

Quality Improvement with CQL and FHIR: Care Gaps and Near Real-Time Data Submission

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PARTNER



Who am I?

- Samuel Sayer
- MITRE
- Program Manager, Interoperability



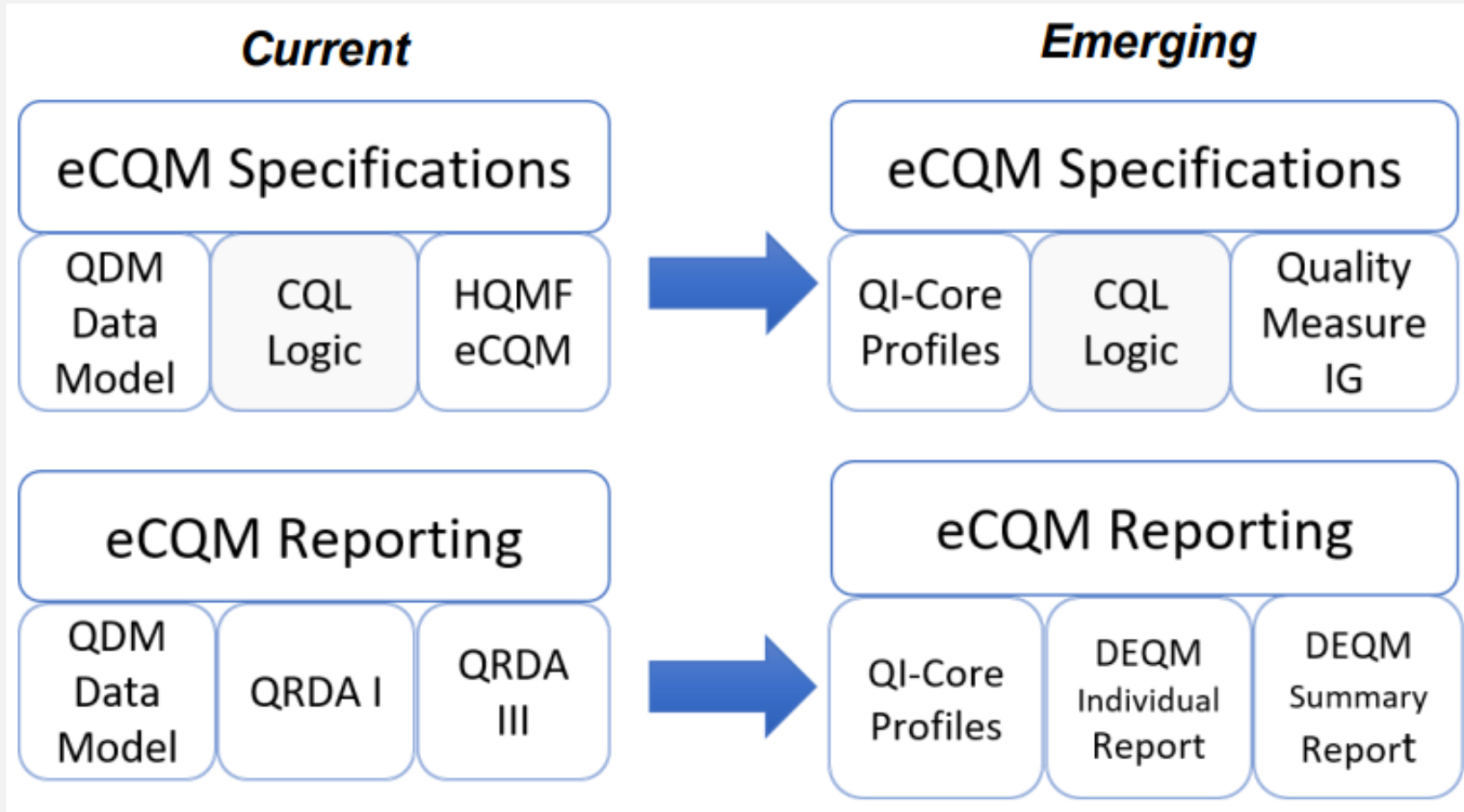
Learning Objectives

- Describe the differences between existing quality reporting standards and FHIR-based quality reporting standards
- Explain how FHIR can reduce burden for vendors and providers
- Demonstrate the steps required to report quality data and receive care gap reports using FHIR
- Produce and understand a detailed care gap report

Background

- The Data Exchange for Quality Measures (DEQM) implementation guide has been under development since 2018 under the Da Vinci FHIR Accelerator
- In late 2019, DEQM began work to enable reporting of “Gaps in Care” reports back to providers.

