Healthcare Directory Technology Learning Community

TLC Meeting – April 14th, 2017
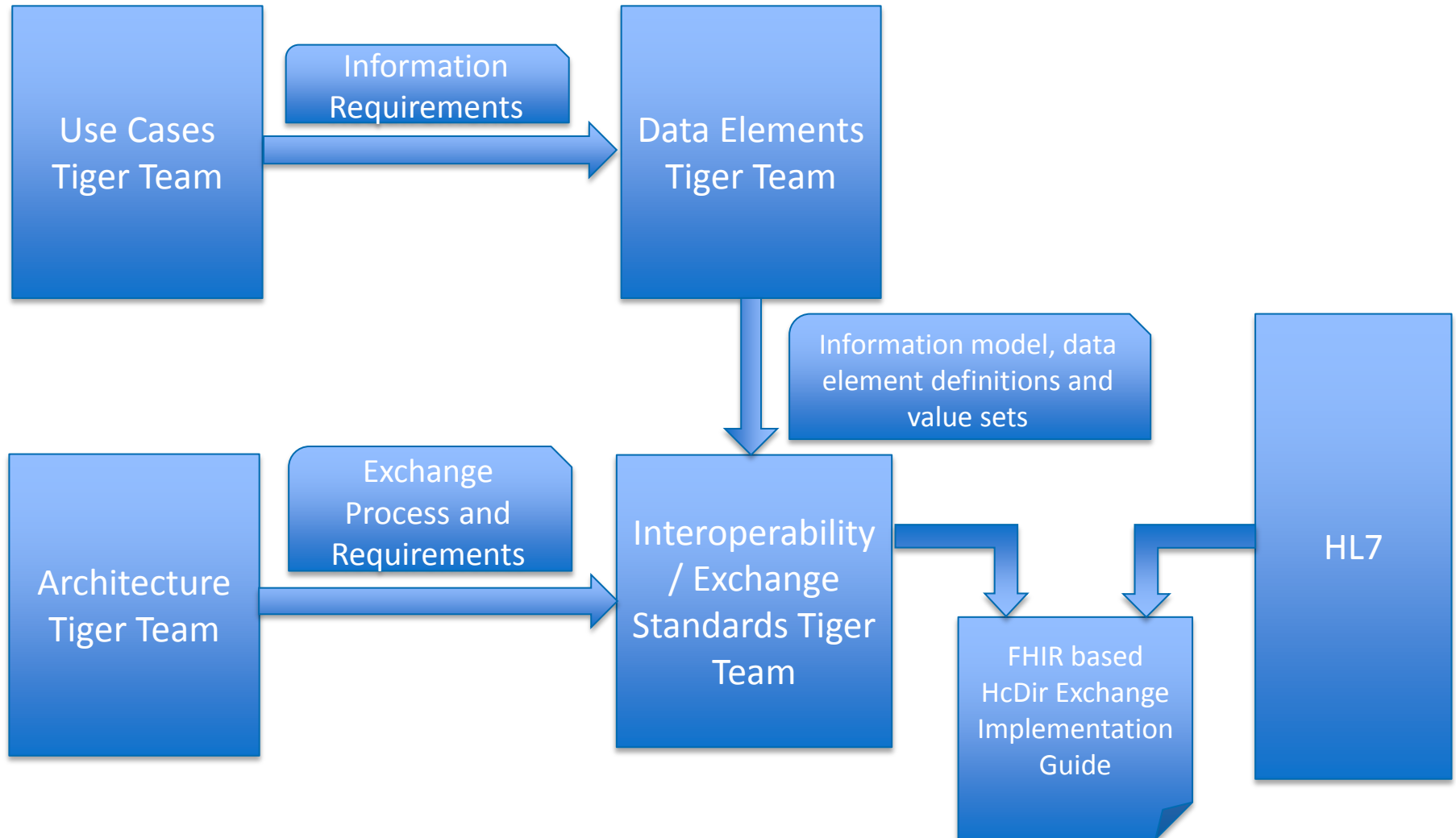
Daniel Chaput, ONC – Rim Cothren, A Cunning Plan - Bob Dieterle - EnableCare, LLC

- Welcome and Housekeeping

- Tiger Team Updates

- Discussion – Industry Updates

ONC-FHA Healthcare Directory Tiger Team Dependencies

Use Cases Tiger Team → **Information Requirements** → Data Elements Tiger Team

Data Elements Tiger Team → **Information model, data element definitions and value sets** → Interoperability / Exchange Standards Tiger Team

Architecture Tiger Team → **Exchange Process and Requirements** → Interoperability / Exchange Standards Tiger Team

Interoperability / Exchange Standards Tiger Team → FHIR based HcDir Exchange Implementation Guide → HL7

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FHA — FEDERAL HEALTH ARCHITECTURE

Use Cases Tiger Team - Charter

- Goals:
  - » Define a key set of use cases for healthcare directories
  - » Prioritize those uses cases in suggested order of implementation

- Healthcare directories should be considered as broadly as possible, encompassing all potential stakeholders, users, and actors

- "Use cases" should define the functionality of healthcare directories as observed by users; they should describe business processes as opposed to detailed technical requirements

- No technical architecture, technical standard, or geographic scope should be assumed; the discussion should be generalized to any scope, architecture, or implementation

- It is not the purpose of this Tiger Team to define an architecture; however, use cases will inform requirements for an architecture for the Architecture Tiger Team

- It is not the purpose of this Tiger Team to define details of the data elements required to address identified use cases; however, high-level data requirements should be defined to inform the Data Elements Tiger Team

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Use Cases

- **Basic Information Exchange**

  - » A1. Enable electronic exchange (e.g. discovery of electronic end points such as IHE/EHR endpoints, FHIR server URLs, Direct addresses)

  - » A2. Find an individual and/or organization (even if no electronic end point is available)

- **Patient/Payer focused**

  - » B1. Find provider accessibility information (specialty, office hours, languages spoken, taking patients)

  - » B2. Relationship between provider and insurance plan (insurance accepted) or plan and provider (network)

  - » B3. Plan selection and enrollment

  - » B4. Claims management (adjudication, prior authorization, payment)

Use Cases (Cont.)

- Care Delivery / Value Based Care

  » C1. Provider relationship with a patient (e.g. for alerts)

  » C2. Provider relationship with other providers in context of a patient (e.g. care team communications)

- Other

  » D1. Provider credentialing

  » D2. Quality or regulatory reporting (e.g. aggregate data, plan networks)

  » D3. Detection of fraud; inappropriate approval of services and/or payment for services

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Data Elements Tiger Team

- **Logical Groupings:**

  » Demographics (e.g. name, gender, DOB, type)

  » Contact information (e.g. phone, email, fax, purpose of each)

  » Location (e.g. addresses, hours, contact info, purpose)

  » Identification (e.g. unique ID/type)

  » Education/license (e.g. education, license information, tax ID)

  » Relationships (e.g. parent-child, individual-org, role)

  » ESI/electronic end point

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Validation Considerations:

» Type

» Status

» Primary source(s)

» Secondary sources

» Frequency

» Last completed

» Process (recommended and alternative)

» Alert to changes

» Reporting process (if validation fails)

» Failure (fatal, warning, other)

» Audit Trail

» Effective

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Architecture Tiger Team – Draft Architectural Components

- **Architecture Overview**

- **Exchange**

  - » Define transport processes (e.g. REST, SFTP, SOAP)

  - » Define exchange processes (e.g. pull, push)

  - » Data aggregation (e.g. batch, real-time)

  - » Bandwidth considerations

- **Restricted information**

  - » Handling of core information

  - » Handling of use case specific information

  - » Define requirements for restricting information

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Architecture Tiger Team – Draft Architectural Components

- Restricted information (contd.)

