

Connecting Communities for Biosurveillance

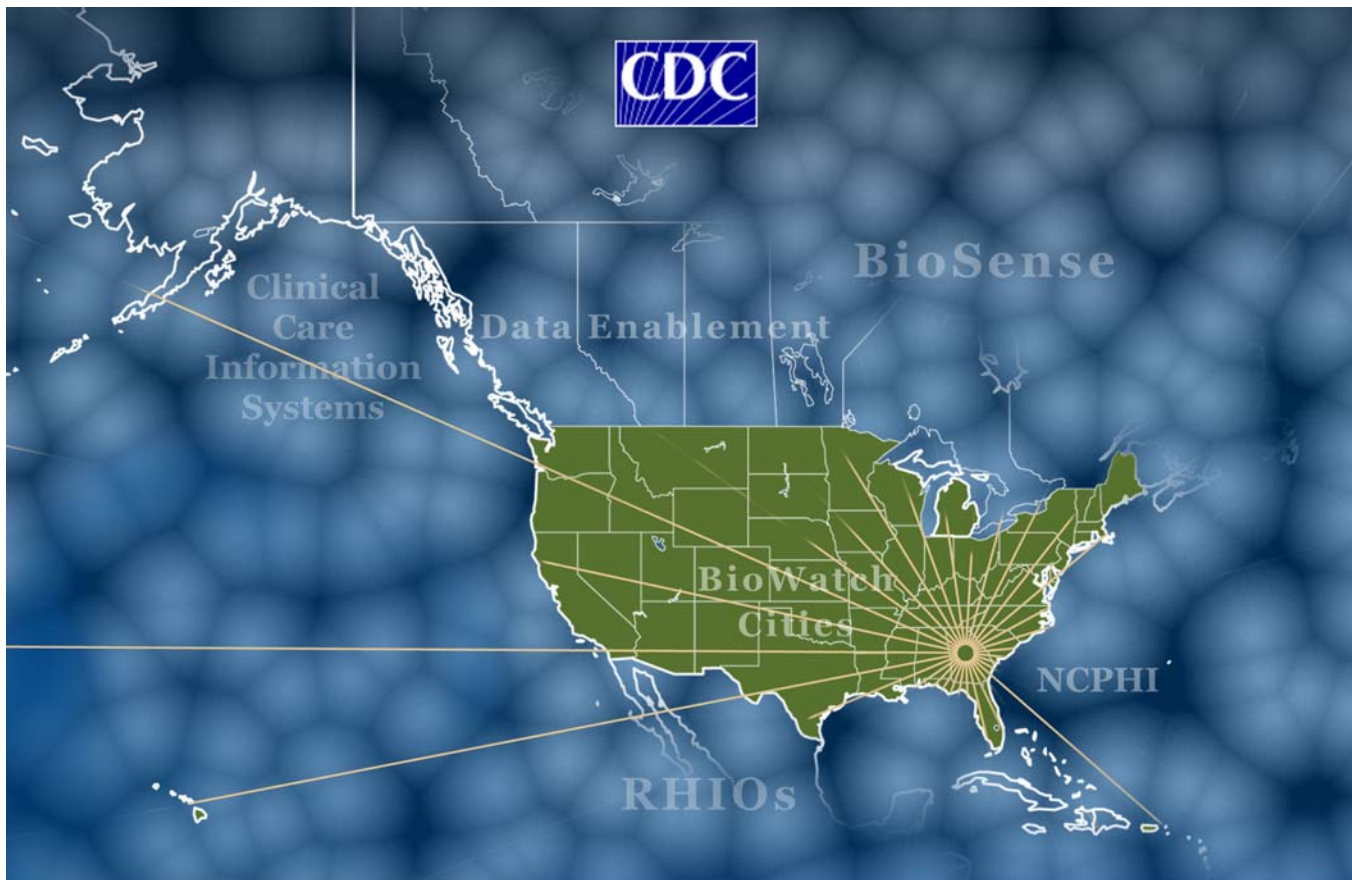
Creating Real-Time Clinical Connections

David Groves, MBA
Vice President, Public Health Informatics
Science Applications International Corporation



