

Should We Be Worried?

Investigation of signals generated by an
electronic syndromic surveillance system

William Terry, MPH

Belinda Ostrowsky, MD, MPH

Ada Huang, MD

Overview of Talk

- Overview of Westchester County
- Background of our surveillance efforts
- Overview of the CHES system
- Objectives of this review
- Results
- Conclusions

Background

- Westchester has been part of the Metropolitan New York BT Working Group
- Other types of surveillance pre-dating the current syndromic surveillance system
 - Passive Surveillance
 - MD and lab notification of reportable communicable diseases
 - Schools, Health Care Facility reports
 - Active Surveillance
 - Calls to Hospitals for West Nile surveillance
 - Calls to EDs for numbers of visits logged in for EMS Diversion Program
 - Calls to EDs/ICNs with qualitative questionnaire

Hospital ED Call Form

WC BT SURVEILLANCE FORM-EMERGENCY DEPT/ICN REPORT

Date of Report ___/___/___ Person Completing Form _____

HOSPITAL NAME _____

HOSPITAL CONTACT: NAME _____ TITLE _____

PHONE _____

Have you had any sudden and unexplained deaths in young previously healthy people? NO YES

If YES, explain:

Have you notice significant increases in ER visits or hospital admissions? NO YES

If YES, explain:

Have you noticed clusters of patients arriving from a single household/event? NO YES

If YES, explain:

Have you noticed increases in persons presenting with:

(Check all that apply)

Unexplained rash and fever high (including: fever followed by a vesicular or pustular rash with lesions more abundant on the face and extremities than the trunk and

that are of the same age in a given area of the body – smallpox)

Unexplained pulmonary syndromes (including: gram-negative pneumonia with hemoptysis--pneumonic plague)

Unexplained sepsis (including: a widened mediastinum with fever and sepsis)

Unexplained gastrointestinal symptoms

Diseases that are relatively uncommon, have bioterrorism potential (pulmonary anthrax, tularemia, brucella, or plague)

NO YES

If YES, explain:

Have you seen any suspect SARS cases? NO YES

If YES, explain:

Intro to CHES

- What does CHES mean?
 - Community Health Electronic Surveillance System
- Number of hospitals involved in CHES
 - Began in January, 2003 with 4/13 county hospital EDs
 - Has now expanded to include 7/12 EDs
- Volume
 - Approximately 600 daily ER visits captured by system
 - Represents about 65% of total ER visits in the county
- Daily transfers of electronic chief complaint data
- Receipt and analysis by Planning and Evaluation
 - Based on systems used and developed by other organizations and LHDs
- Signals forwarded to DDC for review and follow-up

Types of Filters

- Four Main Syndrome Filters
 - Fever/Flu
 - Respiratory
 - Vomiting
 - GI/Diarrhea
- Other Syndrome Filters
 - Sepsis
 - Rash
 - Hemorrhagic Events
 - Neurologic Events

Objectives

- Refine Data Analysis Methods
 - Increased sensitivity/specificity of filters
 - Relatively small number of complaints needed to generate a signal
- Develop Procedures for Investigating Signals
 - Response Algorithm
- Determine if any signals related to a Public Health Emergency have occurred
- Evaluate the effort required for follow-up

