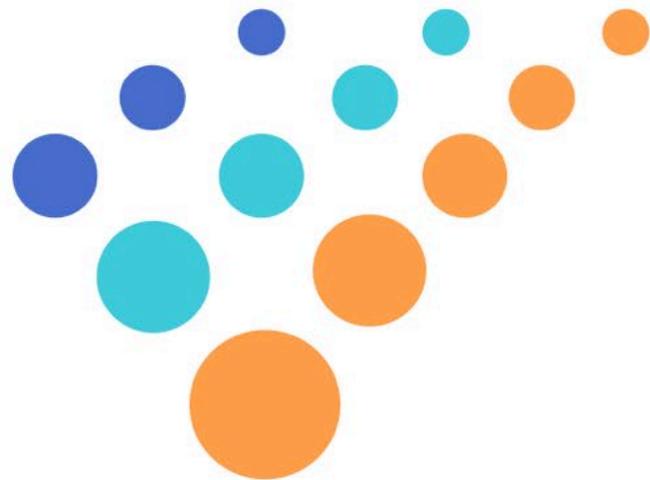




AGENCY FOR HEALTHCARE RESEARCH AND QUALITY



July 2020 CDS Connect Work Group Call



CDS Connect

Agenda

Schedule	Topic
• 3:00 – 3:02	• Roll Call, Michelle Lenox (MITRE)
• 3:02 – 3:05	• Review of the Agenda, Maria Michaels (CDC)
• 3:05 – 3:45	• Sharing Lessons Learned with CDS: Nancy Nurthen and Sai Simhadri, Digital Infuzion
• 3:45– 3:50	• What's New with CDS Connect This Month (MITRE)
• 3:50 – 4:00	• Open Discussion and Close Out, Maria Michaels (CDC) <ul style="list-style-type: none">• Open discussion and announcements• Concluding comments, review next steps and adjourn

Objectives

- Share lessons learned for use of CDS Connect
- Share new features and resources available for CDS Connect
- Discuss topics of interest to members relating to opportunities for CDS Connect

SHARING LESSONS LEARNED WITH CDS:

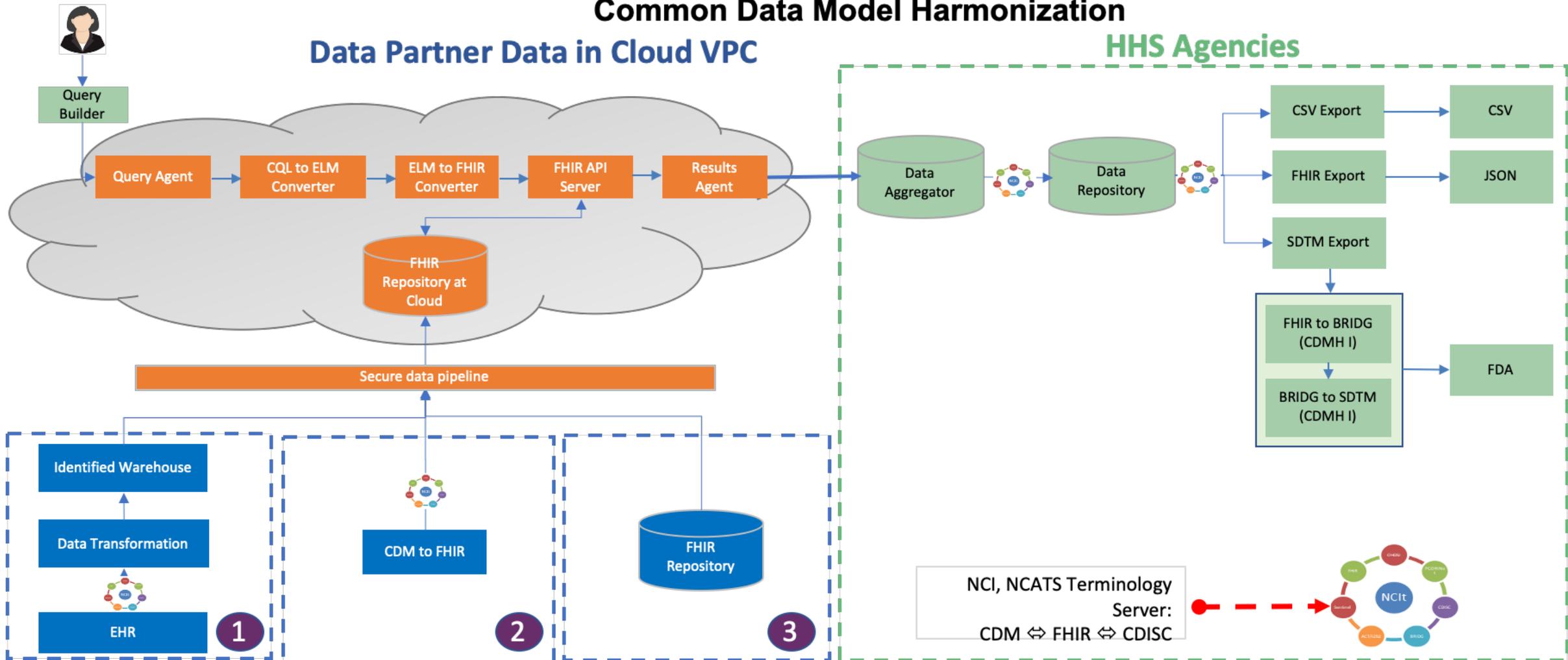
**Nancy Nurthern and Sai Simhadri,
Digital Infuzion**

