

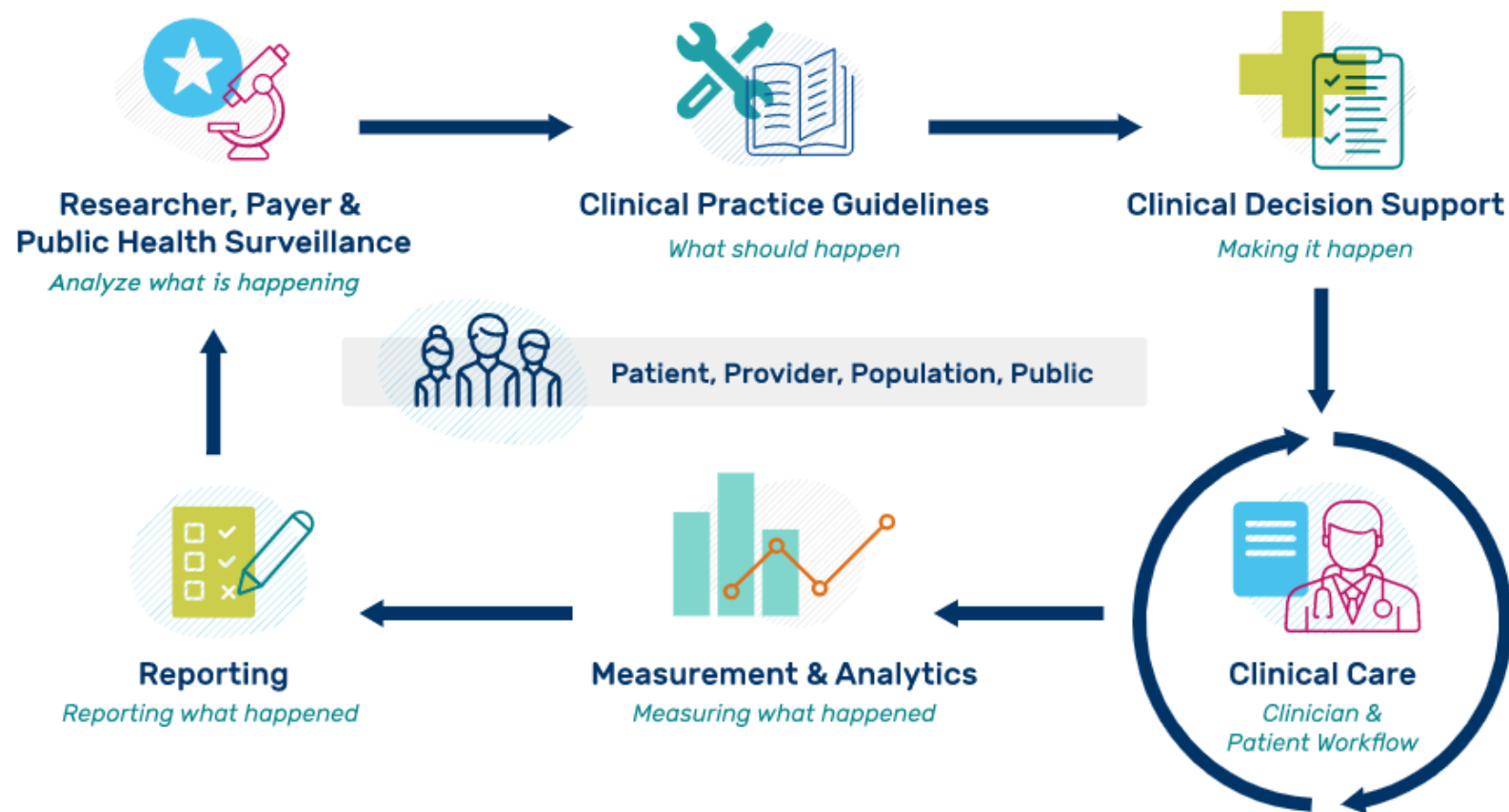
Reporting dQMs Using the HL7[®] Fast Healthcare Interoperability Resources[®] (FHIR[®]) Standard

Updated December 2025

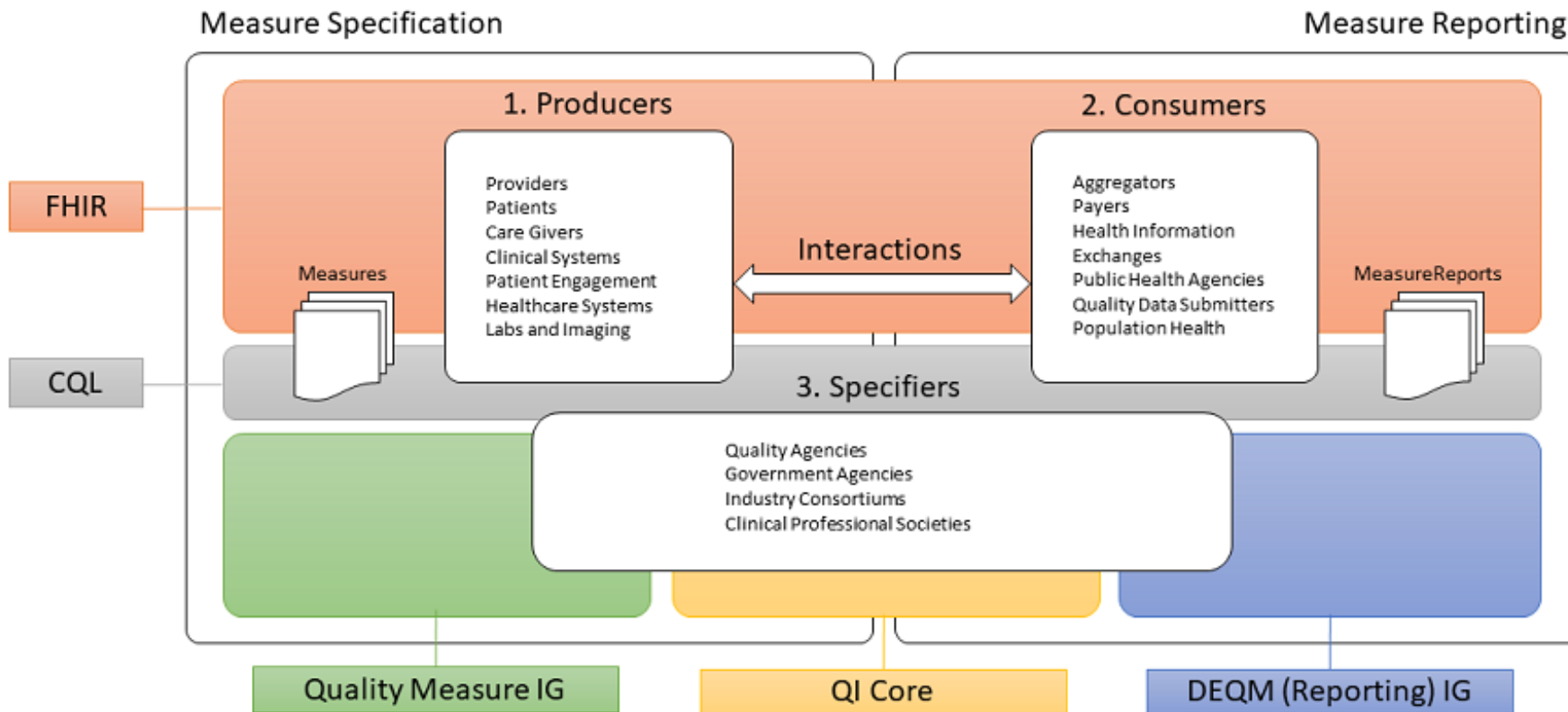
Topics

- Background
- Review Quality Measure architecture
- Data Exchange for Quality Measures (DEQM) deep dive:
 - Describe DEQM Measure Report Profiles, Operations, and Scenarios
 - Describe exchange roles, workflow steps
 - Review Data Exchange scenarios
 - Review Measure Reporting scenarios