Standards Evolution



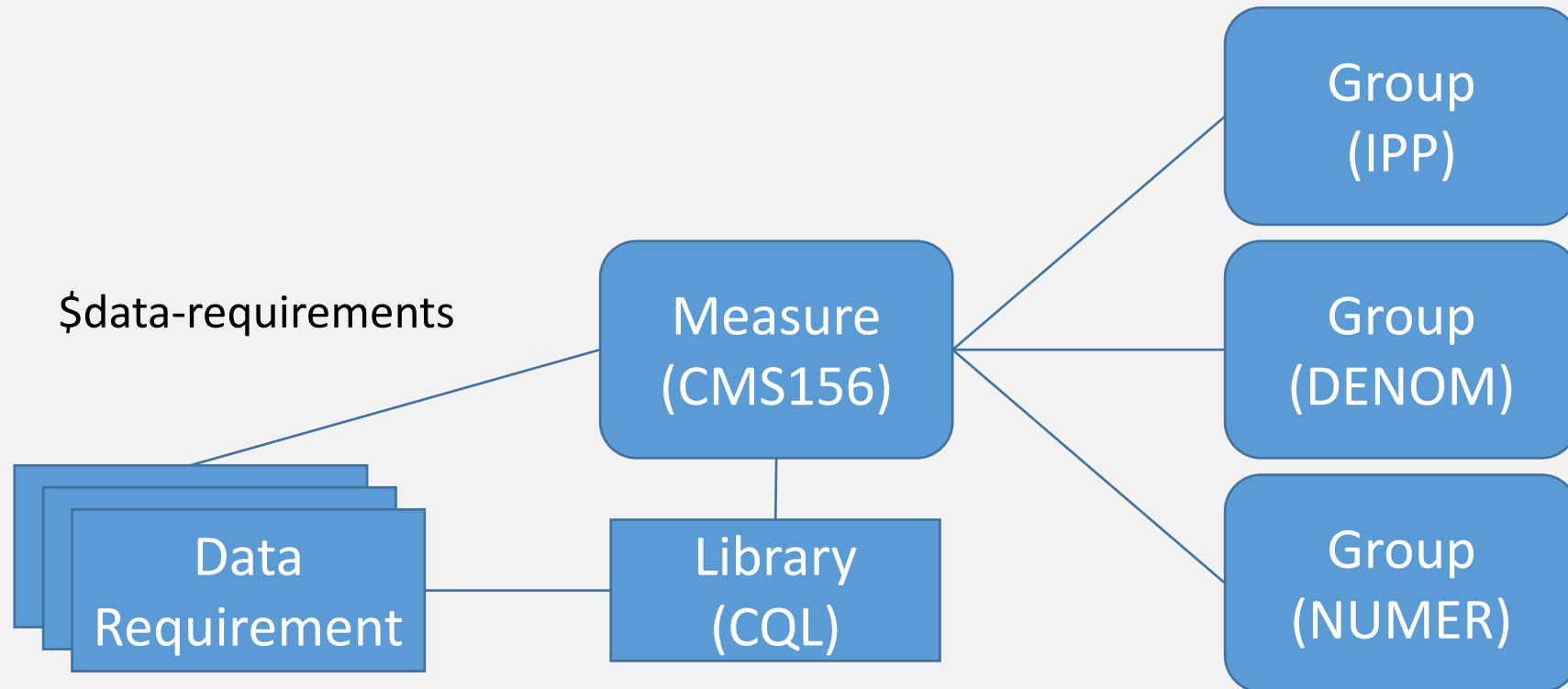
Example Measure – Colorectal Cancer Screening

```
define "Numerator":
  exists "Colonoscopy Performed"
  or exists "Fecal Occult Blood Test Performed"
  or exists "Flexible Sigmoidoscopy Performed"
  or exists "Fecal Immunochemical Test DNA"
  or exists "CT Colonography Performed"

define "Denominator Exclusion":
  Hospice."Has Hospice"
  or exists "Malignant Neoplasm Ever"
  or exists "Total Colectomy Performed"

define "Initial Population":
  Global."CalendarAgeInYearsAt"(FHIRHelpers.ToDate(Patient.birthDate), start of "Measurement Period") in Interval[50, 75]
  and exists AdultOutpatientEncounters."Qualifying Encounters"
```

