

Standards-Based Public Health Reporting from Clinical Sites: CDC's Role

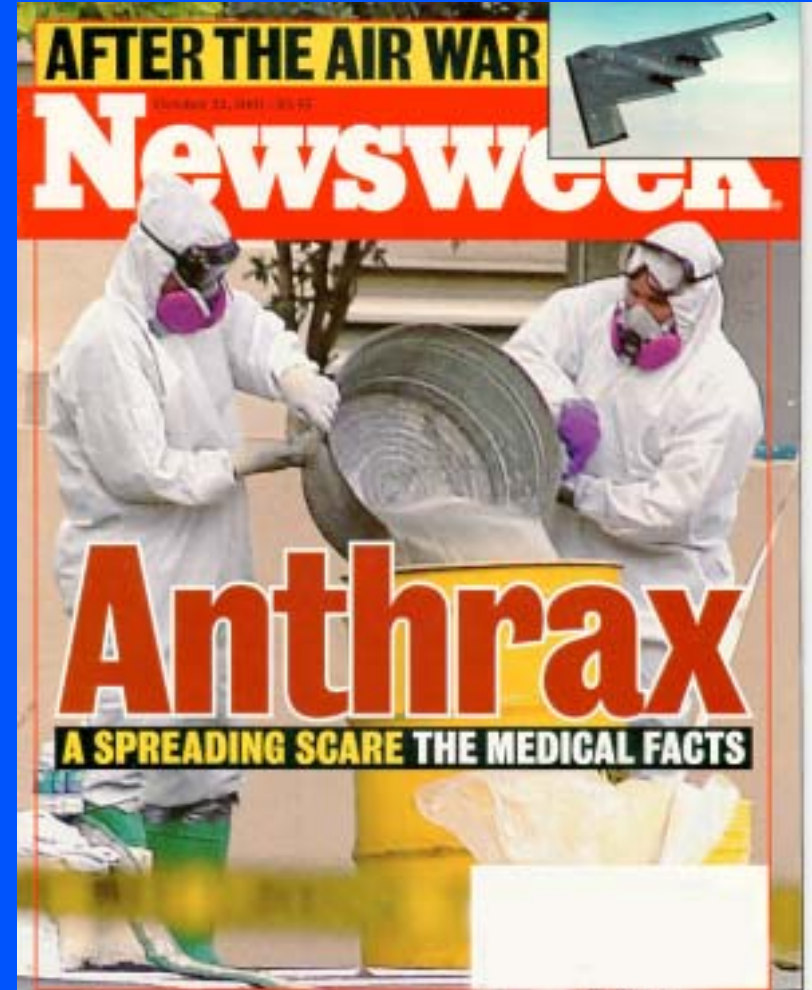
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Clinical-Public Health Partnerships: A New Sense of Urgency



Overview

- Public health surveillance and clinical reporting
- Emergency department data and CDC recommendations for ED patient record systems
- CDC's National Electronic Surveillance System (NEDSS)

Bioterrorism Preparedness and Response is Part of Public Health

Biological Warfare Defense

2. The Epidemic Intelligence Service of the
Communicable Disease Center

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Public Health's Role in Bioterrorism

Preparedness and Response

- **Detection** of an unannounced bioterrorist attack would come from ongoing disease surveillance mechanisms
- Public health has the expertise and authority to undertake **investigation** of the attack— source, vehicle, magnitude, progression
- Public health has the expertise and authority to institute appropriate population wide **interventions**: screening, prophylaxis, vaccination, quarantine, and other countermeasures

Public Health Surveillance

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THE NEW ENGLAND JOURNAL OF MEDICINE

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SPECIAL ARTICLE

THE SURVEILLANCE OF COMMUNICABLE DISEASES OF NATIONAL IMPORTANCE*

ALEXANDER D. LANGMUIR, M.D.†

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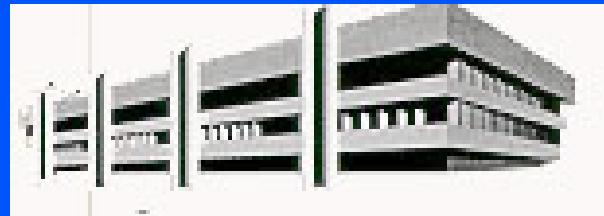
IN the introduction to his comprehensive report on the cholera epidemic of 1848-49, William Farr,¹ terly, annual and special reports he became an active protagonist in the great controversies of his time.

Ongoing and systematic collection, analysis, interpretation, and dissemination of data on health problems that affect or threaten the general population.

