Early Event Detection Issues and Requirements

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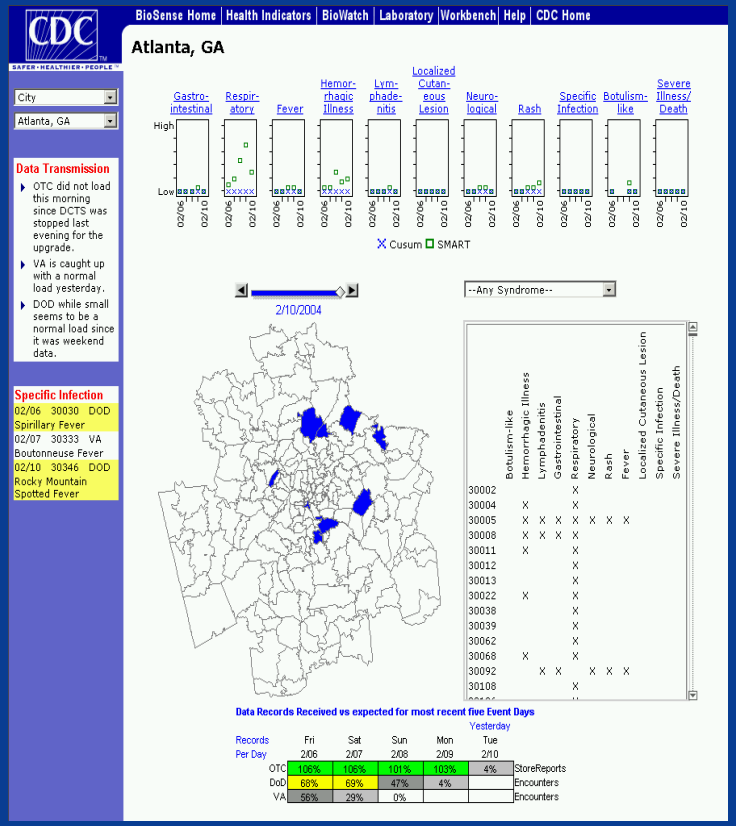
Early Event Detection Issues and Requirements

- Terminology and setting
- Reporting Methodology Considerations
- Data Considerations
- Next steps

BioSense



BioSense is an initiative to enhance early detection, quantification and localization of possible bioterroism attacks and outbreaks.

BioSense - Setting

One of the new national bioterrorism initiatives:

BioShield -rapid development of new vaccines and therapeutics

BioWatch - deployment of environmental air samplers in key locations

BioSense - early event detection through accessing and analyzing pre-existing diagnostic and pre-diagnostic health data

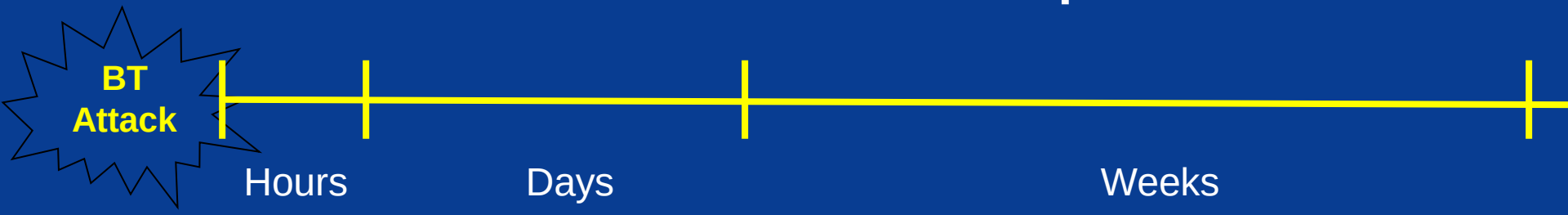
BioSense is a major part of the DHHS / DHS 2005 biosurveillance initiative. Integration point for human health “sector”

Bio-integration function – integration with intelligence data and other sectors (DHS)

“Early Event Detection”

- Initial detection – find an event as early as possible
- Quantification – how many people are ill?
- Localization – where is it taking place?
- Investigation – demographics, etiology, conveyance
- Subsequent detection – identifying other possible cases, leading to…
- Outbreak management – confirming true cases, tracking who was exposed
- Countermeasure administration – prevention information, isolation, prophylaxis, vaccination
- Target – minimizing morbidity and mortality of an event

All Hazards Detection and Response Data



Early health seeking behaviors – OTC, absenteeism

Ambulatory care visits / Nurse call lines

Tertiary Care, morbidity and mortality (traditional)

Initial detection

Subsequent detection, quantification, localization

Outbreak management, contact tracing, case confirm

Countermeasure admin, isolation, prophylaxis, Rx

Public Health Information Network - Setting

Early Event Detection
BioSense

Outbreak Management
Outbreak Management System

Connecting with Laboratory Systems
lab result reporting

Surveillance
NEDSS

Communications & Alerting
Epi-X
Health Alerting

Analysis & Interpretation
BioIntelligence
analytic technology

Information Dissemination & Knowledge Management
CDC Website

Countermeasure & Response Administration
isolation, vaccine, prophylaxis

Federal Health Architecture & Consolidated Health Informatics, NHII

Issues and Terminology

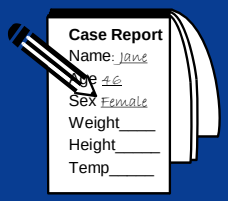
Reporting Methodology

1. “Traditional” public health reporting
2. Secondary use – “data mining”

