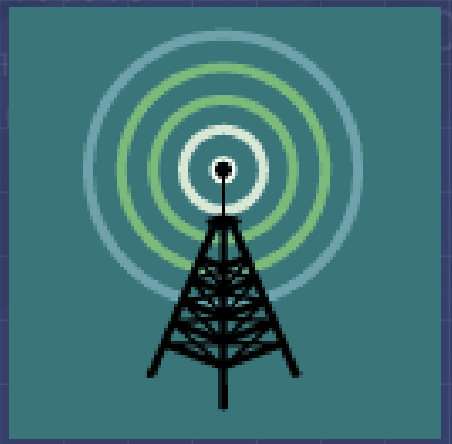
CERNER®

Presentation for

Kansas House Health and Human Services Committee

January 21, 2004



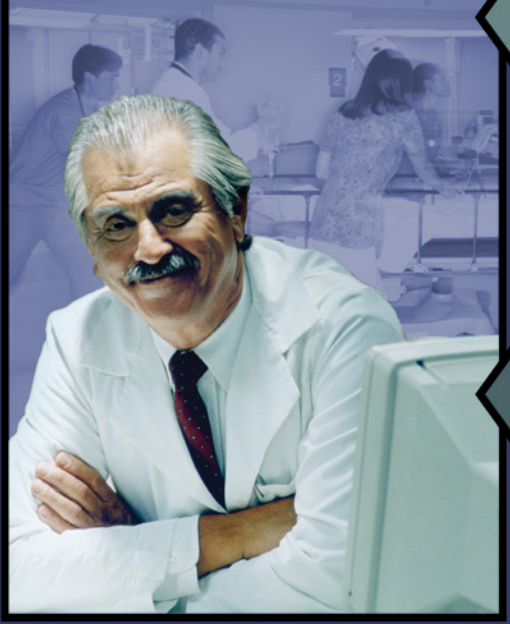
The ‘Surveillance’ Challenge

Pharmacies

EDs

Providers

Labs



With Paper-based System

Lack of Communication

Delayed Action

Unchecked Disease

With Health Care IT

Bridge the Gap

State Administrators

Public Health

CDC

Physicians

Consumers

HealthSentry – Implementation

- **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**

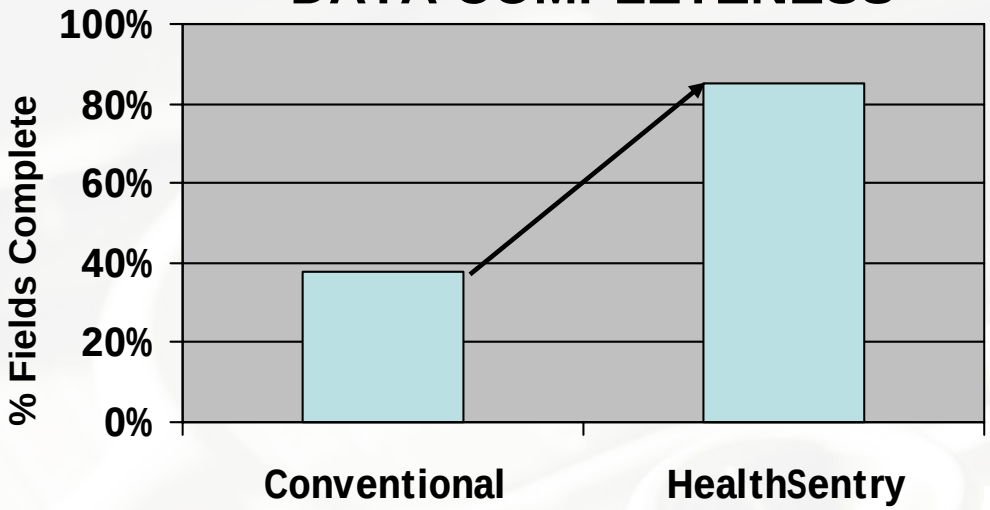
- **Consists of:**
  - Auto collection of Demographics, Lab Requests, and Lab Results from 22 hospitals and reference labs
  - Expert System Alerts and reports provided to Depts of Health and Participating Lab
    - *Detailed reports, graphs, integrated with Geo Info System*

