Denver Center for
*Public Health Preparedness*

Colorado
*Health Information Exchange*

# Local Perspective:

# *RHIO and PHIN*

Arthur Davidson, MD, MSPH

*Public Health Information Network Conference,*
*Atlanta, GA*
*May 10, 2005*

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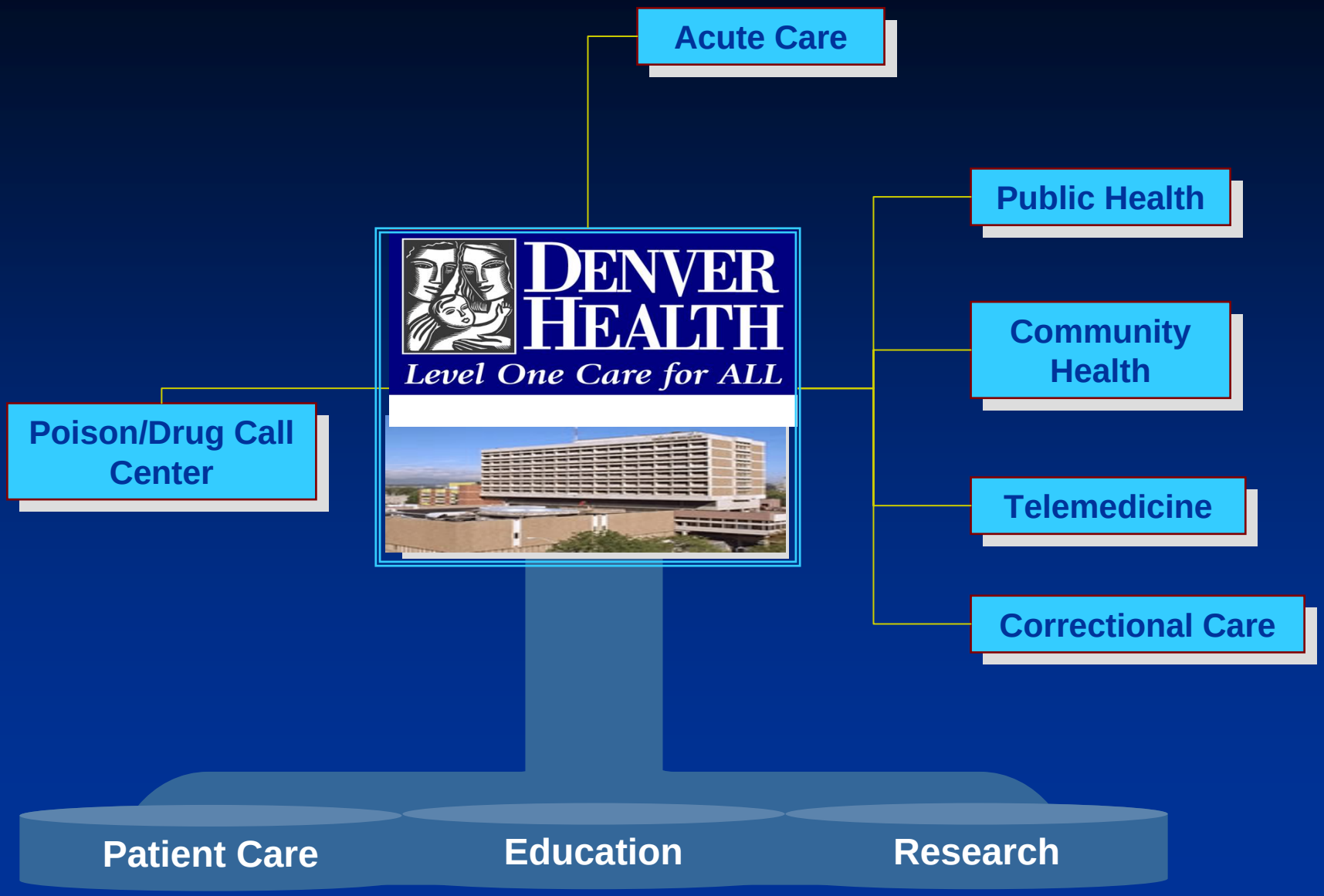
*The contents of this presentation are solely the responsibility of the author and do not necessarily represent the official view of AHRQ, HRSA/OAT or FeHI.*

# *Vertically integrated safety-net institution*



Level 1 Trauma Center

911/EMS

Hospital

Acute Care

Rocky Mountain Center for Medical Response

to Terrorism, Mass Casualties, and Epidemics

(RMCMR)

