

Distributed Population Queries

Update for the HIT Standards Committee on
Query Health's Proposed Standards, Reference Implementations and Pilots

Rich Elmore
Michael Buck

ONC Coordinator – Query Health
Director, Primary Care Information Project, NYC DPH
and Query Health Clinical Work Group Leader

May 24, 2012

Agenda - Objectives

- Scope
- Proposed standards
- Reference implementations
- Pilots
- Going forward / impact

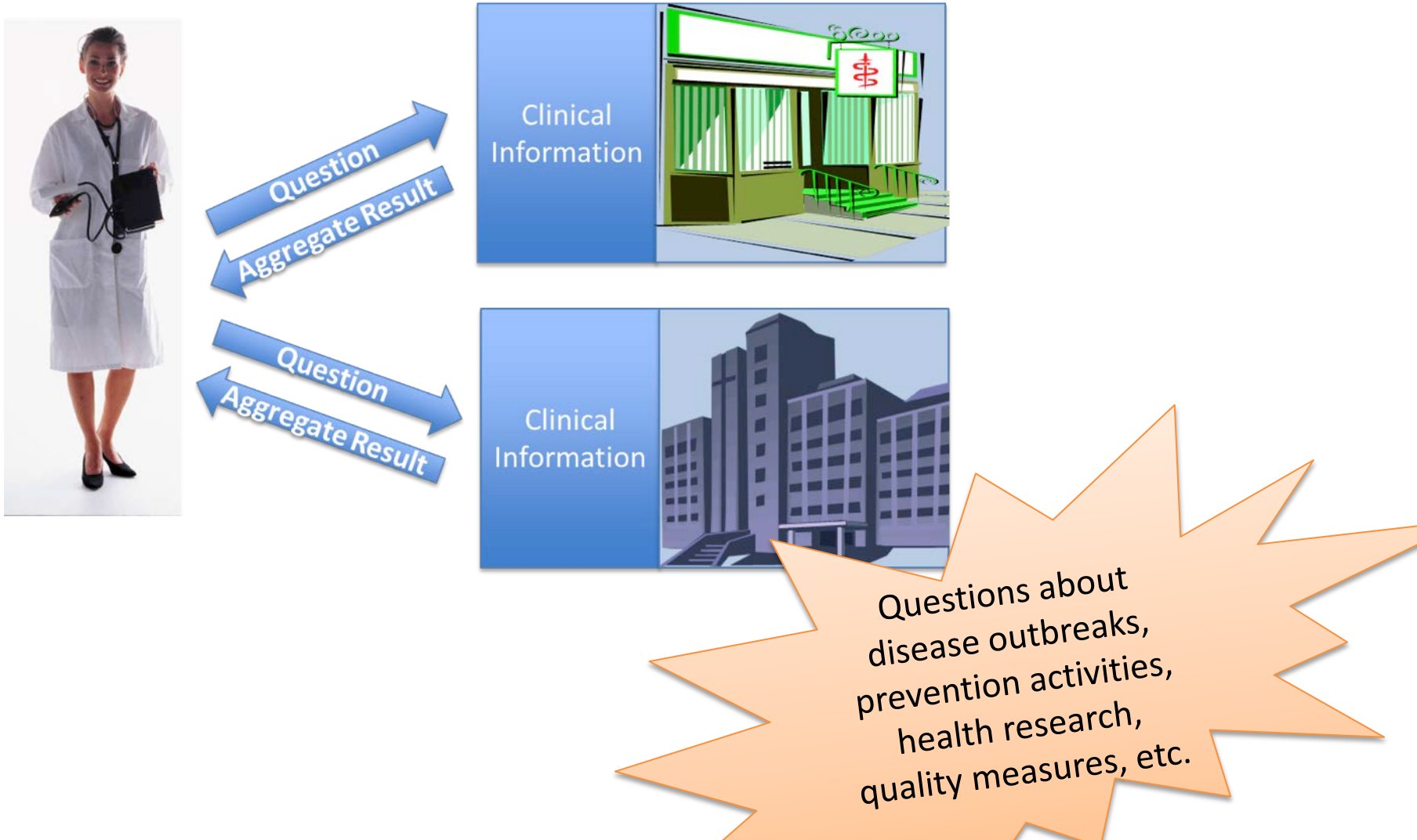
Recognition and thanks for outstanding performance to:

- The Query Health Community
- Special kudos for their leadership roles:
 - Keith Boone, GE Healthcare
 - Jeff Brown, Harvard School of Population Medicine
 - Michael Buck, NYC Primary Care Information Project
 - Floyd Eisenberg, NQF
 - Marc Hadley, MITRE
 - Jeff Klann, Partners Healthcare
 - Alice Leiter, Center for Democracy and Technology
 - Shawn Murphy, Partners Healthcare
 - Rob Rosen, Lincoln Peak
 - Structured Documents Work Group, HL7



