



Exchange of Health Information Between Public Health and Clinical Care

The vision, challenges and benefits

*Dr. Leslie Lenert, Director, National Center for
Public Health Informatics*



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National Center for Public Health Informatics

MISSION

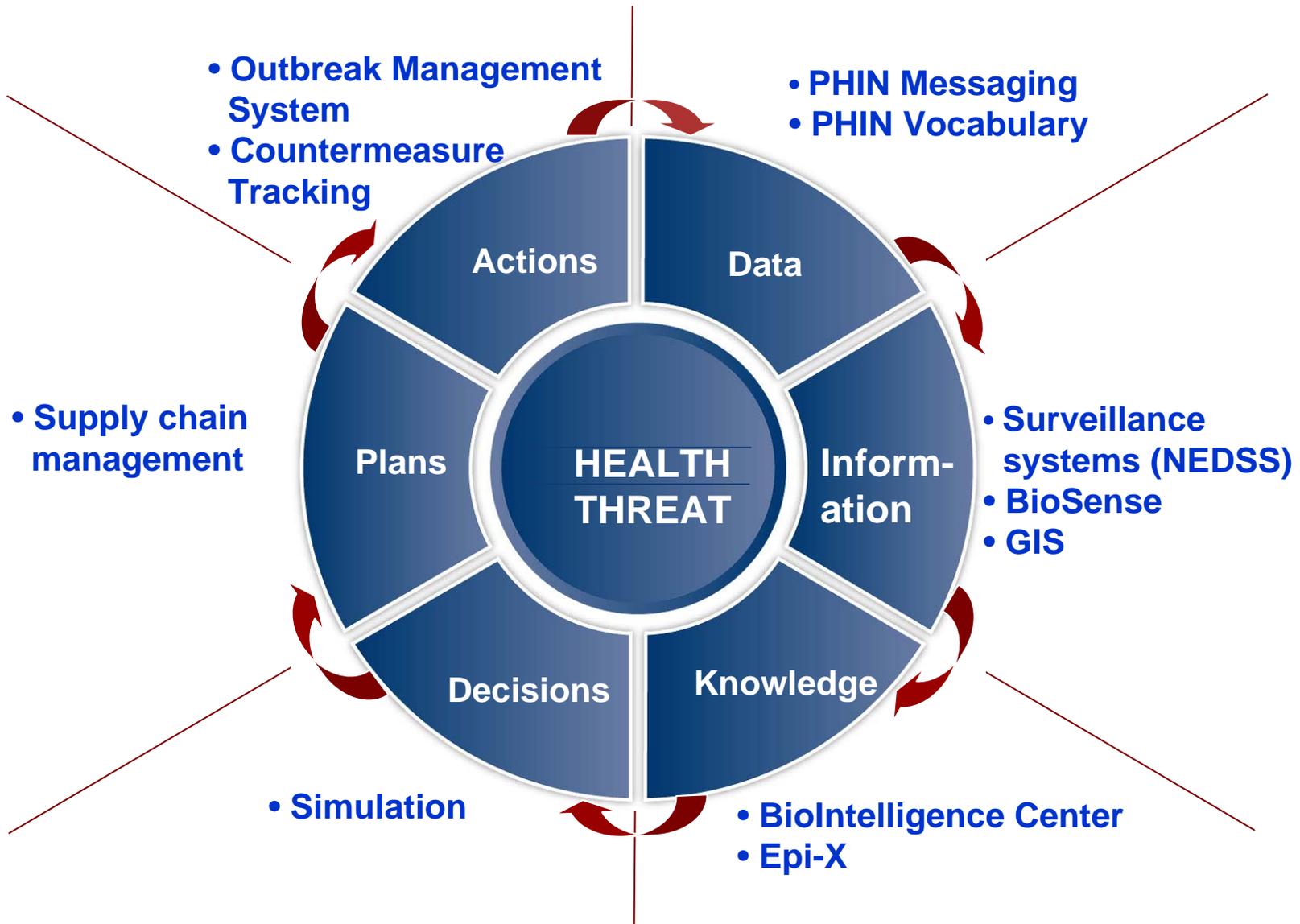
“Protecting public’s health, promoting health equity, and transforming the health system through advancement of the science of biomedical informatics as it applies to public health practice.”



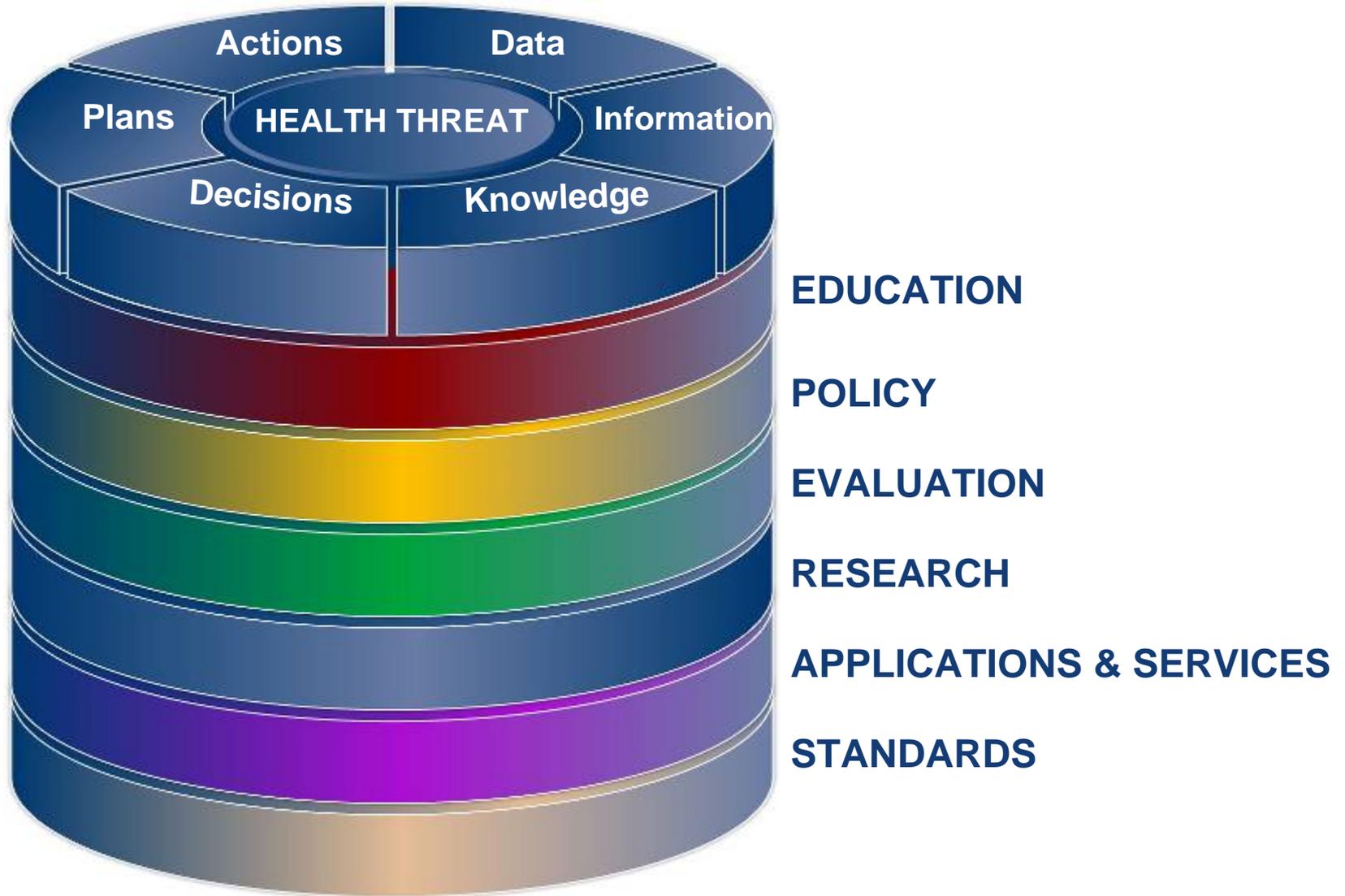
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Model Formulation: Health Protection Framework



