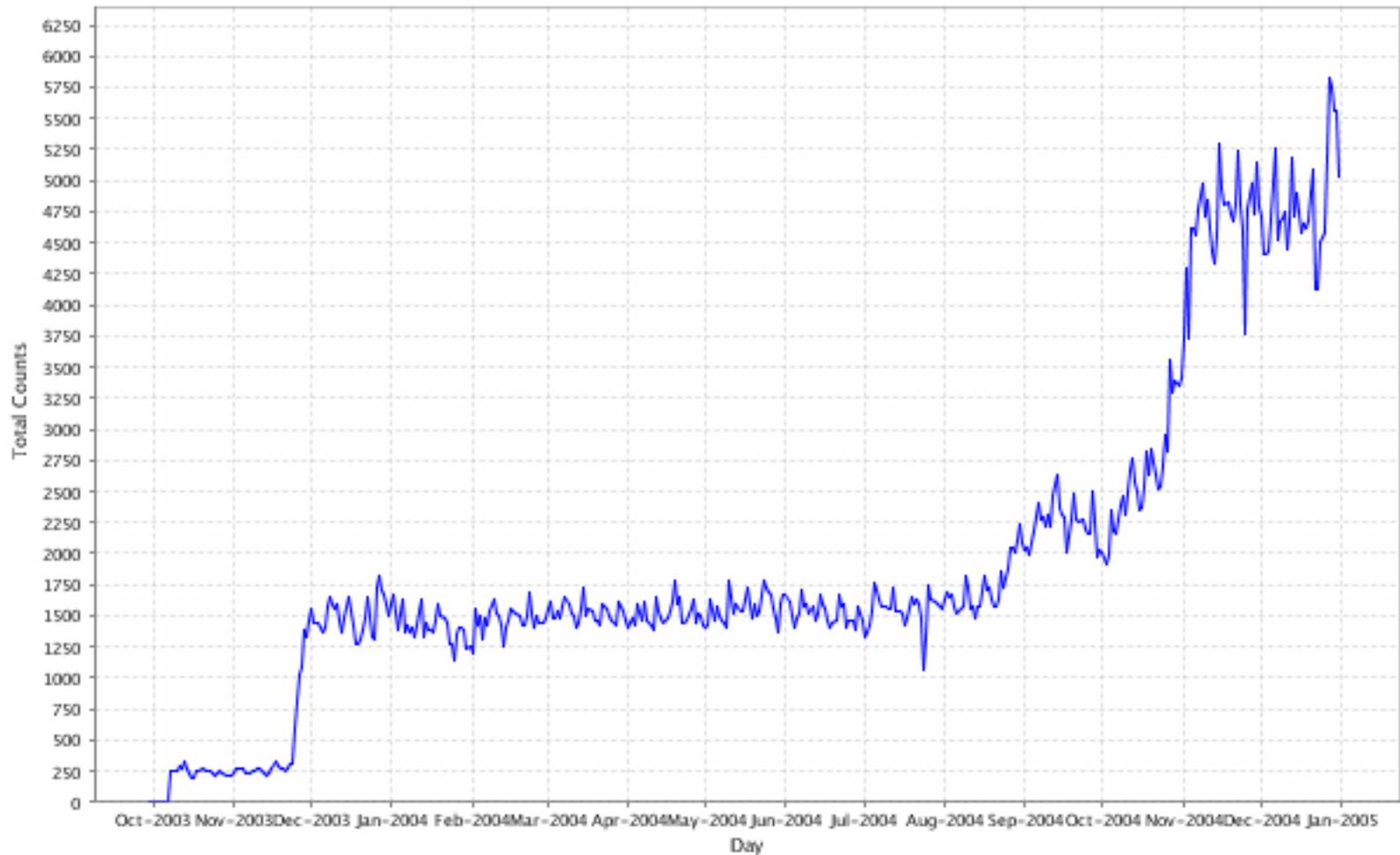
RODS Project Progress



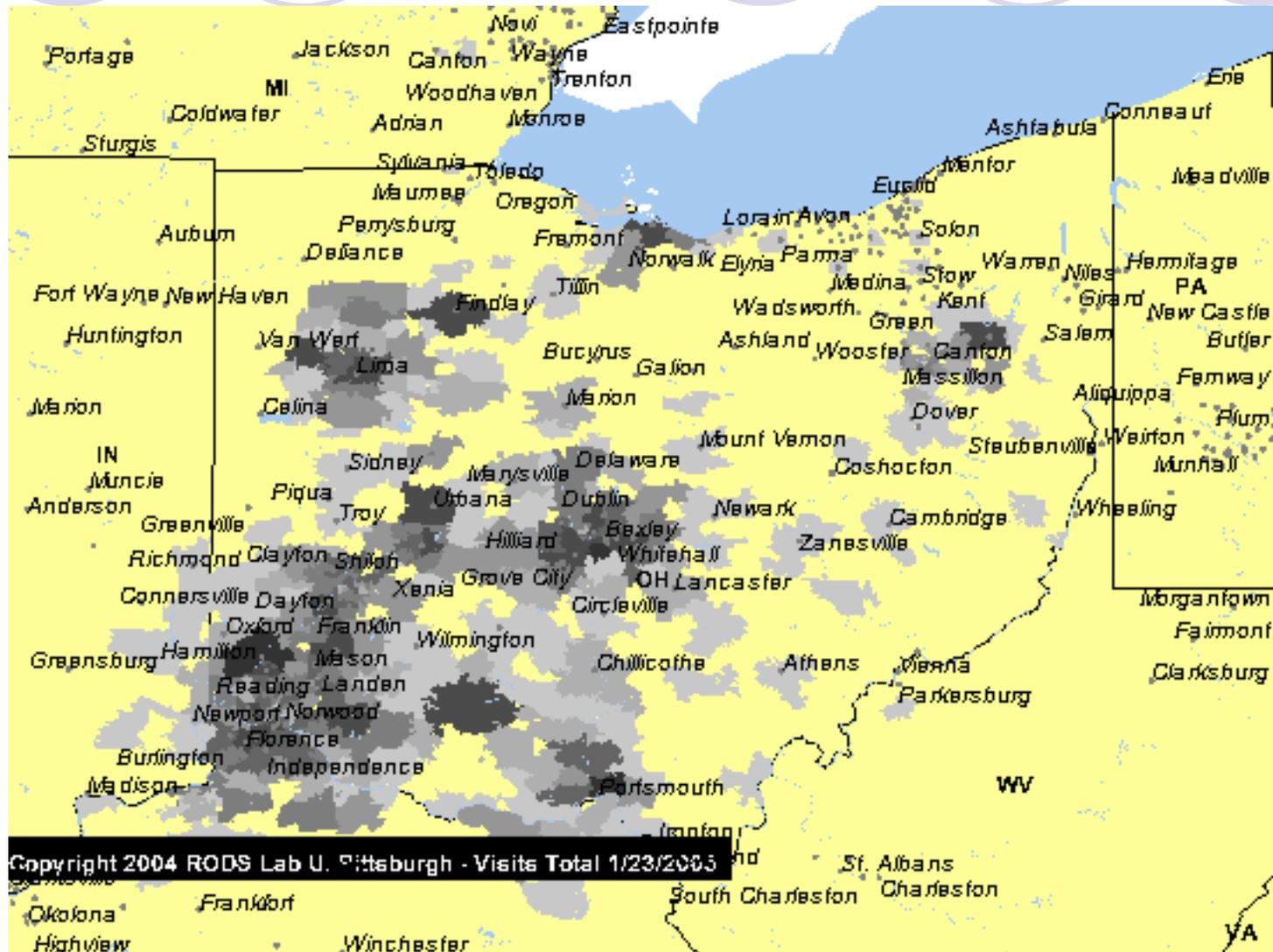
RODS Project Progress



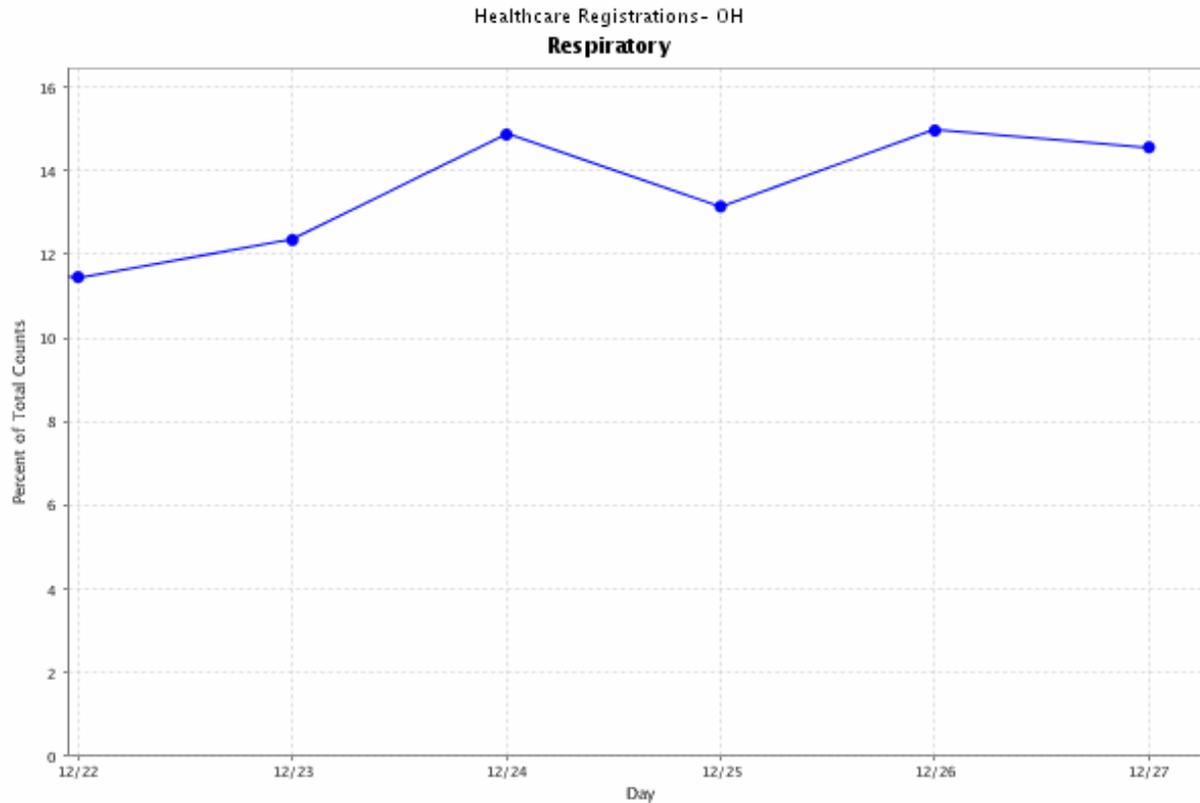
Healthcare Registrations- OH