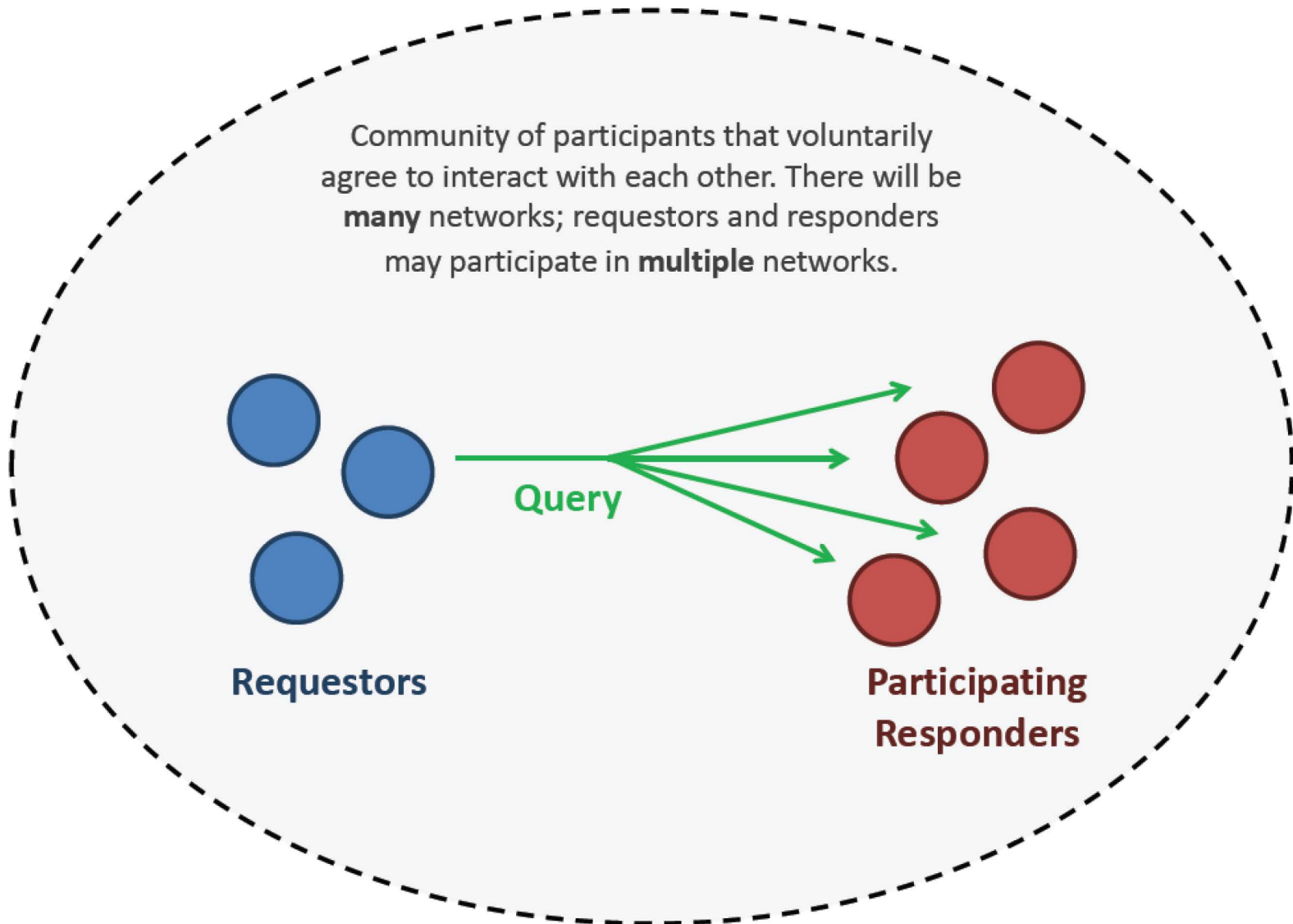
Enable a learning health system to understand population measures of health, performance, disease and quality, while respecting patient privacy, to improve patient and population health and reduce costs.

