The Office of the National Coordinator for Health Information Technology

ONC on FHIR

ONC Annual Meeting, November 29, 2018

Adam Wong, FHIR Strategy Lead, Office of Technology, ONC

Today's Panel

- John Snyder – Senior Technical Advisor
- Caroline Coy – Branch Chief, Strategic Initiatives
- Mera Choi – Director, Technical Strategy and Operations Division
- Dan Chaput – IT Specialist

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Inferno Testing Suite

Introduction and Demonstration

John Snyder | Senior Technical Advisor, ONC Office of Technology

ONC's Current Focus

- Promote open, accessible application programming interfaces (APIs)
- Improve individuals' ability to access-send their health information
- Accelerate data exchange between disparate health networks
- Inferno facilitates all of these objectives by establishing a consistent baseline of server capabilities and standards for a mobile world
- ONC has partnered with MITRE to develop the Inferno suite of FHIR test tooling – today we offer a "Developers Preview"

health information accessible when and where it matters most

What is Inferno?

Inferno is a free, open source testing tool for HL7® FHIR® servers. It makes HTTP requests to test your server's conformance to authentication, authorization, and FHIR content standards and reports the results back to you.

What does Inferno Test?

App Registration through either manual client registration or the OAuth 2.0 Dynamic Client Registration Protocol

App Launch using the SMART App Launch Framework with support for both the Standalone Launch and EHR Launch sequences

Authentication, which must conform to OpenID Connect Core 1.0

Conformance to the Argonaut Data Query Implementation Guide, including support for the following DSTU2 resources:

`AllergyIntolerance, CarePlan, Condition, Device, DiagnosticReport, DocumentReference, Goal, Immunization, Medication, MedicationOrder, MedicationStatement, Observation, Patient, Procedure`

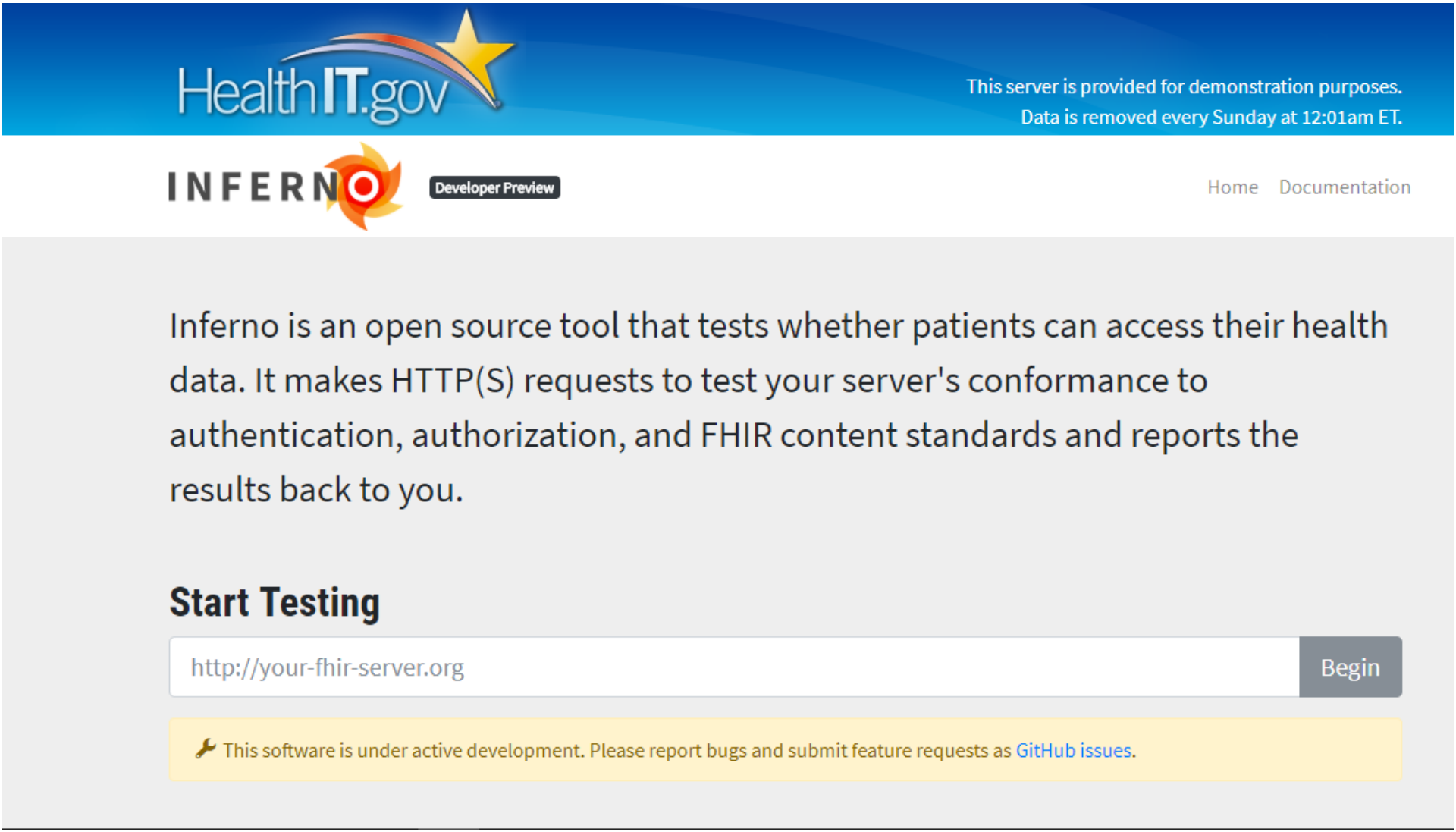
Design Goals

- Quick test execution for experts
- Learning tool for all developers
- Prioritize Testing Speed
- Focus on Patient Access