All



Geographic Coverage

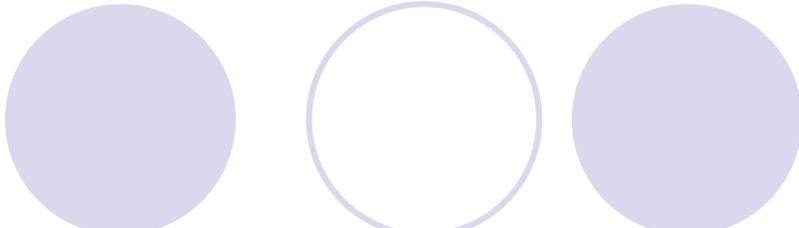


Example #1: Respiratory Visits



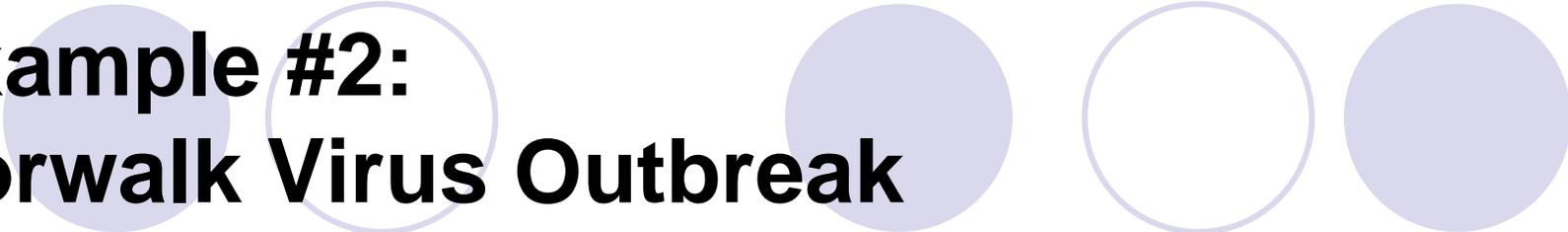
- 12/24/2004 @ 14:58: alert for all Ohio
