S&I Framework: The Role of Standards in Supporting Healthcare Data Initiatives

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Agenda

• Drivers of Big Data
  – Big Data in Healthcare
  – Health IT Ecosystem

• Standards & Interoperability (S&I) Framework
  – S&I Framework and Big Data
  – S&I Framework Overview
  – How can S&I Support Healthcare Goals
  – S&I Initiatives
    • Structured Data Capture and Data Access Framework

• Conclusion
  – Questions & Discussion
Drivers of Big Data

- Data Policies: Privacy, liability, sensitivity, IP
- Skills
- Tools and Technologies: Converging architectures, compatibility, integration
- Data Management: Data-centricity, incentives, sharing and collaboration
- Organizational Change: Access and availability, ownership, quality
- Data science: Visualization, solution, development
Why does Big Data matter for Healthcare?

**Agile intelligence on clinical outcomes**
- Use analytics & decision support to improve quality of Patient Care

**Large-scale data analytics**
- Use predictive modeling to influence cost control at the point of care

**Dealing with unstructured data**
- Aggregating across different domains
  - Public: Public Health Reporting: Surveillance, Immunizations, Fetal Births & Deaths, Environmental
  - Private: Patient data, Costs

*Isolated islands of structured and unstructured data present a narrow view of the breadth and depth of healthcare data. For data to drive innovation and differentiation, leading to better patient outcomes at a lower cost, data need to be aggregated; it needs to be explored through multiple paths/routes to find interesting insights.*
Health IT Ecosystem

- **Individuals Access & Share Health Information**
  - Quality Measures

- **HIT used for Quality and Safety in Care Delivery**
  - Public Health
    - Technical standards and services
    - Certification of HIT to accelerate interoperability
    - Privacy and Security Protections

- **Population Health Management and Cross Organization Exchange**
  - Clinical Research
    - Supportive business, clinical, and regulatory environments
    - Rules of Engagement and Governance

- **Big data and analytics**
  - Clinical Guidelines
S&I Framework and Big Data

The Standards & Interoperability Framework kicked-off under the Office of Science & Technology of ONC/HHS in 2010

- 14 initiatives have resulted in technical solutions to facilitate standardized, interoperable healthcare information exchange
- Increasing frequency of health data exchange and types of information being exchanged drives a Big Data environment
- We will highlight several S&I Use Cases which are tightly coupled with Big Data
How S&I Supports Healthcare Goals using Big Data

**Goals**
- Improve quality & patient care
- Control costs
- Proprietary or customized data collection and aggregation
- Move away from closed data sets

**Needs**
- Aggregated data sources
- Standards
- Patient engagement
- Population awareness and education
- Open data & application development

**Solutions**
- Searchable & processable data sources for predictive analytics
- Standardized health information exchange and data
- Decreased costs of chronic illness on the health care system
- Population awareness and education
- Applications for patient & public/private organization empowerment
S&I Initiatives

Each initiative drives value through:

- Development of standards, specifications, implementation guidance, & reusable tools
- Empowerment & deep engagement of the community to build and leverage these deliverables to enhance the efficiency, quality, and efficacy of care delivery
- Standards enable development of uniform, sharable data stores that can drive Big Data analytics
Structured Data Capture (SDC)

1. Sends request for form/template
2. Sends requested form/template
3. Converts, populates & displays form
4. Fills, stores/transmits structured data
5. Extract, Transform, & Load Data by form/template

Actor Key:
- Forms Filler
- Forms Manager
- External Repository

CDE Library
Form Library
SDC Data Collection

Structured Data Capture Conceptual Workflow

1. Selects form/template
2. Finds form/template
3. Converts, populates & displays form
4. Inputs data
5. Temporarily captures data
6. Sends/transmits data
7. Extract, transform, & load data by form/template

Big Data Opportunity

SDC Data Collection

Structured Captured Data

Provider

EHR System

Specified Form/Template

Displayed Form/Template

CDE Library

Clinical Research CDEs

AHRO CDEs (Common Formats)

Other domain CDEs

Form Library

Patient Safety Forms (Common Formats)

Other domain-specified Forms

Template Library

Domains-specified Templates

External Data Repository
Data Access Framework (DAF)

Local Access via Intra-Organization Query:
- Create and disseminate queries internal to organization
  - Query Structure Layer
  - APIs
  - Authentication/Authorization Layer
- Receive standardized responses
  - Query Results Layer

Targeted Access via Inter-Organization Query:
- Create and disseminate queries to external organization
  - Query Structure Layer
  - Transport Layer
  - Authentication/Authorization Layer
- Receive standardized responses from external organization
  - Query Results Layer

Multiple Data Source Access via Distributed Query (Query Health) – Completed Initiative:
- Create and disseminate queries to multiple organizations
  - Governed by a network
- Receive aggregated or de-identified responses
  - Focus on Information Model for the network and leverage standards from earlier phases.

Standards based approach to enable access at all levels: Local, Targeted, and Distributed

Note: An organization can be a hospital that is part of a larger organization and can also include HIEs, RIOs, other types of organizations etc.
DAF Targeted Access

Targeted DAF Scope

Two Known Healthcare Organizations

1. Sends: Data Query

Trusted Healthcare Organization 1 (Query Requestor)

2. Receives: Patient Data

Trusted Healthcare Organization 2 (Query Responder)
Conclusion

• Healthcare is an industry that is in great need of stronger predictive modeling and reporting; both from a business and clinical perspective
• The S&I Framework translates existing tools into the healthcare environment to increase interoperability
• Interoperability supports Big Data and identifies new areas for the utilization of analytical tools
• The S&I Framework targets the siloed collection of clinical data to build towards a Big Data environment
Questions/Discussion

ONC website:
www.healthit.gov/

S&I Framework Wiki:
http://wiki.siframework.org/