



Preparedness at a Local Level: Perspective from Denver, Colorado

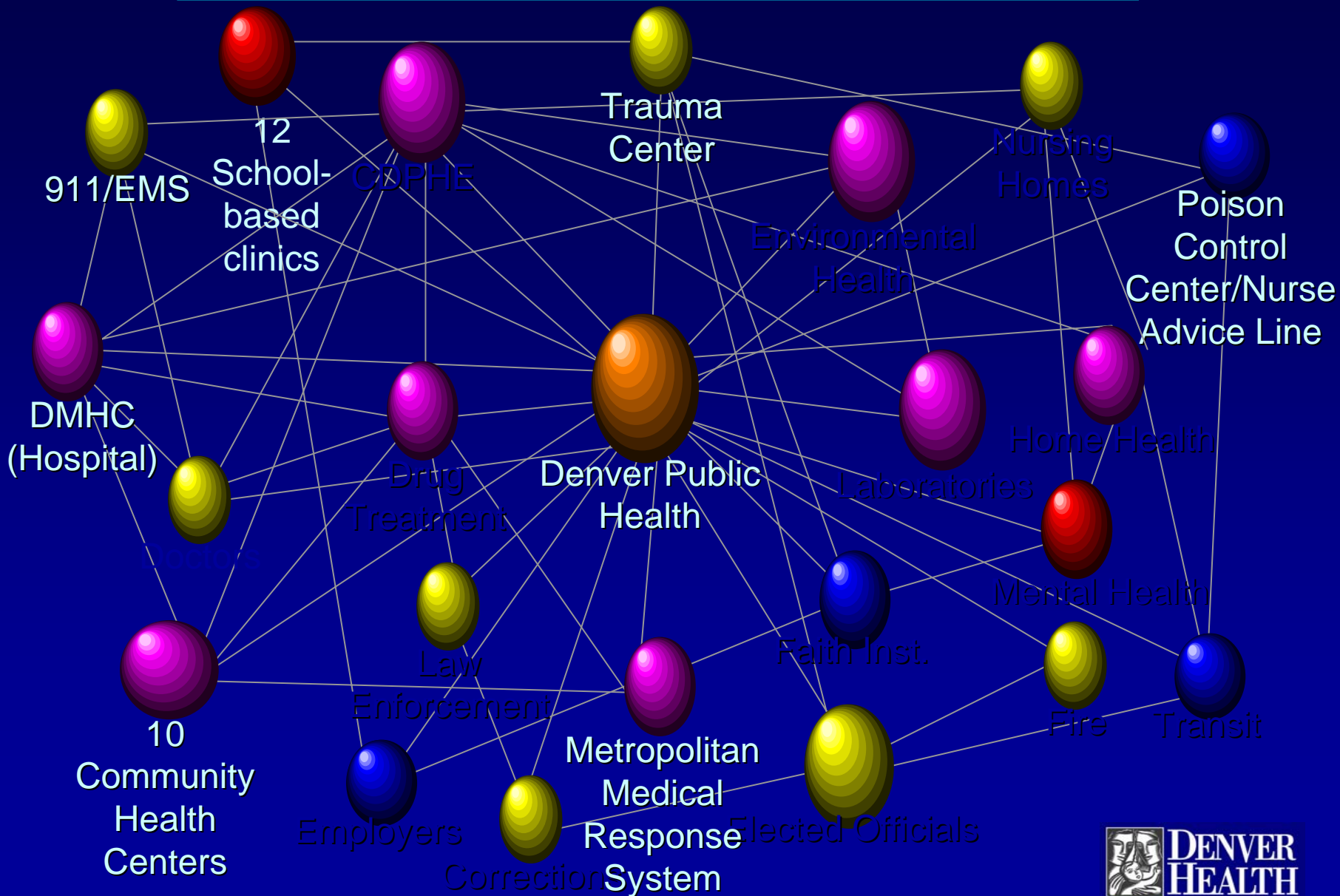
***2006 U.S. Public Health Service Professional Conference
Tuesday, May 2, 2006***

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Director, Public Health Informatics
Denver Public Health
Denver Health

Learning Objectives

- How has Denver prepared for natural or man-made public health events? What factors influence our local public health preparedness?
- Understand a local public health perspective on capacity for preparedness
- Learn about ways that informatics can assist with preparedness through routine applications

Denver Health's System



Denver's Responsibilities/Assets

- Responsibilities
 - Denver International Airport
 - Biologic Detection System
 - BioSense
 - BioWatch
 - Metropolitan region with greater vulnerability/risk
- Assets
 - Integration of public health with EMS, ED, DHMC, CHC
 - Infectious disease expertise
 - HRSA response agency (Level 1 ED/trauma center)
 - Laboratory Response Network (functioning sentinel PCR)
 - Informatics focus

Is Denver prepared?

- Planning
 - Biologic Detection System
 - Biowatch/Biosense
 - Cities Readiness Initiative (10 county North Central Region) – *Green assessment, 2006*
 - Mass prophylaxis/quarantine and isolation
 - Memoranda of understanding (schools, colleges, mental health)
- Exercising
 - TopOff 2000, Fowl Play, MMRS dispensing
- Communications
 - Pandemic talks and outreach
 - Health Alert Network, Dialogics
- Performance improvement efforts
 - Employee emergency alerts
 - Mass vaccination clinics

Factors influencing preparedness

- Incident Command Structure/NIMS
- Coordinated communications
- Sense of learning community

Coordinated communications

- Technology
 - Need for multi-jurisdiction 800 MHz integration
- Community participation
 - Leadership and management
 - Critical process characteristics
 - Proximal outcomes
 - Collaborative problem solving

Leadership and Management

Community collaborations appear to benefit from having leaders and staff who:

- believe in the capacity of diverse, broad-based, activated people/organizations to work together to identify, understand, and solve community problems
- understand and appreciate different perspectives,
- are able to bridge diverse cultures, and
- are comfortable sharing ideas, resources, and power.

Cultural Competency

Utilize appropriate methods for interacting sensitively, effectively, and professionally with persons from diverse cultural, socioeconomic, educational, racial, ethnic and professional backgrounds, and persons of all ages and lifestyle preferences

Do we all have a common terminology?

- community engagement
- partnership
- collaboration

Ambiguity

- source of frustration
- variable expectations

Challenge: translate rhetoric and abstract community participation principles into practice.

Collaborative Problem-solving Process

Ensure Broad-Based Influence and Control

- avoid domination by powerful people/organizations
- recognize personal/organizational agenda and control
- diffuse power among participants

Facilitate Productive Group Dynamics

- acknowledge past history/relationships
- stimulate creativity and different perspectives
- combine complementary skills and resources

Extend Scope of Process – challenges

- engage participants to conduct more diverse work
- appreciate complex relationships, see a bigger “picture”
- develop and implement more comprehensive strategies.