FHIR Measure



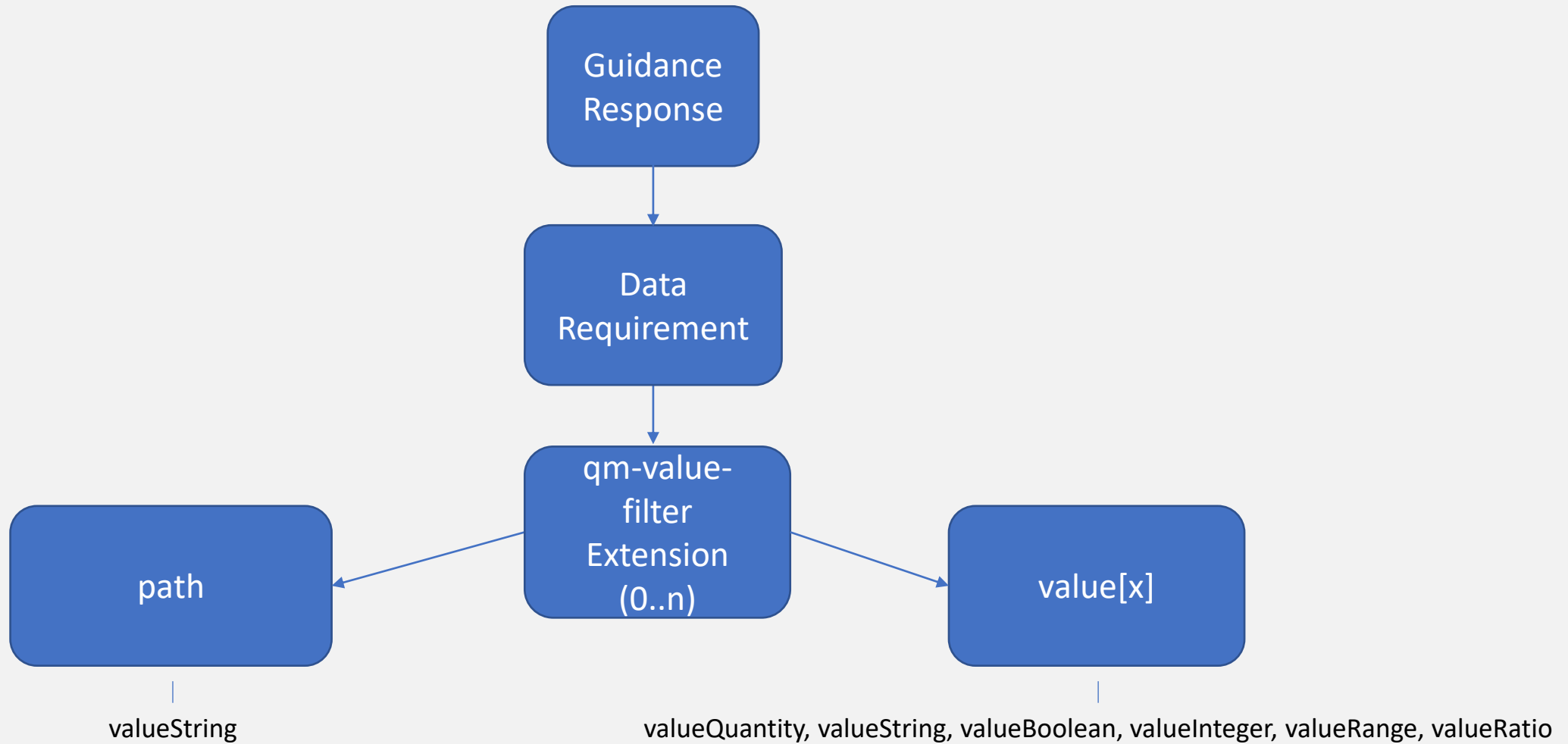
Data Requirements

- A DataRequirement type includes the attribute definitions a measure requires in order for a data element to apply
- The \$data-requirement operation will return a Library including of a list of DataRequirements for a Measure

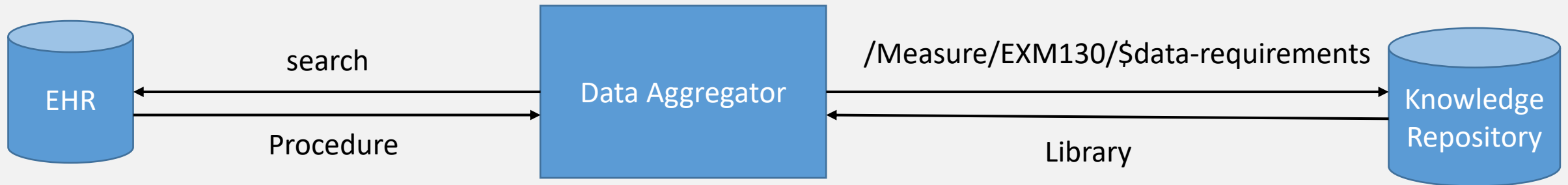
Attribute	Cardinality	Allowed Types
type	1..1	Any FHIR Resource
codeFilter	0..*	Coding, valueSet
dateFilter	0..*	DateTime, Period, Duration

Value Filter

*(proposed for FHIR R5, currently being developed as an extension for Quality Measure IG)



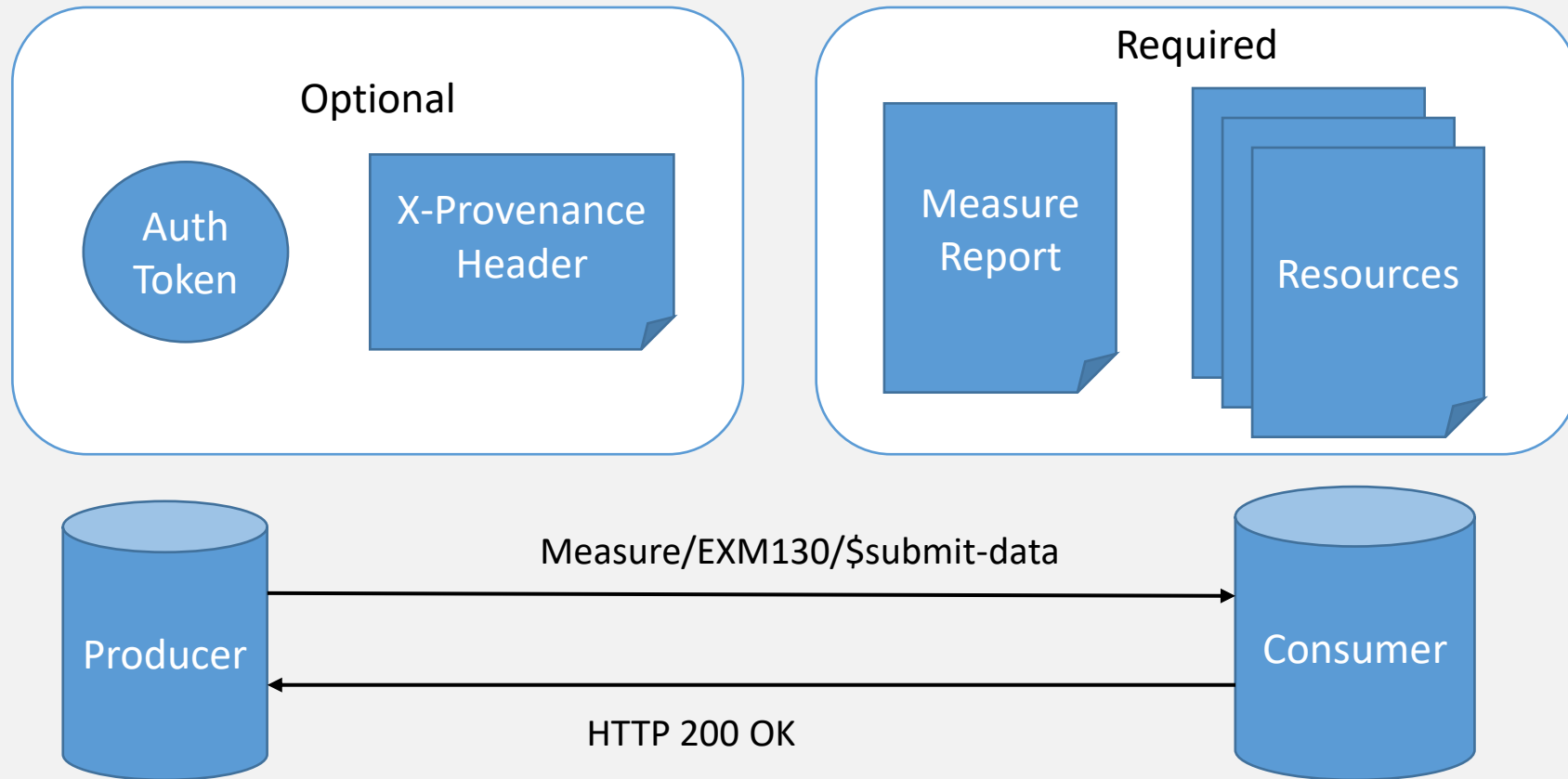
Data Extraction - Query



Search Params - /Procedure	
code.in	2.16.840.1.113883.3.464.1003.108.12.1020
performed.gte	1/1/11
performed.lte	12/31/21


