Meaningful use of Electronic Health Records: What’s in it for Public Health?”

Arthur Davidson, MD, MSPH
Director, Public Health Informatics, Epidemiology and Preparedness
Denver Public Health, Denver Health

adavidson@dhha.org

December 18, 2012
Virtual Conference
Centers for Disease Control and Prevention
Office of Surveillance, Epidemiology and Laboratory Services
Overview - Discussion Points

• Context
• Meaningful Use Definitions
• Public Health Reporting Initiatives
• Onboarding
• Registries
• Conclusions
A Problem

Life expectancy in years

Health spending per capita (USD PPP)

American Recovery and Reinvestment Act

Health Information Technology for Economic and Clinical Health Act ("HITECH Act")

1. **TITLE XIII – HEALTH INFORMATION TECHNOLOGY**
   Sec 13001.
   (a) Short Title: This title (and title IV of division B) may be cited as the “Health Information Technology for Economic and Clinical Health Act” or the “HITECH Act”

   • **HIT Policy Committee:** 18 members (3 HHS, 13 Comptroller General, 4 Congress)

2. **TITLE IV – MEDICARE AND MEDICAID HEALTH INFORMATION TECHNOLOGY; MISCELLANEOUS MEDICARE PROVISIONS**

3. **OFFICE OF THE SECRETARY**
   **OFFICE OF THE NATIONAL COORDINATOR FOR HEALTH INFORMATION TECHNOLOGY (including transfer of funds)**

   For an additional amount for “Office of the National Coordinator for Health Information Technology $2,000,000,000 to carry out title XIII of this Act to remain available until expended.”
Meaningful Use Components

1. Use a certified EHR in a meaningful manner (e.g., e-prescribing)
2. Use a certified EHR technology for electronic exchange of health information to improve quality of health care
3. Use of certified EHR technology to submit clinical quality measures (CQM) and other such measures selected by the Secretary

Eligibility

1. Medicare ~$44,000 (if bill ~25K/year)
2. Medicaid ~$63,500 (if Medicaid constitutes 20-30% of patients)
Focus on use of certified EHR technology (CEHRT) toward the following policy priorities:

### 5 Policy Priorities

<table>
<thead>
<tr>
<th>Improve quality, safety, efficiency and reduce health disparities</th>
<th>Improve care coordination</th>
<th>Engage patients and families in their care</th>
<th>Improve population &amp; public health</th>
<th>Ensure adequate privacy and security protections for PHI</th>
</tr>
</thead>
</table>

---
Staged Approach: *evolutionary path with incremental growth; each journey starts with a few steps*

**Data capture and sharing**
- Structured data (e.g., lab results in EHR)
- Security protocols
- ePrescribing
- Clinical summaries to providers and patient
- Quality reporting

**Finalized CMS Rule 2014-2015**
- Improved outcomes
  - Exchange data with other sources
  - Patient access to self-management tools
  - Track clinical outcomes
  - Patient care initiatives

**Current CMS Rule 2011-2012**
- Structured data (e.g., lab results in EHR)
- Security protocols
- ePrescribing
- Clinical summaries to providers and patient
- Quality reporting

**Future CMS Rule 2016-2017**
- Improved outcomes
  - Reduced cost
  - Improved care
  - Less errors
  - Better integration
  - Learning health system
Meaningful Use Measures – Stage 1
(Core and Menu Set)

1) Submit all 15 Meaningful Use
CORE SET Measures

- **Counting**
  - CPOE
  - eRx
  - *Vital signs*
  - *smoking status*
  - clinical summaries

- **EHR calculation**
  - demographics
  - problem list
  - med list
  - med allergy list
  - health info
  - *Clinical Quality Measures* *

- **Yes/No attestation**
  - drug-drug/allergy checks
  - clinical decision support
  - exchange info
  - protect PHI

2) Submit 5 of 10 Meaningful Use
MENU SET Measures

- **Counting**
  - lab results
  - reminders
  - access to health info
  - med reconciliation
  - summary of care

- **EHR calculation**
  - patient education

- **Yes/No attestation**
  - lists of patients
  - drug/formulary
  - *immunization registries*
  - *syndromic surveillance*
# Meaningful Use – Public Health Objectives