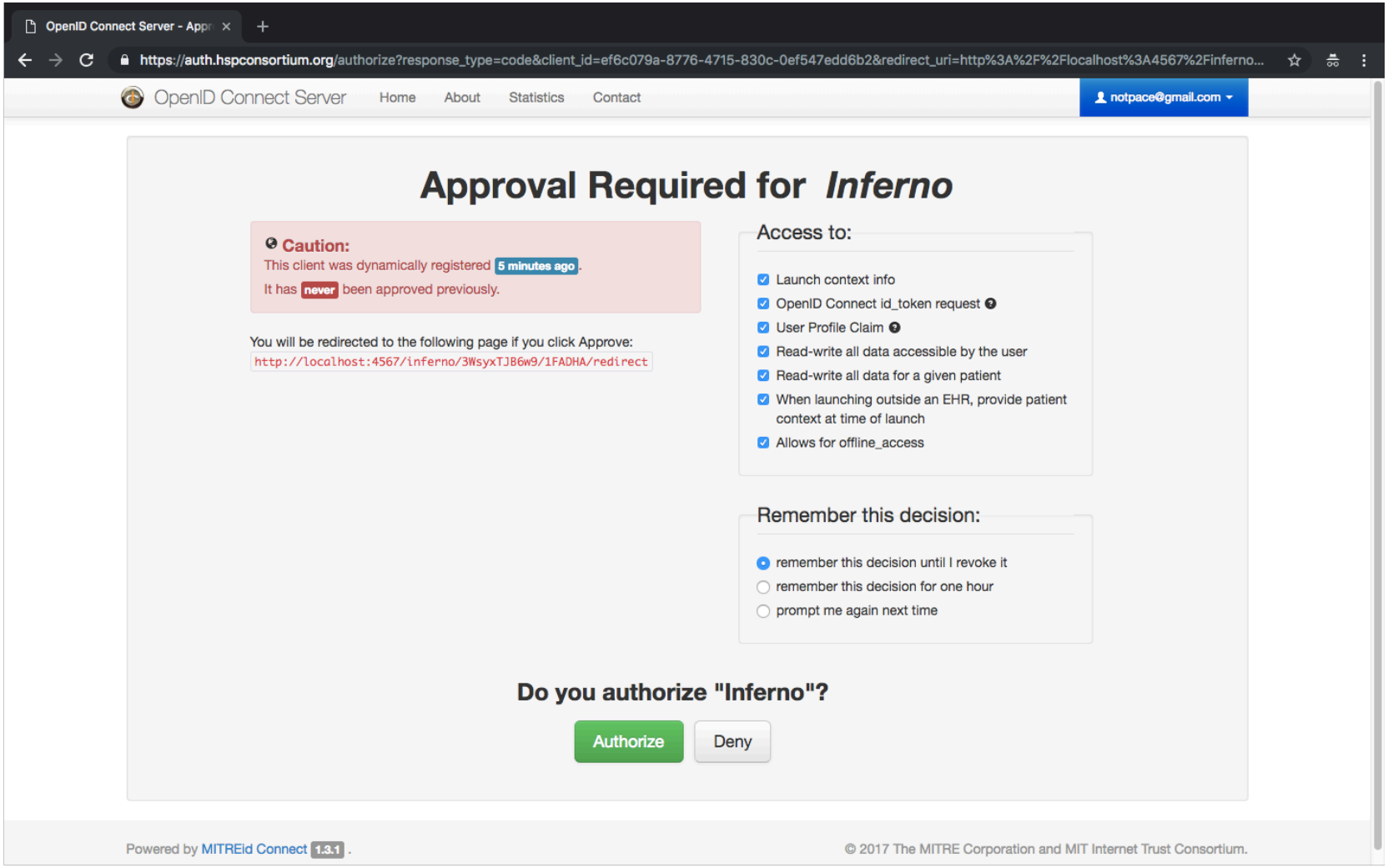
Introducing Inferno

INFERNO

Getting Started



Standalone Launch Sequence



Command-Line Testing

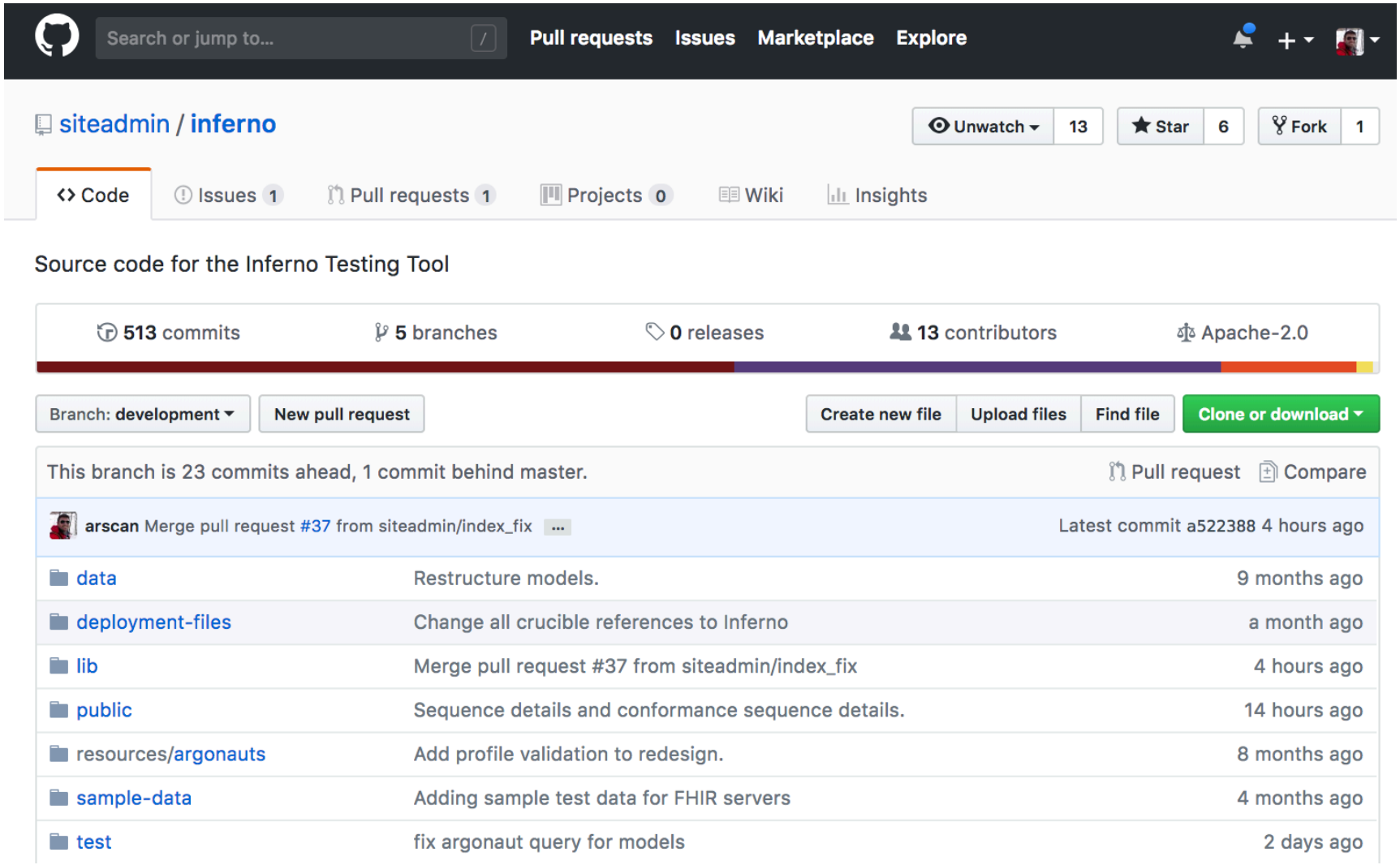
```
inferno $ rake inferno:execute[https://api-v5-dstu2.hspconsortium.org/InfernoDev/data,Conformance]

==========================================
 Testing 1 Sequences
==========================================

ConformanceSequence Sequence:
 ✓ pass - FHIR server secured by transport layer security
 ✓ pass - FHIR server responds to /metadata endpoint with valid DSTU2 Conformance Statement resource
 ✓ pass - Conformance Statement states JSON support
 ✓ pass - Conformance Statement provides OAuth 2.0 endpoints
 X fail (optional) - Conformance Statement describes SMART on FHIR core capabilities
    Message: Conformance statement does not list required SMART capabilties: launch-ehr, launch-stan
-ehr-patient, context-standalone-patient, context-standalone-encounter, permission-offline, permissi
 ✓ pass - Conformance Statement lists supported Argonaut profiles, operations and search parameters

ConformanceSequence Sequence Result: pass ✓
------------------------------------------
 Result: 0 failed, 1 passed
==========================================
```