- Normalized increase from 11.5% to 15%

Example #1: Respiratory Visits



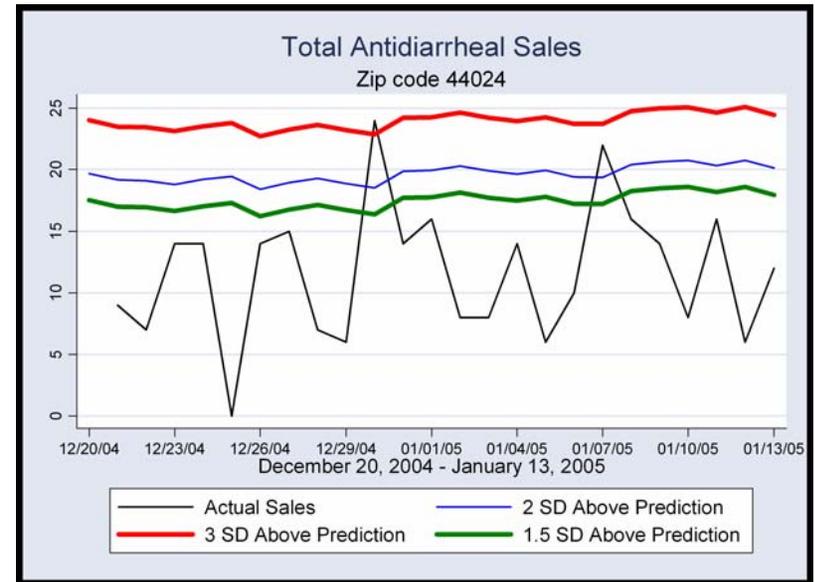
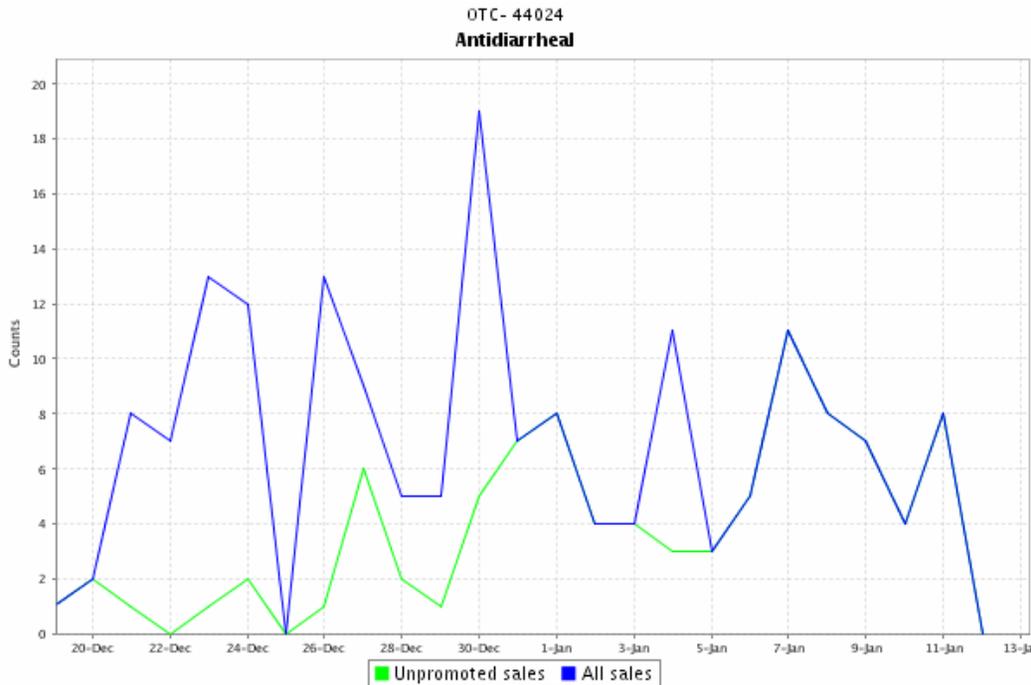
- 12/23/2004: Severe ice storm results in massive power outages.
- Stores throughout area sell out of kerosene and other supplemental heating units.
- Review of chief complaints reveals carbon monoxide poisoning as culprit.
- Total preliminary investigation: 10 minutes