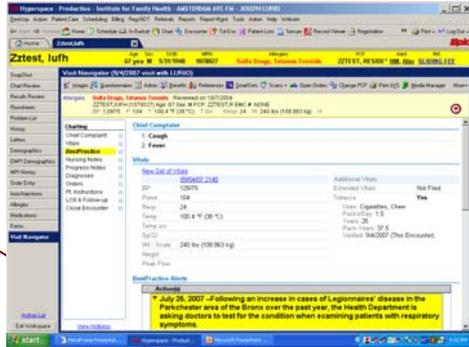
Health Protection Framework Foundation



Integrated Systems of Systems

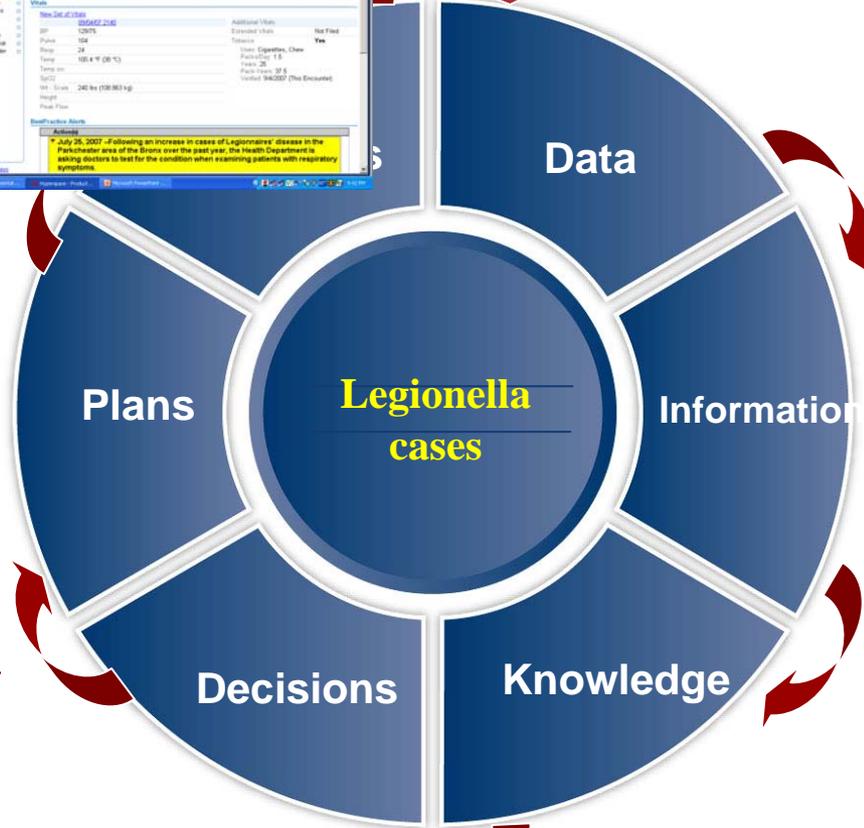


Practice Alert in EHR prompts changes in physicians' behaviors



Index case of Legionella reported

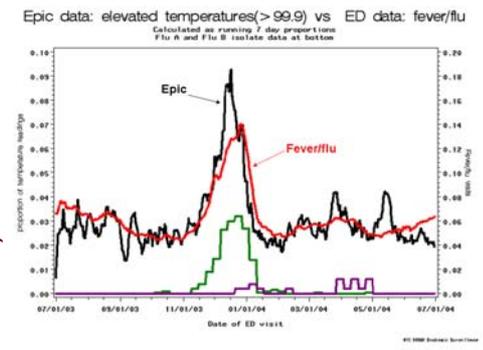
Surveillance system @ NYC Department of Health detect cases of Legionella in Parkchester community in Bronx



Alert is embedded into Electronic Health Records (EHR)

NYCDOH issues alert on Legionella Outbreak

NYCDOH decides there is a Legionella Outbreak



Action: Influencing Health Provider Behavior



Epic Hyperspace - Production - Institute for Family Health - AMSTERDAM AVE-FM - JOSEPH LURIO

Desktop Action Patient Care Scheduling Billing Reg/ADT Referrals Reports Report Mgmt Tools Admin Help Website

Back Forward Home Schedule In Basket Chart Encounter Tel Enc Patient Lists Secure Record Viewer Registration Print Log Out

Home Zztest,lufh

Zztest, lufh Age: 67 yea Sex: M DOB: 5/31/1940 MRN: 1078027 Allergies: Sulfa Drugs, Tetanus Toxoids PCP: ZZTEST, RESIDE* Alert: HM, Aler INS: SLIDING FEE

Snapshot Visit Navigator (9/4/2007 visit with LURIO)

Chart Review Images Questionnaires Admin Benefits References SmartSets Scans Open Orders Change PCP Print AVS Media Manager More

Results Review Allergies **Sulfa Drugs, Tetanus Toxoids** Reviewed on 10/7/2004
ZZTEST,IUFH (1078027) Age: 67 Sex: M PCP: ZZTEST,R EMC #: NONE
BP: 129/75 P: 104 T: 100.4 °F (38 °C) T Src: Resp: 24 W: 240 lbs (108.863 kg) H:

Flowsheets

Problem List

History

Letters

Demographics

EMPI Demographics

MPI History

Order Entry

Imm/Injections

Allergies

Medications

Forms

Visit Navigator

Hotkey List

Exit Workspace View Hotkeys

Charting

- Chief Complaint
- Vitals
- BestPractice**
- Nursing Notes
- Progress Notes
- Diagnoses
- Orders
- Pt. Instructions
- LOS & Follow-up
- Close Encounter

Chief Complaint

1. Cough
2. Fever

Vitals

New Set of Vitals

BP	129/75	Additional Vitals	
Pulse	104	Extended Vitals	Not Filed
Resp	24	Tobacco	Yes
Temp	100.4 °F (38 °C)	Uses: Cigarettes, Chew	
Temp src		Packs/Day: 1.5	
SpO2		Years: 25	
Wt - Scale	240 lbs (108.863 kg)	Pack-Years: 37.5	
Height		Verified: 9/4/2007 (This Encounter)	
Peak Flow			

BestPractice Alerts

Action(s)

July 25, 2007 –Following an increase in cases of Legionnaires' disease in the Parkchester area of the Bronx over the past year, the Health Department is asking doctors to test for the condition when examining patients with respiratory symptoms.

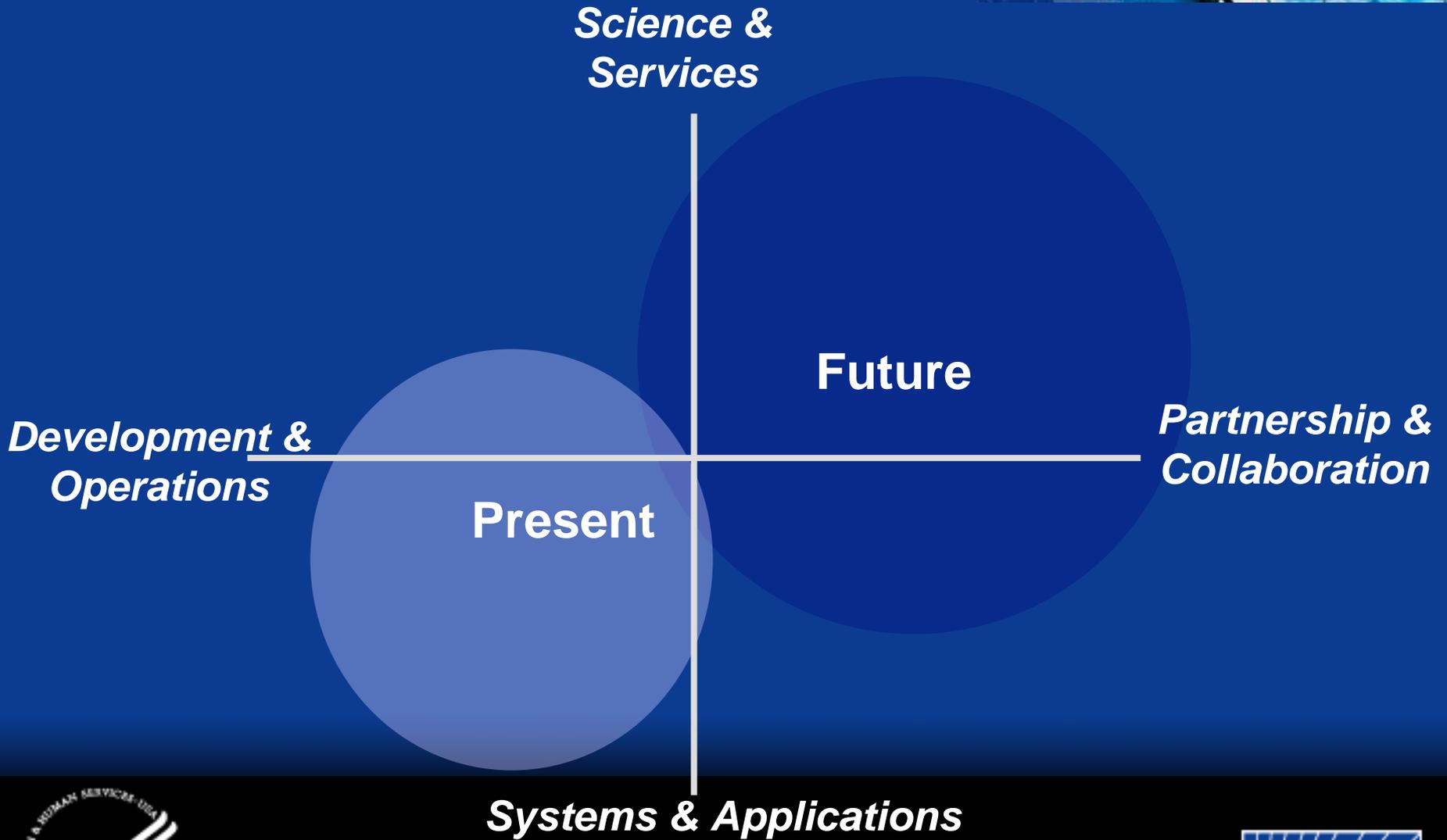
start MetaFrame Presentat... Epic Hyperspace - Product... Microsoft PowerPoint ... 68° 9:42 PM