Quality Improvement Ecosystem



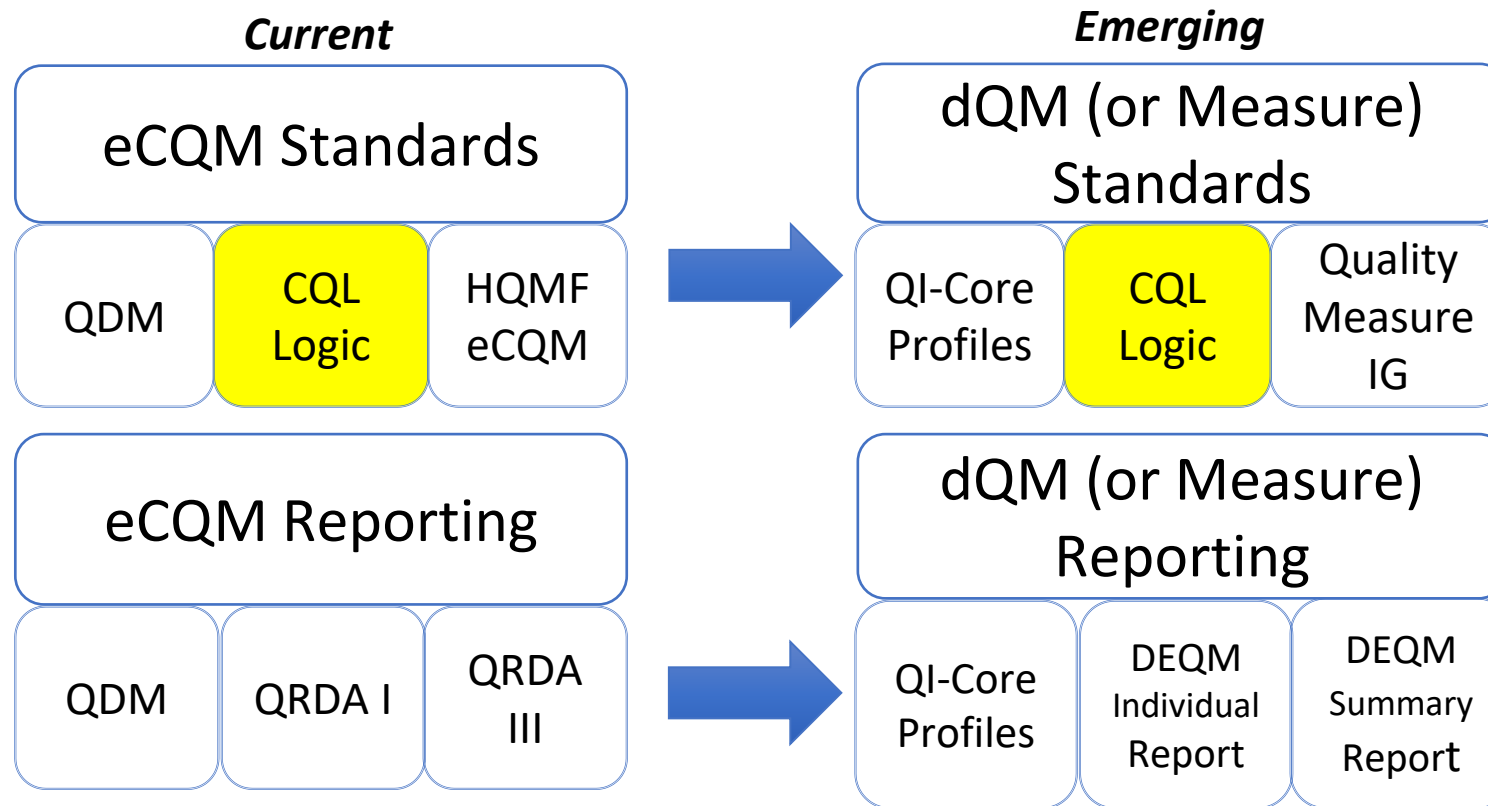
Quality Measurement Standards Landscape



CQL – Clinical Quality Language
DEQM – Data Exchange for Quality Measures
FHIR – Fast Healthcare Interoperability Resources
IG – Implementation Guide
QI – Quality Improvement

Retrieved from: <https://build.fhir.org/ig/HL7/cqf-measures/>

Evolution of Standards used in Digital Measures



Goal is to align quality measurement standards for measure development and reporting using FHIR

- QI-Core replaces QDM for data element representation;
- Quality Measure IG replaces HQMF for dQM structure;
- DEQM IG for Individual and Summary replaces QRDA I and III

CQL – Clinical Quality Language | eCQM – electronic Clinical Quality Measure | HQMF- Health Quality Measure Format | QDM – Quality Data Model |
QI-Core – Quality Improvement Core | QRDA- Quality Reporting Document Architecture | DEQM – Data Exchange for Quality Measures

Data Exchange for Quality Measures (DEQM) Deep Dive

DEQM Measure Report Profiles: Individual - Measure Report

- Profile designed to exchange a measure outcome for an individual
 - Similar to QRDA I reporting
 - Requires minimum set of elements to support meaningful exchange
 - Can be exchanged with or without supporting clinical data

13.17.1 Resource Profile: DEQM Individual MeasureReport Profile

Official URL: http://hl7.org/fhir/us/davinci-deqm/StructureDefinition/indv-measurereport-deqm		Version: 5.0.0
Standards status: Trial-use	Maturity Level: 4	Computable Name: DEQMIndividualMeasureReportProfile
Other Identifiers: OID:2.16.840.1.113883.4.642.40.2.42.26		

[MeasureReport](#) is used as an organizer for both data exchange for measure and for measure reporting. Three profiles on the MeasureReport resource are defined in this guide to delineate these different uses. The **DEQM Individual MeasureReport Profile** defined here is used when a measure is reported to an aggregator for one specific subject. It contains all of the data that is relevant to generate the report including the measure outcome and is similar to a QRDA Category 1 report. In addition to the MeasureReport, the report would be collected in a Bundle with the reporter, subject, and any other resources that were used to calculate this measure.

13.17.1.1 Mandatory Data Elements and Terminology

The following data-elements are mandatory (i.e data MUST be present).

