Case Study On Meaningful Use and Public Health: Immunization Information System In New York City

August 24, 2011
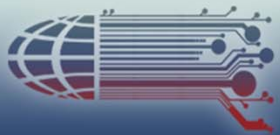
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Overview

- Brief Review of Meaningful Use (MU)

- IIS Path to Interoperability and MU

- NYC Immunization Information System (IIS): Citywide Immunization Registry (CIR)

- CIR Path to Interoperability and MU

- NYC Participants and Progress to Date

Brief Review of Meaningful Use (MU)

- In July 2010, the Centers for Medicare and Medicaid Services (CMS) and the Office of the National Coordinator (ONC) published final rules for Meaningful Use Stage I

- Authorized incentive payments to healthcare providers and hospitals that demonstrate meaningful use of certified electronic health records (EHRs)

- One objective of Meaningful Use is the use of an EHR system (EHR-S) to report to the state/local immunization registry

- Not mandatory--one of three Public Health measures

- CDC provided interoperability grants to 20 IIS projects

Immunization Objective and Measure

CMS Objective	"Capability to submit electronic data to immunization registries or Immunization Information Systems and actual submission in accordance with applicable law and practice."
CMS Measure	"Performed at least one test of certified EHR technology's capacity to submit electronic data to immunization registries and follow up submission if the test is successful (unless none of the immunization registries to which the EP, eligible hospital or CAH submits such information have the capacity to receive the information electronically)."

IIS Path to Interoperability and MU

- Long process—more than a decade in the making
- Significant investment of time and resources
- Coordination of stakeholders at the national and local level
- Development of national standards
  - CVX codes to identify immunizations
    - Developed and maintained by CDC
    - Part of HL7 standards
  - MVX codes to identify manufacturers
  - CDC recommended HL7 standards in the '90s; first guide published in 1999
  - More importantly, MU *requires* immunization reporting in HL7 v2 format

NYC IIS: Citywide Immunization Registry (CIR)

- In production since 1997

- Primarily contains children up to 18 years of age (@125,000 births annually)

- Mandatory reporting of immunizations administered to children age $\leq$ 7 years

- Consolidated Immunization Histories
  - 4.4 million patient records
  - 51+ million immunization records
  - 1,815 active provider sites

- Clinical Decision Support
  - Evaluations (e.g., was the immunization valid?)
  - Recommendations (e.g., when is next dose due?)
  - Updated for new vaccines, changing guidelines

CIR Interoperability pre-MU

- 1997: CIR began accepting electronic data from provider EHR-S or billing systems in a CIR-designed format, the Universal Provider Interface Format (UPIF)
- File-based data transfer via a secure web server
- Concerted effort between CIR, PCIP and eCW to implement UPIF reporting for eCW clients
- Utilized by 620 sites as of 2010
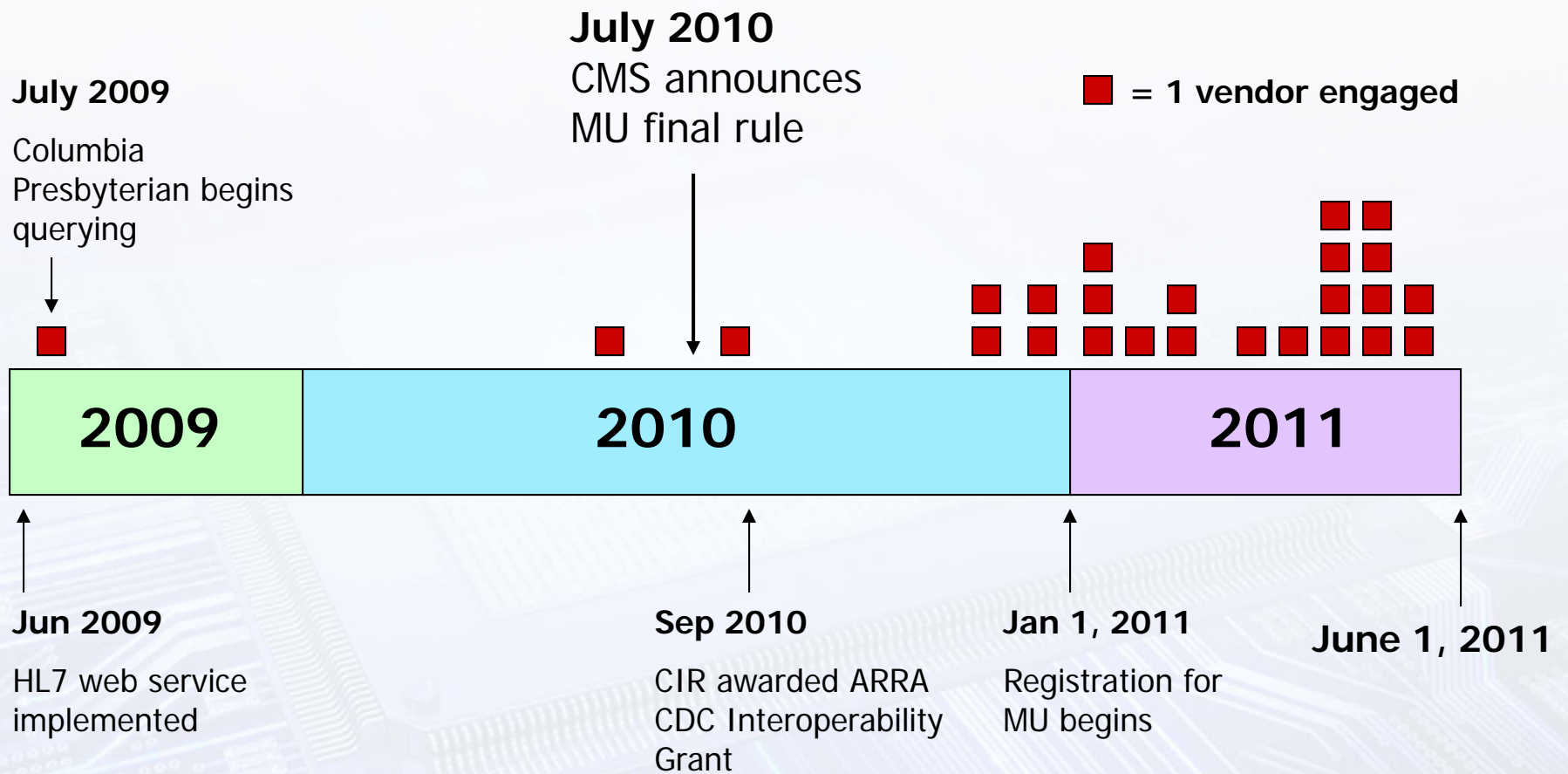- UPIF files will **not** satisfy MU requirements