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Moving Forward



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BioSense and NEDSS



- ❑ BioSense is a national program intended to improve the nation's capabilities for conducting near real-time biosurveillance, enabling health situational awareness through access to existing data from healthcare organizations across the country.
- ❑ NEDSS (National Electronic Disease Surveillance System) is an Internet-based infrastructure for public health surveillance data exchange that uses specific Data Standards for notifiable disease reporting.

The richness of data from the BioSense feed includes laboratory test results, which may be required for notifiable reporting in a health jurisdiction



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Unique capabilities of BioSense



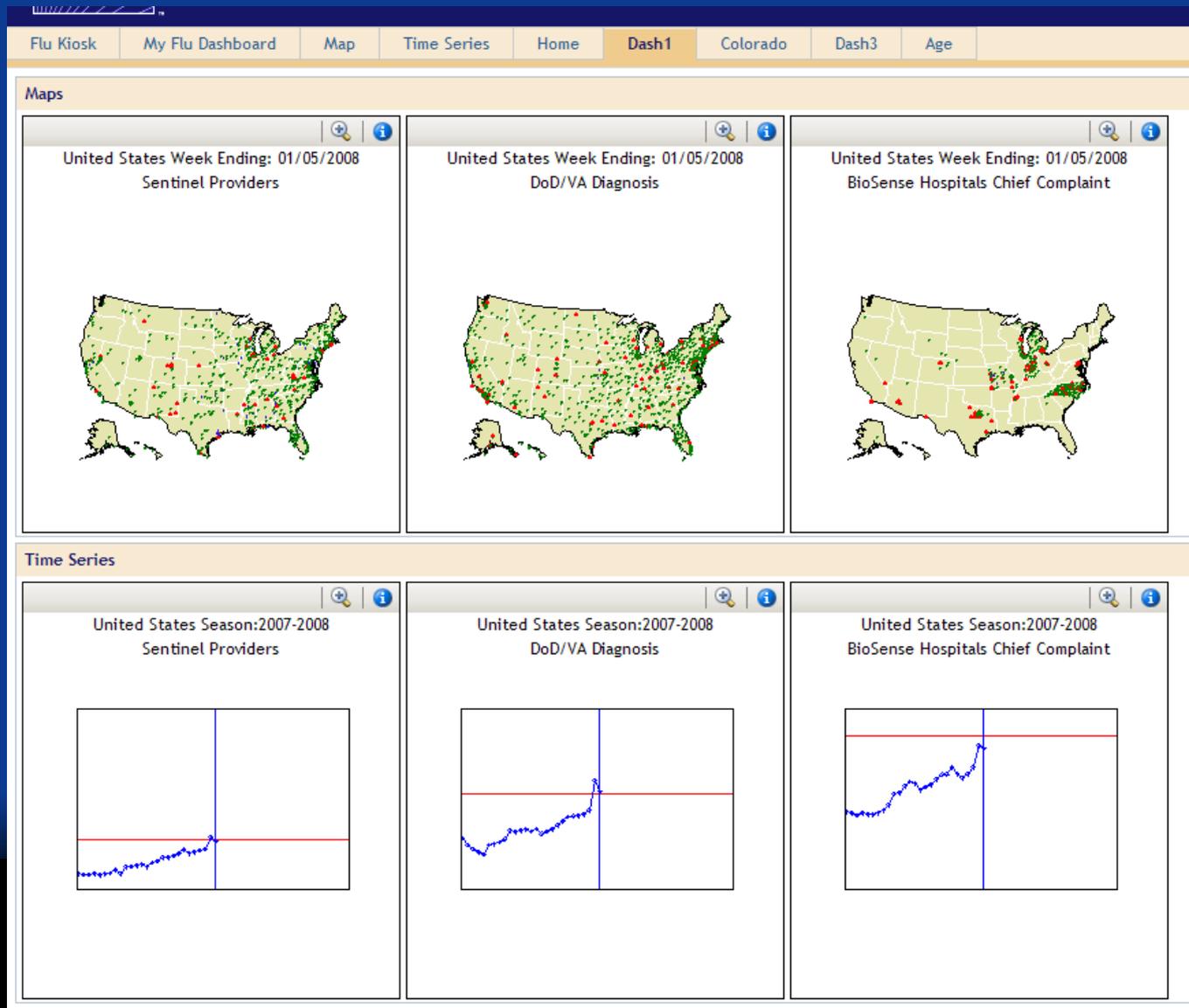
- Interoperability
- Capacity for secure large scale data management
- Custom tailoring of queries
- Integrated electronic laboratory reporting
- Individual level identifier
- Regional Health Information Exchange Testbed



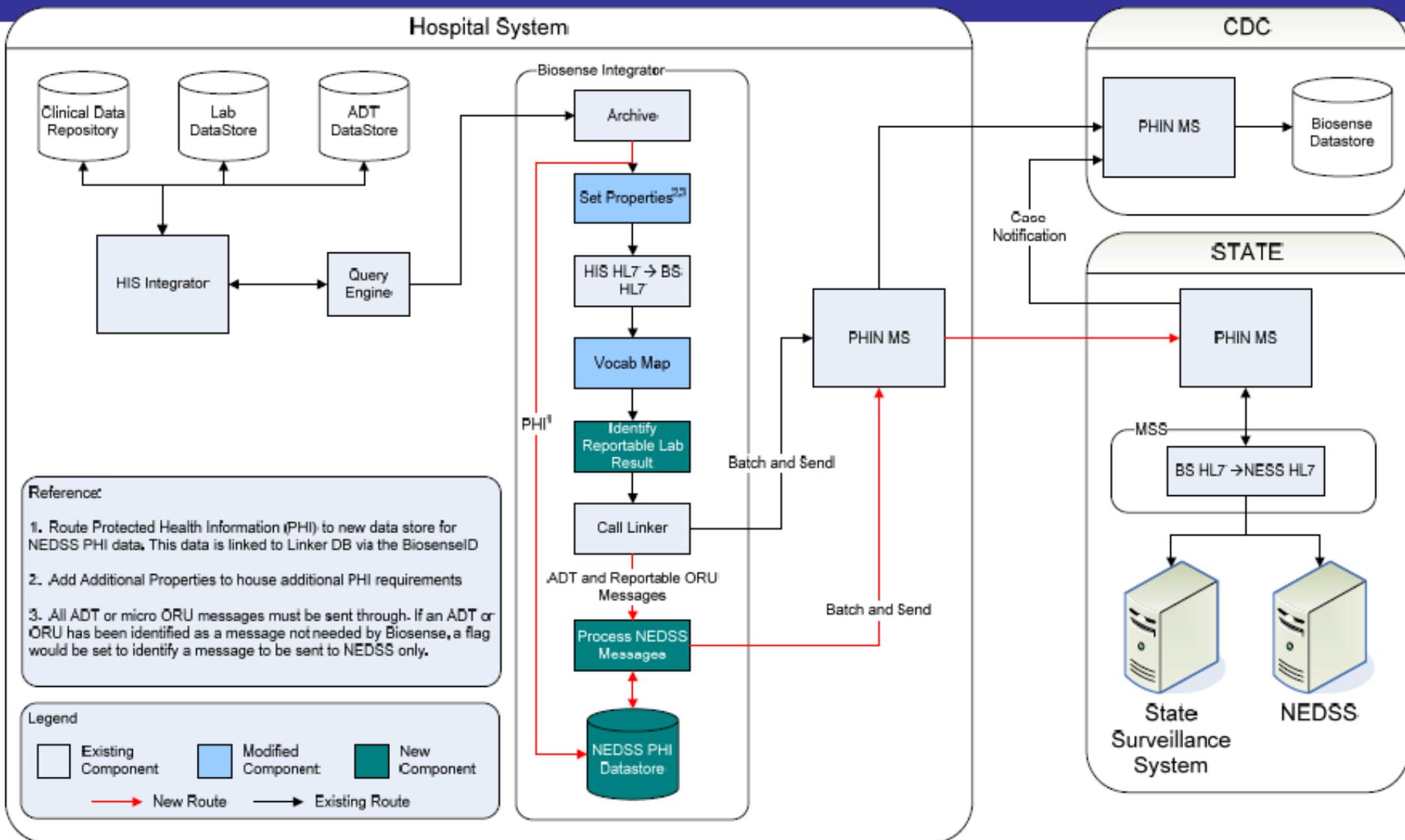
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Biosense Influenza Tool Merges Multiple Sources