Rocky Mountain Poison/Drug Center

Metropolitan Medical Response System

Nurse line

Public Health

Center for Public Health Preparedness

Community Health

Family Health Centers

School-based Clinics

Telemedicine

Correctional Care

Patient Care

Education

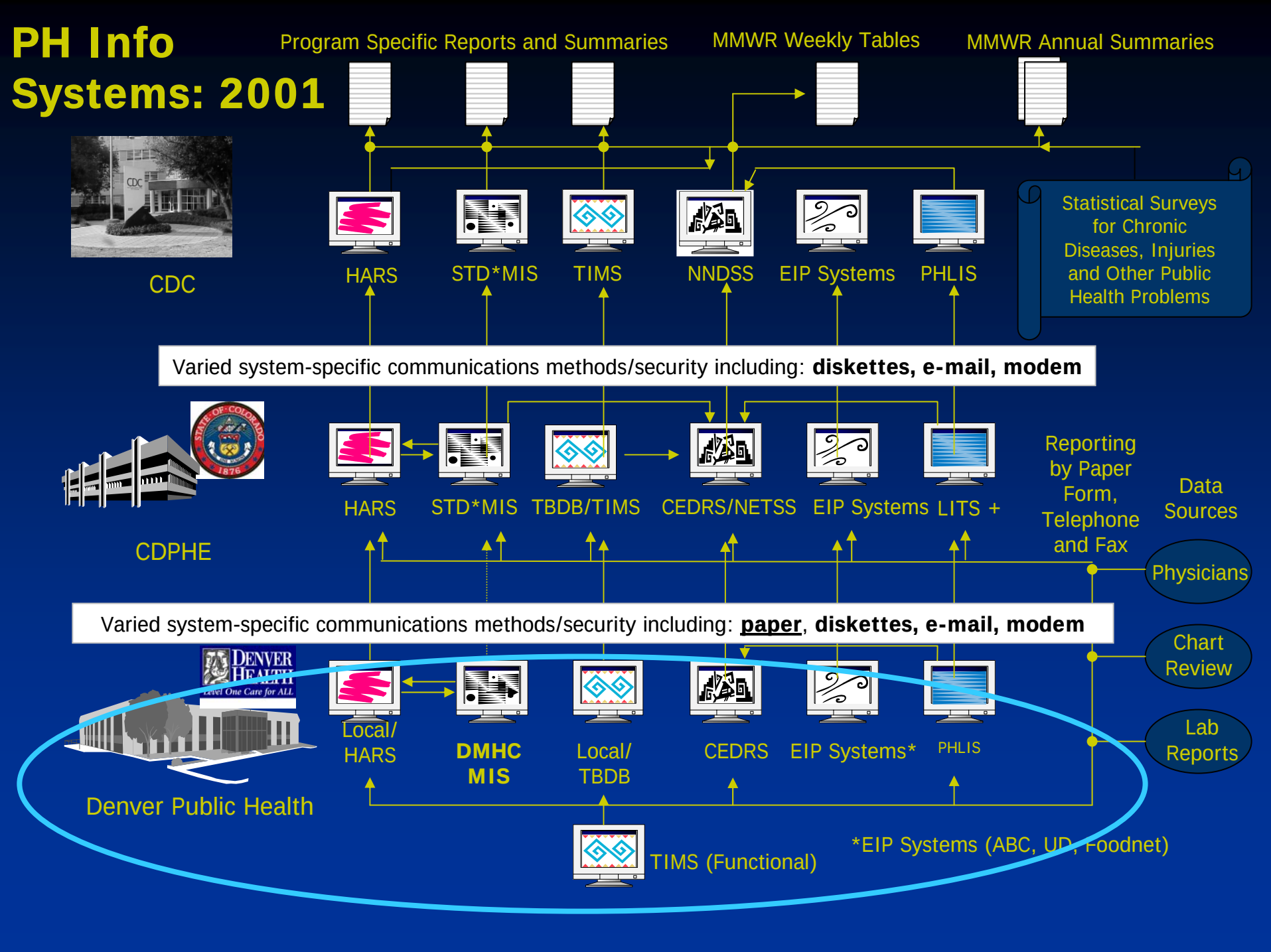
Research

# *Context - 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

# PH Info Systems: 2001



# *Context - Local*

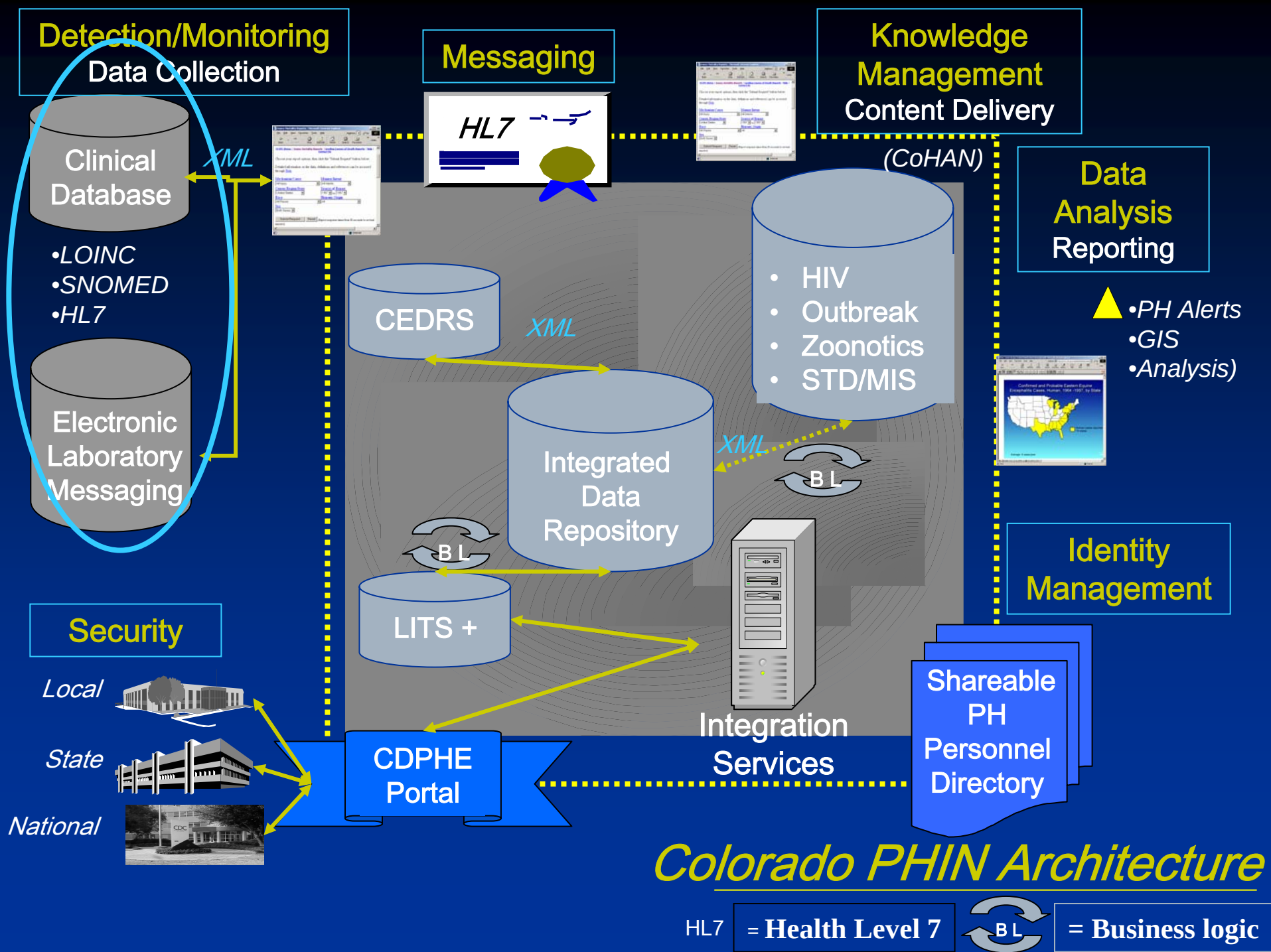
**Denver Center for Public Health Preparedness (DCPHP)**

- Following a collaboratively defined environment (state/local) 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

# *Context - State*

**CDPHE - NEDSS**

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


Detection/Monitoring
Data Collection
Clinical Database
XML
•LOINC
•SNOMED
•HL7
Electronic Laboratory Messaging
Messaging
HL7
Knowledge Management
Content Delivery
(CoHAN)
Data Analysis
Reporting
•PH Alerts
•GIS
•Analysis)
CEDRS
XML
Integrated Data Repository
• HIV
• Outbreak
• Zoonotics
• STD/MIS
XML
B L
B L
LITS +
Integration Services
Identity Management
Shareable PH Personnel Directory
Security
Local
State
National
CDPHE Portal
Colorado PHIN Architecture
HL7 = Health Level 7
B L = Business logic