Bi-directional Communication

- 2007: CIR received funds from Primary Care Information Project (PCIP) to develop the capacity for bi-directional, real-time communication
- Needed to support HL7 standards
- Benefits:
  - Allows clinicians to send and receive immunization data without leaving their EHR-S
  - Eliminates double data entry
  - Delivers decision support
  - Reduces missed opportunities and extra immunizations
  - Anticipated improves practice coverage rates
- In NYC, 805 provider sites are currently using EHR-S, covering 455,000 children < 6 years of age

CIR's Interoperability Technology: SOAP Web Service

- Simple Object Access Protocol—information transport method

- Ease of integration with EHR-S using Microsoft's .NET framework or Java

- Free, Open Source Apache Axis (web service infrastructure) fits with other NYC CIR technologies (*e.g.,* online registry)

- Recent vote by CDC expert panel selected SOAP as the recommended standard for immunization data exchange

CIR Web Service and MU Timeline

July 2009

Columbia Presbyterian begins querying

July 2010
CMS announces MU final rule

■ = 1 vendor engaged

2009 **2010** **2011**

Jun 2009

HL7 web service implemented

Sep 2010

CIR awarded ARRA CDC Interoperability Grant

Jan 1, 2011

Registration for MU begins

June 1, 2011

Implementation Process

Timeline varies from 2-6 months, depending on vendor capacity

Send CIR HL7 integration guide and implementation checklist to vendor

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Development, regular conference calls

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Testing and Quality Assurance with Enhanced QA tool
- 30 days of real patient data

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Certification

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Roll-out

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Ongoing Data Monitoring (Enhanced QA Tool)

Encourage EHR-S vendors to…

- Include important fields —*e.g.,* VFC eligibility, vaccine manufacturer, lot number

- Validate messages before sending to CIR

- Develop an effective error handling process that is convenient for the provider

Testing Process

- EHR vendors send one month of real patient data to web service test environment from pilot site

- CIR staff use Enhanced QA tool to review data quality, give vendors feedback regarding their data quality, and provide suggestions for resolving any problems observed

- Vendors repeat test with new data until all issues have been resolved

Enhanced QA Tool

- ## Raw HL7 messages are very difficult to read:

  MSH |^~\&|PATIENTS1ST1.1|8000N70|||20080424162946||VXU^V04|578438|P|2.3.1||||AL|
  PID|||531151424^^^^LR~BB77777B^^^^MA~221345671^^^^MR||CARRY^JOHN^J^^ ^^
  |WALTERS^^^^^^M|19991125|M| CARRIE^JOHNNY^^^^^A|2106- 3^WHITE^HL70005|1907
  CRUMPTON ROAD ^APT 3B^JAMAICA^NY^11423^^
  ||^^^^^617^5551212||EN^ENGLISH^HL70296|||||||N^NOT HISPANIC OR LATINO|11116|N|

- ## CIR staff use enhanced QA tool to:

  - Search for messages coming from a particular facility
  - Quantify the number of successful, partially successful, and failed messages, and identify common errors
  - List parsed field values for each message
  - Display errors and warnings at field level

Enhanced QA Tool

Market Share of EHR Vendors Among CIR Providers

MDLand
2%
(15 sites)

Others
20%
(158 sites)

EPIC
6%
(52 sites)

EClinicalWorks
51%
(405 sites)

Columbia
Presbyterian
3%
(26 sites)