Developer Feedback



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We Want Your Input!

inferno.healthit.gov

github.com/siteadmin/inferno

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Advancing the Capture and Use of Patient-Reported Outcomes through Health IT

ONC on FHIR, November 29, 2018

Caroline Coy, Branch Chief, Strategic Initiatives, ONC

Project Background

- Patient Reported Outcomes (PROs):
  - Any information providing the status of a patient's health outcome which comes directly from the patient without interpretation of that patient's response by a clinician or anyone else.
- Why PROs?
- ONC Project Goal:
  - Standardize integration (uploading and representation) of structured PRO data in EHRs and other health IT solutions for interoperable exchange
- Federal partners

Goals

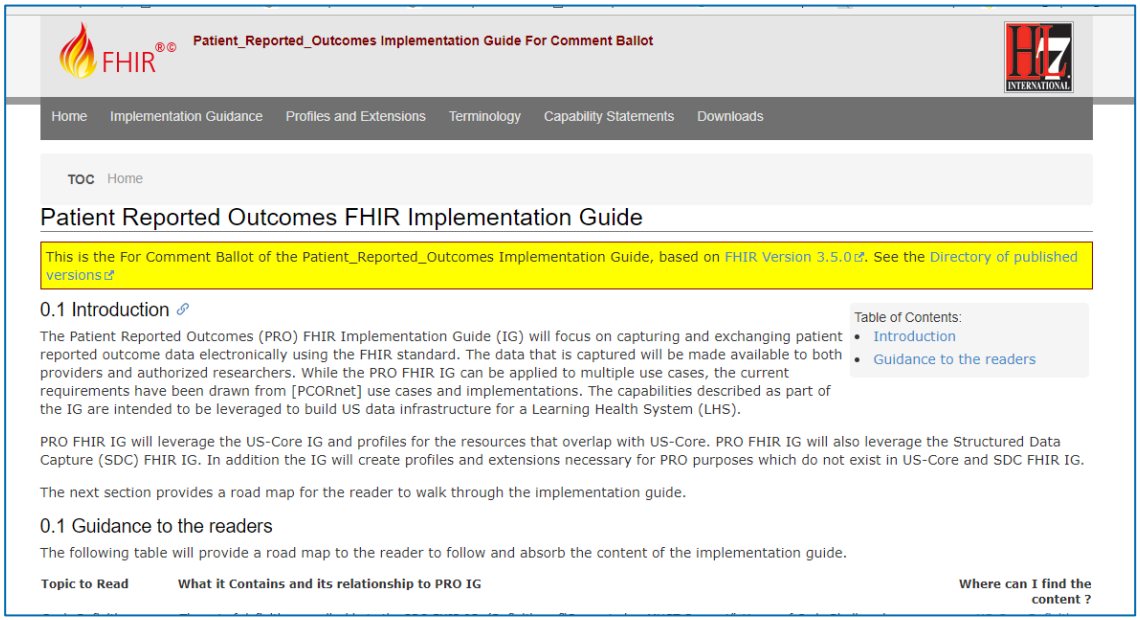
- Identify barriers related to electronic capture of PROs
- Develop technical specifications to improve electronic capture of PROs
- Test the technical specifications in clinical settings using electronic health record systems and/or applications
- Communicate challenges and successes related to implementing the technical specifications
- Identify gaps in technical specifications and provide suggestions for improvement
  - » Implement workflow and administrative processes to support testing of the technical specification and report on progress

Activities to Date

- Stakeholder discussions and research
- Implementation specifications and HL7 collaboration
- Pilot site selection
- Pilot site sprints underway

FHIR Implementation Guide

- https://build.fhir.org/ig/HL7/patient-reported-outcomes/



Pilot Sites

REACHnet (Louisiana Public Health Institute – LPHI)

- PCORI funded clinical data research network (CDRN) of health systems in Louisiana and Texas covering 5 million patients.

pSCANNER (University of Southern California – USC)

- PCORI funded, stakeholder-governed federated network that utilizes a distributed, service-oriented architecture to integrate data from three existing networks covering over 24 million patients.

Pilot Use of the Assessment Center and API

- Each of the PRO pilot organizations are leveraging the work done by the Assessment Center team at Northwestern (HealthMeasures)
- Assessment Center is a web-based data collection platform that enables researchers to create study-specific websites for capturing participant data securely
- Assessment Center Application Programming Interface (API) allows data collection systems to administer self- and proxy-reported HealthMeasures (i.e. PROMIS Physical Function v2.0)
- The applications created by the Pilots will interface with the Assessment Center using the Assessment Center API to retrieve the possible list of Questionnaires (Short Form or CAT)
- In order to achieve interoperability among various platforms the questionnaires and the responses will be mapped into a FHIR format and stored within the FHIR server

Pilot Use of the Assessment Center and API (cont.)