    » Labeling of restricted information

    » Handling of restricted information (e.g. access controls)

    » Flow down of restrictions

- Populations

    » Define population requirements

    » Define process to request population

    » Define preprocessing process

Architecture Tiger Team – Draft Architectural Components

- Security

  » Define security requirements

  » Define identity, authentication, and authorization processes

  » Signing and encryption

- Inputs

  » Define primary source exchange options

  » Define attested information submission options

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Interoperability Tiger Team

- Project Scope Statement (PSS) submitted – minor revisions requested

- Scope:

  » The development of a FHIR based implementation guide to enable the exchange of validated healthcare directory information between a reference source (e.g. national directory) and "local" workflow environments (e.g. local directories).

  » The exchange will include validation information to communicate the timing, source(s) and validation method for all of the significant elements of the healthcare directory.

  » The implementation guide shall include constrained exchange content, conformance statements, and exchange methods

Today's discussion – Industry Updates

- The Sequoia Project – Eric Heflin

- DirectTrust - David Kibbe and Stephen Weiss

- Michigan Health Information Network Shared Services (MiHIN) – Jeff Livesay

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The Sequoia Project's Role

The Sequoia Project is a trusted, independent convener of industry and government

Works to address the challenges of secure, interoperable nationwide health information exchange (HIE).

SECURE	INTEROPERABLE	NATIONWIDE

the
sequoia
project

The Sequoia Project® Healthcare Directory

- Based on the Argonauts workgroup
- Went live February 2017
- EndPoint is a contained resource of Organization resources
- Extensions include additional EndPoint data elements for
  - Use cases supported
  - Technical transaction information
  - Version
  - PurposeOfUse
  - Role
  - IPA
  - More
- Supports JSON and XML

The Sequoia Project® Healthcare Directory

- Sample PurposesOfUse extension:

```
<!--PurposesOfUse Value Set for SAML header and/or access control-->
        <extension url="PurposesOfUse">
          <valueCodeableConcept>
            <coding>
              <system value="https://sequoiaproject.org/StructureDefinition/Endpoint/PurposesOf
              <value value="Treatment"/>
            </coding>
          </valueCodeableConcept>
        </extension>
```
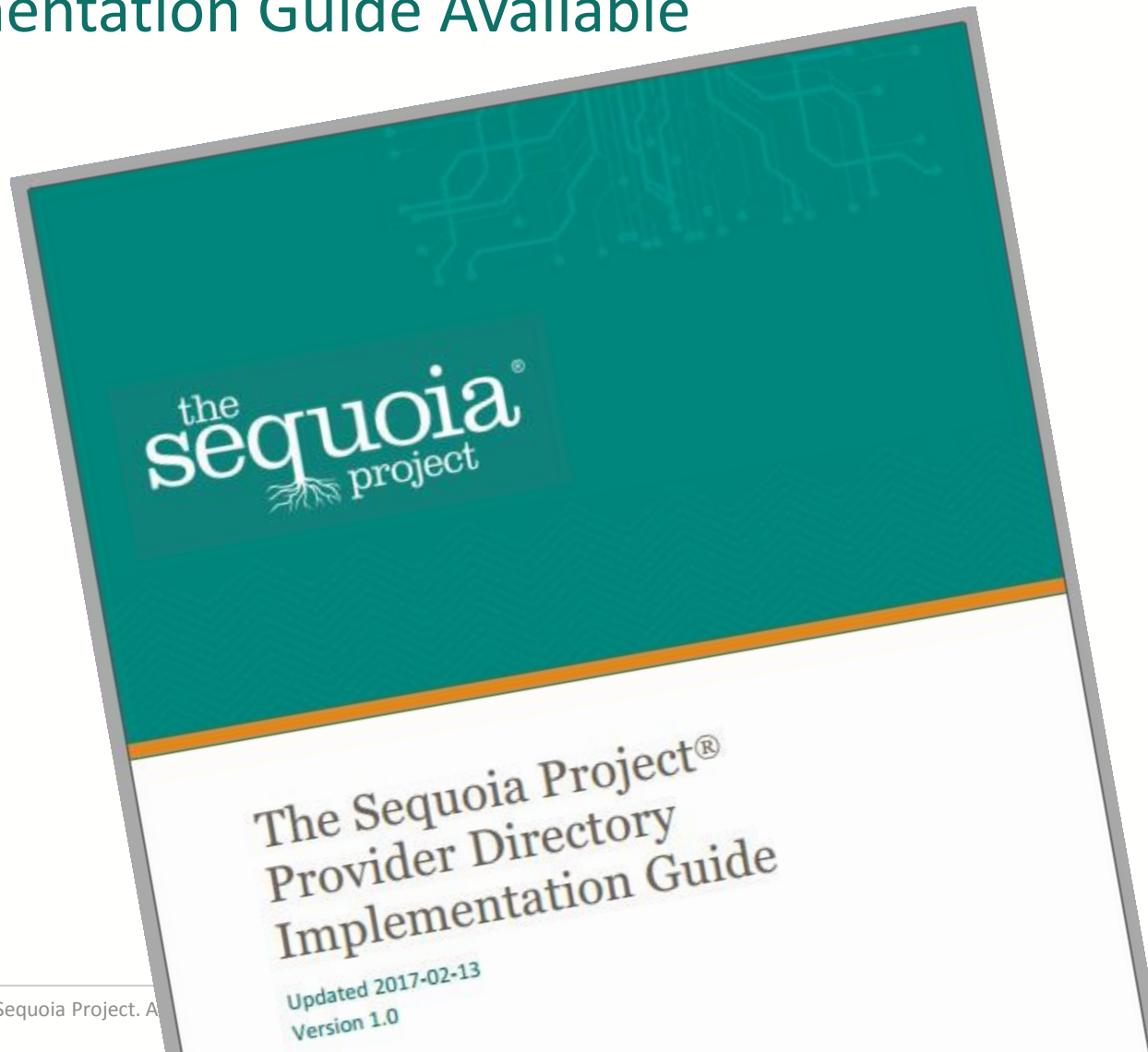
The Sequoia Project® Healthcare Directory

- Sample PurposesOfUse extension:

```xml
<!--Version of the service as per the eHealth Exchange specifications-->
        <extension url="Version">
          <valueCodeableConcept>
           <coding>
             <system value="https://sequoiaproject.org/StructureDefinition/Endpoint/Version/1.0
             <value value="2.0"/>
           </coding>
          </valueCodeableConcept>
        </extension>
<!--Initiative specific list of use cases supported-->
        <extension url="UseCases">
          <valueCodeableConcept>
           <coding>
             <system value="https://sequoiaproject.org/StructureDefinition/Endpoint/UseCases/1
             <value value="QueryBasedDocumentExchange"/>
```

Implementation Guide Available

The Sequoia Project®
Provider Directory
Implementation Guide

Updated 2017-02-13
Version 1.0

Thank You!

