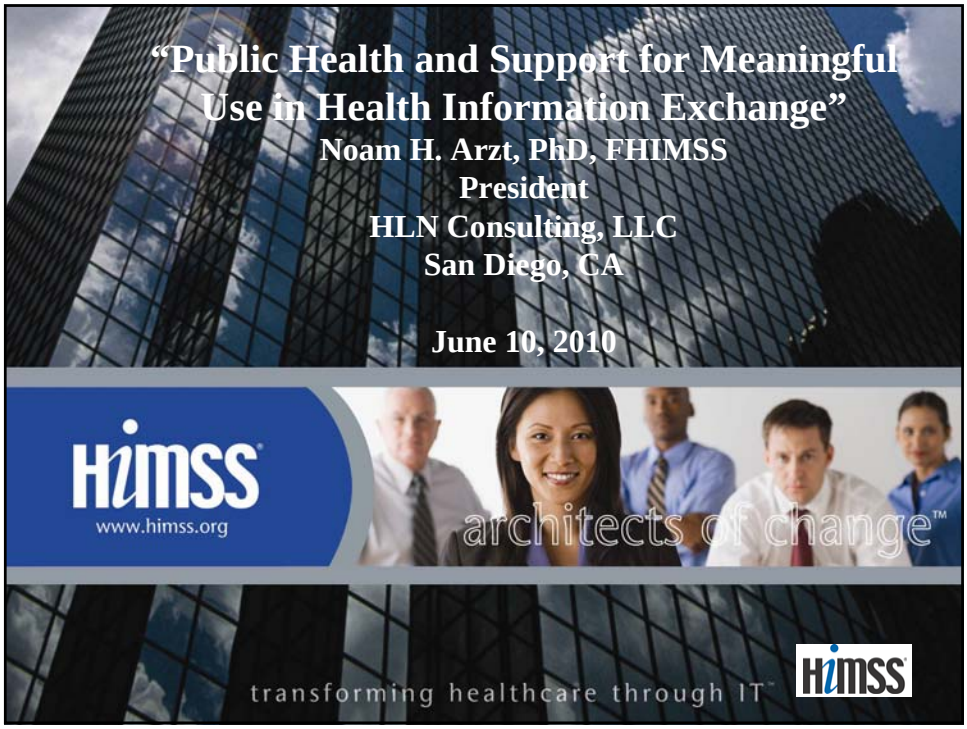

"Public Health and Support for Meaningful Use in Health Information Exchange"
Noam H. Arzt, PhD, FHIMSS
President
HLN Consulting, LLC
San Diego, CA
June 10, 2010
HIMSS
www.himss.org
architects of change™
transforming healthcare through IT
HIMSS


HIMSS
Conflict of Interest Disclosure
Noam H. Arzt, PhD, FHIMSS
Has no real or apparent
conflicts of interest to report.
2

Session Objectives

- Identify the ways in which public health is positioned to participate in and assist health information exchange efforts based on the evolution of public health systems
- Identify specific public health goals and requirements in the CMS EHR Incentive Programs and how public health should successfully participate.
- Provide insight to help bridge the gap between public health and clinical IT perspectives

3

Public Health and Meaningful Use

Notice of Proposed Rulemaking (NPR)

- Health Policy Outcome: Improve public health
- Three Stage 1 objectives:
  - Submit data to Immunization Registries (P, H)
  - Disease Surveillance: Transmit lab results (H)
  - Provide syndromic surveillance data (H, P)
- Proviso: “where required and accepted”
- Standards are well developed and harmonized for these transactions
  - HITSP IS02 (Biosurveillance)
  - HITSP IS10 (Immunization)
  - HITSP IS11 (PH Case Reporting)