# Context - Local

**Prototype mobile data collection units**

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

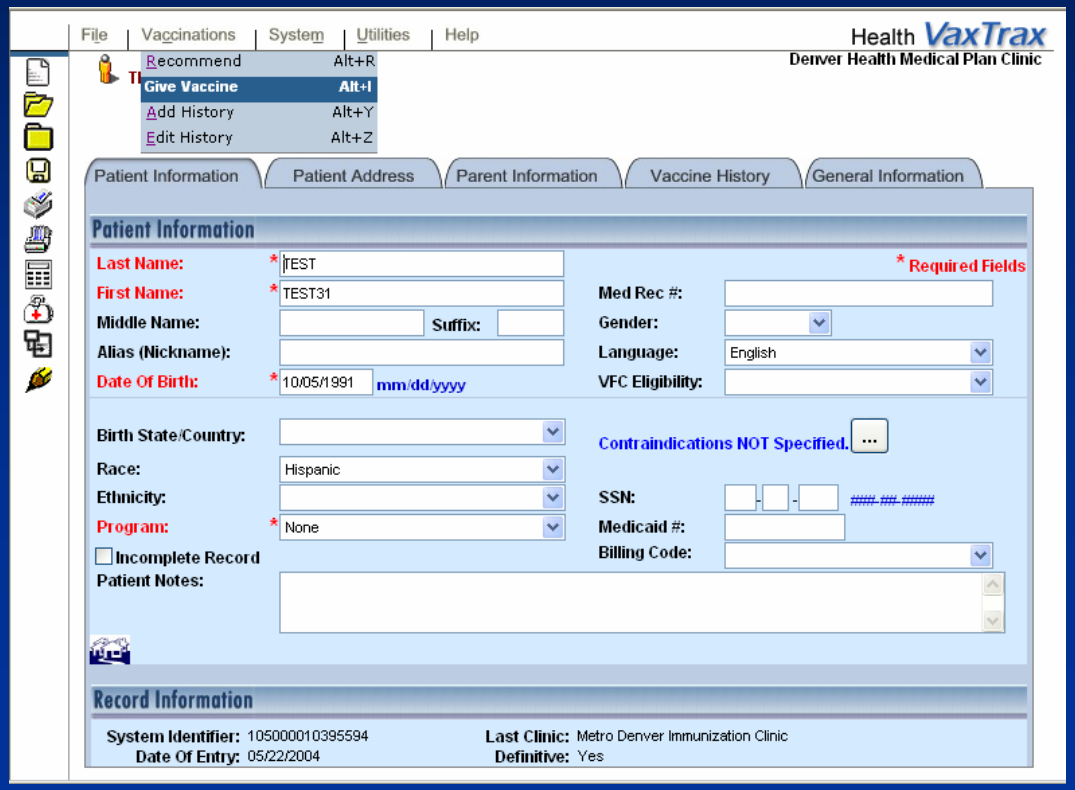
*Lober WB, et al. Communicable Disease Case Entry Using PDAs and Public Wireless Networks, AMIA 2004*

# Context - Local

## Expand local architecture

### Immunization registry

- web services
- adopt emerging national standards
- flexibility



# *Context - Local*

**Expand local architecture**

**Paperless STD Clinic**

- Functional since 3/05
- Tests PHIN standards in local/state environment
- Generates knowledge-base for implementing newer technologies

*Davidson et al, PHIN 2004*

Per #603 : Davis, Betty - Microsoft Internet Explorer

File Edit View Favorites Tools Help

**HealthDoc** Person Information

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Patient Name:** | Davis, Betty | **Person #:** | 603 | **Med Rec #:** | 9871252 | **County:** | Denver |
| **DOB:** | 12/3/1972 | **Gender:** | Female | | | | |

**Created By:** User, Super On 12/12/01 12:00 AM **Updated By:** User, Super On 7/31/02 12:00 AM

- Summary Chart
- Visits
  - Add a Visit
  - 4/15/05
    - Eligibility Items
    - Visit Forms
    - Detail Medical Chart
    - Add a Department/Service
    - Add Telephone Counseling
    - STD Clinic
      - Print a Label
      - Clinical Visit
        - Forms
        - Lab Orders
          - Add a Lab Order
          - CT SDA - Public H
          - GC SDA - Public H
          - GC Culture - STD
          - HCV - 1045874 -
          - HIV
        - DX
  - 4/14/05
  - 1/3/05
  - 12/18/04

| | | |
|---|---|---|
| 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 | >> |

Submit

*This information is private and confidential...*

Done Local intranet

Start Inbox - Mi... Patient Lis... G:\COMM... lab.doc - ... Post Resul... Per #603... 2:07 PM