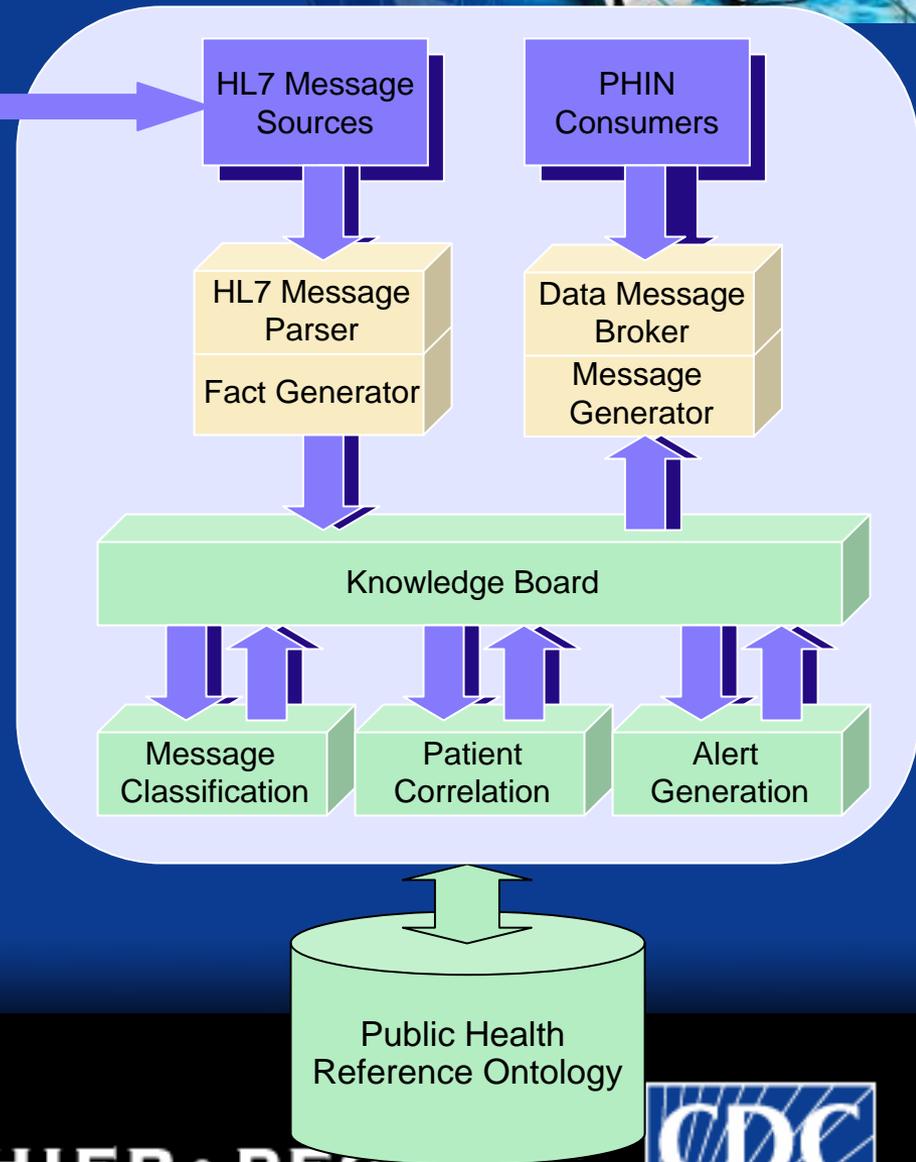
Combining BioSense and NEDSS



BioSense Case Recognition

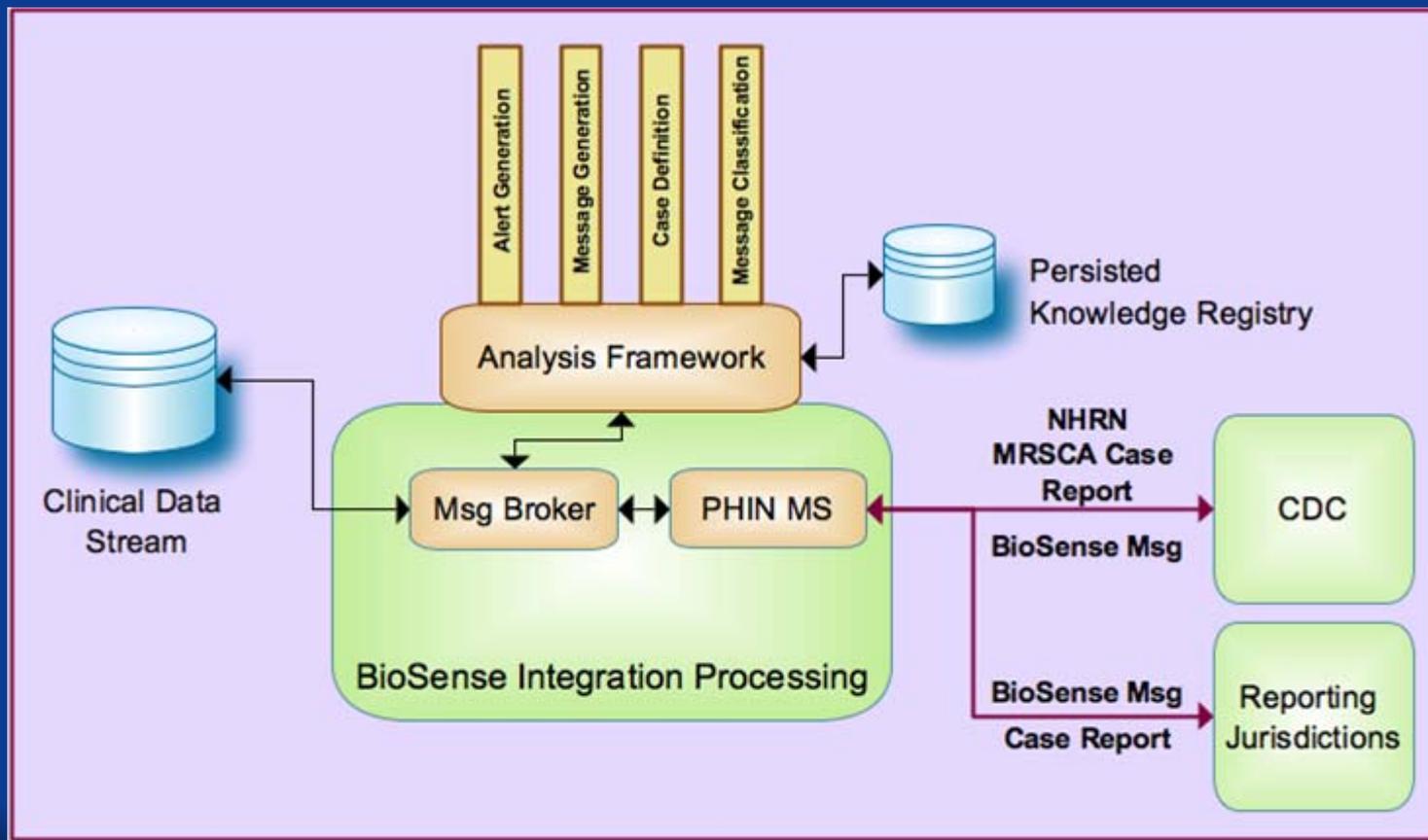
HL7 2.5 Source Message

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
<!-- edited with XMLSpy v2007 sp2 (http://www.altova.com) by Ce... -->
- <ORU_R01>
+ <MSH>
- <ORU_R01.PATIENT_RESULT>
+ <ORU_R01.PATIENT>
- <ORU_R01.ORDER_OBSERVATION>
- <OBR>
+ <OBR.1>1</OBR.1>
+ <OBR.2>
+ <OBR.3>
- <OBR.4>
+ <CE.4>CSF protein</CE.4>
+ <CE.5>CSF protein</CE.5>
</OBR.4>
+ <OBR.7>
+ <OBR.8>
+ <OBR.14>
- <OBR.15>
- <SPS.1>
+ <CWE.4>Spinal Fluid</CWE.4>
</SPS.1>
</OBR.15>
+ <OBR.22>
+ <OBR.24>LA</OBR.24>
+ <OBR.25>F</OBR.25>
</OBR>
- <ORU_R01.OBSERVATION>
- <OBX>
+ <OBX.1>1</OBX.1>
+ <OBX.2>NM</OBX.2>
- <OBX.3>
+ <CE.1 />
+ <CE.2>CSF protein conc</CE.2>
+ <CE.5>CSF protein mg%</CE.5>
</OBX.3>
+ <OBX.4>34</OBX.4>
- <OBX.5>
+ <NM.1>34</NM.1>
</OBX.5>
- <OBX.6>
+ <CE.1>mg/dL</CE.1>
</OBX.6>
```



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Moving Forward



- ❑ Public health integration into the NHIN
- ❑ Communities of practice
- ❑ Open source initiative
- ❑ Centers of Excellence
- ❑ Workforce training in informatics
- ❑ Service Oriented Architecture for the CDC
 - Vocabulary, GIS, simulation, etc.



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NCPHI and the NHIN



- ❑ President's Mandate - 2004
 - By 2014 - Widespread Electronic Health Records (EHRs)
- ❑ Office of the National Coordinator for Health Information Technology (ONC)
- ❑ American Health Information Community (AHIC)
 - Healthcare IT Standards Panel (HITSP)