5

“Mixed Bag” of Issues to Consider

- Stage 1 requirements somewhat meager, with a big “escape clause”
- Stage 2 (and 3) requirements likely to be more stringent, especially for data exchange
- No consistent tests for Stage 1 measures – NIST will likely stick to the “letter of the law”
- The immunization use case is a good one for HIE
- Public Health not yet utilizing document-center approaches (*e.g.,* CCD)

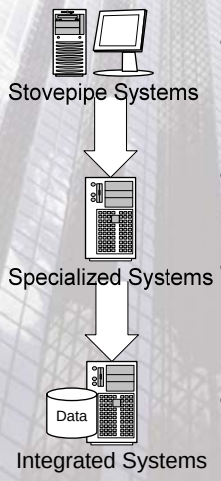
6

Issues to Consider *(continued)*

- It may take an HIE several years to develop the capability to accept these transactions, so planning early is good
- Public health underfunded to make data exchange "accepted" in many agencies or to refocus data exchange to an HIE
- Federal agencies not consistently coordinating their funding, activities, requirements
- ONC State HIE Cooperative Agreements require this coordination
- Wide variety of organization in public health agencies making leverage of programs uneven

7

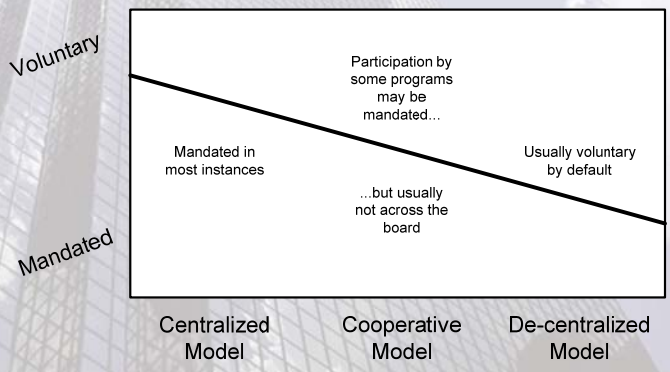
Public Health Systems



- Began as program-specific, stovepipe systems, often PC-or mainframe-based
- Evolved into more robust specialized systems
- In some cases became integrated systems, either patient-centric or case-centric
- Eventually some applications aimed outside of the agency

9

Enterprise-wide Integration



10

From Integration to Interoperability

- To support outwardly-facing projects
- To assimilate into an emerging HIE-enabled world
- As a bi-product of ARRA/HITECH

11

HL7 Definition of Interoperability

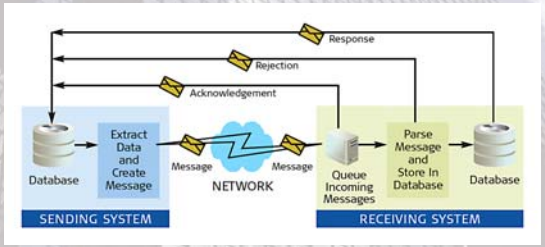
- Technical Interoperability
  Structure, syntax, reliable communication
- Semantic Interoperability
  Full meaning preserved
- Process Interoperability
  Integral to (healthcare delivery) process, work flow

Source: HL7 EHR Interoperability Working Group "Coming to Terms" Working Paper developed in 2006

12

Technical Interoperability: System-to-system Messaging

- Public health systems have been engaged in data exchange for years (mostly *to* them)
- Though flat file formats still dominate, HL7 messaging is beginning to gain steam