DataRequirement – EXM130	
Type	Procedure
codeFilter.path	code
codeFilter.valueSet	2.16.840.1.113883.3.464.1003.108.12.1020
dateFilter.path	performed
dateFilter.valuePeriod.start	1/1/11
dateFilter.valuePeriod.end	12/31/21

Data Reporting

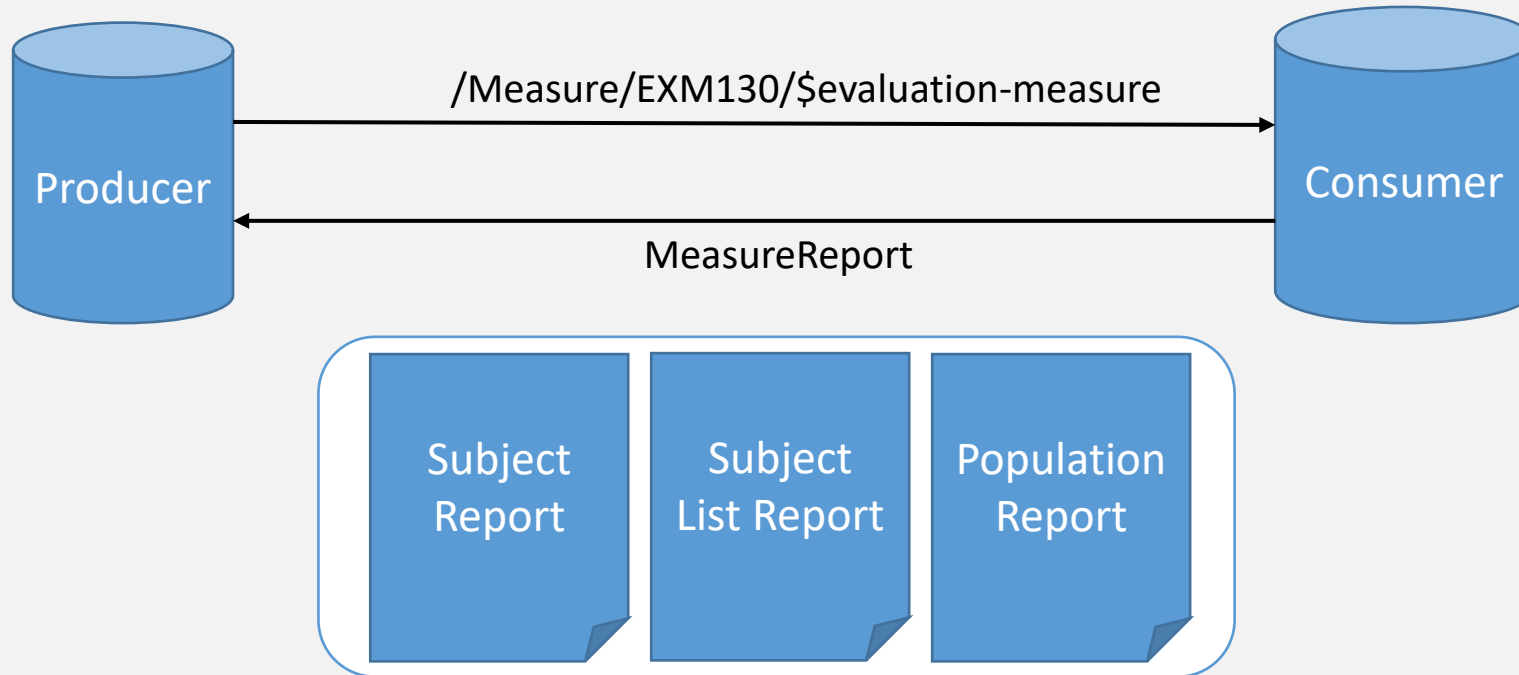


Measure Calculation

Optional




Auth
Token

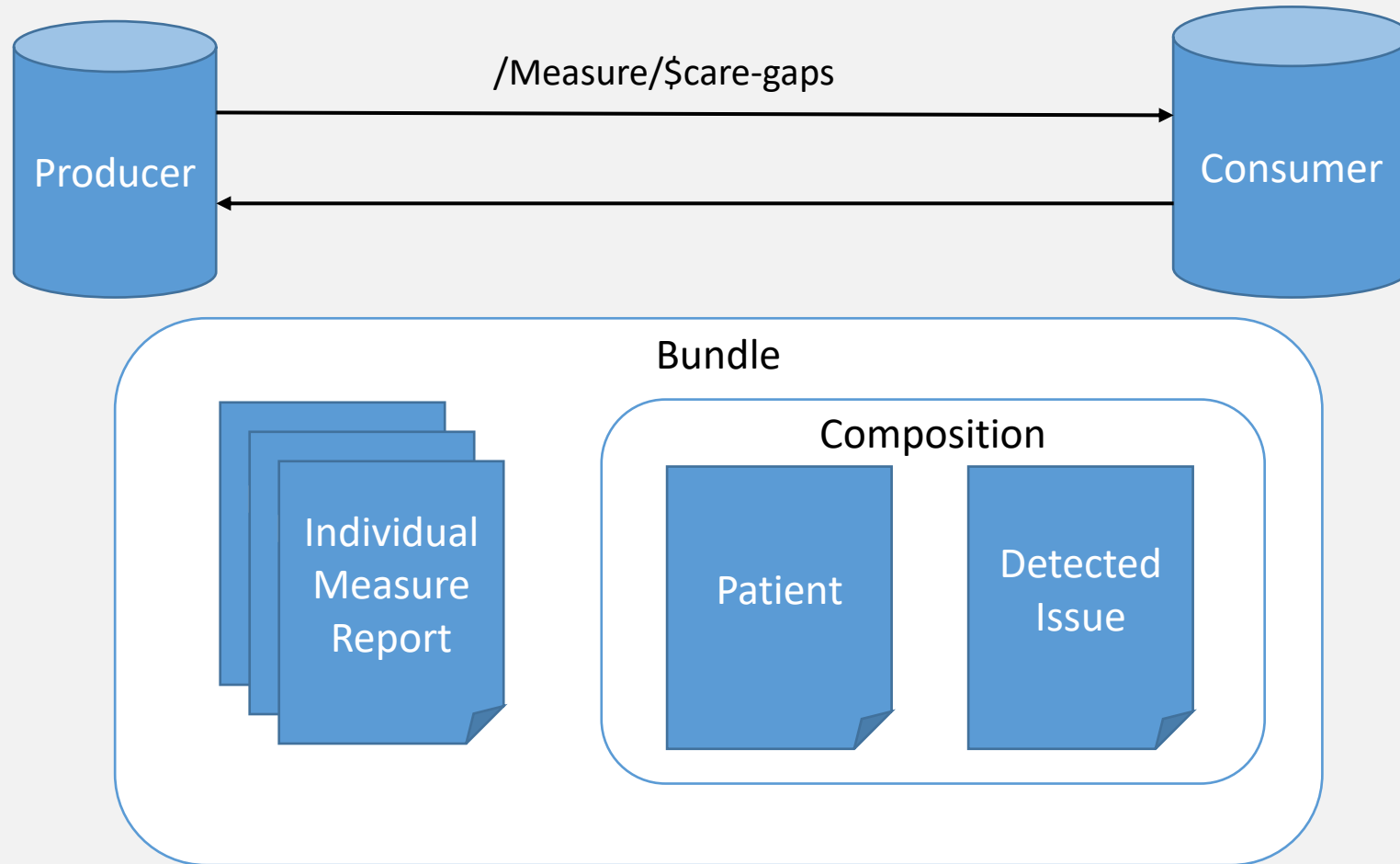


Gaps in Care

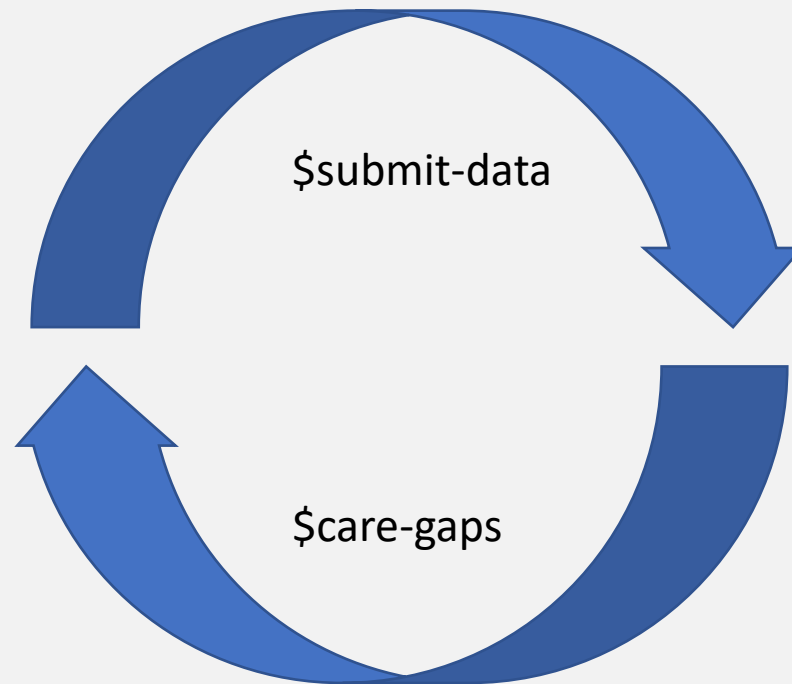
Optional



Auth
Token



Reporting



Detailed Care Gaps

- Can we tell the provider which data elements caused a care gap based on quality measure CQL definition?
 - “No valid colonoscopy found for patient”
- How much detail can we give them?
 - “Patient is overdue for colonoscopy; last colonoscopy was 12 years ago”
- Measure logic introduces difficult edge cases

CMS122 – Negative Improvement Notation, Multiple Paths

▲ Numerator

"Has Most Recent HbA1c Without Result"
or "Has Most Recent Elevated HbA1c"
or "Has No Record Of HbA1c"

CMS124 – Patient Characteristics

```
define "Numerator":  
  exists "Cervical Cytology Within 3 Years"  
    or exists "HPV Test Within 5 Years for Women Age 30 and Older"
```

CMS130 – Multiple Ways to Close a Gap

```
define "Numerator":  
  exists "Colonoscopy Performed"  
    or exists "Fecal Occult Blood Test Performed"  
    or exists "Flexible Sigmoidoscopy Performed"  
    or exists "Fecal Immunochemical Test DNA"  
    or exists "CT Colonography Performed"
```

CMS506 - Counts

```
define "Numerator":  
  "Encounter with Two or More Concurrent Opioids at Discharge"  
  union "Encounter with a Concurrent Opioid and Benzodiazepine at Discharge"
```

Representing Detailed Car Gaps - DetectedIssue

DetectedIssue.evidence

Element Id DetectedIssue.evidence

Definition Supporting evidence or manifestations that provide the basis for identifying the detected issue such as a GuidanceResponse or MeasureReport.