 - Certification Commission for Healthcare Information Technology (CCHIT)
 - NHIN Prototypes

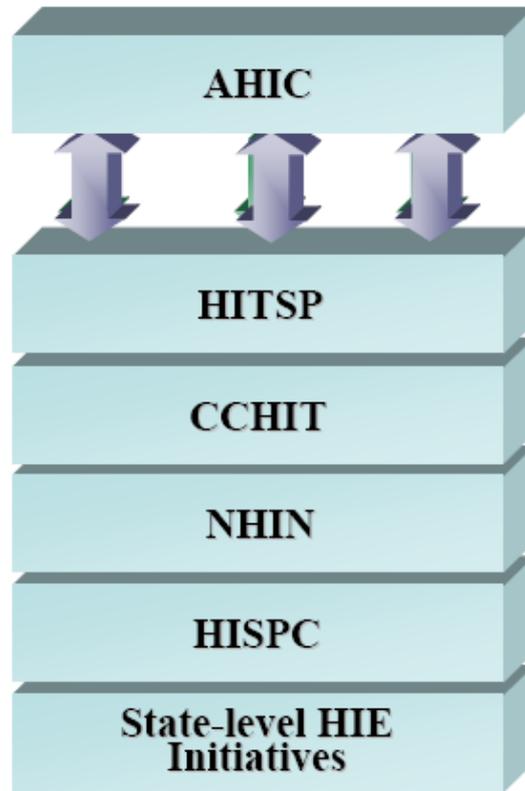


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AHIC – a Public and Private Sector Collaborative

AHIC is the public-private collaborative that sets priorities and oversees and/or endorses HIT standards, certification, the NHIN, and policies on a national level.



➤ **AHIC** - American Health Information Community

➤ **HITSP** – Health IT Standards Panel

➤ **CCHIT** – Certification Commission for Health IT

➤ **NHIN** - Nationwide Health Information Network Prototypes

➤ **HISPC** – Health Information Security and Privacy Collaboration

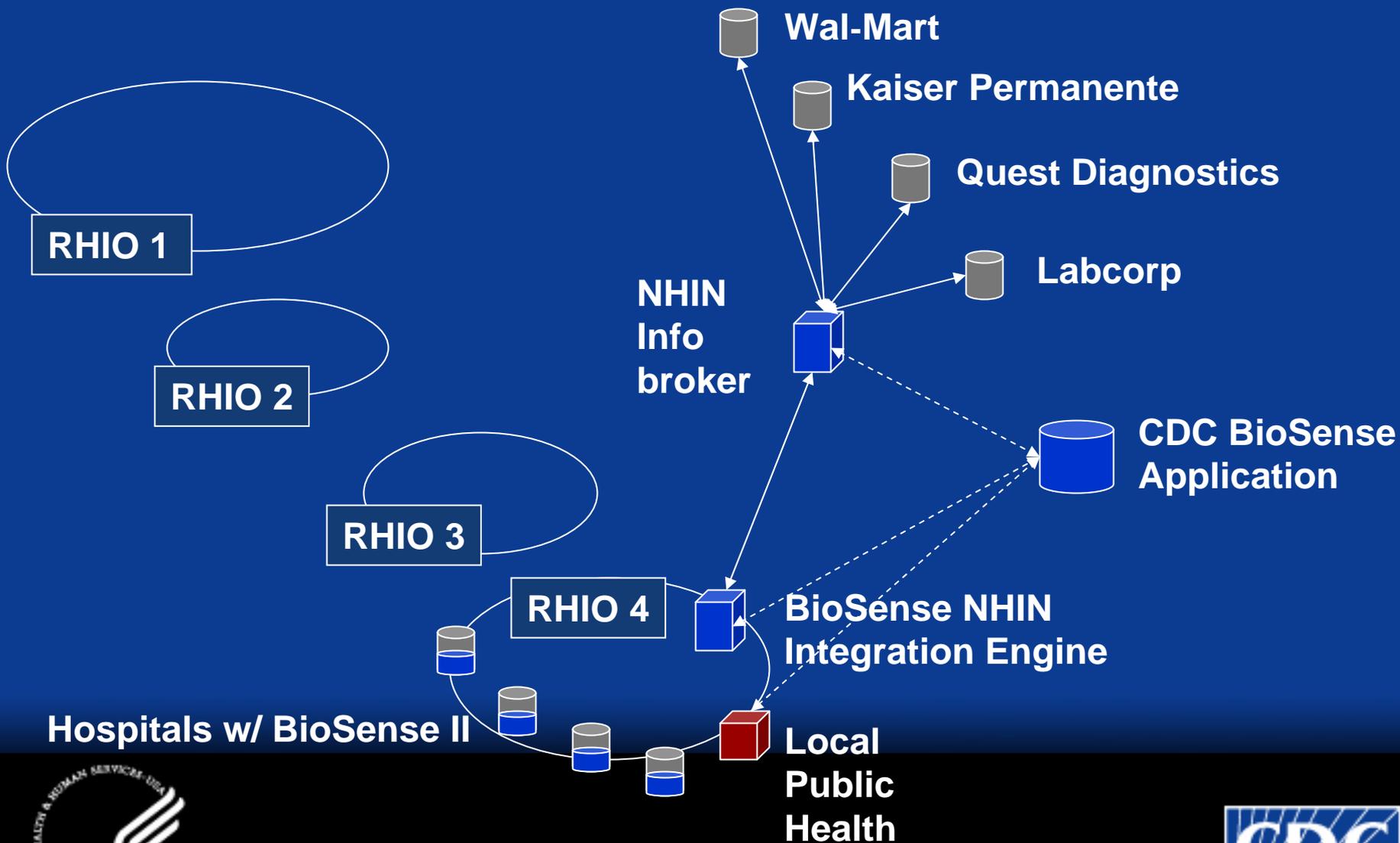
➤ **State-level HIE Initiatives** – State-level Health Information Exchange Initiatives



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BioSense as Broker for National Resources



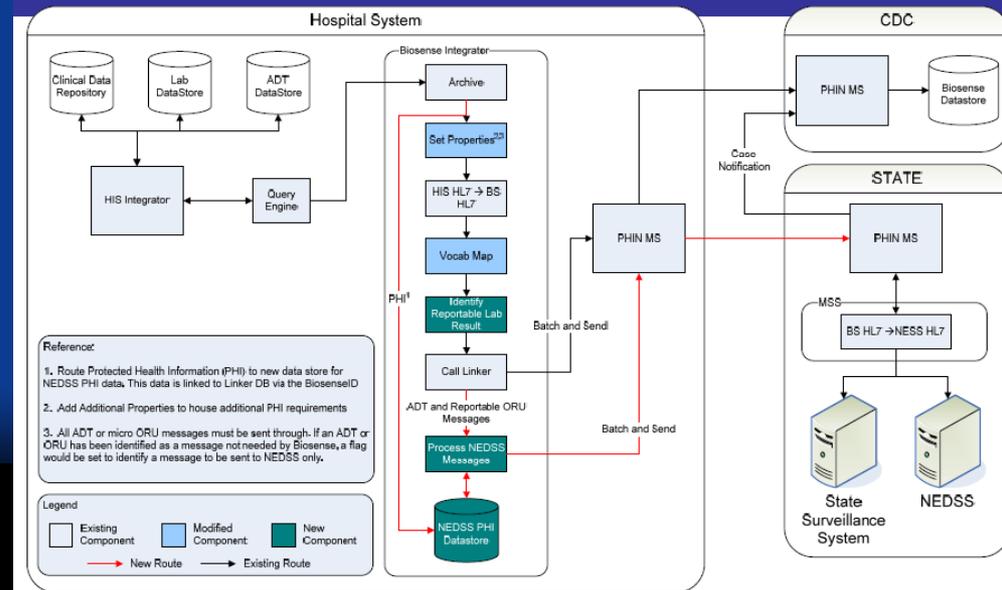
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Open Source ELR Reporting Tool

- ❑ 9 states use RODS, an open source surveillance tool
 - 2 states forward data to BioSense
- ❑ Capture by adding ELR reporting functionality to open source toolset along with BioSense feed

BioSense ELR prototype



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BioSense Extramural Research



- Extramural (CoE's, R01's, and Cooperative Agreements)
 - Nationwide impact
 - Example research topics
 - Value of NLP of progress notes
 - Grid technologies
 - Case recognition rules and strategies
 - Value of syndromic surveillance strategies