What is the Clinical Environment? (1 of 11)

Common Data Model Harmonization

Data Partner Data in Cloud VPC

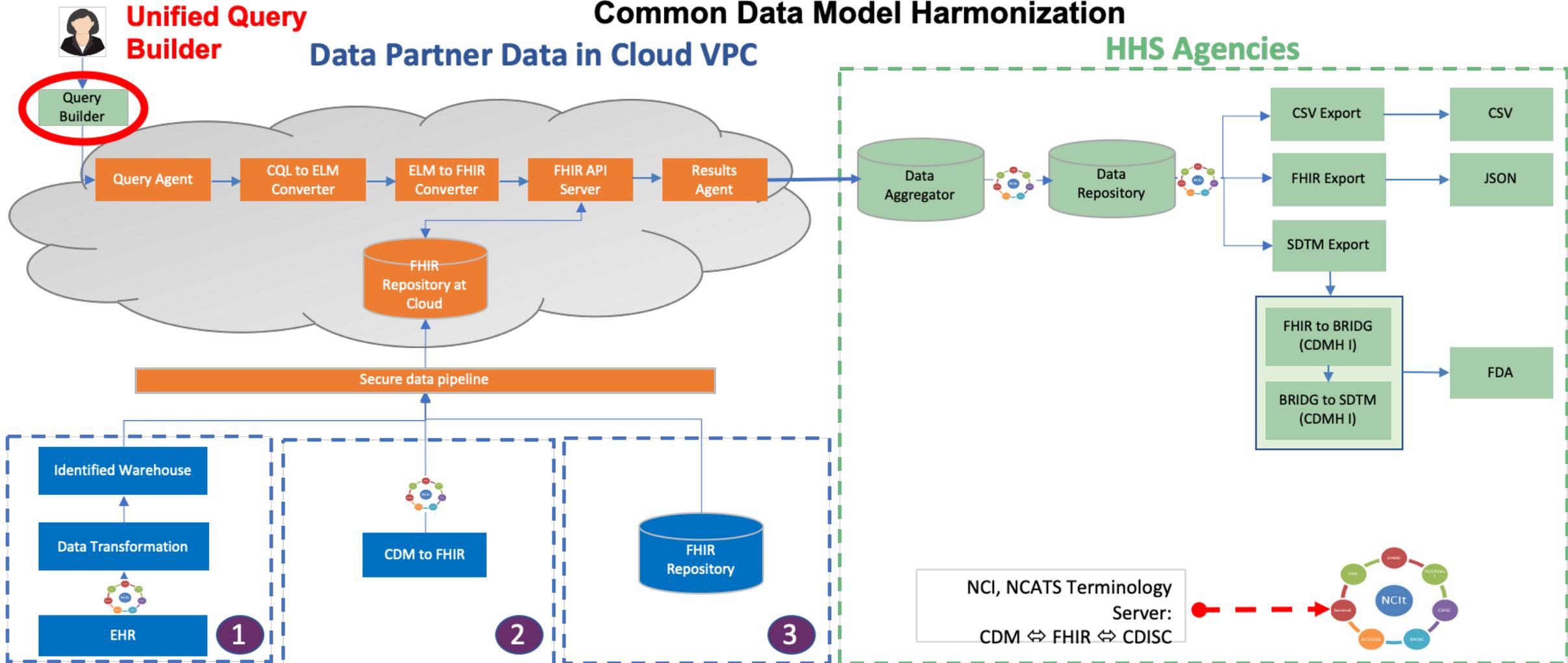
HHS Agencies



- 1 Data Partner with EHR interface
- 2 Data Partner with CDM interface
- 3 Data Partner with FHIR interface

How is CDS relevant? (2 of 11)

Common Data Model Harmonization



- 1 Data Partner with EHR interface
- 2 Data Partner with CDM interface
- 3 Data Partner with FHIR interface

CDS Authoring Tool as Unified Query Builder (3 of 11)



U.S. Department of Health & Human Services

Common Data Model Harmonization

demo ▾

Home Query Manager Query Builder CQL Editor Help Feedback

QUERY NAME	VERSION	LAST UPDATED	SHORT DESCRIPTION	ACTIONS	STATUS	RESULTS
Untitled Query	1	5 days ago	test	  	Pending Results	 
Condition Test	1	6 days ago	Rectal Polypectomy procedure	  	Pending Results	 
Rectal polypectomy (procedure)	1	6 days ago	Demo Query	  	Pending Results	 
Test Query - Rectal polypectomy (procedure)	1	6 days ago	With NO FHIR profiles selected	  	Submitting	 
Tuple test	1	6 days ago	test	  	Pending Results	 

Query Manager Interface

CDS Authoring Tool as Unified Query Builder – cont. (4 of 11)



U.S. Department of Health & Human Services

Common Data Model Harmonization

demo ▾

[Home](#) [Query Manager](#) [Query Builder](#) [CQL Editor](#) [Help](#) [Feedback](#)

 **Untitled Query**

 Download CQL ▾

 Save

Inclusions

Exclusions

Subpopulations

Parameters

Specify criteria to identify a target population in this query. Examples might include an age range, gender, presence of a certain condition, or lab results within a specific range.