Public Health Surveillance



CDC



State, County, and Local Health Departments



Laboratories



Practitioners

Surveillance Approaches Proposed for Rapid Detection of a Bioterrorism Event

- Informed alert health care provider notifies local or state health department 24/7 contact
- “Routine” public health surveillance system detects an aberration
- Novel data sources (e.g., veterinary labs, retail supermarket sales, business absentee data) scanned with various aberration detection algorithms
 - **Utility of these approaches needs rigorous evaluation**

The Emerging Science of Very Early Detection of Disease Outbreaks

**Michael M. Wagner, Fu-Chiang Tsui, Jeremy U. Espino, Virginia M. Dato,
Dean F. Sittig, Richard A. Caruana, Laura F. McGinnis, David W. Deerfield,
Marek J. Druzdzal, and Douglas B. Fridsma**

Work on early warning systems raises key questions:

- Which data are useful?
- What are the timeliness requirements for different agents?
- How should the responsiveness of a detection system be measured, particularly for detecting outbreaks that have *not* occurred in areas monitored by the new system?

Clinical Reporting: A Potentially Invaluable Public Health Asset

American Medical
NEWS

www.amednews.com AMERICAN MEDICAL ASSOCIATION • VOLUME 34 NUMBER 33

Physicians are early warning system against bioterrorism

Reporting suspicious disease clusters to public health agencies is a critical part of the nation's ability to combat an attack involving a biological pathogen.

Susan J. Landers
AMEDNEWS STAFF

Washington ALL PHYSICIANS WILL BE on the front lines if a bioterrorism event occurs.

After the Sept. 11 attacks in New York City and Washington, D.C., the threat of an assault with a lethal virus or other pathogen, already considered a very real possibility by many in the medical community, has moved to the top of the public's fears.

"It's not that the risk is greater now," said J. Chris Hawk III, MD, a member of the AMA's bioterrorism



Advantages of Emergency Department Clinical Reporting to Public Health

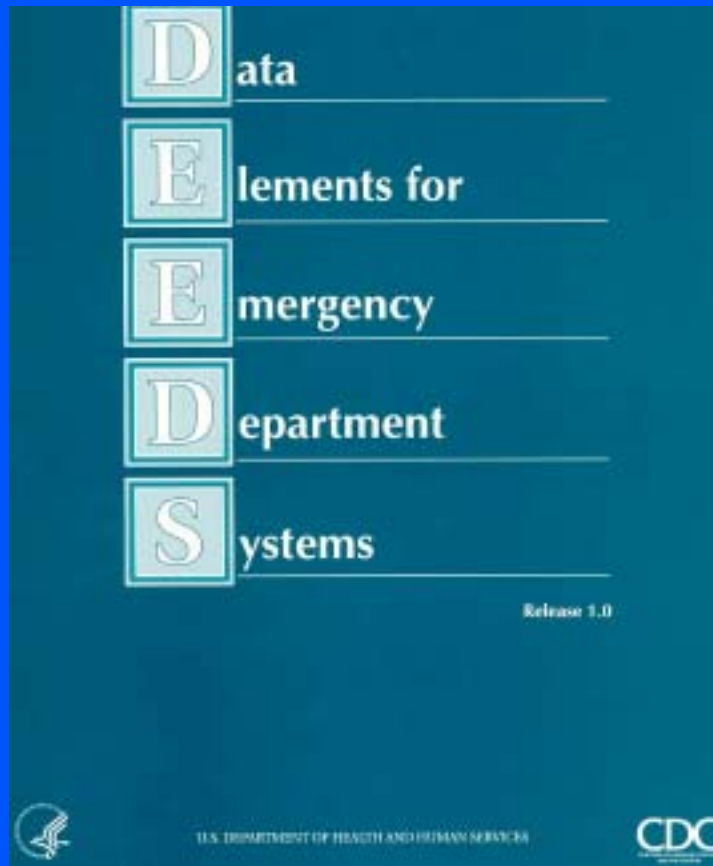


- Large volume and range of clinical problems
- Early timing of patient presentations
- Coverage of inpatients and outpatients

Obstacles to Emergency Department Clinical Reporting to Public Health

- Busy clinical environments
- Shortcomings in data quality and completeness
- Limited, but increasing use of electronic patient records
- Data standards are underdeveloped and underused

A CDC-Recommended Set of Specifications for ED Patient Records



- Objective is to foster greater uniformity in ED patient records
- Intended for voluntary use
- Specifications for 156 data elements in 1st version
- Focus is on data that have the highest reuse value for multiple users

Mapping DEEDS Data Elements to Health Level 7 (HL7) Version 2.3

- Documentation for each element includes its HL7 data type
- Element components are specified in accordance with HL7
- Elements are organized into segments for HL7 messaging

DEEDS Data Element 4.06 - Chief Complaint

Definition - Patient's reason for seeking care or attention, expressed in terms as close as possible to those used by patient or responsible informant

