What is “Syndromic” Surveillance?

• Other names you may have heard…
  – “Health indicator”
  – “Non-traditional”

• Goals
  – Same as traditional surveillance
    • Ongoing, systematic collection, analysis, interpretation, and dissemination of health data
  – Another mechanism to monitor health status of a community
  – Ideally provide earlier warnings than traditional surveillance
  – Provide rapid access to data (including line lists)
Syndromic Surveillance Methods

- Use of non-traditional data sources
  - ER chief complaints, outpatient ICD-9 codes, pharmaceutical sales, ambulance runs (EMS)
- Automated data collection and analysis
- Data is grouped into “syndromes”
  - Respiratory, gastrointestinal, rash, botulism-like, etc.

![Graph showing the comparison between traditional disease detection and syndromic surveillance. The graph illustrates the probability of disease detection over time, with syndromic surveillance detecting the disease earlier than traditional methods, leading to a potential gain of 2 days for effective treatment.](image-url)
Potential “Early Indicators”

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Benefits & Limitations

THE GOOD...

• Aids in descriptive epidemiology
  – Rapid access to line lists and demographics
  – Easy to graph data by counts per day, by age group, by clinic location, etc.
• Mapping capabilities (GIS)
• Compare multiple data streams
• Awareness of local and regional trends
• Easy to assess background rates of disease

THE BAD...

• Not always more timely than traditional methods
• Requires ongoing IT support
• Requires thorough analyses of each data source
  – Able to capture trends
  – Accurate
  – Best way to group the data
  – Reliable
• Sharing difficulties across jurisdictions
• Access to data
  – Data use agreements
  – Fees
Guiding Principles and Key Considerations

• Might not work for all communities

• Existing systems can provide a model for:
  – Templates of data use agreements (DUAs)
  – Graphics and design
  – Analytical methods
  – Access to data

• Not limited to bioterrorism surveillance
  – Other utilities, e.g. influenza, STDs and mental health
  – Dual use promotes routine use and familiarity
Syndromic Surveillance

But, what if you live in a nice, quiet, place…?

Bill Lober, MD
lober@washington.edu
Does Syndromic Surveillance Apply?

I am interested in (syndromic surveillance), but I want to be sure it will be of value for our situation. I work at the local health department. We are fairly rural with a population of 60,000 in the city and another 100,000 throughout the rest of the eight counties of our jurisdiction.

Is it feasible to implement some kind of a syndromic surveillance system in Smalltown, USA? It could be quite expensive to implement and maintain and we would probably only get a small amount of data because of the limited resources and population.

Would the return be of any significance?
Rural Syndromic Surveillance

• Is it feasible to implement in rural areas with small populations?

• What are the issues?

• Is it worth the investment?
Same issues in the big city…

• Is it feasible in MY metropolitan area? Do I have enough data? Can I gain access to those data?

• What data do I use? How do I analyze it?

• Can I afford this? Is it sustainable? Will anything come from it?
What is Syndromic Surveillance?

- **Narrow** (domain): Surveillance based on disease syndromes (pre-diagnostic) for infectious disease (bioterrorism)

- **Broad** (techniques): Automated collection, semi-automated processing, and manual review of electronic data to monitor population health

- **Expanded** (techniques): Monitor population health and inform public health response
Rural Population Health Issues

- Bioterrorism (wait for Scott’s talk…)
- Foodborne outbreaks
- Industrial/Agricultural exposures
- Injury surveillance
- Infectious disease

- Automated collection, semi-automated processing, and manual review of electronic data to monitor population health and inform public health response
Feasible?

• What sources of secondary data do you have?
  – ED c/c, billing (ICD-9 Dx)
  – Primary care visit data
  – Integrated delivery systems/INHS
  – EMS run data
  – Pharmacy (PBM, OTC)
  – Poison Center
  – (who uses computers in their business operations?)

• What portion of your population do these data cover?
Development Issues

• Sharing information across jurisdictions
  – BT regions
  – Metro areas

• Accessing Data
  – HIPAA issues with Protected Health Information
  – [http://www.cdc.gov/mmwr/preview/mmwrhtml/m2e411a1.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/m2e411a1.htm)
  – Examples of MOUs, Data Use Agreements (DUAs)?