Eric Heflin
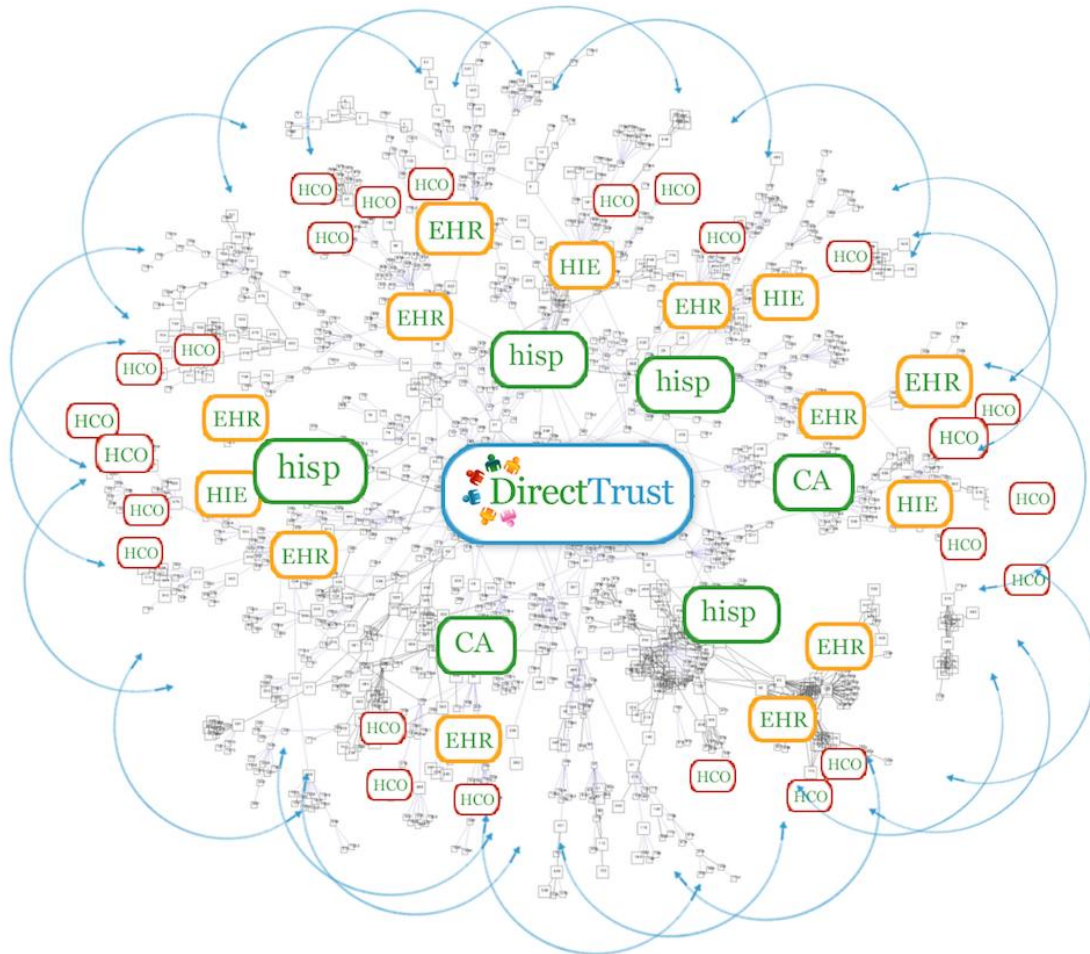eheflin –at- sequoiaproject –dot- org

Provider Directory Data Aggregation Service

April 14, 2017

DirectTrust.org

Background and Overview
# Direct Exchange and DirectTrust

The DirectTrust Network

- 40 HISPs, 17 RA/CAs
- 300+ Direct-enabled, ONC certified EHRs & PHRs
- 71,000 health care organizations
- 50+ HIEs in 20 states
- 5 Federal Agencies
- 1.4 million Direct addresses
- 166 MM transactions by end 2016
- Estimated over 200 million in 2017
- Replacing fax, courier, mail for transport of PHI data and info

Provider Directory Data Aggregation Pilot started May 2015, in transition to early production May 2016

DirectTrust The most trusted names in healthcare exchange.

DirectTrust Directory Services Architecture
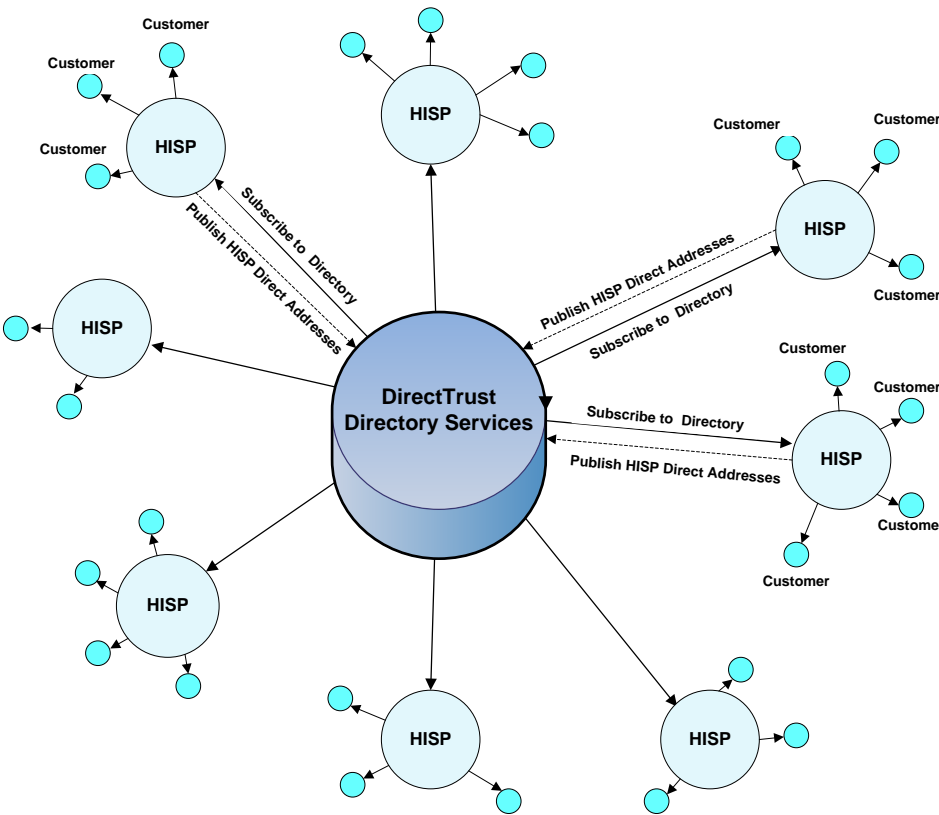
DirectTrust recognized the need for a member Provider Directory Aggregation Service to advance adoption of Direct

Participation is voluntary and open to all DirectTrust accredited HISPs for use by them and their customers

Single Provider Directory Data Sharing Agreement to publish and subscribe with multiple trading partners, eliminating the need for one-off agreements and data feeds, assuring privacy of data, no spamming, etc.

Pilot started as a proof of concept – testing technology and design – keep it simple!

Policy and governance are defined by member consensus

- Directory Aggregation Service Pilot Statistics

  As of April 7, 2017

  - Twenty Two HISPs (to date) have signed up

  - Sixteen HISPs are live contributing and receiving aggregated Data

  - Two HISPs are actively testing

  - Just over 560,000 Direct Addresses in the Directory Service

  - Working with the other HISPs on enrollment

  - Software/technology working without issues

Some lessons learned…

- Simple works.

- HISPs, EHRs PHRs, and HCOs are often very worried about release of Direct addresses to third parties, which might encourage junk mail, spamming, unrequested messages

- As use of Direct grows, so does the demand for basic provider directory information, not only in private sector but for federal agencies

- Thus, there is a tension and "trade-off" between access, reliability, currency, curation of the data and its allowed and prohibited uses

- No one wants to pay for directory services! (or not much, anyway)

- Will there be increased demand for additional data model components?

Further technical details

- Mutual TLS is used to provide system security

- Participating HISPs upload their Direct Addresses in a CSV File

- Two Interfaces are supported – Interactive and RESTful API

- HISPs upload their data and download aggregated Directory
  - HISPs must contribute by uploading their data to participate

- Edit Checking Verification Reports available for uploads
  - As file is uploaded the file is checked for compliance with format. A report of the edit check process is available for download to the HISP