<table>
<thead>
<tr>
<th>Health Outcomes Policy Priority</th>
<th>Stage 1 Objective</th>
<th>Stage 1 Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve population and public health¹</td>
<td>Capability to submit <strong>electronic data to immunization registries</strong> or Immunization Information Systems and actual submission in accordance with applicable law and practice</td>
<td>Performed at least <strong>one test</strong> of the 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 such information electronically)</td>
</tr>
<tr>
<td>Hospitals Only: Capability to submit <strong>electronic laboratory reportable data</strong> (as required by state or local law) lab results to public health agencies and actual submission in accordance with applicable law and practice</td>
<td>Performed at least <strong>one test</strong> of certified EHR technology’s capacity to provide submission of reportable lab results to public health agencies and follow-up submission if the test is successful (unless none of the public health agencies to which the EP, eligible hospital or CAH submits such information have the capacity to receive such information electronically)</td>
<td></td>
</tr>
<tr>
<td>Capability to <strong>submit electronic syndromic surveillance</strong> data to public health agencies and actual submission in accordance with applicable law and practice</td>
<td>Performed at least <strong>one test</strong> of certified EHR technology’s capacity to provide electronic syndromic surveillance data to public health agencies and follow-up submission if the test is successful (unless none of the public health agencies to which the EP, eligible hospital or CAH submits such information have the capacity to receive such information electronically)</td>
<td></td>
</tr>
</tbody>
</table>

¹Unless an EP, eligible hospital or CAH has an exception for all of these objectives and measures they must complete at least one as part of their demonstration of the menu set in order to be a meaningful EHR user.
<table>
<thead>
<tr>
<th>Improve population and public health&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Stage 2 Objective</th>
<th>Stage 2 Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capability to <strong>submit electronic data to immunization registries</strong> or immunization information systems except where prohibited, and in accordance with applicable law and practice</td>
<td><strong>Successful ongoing submission</strong> of electronic immunization data from Certified EHR Technology to an immunization registry or immunization information system for the entire EHR reporting period.</td>
<td></td>
</tr>
<tr>
<td>Capability to <strong>submit electronic reportable laboratory results</strong> to public health agencies, except where prohibited, and in accordance with applicable law and practice</td>
<td><strong>Successful ongoing submission</strong> of electronic reportable laboratory results from Certified EHR Technology to public health agencies for the entire EHR reporting period.</td>
<td></td>
</tr>
<tr>
<td>Capability to <strong>submit electronic syndromic surveillance data</strong> to public health agencies, except where prohibited, and in accordance with applicable law and practice</td>
<td><strong>Successful ongoing submission</strong> of electronic syndromic surveillance data from Certified EHR Technology to a public health agency for the entire EHR reporting period.</td>
<td></td>
</tr>
</tbody>
</table>

<sup>1</sup>Unless an EP, eligible hospital or CAH has an exception for all of these objectives and measures they must complete at least one as part of their demonstration of the menu set in order to be a meaningful EHR user.
### Meaningful Use – Certification Population/Public Health Menu Objectives

<table>
<thead>
<tr>
<th>Improve population and public health(^1)</th>
<th>Stage 2 Objective</th>
<th>Stage 2 Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capability to <strong>submit electronic syndromic surveillance data</strong> to public health agencies, except where prohibited, and in accordance with applicable law and practice</td>
<td><strong>Successful ongoing submission</strong> of electronic syndromic surveillance data from Certified EHR Technology to a public health agency for the entire EHR reporting period.</td>
<td></td>
</tr>
<tr>
<td>Capability to identify and <strong>report cancer cases</strong> to a public health central cancer registry, except where prohibited, and in accordance with applicable law and practice.</td>
<td><strong>Successful ongoing submission</strong> of cancer case information from CEHRT to a public health central cancer registry for the entire EHR reporting period</td>
<td></td>
</tr>
<tr>
<td>Capability to identify and <strong>report specific cases to a specialized registry</strong> (other than a cancer registry), except where prohibited, and in accordance with applicable law and practice.</td>
<td><strong>Successful ongoing submission</strong> of specific case information from Certified EHR Technology to a specialized registry for the entire EHR reporting period.</td>
<td></td>
</tr>
</tbody>
</table>

\(^1\)Unless an EP, eligible hospital or CAH has an exception for all of these objectives and measures they must complete at least one as part of their demonstration of the menu set in order to be a meaningful EHR user.
## Medicare & Medicaid Payments