Proximal Outcomes

empower individuals: get them directly and actively involved in addressing problems that affect their lives

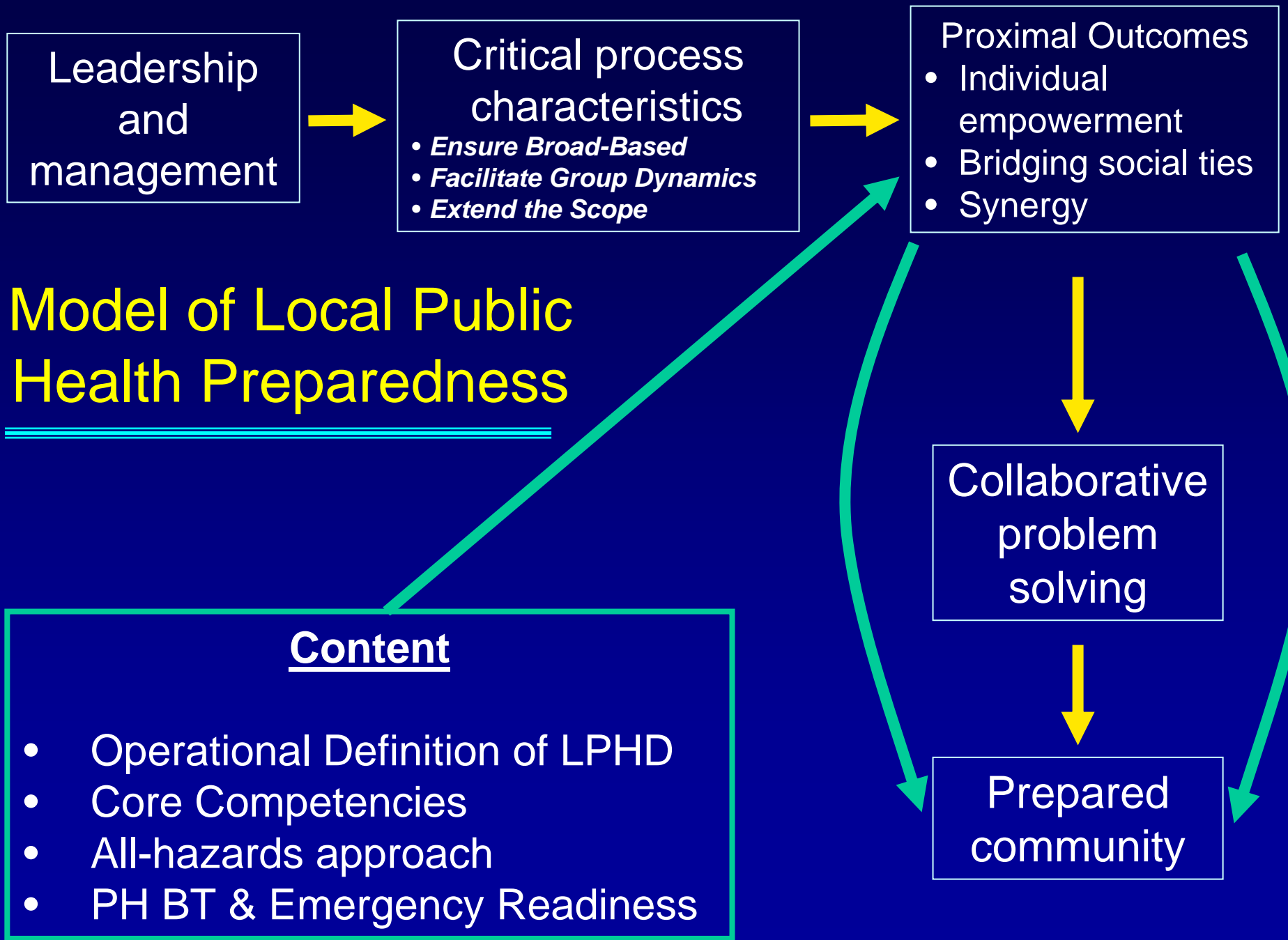
create bridging social ties: bring people together across society's dividing lines, build trust and a sense of community, and enable people to provide each other with various kinds of support

create synergy: breakthroughs in thinking and action produced when collaborative processes successfully combine the knowledge, skills, and resources of a group of diverse participants

What can a “learning community” accomplish?

A group of people, an organization, or an organization of organizations that increases its competency by:

- sharing a common vision
- striving to share mental models
- expanding capacity of individual members
- focusing change at the system level
- valuing team learning



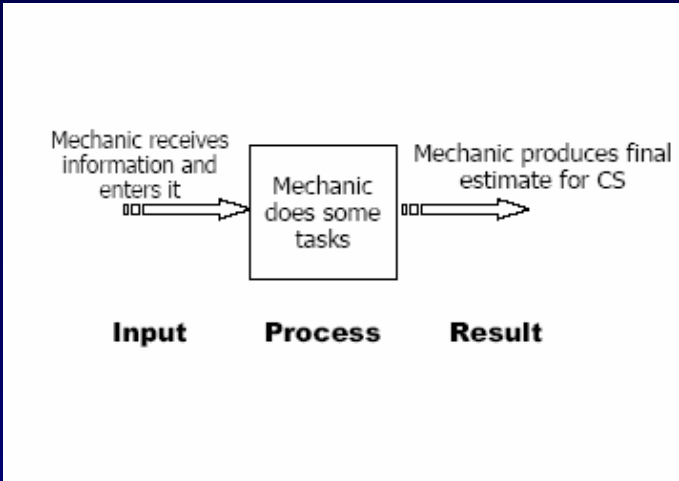
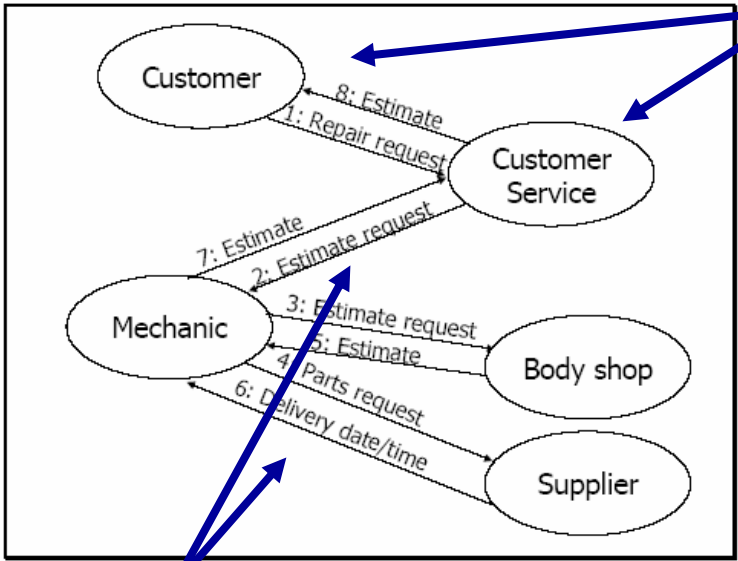
LPH perspective

- Business process? (yes/no)
- 3 waves of IS development
- Potential for technology (informatics)
- Need for and value of dual use

Business: purposeful activity

- activity directed toward some end
- activity engaged in as normal, logical, or inevitable and usually extending over a considerable period of time : ROLE, FUNCTION
- activity engaged in toward an immediate specific end and usually extending over a limited period of time : TASK, CHORE, MISSION, ASSIGNMENT
- transactions, dealings, or intercourse of any nature

Entities



Transactions

A **business process analysis** Each business process has inputs, method and outputs. The inputs are a pre-requisite that must be in place before the method can be put into practice. When the method is applied to the inputs, then certain outputs will be created.

