Query Health: Distributed Population Queries

Update from
ONC’s Office of Standards & Interoperability

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Objectives

Provide a look at how the Query Health initiative is evolving

• How do the different parts of the Query Health solution fit together?
• How might a distributed query work in a real technical environment?

Talk about the opportunities for pilot
Vision

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

Questions about disease outbreaks, prevention activities, health research, quality measures, etc.
Query Health
Scope and Approach

Standards & Service

- EHRs & Other Clinical Records
- Community Driven, Consensus-based
- Query Health – Distributed Population Queries
- Public / Private Partnership Project

Guideposts:
HITPC: Policy
HITSC: Stds

Practice drives standards
1. Rough consensus
2. Running code (open source)
3. Pilot
4. Specifications
5. Standards
Inside Query Health

1. EHR System Provides Patient Data
2. Define Query and/or Case Definition
3. Each data provider generates aggregate results based on the query or case definition
4. Leverage Results to Improve Patient Outcomes

Establish Community-Driven Standards and Protocols For:
- Patient Data
- Queries and Case Definitions
- Results

Query execution and results distribution remain ultimately under the control of the disclosing entity.
Community of participants that voluntarily agree to interact with each other. There will be many networks; requestors and responders may participate in multiple networks.
"Summer Concert Series"
The focus of the Query Health Initiative is on data from the clinical record (e.g., EHRs, HIEs, payer clinical repositories, PHR, etc.).

- How can we analyze this data to better analyze patient populations?

I want to make a general distributed query, to learn more information on disease outbreak, quality measures, comparative effectiveness, etc.

In an outpatient setting, I want to query clustered metrics related to Type 2 diabetes.
How would a distributed query work?

Note: All patient level data stays behind the firewall.

1. EHR / Clinical Record (Patient Data)

2. Query Health Data Model

3. Distribute Query to Data Sources

4. Execute Query, format & return Results

5. Sends Query Results to Information Requestor

Data Source
## Example Result Set

**Query Result for Provider X** (where X is each reporting provider):

For specified time frame: (MM-DD-YYYY - MM-DD-YYYY)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Age Range</th>
<th>Zip Code</th>
<th>Setting</th>
<th>Encounter Type</th>
<th>Race</th>
<th>Ethnicity</th>
<th>Insurance Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>Male</td>
<td>Female</td>
<td>&lt;18</td>
<td>18 - 64</td>
<td>≥65</td>
<td>10021</td>
<td>10031 10041</td>
</tr>
<tr>
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<td></td>
</tr>
</tbody>
</table>

**Numerator Counts**

<table>
<thead>
<tr>
<th>Risk Score</th>
<th>HbA1c &gt; 9.0%</th>
<th>Blood Pressure ≥ 140/90 mm Hg</th>
<th>LDL ≥ 130 mg/dl</th>
<th>Microalbumin &gt; 30 microgram/mg</th>
<th>Creatine</th>
<th>BMI ≥ 25 kg/m²</th>
<th>Smoking Status</th>
<th>Foot Examination</th>
<th>Eye Examination</th>
<th>Medication - Statin</th>
<th>Medication - Aspirin</th>
<th>Medication - Ace Inhibitor/ARB</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td></td>
<td></td>
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<td>2-3</td>
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<td>4-5</td>
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<td>6-7</td>
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</tr>
</tbody>
</table>

**Denominator Counts**

<table>
<thead>
<tr>
<th>Diagnosis of Diabetes</th>
<th>Type I</th>
<th>Type II</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>And all Risks Scores</td>
<td></td>
<td></td>
</tr>
<tr>
<td>And Hb A1c Result</td>
<td></td>
<td></td>
</tr>
<tr>
<td>And BP Reading</td>
<td></td>
<td></td>
</tr>
<tr>
<td>And LDL Result</td>
<td></td>
<td></td>
</tr>
<tr>
<td>And Microalbumin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>And BMI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>And Medications</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Develop modular, testable portfolio of Query Health standards and specifications that can be adopted by the industry, and support key HITECH and govt. priorities.

**Reference Implementation Stack**

- **Vocabulary & Code Sets**
  - SNOMED-CT
  - LOINC
  - ICD-10
  - RxNorm

- **Content Structure**
  - Clinical Element
  - Data Dictionary

- **Queries & Responses**
  - Modified HQMF
  - QRDA Category 2 & 3

- **Privacy & Security**
  - Query Envelope
  - Privacy Policy Enablement

- **Foundation: Distributed Query Solutions**
  - i2b2
  - PopMedNet
  - hQuery
Develop modular, testable portfolio of Query Health standards and specifications that can be adopted by the industry, and support key HITECH and govt. priorities.
The Road Ahead

January
Submit HQMF Proposal to HL7

February
Q1 - 2012
Concept to Code Mapping Best Practices

March
Reference Implementation prototype completed
Created to support and administer the Pilot Projects Program. The program encompasses pilot projects to be undertaken by participants in the Standards & Interoperability Framework and the Query Health Initiative. This group will:

• Help to organize Query Health Pilot Projects.
• Provide a forum wherein Pilot Project participants can discuss ideas, resolve issues, and collaborate on common work.
• Provide facilities whereby the other Query Health Work Groups and the ONC support staff can support the participants in their Pilot Projects.

Benefits of participation include:

• National Recognition
• Direct Feedback to ONC
• Staff Support
• First-Mover Advantage

Planning underway for:

• NYC / NYS
• CDC
New York City / New York State Pilot

Information Requestors

NYC PCIP

NYS DOH

Data Sources

Axolotl

RHIO

Inter-systems

RHIO

eCW

EHR
Query Health Recap

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Clinical Information
- Question
- Aggregate Result

Clinical Information
- Question
- Aggregate Result