Refining Filters

Some examples of terms included and excluded from filters

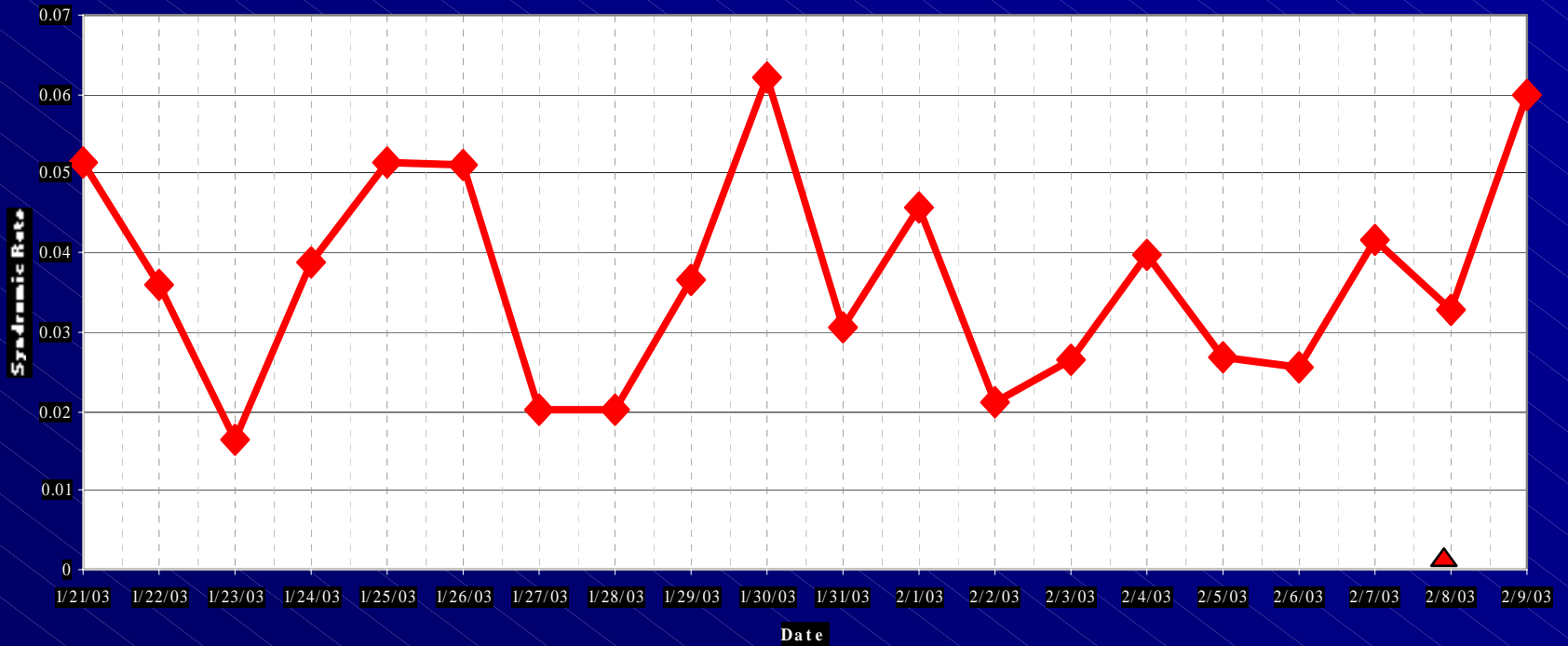
SYNDROME	INCLUDE	EXCLUDE
Fever/Flu	Chills, Fever, Hot, Rigors, Temp, FUO	Attempt, Gunshot, 'flashes'
Respiratory	Cough, Dyspnea, cold, pleuritic chest pain	TB, aspiration, emboli
Vomiting	Emesis, N/V, nausea, heaves	Migraine, S/P fall, "pregnant"
GI/Diarrhea	N/V/D, cramps, diarrhea	"leg", "menstrual"
Sepsis	Shock, unresponsive, bacteremia, DOA	Cancer, urosepsis, micturition

Developing Procedures for Signal Response

- Receipt of signal from Planning & Evaluation group
 - Review type of statistical signal (C1, C2, C3)
 - Also ask if in normal range of absolute numbers

Developing Procedures for Signal Response, cont'd.

Westchester County Emergency Department Syndromic Surveillance:
Rate of Visits Due to Fever & Flu Syndromes to Participating Hospitals, Ages 13+



Syndromic Rate: Total# of cases with fever or flu syndromes / Total# of ER visits during that day

▲ CUSUM Alarm

Developing Procedures for Signal Response, cont'd.