Directory App Software

Directory App Software

DirectTrust.org (active)

| DD | Welcome | Contribute | Published | Download | Help |

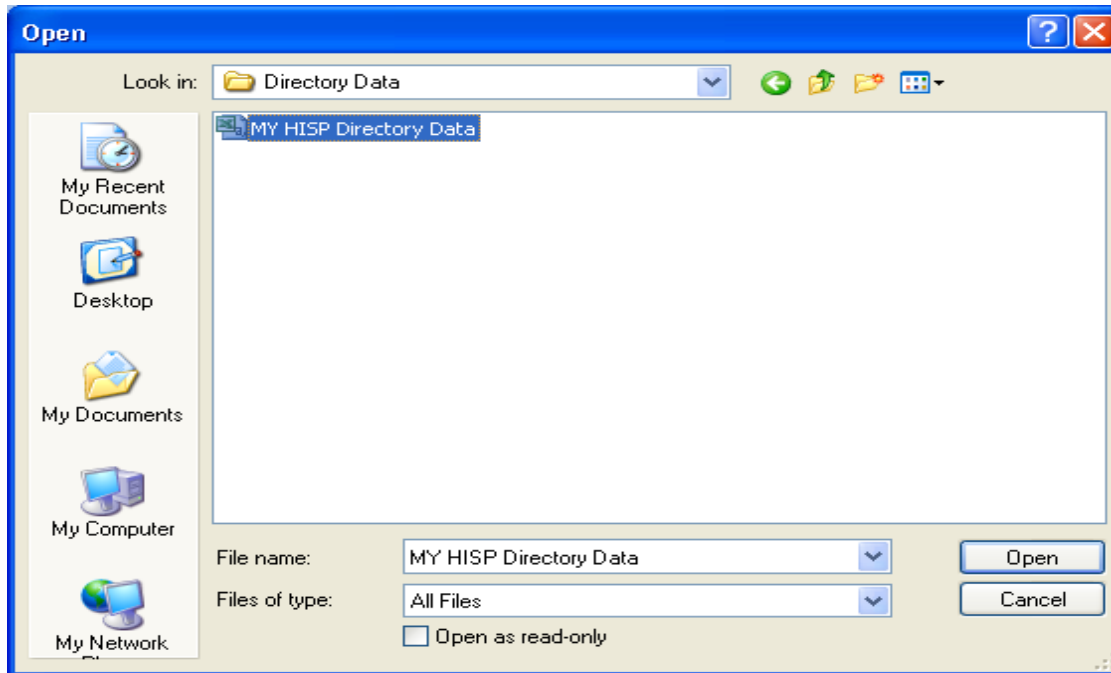## Contribute

Select a file

Select...

Details

Format

Directory data is contributed in a CSV format. Details of this format can be found in the Help section.

Schedule

Contributions received prior to **10:00 PM EDT** are processed for inclusion in the full directory for the following day. New directory data is published daily at **2:00 AM EDT**.

Directory App Software

- Select a file to upload

Directory App Software

- Upload the file

Directory App Software

- File Upload confirmation

Directory App Software

- ## Code example – Upload Directory Data

- curl --cert client.crt --key client.key --data-binary @data.csv
  https://directory.directtrust.org/dd/api/contribute

- ## Code example – Download Parsing Log File

- curl --cert client.crt --key
  client.key https://directory.directtrust.org/dd/api/report

- ## Downloading Aggregated Directory File Just As Easy

- ## User Guide has instructions and illustrations

Directory App Software

- Easy to get started – 4 step process
  - Execute Directory Data Sharing Agreement
  - Enrollment (submit self-signed org cert and contact info)
  - Test Directory Data Uploads
  - Go live

Contact Information

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Admin

Admin@DirectTrust.org

Overview of Michigan's Statewide Health Directory

Scalable, standards-based solution to manage healthcare provider information and enable ***accurate, secure exchange of health information***

MiHIN
Shared Services

Who uses the Health Directory?

- Staff in practice units or provider organizations
  - Operators, receptionists, check in/out staff, care coordinators, referral specialists, medical assistants, registered nurses
- State Immunization Information Systems (IIS) (MCIR)
- Medicaid Incentive Programs (for MU reporting and quality measures)
- State Medicaid – for Admission, Discharge, Transfer Notifications and Medication Reconciliation messages for beneficiaries
- Regional Extension Centers
- State Innovation Model (SIM) states:
  - Patient Centered Medical Home operators
- Health Information Exchanges
- Other emerging organizations: CINs, ACOs, etc.
- Under pilot: Commercial health plans

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Health Directory Facts

Populated with Provider information from:

- Providers (monthly)
- CMS (NPPES 3.0 – real-time via REST APIs)
- Commercial sources: HISPs, state licensing, vendors (stopped using commercial data)
- Commercial and Medicaid health plans
- Medicaid Meaningful Use attestation database
- Medicaid Management Information System (MMIS)
- Immunization Information System (IIS); other public health registries
- Regional Extension Centers (varies by state)
- Multi-source data imported, mapped, de-duplicated
    - Master Data Management (MDM)
    - Data Stewardship
    - Object Identifiers (OIDs)

Reliable: Stable 24x7 production in Salesforce.com cloud

- Force.com platform - production-quality deployment:
    - Familiar GUI: global, ubiquitous, tablet and mobile friendly

Health Directory Key Benefits

- Tracks simple and complex relationships between physicians, practices, physician organizations, hospitals, health systems, ACOs, and payers with multiple relationships and addresses allowed at various levels
  - Maintains all provider information from clinic to health system or payer
  - Used to find or report provider information manually or automatically

- Features accurate provider information updated monthly including:
  - Provider demographics
  - Provider affiliations (practice, organization, health system, payer)
  - Provider and organizational program participation (SIM, MU, PGIP, etc.)
  - Provider electronic addresses and preferences for receiving PHI

- Allows organizations that keep their information current in the Health Directory to receive near-real-time ADTs, Medication Reconciliations, and other content such as Laboratory Results for their attributed patients
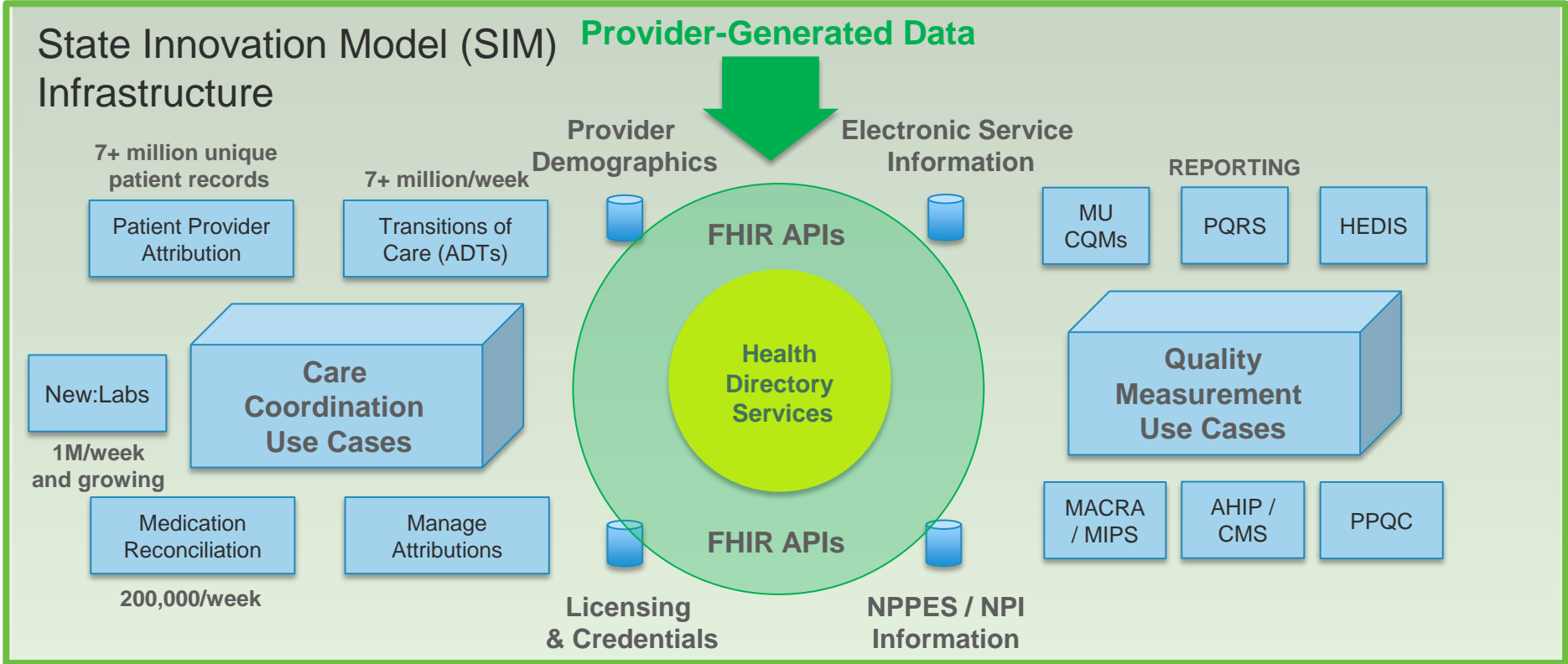
MiHIN
Shared Services

Health Directory Key Benefits (cont'd)

- Contains more complete picture than hospital or enterprise provider directories
- Facilitates "One-stop shopping" for provider information statewide
  - Supports searching for other providers for referrals
  - Offers most current information regarding providers
  - Uses NPI and medical license as key identifiers for matching providers
  - New modules will support:
    - Managing active care relationships
    - Referrals
    - Viewing PHI
- Replaces technology used by some organizations (e.g. Excel, Access)
- **Enables accurate patient-provider attribution management**
  - **In Michigan this is called the Active Care Relationship Service (ACRS)**
- Maintains electronic address information to help find/send PHI
  - e.g. IHE/EHR routing number, FHIR URL, Direct address

MiHIN Shared Services

Provider Directory Services: Infrastructure to Support Valuable Use Cases

Accurate! Current! Affordable!