Example #2: Norwalk Virus Outbreak



- January 11, 2005: Norwalk-like outbreak involving 4 staff and 7 residents of nursing home reported to State. Later confirmed via bulk stool analysis.
- January 4, 2005: Disease first reported locally with nausea, diarrhea, and vomiting lasting between 12 and 48 hours.

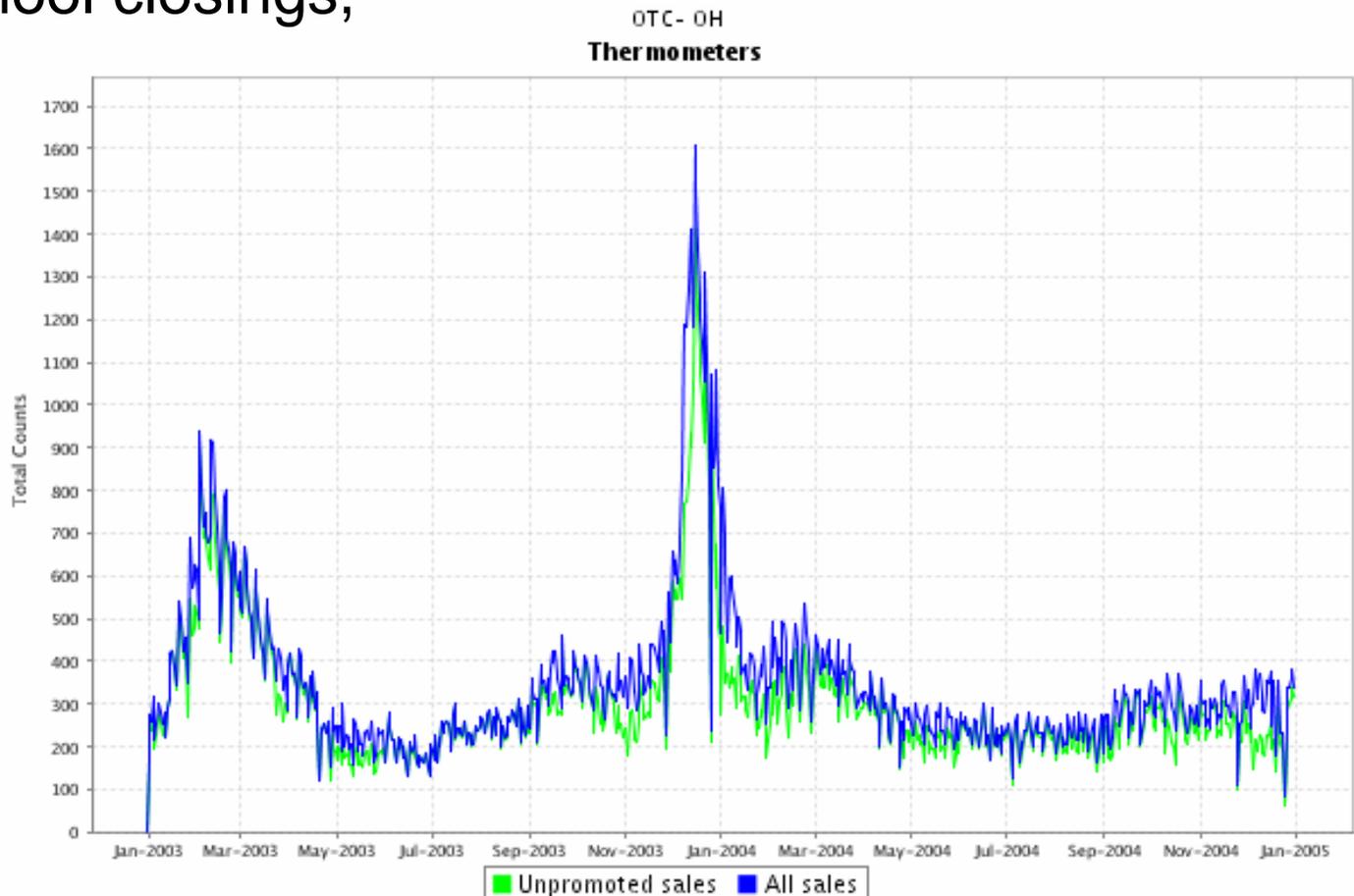
Example #2: Norwalk Virus Outbreak



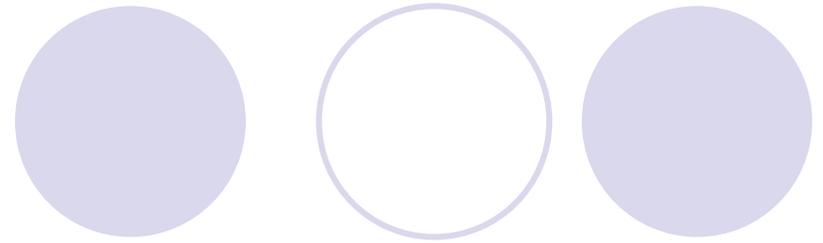
- 12/31/2004: >3 SD from moving average for anti-diarrhea medications in ZIP code 44024
- Possibility: community infection brought into nursing home by employee/visitor

