The ‘Surveillance’ Challenge

With Paper-based System
- Lack of Communication
- Unchecked Disease
- Delayed Action

With Health Care IT
- Bridge the Gap

Pharmacies
- EDs
- Providers
- Labs

State Administrators
Public Health
CDC
Physicians
Consumers

Innovation You Can Trust
Collaborative project: Kansas City, Mo. Health Department (KCHD), State of Missouri, State of Kansas, Local healthcare organizations/Cerner clients, and Cerner

GOAL: Improve timeliness, completeness and accuracy of reportable disease information received by KCHD

Consists of:
- Auto collection of Demographics, Lab Requests, and Lab Results from 22 hospitals and reference labs
- Expert System Alerts and reports provided to Depts of Health and Participating Lab
  - Detailed reports, graphs, integrated with Geo Info System
22 organizations in KC
659 days of data (Mar. 25-Jan.13)
3,409,391 total encounters
1,380,667 total persons
721,323 final isolates found
12,276 reportable isolates found
**Innovation You Can Trust**

**DATA COMPLETENESS**

Reportable cases (non-STD): March-Sept 2002

*Average over 6 key data fields*

**TIMELINESS**

*Average over all reportables*

*Increased overall reporting by 96%*
Multijurisdictional Approach to Biosurveillance, Kansas City

Mark A. Hoffman,* Tiffany H. Wilkinson,† Aaron Bush,* Wayne Myers,* Ron G. Griffin,†
Gerald L. Hoff,† and Rex Archer†

An electronic reporting system for a network of 22 laboratories was implemented in Kansas City, Missouri, with an independent organization acting as a data clearinghouse between the reporting laboratories and public health departments. The system ran in tandem with conventional reporting methods. Laboratory test orders and results were aggregated and mapped to a common nomenclature. Reports were delivered through a secure Internet connection to the Kansas City Health Department (KCHD); during the first 200 days of operation, 359 qualified results were delivered electronically to KCHD. Data were received more quickly than they were with conventional reporting methods: notification of chlamydia cases arrived 2 days earlier, invasive group A streptococcal disease cases arrived 2.3 days sooner, and salmonellosis cases arrived 2.7 days sooner. Data were more complete for all demographic fields, including address, age, sex, race, and date of birth. Two hundred fourteen cases reported electronically were not received by conventional means.

(4). Underreporting is a major concern with traditional disease surveillance strategies (5); even cases of severe diseases sometimes go unreported (6). In addition, substantial variability exists in the completeness of the information sent to public health; initial reports often include only the test result and the patient name. They lack demographic details that are useful to public health officials, requiring them to perform followup calls to get the additional information (7). These delays and inconsistencies may impair the ability of public health officials to detect or respond to a bioterrorist event. One solution to these deficiencies is to use an electronic system to report disease to public health authorities.

Three approaches to electronic disease reporting are feasible. The first approach (Figure 1A) requires each healthcare provider to standardize clinical results (i.e., by using the Systematized Nomenclature of Medicine
HealthSentry complies with HIPAA Privacy and Security policies and procedures

- HIPAA explicitly exempts use of identifiable information for Public Health purposes

- Data encrypted at provider site

- Data securely transferred to Cerner via SSH

- Data “blinded” at point of entry, allowing view of aggregate data

- Data encrypted the entire time at Cerner
### Monthly Orders by Facility Report

**Year Selected:** 2002  
**Months Selected:** Apr, Aug, Jul, Jun, May  
**Order Selected:** Blood Culture

<table>
<thead>
<tr>
<th>Month</th>
<th>Isolate Category</th>
<th>Result Type Desc</th>
<th>Distinct Encounters w/ Isolate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mar</td>
<td>Chlamydia trach.</td>
<td>Final Reports</td>
<td>9</td>
</tr>
<tr>
<td>Mar</td>
<td>Giardia</td>
<td>Final Reports</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Final Reports</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Final Reports</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Final Reports</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Final Reports</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Final Reports</td>
<td>13</td>
</tr>
</tbody>
</table>

### Daily Isolate Report

**Result Type Selected:** Final Reports  
**Months Slected:** Sep

**Isolate Category(s) Selected:** Giardia, Hepatitis C, N. meningitidis

<table>
<thead>
<tr>
<th>Completed Dt</th>
<th>Isolate Category</th>
<th>Distinct Encounters w/ Isolate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sep 01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sep 02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sep 03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sep 04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sep 05</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Geographic Information System

- Zoom in/out
- Drop down menu to select pathogen
- Control aggregation layers
- Display ZIP code demographics
State of Kansas Status

Risks to Kansas citizens without the benefits of HealthSentry™

- Reliance on manual reporting and data entry can take valuable resources away from other communicable disease response or prevention activities.
- Less timely and incomplete reports can lead to delayed detection of outbreaks or potential bioterrorism events.
- Unreported or delayed reporting of disease can lead to increased risk for further spread and subsequent outbreaks.
- Without automated alerts, disease reporting of critical or significant events relies solely on manual processes.
State of Kansas Benefits

- Increase health and safety of patients and area residents
- Better view into the health of the community
- Auto alerting of critical pathogens
- Pathogen prevalence and trend analysis
- Automated collection and preparation of required reports to Public Health
  - Enable regulatory compliance
  - Drive-out costs
- Positive public relations, part of “Network”
Future Directions

- Antibiotic resistance profiling – rolling out currently
- Symptom / syndrome information – alpha underway
- Medication orders (inpatient, OTC)
- Alerts/Information delivered to members of community - consumers
- Veterinary data/tracking
- Non-clinical data sources
  - Sensors
  - Water
HealthSentry’s Community Antibiogram

- Current data on the antibiotic resistance in a community enables appropriate antibiotic prescribing
  - Cost Savings
  - Improved Patient Care
- Detects changes in susceptibility of an organism population over time
  - Acts as a first alert to emerging resistance patterns
- Serves as a centralized repository for epidemiological research and further analyses of the data
First contact ED data
- Earlier detection, Earlier Intervention

Many implemented system to collect data after 9/11 - Web and other manual collection methods experienced declining participation in months following implementation

The KEY is AUTOMATED data collection
- Through ED clinical system
- Through an EMR