

NYSDOH
Emergency Department Pilot
Syndromic Surveillance
Project

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Division of Epidemiology

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Overview

- Objective
- Background
- Current Activities
- Next Steps

Next up

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Objective

- Develop an early warning surveillance tool that will identify possible non-specific disease outbreaks (either naturally occurring or intentionally dispatched) in an extremely timely manner.

Background

- Capital District Pilot Project
 - 3 Hospital ED
 - Daily total census reporting
 - Implemented April 2001
- Post 9/11 ED surveillance
 - Local Health Department staff call ED daily
 - Collect daily census and unusual conditions

Continued...

- Monroe County ED surv. project
 - Utilized ICD 9 coded diagnosis
- NYC surveillance
 - 911 project
 - ED surv. Project, utilizing Chief Complaint
- NYS ED Billing Data Reporting Legislation

Continued...

- **Cerner** project in Kansas City, this is a laboratory reporting system
- **RODS** - Real-time Outbreak Detection System
- **RSVP** - Rapid Syndrome Validation Project
- **ESSENCE** - Electronic Surv. System for Early Notification of Community Based Epidemics

NYSDOH ED billing information legislation

- Implementation date Sept. 2003
- Regulations are in the final stage of being implemented
- All elements for ED surveillance are included.

Cerner project in Kansas City

- Laboratory results based
- Cerner provides standardized coding and data handling
- Cerner provides analysis of orders and results by time and geographically

RODS

- University of Pittsburgh
- Deployed in 1999
- Working with 10 ED departments in Pittsburgh
- Collects ED registration data, micro culture reports, x-ray reports, dictation from ED clinicians, test orders and lab results.

RSVP

- Sandia National Laboratories, Los Alamos National Laboratories, U. of New Mexico Dept. of Emergency Medicine, NM Dept. of Health.
- Clinicians enter signs and symptoms of interest into RSVP.

ESSENCE

- Uses data from 121 Army, 110 Navy, 80 Air Force, 2 Coast Guard installations
- Daily feed of outpatient data, including ICD-9 discharge codes.
- Syndromic and geographic analysis
- [essence.pdf](#)

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Where we are.

- Data elements available in 12 to 24 hours
 - DOB, sex, Hospital ED, ED location, date/time, textual Chief Complaint, Medical Record Number.
- Data can be reliably collected if the process is totally automated and no human intervention is required.
- No additional or duplicative data entry in the Hospital

Continued ...

- Three components to the system
- Data Analysis
 - Coding chief complaint to a syndrome
 - Statistical analysis of the syndromes
 - Risk Analysis of the trends
- Data collection
- Security, Data Sharing and Confidentiality agreements

What we have been working on.

- Defining the syndromes of interest:
 - NYC (CC Based)
 - Influenza Like Infection, Shortness of Breath, Diarrhea, Vomiting, Rash, Sepsis, Asthma
 - Emergency Medical Associates (ICD9 Based)
 - Fever, Respiratory, GI, Diarrhea, Headache, Asthma, Skin
 - Department of Defense (ICD9 Based)
 - Fever, Respiratory, Dermatological - Infection, Dermatological - Hemorrhagic, GI, Neuro

Validating the CC filter

- What we have: Chief Complaint
- What we want: Syndrome detectable by Chief Complaint.
- What we need: A data source (right now) that will permit this analysis.
- What we have found: Proprietary data set with 4.5 million ED discharges.

Initial steps in filter validation.

- Limitations:
 - Problem: our comparisons were with a not well developed ICD9 syndrome classification scheme.
 - Plan: Compare our CC filter with a modified version of the DOD's ICD9 classification scheme.
 - Look for similar patient identification for each syndrome
 - Look for similar alert capabilities when output is analyzed (both approaches identify the same epidemics at the same time).

Continued ...

- Advantages
 - Compares favorably with ICD9 discharge diagnosis.
 - Using ICD9 code parsing as a standard, our filter obtained between 94% and 99% specificities.
 - Patients identified with our filter would almost universally be classified identically by an ICD9 based system.
 - Depending on syndrome, between 40% and 60% sensitivities.
 - CC filter did not identify all of the patients picked up by the ICD9 filter
 - Trend charts showed near perfect overlay of seasonal and epidemic levels between the ICD9 and the CC filters.

How to detect a possible Public Health event?

- We have at least three possible techniques, none of which have a clear *a priori* advantage over the others.
- We are planning on running at least two of these techniques simultaneously at first.
- Compare the outcomes with each approach.

Three possible methods

1. Two week look back CUSUM

- Similar to NYC method

2. Seasonally Adjusted CUSUM

- Use a regression analysis on retrospective data to adjust each day's data for seasonality, producing an even adjusted mean and variance for CUSUM analysis

7/17/2002 **Requires baseline data**

Continued ...

3. Serfling Method

- A technique using dual cyclical regression to account for seasonal variation
- Establishes an expected threshold for each day's statistic.
- Used by CDC for Influenza surveillance
- Requires baseline & incidence of flu data

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Next Steps

- Compare various analysis techniques
 - Start operation using multiple techniques. (This will require retrospective data)
 - Compare sensitivities and false-positive rates between different techniques.
 - Drop redundant or poorly performing analysis techniques.

Hospital ED participating in the pilot

- Erie County Medical Center
- Strong Memorial Hospital
- SUNY Upstate Medical Center
- Albany Medical Center
- St. Peters (Albany)
- Albany Memorial
- United Memorial Hospital
- New York United Hospital
- Columbia Presbyterian

Next Steps

- Follow-up conference call with everyone that participated in the March 14 meeting.
- Scheduled call for July 24 with technical staff.
 - Identify message format
 - Discuss data elements
 - Discuss automated file upload procedures

Continued...

- Collect retrospective data.
- Pilot test collection of ED data.
- Implement automated data collection
- Prototype data display and geographic analysis tools.

Work in progress.