**November 2012**

**DRAFT ESTIMATES ONLY**

<table>
<thead>
<tr>
<th>Providers Paid</th>
<th>Oct-12</th>
<th>LTD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicare Eligible Providers</td>
<td>8,250</td>
<td>107,250</td>
</tr>
<tr>
<td>Medicaid Eligible Providers</td>
<td>4,000</td>
<td>66,100</td>
</tr>
<tr>
<td>Medicaid/Medicare Eligible Hospitals</td>
<td>525</td>
<td>3,750</td>
</tr>
<tr>
<td><strong>Total Number of Unique Providers Paid</strong></td>
<td><strong>12,775</strong></td>
<td><strong>177,100</strong></td>
</tr>
</tbody>
</table>
# Medicare & Medicaid Payments November 2012

**DRAFT ESTIMATES ONLY**

<table>
<thead>
<tr>
<th>Payments</th>
<th>Oct-12</th>
<th>LTD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicare Eligible Providers</td>
<td>$150,000,000</td>
<td>$1,850,000,000</td>
</tr>
<tr>
<td>Medicaid Eligible Providers</td>
<td>$73,000,000</td>
<td>$1,395,000,000</td>
</tr>
<tr>
<td>Medicaid/Medicare Eligible Hospitals</td>
<td>$645,000,000</td>
<td>$6,000,000,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$868,000,000</strong></td>
<td><strong>$9,245,000,000</strong></td>
</tr>
</tbody>
</table>
Two key efforts:
1. harmonized data element profile and
2. Clinical Document Architecture implementation guide

Based on functioning implementations:
1. Cancer Registry reporting standard - in Stage 2 MU rules
2. National Healthcare Safety Network - recommended for Stage 3

Advantages to PHRI approach:
1. requires no change to existing MU reporting activities (i.e., ELR, immunization registries or syndromic surveillance)
2. provides reusable, modular, and extensible methodology; could be leveraged by current and future reporting needs
   • e.g., communicable disease case reports, chronic disease reports, product safety reports, birth and death reports
3. more generic interoperability between EHR and public health surveillance systems.
Public Health Reporting Initiative (PHRI)

Requirements for success:

1. Centers for Disease Control and Prevention (CDC) surveillance and informatics leadership: 1) support PHRI pilot implementations, 2) full-scale PRHI implementation, and 3) promote and contractually encourage broad health department migration to the new approach.

2. ONC and CMS collaboration in proposed rule making and tool building; assure PHRI products (i.e., harmonized data elements profile, consolidated clinical document architecture) are maximally aligned with the ONC-convened Standards and Interoperability Framework.

3. Local and state health departments review and advise CDC. Need strong orientation and understanding by local and state health departments
   • how Stage 2 changes health departments obligations and opportunities
   • how Stage 3 may set a new foundation for public health monitoring.
Meaningful Use Exclusions

- Public health authority:
  - Insufficient technical capacity to receive the data
  - Insufficient resources to support ongoing submission from an EP or hospital
- Eligible Provider/Hospital meets measure, if:
  - registered to submit
  - in the process of testing and validation, or
  - awaiting an invitation to begin submission.
• **Declaration**: how public health authority (PHA) lets community of eligible professionals and eligible hospitals (EP/EH) and CMS know what MU objectives are supported.

• **Registration of Intent**: how EP/EH register with PHA and indicate intent to achieve a MU measure.

• **On-Boarding**: how PHA queues and registers EP/EH for exchange and receipt; how PHA defines “ongoing submission” criteria.

• **Acknowledgements**: how PHA validates EP/EH as achieving “on-boarding” and meets criteria for ongoing submission.
Stage 2 MU: On-Boarding

EP/EH Registration of intent

PH capable?

No

EP/EH exclusion

Yes

PH requests provider action

EP/EH passes: Letter for attestation

Yes

MU objective met?

No

EP/EH fails

Provider must:
- register intent by the deadline
- participate in on-boarding process
- respond to PHA written requests for action within 30 days on two separate occasions.

Provider acts?

Yes

PH on-boards EP/EH

No

1st Time Failure?