Each MeasureReport Must Have:

1. period.start: Starting time with inclusive boundary
2. subject: What individual(s) the report is for
3. status: complete | pending | error
4. type: individual | subject-list | summary | data-collection
5. period.end: End time with inclusive boundary, if not ongoing
6. date: When the report was generated. Note: The language in R5 was changed to calculated. We are clarifying that intent.
7. period: The period for which the report was calculated. For the gaps in care use case, this is referred to as the gaps through period.
8. measure: What measure was calculated
9. reporter: Organization that generated the MeasureReport

<https://hl7.org/fhir/us/davinci-deqm/StructureDefinition-indv-measurereport-deqm.html>

DEQM Measure Report Profiles: Summary Measure Report

- Profile designed to exchange a measure outcome for a group of subjects
 - Similar to QRDA III reporting
 - Requires minimum set of elements to support meaningful exchange

13.16.1 Resource Profile: DEQM Summary MeasureReport Profile

Official URL: http://hl7.org/fhir/us/davinci-deqm/StructureDefinition/summary-measurereport-deqm		Version: 5.0.0
Standards status: Trial-use	Maturity Level: 4	Computable Name: DEQMSummaryMeasureReportProfile
Other Identifiers: OID:2.16.840.1.113883.4.642.40.2.42.30		

[MeasureReport](#) is used as an organizer for both data exchange for measure and for measure reporting. Three profiles on the MeasureReport resource are defined in this guide to delineate these different uses. The **DEQM Summary MeasureReport Profile** defined here is used when a measure is reported to an aggregator for a group of subjects. It contains all of the data that is relevant to generate the report including the measure outcome and is similar to a QRDA Category 3 report. Unlike the [DEQM Individual MeasureReport Profile](#), the report is typically transacted as a single MeasureReport report.

13.16.1.1 Mandatory Data Elements and Terminology

The following data-elements are mandatory (i.e data MUST be present).

Each MeasureReport Must Have:

1. measure: What measure and version was calculated
2. reporter: Organization that generated the MeasureReport
3. period.start: Starting time with inclusive boundary
4. status: complete | pending | error
5. type: individual | subject-list | summary | data-collection
6. period.end: End time with inclusive boundary, if not ongoing
7. date: When the report was generated. Note: The language in R5 was changed to calculated. We are clarifying that intent.
8. group: Measure results for each group
9. period: What period the report covers

<https://hl7.org/fhir/us/davinci-deqm/StructureDefinition-summary-measurereport-deqm.html>

DEQM Measure Report Profiles: Exchange Measure Report

- Profile designed to identify data of interest for a measure
 - Defines minimum elements to support meaningful exchange
 - Focused on data of interest, not the score
 - Supports incremental or snapshot exchange

13.18.1 Resource Profile: DEQM Data Exchange MeasureReport Profile

Official URL: http://hl7.org/fhir/us/davinci-deqm/StructureDefinition/datax-measurereport-deqm		Version: 5.0.0
Standards status: Trial-use	Maturity Level: 4	Computable Name: DEQMDataExchangeMeasureReportProfile
Other Identifiers: OID:2.16.840.1.113883.4.642.40.2.42.4		

[MeasureReport](#) is used as an organizer for both data exchange for measure and for measure reporting. Three profiles on the MeasureReport resource are defined in this guide to delineate these different uses. When a data producer needs to send data to a data consumer, they use the **DEQM Data-Exchange MeasureReport Profile** defined here. The type element in this profile is set to "data-collection". Along with the MeasureReport profile, the data producer sends the reporter, subject, and any relevant resources for the measure they have produced data on. When a data producer sends a MeasureReport and the associated data, they may not have all the data that is required to calculate the measure report. Additional data may need to be collected later or there may be additional data used in the measure that the aggregator owns such as a continuous coverage period requirement.

13.18.1.1 Mandatory Data Elements and Terminology

The following data-elements are mandatory (i.e data MUST be present).

Each MeasureReport Must Have:

1. period.start: Starting time with inclusive boundary
2. subject: What individual(s) the report is for
3. status: complete | pending | error
4. type: individual | subject-list | summary | data-collection
5. reporter: The organization where the measure was completed
6. period.end: End time with inclusive boundary, if not ongoing
7. updatetype: Optional Extensions Element
8. date: When the report was generated
9. period: What period the report covers
10. measure: What measure and version was calculated

<https://hl7.org/fhir/us/davinci-deqm/StructureDefinition-summary-measurereport-deqm.html>

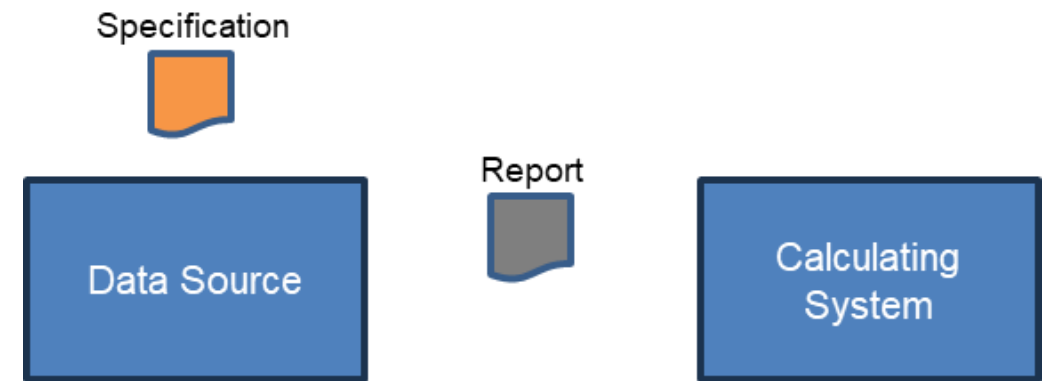
Data Exchange with DEQM

DEQM defines three exchange operations:

- \$collect-data
 - A data Consumer requests data from a Producer
- \$submit-data
 - A data Producer submits data to a Consumer
- \$bulk-submit-data
 - To be aligned with Bulk Data Access IG

DEQM Operations (Cont'd)

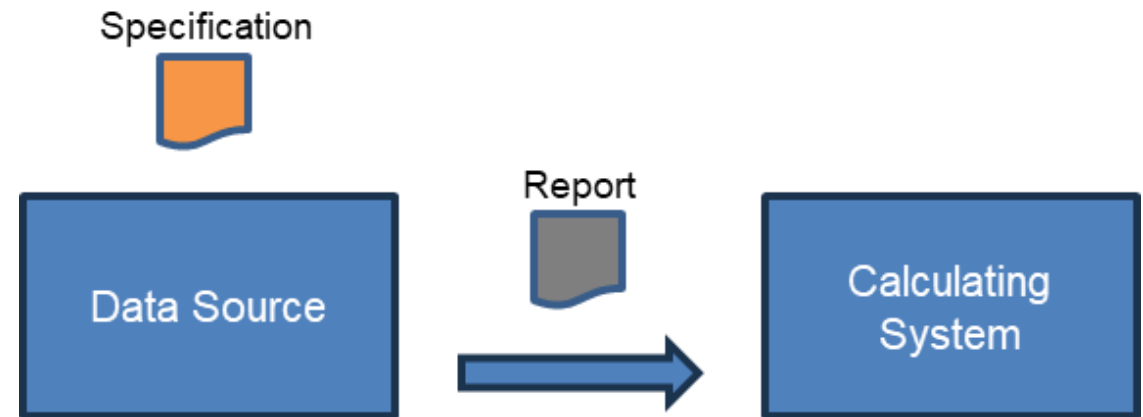
- Data Source
 - Source system(s) with data of interest for the measure(s)
- Calculating System
 - System that will perform the measure calculation
- Specification
 - The Measure to be calculated
- Report
 - MeasureReport describing the exchange