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Bringing HIEs & Public Health Together



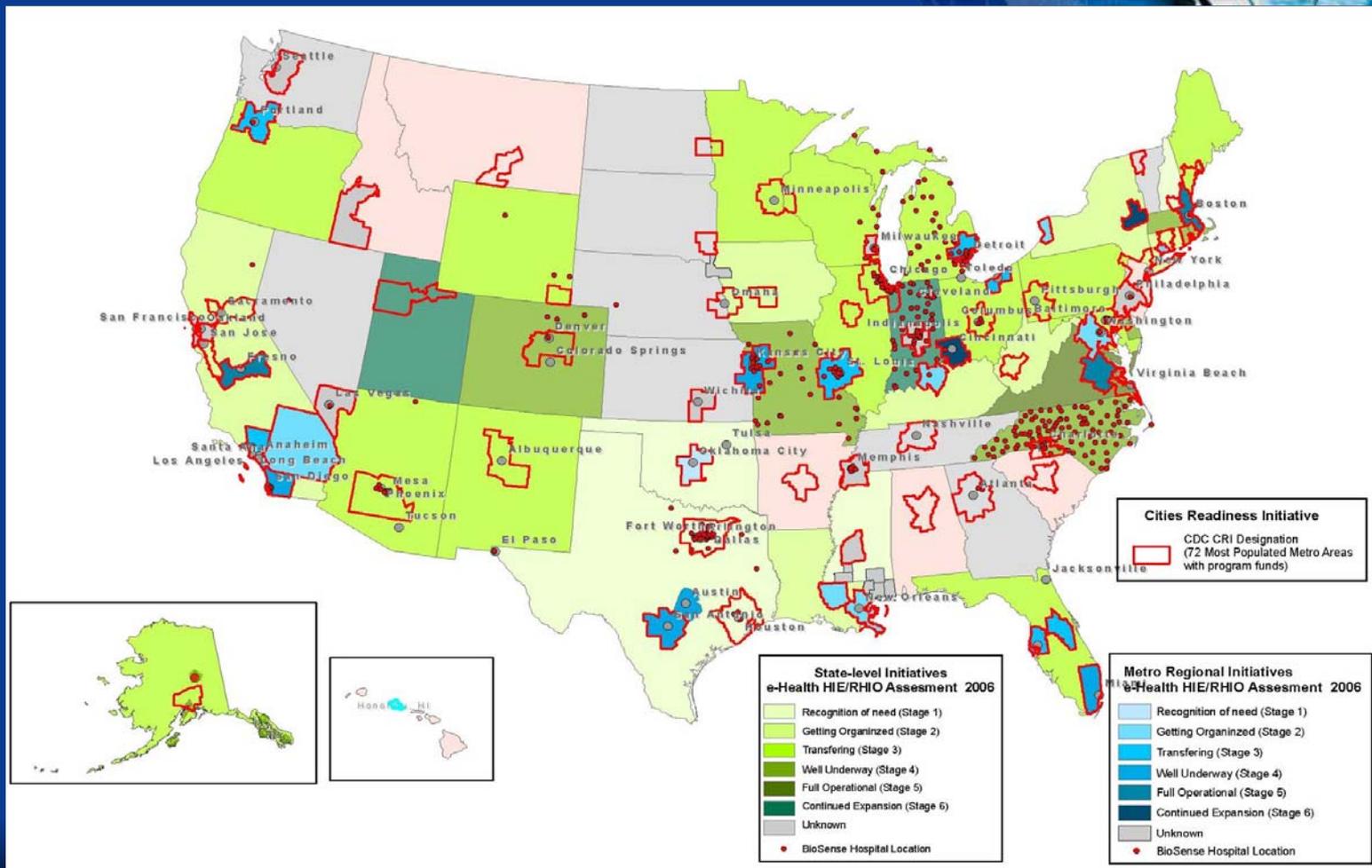
- ❑ Health Information Exchanges (HIEs) are an integral part of the vision for a Nationwide Health Information Network
- ❑ Benefit to all parties for HIEs and Public Health to work together
 - HIEs benefit to public health:
 - Electronic reporting of notifiable diseases
 - MRSA occurrence tracking
 - Enhanced biosurveillance at local, state, and national level
 - Sharing aggregated data across jurisdictional boundaries
 - Efficiency of repurposing already existing data for multiple uses including public health, disease registries, potential use for health statistics



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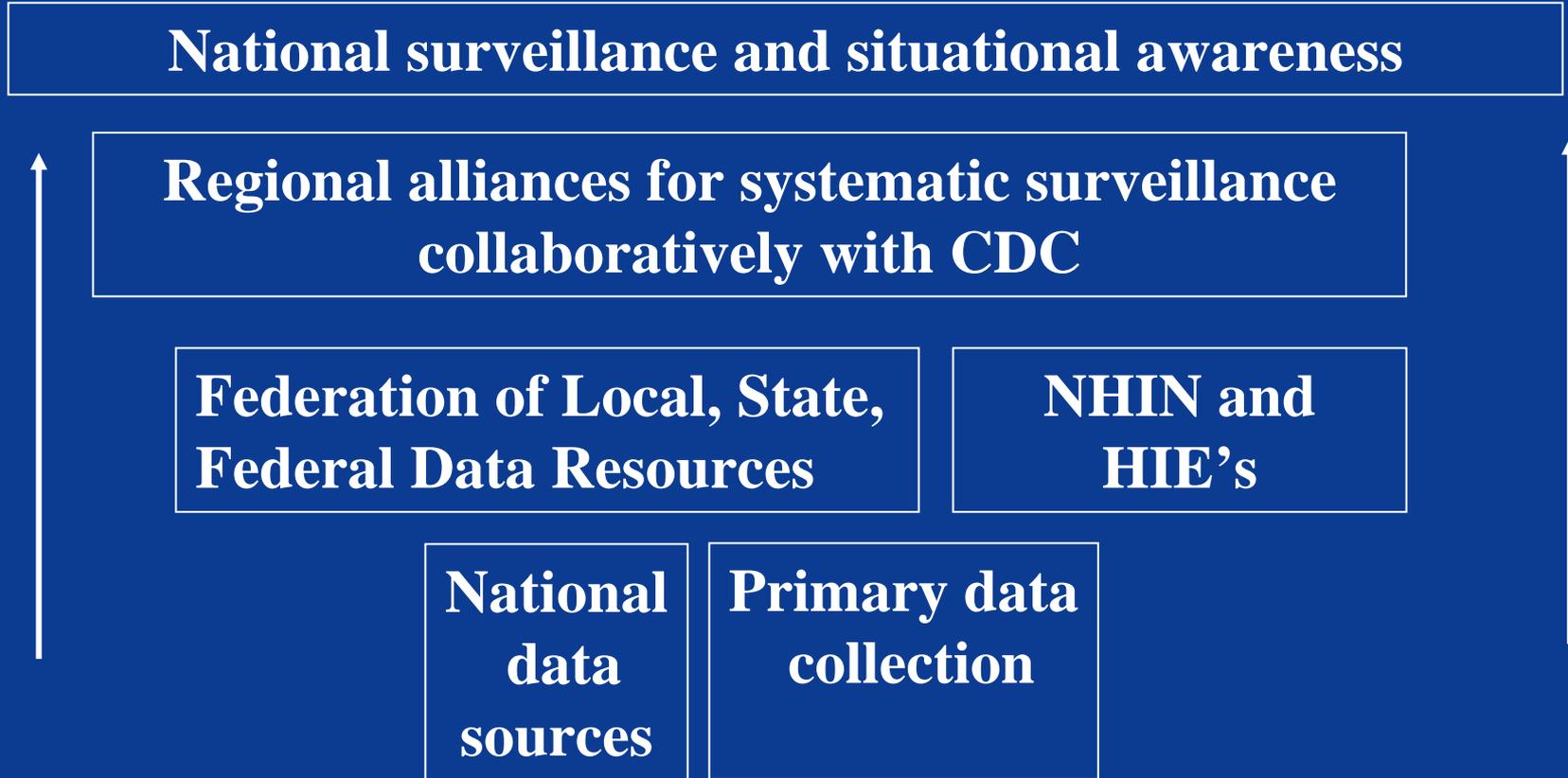
HIE Infrastructure Available to Support Surveillance



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Overall Strategy: Multi-level Regional Strategy



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Regional Surveillance Collaboratives



- ❑ The USA is a LARGE Country
- ❑ Someone needs to do the WORK of surveillance and maintain systems
 - State, local and CDC partnerships to systematically cover the United States
- ❑ Mechanisms need to be in place to share data
 - Uniform governance within a region
- ❑ Support and growth based on advancement of regional capabilities
 - States help each other

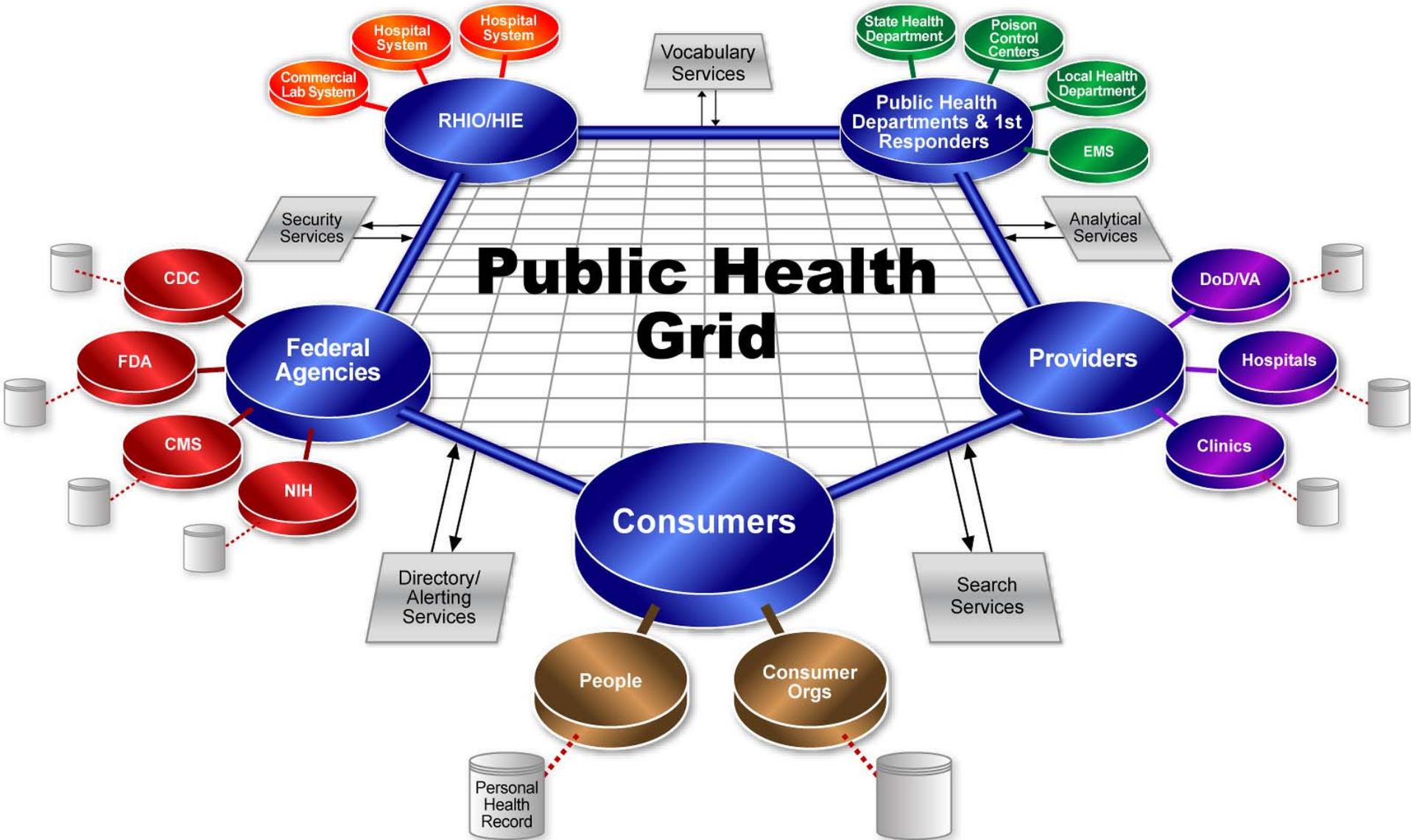


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Goal State

Collaborative, Efficient, Agile