Distributed queries unambiguously define a population from a larger set



Distributed Query Networks

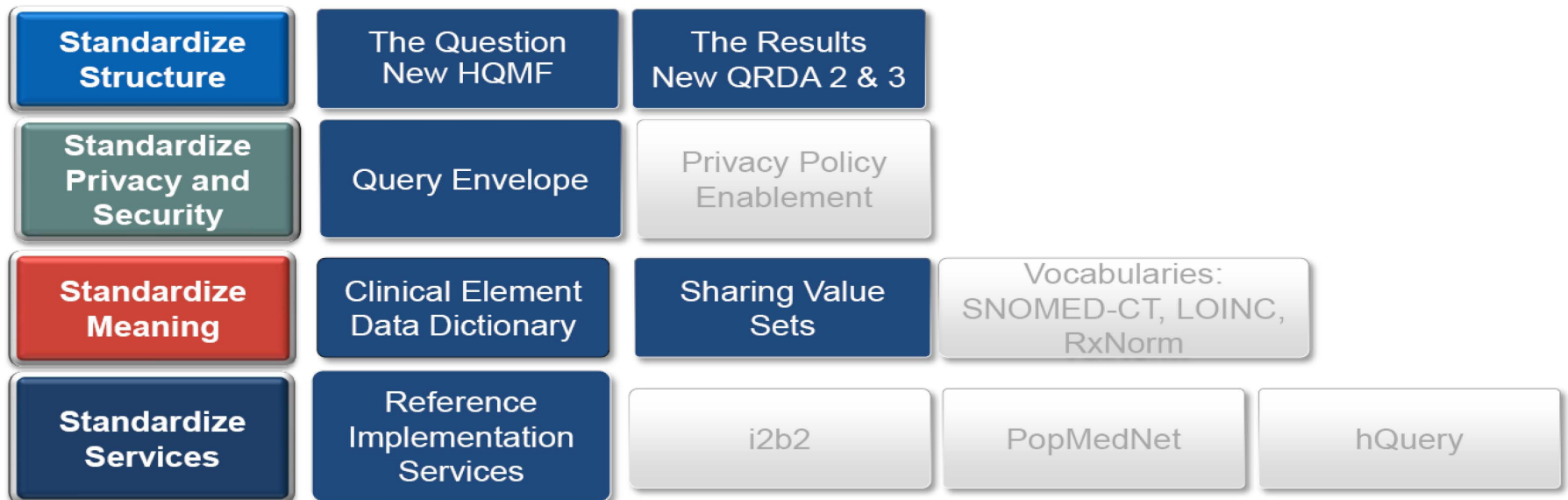
Voluntary, No Central Planning



Query Health Standards and Reference Implementation Stack

Reference Implementation Stack

Develop modular, testable portfolio of Query Health standards and specifications that can adopted by the industry, and support key HITECH and govt. priorities



1. Query Envelope and Policy Requirements:

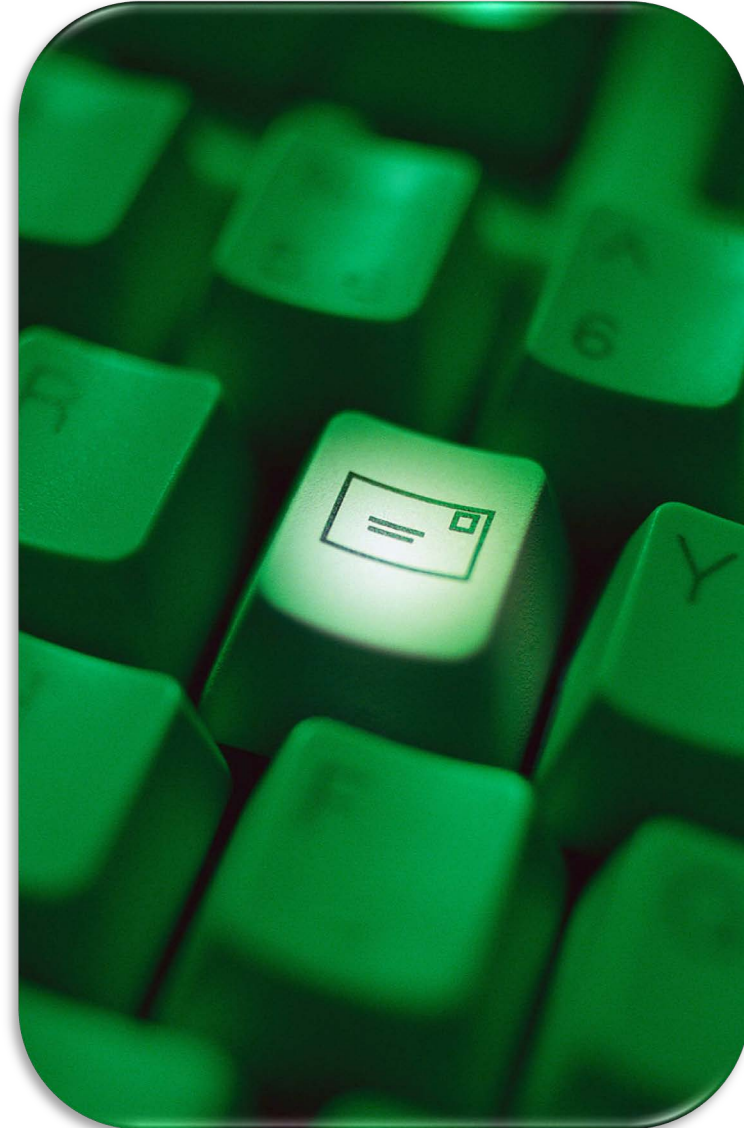
- Applicable to any distributed query

2. Query, Data and Results

- Applicable to clinical data sources (e.g., EHRs, HIEs, etc.)