<https://hl7.org/fhir/us/davinci-deqm/operations.html>

\$submit-data

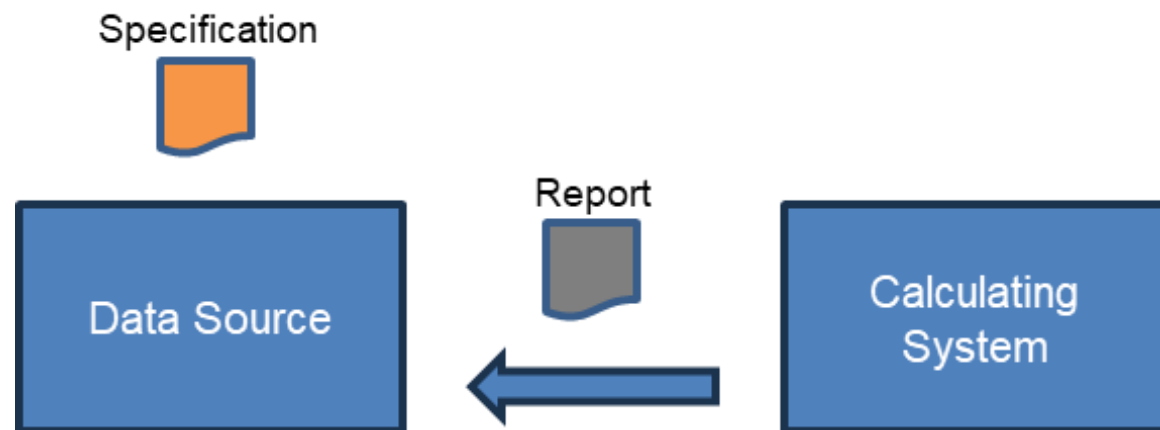
- “Push”
 - The source system gathers the data and submits it to the calculating system
- Snapshot/Incremental
 - “all data” or “all data since”
- Data of Interest
 - Measure specifies data-of-interest (e.g. Mammography procedures in the last year)
- Report
 - Uses an Exchange MeasureReport



<https://hl7.org/fhir/us/davinci-deqm/OperationDefinition-submit-data.html>

\$collect-data

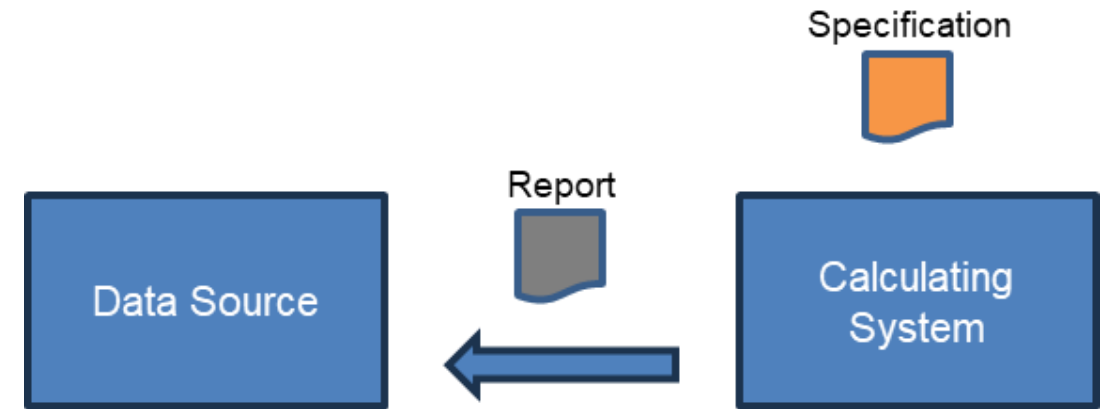
- “Pull”
 - The calculating system collects the data from the source system
- Snapshot/Incremental
 - “all data” or “all data since”
- Data of Interest
 - Measure specifies data-of-interest (e.g. Mammography procedures in the last year)
- Report
 - Uses an Exchange MeasureReport