State Innovation Model (SIM) Infrastructure

Provider-Generated Data

Provider Demographics

Electronic Service Information

REPORTING

7+ million unique patient records

| Patient Provider Attribution |

7+ million/week

| Transitions of Care (ADTs) |

FHIR APIs

| MU CQMs | | PQRS | | HEDIS |

Health Directory Services

New:Labs

Care Coordination Use Cases

Quality Measurement Use Cases

1M/week and growing

| Medication Reconciliation | | Manage Attributions |

FHIR APIs

| MACRA / MIPS | | AHIP / CMS | | PPQC |

200,000/week

Licensing & Credentials

NPPES / NPI Information

| Immunization Information Systems |

Help Desk Use Cases

| Regional Extension Centers |

| Any Public Health Registry |

MiHIN Shared Services

Real-world example of provider relationship complexity

Service Use Cases <==> Endpoints
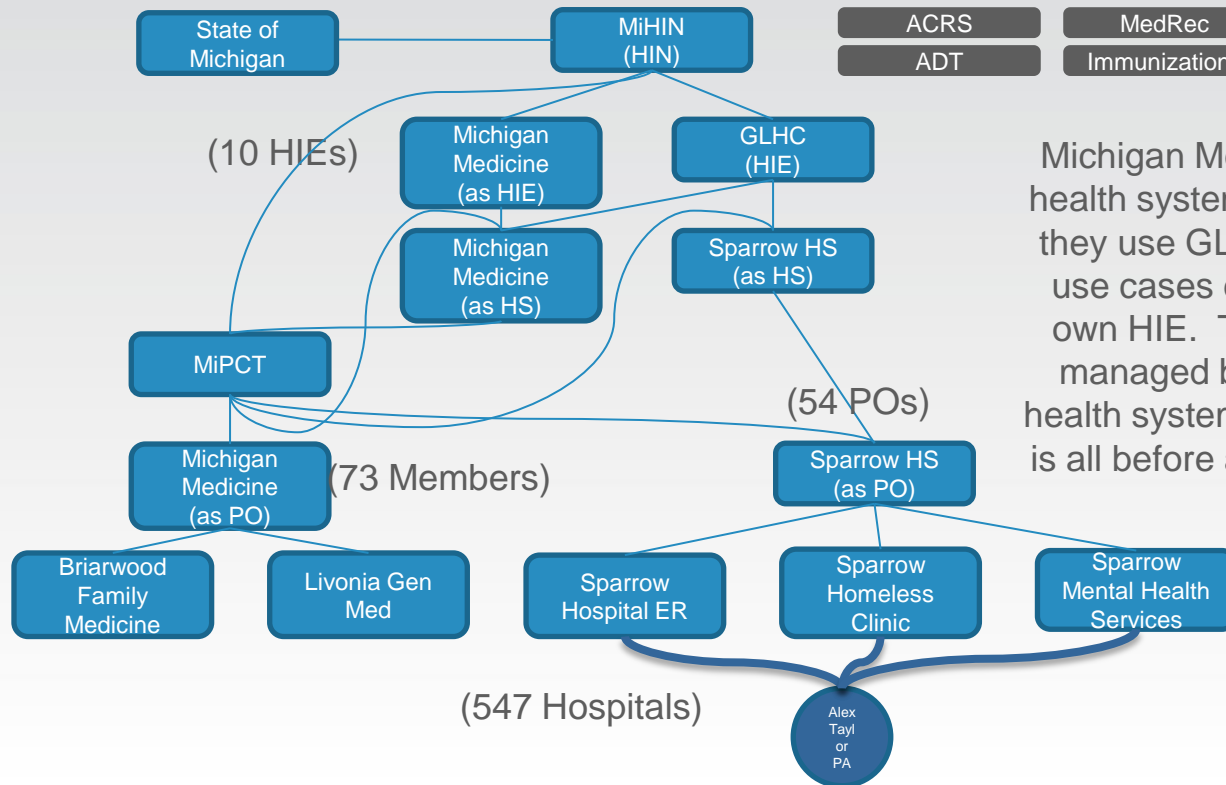
ACRS	MedRec	LABs	CAT-1
ADT	Immunizations	Syndromics	CAT-3

State of Michigan — MiHIN (HIN)

(10 HIEs)

Michigan Medicine (as HIE)

GLHC (HIE)

Michigan Medicine (as HS)

Sparrow HS (as HS)

MiPCT

Michigan Medicine (as PO)

(73 Members)

Sparrow HS (as PO)

(54 POs)

Briarwood Family Medicine

Livonia Gen Med

Sparrow Hospital ER

Sparrow Homeless Clinic

Sparrow Mental Health Services
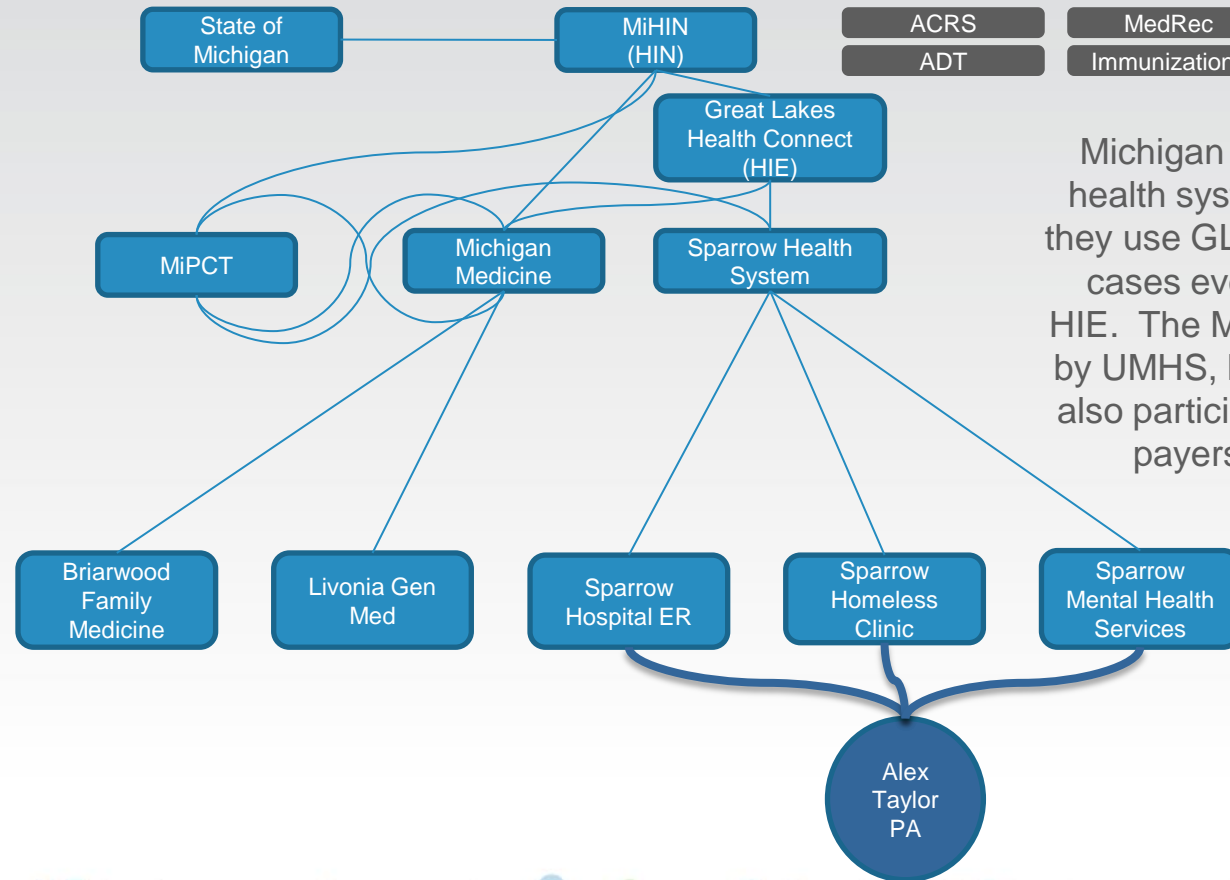
(547 Hospitals)