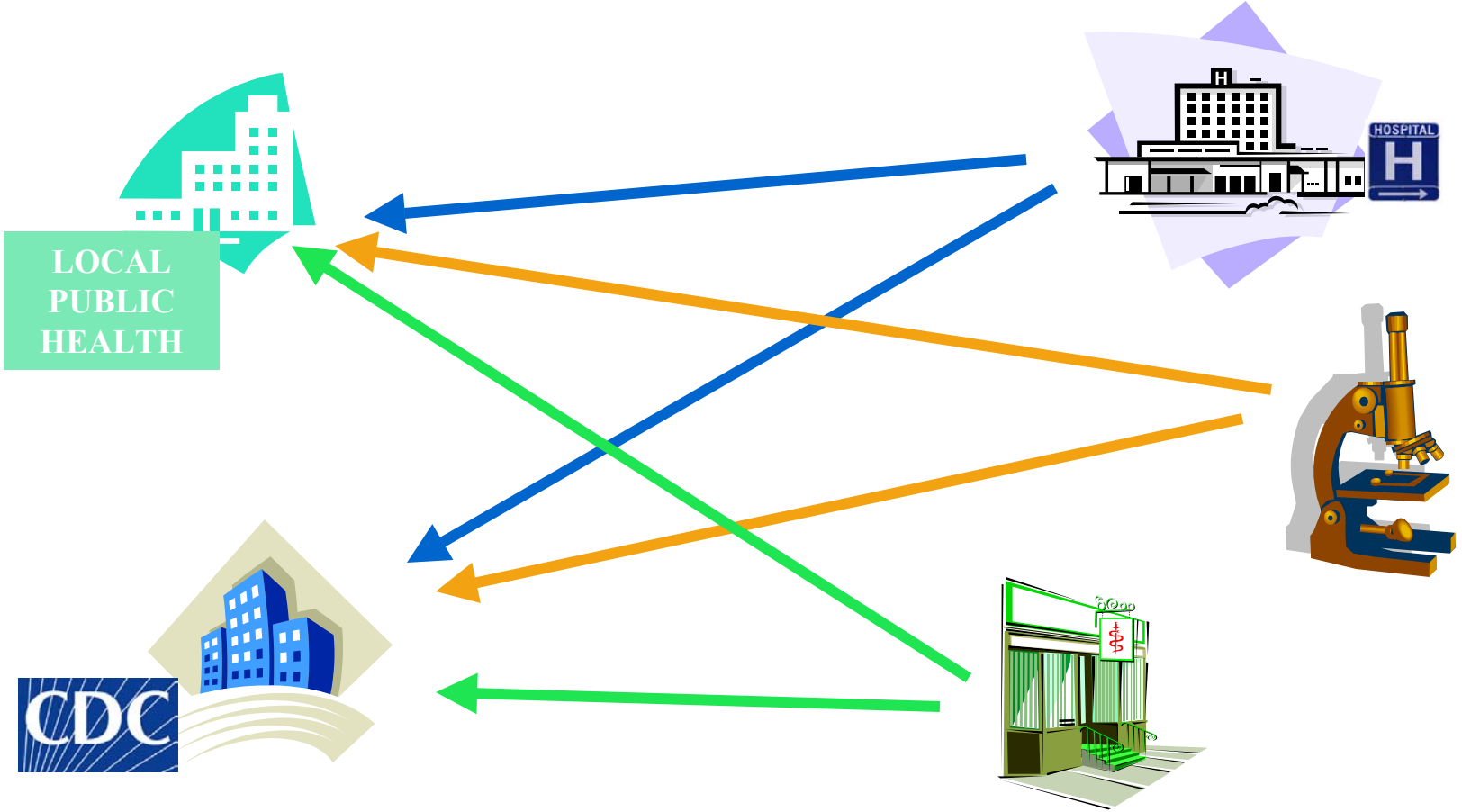


BioSense Data Provisioning



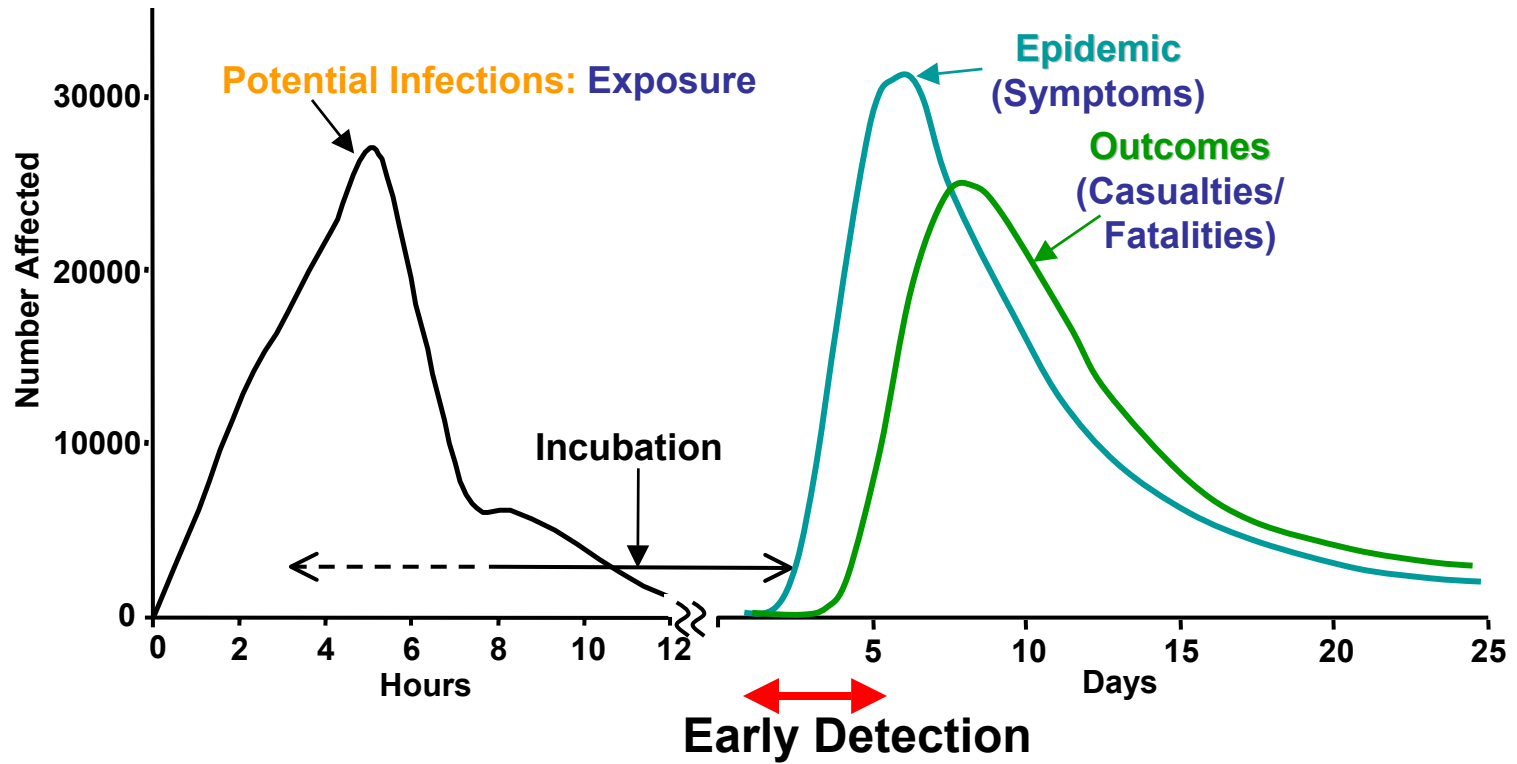


Bridging Healthcare and Public Health





Health Data for Detection and Response



Situational Awareness



Biosurveillance Requirements

- Data Agreements
- Data Standards
- Vocabulary Standards and Coding
- Message Standards
- Maintaining the integrity of patient record
- Privacy by de-identification or anonymization
- Timeliness of reporting
- Secure and reliable connectivity