HealthSentry – Statistics

- 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

HealthSentry – Proven Results

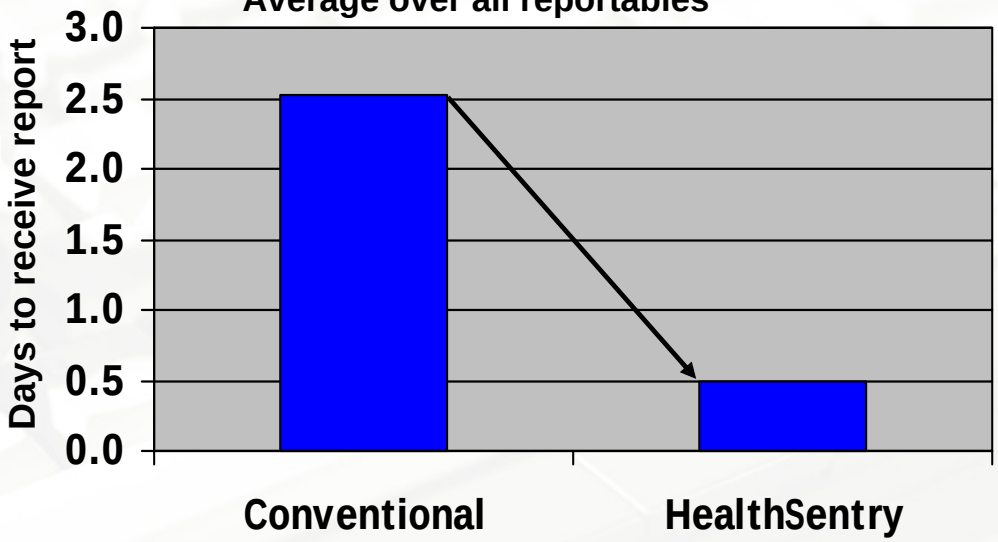
DATA COMPLETENESS



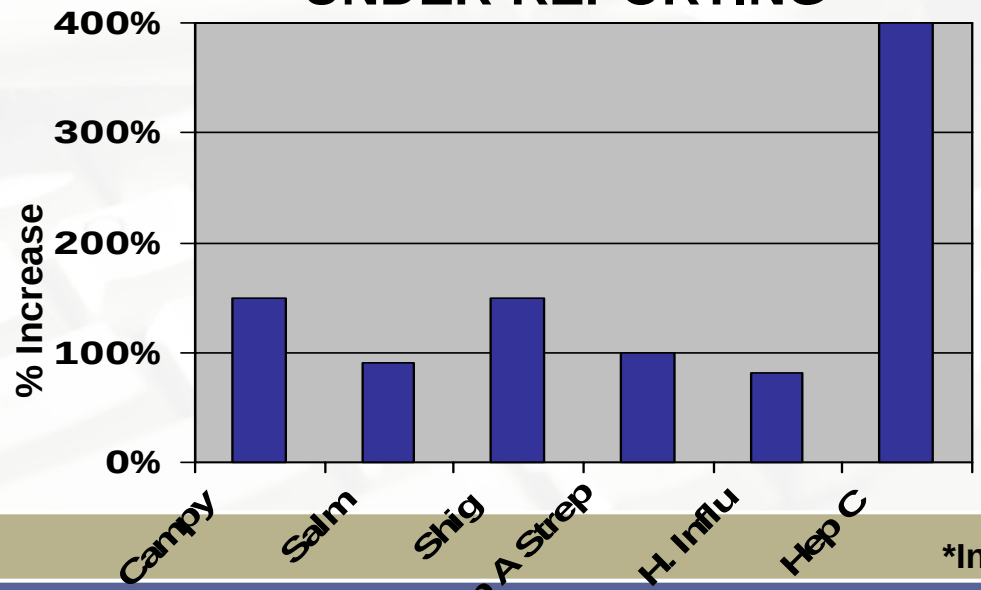
Reportable cases (non-STD): March-Sept 2002
*Average over 6 key data fields

TIMELINESS

*Average over all reportables



UNDER-REPORTING



*Increased overall reporting by 96%

EMERGING INFECTIOUS DISEASES
A Peer-Reviewed Journal Tracking and Analyzing Disease Trends