Alex Taylor PA

Michigan Medicine is simultaneously a health system, a PO, and an HIE – BUT they use GLHC as their HIE for certain use cases even though they are their own HIE. The MiPCT organization is managed by UMHS, but many other health systems also participate in it. This is all before any payers are brought into the mix.

MiHIN Shared Services

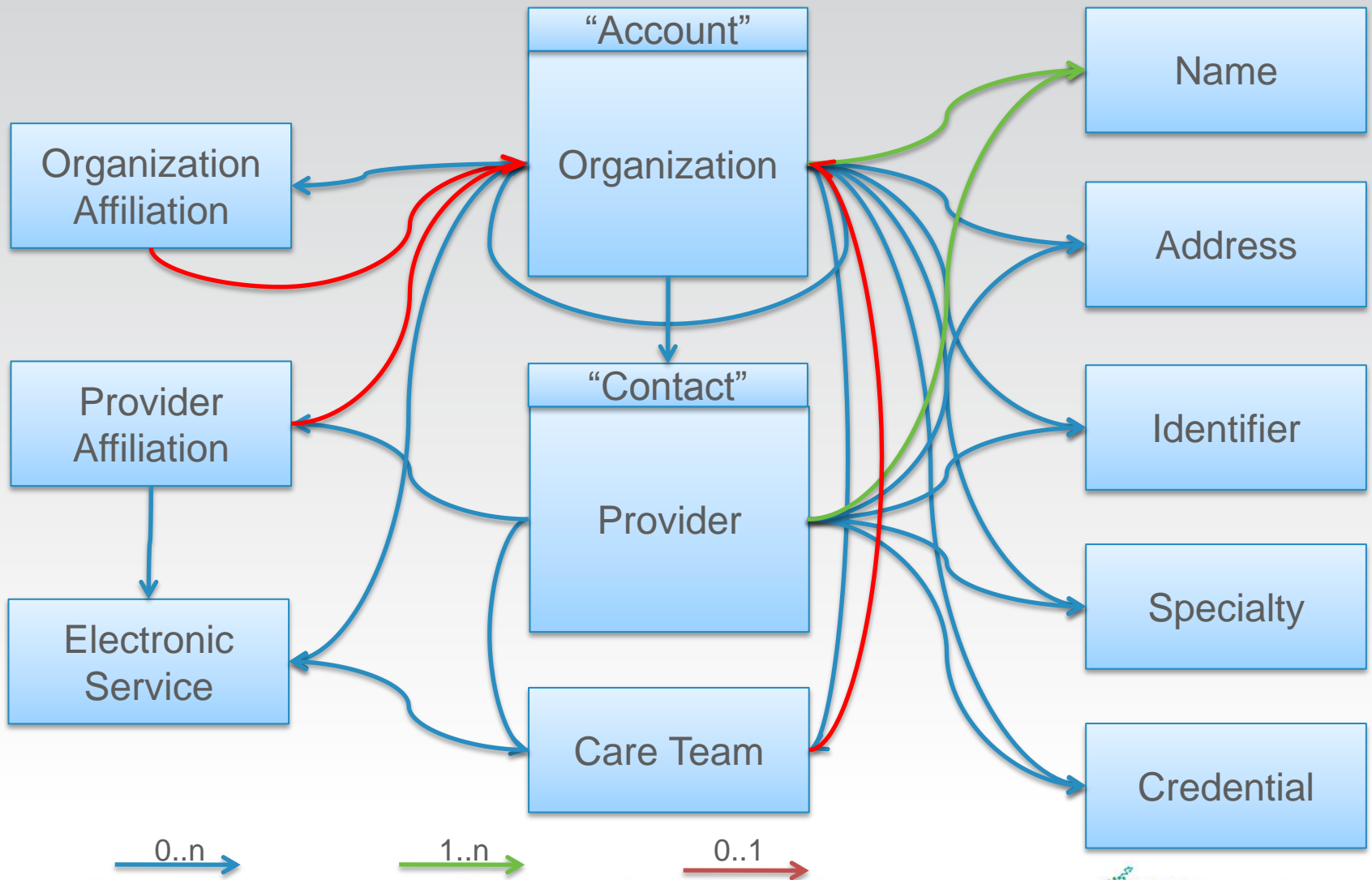# Real-world Example of Complexity (continued)

Service Use Cases <==> Endpoints

| ACRS | MedRec | LABs | CAT-1 |
| ADT | Immunizations | Syndromics | CAT-3 |

State of Michigan — **MiHIN (HIN)**

Great Lakes Health Connect (HIE)

MiPCT

Michigan Medicine

Sparrow Health System

Michigan Medicine is simultaneously a health system, a PO, and an HIE – BUT they use GLHC as their HIE for certain use cases even though they are their own HIE. The MiPCT organization is managed by UMHS, but many other health systems also participate in it. This is all before any payers are brought into the mix.