The Query Envelope

- Query agnostic
- Content agnostic
- Metadata facilitates privacy guidance from HIT Policy Committee
- RESTful Interface specification to integrate RI natively



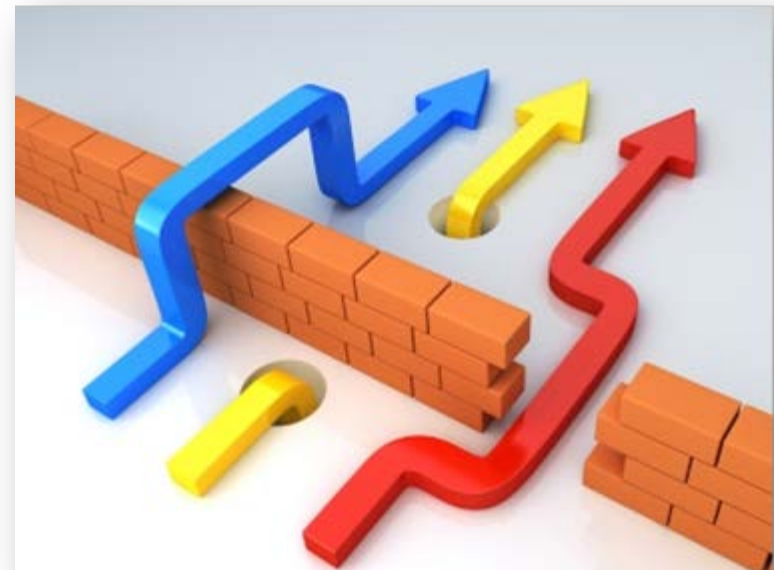
HIT Policy Committee and the Privacy and Security Tiger Team policy guidance informed:

- RI Policy enablement layer
- Data use agreement template
- Guidelines document



Standards & Interoperability Framework
Query Health Technical Approach
Operational Guidelines

March 26, 2012



1. Query Envelope and Policy Requirements:

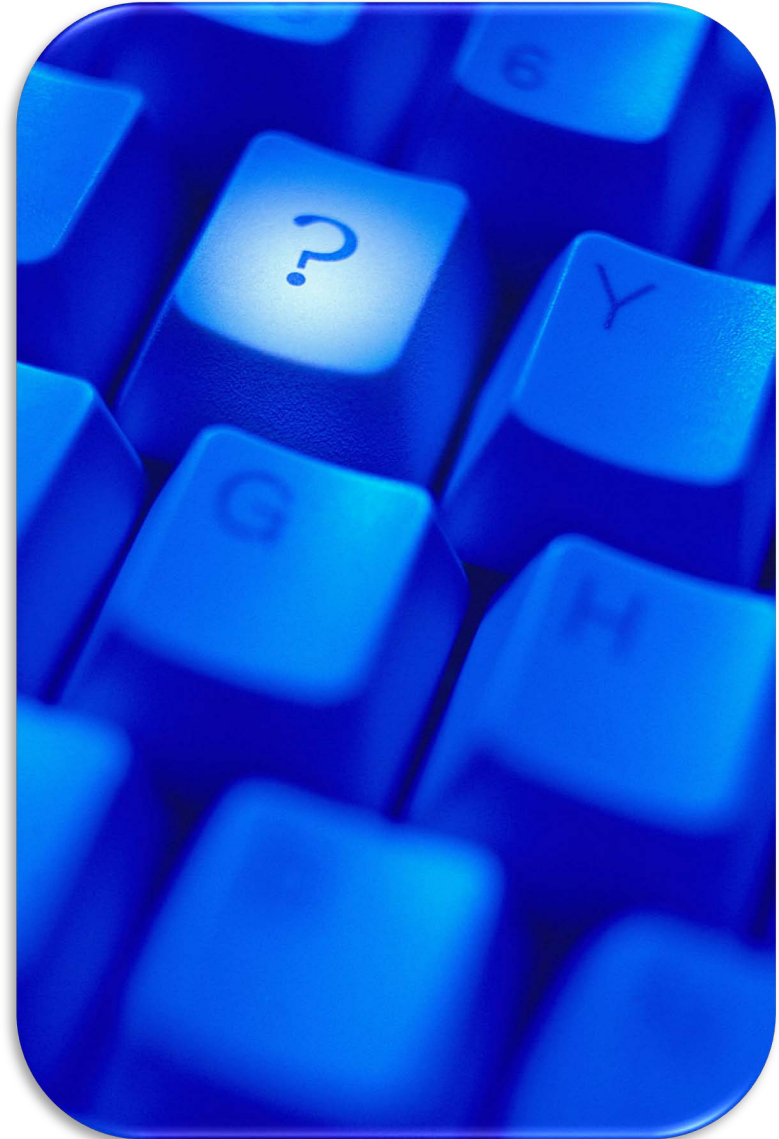
- Applicable to any distributed query

2. Query, Data and Results

- Applicable to clinical data sources (e.g., EHRs, HIEs, etc.)