RESEARCH

Multijurisdictional Approach to Biosurveillance, Kansas City

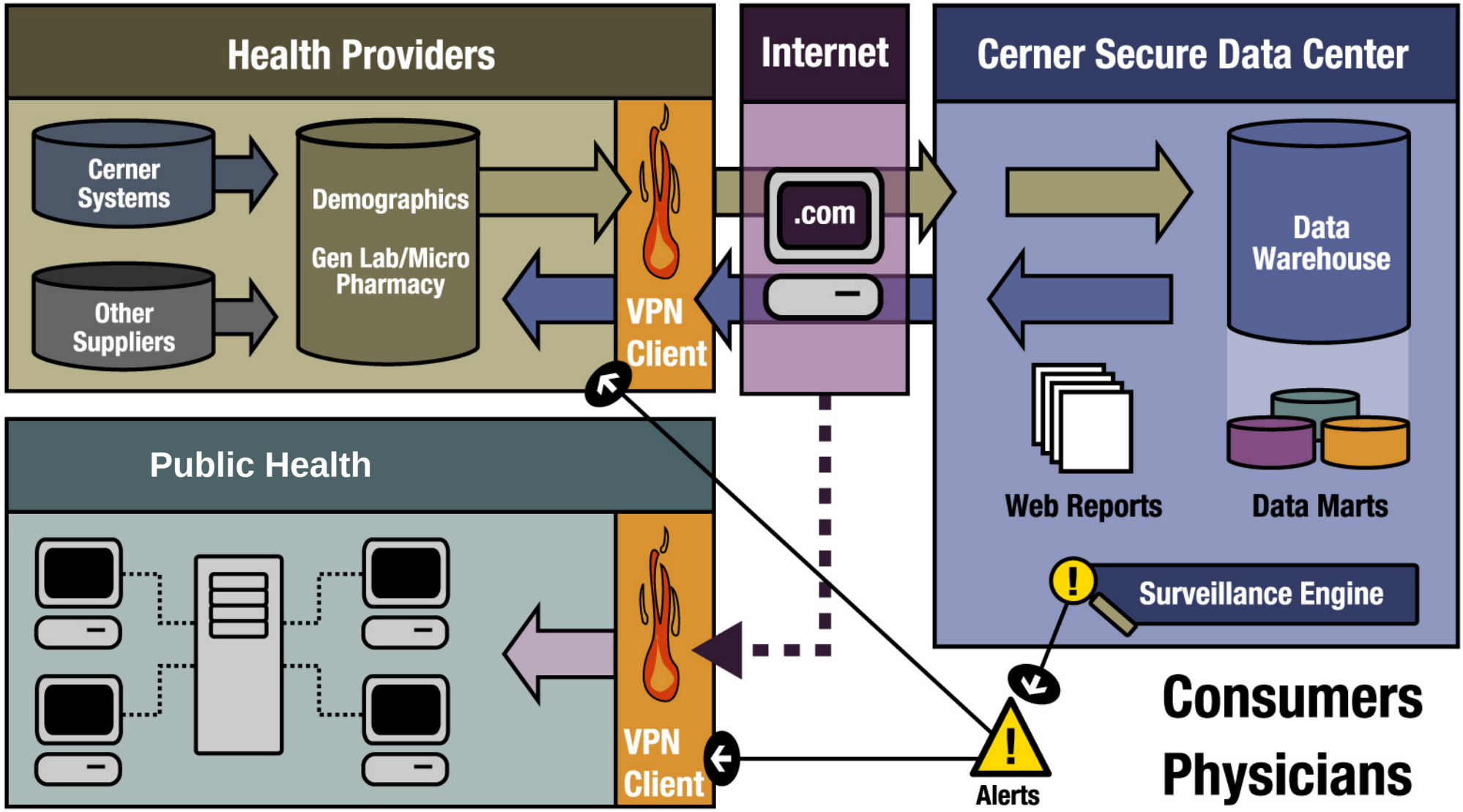
Mark A. Hoffman,* Tiffany H. Wilkinson,† Aaron Bush,* Wayne Myers,* Ron G. Griffin,† Gerald L. Hoff,† and Rex Archer†

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

Leveraging Existing Architecture



Privacy and Security

- **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**

Actual KC Reports

Isolate Overview

HealthSentry

Drill

Final Reports | Positive Isolate - High Confidence | 2002

Completed Month	Isolate Category	Result Type Desc	Distinct Encounters w/ Isolate
Mar	Chlamydia trach.	Final Reports	9
Mar	Giardia	Final Reports	1
		Final Reports	10
		Final Reports	1
		Final Reports	2
		Final Reports	1
		Final Reports	13