Specifies

1. Data
2. Coded Terminology
3. Messaging Structures



PHIN Messaging Standard

BIOSENSE DATA MESSAGING GUIDE

HL7 Version 2.5

Document Version ID: 1.04b

February 14, 2006

Centers for Disease Control and Prevention





BioSense Data Types of Interest

- Hospital Census and Utilization
- Patient Demographic and Visit Data
- Clinical Problems, Observations and Diagnoses
- Laboratory Orders and Results
 - Microbiology, Serology, Immunology
- Radiology Orders and Results
 - Diagnostic exams for pneumonias and fractures
- Medication Orders
 - Prefer Pharmacy encoded orders



Coded Terminology Standards

- Improving semantic interoperability
- Consolidated Health Informatics Recommended Standards
- Managed by the CDC PHIN Vocabulary Services
- Drawn from several standards organizations
 - Health Level 7 (HL7)
 - ICD-9-CM
 - CPT
 - LOINC
 - SNOMED CT



Vocabulary Coding Samples

- Patient Class:
PHVS_PatientClass_HL7_2x
- Diagnosis Type:
PHVS_DiagnosisType_HL7_2x
- Observations: LOINC
- Identified Organisms:
SNOMED

	B	Obstetrics
	C	Commercial Account
	A	Admitting
Triage Note (ED)	34120-6	INITIAL EVALUATION NOTE
ED Problem Observation	18624-7	ED PROBLEM/FINDING
Diagnosis Observation	11300-1	ED DIAGNOSIS IMPRESSION
Chief Complaint Observation	11292-0	ED CHIEF COMPLAINT - PATIENT REPORTED



Message Standards

HL7 V2.5 Standard

- Admit, Discharge and Transfer Messages (partial)
 - ADT^A01 – Patient Admission
 - ADT^A04 – Patient Registration
 - ADT^A08 – Patient Update
- Order Message
 - ORM^O01 – General Order
- Result Message
 - ORU^R01 – Unsolicited Observations
 - ORU^R01 – Census Report
- Pharmacy Order
 - OMP^O09 – Medication Order



HL7 Message Example

- HL7 Data Type: CE – Coded Element
 - Std Code+ Std Description+ Std Code System OID
 - + Local Code+Local Description+Local Code System
- OBX – Observation Result Segment
 - a) OBX -2 => Data Type (CE – Coded Element)
 - b) OBX-3 => Observation / Test Name (LOINC)
 - c) OBX-5 => Lab result (SNOMED CT)

```
OBX||CE|5887-5^Virus Throat Culture^2.16.840.1.113883.6.1^VCLT^Virus Culture^Local  
||407479009^Influenza A Virus^2.16.840.1.113883.6.96 ^INFA^Influenza A^Local|
```



Coded Terminology Mapped at Sender Site

OBX||CE|^^^VCLT^Virus Culture^Local
 ||^^^INFA^Influenza A^Local|



Local Vocabulary			CDC Biosense Vocabulary Map		
Local Concept Code	Local Concept Name	Local Code System Name	Biosense Concept Code	Biosense Concept Name	Biosense Code System OID
VCLT	Virus Culture	Local	5887-5	Virus Throat Culture	2.16.840.1.113883.6.1
INFA	Influenza A	Local	407479009	Influenza A Virus	2.16.840.1.113883.6.96



OBX||CE|5887-5^Virus Throat Culture^2.16.840.1.113883.6.1^VCLT^Virus Culture^Local
 ||407479009^Influenza A Virus^2.16.840.1.113883.6.96 ^INFA^Influenza A^Local|