The Query New HQMF

- Health Quality Measure Format
- HQMF newly modified to support the needs for dynamic population queries:
 - More executable
 - Simplified
- Advantages for query
 - Avoids “yet another standard”
 - Secure (vs procedural approach)
 - Works across diverse platforms
- Benefits – Speed and Cost



Existing HQMF compared to New HQMF

Example: Measurement Period = 1 year

Existing HQMF

```
<subjectOf>
  <measureAttribute>
    <templateId root="2.16.840.1.113883.3.560.1.74"/>
    <id root="55BFEB56-4FFF-477E-9D2D-3F34C14FD057"/>
    <code code="MSRTP" displayName="Measurement period" codeSystem="2.16.840.1.113883.3.560"/>
    <value xsi:type="EXPR_PQ" value="12" unit="m">
      <expression mediaType="text/plain">measureEndDate - measureStartDate</expression>
    </value>
  </measureAttribute>
</subjectOf>
<subjectOf>
  <localVariableName>measureStartDate</localVariableName>
  <measureAttribute>
    <templateId root="2.16.840.1.113883.3.560.1.75"/>
    <id root="7A4CEE7F-3003-44C6-BFFF-822CC5AADBB8"/>
    <code code="MSRSD" displayName="Measurement start date" codeSystem="2.16.840.1.113883.3.560"/>
    <value xsi:type="TS" value="00000101"/>
  </measureAttribute>
</subjectOf>
<subjectOf>
  <localVariableName>measureEndDate</localVariableName>
  <measureAttribute>
    <templateId root="2.16.840.1.113883.3.560.1.75"/>
    <id root="EA5776B1-D706-4BC9-AD30-CD27545AD99B"/>
    <code code="MSRED" displayName="Measurement end date" codeSystem="2.16.840.1.113883.3.560"/>
    <value xsi:type="TS" value="00001231"/>
  </measureAttribute>
</subjectOf>
<subjectOf>
  <measureAttribute>
    <code code="MSRMD" codeSystem="2.16.840.1.113883.3.560" displayName="Measurement duration"/>
    <value xsi:type="ED" mediaType="text/plain">12 month(s)</value>
  </measureAttribute>
</subjectOf>
```

New HQMF

```
<controlVariable>
  <localVariableName>MeasurePeriod</localVariableName>
  <measurePeriod>
    <id root="0" extension="StartDate"/>
    <value>
      <width unit='a' value='1'/>
    </value>
  </measurePeriod>
</controlVariable>
```

New HQMF:
Parsimonious.
Computable.
Expressive.

The Data Clinical Element Data Dictionary

- Demographic
- Patient Contact Information
- Payer Information
- Healthcare Provider
- Allergies & Adverse Reactions
- Encounter
- Surgery
- Diagnosis
- Medication
- Procedure
- Immunization
- Advance Directive
- Vital Signs
- Physical Exam
- Family History
- Social History
- Order
- Result
- Medical Equipment
- Care Setting
- Enrollment
- Facility

- Standards independent dictionary
- Aligned with QDM
- Built for flexible response to evolving standards (e.g., CIMI)



The Results New QRDA

- Quality Reporting Document Architecture
 - Category I – Patient Level
 - Category II – Patient Populations
 - Category III – Population Measures
- Working together with HL7 and Structured Documents Work Group towards upcoming ballot
- Very productive start at May HL7 meeting