- REACHnet
  - The Assessment Center API will be used to retrieve the PROMIS measure (Questionnaires)
  - Those questions will then be mapped to a FHIR resource and stored in a FHIR server
- pSCANNER
  - The Assessment Center API will be used to retrieve the PROMIS measure (Questionnaires) that are ordered by the physician/clinician to administer to a patient
  - The Assessment Center API will then collect the responses and score them
  - The Assessment Center API then sends the results back for physician/clinician access

FHIR PRO Testing and Next Steps

- AHRQ Step Up App Challenge: Advancing Care through Patient Self Assessments and MedStar collaboration
- Continue HL7 collaboration and update technical specifications
- Continue pilot site testing
- Identify lessons learned

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PDMP FHIR IG and Pilots Overview

Mera Choi, Division Director, Technical Strategy and Operations Division, ONC

November 29, 2018

Agenda

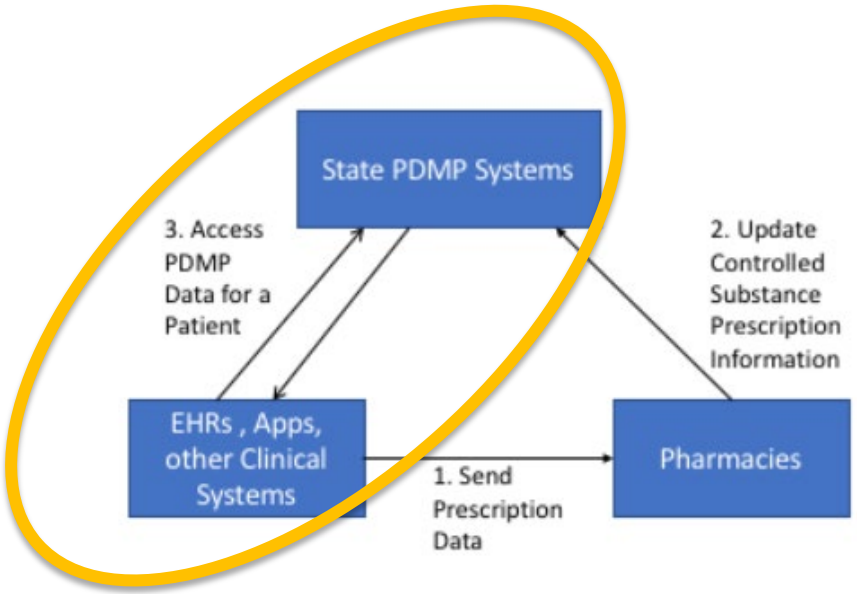
- PDMP Background
- Overview of the Project Phases
- Pilot Sites, Scope, and Goals
- Pilot Approach
- Pilot Example – IL LogiCoy Web App

Prescription Drug Monitoring Programs (PDMPs)

- PDMPs are statewide electronic data systems that collect, analyze, and make available prescription data on controlled substances dispensed by non-hospital pharmacies and practitioners
- PDMPs collect information on the type and quantity of drug, dispense date, and prescriber and pharmacy identifiers
- PDMP data can help providers identify patterns of possible nonmedical or dangerous use of prescription drugs
- Access to PDMP information is determined by state law. All states with a PDMP allow prescribers, and most allow pharmacists, to obtain controlled substance prescription history information on patients under their care

PDMP FHIR – Project Phases

- **Phase 1 – PDMP FHIR Mapping**
  - » Objective
    - – Develop a PDMP Implementation Guide (IG) to enable EHRs to access PDMPs using the HL7 FHIR standard and ballot the IG via HL7
  - » Deliverables
    - – Environmental survey assessing PDMP landscape and challenges
    - – Mapping of HL7 FHIR to NCPDP Script 10.6 and to PMIX 1.0 for request and response transactions
    - – PDMP IG (balloted and approved in June 2018)
    - – http://hl7.org/fhir/us/meds/2018May/pdmp.html



Transaction 3 (diagram) is only transaction in scope for the US Meds PDMP FHIR IG

PDMP FHIR – Project Phases

PDMP IG Details

- Project used the US-Core profiles and the US Meds profiles to request and receive PDMP data using FHIR resources (no new FHIR profiles were created)
- Request: 16 Data Elements mapped between PMIX and FHIR
- Response: 46 Data Elements mapped between PMIX and FHIR
- http://hl7.org/fhir/us/meds/2018May/pdmp.html

PDMP FHIR – Project Phases

- Phase 2 – PDMP FHIR Pilots
  - Objective
    - Provide support for the PDMP standards mapping and balloting efforts and refine the PDMP FHIR standards through pilot testing
  - Deliverables
    - Pilot sites feedback based on implementation and testing of the current PDMP FHIR IG
    - An updated PDMP FHIR IG with pilot site input (and any other sources)

Pilot Goals

- Implementation and testing of the PDMP FHIR IG
- Refine mapping in the PDMP FHIR IG (based on pilot findings)
- Revise and update the PDMP FHIR IG based on project activities and pilot testing
- Update (and re-ballot if necessary) the updated PDMP FHIR IG at HL7

Pilot Scope

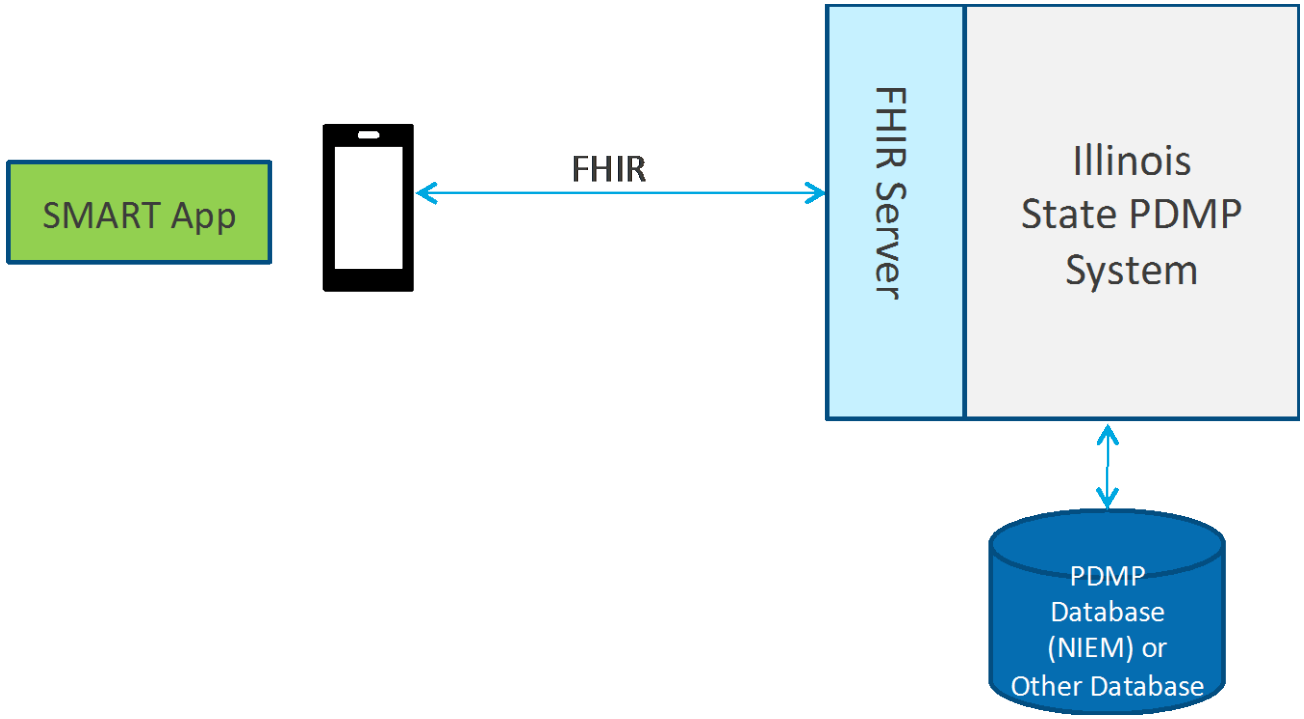
- Core Tasks
  - Utilize PDMP FHIR IG to implement both routes in test environments
    - Direct route testing: FHIR server to be hosted at IL PDMP for IL
    - Intermediary route testing: FHIR server to be hosted by LogiCoy for KY & UT
  - Capture lessons learned to update and refine the PDMP FHIR IG
- Potential Tasks
  - Integration of PDMP data into EHR systems via FHIR (in sandbox)
  - Gathering clinician feedback on use