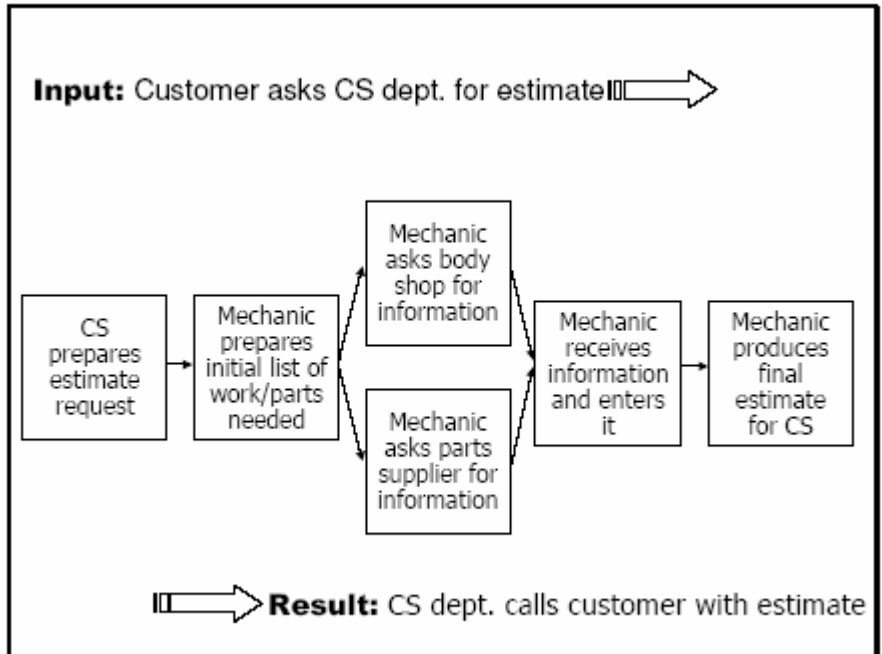
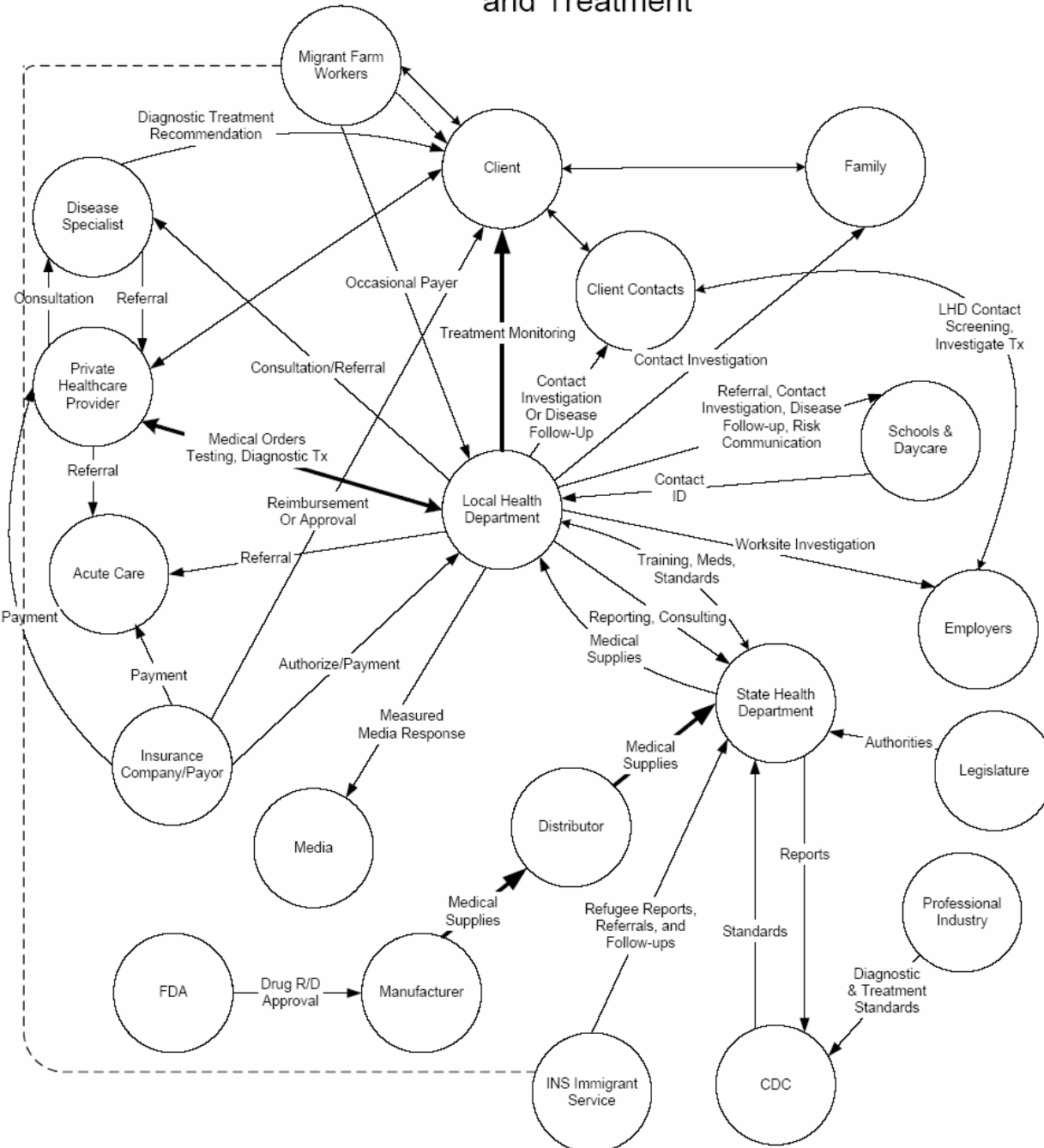


Figure 8

Communicable Disease & Clinical Intervention and Treatment



- Input:**
- Provider suspects communicable disease;
 - Laboratory report;
 - General public reports suspicion.

- Output:**
- Treatment completed
 - Exposed Contacts Cleared

3 Waves of Federal-State Information System Development

- Independent systems development
- Federal funding of state-level systems
- Integration of the benefits of state-level system development with tools of software reuse

Informatics Can Change PH Practice

Level
of
Value

Practice is the action taken based on our understanding of the knowledge and context for public health use.