Cardinality 0..*

Name	Flags	Card.	Type	Description & Constraints
DetectedIssue		0..*	DetectedIssue	Clinical issue with action
modifierExtension:gapStatus	?! S	1..1	DEQMGapStatusModifierExtension	Gap Status
code	S	1..1	CodeableConcept	Issue Category, e.g. drug-drug, duplicate therapy, etc. Fixed Value: As shown
coding		1..1	Coding	Code defined by a terminology system Fixed Value: (complex)
system		1..1	uri	Identity of the terminology system Fixed Value: http://terminology.hl7.org/CodeSystem/v3-ActCode
code		1..1	code	Symbol in syntax defined by the system Fixed Value: CAREGAP
display		1..1	string	Representation defined by the system Fixed Value: Care Gaps
patient	S	1..1	Reference(QICorePatient)	Associated patient
evidence	S	1..*	BackboneElement	Supporting evidence
detail	S	1..1	Reference(DEQM Individual MeasureReport Profile GuidanceResponse)	This references either a DEQM Individual MeasureReport or a GuidanceResponse resource. Note that referencing the GuidanceResponse resource allows potential profiling on GuidanceResponse in the future without breaking backward compatibility.



GuidanceResponse

Name	Flags	Card.	Type	Description & Constraints
 GuidanceResponse	TU		DomainResource	The formal response to a guidance request Elements defined in Ancestors: id , meta , implicitRules , language , text , contained , extension , modifierExtension
 requestIdentifier	Σ	0..1	Identifier	The identifier of the request associated with this response, if any
 identifier	Σ	0..*	Identifier	Business identifier
 module[x]	Σ	1..1		What guidance was requested
 moduleUri			uri	
 moduleCanonical			canonical()	
 moduleCodeableConcept			CodeableConcept	
 status	?! Σ	1..1	code	success data-requested data-required in-progress failure entered-in-error GuidanceResponseStatus (Required)
 subject		0..1	Reference(Patient Group)	Patient the request was performed for
 encounter		0..1	Reference(Encounter)	Encounter during which the response was returned
 occurrenceDateTime		0..1	dateTime	When the guidance response was processed
 performer		0..1	Reference(Device)	Device returning the guidance
 reasonCode		0..*	CodeableConcept	Why guidance is needed
 reasonReference		0..*	Reference(Condition Observation DiagnosticReport DocumentReference)	Why guidance is needed
 note		0..*	Annotation	Additional notes about the response
 evaluationMessage		0..*	Reference(OperationOutcome)	Messages resulting from the evaluation of the artifact or artifacts
 outputParameters		0..1	Reference(Parameters)	The output parameters of the evaluation, if any
 result		0..1	Reference(CarePlan RequestGroup)	Proposed actions, if any
 dataRequirement		0..*	DataRequirement	Additional required data

Reasons

Missing

Present

Invalid

DateOutOfRange

CountOutOfRange

ValueOutOfRange

Extension: ReasonDetail

Path (string)

Value (value[x])