Pilot Sites

- Illinois (Department of Human Services)
  - » Path: Direct to PMP
- Kentucky (Department of Health)
  - » Path: Intermediary (RxCheck) along with LogiCoy converter
- Utah (Department of Health)
  - » Path: Intermediary (RxCheck) along with LogiCoy converter

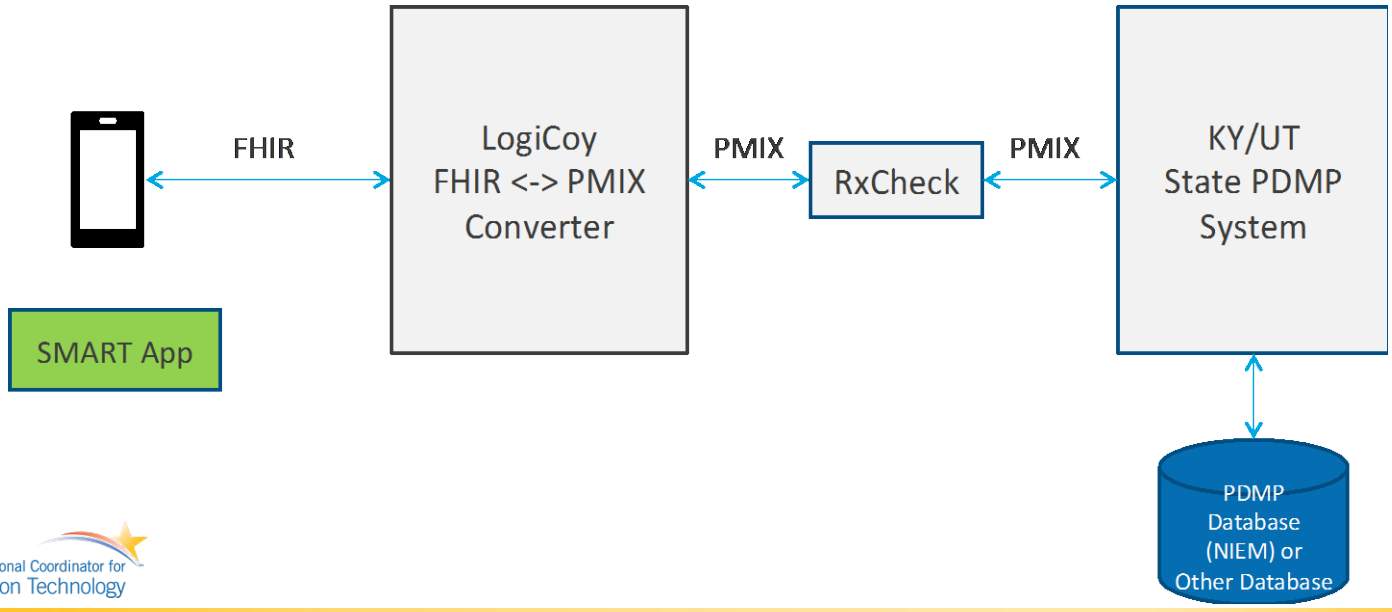
Pilot Approach

- Direct Route (IL)
  - » FHIR server at PDMP data store
    - – Outside FHIR clients (e.g., a SMART App) connect to FHIR server
    - – FHIR server directly connects to data store
    - – FHIR server returns results to FHIR clients



Pilot Approach

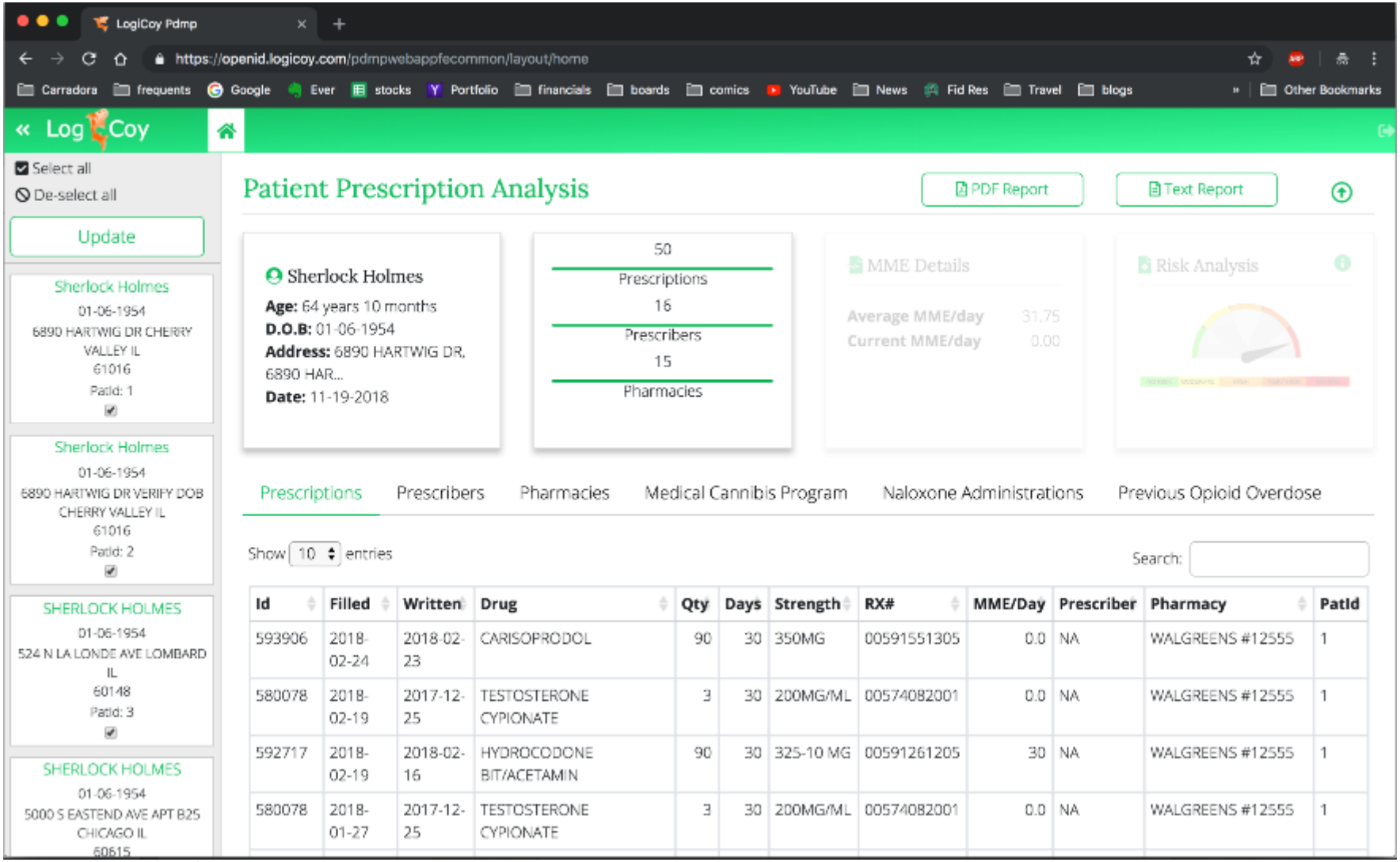
- Intermediary Route (KY, UT)
  - » FHIR converter upstream from intermediary
    - – Outside FHIR clients connect to LogiCoy FHIR converter
    - – FHIR converter translates from FHIR, queries data store via intermediary, obtains results, translates back to FHIR
    - – FHIR converter returns results to FHIR clients