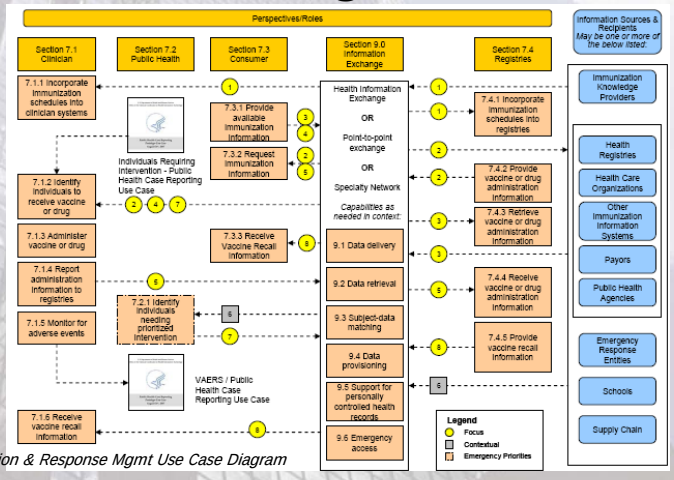
13

Semantic Interoperability: VT Health Info Tech Plan

Standard	Description
CMS' Healthcare Common Procedure Code System (HPCPCS)/American Medical Association (AMA) Current Procedural Terminology (CPT®) Fourth Edition (CPT-4)	This is the standard coding for procedures widely used in the healthcare community: Level I: Hospital Outpatient Procedures (CPT4) Level II: Products, supplies and other services
Centers for Disease Control and Prevention (CDC) Race and Ethnicity Code Sets	These code sets are based on current federal standards.
College of American Pathologists Systematized Nomenclature of Medicine Clinical Terms (SNOMED CT®)	This is the standard coding used for a wide variety of medical and health care terms.
International Classification of Diseases, Ninth Edition, Clinical Modifications (ICD-9-CM)	This is the standard coding used for diagnoses and procedures by hospitals: Volume 1 & 2: Hospital diagnoses Volume 3: Inpatient hospital procedures
International Classification of Diseases, 10th revision, Related Health Problems (ICD-10 CM)	This revision to ICD-9-CM contains a number of important improvements. This standard is not yet widely implemented.
Logical Observation Identifiers Names and Codes (LOINC®)	This is the standard coding for laboratory and clinical observations used by health care systems and messaging (like HL7).
National Library of Medicine (NLM) Unified Medical Language System (UMLS) RxNorm	This is the standard for coding the names of drugs and dose forms.
National Drug Code (NDC)	This is a universal product identifier for human drugs.

14

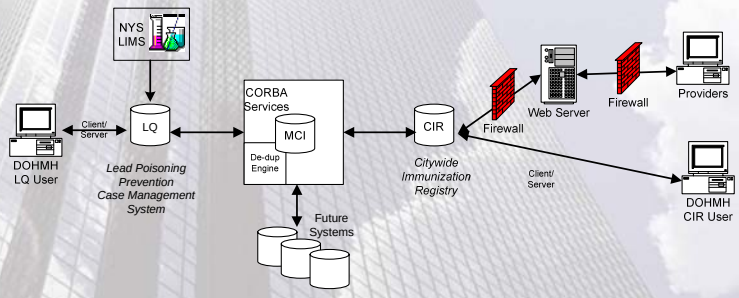
Process Interoperability: Immunization Management



AHIC Immunization & Response Mgmt Use Case Diagram

15

Case Study: NYC MCI



- LeadQuest and CIR developed independently
- Integrated by sharing a Master Patient Index
- System evolved incrementally over 10+ years

16

Improvement in NYC

TABLE 1 ● Number and percentage of matching results of the "initial load" data by system

	Within system		Between system	Within and between system
	CIR	LQ	MCI	CIR, LQ, and MCI
Pre-MCI, *N*	2,426,369	2,184,216	4,086,865*	4,610,585
Post-MCI, *N*	2,065,230	2,021,635	2,977,290	2,977,290
Merged, *N*	361,139	162,581	1,109,575	1,633,295
Merged, %	14.9	7.4	27.1	35.4
Human review, *N*	74,798	56,747	95,886	227,431
Human review, %	3.1	2.6	2.3	4.9

*This number represents the sum of records in each data system after MCI's internal de-duplication, ie, 2,065,230 + 2,021,635 = 4,086,865.
CIR = Citywide Immunization Registry; LQ = Lead Quest; MCI = Master Child Index.