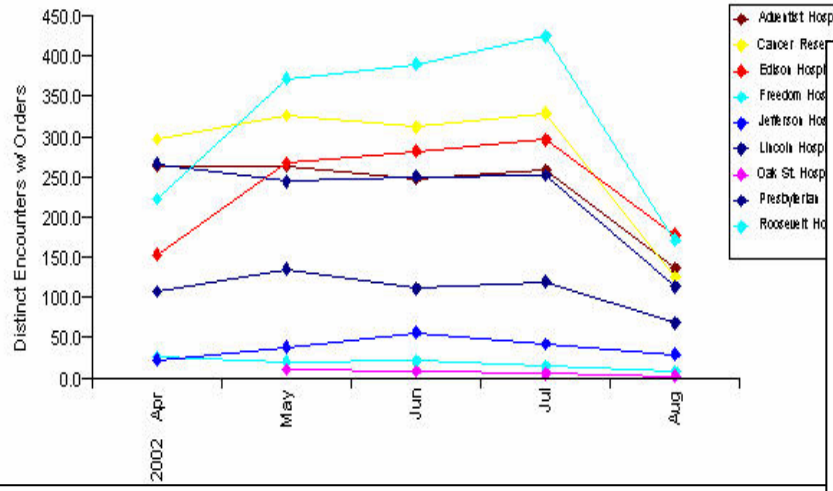
Monthly Orders by Facility Report

HealthSentry

Year Selected:2002

Months Selected: Apr; Aug; Jul; Jun; May

Order Selected:Blood Culture



Daily Isolate Report

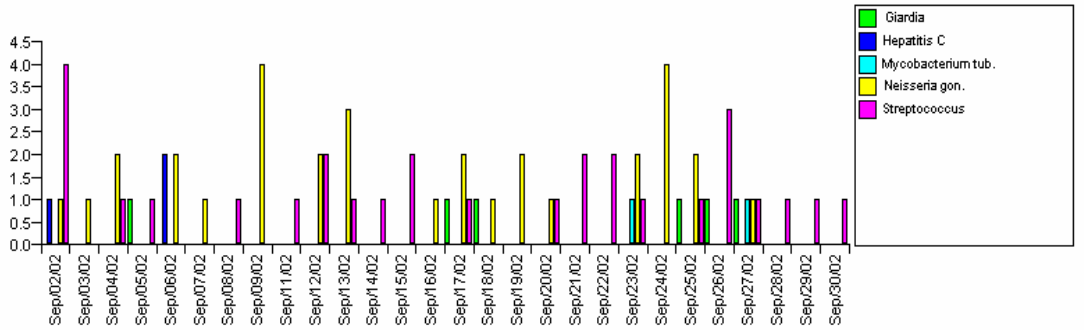
HealthSentry

Result Type Selected: Final Reports

Months Selected:Sep

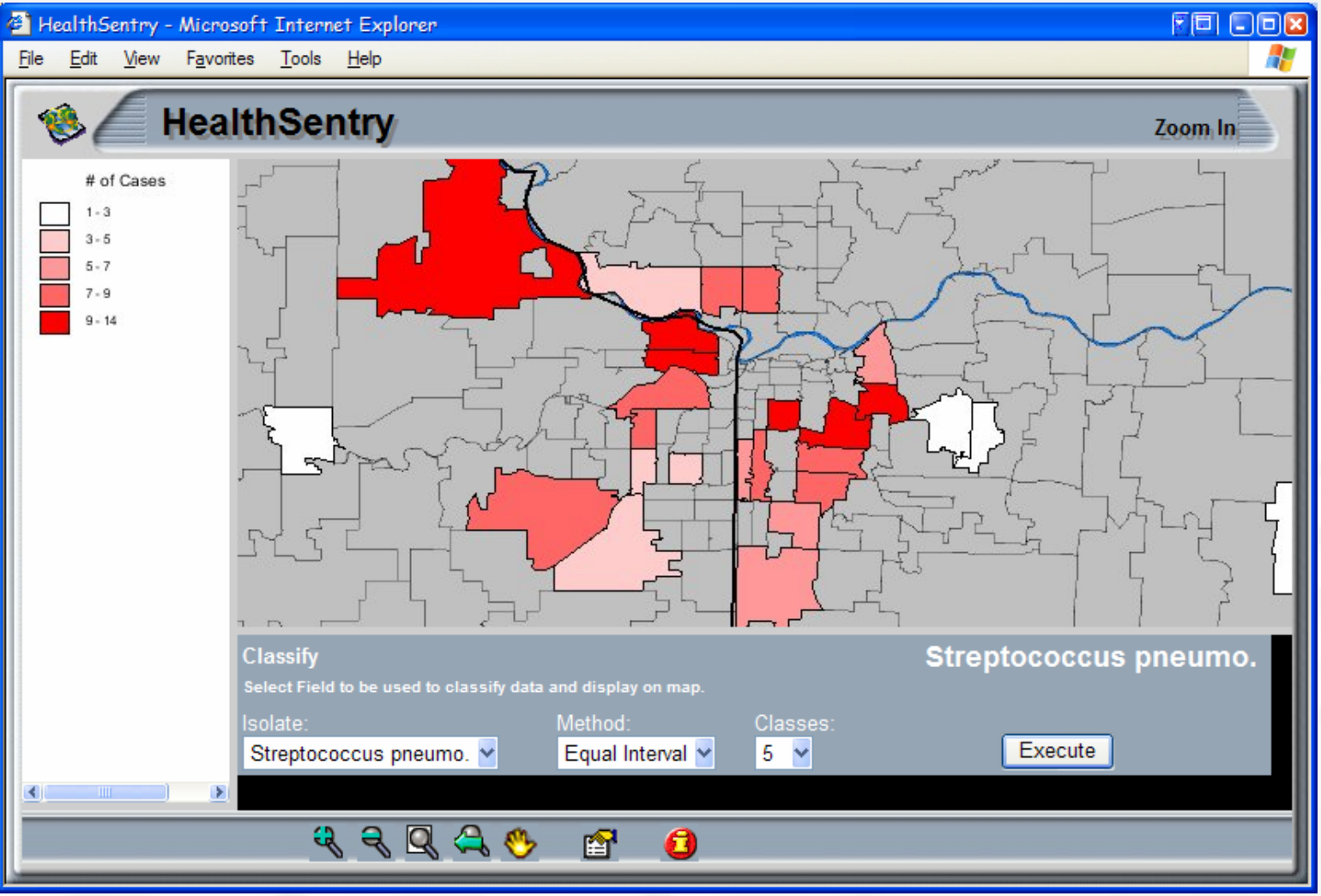
All Results:Positive Isolate - High Confidence

Isolate Category(s) Selected: Giardia; Hepatitis C; Mycobacterium tub.; Neisseria gon.; Streptococcus



Completed Dt	Isolate Category	Distinct Encounters w/ Isolate
Sep/02/02	Hepatitis C	1
Sep/02/02	Neisseria gon.	1
Sep/02/02	Streptococcus	4
Sep/03/02	Neisseria gon.	1
Sep/04/02	Neisseria gon.	2