Office Practicum
6%
(49 sites)

Quadramed
12%
(100 sites)

*N=805 provider sites with EHR-S
(out of 1,815 CIR providers)*
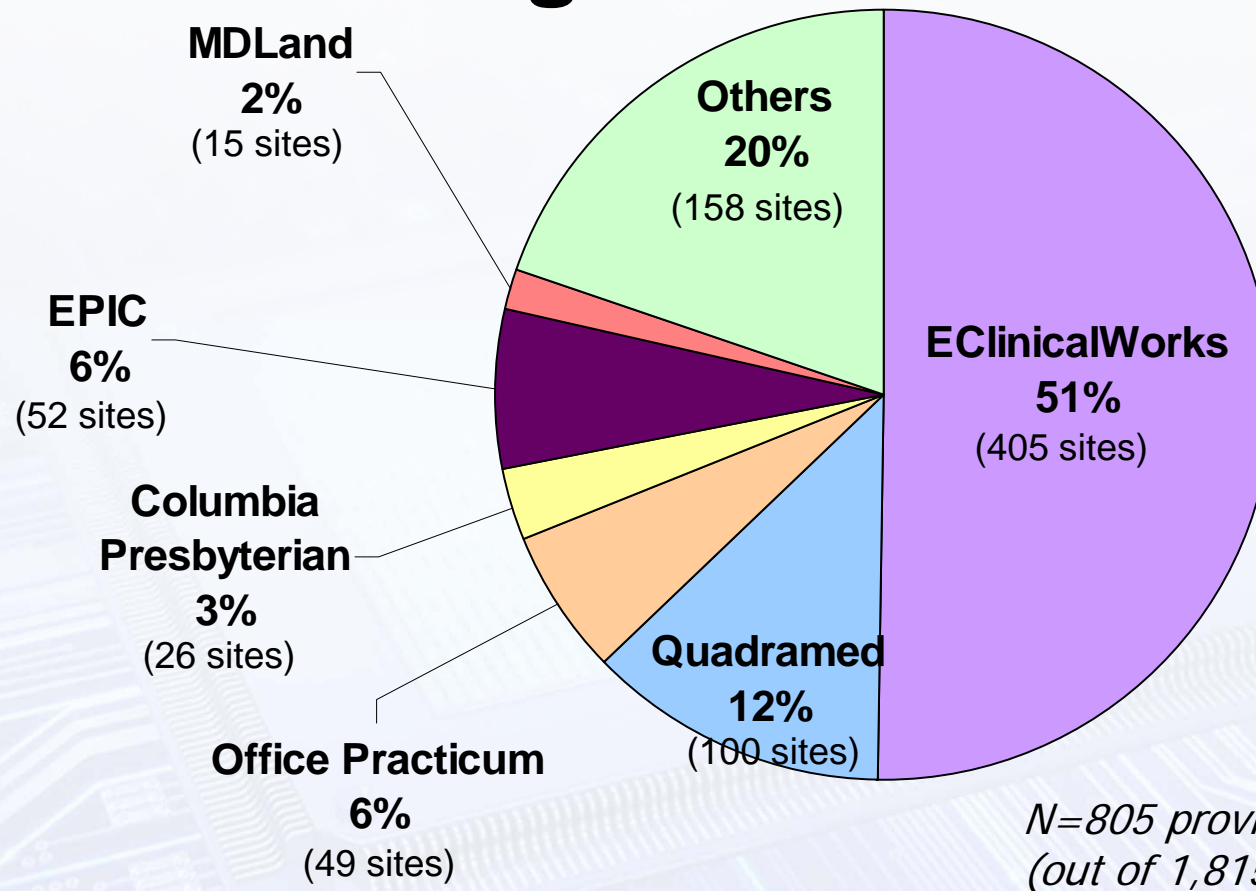
Successes

As of August 1, 2011:

- 45 sites (including one HHC hospital) reporting via the HL7 web service in production; 43,129 VXU (immunization report) messages received thus far

- 28 sites in production with bi-directional communication (reporting and querying)

- 24 sites (Columbia Presbyterian) in production for query messages only, in final testing phase for reporting

- 26 EHR vendors working to connect to the web service:

- NYC schools querying CIR for all incoming pre-K, K and 1st graders

- Involvement of many large hospital networks

Challenges

- Resistance on the part of EHR vendors to develop bi-directional communication

- Some resistance to developing a web service interface

- Limited leverage to keep vendors to a timeline

- Multiple hospitals may be using the same EHR vendor, but have different development teams, different development requirements

- Working with small vendors with few provider sites

Keys to Success

- Concerted national effort towards standardization pre-MU
- Coordination among stakeholders at both the national and local level
- CIR investment (pre-MU) in resources to support interoperability
- Incentive money for healthcare providers
- CDC/ARRA grant awarded to CIR
- Full time staff dedicated to this project
- CIR technical expertise

Future Needs/Issues

- Funding to sustain current (and new) initiatives

- May need to work with clinical documents (CCD)

- Uncertainty of Stage 2 and 3 MU

- Development of incentives for bi-directional exchange

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