# *Context - Local*

**Expand local architecture**

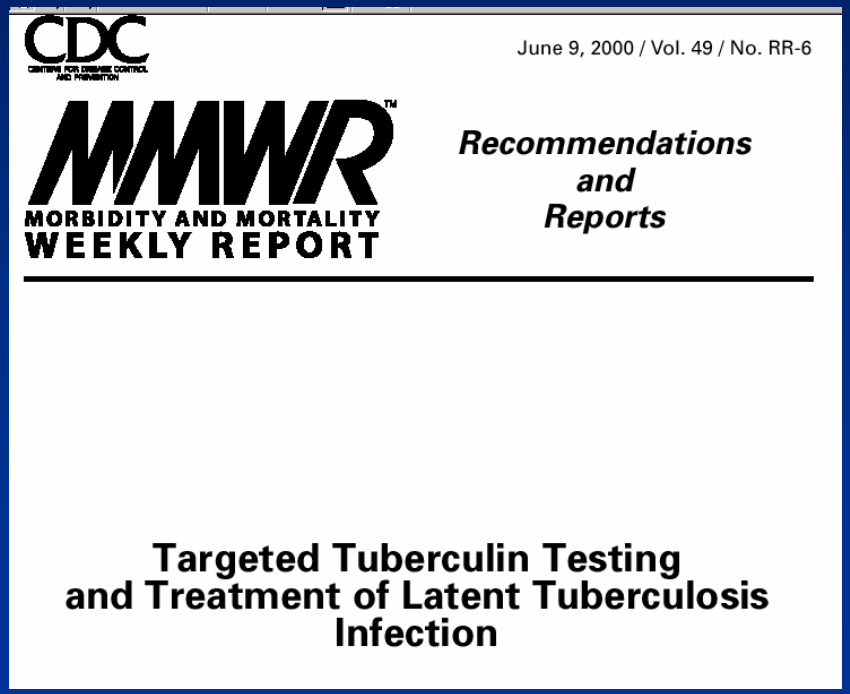
**Apply knowledge**

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

# Context - Local

**Promote enhanced disease detection**

- automated CDC guidelines



CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

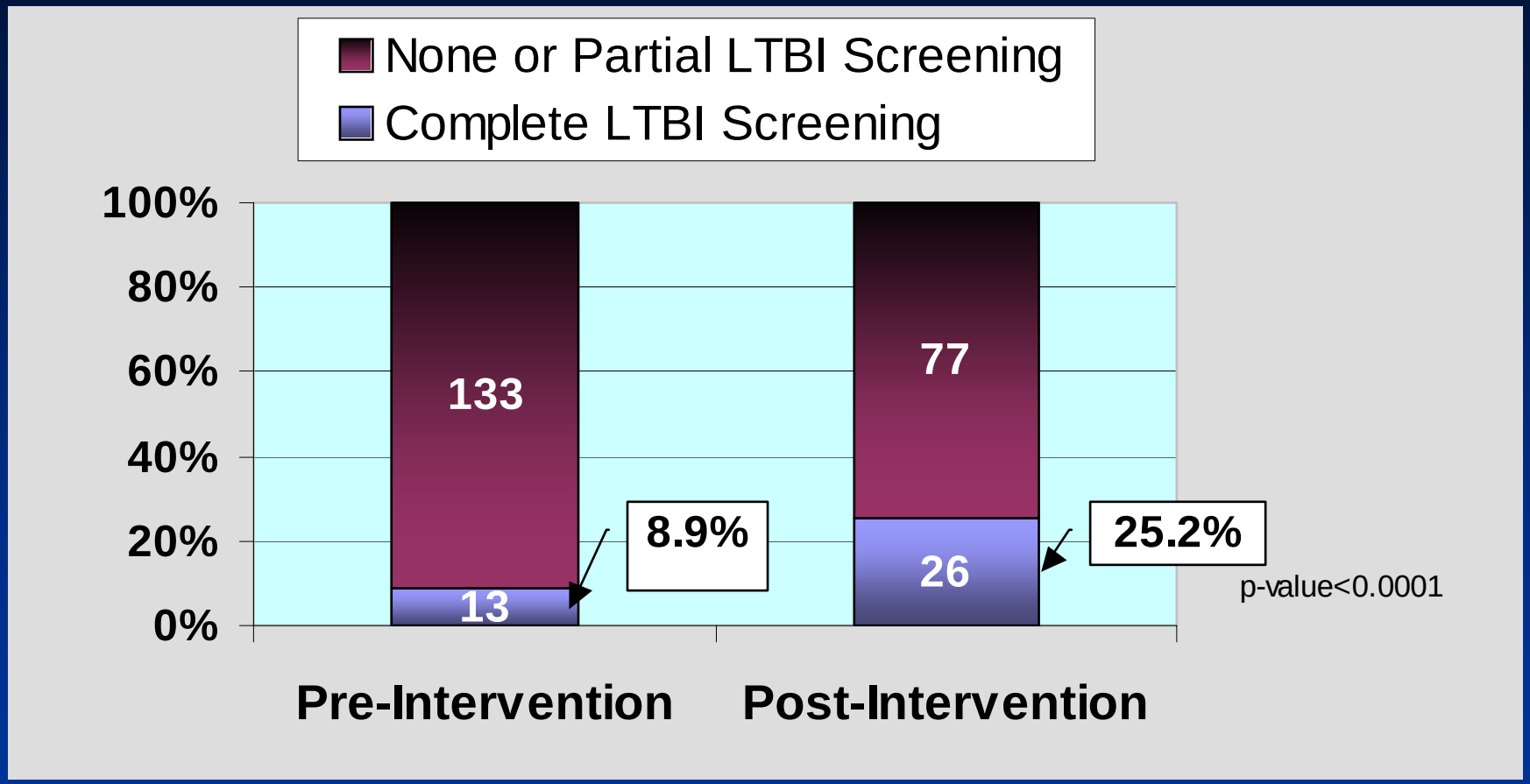
June 9, 2000 / Vol. 49 / No. RR-6

MMWR™
MORBIDITY AND MORTALITY WEEKLY REPORT

*Recommendations and Reports*

**Targeted Tuberculin Testing and Treatment of Latent Tuberculosis Infection**

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




*Garrett N et al. Integrating Public Health Practice Guidelines in Clinical Systems: A Case Study at Denver Health, PHIN 2003*

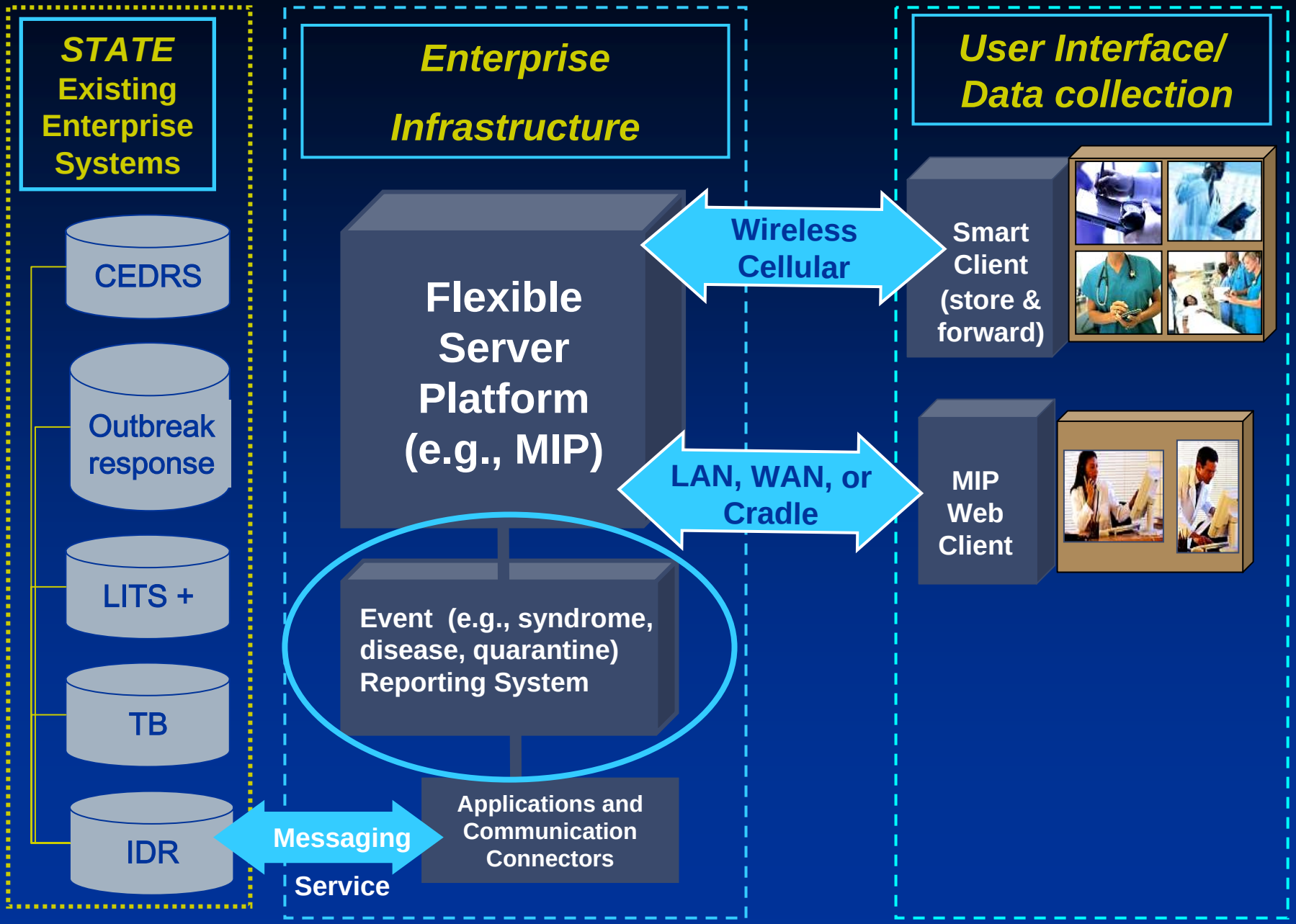
*Steele A et al. Using computerized clinical decision support for latent tuberculosis infection screening. American Journal of Preventive Medicine (in press).*