TABLE 2 ● Number and percentage of Lead Quest records merged with Citywide Immunization Registry or vital records

Birth cohort	CIR	LQ	Integration merges	LQ records merged with CIR records, %
<1996 (no vital records)	851,460*	1,235,734*	494,595†	40.0
1996	157,818	133,368	105,280	78.9
1997	159,194	126,373	100,336	79.4
1998	154,415	124,180	99,236	79.9
1999	146,339	116,795	94,532	80.9
2000	150,899	107,048	87,802	82.0
2001	151,601	95,044	79,979	84.1
2002	148,015	74,892	63,228	84.4
2003	142,675	7,985	6,437	80.6
1996–2003	1,210,956*	785,685*	636,830†	81.1

Source: Tables are from Papadouka, Vikki et al, "Integrating the New York Citywide Immunization Registry and the Childhood Blood Lead Registry, *Journal of Public Health Management and Practice*, November 2004 (Supplement), p. S77.

17

CIR: From Integration to Interoperability

- Added HL7 v2 SOAP-based web services
- Allows standards-based submission of new immunizations and histories
- Allows access to immunization schedule through system-to-system query
- New functionality added
  - Without disruption to current operations
  - Compliant with national standards
  - Without re-architecting the entire system

18

What Can Public Health Contribute to an HIE/HIO?

- "Quick start" by leveraging existing activities, including interfaces to labs and providers
- Existing data, including consolidated data and population-based data
- Expertise: de-duplication, database management, web applications, data exchange including HL7
- Existing relationships with many relevant stakeholders: providers, hospitals, payers, professional associations
- Governance: experience in negotiating and implementing data sharing agreements
- Meaningful use: facilitate achievement

20

Benefits to Public Health of HIE/HIO Participation

- Many of public health's data trading partners will choose to interoperate with an HIEN and reduce (or eliminate!) superfluous connections
- Public health can gain access to data and trading partners who previously might not have participated in its initiatives
- Better to be an insider than an outsider: Public health risks being left out as the medical community moves ahead

21

Risks to Public Health

- Public health applications targeted at these users may have slower uptake as organizations encourage (or require) users to stay with institutionally-supported applications
- Pressure will build for providers to interoperate solely through HIEs
- Public health systems run the risk of becoming focused as data repositories as users over time lose access to their distinctive features
- While many specialized features are part of the approved HL7 EHR FM specification they are often not yet *required* for CCHIT (or other) certification

22

Bridging the Interoperability Gap

- Public health world is largely data-centric and not document-centric
- EHR system world is becoming document-centric: public health systems need time to adjust
- Consider more advanced interoperability to leverage unique public health capabilities

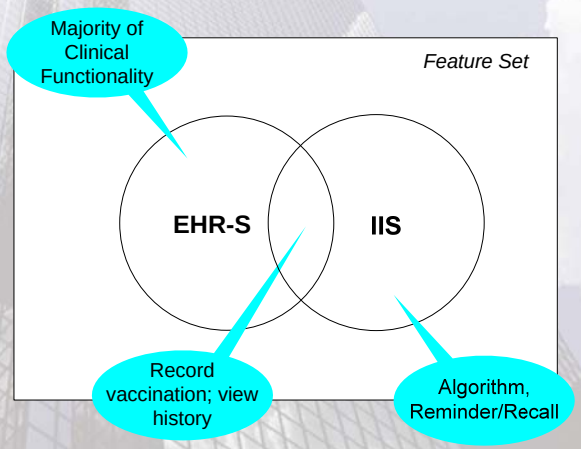
24

Advanced Interoperability: Example

- Immunization Information Systems (IIS) serve a jurisdiction by providing a common repository for immunization information
- IIS provides specialized features not typically found in an EHR-S, like:
  - Recommendations of next immunizations due
  - Reminder and recall to ensure that patients return
  - Vaccine ordering and order processing
  - Practice-level assessment of up-to-date status