Data Type (and Field Length) – Coded element (200)

Repetition - Yes

Uses of DEEDS 1.0

- ED patient record systems
- LOINC database
- HL7 implementation guide for HIPAA-mandated ED claims attachment
- ASTM standard
- ED public health reporting projects

Electronic Public Health Reporting



Oregon Health Sciences University

Oregon Health Division

Secure
Transmission
Daily

Example of HL7 ORU Message Sent from OHSU ED to OHD

```
MSH|^~\&|OHSU_EMSTAT|OHSU|OHSU_OHD_Project  
|...|ORU^R01|. . .  
PID|1|01509416^2^m10|ED214784^1^m10|...  
PV1|1|E|...  
OBR|1|||ED214784|||200001020059|  
OBX|1|CE|^Diagnosis 1^^^|1|926.19^Crush-  
abdomen^I9C^12725^^EmStatDx|  
OBX|2|CE|^Diagnosis 2^^^|2|^I9C^^|
```

Oregon Project Accomplishments: Reportable Conditions

- Operational case definition: ED diagnosis = “PID,” “Pelvic inflammatory disease,” or “Salpingitis”
- 90% of PID diagnoses in ED during a 10-month study were not reported to OHD via laboratory reporting
- Electronic reporting from the ED will significantly increase PID cases reported

Limitations of Local, State, and National Surveillance Systems

- Multiplicity of categorical systems
- Data incomplete, not timely
- Burden on respondents in health care sector increasingly unacceptable
- Systems do not utilize state of the art information technology

CDC's National Electronic Disease Surveillance System (NEDSS) Initiative

- **NEDSS is a broad initiative using national data and information system standards for development of efficient, integrated, and interoperable surveillance systems at the state and local levels**
 - Data standards—data models <http://www.cdc.gov/nedss>
 - Harmonizing with HL7 Reference Information Model
 - NEDSS System Architecture <http://www.cdc.gov/nedss>
- **Includes tools for electronic data transfer to health departments from health care sector:**
 - multi-jurisdictional clinical labs; from healthcare IT systems
 - single “pipeline”: single format, receiving point, security
- **Security standards (HIPAA compliant) to maintain public health track record in protecting sensitive data**

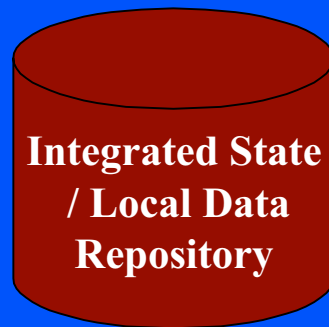
Current Status of NEDSS

- 50 states, 6 cities, and 1 territory funded for NEDSS: 43 started with Assessment & Planning phase.
- September 2001: 35 states and 1 city receiving funds for development of NEDSS compatible systems
- 2002: Public Health and Social Services Emergency Fund provides over one billion dollars for state and local public health capacity (CDC) and for hospital “surge capacity” (HRSA)
 - NEDSS standards explicitly included in guidance to states as part of IT specifications and functions