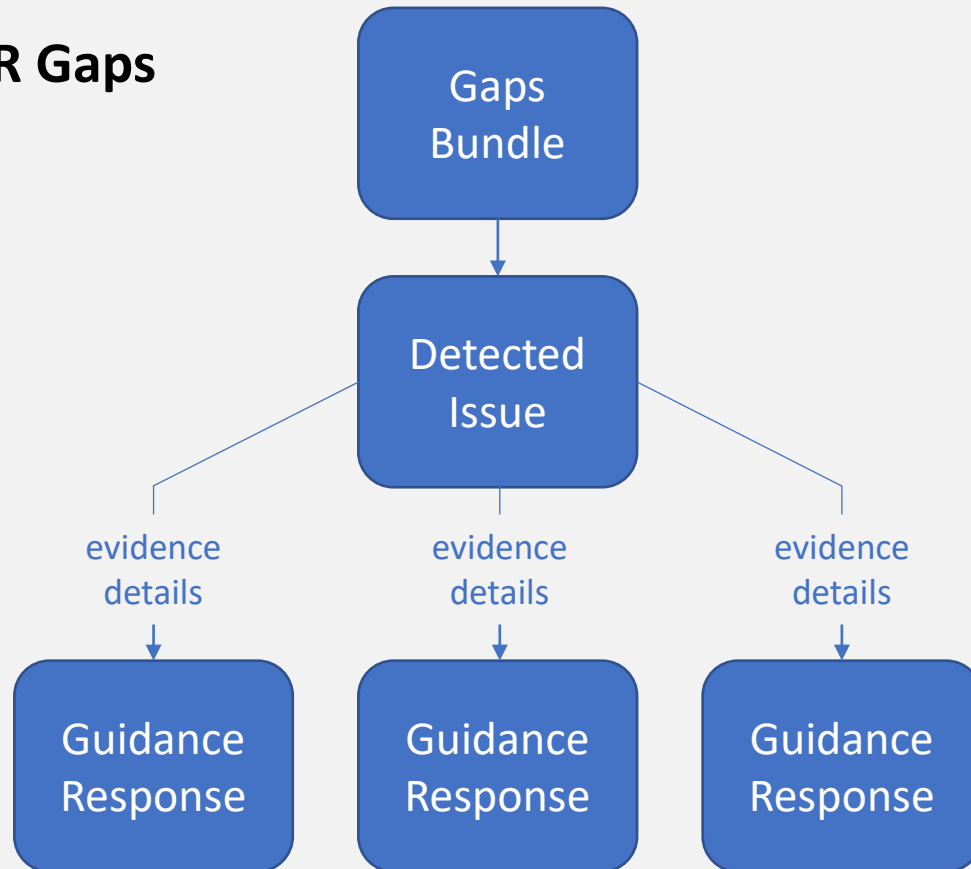


Grouped Gaps

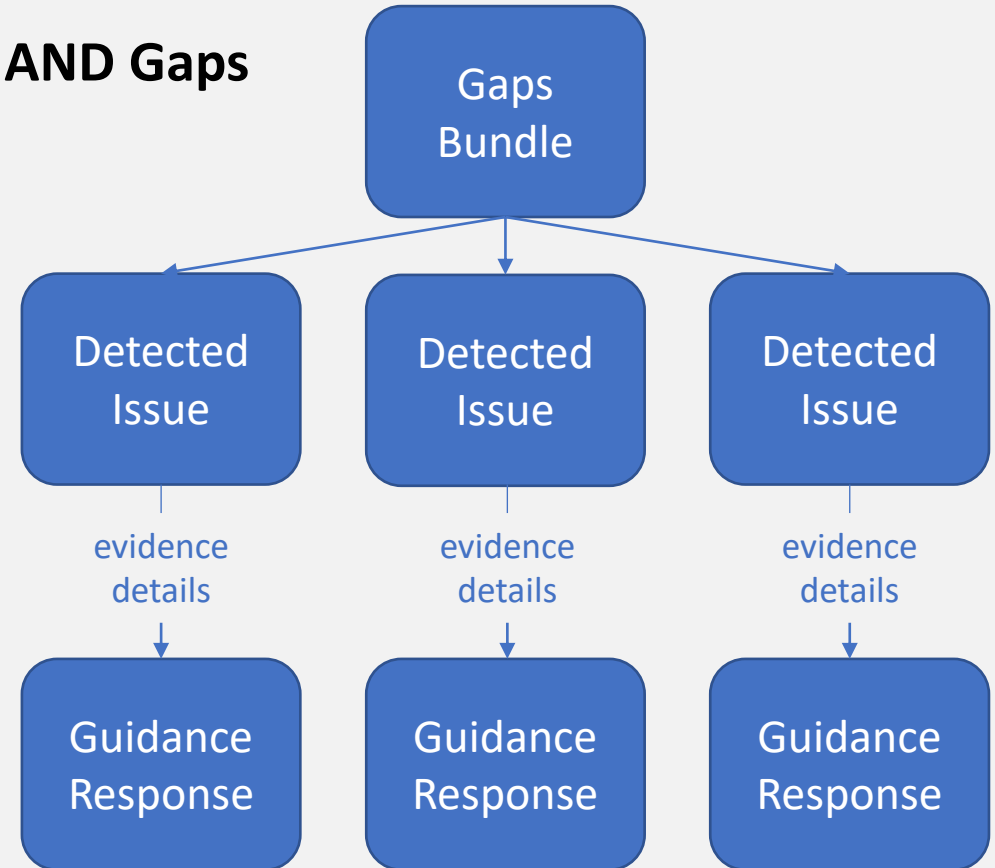
- Multiple care gaps may exist for a single patient
- **OR gaps**
 - A set of gaps for which **only one gap** needs to be closed in order for the patient to meet standards for quality of care
- **AND gaps**
 - A set of gaps for which **every gap** must be closed in order for the patient to meet standards for quality of care