Briarwood Family Medicine

Livonia Gen Med

Sparrow Hospital ER

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Alex Taylor PA

MiHIN Shared Services
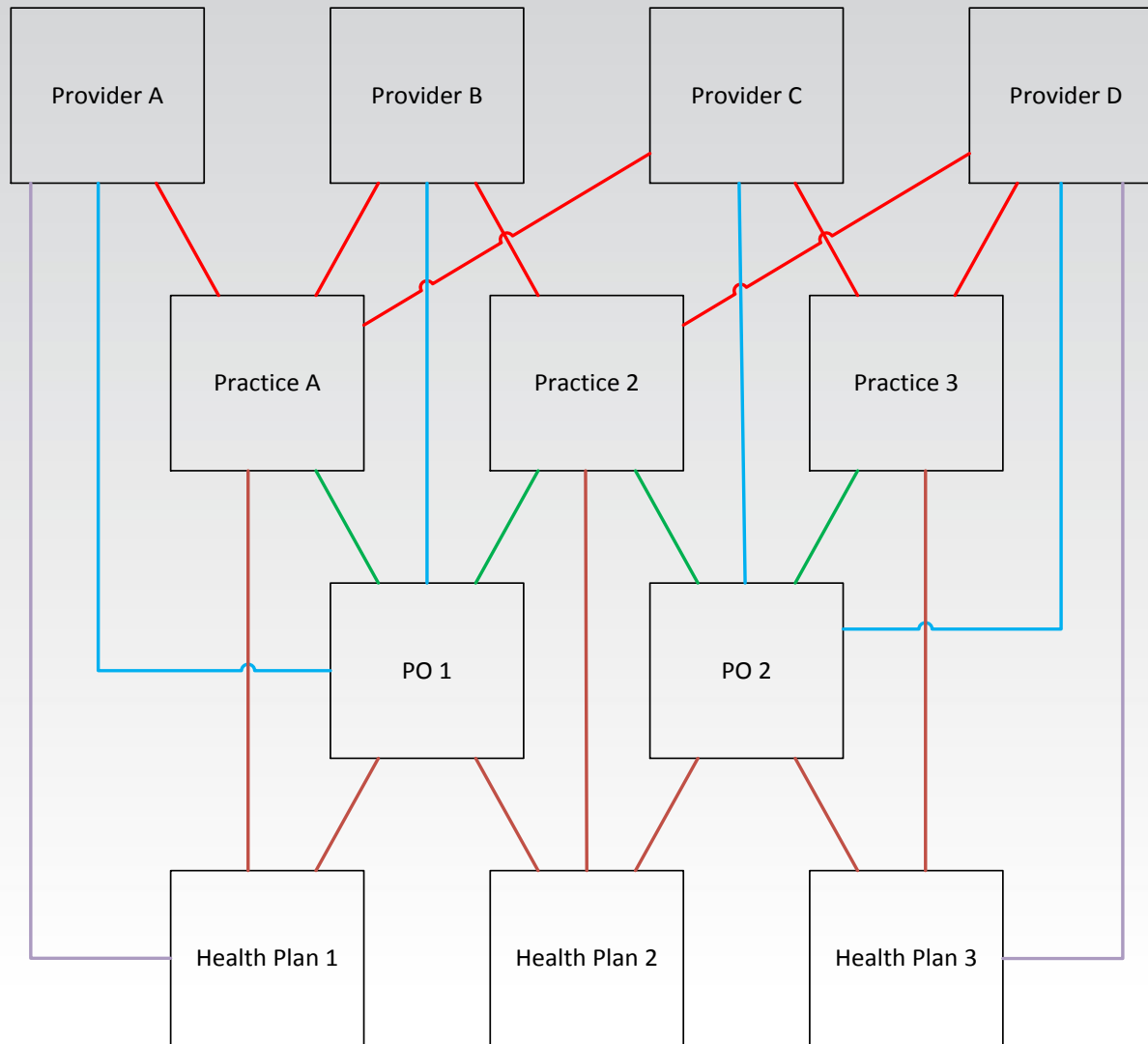
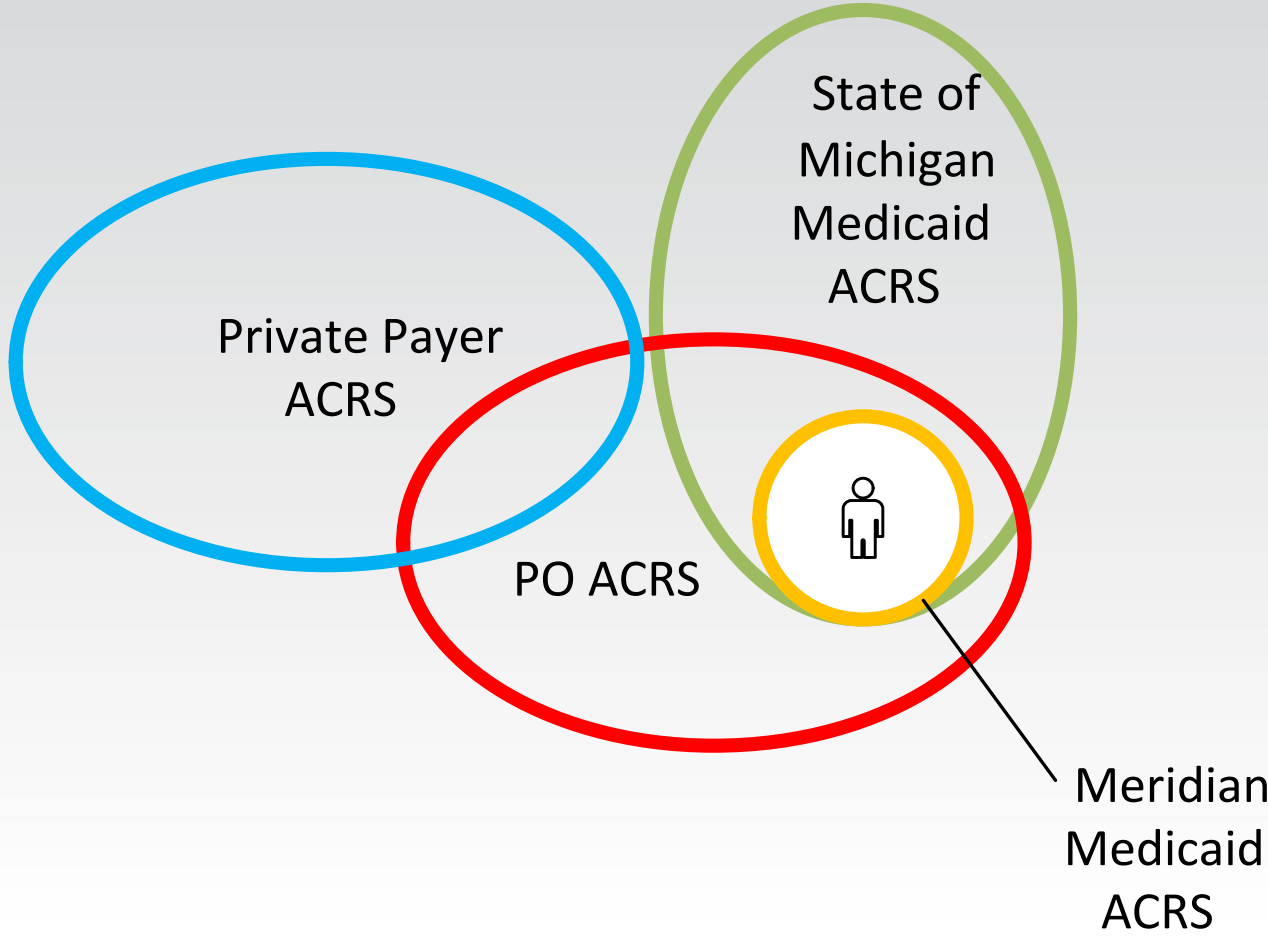# HPD Object Model

HPD Object Model

Modular Role Based Access

- 3 major user management mechanisms:
  - Population
  - Profile
  - Permission Set

- Why is this important?
  - To address evolving access requirements
  - To limit information accessibility for end users

- Ontology information is provided by sources of truth (e.g. ACRS, etc.)
  - These hierarchies are used to build populations

Modular Use of Populations

Private Payer
ACRS

State of
Michigan
Medicaid
ACRS

PO ACRS

Meridian
Medicaid
ACRS

MiHIN
Shared Services

Health Directory APIs in FHIR

- Supports RESTful APIs using FHIR for transactional read-write access to Health Directory

- Supports existing HD object models & standards/profiles

- Supports current and future HD use cases (e.g. HcDir)

- Utilizes current HL7 FHIR STU3 resources

- Uses FHIR extension mechanisms where gaps exist
  - https://mihin.org/hpd/api/

- Working with FHIR community to close gaps
  - Argonauts Provider Directory WG

MiHIN Shared Services

HPD-FHIR Organizations

- Standard FHIR field mappings for Organizations
  - **id** – [0..1] The Organization ID
  - **name** – [1..*] Organization Name related objects
  - **type** – [0..1] Organization Type
  - **identifier** – [0..*] Organization Identifier related objects
  - **address** – [0..*] Organization Address related objects
  - **telecom** – [0..*] Organization Telephone, Email, Website
- IHE HPD required FHIR extension fields
  - **qualification** – [0..*] Organization Credential related objects
  - **taxonomy** – [0..*] Organization Specialty related objects
  - **service** – [0..*] Organization Service related objects

HPD-FHIR Memberships

- Implemented as FHIR Basic Extensions

    - **type** – [1..1] A CodeableConcept that denotes the type of the membership. See Organization Membership Types and Practitioner Membership Types below.