NEDSS Systems Architecture Elements

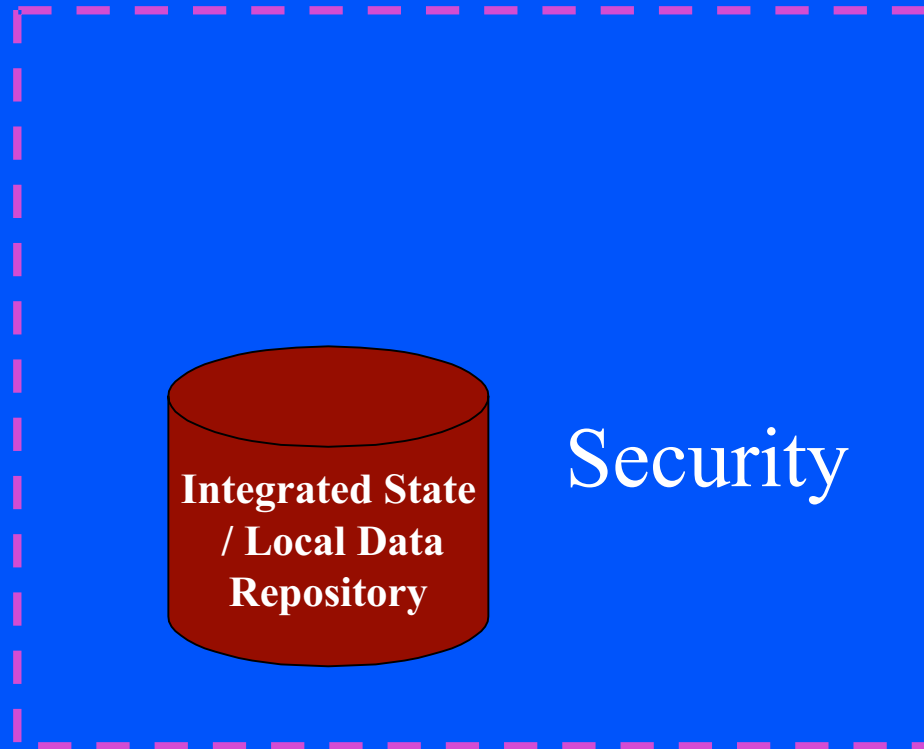


- The NEDSS architecture is currently built around 8 elements that are functionally and technically defined.
- The elements encourage highly modular systems implementations.
- They are delineated by industry standards and the *de facto* standards of existing commercial product niches.
- They facilitate the use of commercial software as elements, but minimize proprietary commercial applications that cross element boundaries.
- They try to facilitate exit strategies to take advantage of new commercial development.



Implement an integrated data repository

- able to be patient centered, non-categorical
- support “thick” client and web applications
- (ODBC, JDBC and ANSI SQL)



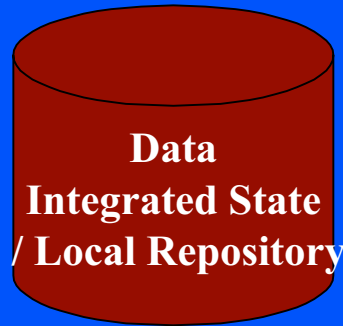
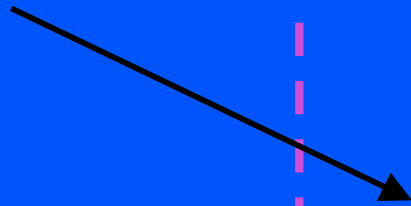
Implement a security system and appropriate security policies (Internet-based, with a firewall and certificates or tokens)