# *Context - Local*

**Develop messaging capacity**

- LOINC encoding
- Hospital lab (MISYS) – slowly getting vendor to provide product functionality
- Public health lab – use a system where "common" events can build and test capacity (*STD Clinic EMR creates HL7 messages using BizTalk*)

# Local Public Health Response Infrastructure



# *Local Lessons Learned*

Demonstrating local informatics skill, capacity and flexibility 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**
  - permits real-life testing of BT investment, and
  - enhances local value of that investment

# *RHIO: Colorado Health Information Exchange*
# *2 Complementary Initiatives*

**Goal: Create a <u>local health information infrastructure</u> for clinicians to access patient information across individual health care institutions**

## *Build upon what exists*

- Denver Health (DH)
  - 150,000 residents (25% of population)
- Kaiser Permanente of Colorado (KPC)
  - 3rd largest CO HMO (350,000 members)
- The Children's Hospital (TCH)
  - Largest pediatric specialty care provider
- University of Colorado Hospital (UCH)
  - Largest Metro area teaching hospital

# COHIE to CORHIO

**PROJECT**

**(10/2004)**

Steering Committee

**COHIE**

**Learning**

**Laboratory**

Working groups:
- Technical
- Clinical
- Evaluation
- Legal
- Organizational

Community Advisory Council

**VISION**

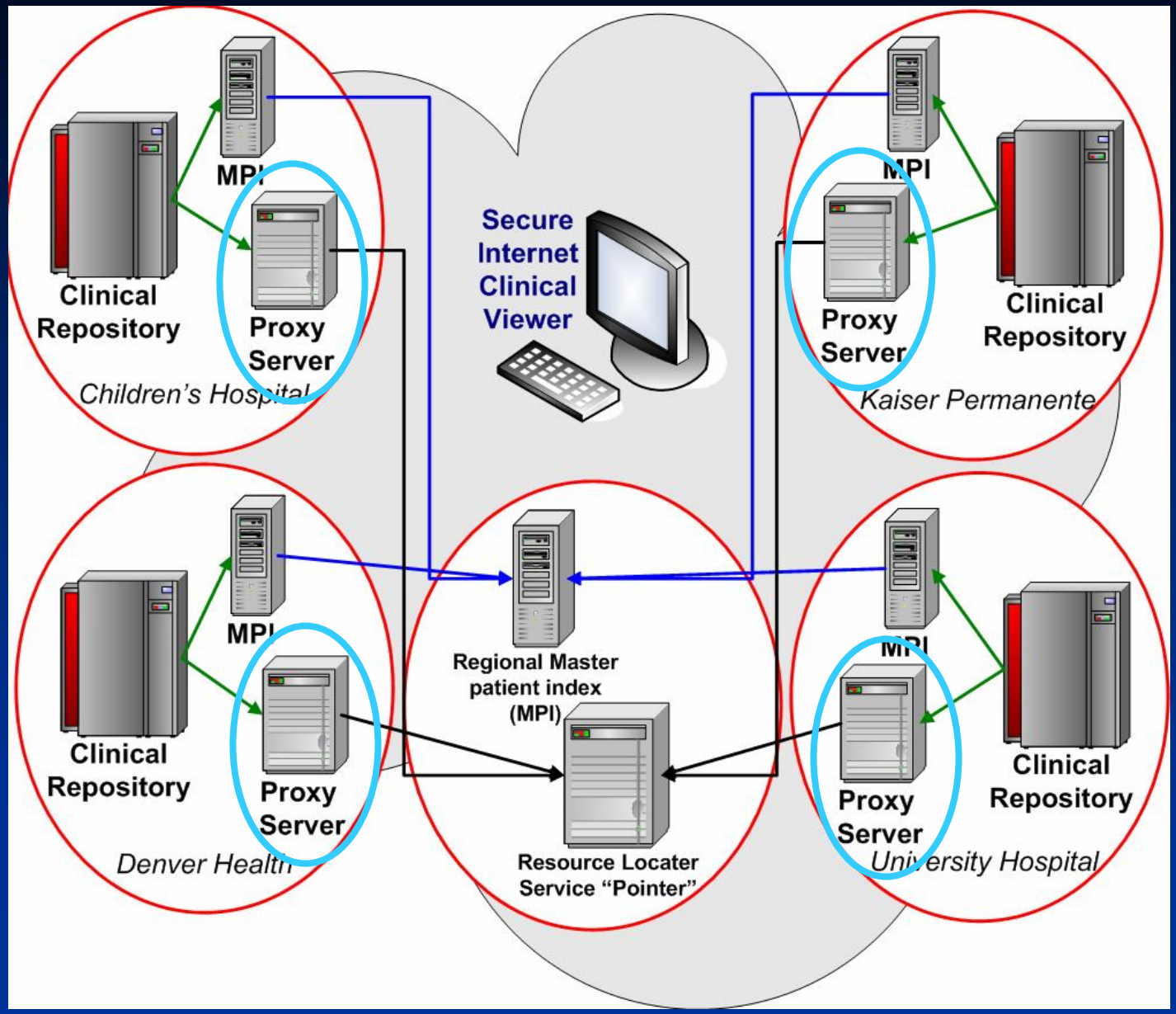
**(10/2009)**

**Colorado Regional Health Information Organization**

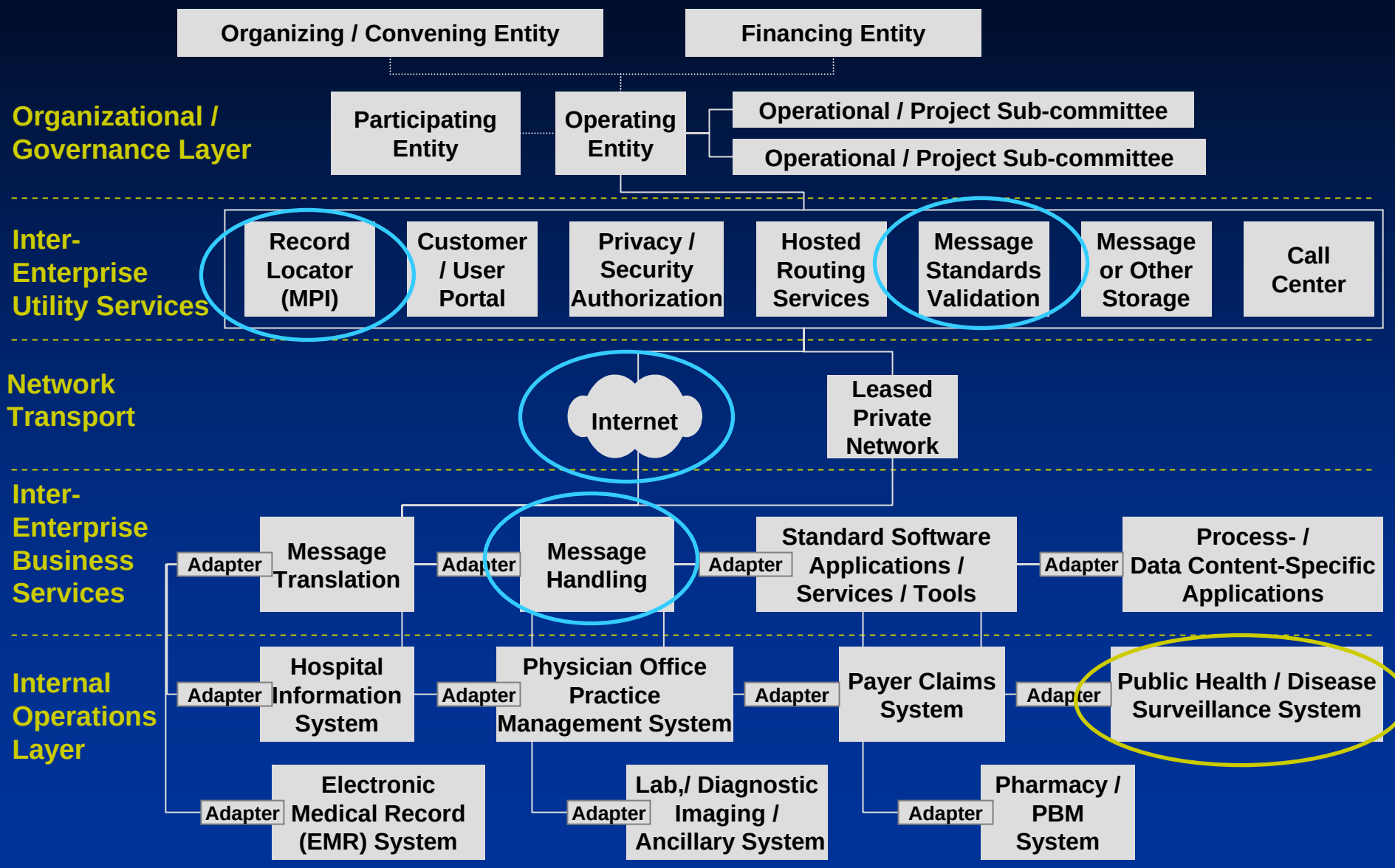
*A sharing, self-sustaining non-profit structure that:*

- Promotes **legal agreements** for participation and access
- Maintains a robust **technical environment**
- Defines clinical value through **policy and procedures**
- Manages the budget and **sustainable business model**
- Supports national **standards** and public health interfaces

# COHIE: 2005 plan



# RHIO: 2005 vision



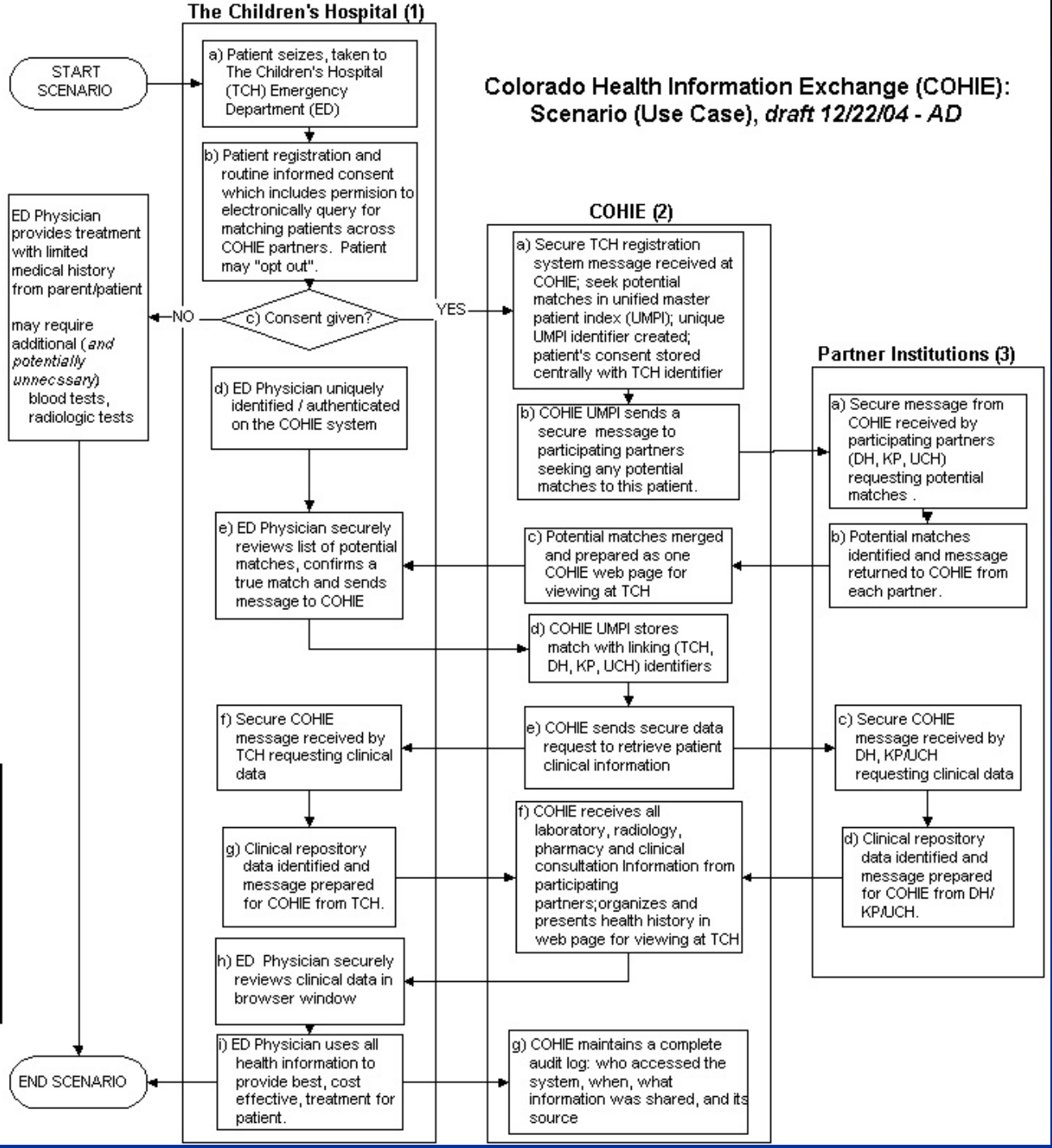
# Colorado Health Information Exchange (COHIE): Scenario (Use Case), *draft 12/22/04 - AD*