Federation of State and Local Systems



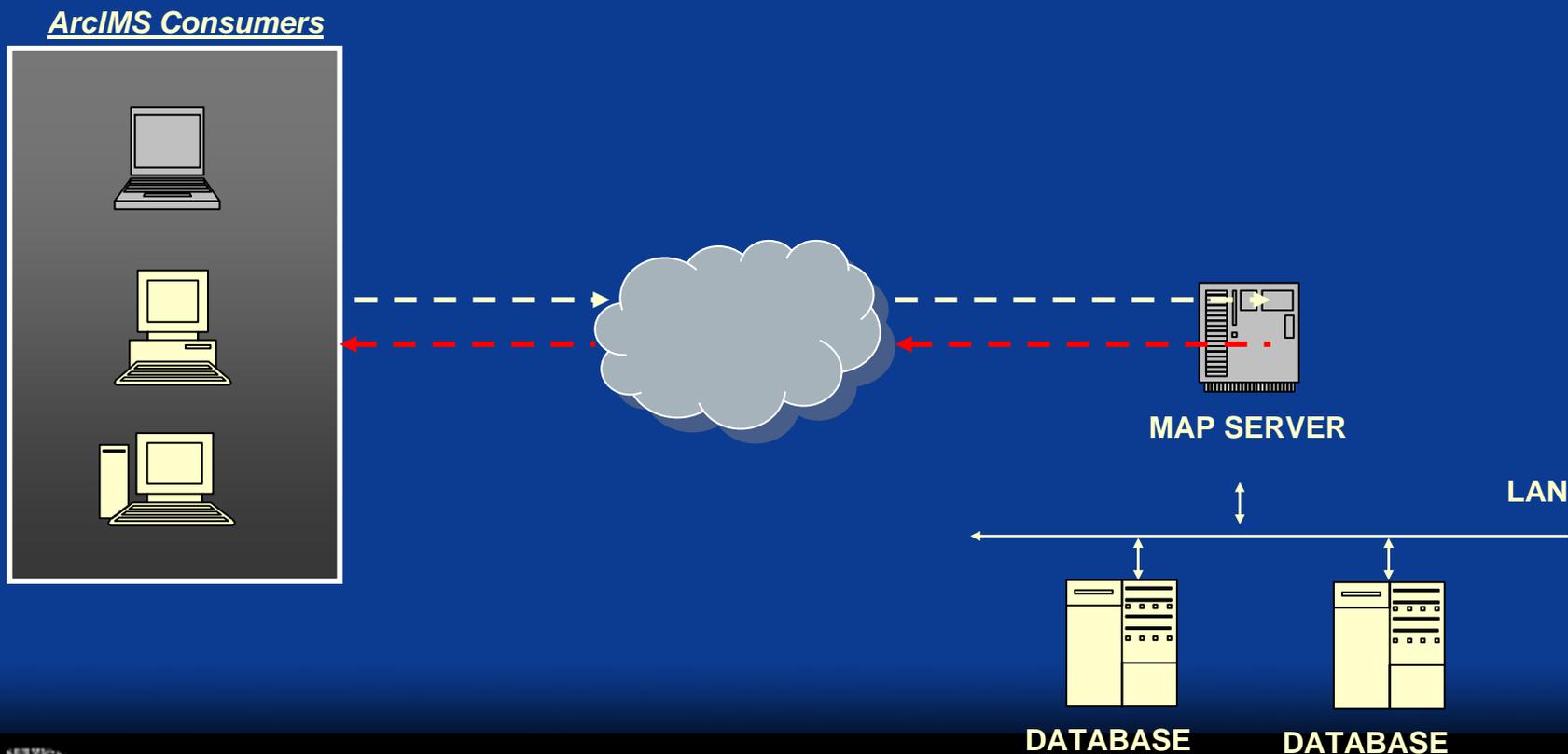
- ❑ Substantial existing investment
 - Syndromic technologies
- ❑ Local control of data paramount
 - Politics of control of data has been the primary obstacle to formation of a national system
- ❑ Technical solution to politics
 - Architecture of system should allow data to remain with each jurisdiction but allows analyses to be run across jurisdictions and combined



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Traditional Client-Server



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Federated System: PH-DGInet Example

NYC
PH-DGInet
Node

Consumers



Address: http://dginedemo2.esri.com/portal/portal_nsf/_ns/YTEwfGMwfgQwfgY__media-type/html/user/jack/page/default.psm/1s_peid/P-1061943751b-10028

DGInet Security Policy

DGInet Overview Map

DGInet Directory

Search: San Diego

Search Results:

- (U) Imagery metadata**
Description: Some medium resolution imagery (16 meter) over the San Diego area
Author/Producer: other
Publish date: 01/01/2004
Product Security Marking: UNCLASSIFIED
- (U) Imagery metadata**
Description: Some high resolution imagery (1 meter and 3 inch) over the San Diego area
Author/Producer: other
Publish date: 01/01/2004
Product Security Marking: UNCLASSIFIED
- (U) Imagery metadata**
Description: Some medium resolution imagery (16 meter) over the San Diego area
Author/Producer: other
Publish date: 2004/01/01
Product Security Marking: UNCLASSIFIED
- (U) Imagery metadata**
Description: Some high resolution imagery (1 meter and 3 inch) over the San Diego area