25

IIS – EHR-S Tension



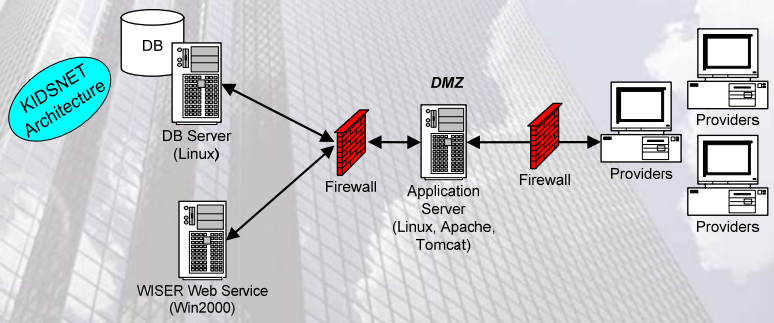
26

Case Study

- KIDSNET, the integrated child health system in RI, did not have a robust immunization predictor algorithm
- Decided to use a version of the algorithm developed in another state (with permission)
- Deployed algorithm as a web service rather than absorbed into KIDSNET
- Other applications could now easily make use of the service

27

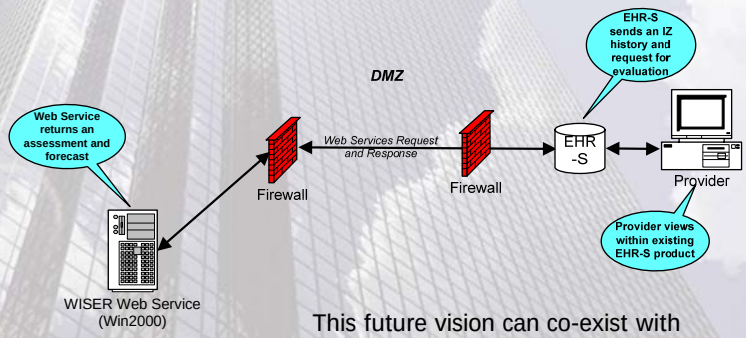
Case Study *(continued)*



- Web service is called in real time from KIDSNET application when needed.
- Core KIDSNET system interoperates with Web Immunization Service Evaluation and Recommendation (WISER) without issue.

28

Case Study *(continued)*



This future vision can co-exist with the previous model: Web service can interact with IIS *and* provider EHR systems

29

Selected Readings

- Noam H. Arzt with contributions by Susan Salkowitz, *Evolution of Public Health Information Systems: Enterprise-wide Approaches*, July 2007.

  <http://www.hln.com/assets/pdf/UT-White-Paper-Final.pdf>
- Patricia Gibbons, et al, *Coming to Terms: Scoping Interoperability for Health Care*, Health Level 7 Electronic Health Record Interoperability Work Group, February 2007.

  <http://www.hln.com/assets/pdf/Coming-to-Terms-February-2007.pdf>
- Noam H. Arzt, Response to Request for Information, *Development and Adoption of a National Health Information Network*, Department of Health and Human Services, Office of the National Coordinator for Health Information Technology, January 18, 2005.

  <http://www.hln.com/noam/ONCHIT-RFI-HLNConsulting.pdf>

30

Selected Sources

- CCHIT: http://www.cchit.org/
- Connecting for Health (Markle Foundation): http://www.connectingforhealth.org/
- eHI: http://www.ehealthinitiative.org/
- HITSP: http://www.hitsp.org/
- HLN: http://www.hln.com/resources/
- NCPHI: http://www.cdc.gov/ncphi/
- ONC: http://www.hhs.gov/healthit/
- PDHSC: http://www.phdsc.org/
- PHII: http://www.phii.org/
- SLHIE: http://statehieresources.org/

31

Questions?

For further information, please contact:
Noam H. Arzt
arzt@hln.com