Practice

Wisdom

Knowledge

Information

Data

INFORMATICS implies a disciplined approach to information systems design and implementation that will drive improvements in public health practice

Public
Health
Practice

Informatics and preparedness

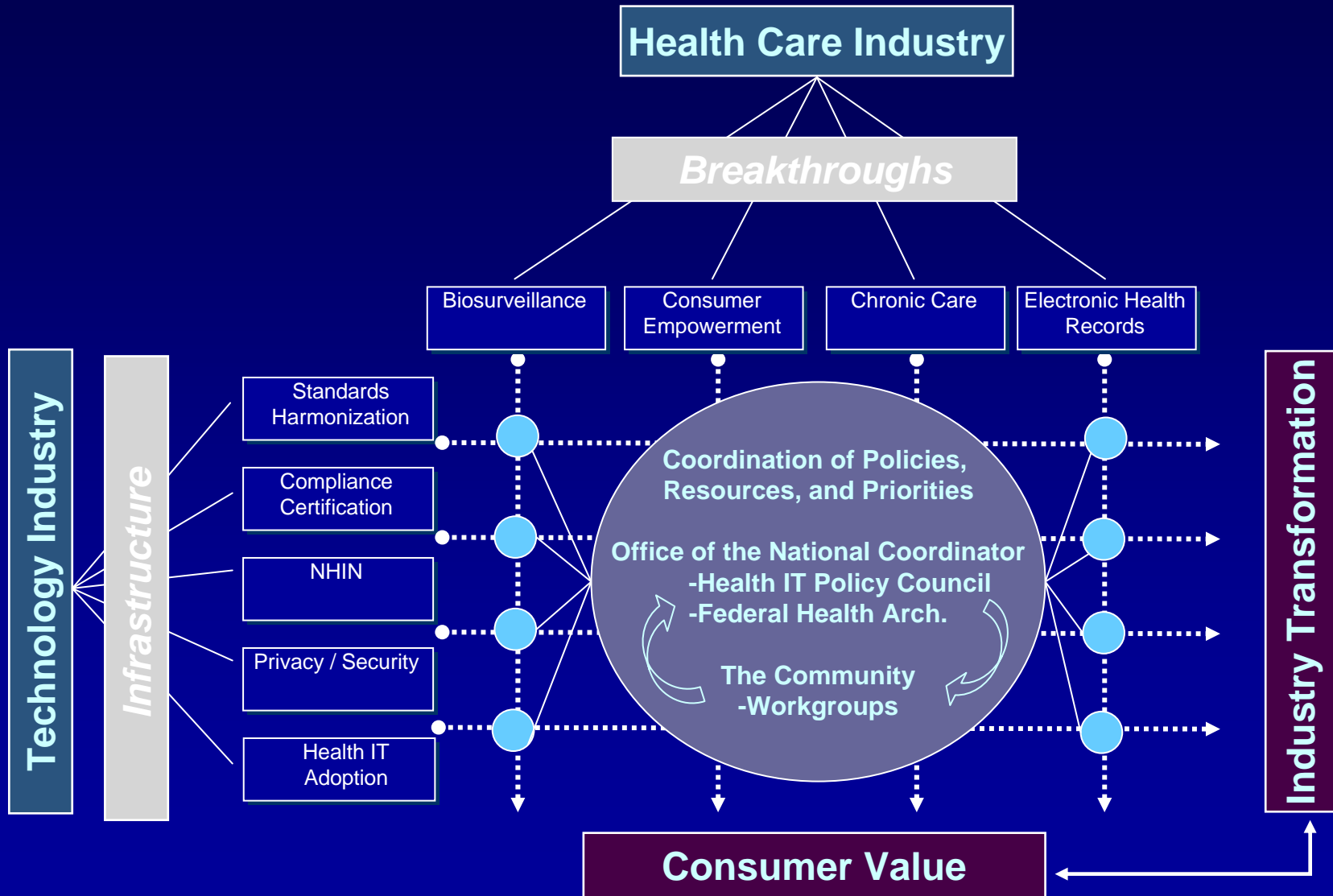
- National
 - American Health Information Community
 - Public Health Information Network
 - Potentially competing designs
- State/local
 - informatics progress

American Health Information Community (AHIC)

- federal advisory body
- chartered to make recommendations to HHS Secretary
 - how to accelerate HIT development and adoption
 - advance four focus areas by the end of 2006.

- **Consumer Empowerment** - Make available a secure, consumer-directed electronic record for registration and medication information.
- **Chronic Care** - Allow widespread use of secure messaging, as appropriate, for doctor/patient communication about care delivery.
- **Biosurveillance** - Enable transfer of standardized and anonymized health data to authorized public health agencies within 24 hours.
- **Electronic Health Records** - Create a widely available, secure, standardized EHR that includes laboratory results and interpretations.

ONC Perspective: HIT – Deployment Coordination



Public Health Information Network

Early Event Detection
BioSense, BioWatch

Disease Reporting &
Monitoring
NEDSS

Analysis & Interpretation
BioIntelligence Center

Secure Communications
Epi-X

Information Dissemination &
CDC Website
Knowledge Management
Health Alert Network

Public Health Response
Countermeasure Response
Administration
(e.g., Lab, Outbreak
Management,
Vaccine/prophylaxis
administration)



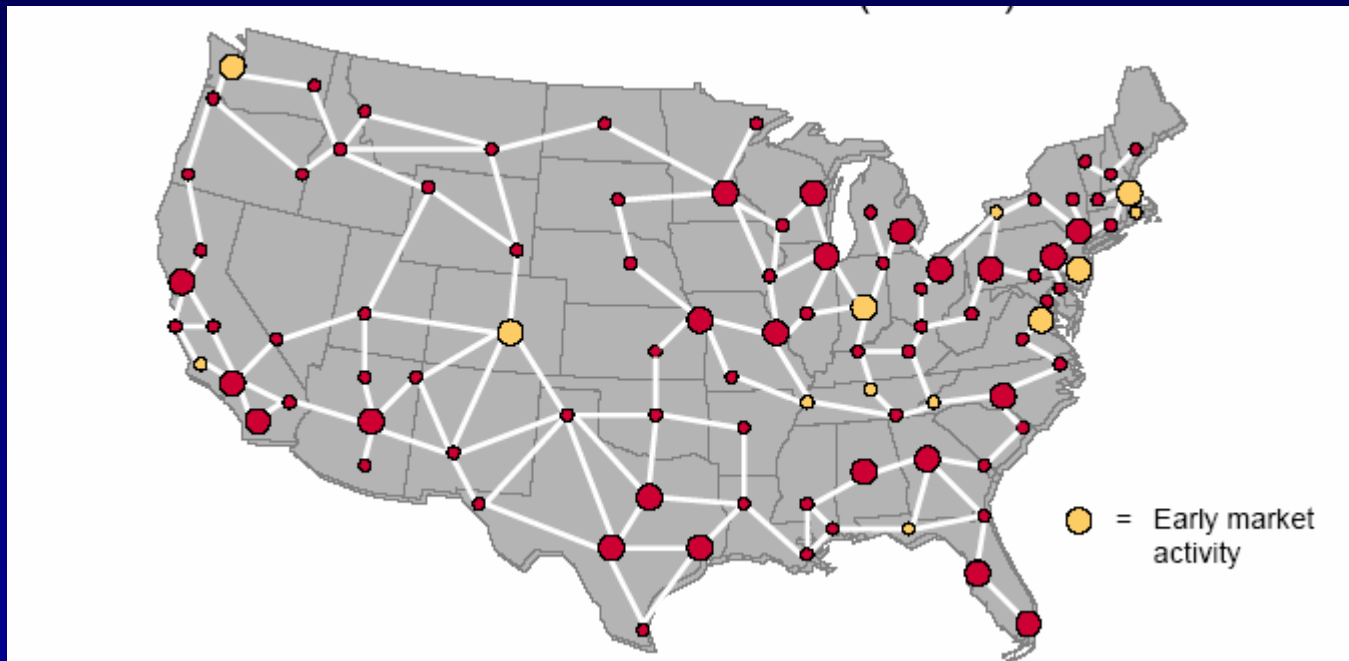
Consolidated Health
Informatics

Federal Health
Architecture

&

National Health
Information
Infrastructure

Nationwide Health Information Network (AHIC)