<https://hl7.org/fhir/us/davinci-deqm/OperationDefinition-collect-data.html>

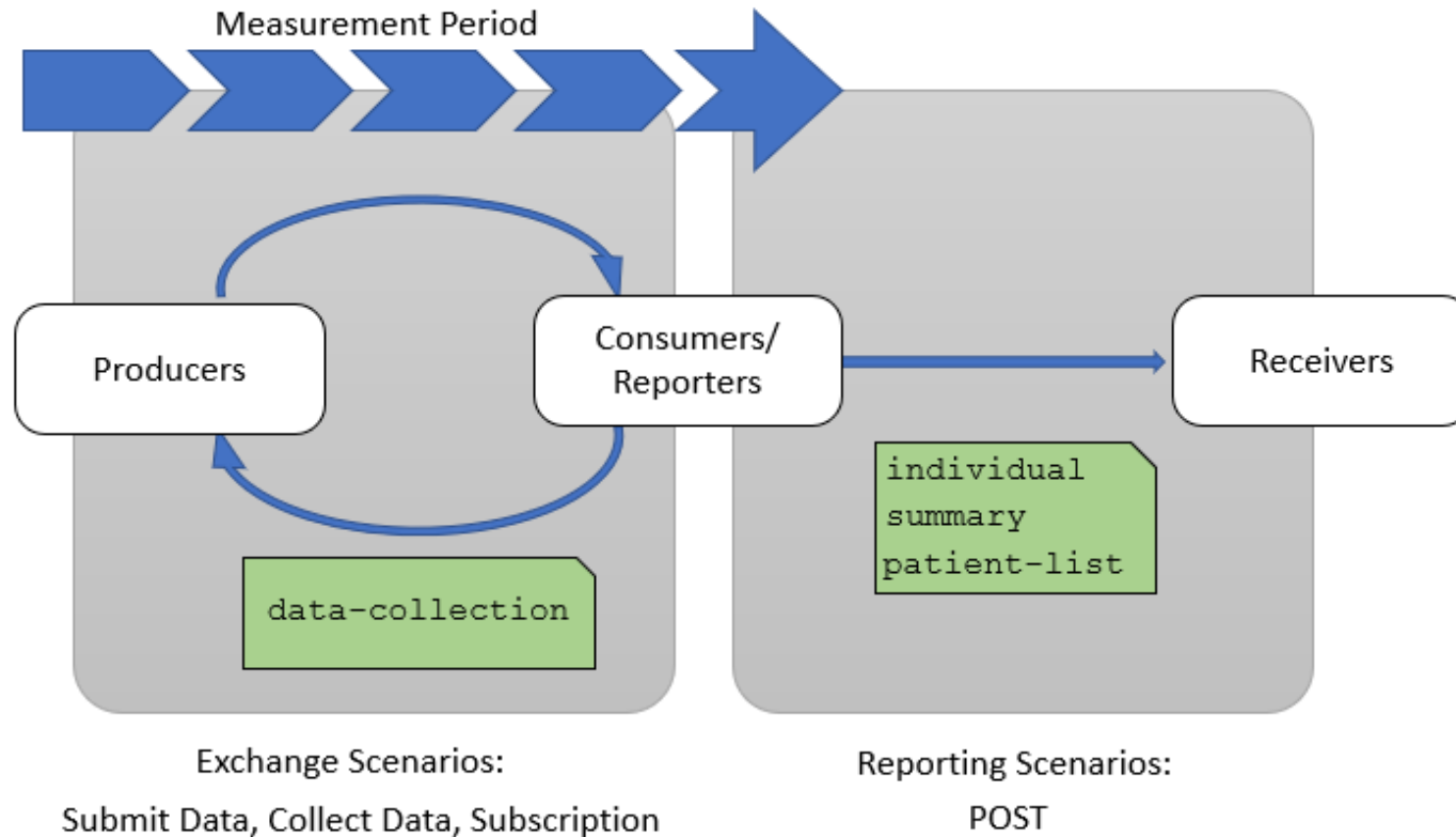
\$evaluate

- “Calculate”
 - Data source requests the result
- Subject
 - Individual or summary
- Data of Interest
 - Measure specifies data-of-interest (e.g. Mammography procedures in the last year)
- Report
 - Uses an Individual or Summary MeasureReport



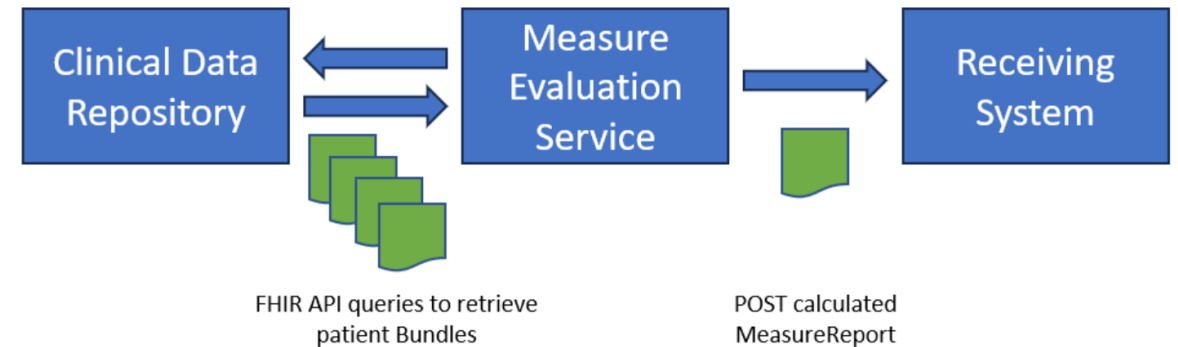
<https://hl7.org/fhir/us/davinci-deqm/OperationDefinition-evaluate.html>

Quality Reporting Scenarios in DEQM



Population Reporting Without Supporting Data

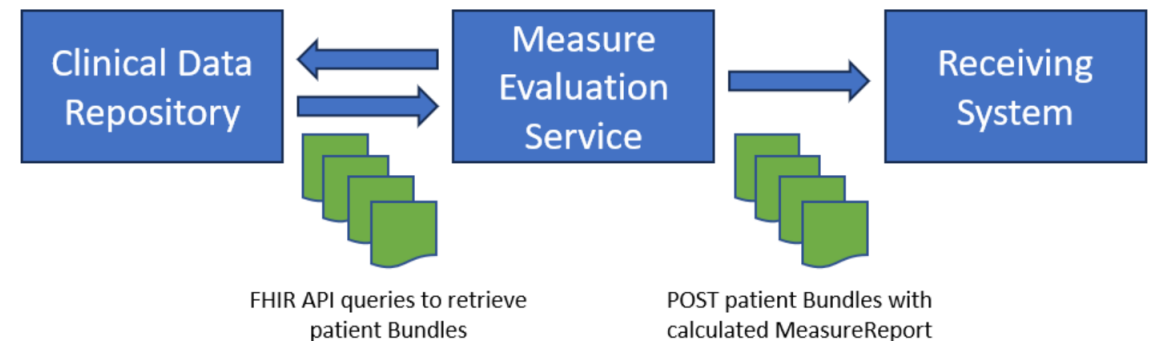
- Eligible Clinician (EC)
 - Subject is a Group
- Summary
 - Calculation is summary level, no individual data is provided or referenced in the resulting measure report
- Stratification and Supplemental Data
 - Reported as counts for each value



<https://hl7.org/fhir/us/davinci-deqm/operations.html>

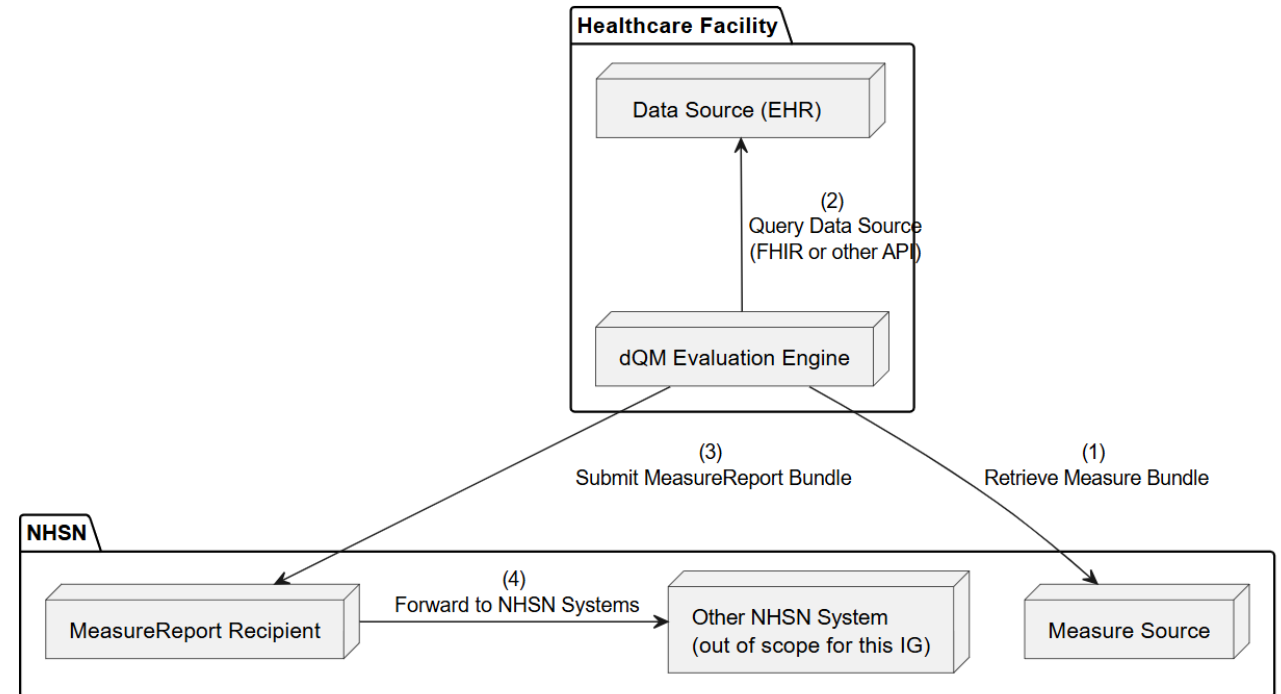
Population Reporting With Supporting Data