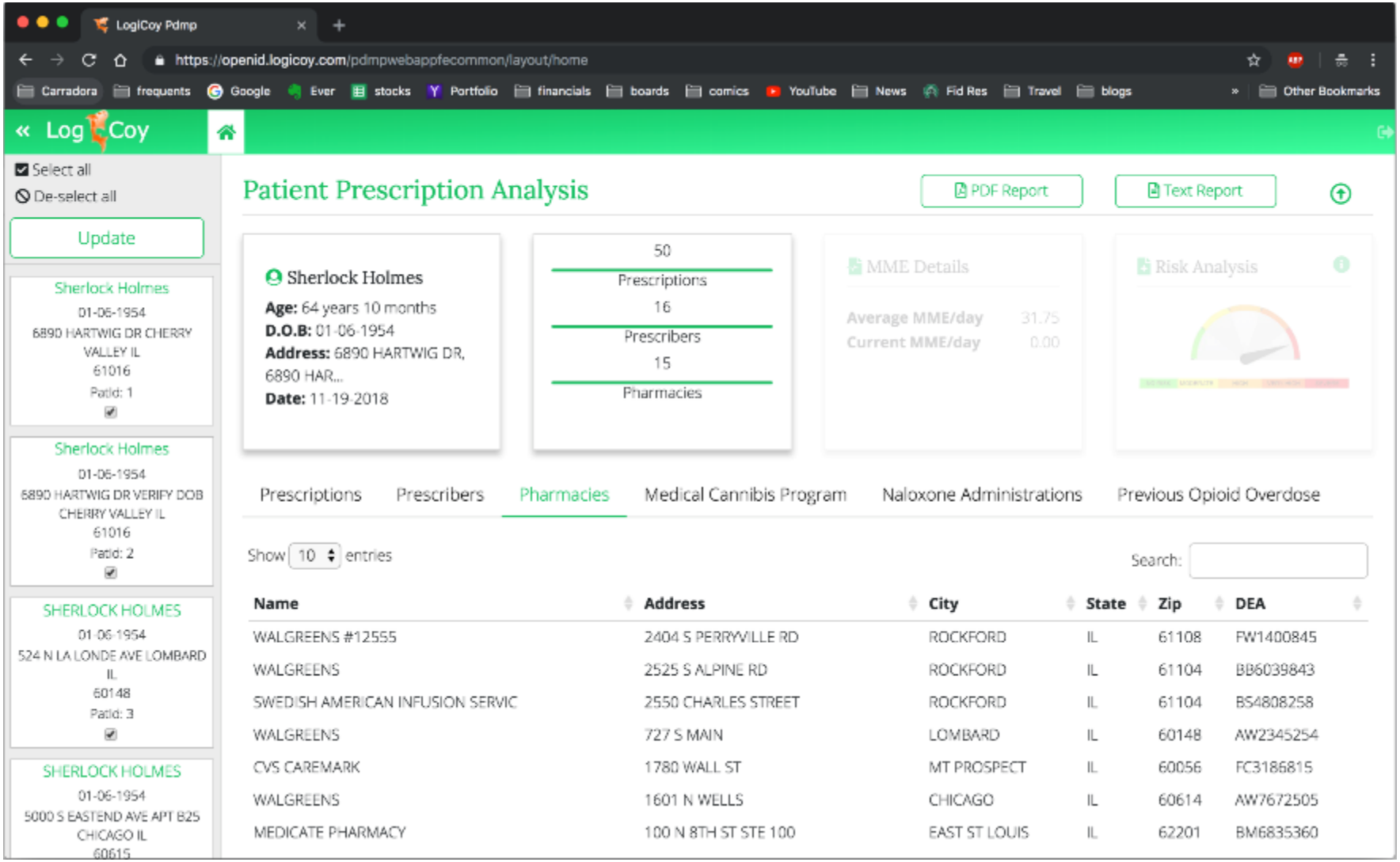
Pilot Example

- Illinois Pilot - Utilizing the LogiCoy SMART on FHIR web app
  - Using test data from the Illinois PDMP
  - This app can also connect to other states via RxCheck
  - There are iOS and Android versions of the web app

