Agenda

• **Overview:** connectathon vs. hackathon

• **Description:** To transform FHIR-CQL based digital quality measure (dQM) definitions to OMOP-CQL

• **Goal:** Ascend to a higher plane of interoperability consciousness
Guides for this Journey

Benjamin N. Hamlin, DrPH
Sr Research Informaticist,
Quality Measurement
and Research Group
NCQA | hamlin@ncqa.org

Anne Smith
Assistant Vice President
Information Technology and
Information Products
NCQA | Smith@ncqa.org
Overview: Connectathon vs. Hackathon

Connectathon
• Testing event to try specifications that are not fully adopted
• Highly collaborative process often continued across multiple events

Hackathon
• Problem solving event focused on introduction of new ideas or techniques
• Rapid development over very short time-period
Track Description

• Transforming FHIR-CQL based digital measure cohort definitions to a standard OMOP-CQL representation.

• We hope to demonstrate a process for generating OMOP-CQL phenotypes derived from FHIR-CQL dQMs using the public instance of ATLAS and CQL scripting.
dQM Cohort Definitions

1. Patients 18+ years old with Type 2 Diabetes
2. Patients aged 45–75 with no prior history of total colectomy or a diagnosis of colorectal cancer
3. Males 21–75 years of age and females 40–75 years of age with clinical atherosclerotic cardiovascular disease (ASCVD)
4. Women with a live birth
5. Children between 6 and 12 years of age diagnosed with ADHD

Domains covered
- Person
- Condition Occurrence
- Drug Exposure
- Episode
- Episode_Event
- Observation
- Visit Occurrence
- Visit Detail
- Provider
- and more…
**DQM Cohort Definitions and Phenotypes**

**Rule-Based Phenotype:** inclusion criteria based on standard data elements (i.e., diagnosis codes, medications, procedures, and lab values) based upon clinical guidelines for diagnosis and treatment.

**Quality Measure Cohort definition**

**FHIR-CQL**

**Measure Denominator**

**Rule-Based**

**Probabilistic**

**Phenotype Evaluation**

*Health data is incomplete, non-standard, inconsistent and dynamic over time. Evaluation of most appropriate phenotyping algorithm depends on contextual factors decreed by the end-user of the information*
OMOP on CQL on FHIR Track

Goal:
• Transform dQM cohort definitions from FHIR-CQL to OMOP-CQL while maintaining relational integrity to the original dQM specification
  • Draw upon as many relevant IGs, profiles, frameworks, recipes, methods, formulas, techniques, guidelines, best practices, and modus operandi as possible

Purpose:
• Unlock a powerful tool for measure developers, clinical guideline developers and CDS application developers
  • Leverage existing knowledge in research and healthcare standards communities around a Quality use case.
WHY OMOP-CQL?


PheValuator: Development and evaluation of a phenotype algorithm evaluator

Joel N Swerdel, George Hripcsak, Patrick B Ryan

Affiliations + expand
PMID: 31369862  PMCID: PMC7736922  DOI: 10.1016/j.jbi.2019.103258


A comparison of phenotype definitions for diabetes mellitus

Rachel L Richesson, Shelley A Rusincovitch, Douglas Wixted, Bryan C Batch, Mark N Feinglos, Marie Lynn Miranda, W Ed Hammond, Robert M Califf, Susan E Spratt

Affiliations + expand
PMID: 24026307  PMCID: PMC3861928  DOI: 10.1136/amiajnl-2013-000898

Validation of electronic medical record-based phenotyping algorithms: results and lessons learned from the eMERGE network


Affiliations + expand
PMID: 23531748  PMCID: PMC3715338  DOI: 10.1136/amiajnl-2012-000896


Measuring the Effect of EHR Data Quality in Identifying Type-2 Diabetes Population Across Common Phenotype Definitions of Diabetes

Priyanka Sood, MPH, Star Liu, BS, Hadi Kharrazi, MD PhD FACMI

Johns Hopkins Bloomberg School of Public Health, Baltimore MD
WHAT ABOUT FHIR?

dQM inclusion criteria identify the population for measurement in a consistent, reliable, uniform and objective manner, finding potentially eligible patients and including only those fitting the cohort definition for the specified use case.

These rule-based cohort definitions use explicit rules rendered as a FHIR-CQL expression to precisely describe which people belong in the cohort.

Implementation:
Value Based care is on FHIR-findings from phenotype evaluation need to reference FHIR with full integrity for both digital quality measurement, quality reporting AND quality improvement.

• DaVinci initiative
  • DEQM
  • HRex/CDex
• US Core/QI Core
Track Roles and Preparation

• All resources necessary to participate will be provided by track leads via Zulip
  https://chat.fhir.org/#streams/396585/OMOP.20.2B.20CQL.20.2B.20FHIR

• Participants must have laptop with Google Chrome browser installed

• ATLAS to CQL: https://github.com/gt-health/AtlasToCQL/
How to get your questions answers

- Zulip (chat.fhir.org)
  - https://chat.fhir.org/#streams/396585/OMOP.20.2B.20CQL.20.2B.20FHIR
  - Log issues in JIRA

- Track Lead Contact Info
  hamlin@ncqa.org    Smith@ncqa.org
Questions?
Appendix: Informational Links

The following list of resources *might* be used for this track:

- FHIR v4.0.1 [https://fhir-ru.github.io/summary.html](https://fhir-ru.github.io/summary.html)
- CQL v1.5.1 [http://cql.hl7.org/index.html](http://cql.hl7.org/index.html)
- OMOP CDM v5.4.1. [https://github.com/OHDSI/CommonDataModel](https://github.com/OHDSI/CommonDataModel)
- ATLAS [https://atlas-demo.ohdsi.org/#/home](https://atlas-demo.ohdsi.org/#/home)
- PheMA/CQL on OMOP [https://github.com/PheMA/cql-on-omop](https://github.com/PheMA/cql-on-omop)
- GT-FHIR [https://github.com/gt-health/GT-FHIR](https://github.com/gt-health/GT-FHIR)
- ATLAS to CQL: [https://github.com/gt-health/AtlasToCQL/](https://github.com/gt-health/AtlasToCQL/)