- Hospital Inpatient/Outpatient
 - Subject is a Patient
 - Reported for a Group, but per Patient
- Individual
 - Individual data is referenced in the MeasureReport
 - Bundle includes data referenced by the report(s)
- Stratification and Supplemental Data
 - Reported as values and potentially additional data (i.e. resources)



NHSN and CMS Hospital Reporting

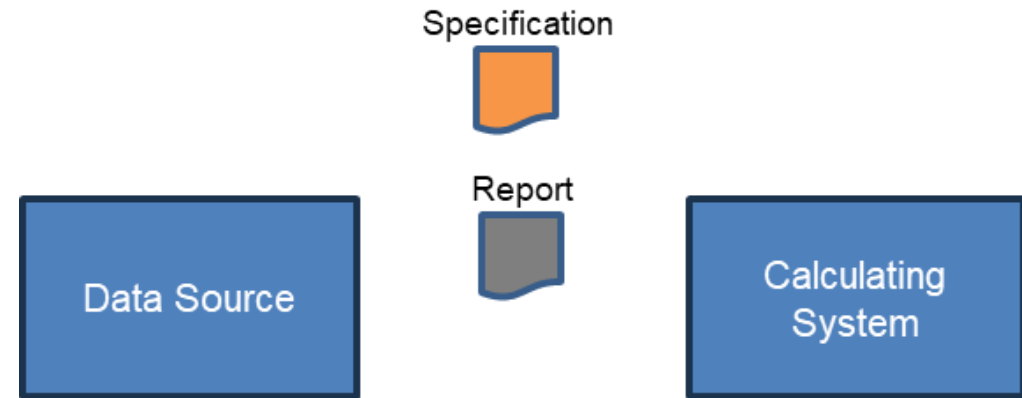
- Hospital Inpatient
 - Same as population with supporting data
- Different Measures, same Source
 - Demonstrate calculation of different measures from the same source data
- Stratification and Supplemental Data
 - Key use of supplemental data to identify data-of-interest
- e.g. Procedures, Labs, Medications



<https://hl7.org/fhir/us/davinci-deqm/operations.html>

Determining Subjects (Attribution)

- Individual
 - Subject is singular (e.g. a Patient, or a Location)
- Summary
 - Subject may be provided as a Group
 - Or through other parameters such as practitioner (i.e. patients with a relationship to the practitioner)
 - Can use DaVinci Attribution to define the Group



<https://hl7.org/fhir/us/davinci-deqm/operations.html>

Determining Data-of-Interest

- Measure
 - Specifies data-of-interest as data requirements
- Multiple Measures
 - Can be collapsed across measures, so required data elements are not duplicated
- By Use Case
 - Can be as broad or narrow as required (consider a cohort measure that identifies patients and supplemental data)



Profile(s): [QICore MedicationRequest](#)

Must Support Elements: medication, authoredOn, status, intent, doNotPerform

Code Filter(s): medication in [Antithrombotic Therapy](#)

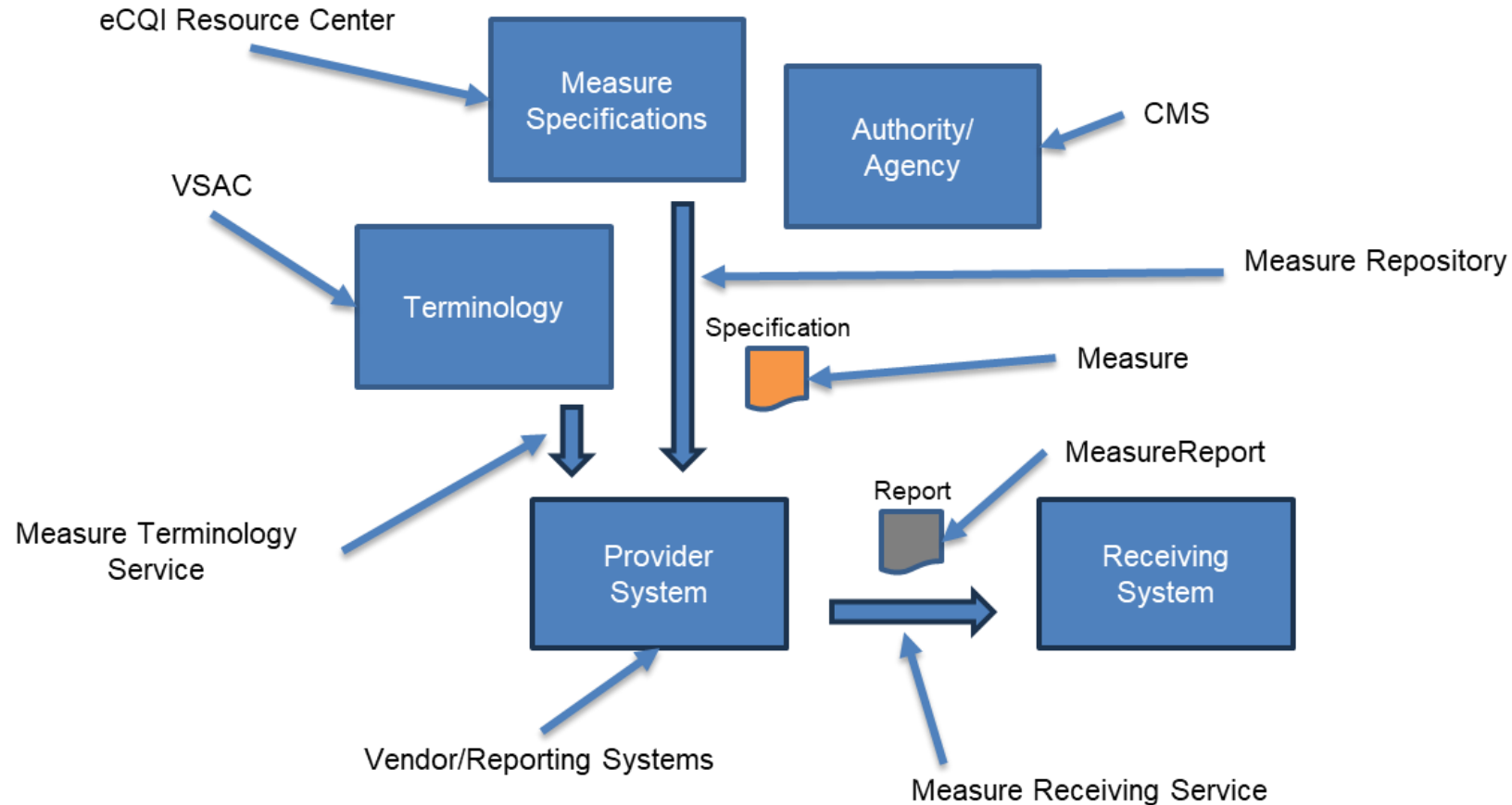
Profile(s): [QICore Encounter](#)

Must Support Elements: type, period, rank, condition, hospitalization

Code Filter(s): type in [Non-Elective Inpatient Encounter](#)