Author/Producer: other
Publish date: 2004/01/01
Product Security Marking: UNCLASSIFIED
- (U) Electrical Power (EP)**
Description: Electrical Transmission, San Diego, Fishnet, FishNet, network, AC Power Line...
Author/Producer: other
Publish date: 1/2/2003
Product Security Marking: UNCLASSIFIED

DGInet Annotation

Layout View

Layout View Options

- Cross Hair
- Lat-Long Border
- Scale Bar
- North Arrow
- MGRS
- GRID

DGInet Find Location

Find Options Results

Find your location by: Geoname

US States and Territories

City:

State: Unknown

International (includes US States and Territories)

City:

Country:

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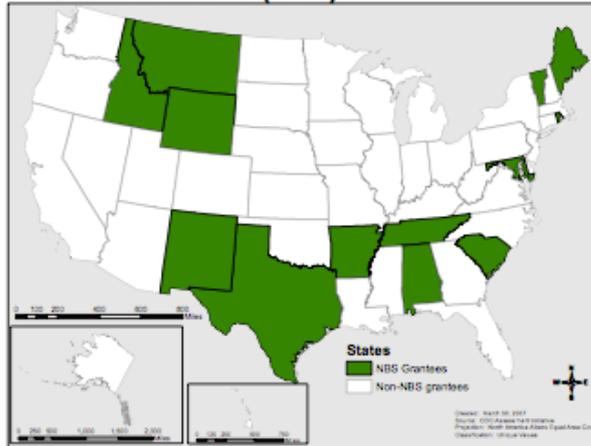
TM

Scope of State and Local Systems that Could be Federated

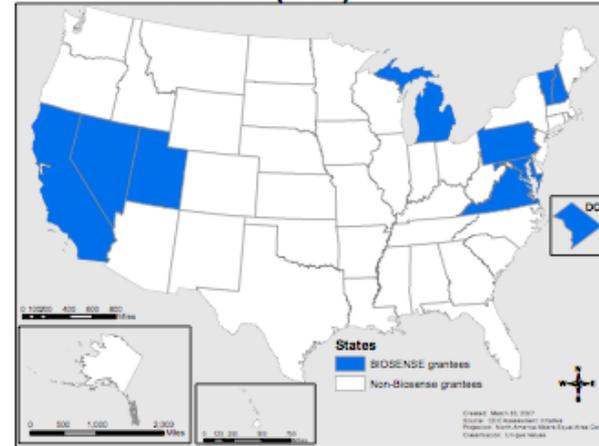


EED Solutions Self-Reported by PHEP Grantees, August 2007

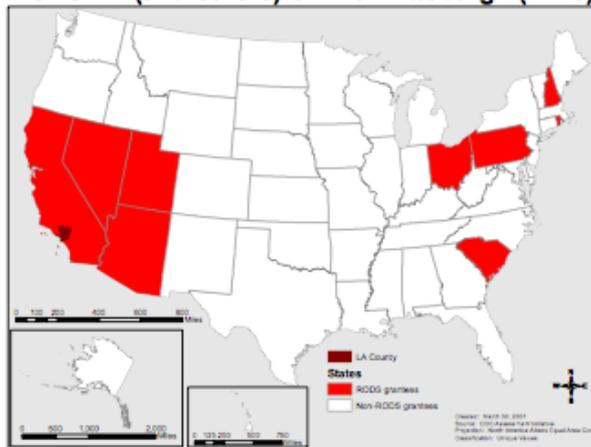
NBS 1.1.5 SP2 CDC (n=13)



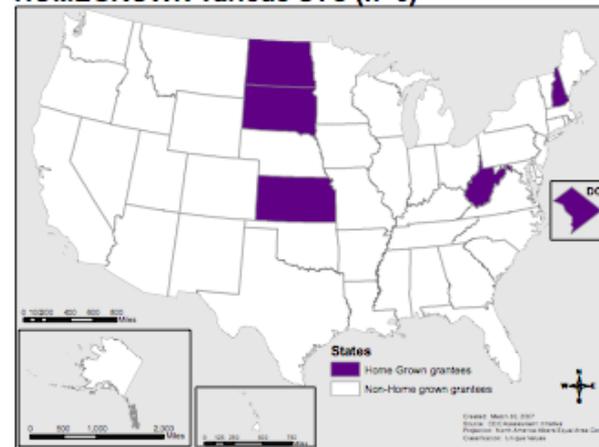
BIOSENSE N/A CDC (n=10)



RODS 4.2 (and others) Univ of Pittsburgh (n=10)



HEMIGROWN various STC (n=6)



Summary and Conclusions



If you want to travel fast, travel alone

If you want to travel far, travel together

African Proverb

□ How to go far together

- Integrate of Public Health practice with the NHIN
- Single public health integration for clinical care providers
- Collaborative development in Communities of Practice
- Open Source
- Decision Support
- Coordinated research efforts and programs for enhancement of professional development



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