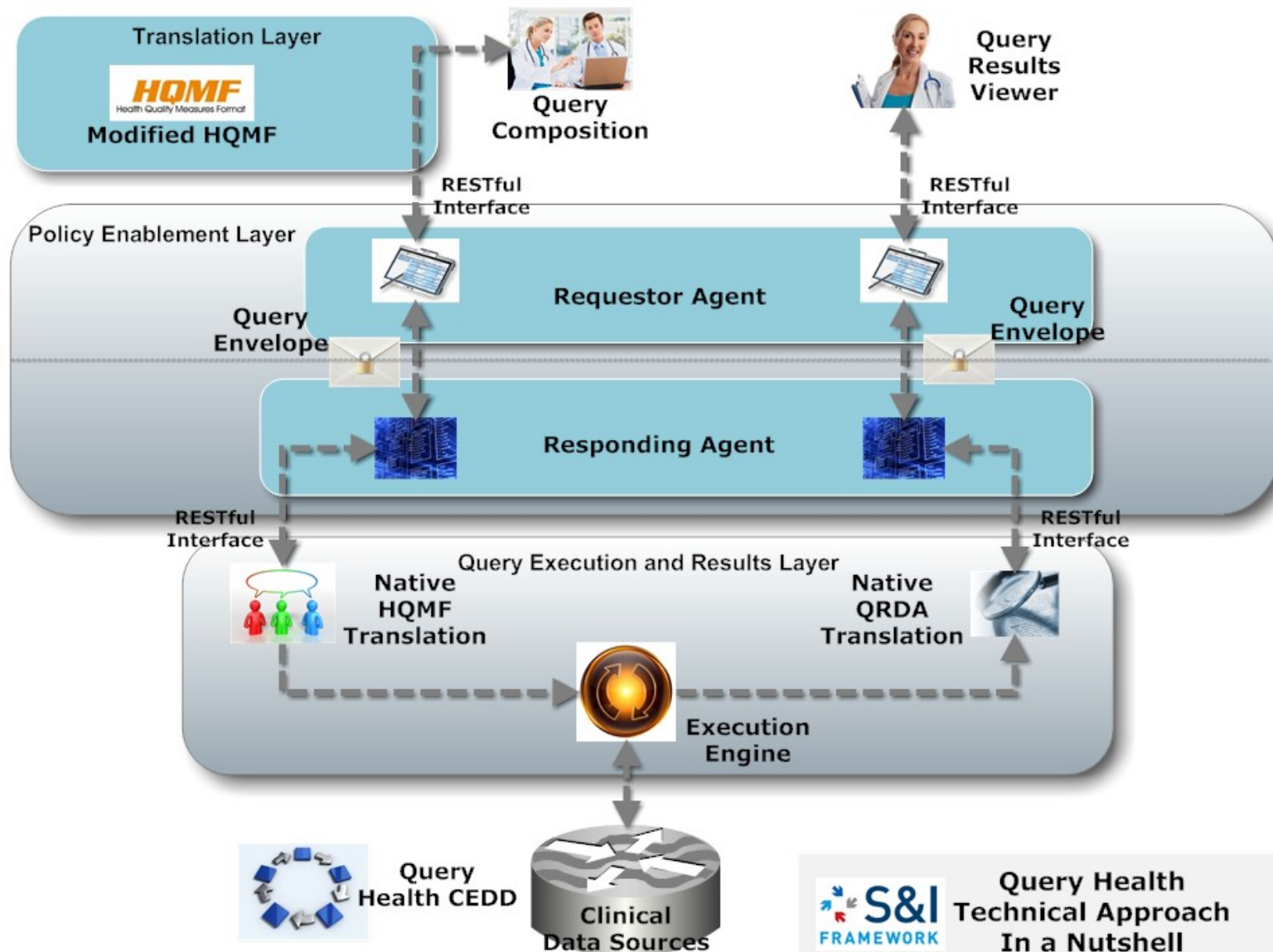
Concept Mapping

- Need consistently computable definitions for “meat & potatoes” concepts like Type 2 Diabetes
- Quality Measure workgroup recommended NLM be the definitive source for Value Sets
- Planning to align with publication, managing and curating of Value Sets
- Query Health is starting with examples from the NQF CQM-based value sets.
- In order to share value sets in a standard way, Query Health is adopting the Sharing Value Sets (SVS) Profile using a RESTful web service.



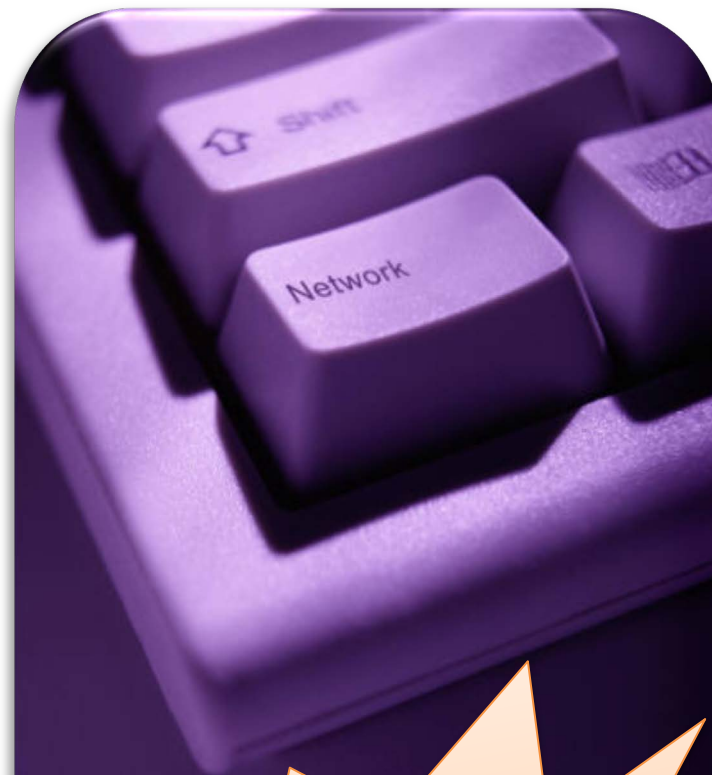
Query Health

How it works together



Reference Implementations

- Three open source distributed query solutions
 - i2b2 60+ large health systems
 - PopMedNet FDA Mini-Sentinel, MDPHNet
 - hQuery Laika / PopHealth successor “Hadoop-like” technology
- Query Health
 - Provides a standards overlay on top of proven solutions
 - Standardizes the questions and responses
 - Enables faster addition of data sources at lower cost