• Model for development
  – Use existing systems (Biosense, RODS, ESSENCE, etc..)
  – Build (Public Health – Seattle & King County IT)
  – Buy (Vendor Systems)
  – Partner – Academic or Commercial (Kitsap – UW SPHCM)
Feasible?

• How do you collect the data?
  – RODS  http://rods.health.pitt.edu/
  – National Retail Data Monitoring  http://rods.health.pitt.edu/NRDM.htm
  – PHRED – WA DOH
  – Build (Public Health – Seattle & King County IT)
  – Partner (Kitsap – UW SPHCM)
Feasible?

• How will you analyze the data?
  – Biosense, RODS, ESSENCE, etc…?
  – Use software packages (EARS, UW…)?
  – Develop your own?

• Analysis Issues
  – Statistical methods for small numbers
  – Implications of population density on geo-coding (BK)
Feasible?

• How do you respond to this new information?
  – Integrating systems w/ practice
  – Criteria to investigate
  – Use of system in management
  – Do you have the resources? (silly question?)

• How do you learn more? (disclaimer)
Return

• Is it worth the investment?

Outline
• Definition
• Scenario (BT Plume)
• Why not just ZIP code?
• One example of the potential benefit of SS

• Can I afford it?

• Is it sustainable?

• Will anything useful come from it?

• Good questions!...
Outline

• Definition

• Scenario (BT Plume)

• Why not just ZIP code?

• One example of the potential benefit of SS
Recent CDC national bioterrorism initiatives BioConcept:

**BioShield** - rapid development of new vaccines and therapeutics against biological threats

**BioWatch** - deployment of environmental air samplers in key locations to detect releases of certain biological agents

**BioSense** - enhanced capability to rapidly detect terrorism by accessing and analyzing diagnostic and pre-diagnostic health data
Is the community where you live “covered” by either Biowatch or Biosense?

A. One
B. Both
C. Neither
D. Don’t know
Scenario (BT Plume)

- Fictitious release of toxin or bio-agent
- Port of entry into the US
- Military bases
- Close access via water & roads
- Largest ferry fleet in the country
Census Tract
Geocoding

The process of taking a street address and converting it to a latitude and longitude.

\[ f \left( \text{street address} \right) = (\text{latitude, longitude}) \]
Flexible level of resolution depending on diagnosis

- Zip
- Census Tract
- Census Block Group
- Census Block
- Lat and Long
What level of geo-coding would help you to identify where an outbreak was occurring?

A. County/Zip Code
B. Census Tract
C. Census Block Group
D. Census Block
County
Block Group
Example of using syndromic surveillance systems and data in rural areas.

Syndromic Surveillance Information Collection -- Peninsula

Early Aberration Reporting System

Aberration Detection Reports

by DATE (Flagged Data Only)
- by Facility - Flagged Events Only
- by Facility - All Events
- Overall - All Events

by SYNDROME (Flagged Data Only)
- Botulinic
- Constitutional
- Gastrointestinal
- Hemmorhagic
- Neurological
- Rash
- Respiratory
- Total Visits
- Nonreportable

Trend Graphs (All Data)
- Trend Graph Index - by Facility
- Trend Graph Index - by Event

Generated at 29JAN04:05:33:10
Simple Graphic Visualizations

Early Aberration Reporting System (EARS-NH)

Syndromic Surveillance Information Collection

All Facilities

Ending Date 02/02/04

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C1=Mild Sensitivity  C2=Moderate Sensitivity  C3=Ultra Sensitivity
Support:

- Centers for Disease Control – BT Preparedness (B2)
- WA State DOH
- PH-Seattle & King Co.
- Kitsap-PH
- NWCPHP – CDC Preparedness Center
- ODIN– DoD

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www.nwcpphp.org
Non-metro areas are not immune to BT or terrorist threats

• Rajneesh in The Dalles, Oregon, 1984

• Algerian man captured in Port Angeles on December 14, 1999 with explosives and timing devices

• Other events that we can not discuss for which the system acted as reassurance that that all was fine
Lessons Learned

• Data sharing agreements take LOOONG time…
• Zip codes don’t give clear picture of disease patterns in rural areas of our three-county region.
• Coded diagnosis take too long (1 week or more) to be of use; pre-coding the chief complaint was a necessity; accuracy is not perfect but it gives us a picture of what is happening.
• There is still research to be done to determine appropriate resolution of geocoding to optimize detection in the mix of small numbers and large areas.