+ Add element

Choose element type ▾

Query Builder Interface

CDS Authoring Tool as Unified Query Builder – cont. (5 of 11)



U.S. Department of Health & Human Services

demo ▾

Common Data Model Harmonization

Home Query Manager Query Builder **CQL Editor** Help Feedback

Q CQL IDE – Develop advanced CQL queries from your editor

Format Examples

Input

Save

```
1  /*
2     This example is provided to illustrate data retrieval in different contexts.
3     1. Run the library as is.
4     Note that no resources are returned when the patient id is null.
5     2. Set the patient id to Patient-1136 and run again.
6     Note that all the returned Procedures refer to Patient-1136 as the subject.
7     3. Comment out context Patient, uncomment context Population, and run again.
8     This will return all the Procedures in the FHIR Server.
9  */
10 library Retrieve1 version '1.0'
11
12 using FHIR version '3.0.0'
13
14 context Patient
15 // context Population
16
17 define Procedures: [Procedure]
18
```

CQL Editor Interface

What is the goal of use? (6 of 11)

Our main goal is to use the User Interface of CDS Connect Authoring tool as a portal for researchers who are new to the Clinical Quality Language (CQL)

- ▶ Provide researchers with simple User Interface (UI) to construct and build CQL queries
- ▶ Provide them with a portal for managing the lifecycle of queries through UI
- ▶ A dictionary service to provide users with the required code systems, codes and value sets i.e. NLM VSAC
- ▶ Validate the CQL queries developed through “CQL Editor” and the ability to fix syntax issues
- ▶ Download the generated CQL query to use as a starter template for “CQL Editor”

Tailoring of CDS Connect (7 of 11)

- ▶ Capability to build CQL queries in the population context
- ▶ Researchers can select FHIR profiles that needs to be included in the query results
- ▶ Enhance Query Manager functionality to manage CRUD functionalities like create, delete, edit and submit queries
- ▶ Ability to download the results in FHIR and CSV formats
- ▶ Display the status of the submitted queries to the researchers

Tailoring of CDS Connect – cont. (8 of 11)



- ▶ Re-purposed the cql2elm service to validate query for syntax/semantic errors and report them to users for correction and re-submission
- ▶ Modified templates to fit population context queries and our project goals
- ▶ Added Capability to submit the results to FDA Gateway in SDTM format
- ▶ Added the ability to add metadata for the queries

When did use begin? (9 of 11)



- ▶ In CDMH Phase I, each of the Data Partners had their own flavor of relational databases at their site. We had to generate a different query for each Data Partner to run it in their environment
- ▶ To overcome this problem in Phase II, we started exploring the use of the Fast Healthcare Interoperability Resources (FHIR) standard to capture, integrate and exchange clinical data for research purposes and to enhance capabilities to share research data. FHIR provides the data model interoperability that lacks in current Common Data Models within the Health care systems
- ▶ CQL could work as a bridge between clinical researchers and FHIR APIs
- ▶ We started scouting for tools that could help build CQL queries which could then be translated to FHIR APIs for execution around May 2019

Next Steps (10 of 11)



- ▶ Enhance CDS Connect by integrating with NCATS UNA which is a federated authentication system
- ▶ Replace NLM VSAC with NCI's caDSR for fetching code systems, value sets and codes
- ▶ Update the code base to support latest FHIR version i.e. R4
- ▶ Build capability to submit SDTM results to FDA Gateway

Recommendations (11 of 11)

- ▶ Enable continuous updates to FHIR version in code base as new versions are introduced
- ▶ Tightly coupled to FHIR version in use (currently supports STU3 and DSTU2). Maintenance would have been easier if code dependencies related to FHIR version are modular
- ▶ Database migrations are required even after moving to the latest DB version
- ▶ Add FHIRSql capabilities when available

THANK YOU

WHAT'S NEW WITH CDS CONNECT

David Winters and Chris Moesel, MITRE

Updates and New Features



- Authoring Tool
 - ▶ Common functions now embedded in primary CQL library
 - ▶ Collapsible comments (defaulting to closed)
 - ▶ Updated icons
 - ▶ Support for Immunization data type
 - ▶ Minor enhancements and bug fixes
- Repository
 - ▶ Initial CPG Artifact changes are almost fully developed and will be undergoing testing and review with AHRQ.
 - ▶ Changes update the profile, menu bar, login/logout, and the home tab are actively under development.
 - ▶ Newly updated Governance page content

Link to CDS Connect: <https://cds.ahrq.gov/cdsconnect>

ANNOUNCEMENTS, OPEN DISCUSSION AND CLOSE-OUT

Maria Michaels

Office of Public Health Scientific Services
Centers for Disease Control and Prevention