Example #3: Influenza

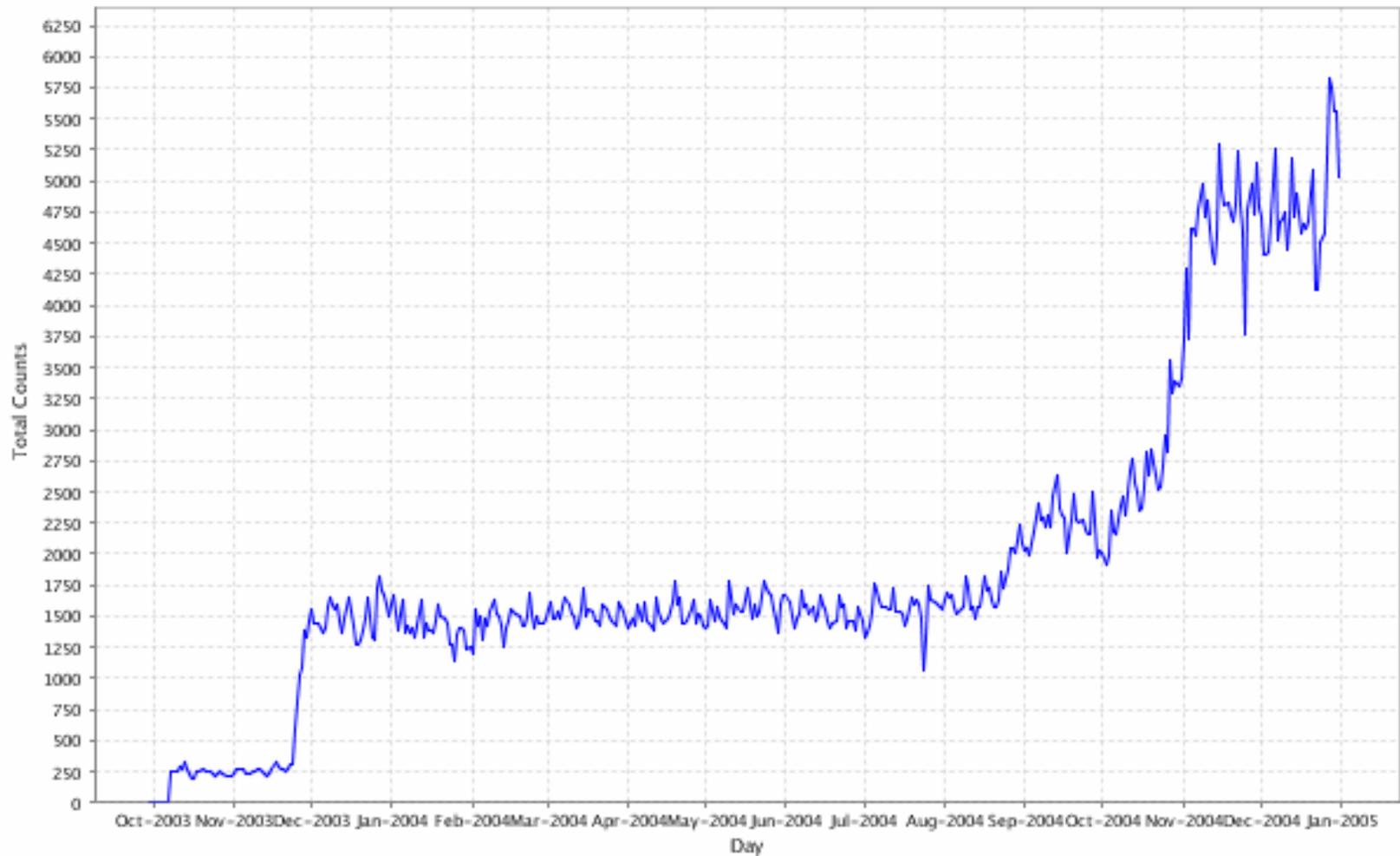
- Influenza surveillance includes lab results, ILI sentinel providers, VA Clinic Visits, Class B, OTC sales, and school closings,