Grouped Gaps

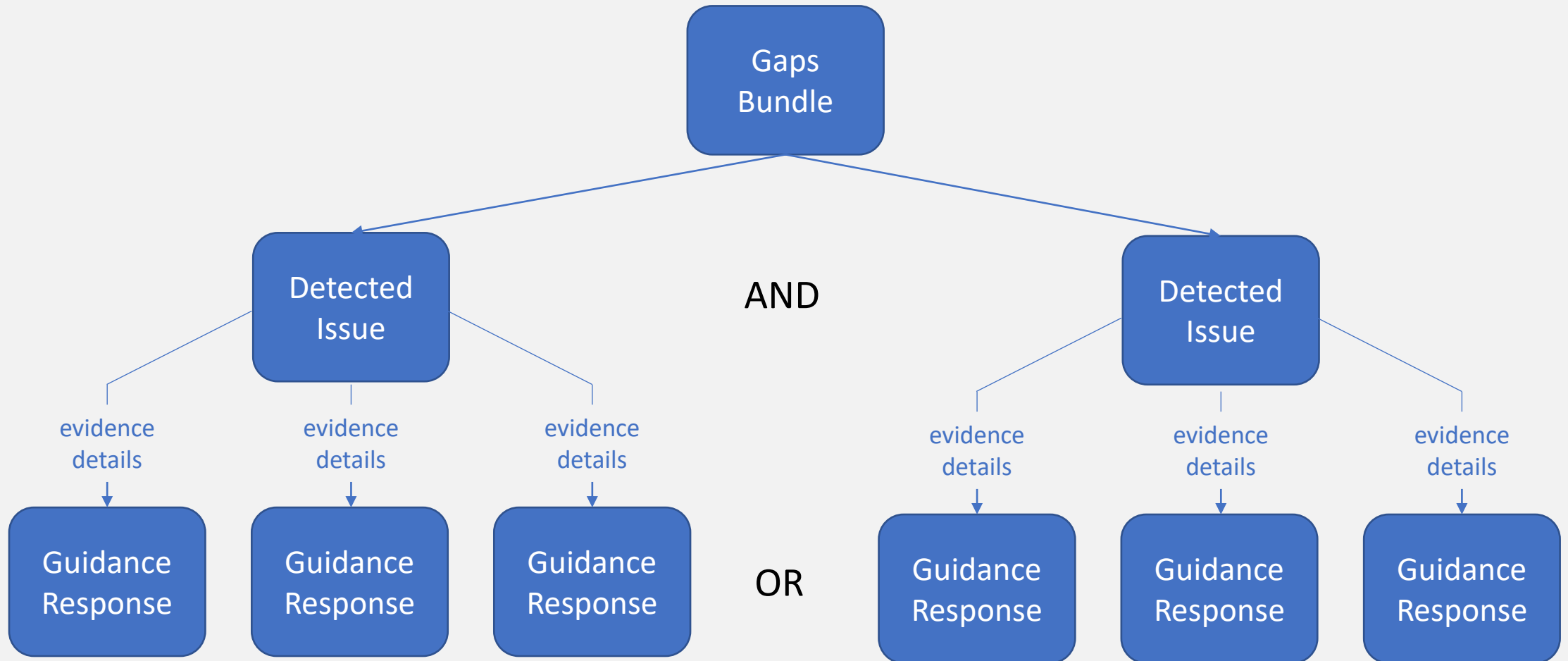
OR Gaps



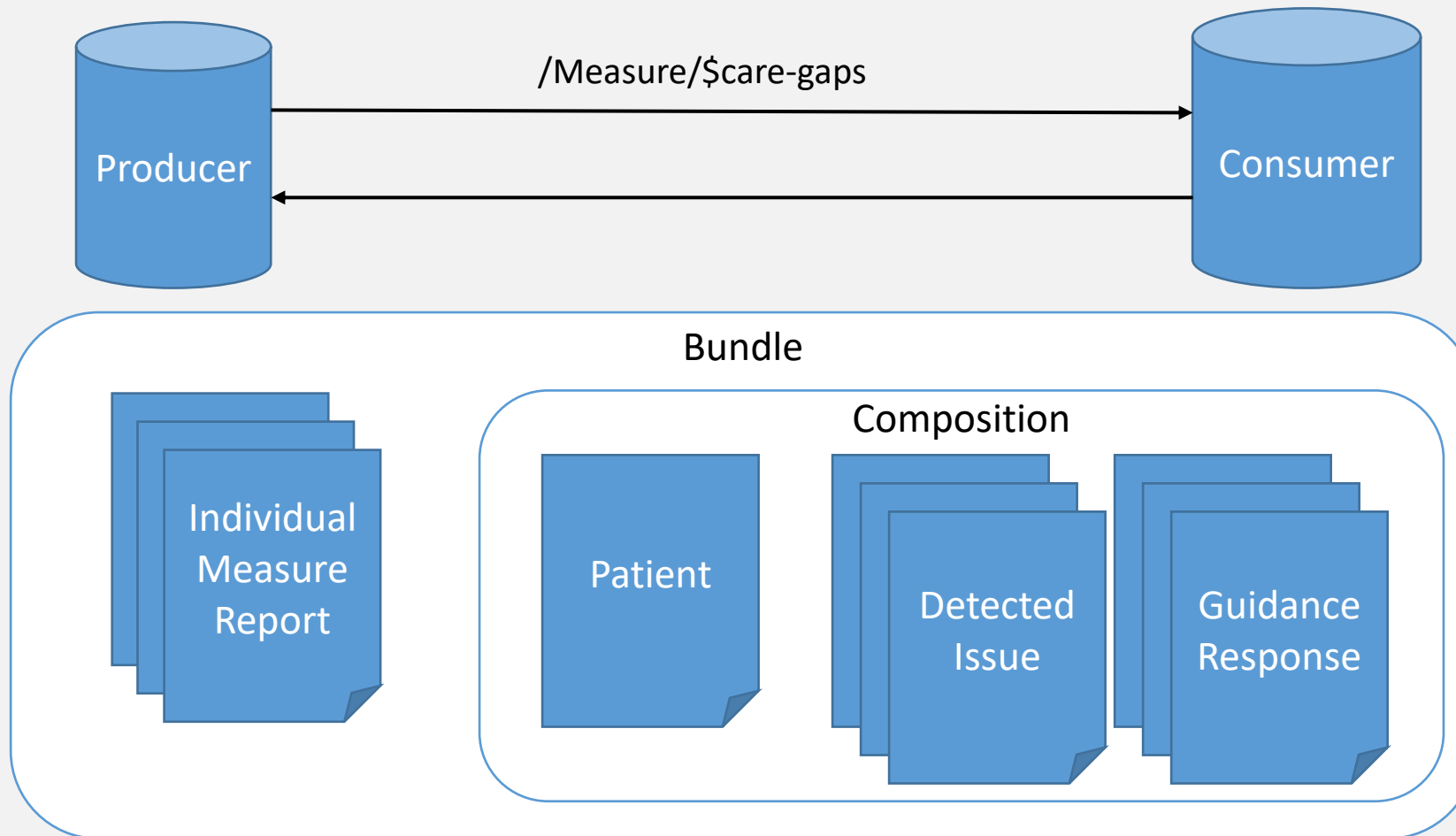
AND Gaps



ANDs and ORs



Detailed Care Gap Report



Detailed Care Gaps Demo

Next Steps

- Continuous Variable/Episode of Care Measures
- Negative Improvement Notation
- How can we determine if a gap is closeable?
- “Selective” data requirements

What did you learn?

- Describe the differences between existing quality reporting standards and FHIR-based quality reporting standards
- Explain how FHIR can reduce burden for vendors and providers
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Contact

- During DevDays, you can find / reach me here:
 - Via Whova App – Speaker’s Gallery
 - Email: ssayer@mitre.org
- Da Vinci Data Exchange for Quality Measures / Gaps in Care Weekly Call
 - Thursdays 2-3pm
- Connectathons: Clinical Reasoning / Gaps in Care Track

Q&A

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