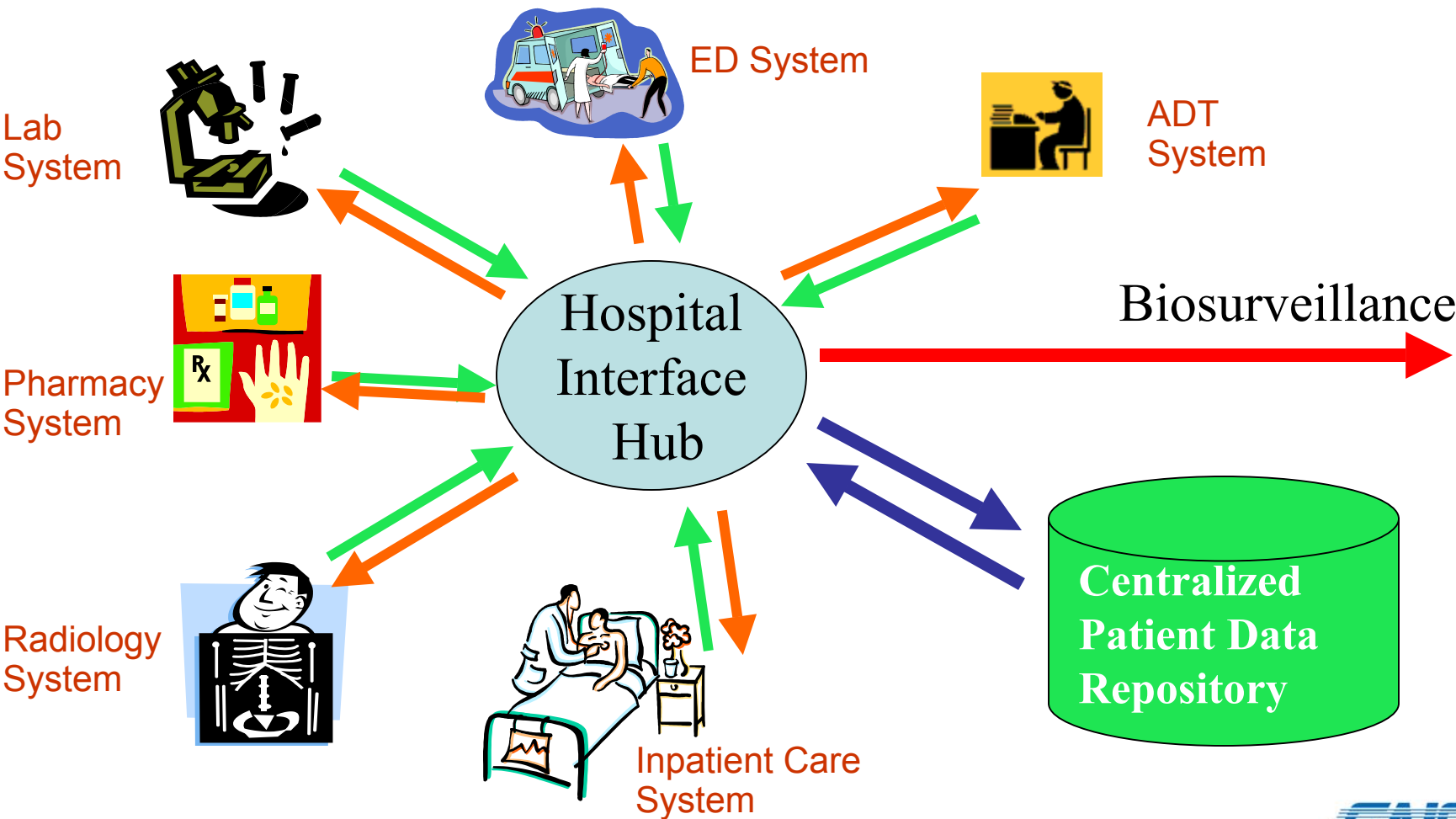


Data Acquisition Options

- HL7 Messaging Intercept
 - Real-Time
 - Transactional – based on trigger events
 - Collects data already **in motion** in the healthcare enterprise
 - Lends itself well to HL7 v2.x messaging
- Clinical Case Report
 - Periodic reporting
 - Summary of all relevant data types
 - Extracts data **at rest** – in clinical databases
 - Lends itself more to HL7 v3.0 messaging

