



Sharing Immunization Data with Bulk FHIR Query: Approaches and Challenges

AIRA National Meeting
May 7, 2024



Agenda

- What is Helios?
- Where have we been working?
- How are you thinking about bulk data access?

HELIOS FHIR Accelerator

Helping public health to align with and benefit from the widespread standardization and transformation that is happening around digital health data

**Focusing
on Impact**

**Bring People
Together**

**Aligning
Efforts**

HELIOS FHIR Accelerator

2024 Community-led priority areas

**Deliver Aggregate
Information to
Public Health**



**Make Data in Public
Health Systems
Accessible in Bulk**



**Public Health Query
& Response**



Make Data in Public Health Systems Accessible in Bulk



Goals

Enable authorized users of Public Health data—such as healthcare partners, private sector payers, state Medicaid programs and schools—to **access complete, accurate, and timely information** on their patients and member populations in a **consistent way** using existing Bulk FHIR API standards.

Who is Actively Engaged

- IIS Community
 - AIRA
 - IIS Vendors & Jurisdictions
- EHR Vendors
- Federal Partners

Key Steps

- 1 Document technical and business needs as well as workflows
- 2 Identify common strategies for bulk patient matching
- 3 Advance testing to be ready for real-world pilots



Bulk Data Access IG
2.0.0 - Standard for Trial Use

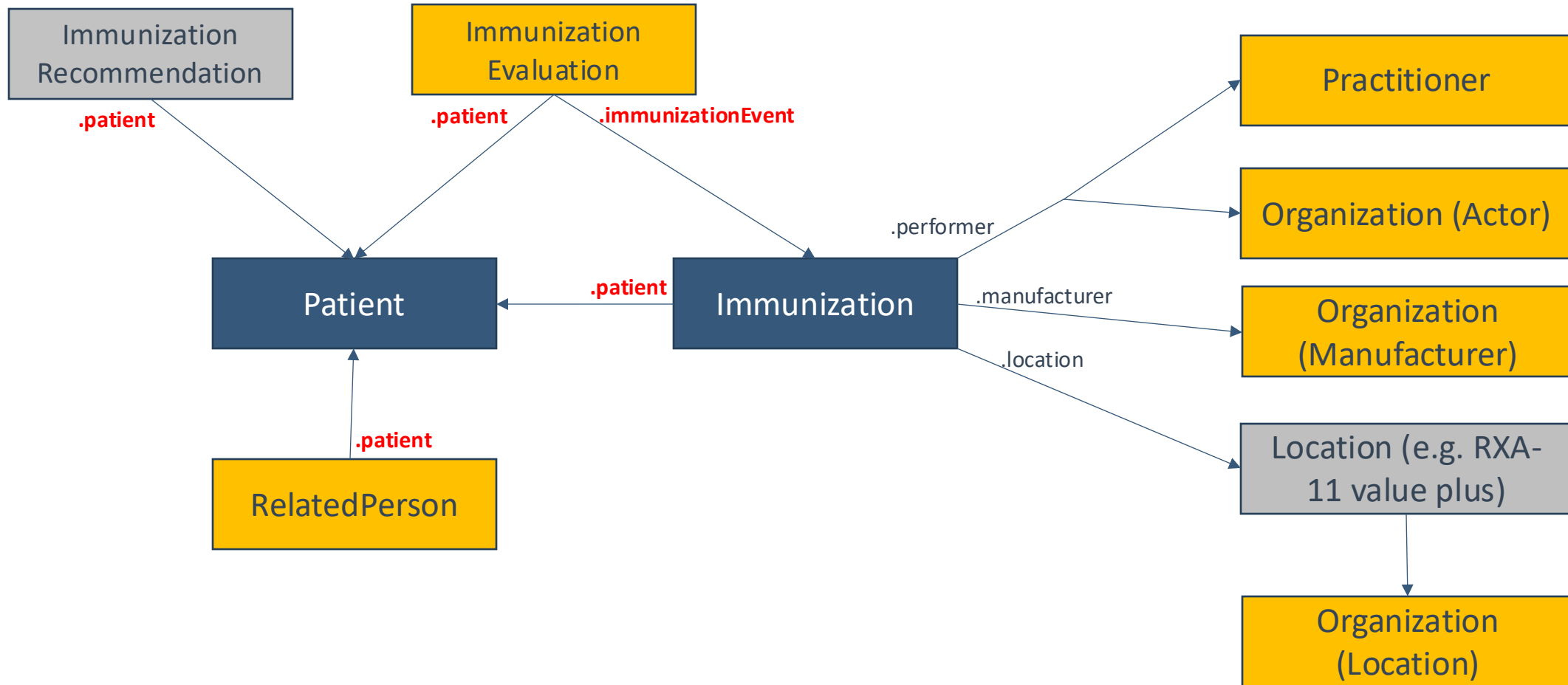


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<https://hl7.org/fhir/uv/bulkdata/>