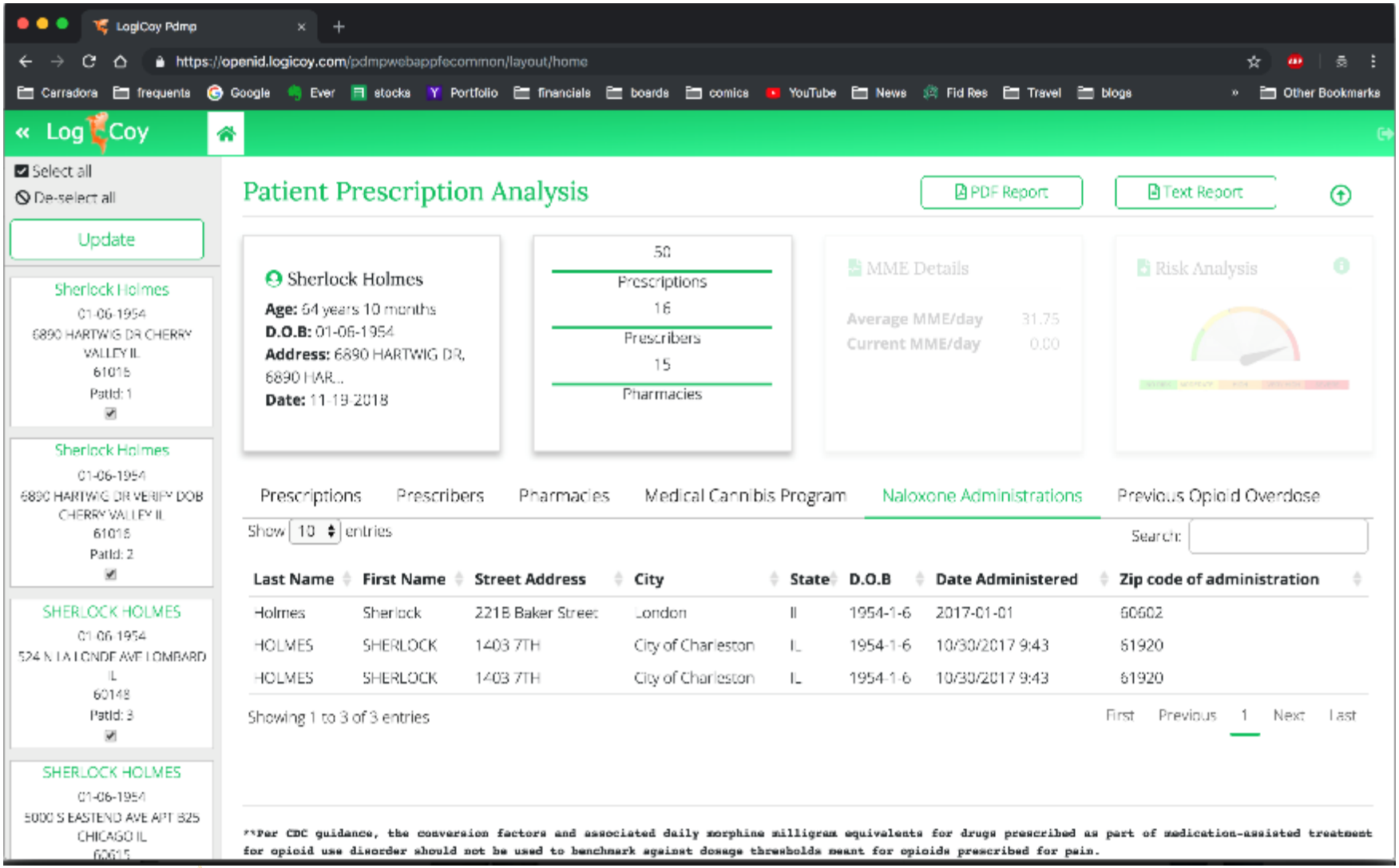
IL LogiCoy Web App: Prescriptions View



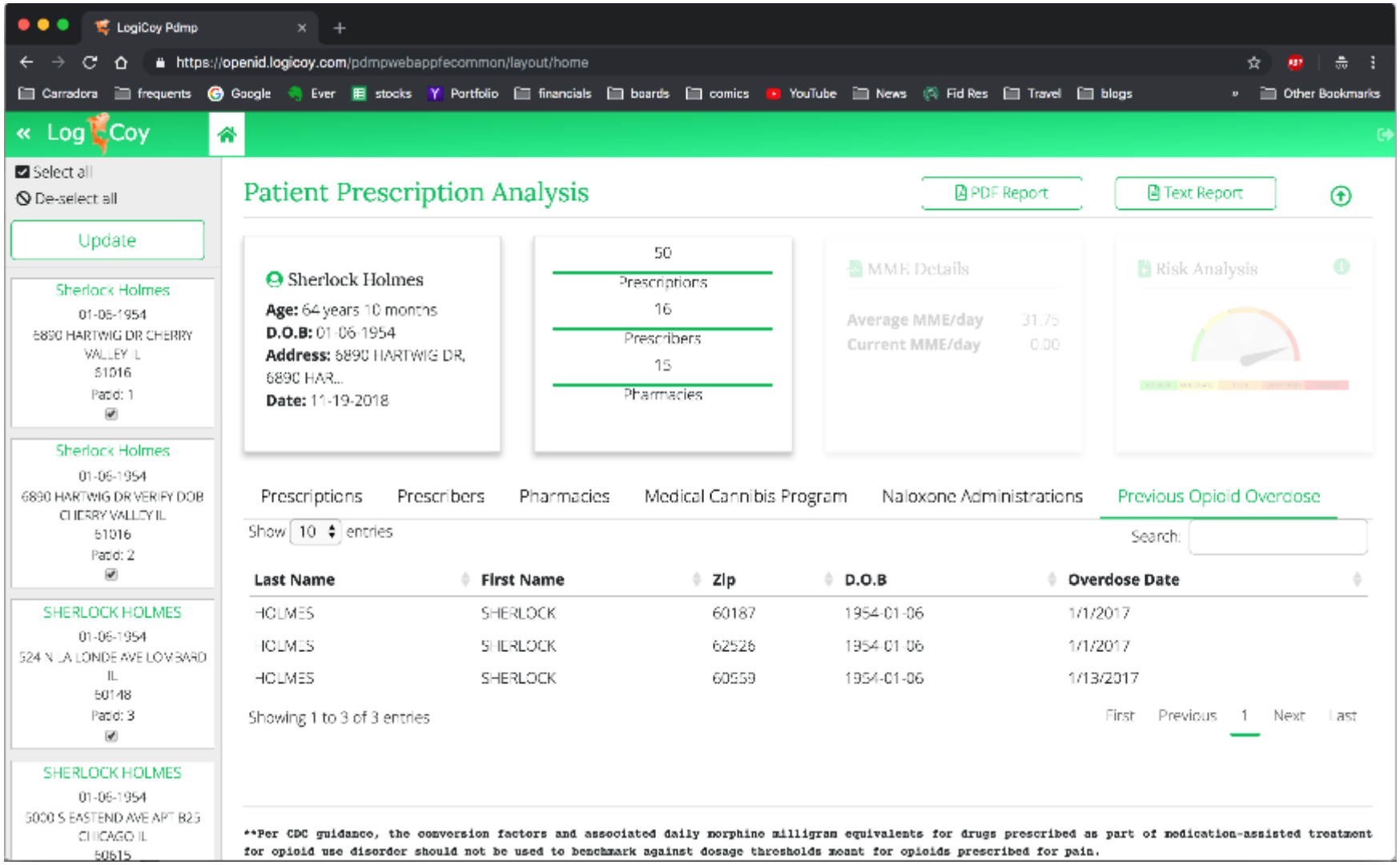
IL LogiCoy Web App: Pharmacies View



IL LogiCoy Web App: Naloxone Administrations View



IL LogiCoy Web App: Previous Opioid Overdoses View



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HL7® FHIR® Validated Healthcare Directory

An introduction and current status – November 29th, 2018

Daniel Chaput| IT Specialist, ONC Office of Technology

Project History

- April 5th and 6th, 2016 - Provider Directory Workshop
  - A joint effort of the Office of the National Coordinator for Health Information Technology (ONC) and the Federal Health Architecture (FHA).
  - Convened public and private stakeholders to review challenges, share successes, and generate new ideas around provider directory standards and solutions.
- ONC and FHA launched a new Healthcare directory effort in July 2016.
  - Objective 1 - Define the architecture of a central source of validated healthcare directory data.
  - Objective 2 - Develop a Fast Healthcare Interoperability Resources (FHIR) Implementation Guide describing the exchange of information between a central source of validated healthcare directory data and local environments (e.g. provider organizations, payers, HIEs).