<https://hl7.org/fhir/us/davinci-deqm/operations.html>

Quality Reporting in FHIR



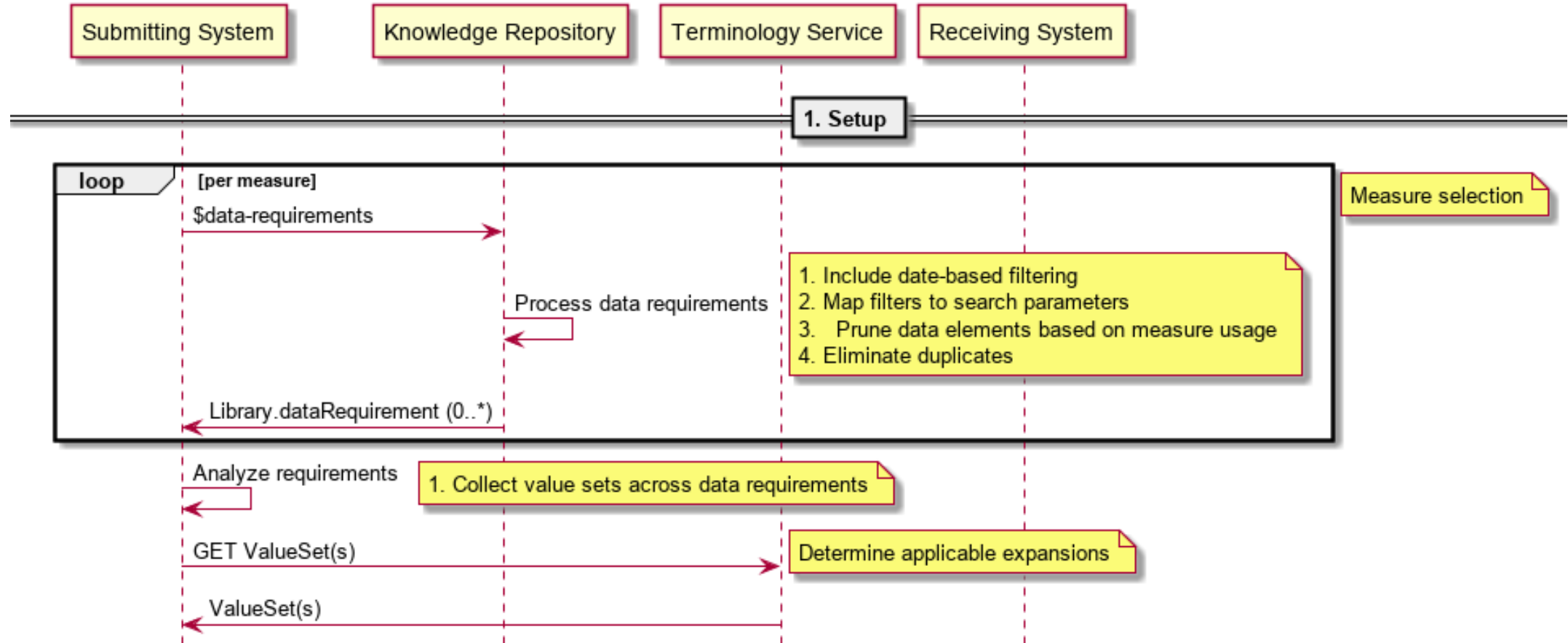
Reporting/Exchange Roles

- Producer – clinician or clinician system that produces data as part of the delivery of care
- Consumer – payers, health information exchanges (HIEs), aggregators, reporting vendors
- Reporter – providers, clinics, hospitals, institutions
- Receiver – payers, agencies
- Knowledge Repository – publishes dQM specifications
- Terminology Service – publishes dQM value sets

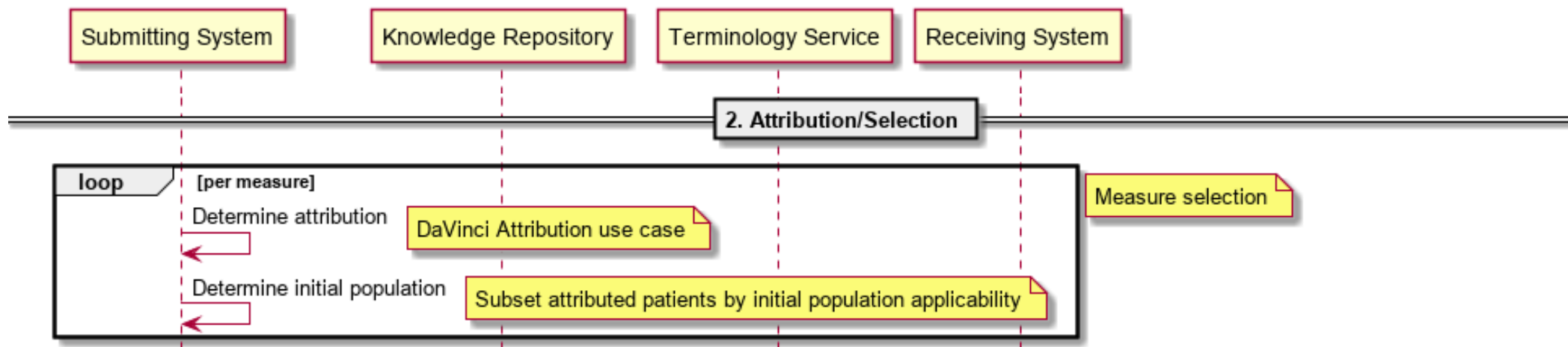
Workflow Steps

- Setup – Measure selection, terminology load
- Attribution – Provider attribution
- Submission – Submitting data-of-interest
- Evaluation – Evaluation of quality measures
- Care Gaps – Determination of care gaps