Immunization Payload



Testing

January 2023

HL7 Connectathon
Henderson, NV



Patient Cohorts

Types of Groups

- Persistent Groups (enumerated)
 - A list of individuals where the list is expected to be relatively stable over time
 - Example use cases:
 - A healthcare organization (HCO) creates a list of patients under their long-term care
 - A payer creates a list of members they are responsible for
- Transient Groups (enumerated)
 - A list of individuals where many (or all) of the individuals are expected to change frequently
 - Example use case:
 - An HCO creates a Group of patients scheduled to be seen the follow day, and updates the list each day with a new set of individuals
- Characteristic Groups
 - A set of characteristics which describes qualities that Group members have
 - Example use cases:
 - All individuals residing in a specific zip code under a specified age

Patient Matching

User System (e.g. EHR)
AKA FHIR Client

IIS
AKA FHIR Server

Use existing v2 messaging to
build a persistent Group

Step 1

Record vaccine or query
IIS for patient
history/forecast

Query or
administration
Jane Doe 1962-01-20



Return query
response

Identify patient
Respond & store

Step 2

Update Group

Use a flat file to
populate a Group

Generate flat file of
demographics for
individuals

Jane Doe 1962-01-20
Tony Smith 2003-09-02

Identify patient

Create/Update Group

Use bulk FHIR matching to
identify patients to manage

Generate bulk FHIR
patient matching
query

Identify patients
to add or remove
from Group

Jane Doe 1962-01-20
Tony Smith 2003-09-02

Return query
response

Identify patient
Respond

Add or
remove
patients

Create/Update Group

Step 3

Submit query that
references existing list

Bulk FHIR
request



Reference to
Cohort ID

Query
Response

Return data for members of the
cohort referenced in the request

Security/Authentication

Authentication on FHIR

HL7 v2 Authentication

- Typically involves username/password – tedious to share and can leak or be weak
- Some use certificate authentication, but also tedious

SMART Backend Services Authentication

- Makes it possible to ***not*** have to share passwords with senders during onboarding
- Partners provide IIS a URL containing their public key
- Leverages public key authentication to securely provide FHIR access tokens

SMART Authentication

User System (e.g. EHR)
AKA FHIR Client

IIS
AKA FHIR Server

Onboarding

Step 1

Register with FHIR Server
by sending public key

URL of public
key



`https://hospital.org/public-key`

Client ID and
FHIR URL

Step 2

Register FHIR
Client

Onboarding happens
once for a FHIR Client

Get Access Token

Use Public Key to generate
signed access token
request

JSON Web
Token (JWT)



`{"alg": "RS384", "kid": ..."`

Access token

Authenticate/fulfill
access token request

FHIR Client obtains short-lived access token
whenever needed to perform FHIR query

Make FHIR Request with Access Token

Attach access token to
FHIR query

Access token +
query



Authorization: ...
GET /Group/1/\$export

FHIR response

Process FHIR
query

Discussion

Technology

- Have you heard of work in your jurisdiction about developing a common FHIR infrastructure?
- Are you part of the FHIR conversations that are happening?
- What plans does your jurisdiction have for FHIR?

Discussion

Groups

- What sort of requests do you get for bulk data?
 - How uniform are the requests and your responses?
 - How many individuals are in a cohort?
 - Are cohorts consistent over time?
- What sort of matching and cohort selection approaches would be useful to your program?

Call to Action

- Helios Priority Area Project Team calls
 - Bi-weekly on Mondays at 12:00PM Eastern
 - Reach out – craig.newman@altarum.org



Talk to your Colleagues

Find out what is happening in your area and beyond



Learn More

Interoperability training opportunities abound

<https://phinterop.org/>




Create a Plan


Be part of your organization's strategy for FHIR



Get Involved

Lend your voice and come test with us




Thank you and
please get involved!

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HELIOS