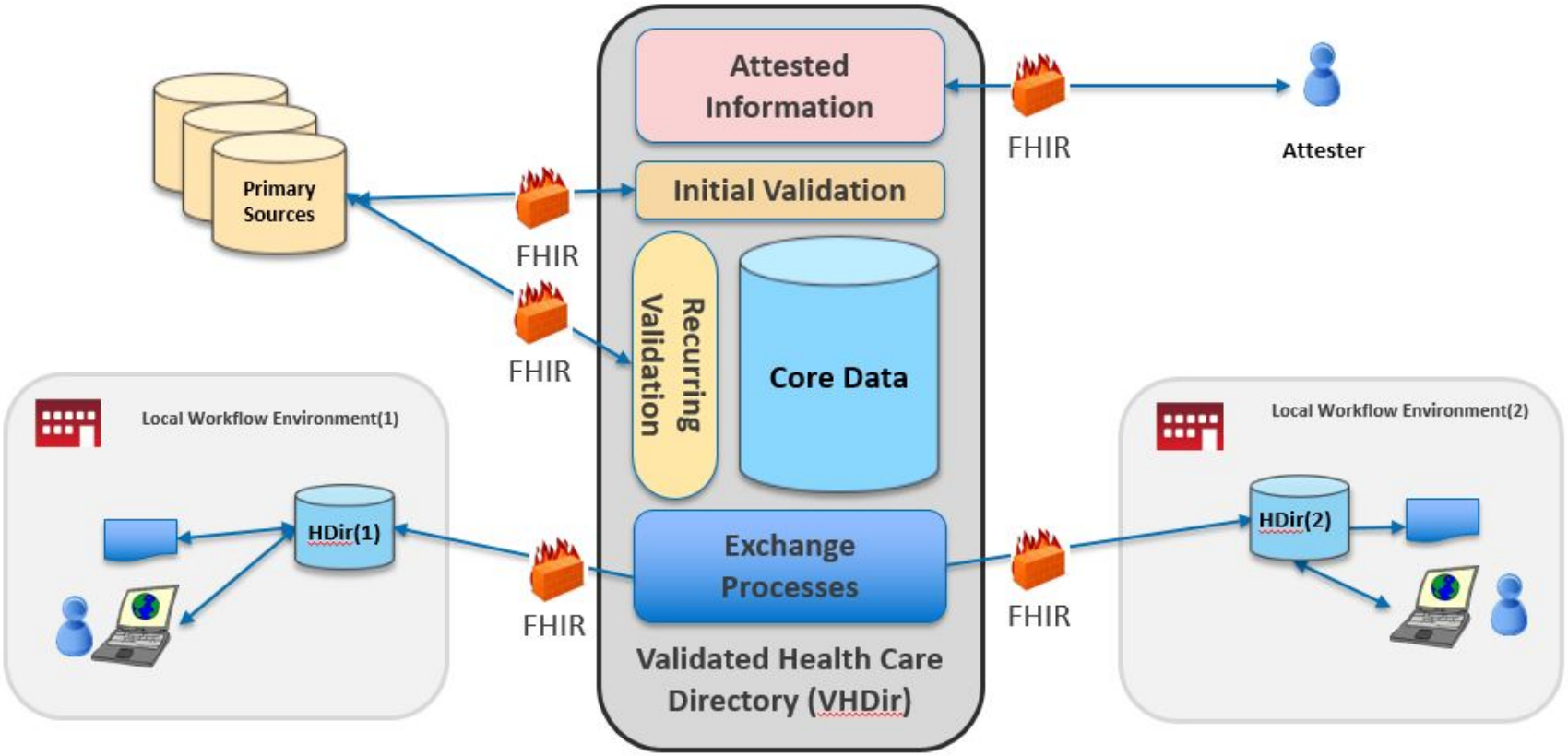
Healthcare Directory vs. Provider Directory - Scope

- The implementation guide encompasses all individuals and entities that provide services which may impact an individual's health and well-being. The scope may include data about community/social service entities and non-licensed administrative/support staff, among others.
- Not limited to
  - only those individuals/entities that are licensed to practice medicine
  - only those individuals/entities that and bill for healthcare services.
- Out of scope – Patient and family caregiver information.

Value Model

- The role of Healthcare directories
  - Electronic endpoint discovery
  - Referrals and transitions of care
  - Health plan enrollment
  - Provider selection
  - Provider credentialing/privileging
- Many healthcare organizations maintain directories
  - providers, payers, health information exchange organizations (HIEs/HIOs), health information service providers (HISPs), government agencies, and credentialing organizations
  - Activities remain scattered, uncoordinated, and are often not interoperable. As a result, the healthcare industry collectively spends significant time and resources registering and validating demographic information for individual and organizational providers for purposes such as licensure, credentialing, certification, and payment.
- Providers often have to submit and manage information about themselves and their places of employment to a variety of stakeholders. In the US, providers often contract with ten or more health plans, and are required to regularly submit similar information to each plan for inclusion in a provider directory. Likewise, provider credentialing and hospital privileging processes require similar documentation. The Council for Affordable Quality Healthcare has estimated that maintaining provider databases costs the US healthcare industry at least $2 billion annually.
- Due to the high cost of acquiring and maintaining provider information and keeping it current, existing healthcare directories often contain information that is inaccurate, out of date, or not validated.

Validated Healthcare Directory Concept Diagram



The current product release

- Continuous build
  - » http://build.fhir.org/ig/HL7/VhDir/index.html
- Balloted build
  - » http://hl7.org/fhir/uv/vhdir/2018Sep/index.html
- Project information
  - » https://oncprojectracking.healthit.gov/wiki/display/TechLabSC/Healthcare+Directory

Next steps

- Planning for FHIR Connectathons
  - Dec 11 (virtual)
  - January 2019 at the HL7 workgroup meeting
- Re-prioritizing our efforts
  - Additional use cases and APIs to support validation
  - Developing a large, synthetic data set for testing

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Thank you!

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