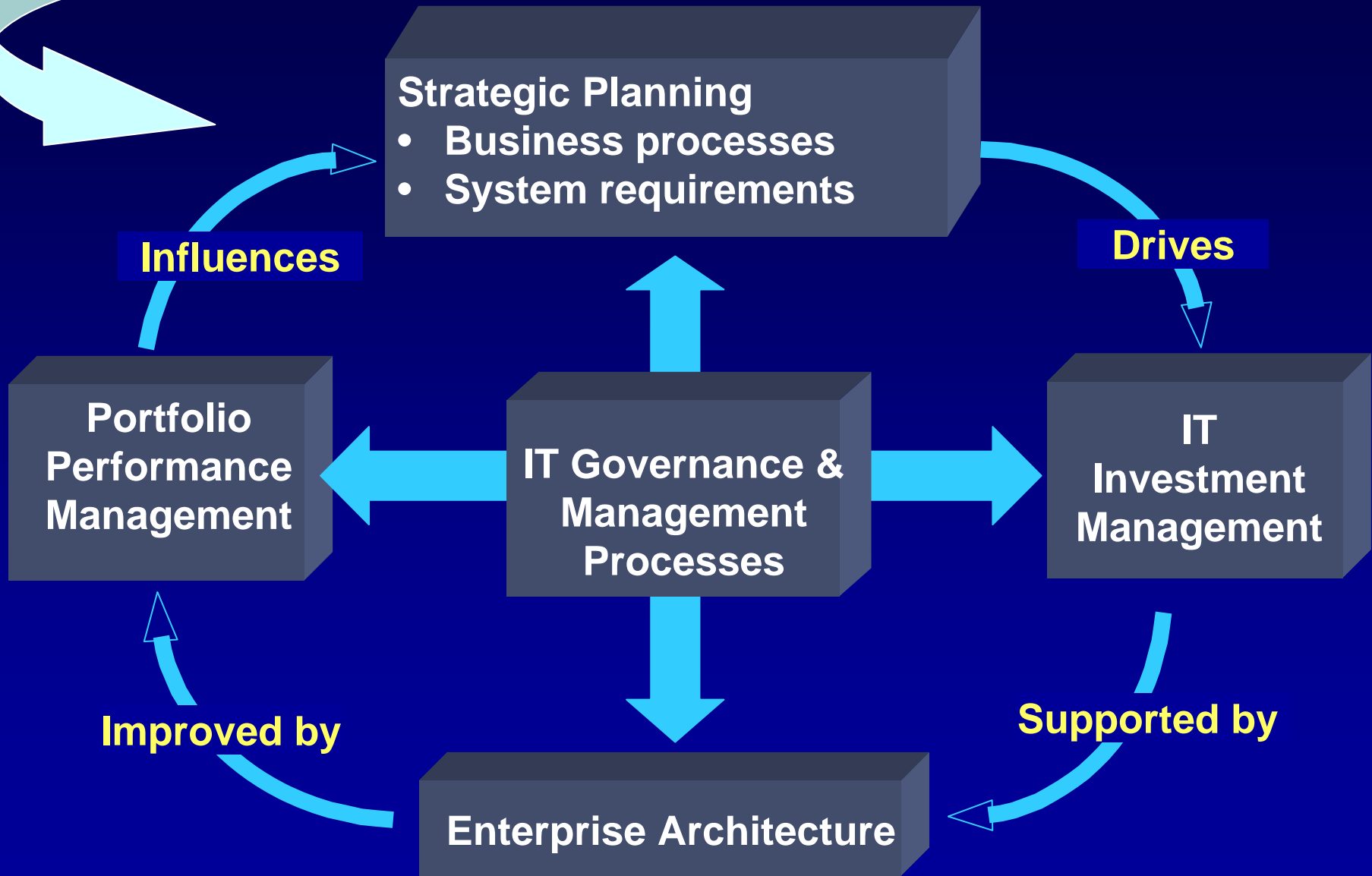
Regional Health Information Organizations (RHIO)

A secure and standards-based “network of networks”, built at the local level through public / private collaboration, interconnected and interoperable, to share electronic health records nationwide.

Nationwide Health Information Network (BioSense) ?