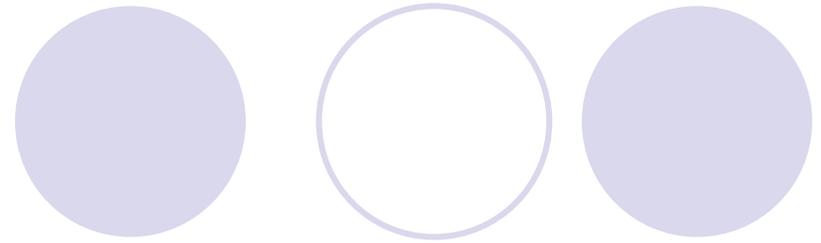
Example #3: Influenza



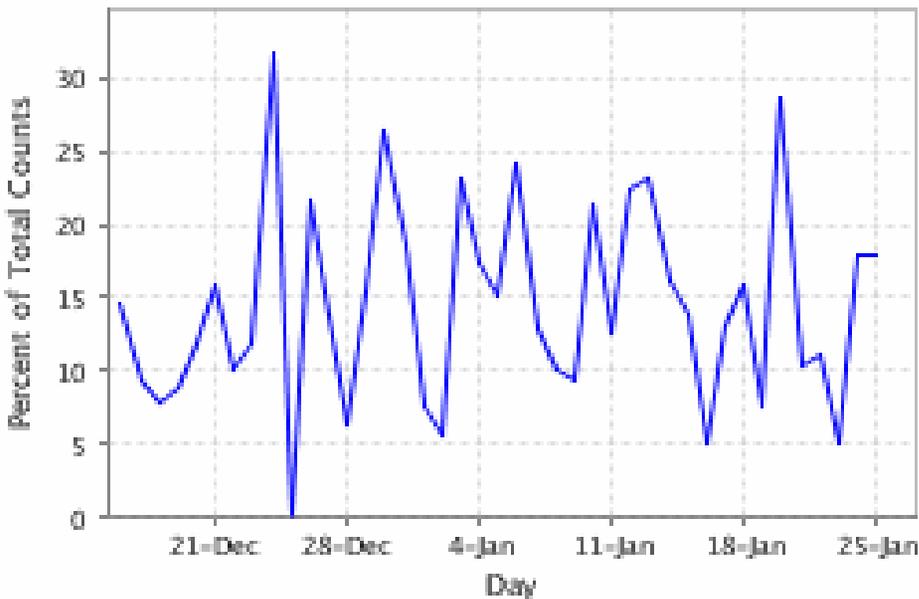
Healthcare Registrations- OH
All



Example #3: Influenza



Healthcare Registrations- 43201
Respiratory



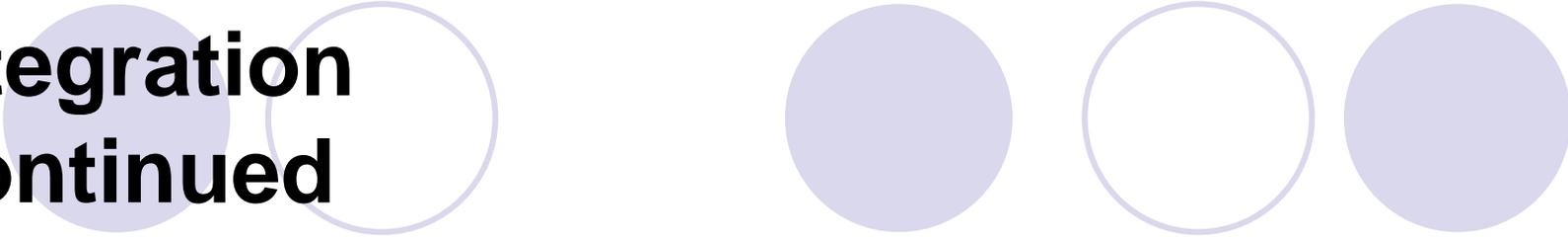
- Franklin Co. resident confirmed with influenza A (H3N2) via lab isolate: 1/19/05
- Specimen date: 1/4/2005
- Illness Onset date: 1/1/2005

Integrating RODS Into Ohio's Surveillance Program



- Establishing intrastate user visibility
 - Who gets access
 - Area of surveillance
 - Data made available
- Inter-state visibility
 - Identifying other states using
 - How much visibility into each other's jurisdiction

Integration Continued

A decorative graphic at the top of the slide consists of a horizontal row of five circles. The first circle is solid light purple and partially overlaps the text 'Integration Continued'. The second circle is hollow with a light purple outline. The third circle is solid light purple. The fourth circle is hollow with a light purple outline. The fifth circle is solid light purple.

- Review and analysis
 - Frequency
 - At what level
 - Standardization of analysis
- What to do with alerts
 - Who is alerted
 - Preliminary investigation
 - Documentation
- Protocol for monitoring, responding, etc.
24/7

Ohio Department of Health

Early Event Surveillance Staff



- Loren Shaffer, Supervisor
 - lshaffer@odh.ohio.gov
- Shannon Rowe, Immunization Epidemiologist
 - srowe@odh.ohio.gov
- Brian Fowler, Syndromic Surveillance Epi.
 - bfowler@odh.ohio.gov
- Muhammad Abbasi, Bio-terrorism Epi.
 - mabassi@odh.ohio.gov
- Brenda Mocarski, Infec. Dis. Control Consultant
 - bmocarsk@odh.ohio.gov