Local Health
Department
Or
Clinical
Site



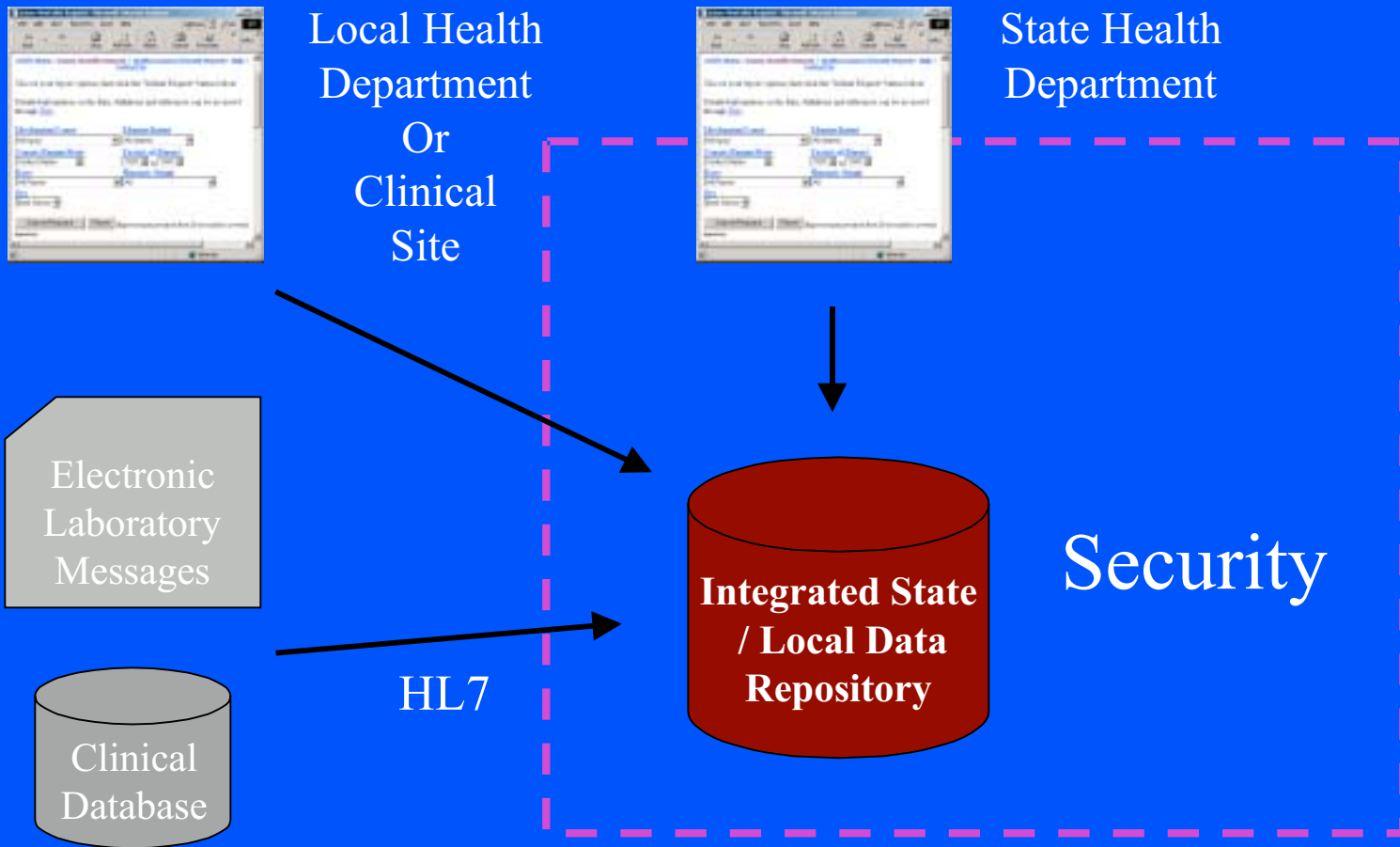
State Health
Department



Security

Conduct and support web browser-based data entry and data management.

- Internet presentable, but not necessary
- Multi-tiered including an application server to run web “forms” from others



Accept, route and process electronic HL7 messages containing laboratory and clinical content (LOINC, SNOMED).



Local Health Department
Or
Clinical Site



State Health Department

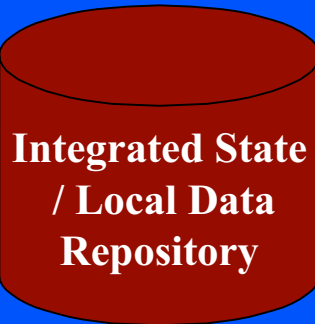


Electronic Laboratory Messages



Clinical Database

HL7



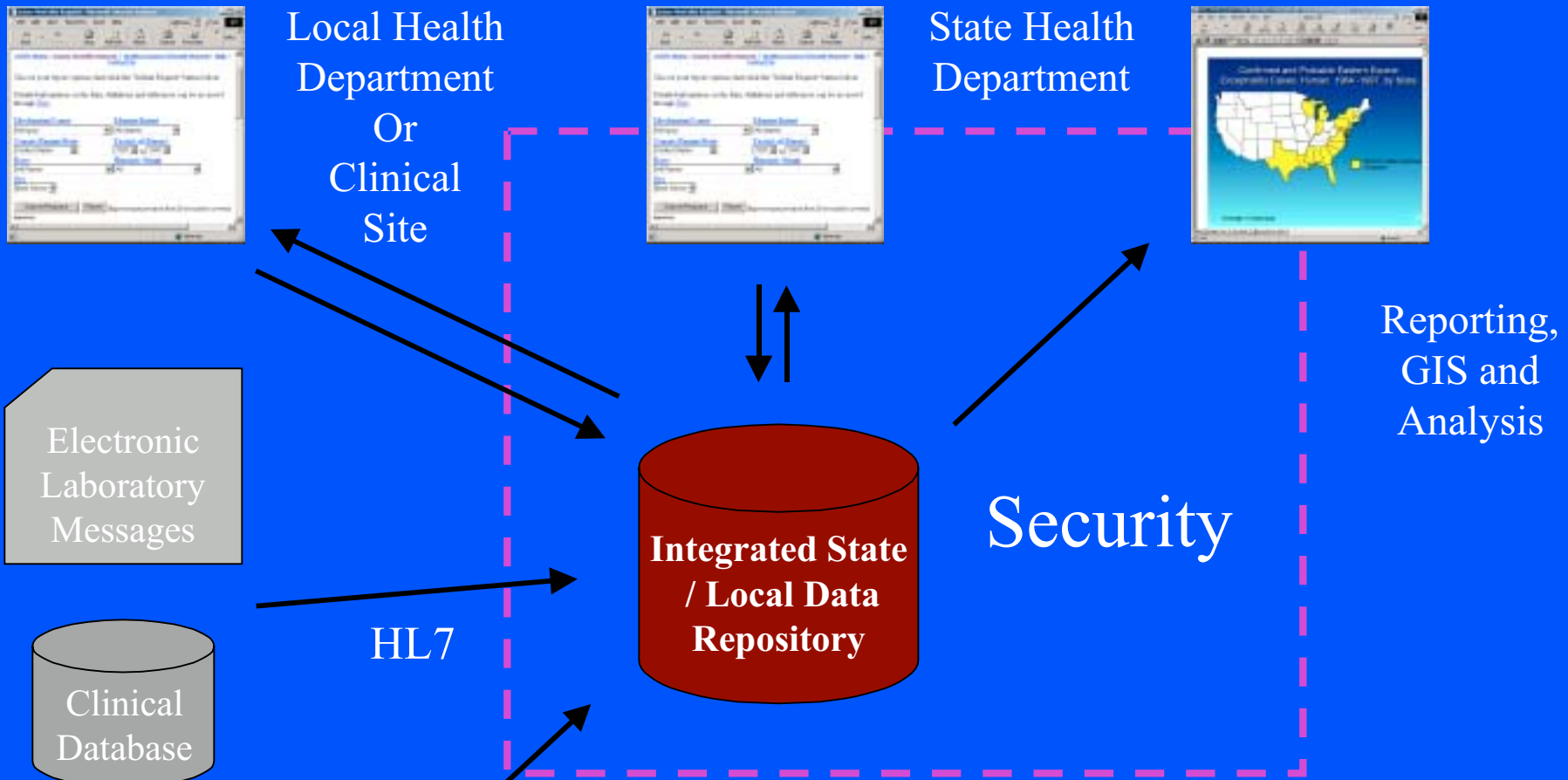
Integrated State / Local Data Repository