PHIN + RHIO



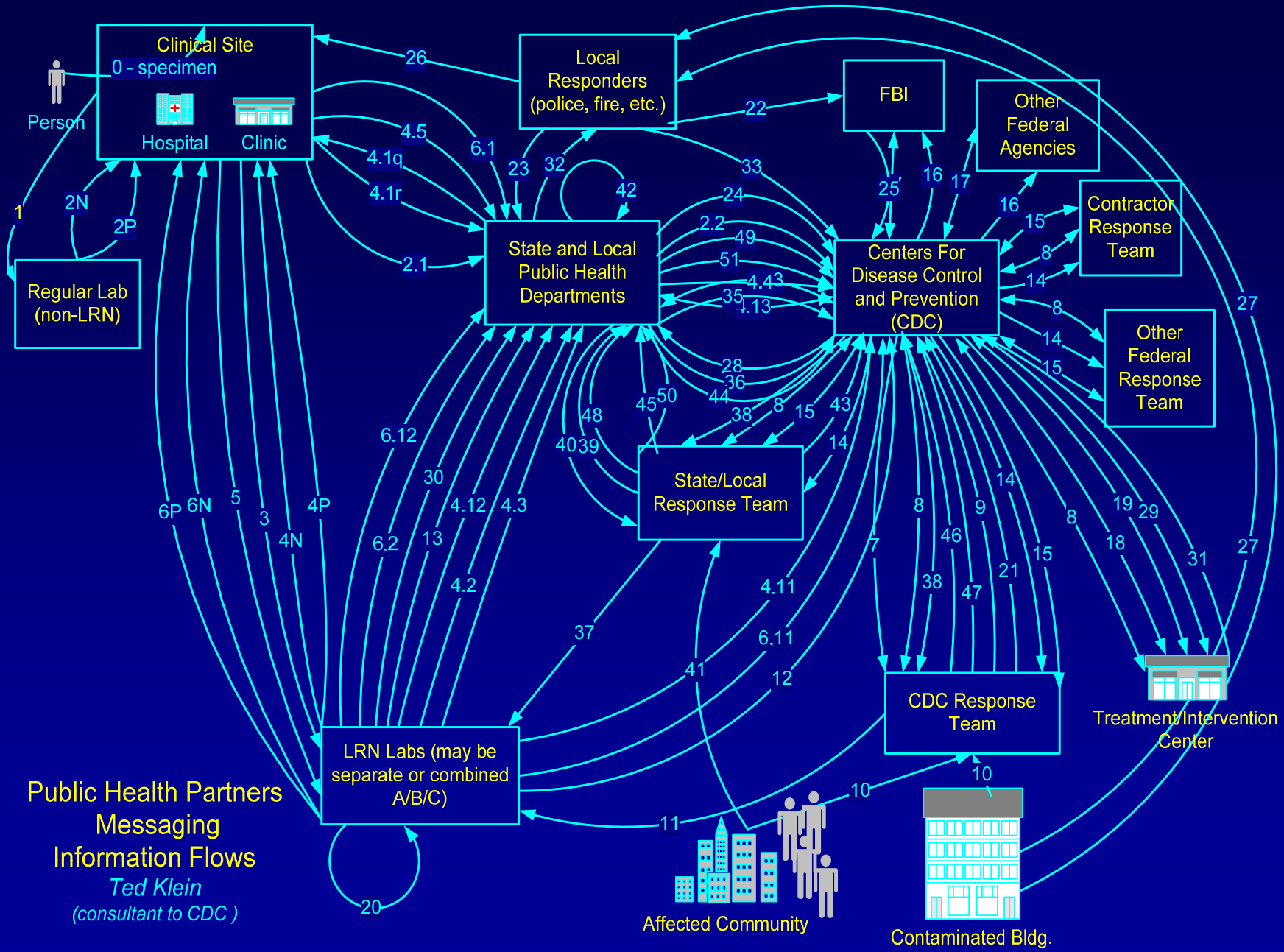
Local

Denver Public Health

- Advanced Practice Center (APC) 1999-2004
(one of original three)
 - Preparedness and resilience require systems that are flexible
 - Operational readiness means building an organization's flexibility
 - Need systems that test flexibility through everyday business processes

Denver Center for Public Health Preparedness

- Following a collaboratively defined state/local environment, one goal was to test/improve our informatics preparedness
 - Enhance surveillance and data collection
 - Expand/update our architecture
 - Promote enhanced disease detection
 - Develop messaging capacity



Public Health Partners
 Messaging
 Information Flows
 Ted Klein
 (consultant to CDC)

State

CDPHE - NEDSS

- Colorado Electronic Disease Reporting System (CEDRS) - prior to NEDSS base system available
- Integrated data repository - functional
- Messaging – PHIN compliant
 - HL7 messaging from Labcorp
 - Active data translation and exchange
 - Business logic drives automated messaging
- Data report and visualization
- Security

Local

Expand architecture:

Prototype mobile data collection units

- store and forward capacity
- changing hardware platforms
- leverage NEDSS/PHIN investments at CDPHE



Local

Expand architecture:

Apply knowledge

- **build for other clinical and public health applications**



Local

Expand architecture: Immunization registry

- web services
- adopt emerging national standards
- flexible
- tracking for pandemic counter measures

The screenshot shows a web-based application interface for an immunization registry. The top navigation bar includes 'File', 'Vaccinations', 'System', 'Utilities', and 'Help'. A dropdown menu is open under 'System', showing options: 'Recommend' (Alt+R), 'Give Vaccine' (Alt+I), 'Add History' (Alt+Y), and 'Edit History' (Alt+Z). The main content area is divided into tabs: 'Patient Information', 'Patient Address', 'Parent Information', 'Vaccine History', and 'General Information'. The 'Patient Information' tab is active, displaying a form with the following fields:

Last Name: *	TEST	Med Rec #:	
First Name: *	TEST31	Gender:	
Middle Name:		Language:	English
Alias (Nickname):		VFC Eligibility:	
Date Of Birth: *	10/05/1991 mm/dd/yyyy	Contraindications NOT Specified.	...
Birth State/Country:		SSN:	
Race:	Hispanic	Medicaid #:	
Ethnicity:		Billing Code:	
Program: *	None		
<input type="checkbox"/> Incomplete Record			
Patient Notes:			

At the bottom, the 'Record Information' section displays:

System Identifier: 105000010395594	Last Clinic: Metro Denver Immunization Clinic
Date Of Entry: 05/22/2004	Definitive: Yes

Local

Expand architecture: Paperless STD Clinic

- functional since 3/05
- tests PHIN standards
- messaging for disease and lab reporting
- generates knowledge-base for implementing newer technologies

The screenshot shows a web browser window titled "Per #603 : Davis, Betty - Microsoft Internet Explorer". The page is titled "HealthDoc Person Information".

Patient Name: Davis, Betty **Person #:** 603 **Med Rec #:** 9871252
DOB: 12/31/1972 **Gender:** Female
Created By: User, Super On 12/12/01 12:00 AM **Updated By:** User, Super On

The interface includes a "Summary Chart" tree on the left with categories like "Visits", "Eligibility Items", "Visit Forms", "Detail Medical Chart", "Add a Department/Service", "Add Telephone Counseling", "STD Clinic", "Print a Label", "Clinical Visit", "Forms", and "Lab Orders". Under "Lab Orders", there are options for "Add a Lab Order", "CT SDA - Public H", "GC SDA - Public H", "GC Culture - STD", "HCV - 1045874 - S", and "HIV".

On the right, a table lists lab orders with columns for test name and lab location:

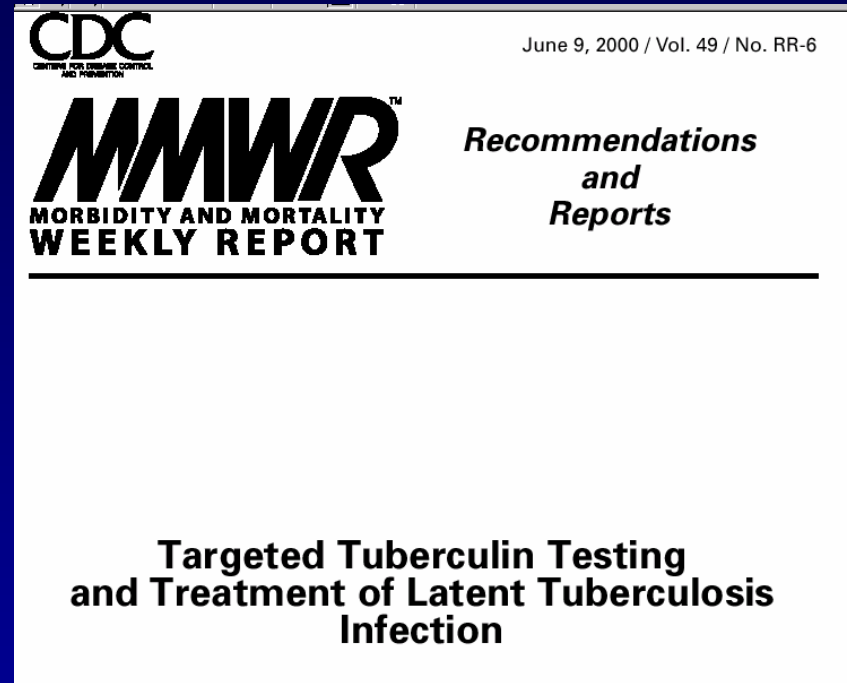
HCG: Urine	STD STAT Lab
HCG: Serum	STD STAT Lab
Darkfield	STD STAT Lab
HSV Culture	Public Health Lab
Wet Prep: KOH	STD STAT Lab
Wet Prep NaCl	STD STAT Lab
Trich Culture	Public Health Lab
Scabies Prep	STD STAT Lab
Urine Dip	STD STAT Lab
Urine Micro	STD STAT Lab
Viral Load	DHHA Lab
CD4	DHHA Lab
HIV-1 ELISA	
HIV-1 ELISA (repeated)	
HIV-1 Western Blot	
HIV-2 ELISA	State Health Dept Lab
HIV-2 ELISA Confirmatory	State Health Dept Lab
HIV-2 Western Blot	State Health Dept Lab
Urine Culture	DHHA Lab
Urine Smear	DHHA Lab
Varicella zoster virus - culture	Public Health Lab
LGV	State Health Dept Lab
PAP	DHHA Lab
HSV Typing	Public Health Lab
Dawn Lab Order	STD STAT Lab
Sanity Test	STD STAT Lab
Marks test	STD STAT Lab

At the bottom of the page, a disclaimer reads: "This information is private and confidential..."

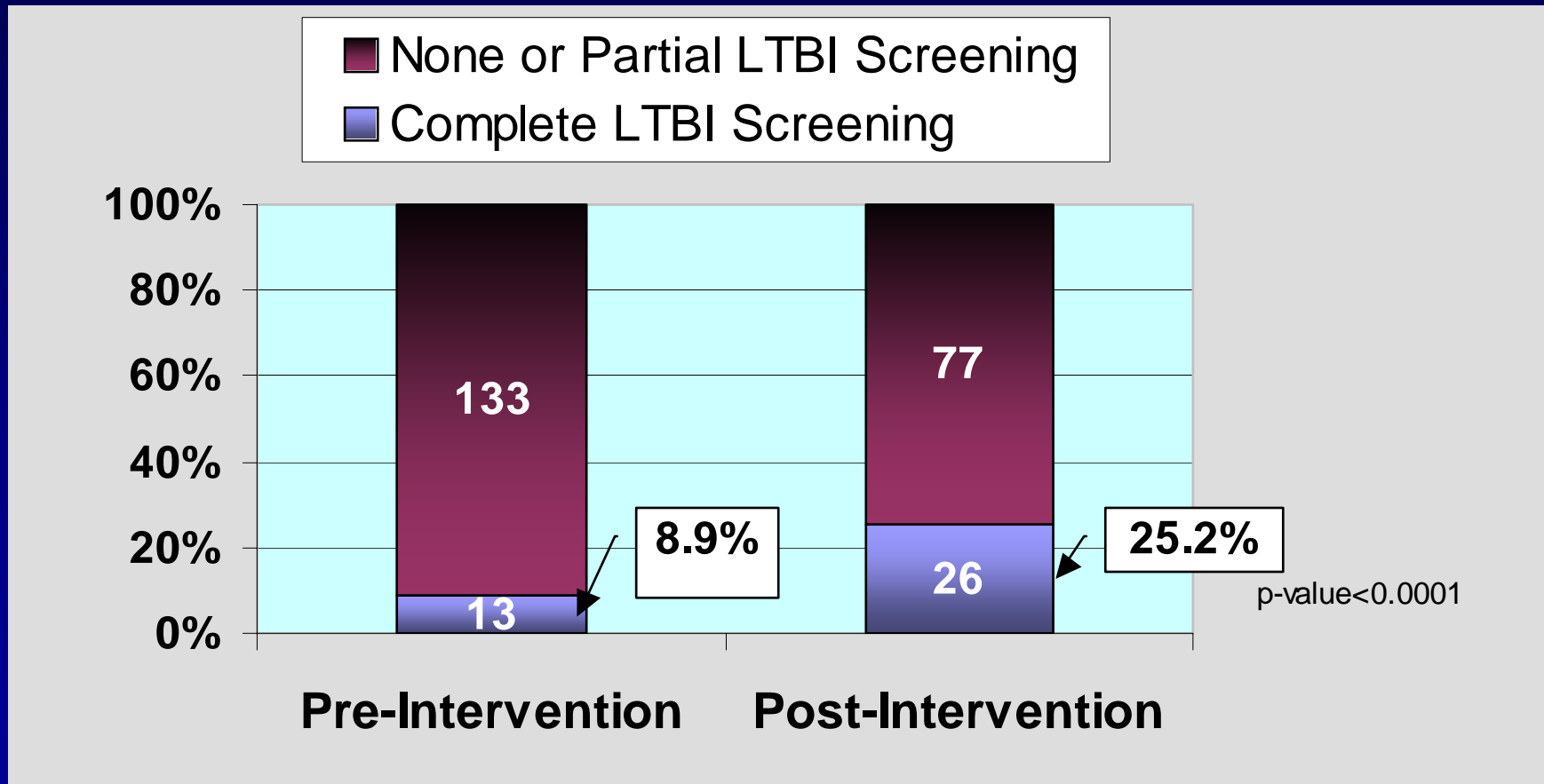
Local

Promote enhanced disease detection: Evidence-based guidelines

- automated CDC guidelines
- embed knowledge at the point of care
- change provider/patient behaviors