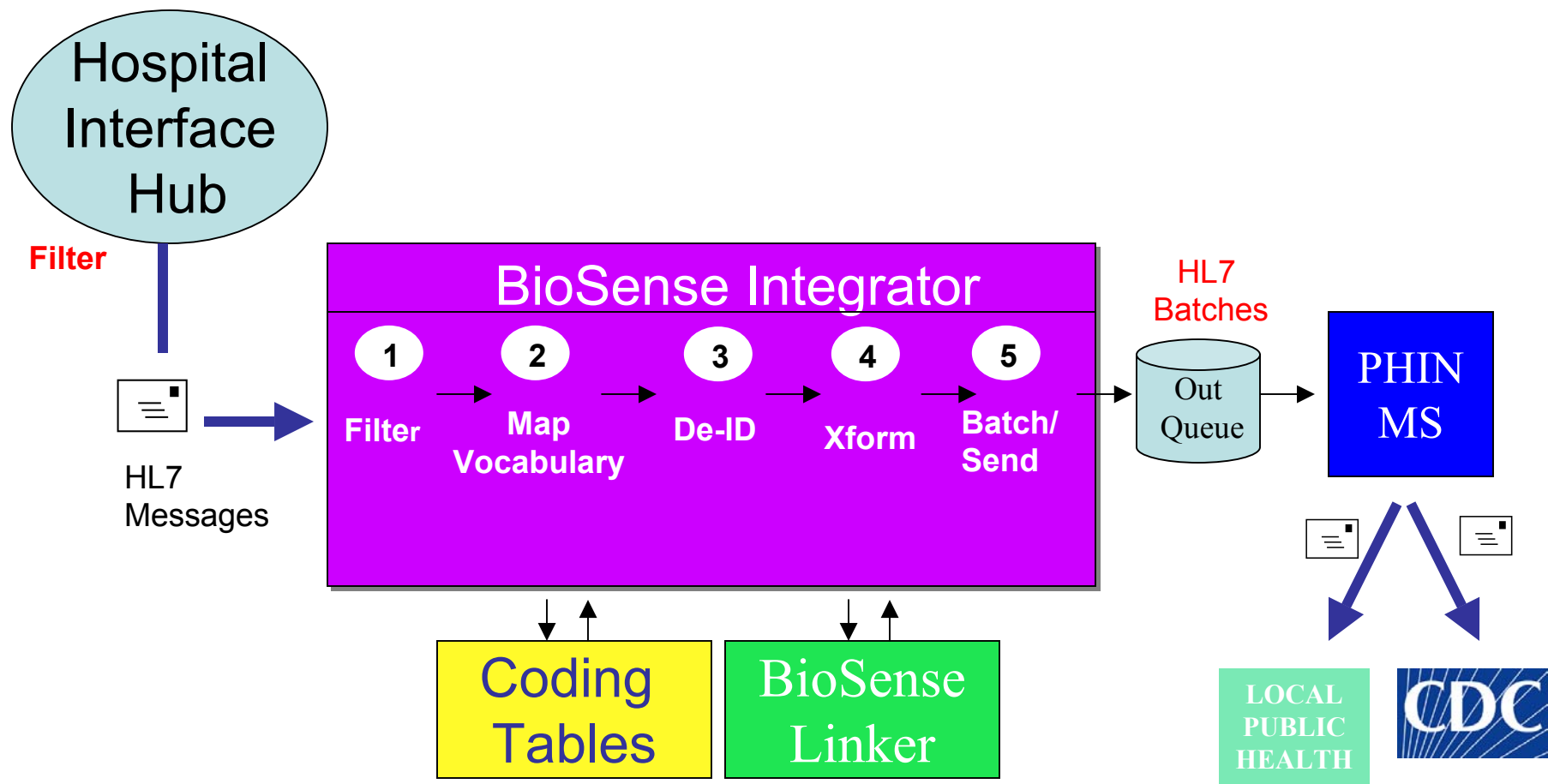


Data is Constantly Moving In Hospitals





BioSense Message Intercept Solution





BioSense Data Provisioning Lessons Learned

- Hospitals are very keen on solutions that do not impact production applications
- Implementation timeline of 5 months is needed for all data types
- A loosely coupled, queue-based architecture is essential to reliability
- ADT data have proven to be straight forward
- ED data often locked in departmental EDIS
 - Chief Complaint
 - ED Discharge Diagnosis
 - Vitals
 - Triage Notes
- Coded diagnosis latency of 3 to 5 days for ED and IP



BioSense Data Provisioning Laboratory Challenges

- Laboratory messaging varies widely in quality
 - Text and formatted text rather than coded results
 - Laboratory section frequently not identified on a result
 - Patient and provider information contained in the text
 - Test ordered by code with no description
 - LOINC and SNOMED mapping tables must be built