Security

XML Data Exchange

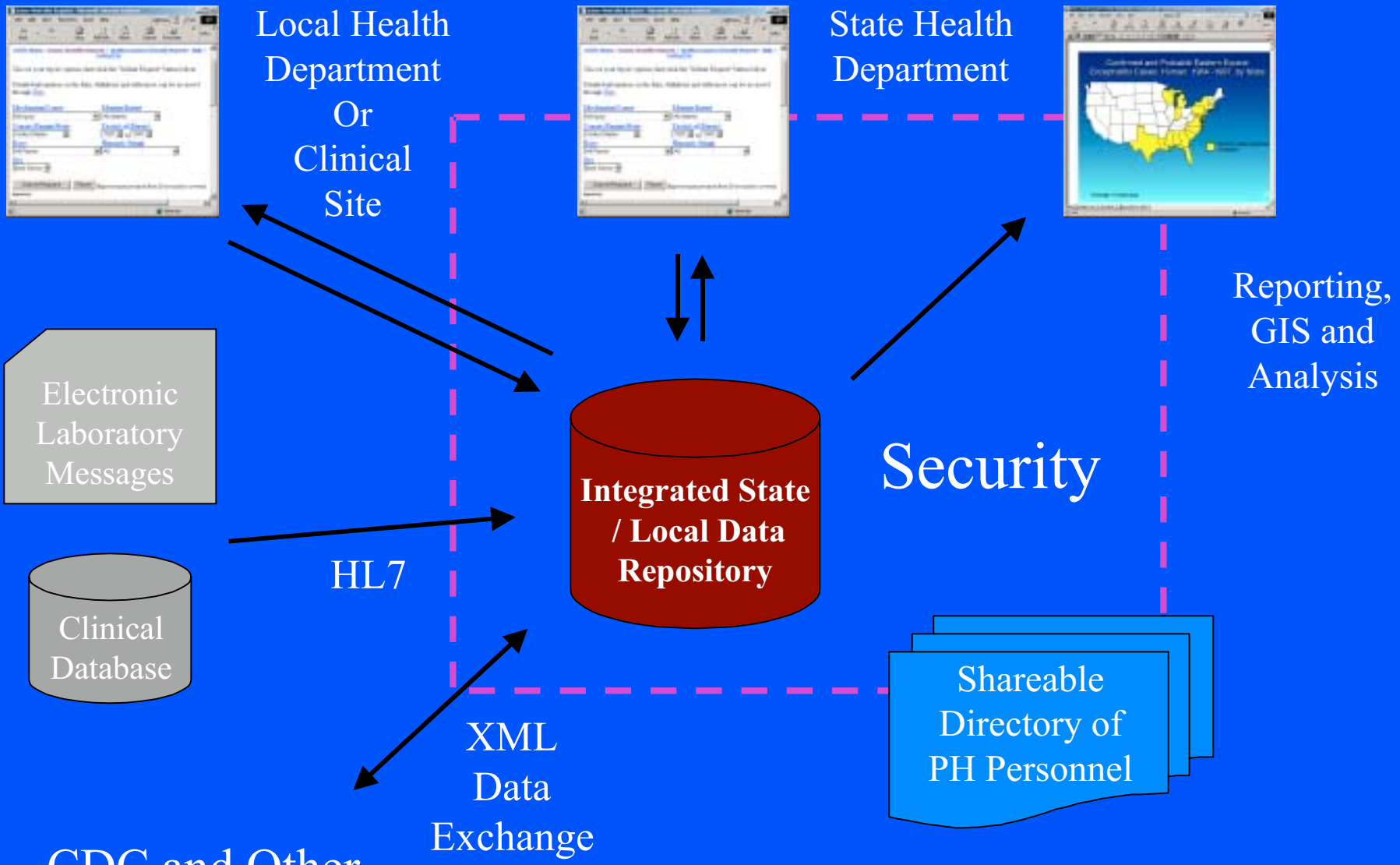
CDC and Other Health Depts.