Latent Tuberculosis Infection (LTBI) Screening, Chart Review: 10/17/02 – 4/30/03



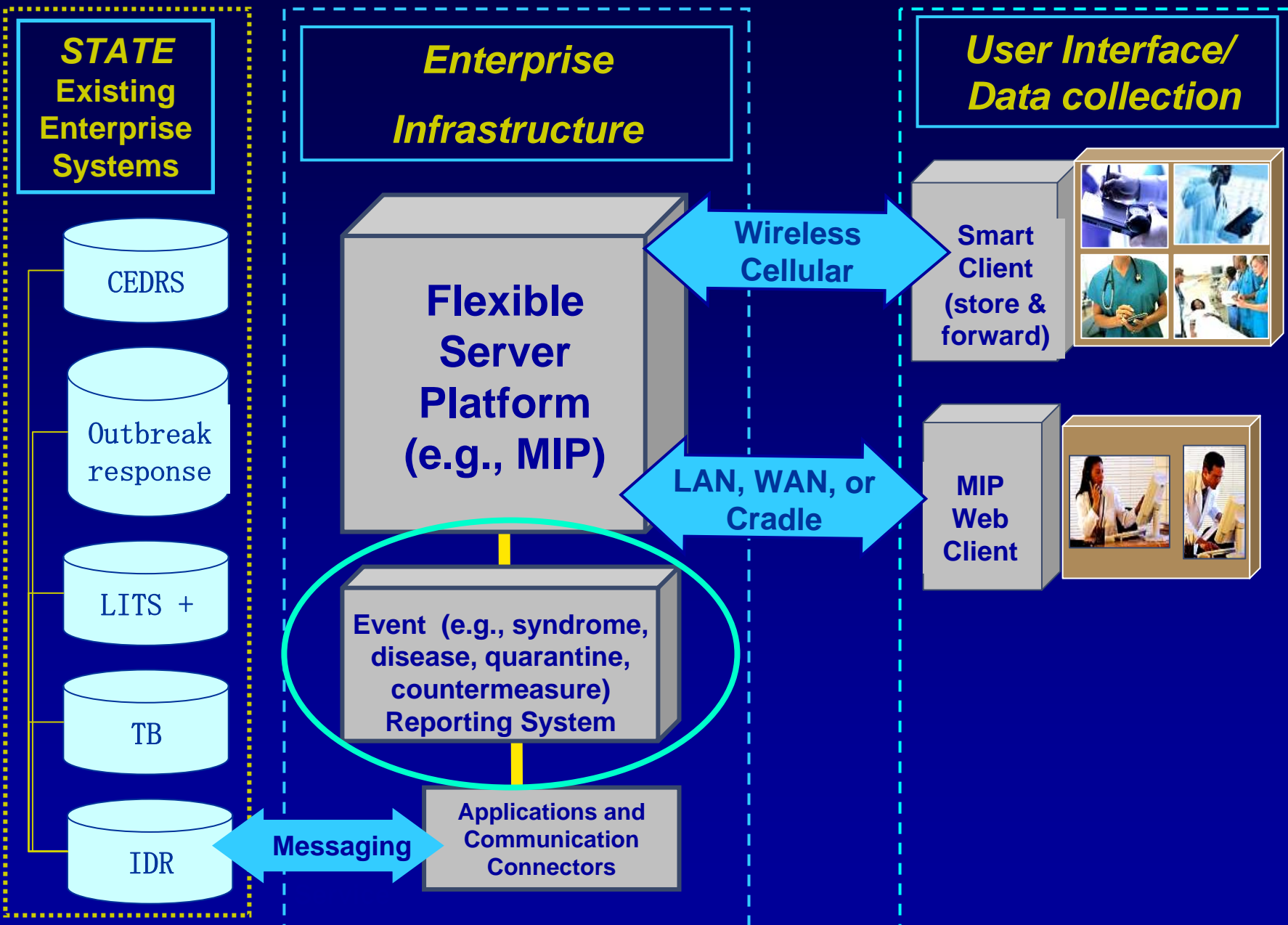
Steele A, Garrett N, Davidson A, Jatko M, Eisert S, Gabow P, Lyons P. Using computerized clinical decision support for latent tuberculosis infection screening. *American Journal of Preventive Medicine* 2005;28:281–284.

State/Local

Develop messaging capacity

- Promote messaging through RHIO
- LOINC/SNOMED encoding
- HL7 message specification
- Hospital lab and RHIO reporting (InfoLinks)
- BioSense functionality
- Public health lab – use “common” events to build and test capacity (*STD Clinic EMR creates XML messages*)

Local Public Health Response Infrastructure



Local Lessons Learned

Using informatics for preparedness skills, capacities and flexibilities is highly dependent on:

- **leveraging partnerships**

- safety-net providers
- state health department
- academics (U of Washington)
- vendors (Siemens, Interlink)
- national agencies (AHRQ, CDC)

- **sufficient financial support**

- informatics is poorly funded at the local level

- **federal/local trust to build dual use systems**

- stakeholder defined business process analysis
- permits real-life testing of BT investment, and
- enhances local value of that investment

Hi,

To all panelists - As you know, the National Response Plan (NRP) is the blueprint for how federal, state and local governments will respond to disasters. According to standard NRP protocols, state and local governments are in charge of responding to a disaster. The federal government provides assistance only when asked. However, the federal government can activate a section of the NRP, the Catastrophic Incident Annex, which gives the federal government special powers, including the ability to bypass state governments, during no-notice catastrophic incidents.

In your opinion, what would be the ideal role from federal agencies during national disaster responses? To take the lead or just provide assistance to local and state governments.

To all panelists - One of the components discussed as part of the commissioned corps transformation is the development of pre-formed and pre-designated teams, that will respond to a disaster as a single unit, and perhaps receive training as a unit.

Can you discuss examples of this type of mobile, trained disaster impact teams from your organizations (state, local or military), and their benefits?

To Dr. Calonge - Can you describe the communication systems used by the Colorado Department of Public Health and Environment during the impact and pos-impact phases of a disaster?

To Dr. Davidson - Can you briefly describe the Health Alert Network (HAN) and how this network can enhance local capacity to broadcast information in support of emergency communications?

“Live” Public Health Information Network

“Live” Exchange of and Access to Specific Data from Interoperable Systems – Messages and Storage

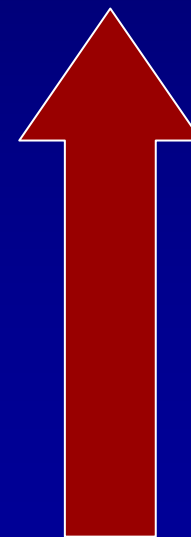
Specific Data Content – Vocabulary Terms

Data Structure – Data Models

Transport / “Handshake Between Info Systems” –
ebXML

Encryption / Security – HTTPS, ebXML

Connectivity – Continuous Internet Connectivity



National Response Plan

- Emergency Support Function (ESF) #8 provides supplemental assistance to State, local, and tribal governments in identifying and meeting the public health and medical needs of victims of an Incident of National Significance.
- Support is categorized into core functional areas:
 - Assessment of public health/medical needs (including behavioral health);
 - Public health surveillance;
 - Medical care personnel; and
 - Medical equipment and supplies.

NRP Responsibilities - Primary Agency (HHS)

- Provides leadership in public health and medical assistance to the affected area.
- Coordinates staffing of ESF #8 group as necessary to support the response operations.
- Requests ESF #8 organizations to activate and deploy health and medical resources
- Uses personnel to address public health and medical needs
- Monitor for internal contamination and administer pharmaceuticals
- Establish a registry of and monitor potentially exposed individuals
- Monitors blood and blood product shortages
- Request deployment of SNS based upon relevant threat information.
- Coordinates with other supporting departments/agencies/governments
- Assures safety and security of food and food facilities in the affected area.
- Conduct trace-backs or recalls of adulterated products.
- Ensure proper disposal of contaminated products and decontaminate affected food facilities in order to protect public health.
- Provides support for public health matters for radiological incidents

Critical Elements for Information Systems Project Success

- Leadership
- Project Governance
- Project Management
- Stakeholder Involvement
- Organizational and Technical Strategy
- Technical Support and Coordination
- Financial Support and Management
- Policy Support
- Evaluation