Yes

No

EP/EH passes: Letter for attestation
Public Health Challenge

• swimming in an ever-deeper pool of data
• lack technology to efficiently use data or convert it to valuable information
• need for all PH staff to feel a direct relationship with data to drive decisions
Opportunities

As data increase:

• **harness resources** for precise decision-making to help improve population and patient outcomes and reduce costs

• **ensure organizational readiness** and increase information to support mission

• **enhance access** to relevant, actionable information (e.g., reports and dashboards),

• **monitor key performance indicators** (KPIs), and make well-informed decisions.
Public Health Business Monitoring

Population Surveillance

Information exchange

Personal Healthcare

PH employee/ PH program
Web-page registration
Population Health Record

Provider(s)/Community resident(s)
Community resident / twitter
Electronic Health Record
Specialized Registries

Eligible Provider
Eligible Hospital

Standard Data Warehouse

Secure federated query

Query Service

Secure Portal

Eligible Provider
Eligible Hospital

Standard Data Warehouse

Secure federated query
## Query Health Pilots

<table>
<thead>
<tr>
<th>Pilot Description</th>
<th>Focus</th>
<th>Owners</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NYC/NYS</strong>: Primary Care Information Project of the NYC Dept of Health and Mental Hygiene and the NYS Dept of Health</td>
<td>Chronic disease, reportable, syndromic</td>
<td>M Buck</td>
</tr>
<tr>
<td><strong>FDA Mini-Sentinel</strong>: with 17 large data providers with 126M covered lives, Harvard Pilgrim and HMO research network.</td>
<td>Diagnoses, drugs, procedures</td>
<td>J Brown</td>
</tr>
<tr>
<td><strong>MDPHnet</strong>: MA Dept of Public Health, MA Leagues of Community Health Centers and Atrius Health</td>
<td>ILI, DM surveillance</td>
<td>J Brown, K Benson</td>
</tr>
<tr>
<td><strong>BioSense 2</strong>: Cloud based system</td>
<td>Syndromic surveillance</td>
<td>T Kass-Hout, M Alletto</td>
</tr>
<tr>
<td><strong>Clinical Quality Measures</strong>: Allscripts and MITRE Group using Health Quality Measure Format (HQMF) for Stage 2 CQM reporting.</td>
<td>Clinical quality measures in EHR</td>
<td>P Rao</td>
</tr>
</tbody>
</table>

[http://wiki.siframework.org/Query+Health+Pilots+Team](http://wiki.siframework.org/Query+Health+Pilots+Team)
Community Transformation Grants

- Supports community-level efforts to reduce chronic diseases such as **heart disease**, cancer, **stroke**, and diabetes.
- Promotes healthy lifestyles, especially among population groups experiencing the greatest burden of chronic disease.
- Targets improved health, **reduce health disparities**, and control health care spending.
- 5-year project period.
- Approximately $103 million in prevention funding has been awarded to 61 states and communities serving approximately 120 million Americans.
Cardiovascular Disease Priorities

- Promoting the most effective prevention and treatment practices for the leading causes of mortality, starting with cardiovascular disease.

- Opportunities for success:
  - Increase blood pressure control in adults
  - Reduce high cholesterol levels in adults
  - Increase the use of aspirin to prevent cardiovascular disease
  - Decrease smoking among adults and adolescents
Prevent/Treat Leading Mortality Cause

• Example: *Prevent/reduce harm caused by CVD*

• Illustrative Measures
  – % >18 years with ischemic vascular disease whose most recent blood pressure during the measurement year is <140/90 mm Hg
  – % of patients with ischemic vascular disease whose most recent low-density cholesterol is <100
  – % of patients with ischemic vascular disease who have documentation of use of aspirin or other antithrombotic during the 12-month measurement period
  – % of patients who received evidence-based smoking cessation services (e.g., medications)
Figure 4. Example: Hypertension (HTN)
Prevalence of Hypertension by Census Tract

*Prevalence calculated using all DH primary care patients.

NOTE: Hypertension defined as BP greater than or equal to 140/90
Figure 1

- Denver Health (personal and public health)
  - Federated query service
  - GIS normalized patient level data
  - GIS rendering service

- National Jewish Health
  - Federated query service
  - GIS normalized patient level data

- Kaiser Permanente
  - Federated query service
  - GIS normalized patient level data

- High Plains (? CACHIE)
  - Federated query service
  - GIS normalized patient level data

- CDPHE
  - Federated query service
  - GIS locating service
  - GIS rendering service

- Colorado Children’s Hospital
  - Federated query service
  - GIS normalized patient level data

- University of Colorado Dept. of Geography
  - Federated query service
  - GIS normalized asset level data
  - GIS rendering service

- University of Colorado - Cancer Center / CCTSI
  - Federated query service
  - Federated query maintenance

- Data Access Point
  - Governance
  - Access control
  - Analytics
Specialized Registry Architecture
Colorado Health Observation Regional Data Sharing (CHORDS)