Develop active data translation and exchange (integration broker) functionality (XML, DTD's HTTPS).

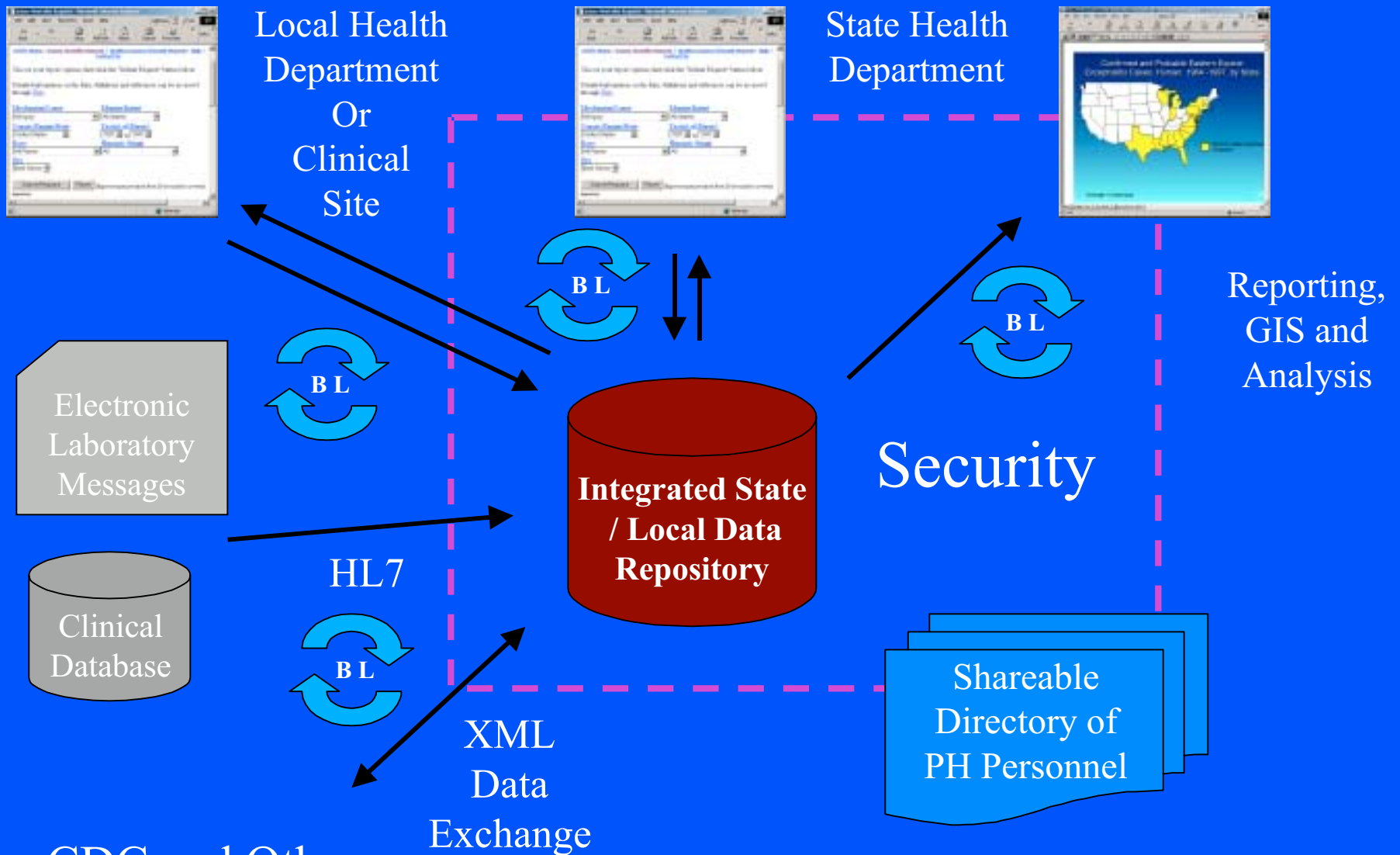


CDC and Other Health Depts.

Develop data reporting and visualization capability (messaging and import/export ODBC, JDBC, ANSI SQL).



Implement a shareable directory of public health personnel (LDAP).



CDC and Other Health Depts.

Develop transportable business logic capability (COM, CORBA, EJB).

How Can NEDSS Help Encourage Use of Standards in Clinical Systems?