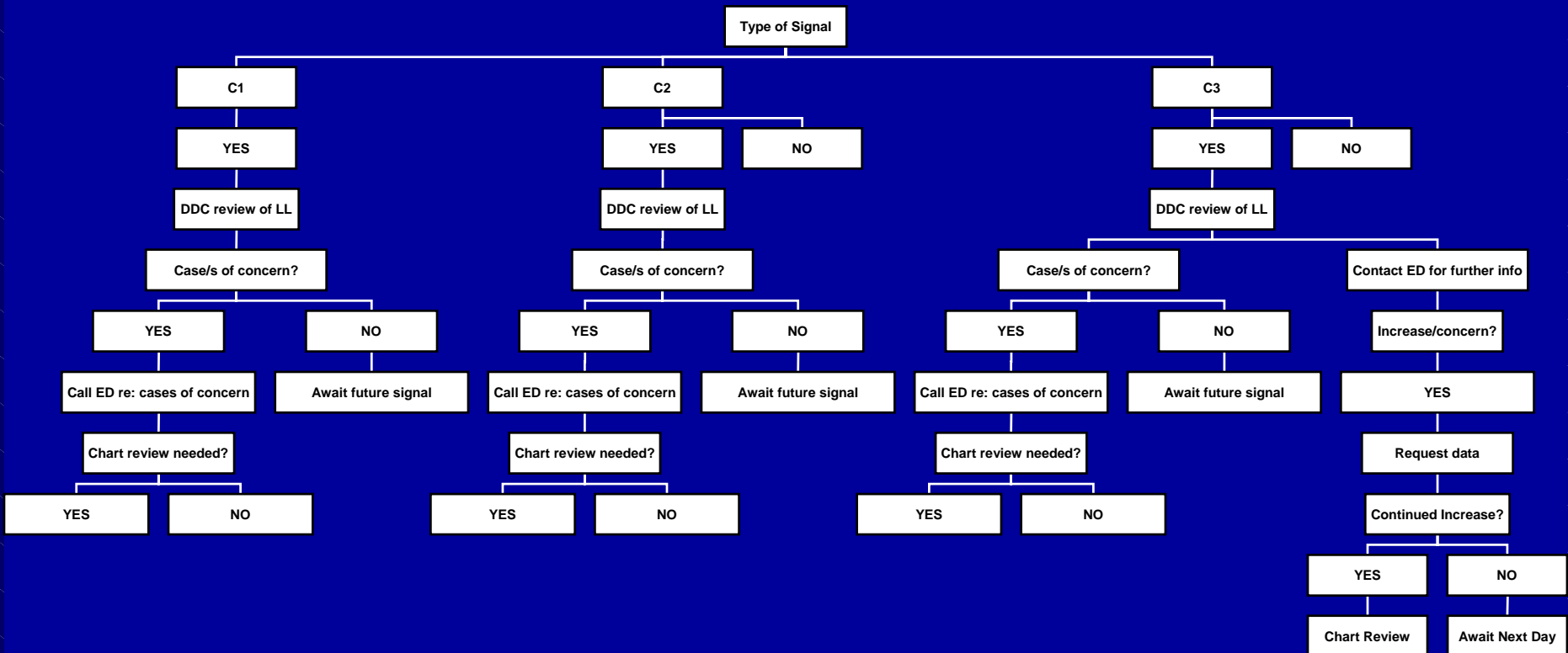
Prov	MEDRECNO	AGE	SEX	CITY	ZIP	ADMTDAT	I_OPT	CLINIC	MEDTXT
LH01	#####	71	F	BRONX	10466	03/13/03	O	ER	FEVER/HEADACHE
LH01	#####	44	F	MT VERNON	10552	03/13/03	I	ER	VIRAL HEPATITIS
LH01	#####	24	F	YONKERS	10705	03/13/03	O	ER	NUMBNESS ALL OVER BODY
NW01	#####	64	F	SOMERS	10589	03/13/03	O	ER	COUGH, FEVER
NW01	#####	32	F	MT KISCO	10549	03/13/03	I	ER	VIRAL MENINGITIS
NW01	#####	50	M	MT KISCO	10549	03/13/03	O	ER	FEVER, VOMITING
NW01	#####	50	M	YORKTOWN HEIGHT	10598	03/13/03	I	ER	FEVER, VOMITING SIG FROM ER
PM01	#####	73	M	YORKTOWN HGTS	10598	03/13/03	O	ER	FEVER URINARY INFECTION
PM01	#####	46	M	WHITE PLAINS	10607	03/13/03	O	ER	HOT KNEE
WP01	#####	17	M	SCARSDALE	10583	03/13/03	O	ER	FEVER/CHILLS/WEAKNESS
WP01	#####	42	F	WHITE PLAINS	10601	03/13/03	O	ER	BREATHING/WHEEZING & MUCUS FEVER

Developing Procedures for Signal Response, cont'd.

- Review line list for zip code, age, complaint and admit/discharge
- Call hospital contact if there is anything questionable
- Wait for next day to see if signal sustained or worsens

Response Algorithm

CHES Signal Follow-Up



Determine if Signals are Worrisome

- To date, no communicable disease incidents of concern have been identified
- Retrospective review to see if events would have been picked up
 - Norovirus in an adult home
 - Respiratory deaths in a children's home
 - Post-blackout GI illnesses

Signals to date

Syndrome	# Signals
Fever/Flu	8
Respiratory	6
Vomiting	7
GI/Diarrhea	6
Sepsis	5
Rash	5
Hemorrhagic	3
Neurologic	4
Combined BT	6
TOTAL	50

Results of Signal Investigation

- Each signal has been reviewed by DDC Epidemiologist and ID physician
- Follow-up with hospitals has been initiated in many instances, even when not meeting all investigation criteria
- One R/O meningitis was detected and investigated
- No events of public health concern have been detected thus far

Efforts Required for Follow-Up

- Personnel available for follow-up
 - DDC ID Physician
 - DDC Epidemiologist
 - 7 DDC nurses
- Time required for follow-up
 - Most line list reviews take about 15 minutes
 - DDC spends approximately 3 hours overall per week for CHES follow-up, other time is spent by P&E staff
 - Phone calls to hospitals can take minutes to hours
 - Further data/chart review would take hours

Conclusions

- Why haven't we picked up an "outbreak"?
 - Last year was a "light" flu year, and the system was not in place until January
 - Not meant to pick up individual, or even a handful of cases
 - Our events for retrospective review were small-scale and spread over time (they were mentioned in the phone calls)

Conclusions

- System has provided a baseline of ER visits for the past year, which will help in future analyses
 - Also gives objective information on ER visits
- Has been part of increased surveillance efforts by local Eds
 - Decreases ED staff workload by not doing daily calls/faxes
- Seems to be appreciated by ED staff when we call with possible signal
- Daily reminder of importance of surveillance
 - WCDH Staff
 - Hospitals
- May also have utility to monitor for chronic diseases
- Is there a minimum size for a county/minimum # ERs to make this a practical approach?

Acknowledgements

- WCDH Administration

Dr. Joshua Lipsman

Patsy Yang-Lewis

- Planning & Evaluation

Renee Recchia

Stanley Cho

Jiali Li

- Division of Disease Control

Dr. Ada Huang

Dr. Belinda Ostrowsky

Julie Jacobs

Cathy D'Aleo

Julia Fullenweider

Virginia Hill

Lori Klaus

Virginia McMath

Rosemarie Camia