Denver Public Health
- Population
  - GIS Assets
  - Vital Records
  - Census
  - BRFSS
- Partner Site Data
  - BMI
  - CVD Risk
  - Tobacco Use

Denver Health
- Vitals/BMI
- Diagnosis
- Visit
- Pharmacy
- Laboratory

Extraction Transform Load (ETL)
- Staging
- Geocoding

Data Warehouse
- Data Marts
  - Tobacco Use/SHS
  - Obesity
  - Hypercholesterolemia
  - Hypertension

DH Virtual Data Warehouse (VDW)

Cubes

Query Service (TRIAD/PMN?)

Partner Health Care Sites (i.e., KP, CHCO, Inner City, Tepeyac, CAHEP, High Plains, CACHIE) Data

Legend
- Operational Data Stores
- Processes
- Data Warehouse
- Metadata Stage
- Registry
- Virtual Data Warehouse
- Output

Sites
- Virtual Data Warehouse (VDW)
  - Site Virtual Data Warehouse

Activities
- Analytics/Reports
- Business Intelligence Activities
- Dashboards
- Ad Hoc Queries

Processes
- Secure federated query
- Secure transfer of partner records to community registry

Specialized Registry Architecture
Colorado Health Observation Regional Data Sharing (CHORDS)
Population Health Record (PopHR)

Data Collection

Data Processing

- Standard Data Warehouse
- Pre-tabulated

Information Retrieval

- PopHR “pre-calculated”
- Retrieval Application Web Service
- PopHR “on-the’fly”

Standard data processing

On-the-fly query

On-the-fly response

- BMI
- Cardiovascular Disease Risk
- Tobacco Use
- Mental Health
- Asthma

Secure, authenticated user access

J Am Med Inform Assoc 2010;17:359e366. doi:10.1136/jamia.2009.00157832
Interoperability

• Remains elusive and is taking a long time
• Technology is only one obstacle to interoperability
• Policy and workflow will always preempt technology

Focus

• Four levels of interoperability specification:
  – workflow, messaging, format, vocabulary.

• Three phases to usage:
  – standards development (SDO), product development (vendors), and system deployment (users)

• Five process steps for each phase:
  – 1) decision to proceed, 2) allocation of resources, 3) development, 4) validation, and 5) deployment.
Interoperability: Network of Networks

Public Health Grid

Federal Agencies
- CDC
- FDA
- CMS
- NIH

Providers
- DoD/VA
- Hospitals
- Clinics

Consumers
- Directory/Alerting Services
- Search Services
- People
- Consumer Orgs
- Personal Health Record

RHIO/HIE

Public Health Departments & 1st Responders
- State Health Department
- Poison Control Centers
- Local Health Department
- EMS

Vocabulary Services

Security Services

Analytical Services
Learning Healthcare System

- **Culture**: participatory, team-based, transparent, improving
- **Design and processes**: patient-anchored and tested
- **Patients and public**: fully and actively engaged
- **Decisions**: informed, facilitated, shared, and coordinated
- **Care**: starting with the best practice, every time
- **Outcomes and costs**: transparent and constantly assessed
- **Knowledge**: ongoing, seamless product of services and research
- **Digital technology**: engine for continuous improvement
- **Health information**: a reliable, secure, and reusable resource
- **Data utility**: data stewarded and used for common good
- **Trust fabric**: strong, protected, and actively nurtured
- **Leadership**: multi-focal, networked, and dynamic
Meaningful Use: *Public Health Opportunities*

Strategic Planning
- Business processes
- System requirements

Influences

Portfolio Performance Management

IT Governance & Management Processes

Drives

IT Investment Management

Supported by

Enterprise Architecture

Improved by

Public Health Informatics Institute

- Data-driven programs
- Population-focused
- Quality Improvement
- Accreditation
- Others …
Conclusions

• Large scale PH challenges (e.g., chronic disease epidemics) require new tools for successful monitoring and key performance indicators - meaningful use supports that.

• PH needs to focus on building multi-purpose tools and infrastructure to support several projects/programs – meaningful use presents a practice opportunity.

• Strategic thinking is essential during periods of limited resources – meaningful use presents a strategic opportunity regarding enterprise solutions.

• During Stage 2, LPHA capacity will be challenged - meaningful use is an opportunity for multi-agency/jurisdiction collaboration to improve surveillance and near real-time access to actionable information.