

# 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?

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# 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/>



# 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](mailto: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