Data Considerations

A. “Electronic reporting” data
B. “Syndromic” and early health seeking behavior data

Reporting Methodology: "Traditional" Public Health

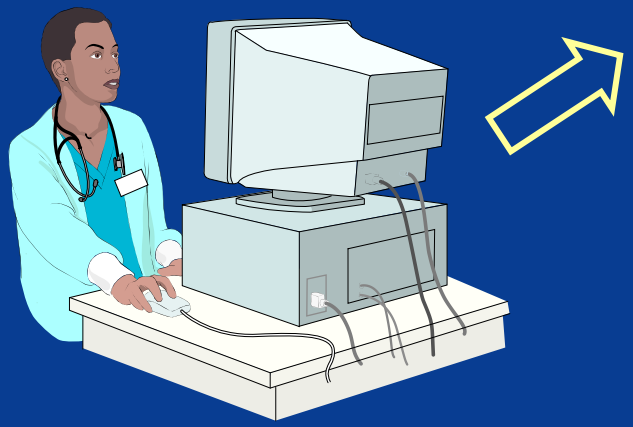


Public Health Case Reports

- "Case Report"
- Low capture rate
- Not timely
- Incomplete data about a report
- If data available in "real time" – only at one level of public health
- Can miss multi-jurisdictional issues
- Difficult to make fully electronic

Reporting Methodology: Secondary use data

Diagnoses and Procedures from Clinical Care Sites



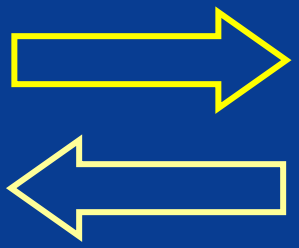
- No clinical reporting burden
- Greatly increased percentage of “cases” reported
- Data frequently available in multi-jurisdictional data stores
- Algorithms for best identifying data anomalies still being refined
- Needs for consistent infrastructure for authorized public health investigation

Secondary Use of Health Data

Use a bi-directional network for getting clinical data (rather than just data uploads)

Do not include patient names and medical record numbers in reported data. Enable appropriate public health investigation.

Reported data – no names or medical record numbers



Appropriate Public Health Investigation

Issues and Terminology

Data Considerations

A. Electronic reporting data
   1. Public health case reports
   2. Clinical care diagnoses and lab results

B. "Syndromic" and early health seeking behavior data
   1. Over the counter drug sales
   2. Chief complaints, clinical care procedures and lab requests
   3. Nurse call lines
   4. Absenteeism
   5. Etc.

“Electronic Reporting Data”

- Many data are accumulated in multi-jurisdictional data stores
  - difference in data flow
  - for either data flow – difficulties in interfaces
- Complement traditional reporting and physician as best bet “detector”
- Data types are not as early as some of the “Syndromic” and early health seeking behavior data
- Clearly useful for secondary detection, better reporting, quantification, localization, outbreak management

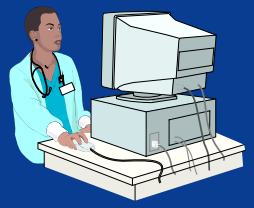
Other Data Sources

- Consider procedures such as “lab requests” as “electronic reporting data”
  - Lab requests connect to results
  - Requests may have early indicator value
- Free text chief complaints can be ICD coded
  - Limited investment to implement
- Rigorous evaluation of some “Syndromic” and early health seeking behavior data is needed

Reporting and Data Issues

Public Health Case Reports

- Manually submitted
- Notifiable disease case reports



Diagnosis and Procedures from Clinical Care Sites

- Clinical care diagnoses
- Clinical laboratory test results

Pre-Diagnostic Data

- Over the counter drug sales
- Nurse call line data
- Other possible early event data

Data Delivery – Draft

- Initial metropolitan area will be constructed from involved zip codes regions
- Process will be implemented for changing the metropolitan area delineation
- Reported “health indicator” and environmental data for a metropolitan area will be delivered to each of the local jurisdictions involved in that metropolitan area
- Some data, like lab results, may be addressed specifically to a local jurisdiction and may not go to other jurisdictions in that metropolitan area

Data Delivery - Draft

- States will have simultaneous access to state “health indicator” data and environmental results
- The CDC will have simultaneous access to national “health indicator” data and environmental results
- A process will be established so that changes in data access can be requested and approved by the relevant jurisdiction
  - Modification of metropolitan area delineation
  - Inclusion of adjacent component metropolitan area data into a state’s data

Early Event Detection Considerations

- Reported data should support more than initial detection over a common infrastructure
- Use PHIN standards for integration / data exchange with outbreak management and countermeasure administration systems
- Prioritize real-time delivery of health care data to public health (diagnostic and pre-diagnostic)
- Many pre-diagnostic data sources still need to be rigorously evaluated

Early Event Detection Considerations

- Consequence management is a major issue
- Support comparative analysis and interpretation by public health professionals
- Coordinate multiple data sources to facilitate signal evaluation, reduce false alarms and minimize end-user burden
- Let public health professionals control alerting and notifications
- Advance reporting but also query infrastructure for electronic investigation

Early Event Detection Considerations

- Reported data will not include patient names or medical record numbers – but allow for appropriate follow-up with source provider
- Data will be securely managed for public health use
- Build on standards and investments
  - Public Health Information Network (PHIN) and National Electronic Disease Surveillance System (NEDSS)
  - Both are fully aligned with the standards identified by CHI and the NCVHS
  - Will align with Federal Health Architecture as it develops

Plans for 2004 - 2005

- Establish test bed(s) to fully evaluate “syndromic” and early health seeking behavior data sources
- Use test beds for refining outbreak detection algorithms and visualization approaches
- Further infrastructure for, and provisioning of, substantiated electronic reporting data
- Implement standards for data exchange for all levels of public health
- Advance consistent application of approaches that ensure confidentiality

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