**SCENARIO ASSUMPTION (USE CASE Pre-condition):**

4 year old boy with history of prior seizures.
Born prematurely at University of Colorado Hospital (UCH) with prolonged stay in NICU
1 year ago had first seizure while a Kaiser (KP) patient. Evaluated with CT scan, EEG and neurologist visit.
Started on unknown medication at that time.
Patient lost health insurance coverage, transferred care to Denver Health (DH) outpatient clinic about 6 months ago.
Seen at Westwood Family Health Center for blood test and change in medication about 3 days ago

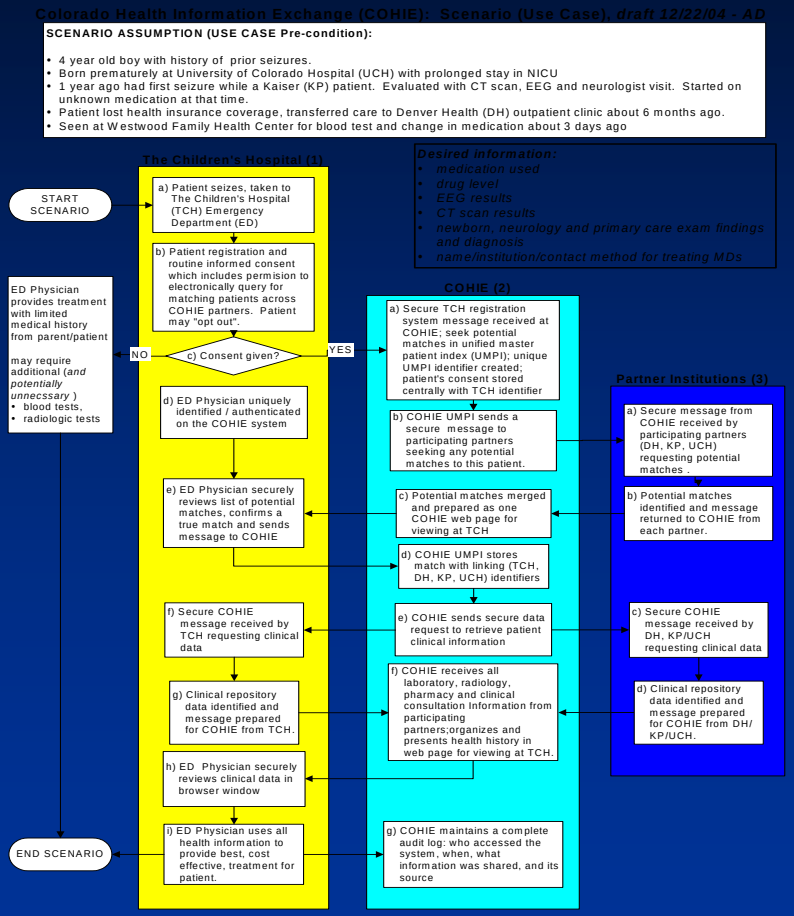
***Desired information:***

*medication used*
*drug level*
*EEG results*
*CT scan results*
*newborn, neurology and primary care exam findings and diagnosis*
*name/institution/contact method for treating MDs*

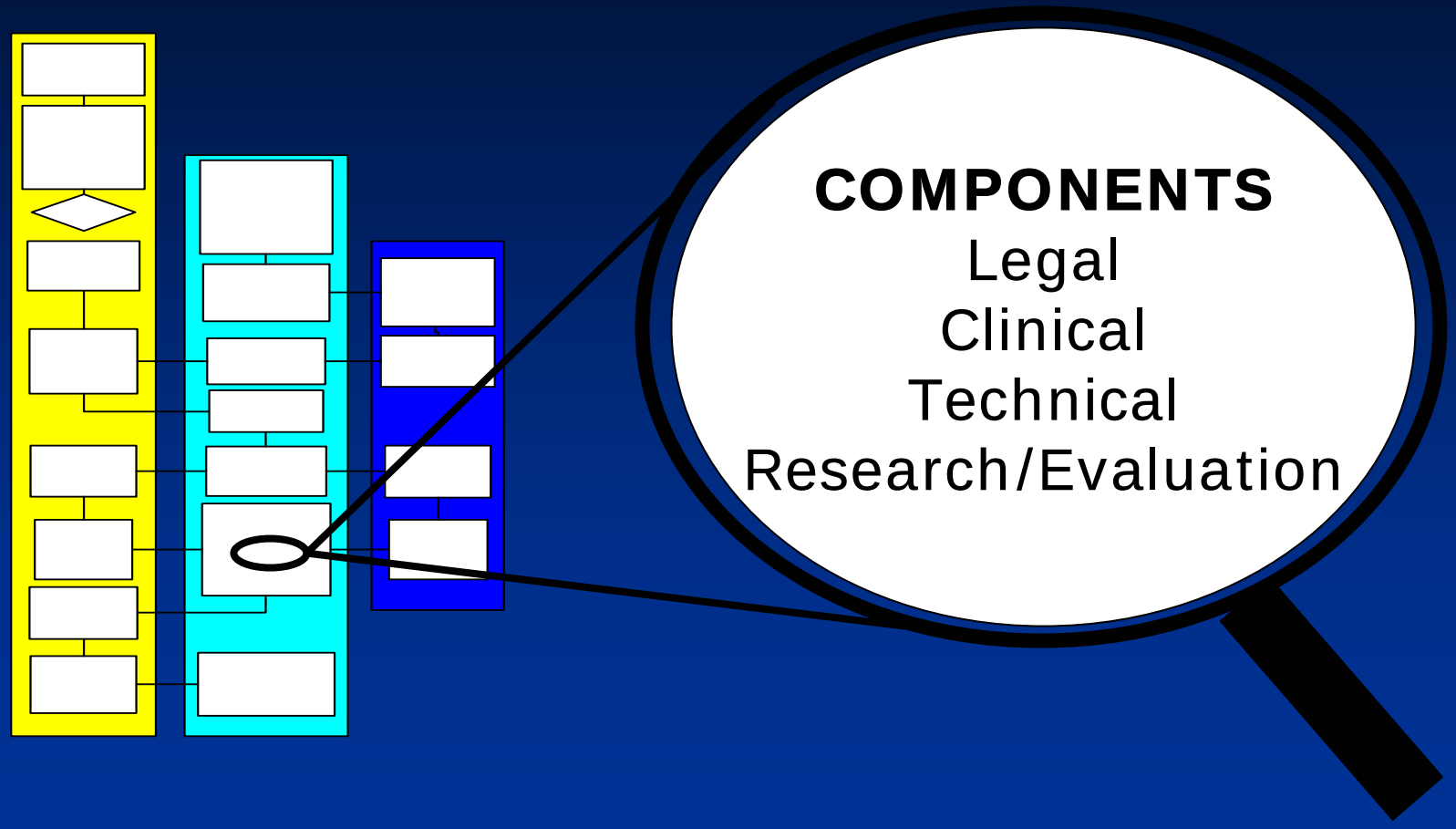


# The "Primary" Scenario

- Clarifies the scope (common understanding)
- Provides a structure to focus meetings and discussion
- Creates a mechanism for logging issues and decisions