Geographic Information System



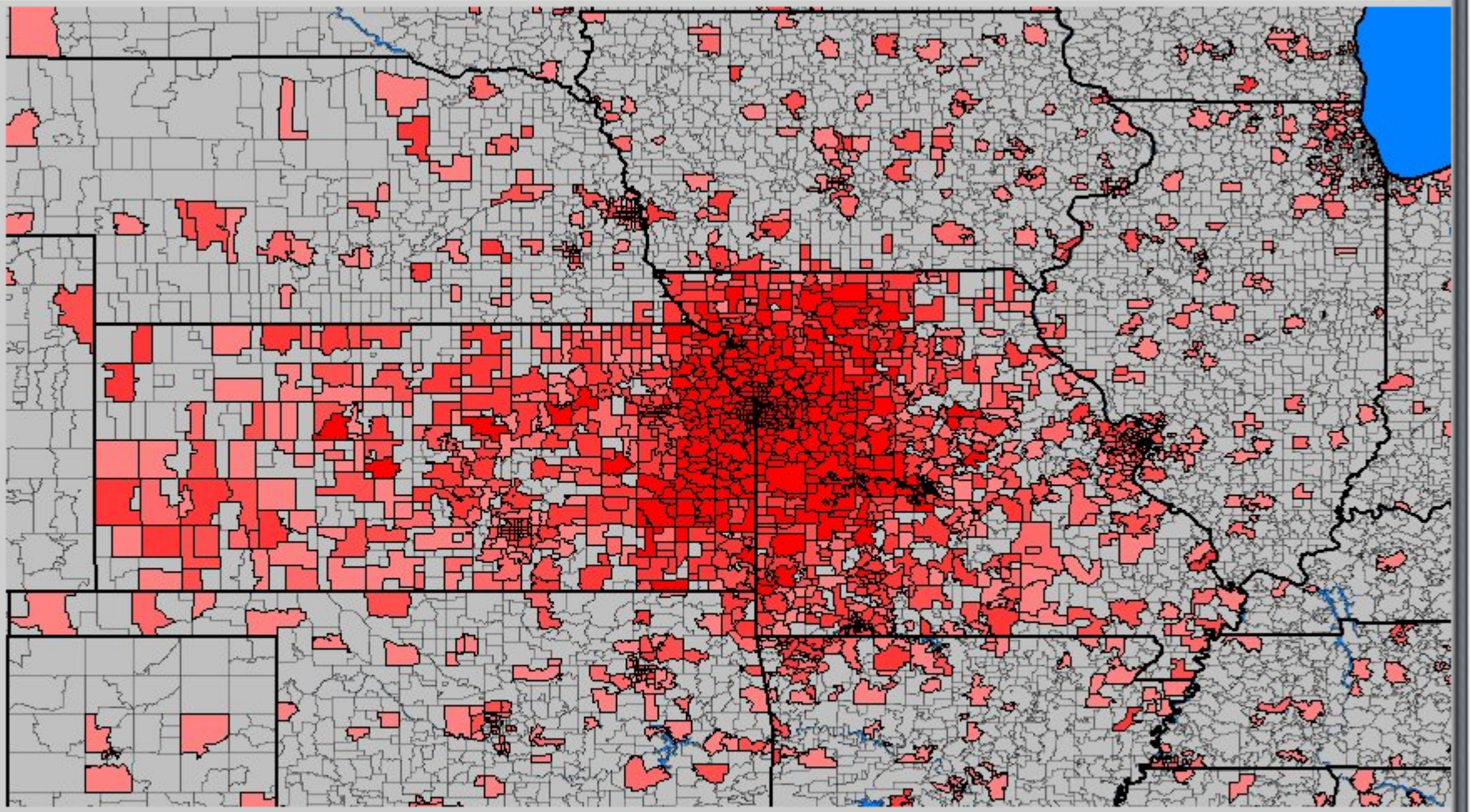
- Zoom in/out
- Drop down menu to select pathogen
- Control aggregation layers
- Display ZIP code demographics

HealthSentry - Microsoft Internet Explorer provided by Cerner Corporation

File Edit View Favorites Tools Help

HealthSentry

Zoom In



Classify

Aggregate

Select Field to be used to classify data and display on map.