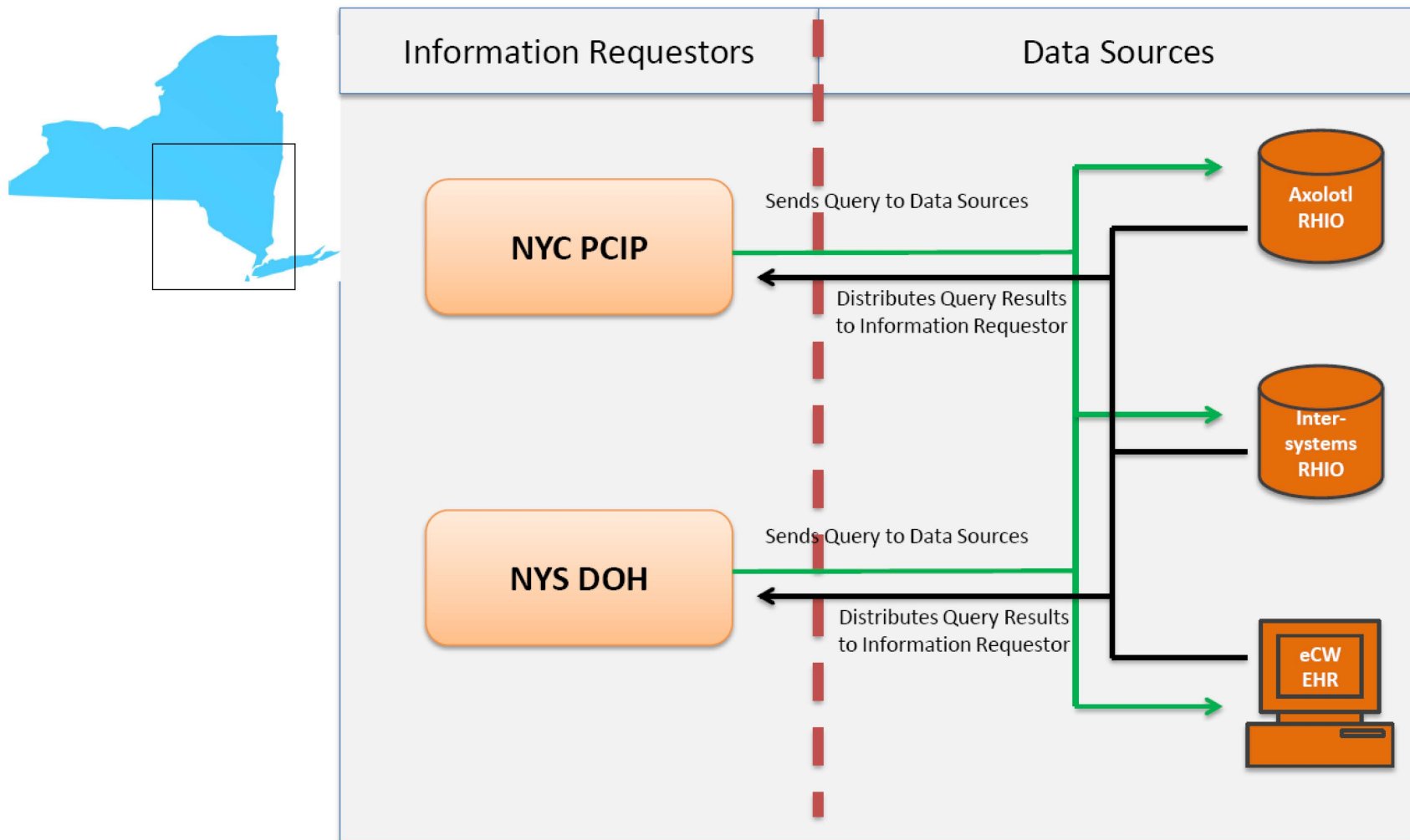


**Secure.
Sustainable.
Simplified.**

Query Health Pilots

Pilot	Focus	RI Queries	RI Policy Layer	Data Sources	Kickoff
NYC & NYS Depts. of Public Health	Diabetes (NYC) Hypertension (NYS)	i2b2	PMN	RHIOs EHR Vendor	May 2012
FDA Mini-Sentinel	Use of clinical data sources for FDA questions	PMN	PMN	i2b2/Beth Israel	June 2012
CDC	National / regional: - Disease syndromes - Situation awareness	i2b2	PMN	Bio-Sense 2	July 2012
Mass. Dept. of Public Health	Diabetes	PMN	PMN	MDPHNet	July 2012
CQM	Quality Measures	hQuery	PMN	EHR Vendor	August 2012

New York City / New York State Pilot



i2b2 Query Composer for NY Pilot

Putting the I in HealthIT
www.HealthIT.gov

i2b2 Web Client - Microsoft Internet Explorer provided by HEALTH

http://ec2-23-20-41-242.compute-1.amazonaws.com/webclient/

File Edit View Favorites Tools Help

Favorites i2b2 Web Client

i2b2 Query & Analysis Tool Project: i2b2 Demo User: i2b2 User Find Patients | Analysis Tools | Message Log | Help | Logout

Navigate Terms Find Terms

- GreenCEDD
 - Allergy
 - Condition
 - Age At Onset
 - Cause Of Death
 - Diagnosis Priority
 - Problem Code
 - Problem Code Display Name
 - Problem Date
 - Problem Status Code
 - Problem Status Display Name

Workplace

- SHARED
- demo

Previous Queries

- Condition@13:17:35 [5-16-2012] [demo]
- Allergy@13:17:04 [5-16-2012] [demo]
- Age At Onset@18:36:36 [5-15-2012] [demo]
- Clinical Measur@23:05:03 [4-24-2012] [demo]
- Clinical Measur@23:04:27 [4-24-2012] [demo]
- Diabetes mellit@19:24:48 [4-23-2012] [demo]