# COHIE Working Groups
# Iterative reviews



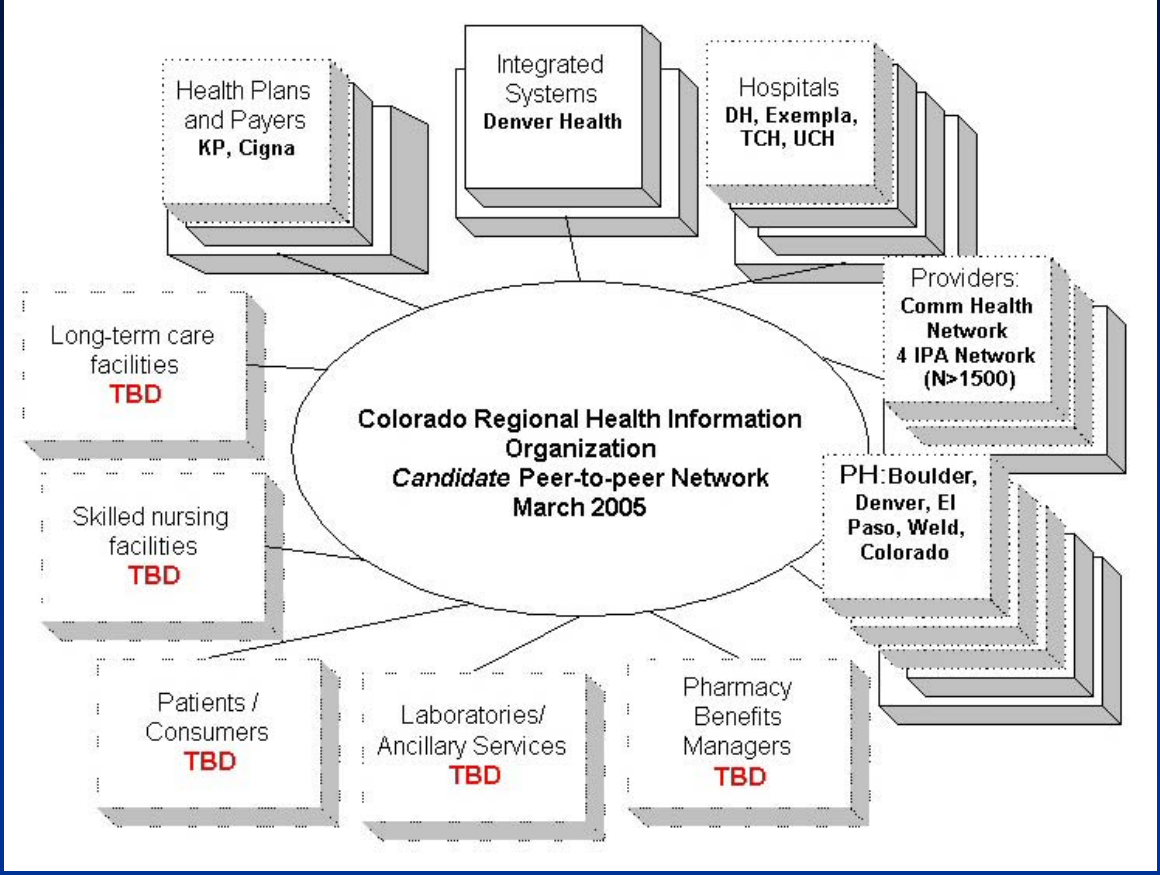
# Other use cases

- Public Health
  - Registries and evaluation of care quality
  - Active surveillance due to recent events
  - Immunization tracking and reminder/recall
  - Others ??
- Use of global-level decision support
- Continuity of care record (CCR) for effective care transitions (acute -> treatment centers -> home)
- Patients controlling EHR access

# *CORHIO Process*

- Colorado Health Institute (*neutral convener*)
- Legal support
- Explore/define relationship COHIE ⇔ CORHIO
- Working Group
  - **Business plan**
  - **Articles of incorporation (501c3)**
  - **Defining the board**
  - **Education / public relations**
- Community Advisory Council

# CORHIO Candidate Partners



# *RHIO brings …*

- **Experience:** early phases are very dynamic
  - Markle Foundation: reference implementation
  - AHRQ HIT - Resource Center
  - Indianapolis, Boston, Santa Barbara
- **Leadership:** Driven by local relations and politics
- **Reality:** RHIO value proportional to widespread EHR deployment; only will happen when local environment/providers see benefits
- ***Strategic potential:*** Groundswell of EHR implementation activity and architectural design can greatly affect ultimate PHIN value
- ***LESSON: public health needs to participate in planning to assure architected to PH needs***

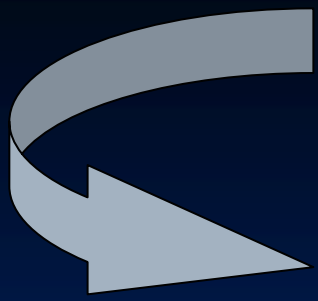
# *PHIN brings …*

- **Experience:** building a conceptual and operational framework for secure data exchange
  - National standards
  - Electronic laboratory reporting
  - PHIN Messaging system (HL7/NLM experiment)
- **Leadership:** adopting and setting standards
- **Reality:** accessing health data for surveillance and response monitoring is a locally-driven phenomenon

- ***Strategic potential:*** leverage investment in RHIO to yield robust public health information

- ***LESSON: PHIN resources (experience and funds) can accelerate RHIO and serve PHIN needs***

# PHIN + RHIO



**Local PH Strategic Planning**
- Business processes
- System requirements

**Drives**

**IT Investment Management**

**Supported by**

**Enterprise Architecture**

**Improved by**

**Portfolio Performance Management**

**Influences**

**IT Governance & Management Processes**

# *Conclusions*

- Engineer local information systems to address the local environment keeping in mind specific state and federal data needs.

- Define local public health business processes (*e.g., PH use cases*) and associated system requirements, especially related to RHIOs.
  - Local PH tasks and values are often different than federal perspective.
  - Emphasize horizontal integration with greater local PH value.

- Engage in the RHIO process locally. National policies will not alone build RHIOs. Funding is essential; PHIN can support those efforts at the local level.