Setup

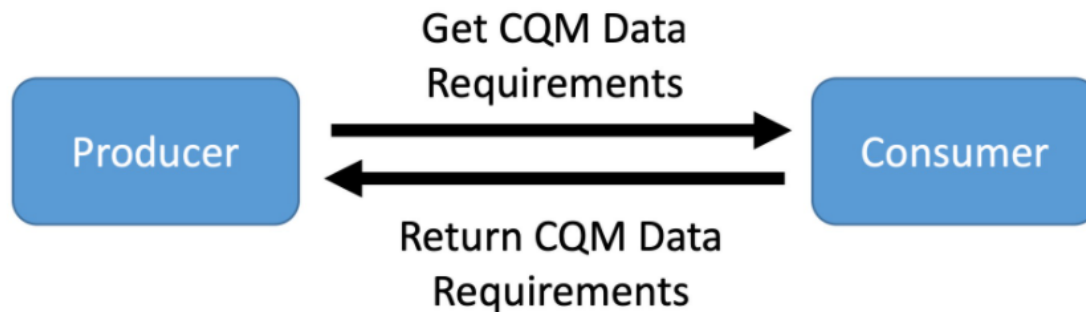


Attribution

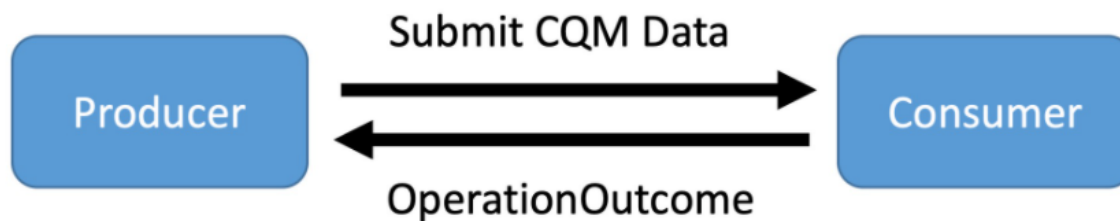


Conceptual Submit Data Workflow

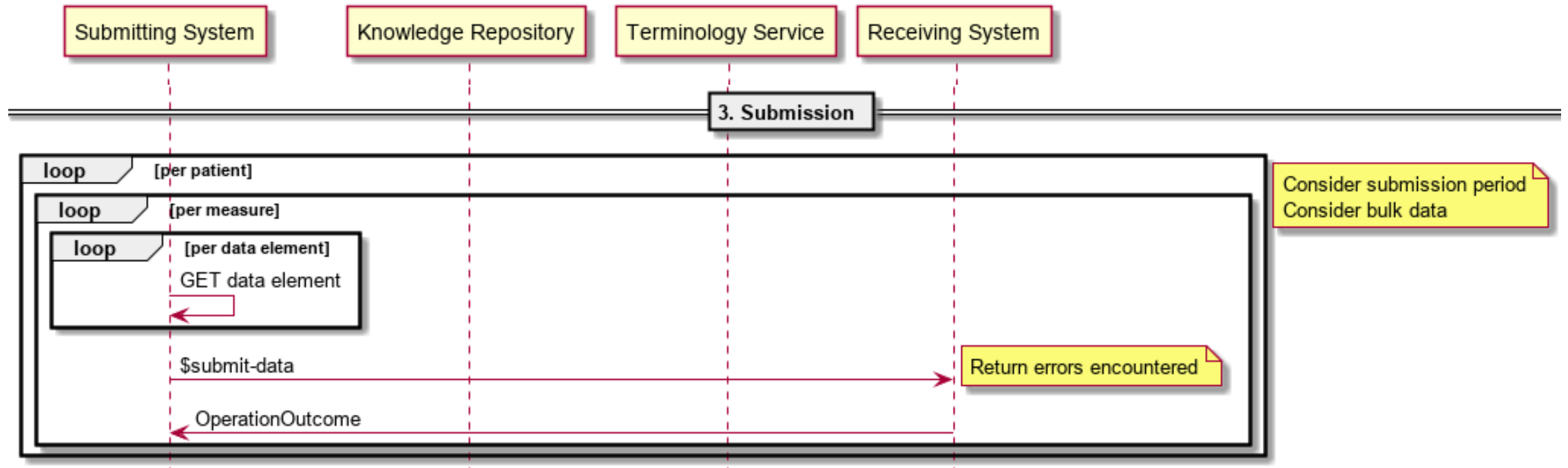
1. Confirm Data Requirements



2. Submit Data



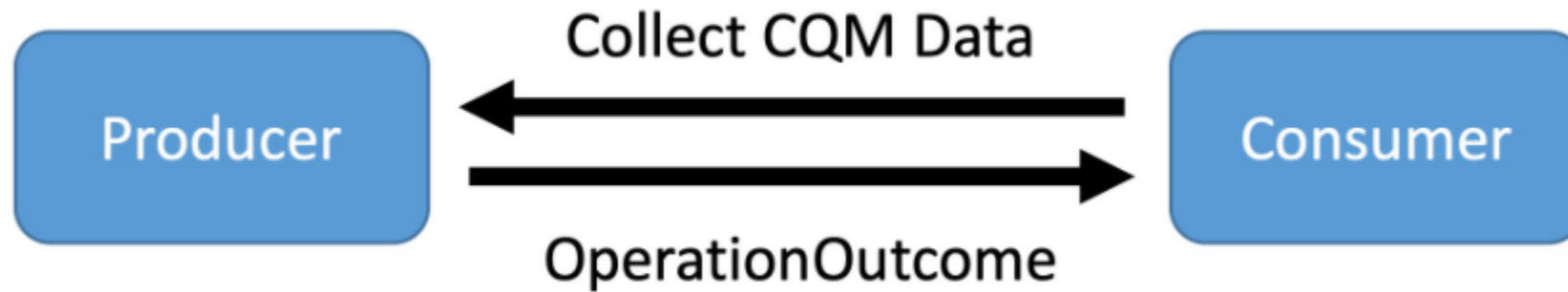
Submission (per-patient)



Technical \$submit-data workflow

- [Colon Cancer Screening Measure Data Exchange- Submit Data Example](#)

Conceptual Collect Data workflow



Technical \$collect-data workflow

- [Colon Cancer Screening Measure Data Exchange: Collect Data example](#)

Considerations for Data Exchange Scenarios

- Incremental vs Snapshot
- Provenance of submitted data (multi-tenant)
- Use of Bulk Data protocol

Quality Reporting with DEQM

- DEQM defines three reporting scenarios:
 - Individual Reporting
 - Summary Reporting
 - Patient-List Reporting

Individual Reporting

- Individual report contains data for one patient for one measure
- Data elements in the report are defined by the measure reported on
- Supported by the DEQM [Individual MeasureReport Profile](#)

Individual Reporting Technical Workflow

- [Colorectal Cancer Screening Individual Reporting Example](#)

Summary Reporting

- Summary reports contain calculated summary data for one or more measures. This includes:
 - Patient counts for initial population, denominator, denominator exclusions/exceptions, and numerator
 - Summary data for stratifier criteria (e.g., gender, age)

Summary Reporting Technical Workflow

- [Colorectal Cancer Screening Summary Report example](#)

End to End Use Case: Medication Reconciliation

- [Medication Reconciliation Post-Discharge](#)

Current Activities

- CMS has converted QDM-based eCQMs to dQMs using FHIR
- CMS program measures continue to be tested at HL7 Connectathons
 - See [GitHub](#) for work-in-progress dQMs and example expressions
- HL7 Clinical Quality Improvement (CQI) Work Group advances DEQM implementation through multi-stakeholder collaboration

Current HL7 Activities

- DEQM was balloted May 19, 2025, applying updates to align with
 - Quality Measure Implementation Guide (QM IG) v5.0.0
 - US Core 4.0.1
- HL7 convenes Connectathons three times per year in January, May, and September

Resources to Get You Started

- Current FHIR Measures on [GitHub](#)
- HL7 FHIR R4 Standards and IGs currently in use
 - [QI-Core](#) (STU6 (v6.0.0) published March 2024)
 - [DEQM](#) (STU5 (v5.0.0) published May 2025)
 - [QM IG](#) (STU5 (v5.0.0) published November 2024)
- Electronic Clinical Quality Improvement (eCQI) Resource Center [FHIR Education page](#)

Resources to Get Involved

- Collaborative learning
 - [CQL Tools & Resources](#)
- Standards advancement
 - [HL7 Clinical Quality Information workgroup](#)
 - [HL7 FHIR® Connectathons](#)
- eCQI Resource Center [FHIR Connect page](#)