Query Tool

Query Name:

Temporal Constraint: Treat all groups independently

Group 1			Group 2			Group 3		
Dates	Occurs > 0x	Exclude	Dates	Occurs > 0x	Exclude	Dates	Occurs > 0x	Exclude
Treat Independently			Treat Independently			Treat Independently		
Problem Code			Gender Display Name [Cont					
one or more of these			AND			one or more of these		
			AND			drop a term on here		

Run Query Clear Print Query 2 Groups New Group

Query Status

Internet | Protected Mode: Off 115%

Next steps

2012

May

Jun

Jul

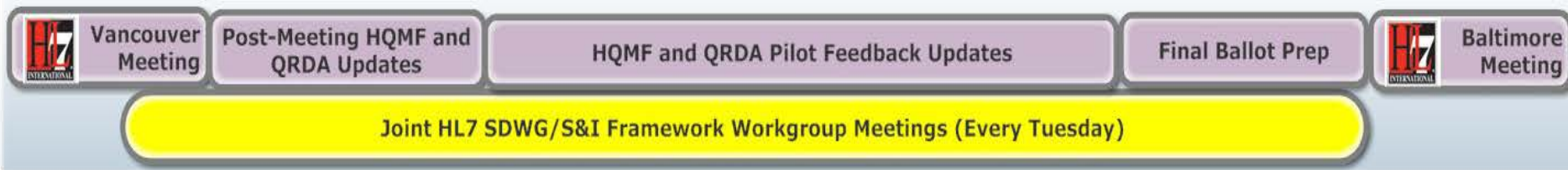
Aug

Sep

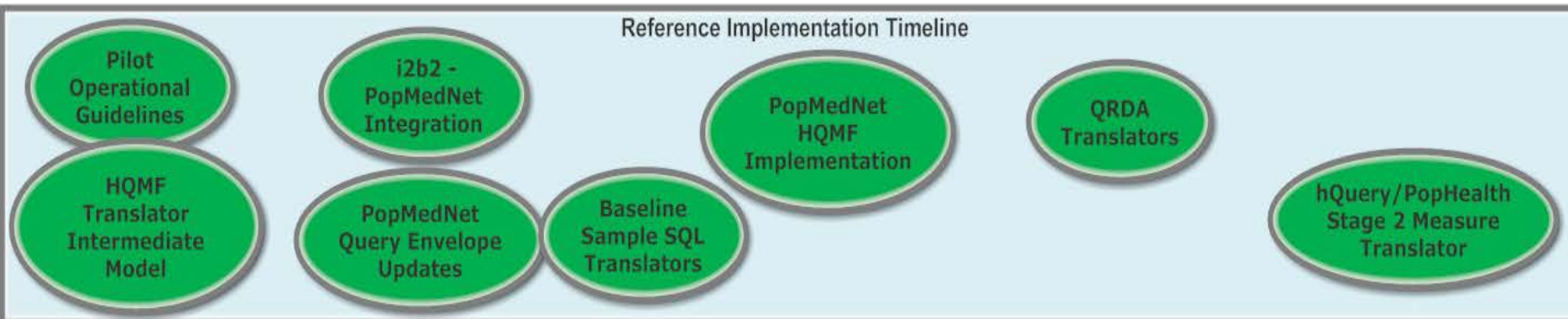
Query Health Pilot Timeline



HL7 Ballot Timeline



Reference Implementation Timeline

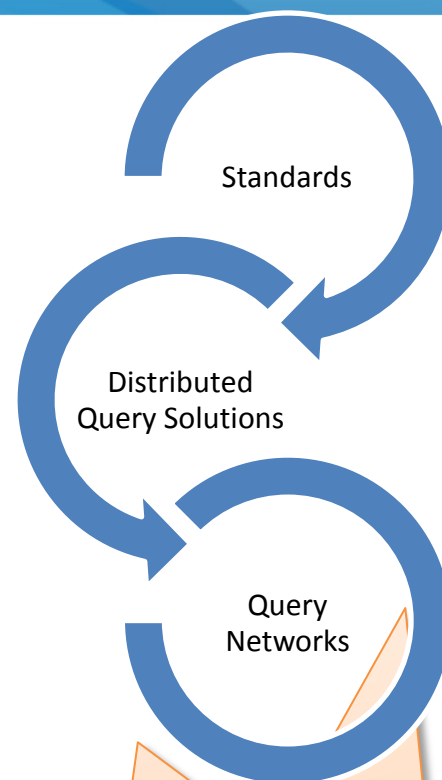


Impact of Query Health

Query Health delivers the standards and reference implementation services for distributed population queries.

Game changer for how the healthcare community can begin to think about:

- Quality measures
- A learning health system
- Health system performance
- Population health
- Disparities
- Comparative effectiveness
- Policies around Health IT



Sustainable standards
embedded in working
distributed query
solutions & networks