Organization: Aggregate

Method: Quantile

Classes: 5

Execute

Map: -87 , 35 -- Image: 816 , 466 -- ScaleFactor: 0.01876897021009445

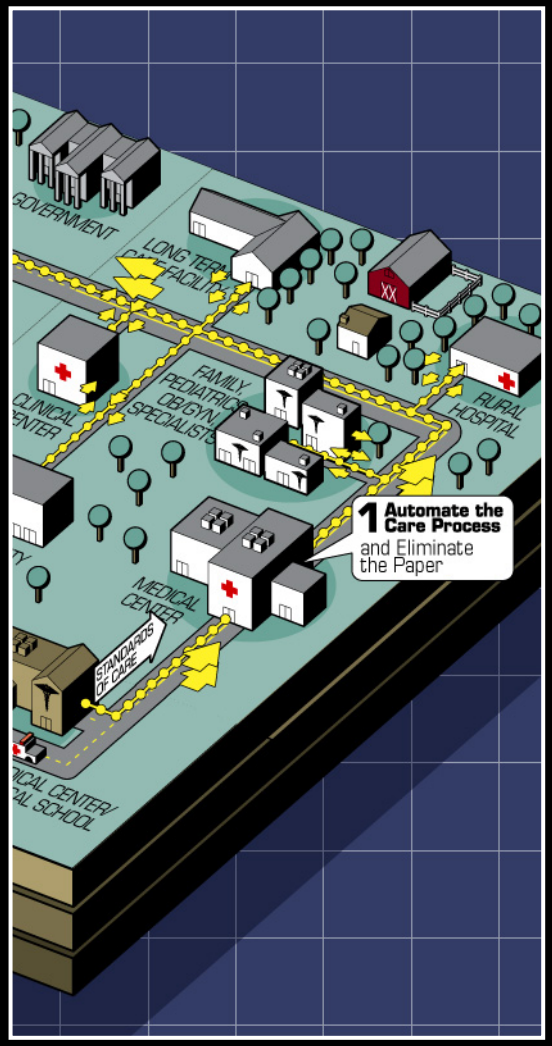
Local intranet

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



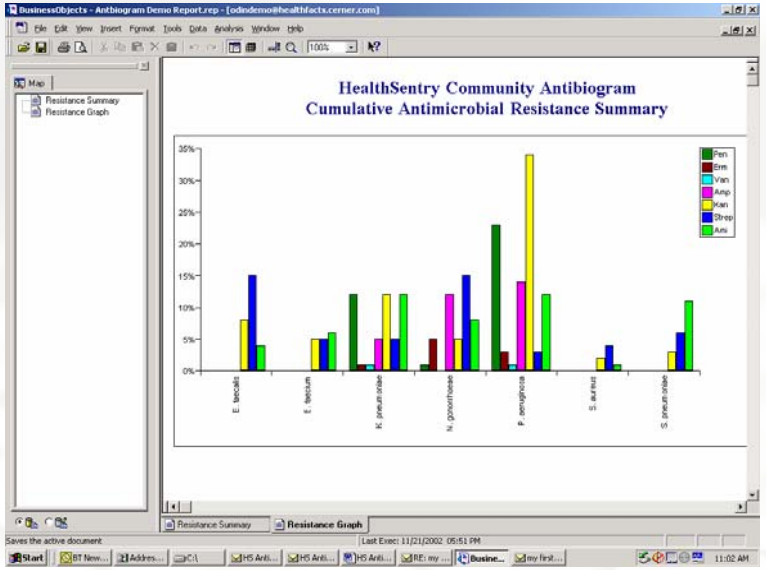
- **Increase health and safety of patients and area residents**
- **Better view into the health of the community**
- **Auto alerting of critical pathogens**
- **Pathogen prevalence and trend analysis**
- **Automated collection and preparation of required reports to Public Health**
  - Enable regulatory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

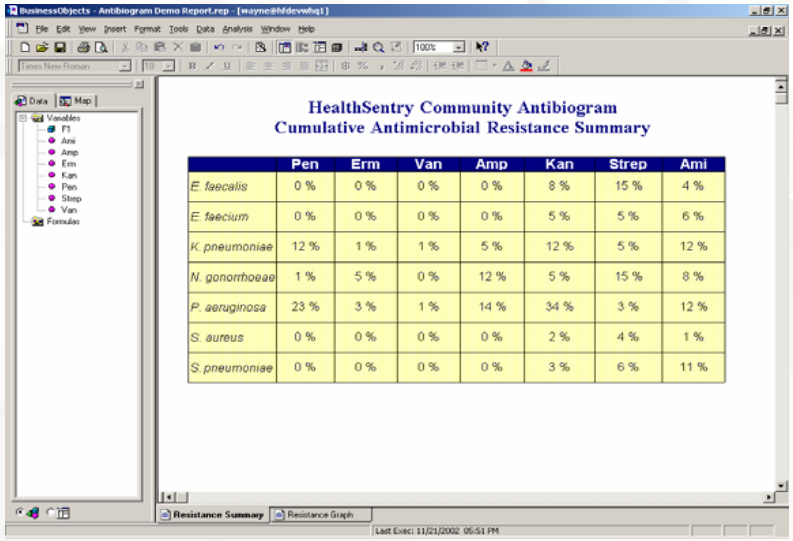
Future Directions

- **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





	Pen	Erm	Van	Amp	Kan	Strep	Ami
E. faecalis	0 %	0 %	0 %	0 %	8 %	15 %	4 %
E. faecium	0 %	0 %	0 %	0 %	5 %	5 %	6 %
K. pneumoniae	12 %	1 %	1 %	5 %	12 %	5 %	12 %
N. gonorrhoeae	1 %	5 %	0 %	12 %	5 %	15 %	8 %
P. aeruginosa	23 %	3 %	1 %	14 %	34 %	3 %	12 %
S. aureus	0 %	0 %	0 %	0 %	2 %	4 %	1 %
S.pneumoniae	0 %	0 %	0 %	0 %	3 %	6 %	11 %

FirstSentry: Symptom Surveillance

- 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