- Understanding of need for preparedness is high among practitioners, hospitals, laboratories, and the public
- Public-private partnership with eHealth Initiative includes public health, Standards Development Organizations, clinical systems vendors supporting 80% of US hospitals, laboratories, and practitioners
 - practical solutions to implement standard messages
 - early step en route to NHII
- Electronic data reporting complements alert clinicians, backstops the system, (and eases burden of public health reporting requirements)
- NEDSS standards are compatible with HIPAA requirements

What does NEDSS have to do with HIPAA?

- **HIPAA mandates national health care data standards and policies in four areas:**
 - Transaction content; unique identifiers for providers, health plans; security; privacy
- **NEDSS architecture standards are HIPAA compliant:**
 - supports “dual use” for security, messaging elements
- **Approach to NEDSS data standards is HIPAA compliant:**
 - Adopting HIPAA standards where relevant eg electronic laboratory reporting in NEDSS uses standards in HIPAA NPRM for laboratory claims attachment
 - Advocating inclusion of data elements relevant to public health with SDO's

What does NEDSS have to do with HIPAA Privacy Rule?

- Privacy Rule allows current practice of sharing data with public health
 - Rule permits health care providers to share individually identifiable information with legally authorized public health entities for public health activities
 - Public health activities include surveillance (NEDSS), investigation, intervention

A Standards-Based Approach Supports State and Local Health Departments

- Provides ability for public health to accept electronic information from clinical and laboratory sources
- Use of data in electronic format, when available
- Decreased respondent burden, decreased health department burden
 - Provides ability for public health to accept electronic information from clinical and laboratory sources
- Efficient use of infra-structure at state and local levels
 - Skilled IT personnel
 - Software, hardware

New Opportunities for Clinical-Public Health Partnerships in Surveillance

Health Care Finally Goes Digital

Doctors and Hospitals Find They Can't Stay Offline Any Longer

By LAURA LAYBRO

THE HEALTH-CARE industry finally has little choice: It has to get wired.

For years, American and European doctors and hospitals have lagged behind other industries in joining the information-technology club—and it didn't look like they'd ever sign up. Because of the unusual payment structure of the health-care industry, providers have never had many incentives to actually improve the quality of their product or install clinical information systems that would let them manage patient care better.

Moreover, health care tends to be local, and not subject to the competitive forces that have forced quality improvement elsewhere—such as the auto industry after Japanese car makers arrived. Quality advocate Don Berwick, founder of the nonprofit Institute for Healthcare Improvement, once famously said: "So far, health care has no Toyota."

Now, at long last, the spur to change has arrived—but it isn't coming from competition. A number of factors, including mounting evidence that information technology helps hospitals save lives, have come together to make hanging back no longer an option for doctors and hospitals. New U.S. rules aimed at protecting the electronic transfer of medical data will be virtually impossible to comply with unless hospitals upgrade their information systems.

So, the issue now is not whether to get new IT systems, but what to buy first, how to pay for it, and how to train health-care workers—from physicians to lab technicians—to do their jobs differently.

There is a growing recognition among the political leaders in Europe that information technology can improve

for a massive transition to clinical information systems. Fewer than 10% of hospitals in the U.S. now have such systems, which include computerized order-entry systems that let doctors create and send prescriptions by computer, instead of writing out scripts; electronic medical records; patient Web sites that let doctors and patients communicate and manage care as a team; and mobile devices that provide doctors making their rounds with vital information on patient care.

"There is a clear linkage now between technology and better patient outcomes," says Steven Lieber, president of the Chicago-based Health Information and Management Systems Society, or HIMSS, which surveys hospitals and suppliers on the use of information technology.

SEPT. 11. In the aftermath of Sept. 11, a national information network to detect bioterrorism attacks and disease outbreaks is at the top of the U.S. government's agenda for the first time since the idea first took root a decade ago. The newly created Office for Public Health Preparedness is seeking more than \$1 billion (\$1.87 billion) for programs that include the Centers for Disease Control's Health Alert Network (HAN), a nationwide program to connect public-health departments via the Internet. The CDC is also developing a National Electronic Disease Surveillance System, which aims to establish a single information standard that all federal, state and local institutions will be able to use to exchange their data.

NEW U.S. RULES. Starting next year, the 1996 Health Insurance Portability and Accountability Act, or HIPAA, takes effect in the U.S. The act mandates the creation of a standardized method for insurance companies and doctors to exchange financial and administrative information electronically (which significantly reduces overhead



APR 2002

Web References and Contact Information

National Electronic Disease Surveillance System

<http://www.cdc.gov/nedss>

Data Elements for Emergency Department Systems

<http://www.cdc.gov/ncipc/pub-res/deedspage.htm>

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