    - **owner** – [1..1] A Reference to an Organization that has the members

    - **member** – [1..1] A Reference to a Practitioner or Organization

    - **identifier** – [0..1] An Identifier by which the member is known to the organization

    - **service** – [0..*] References to Electronic Services

    - **period** – [0..1] A Period that defines the effective dates of this membership

- The need for Memberships to model IHE HPD standard relationships has been discussed within the FHIR community and at the ONC

MiHIN
Shared Services

HPD-FHIR Electronic Services

- Implemented as FHIR Basic Extensions
  - **name** – [1..1] A plain text *string* name of the service
  - **destination** – [0..*] A list of CodeableConcepts that denote the MiHIN Shared Services for which this Electronic Service is a destination. See Service Destination Types below.
  - **content** – [1..*] A list of CodeableConcepts that denote the content data types consumed by this service (i.e. delivery preferences). See Content Profile Types below.
  - **integration** – [1..1] A CodeableConcept that denotes the networking protocol expected by this service. See Integration Profile Types below.
  - **address** – [1..1] A string denoting the service's delivery address (Direct email, IP, logical address)
- The need for Electronic Services to model IHE HPD standard relationships has been discussed within the FHIR community and at the ONC
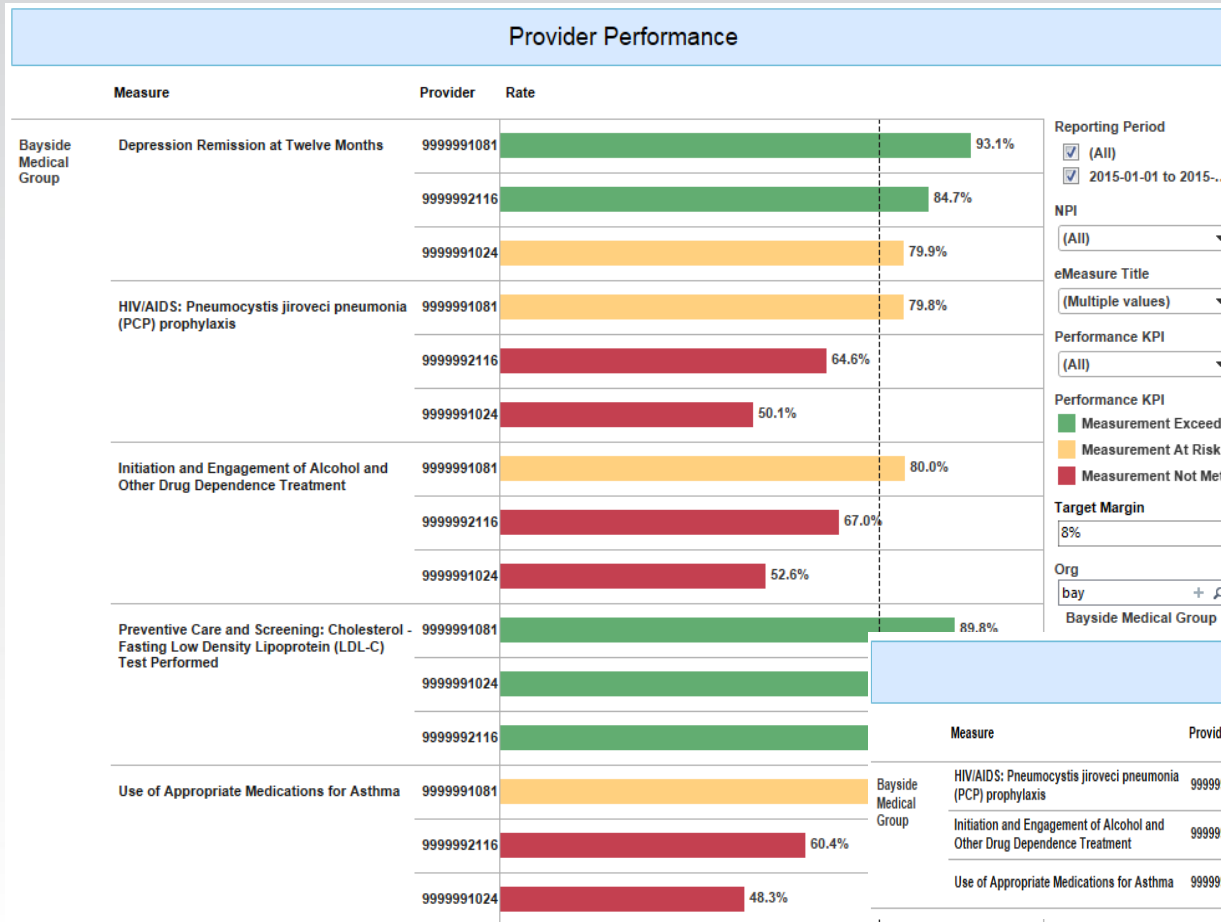
MiHIN
Shared Services

FHIR API for Directories:

- Health Provider and Consumer Directory FHIR APIs

https://mihin.org/hpd/api/
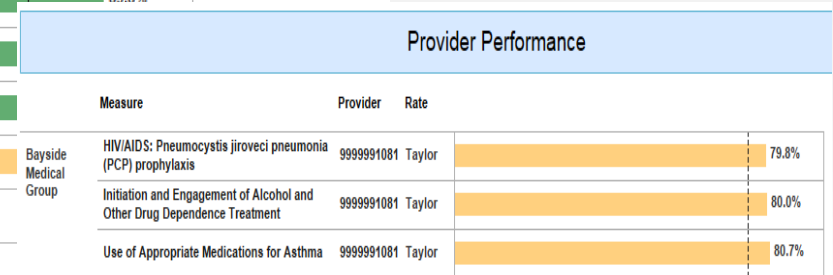
MiHIN
Shared Services

Provider Performance Dashboard

This view offers filtering capabilities for providers in a practice

Filtering:

- **Provider NPI**
- **Measure**
- **Performance**

➢ **Capability for adjusting Target Margin for practice goals**

✓ Example of filtering for single provider on performance

Provider Overview Dashboard

Offers ability to evaluate performance of multiple practices and drill down to a single provider
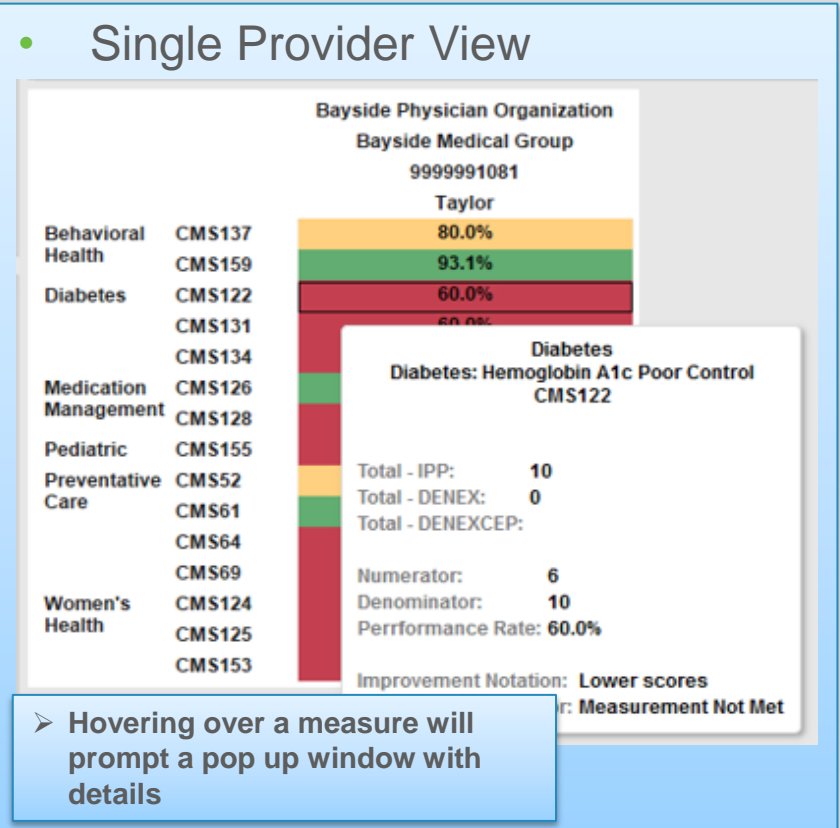
Different Directories for Different Goals

Statewide

Provider Directories (e.g. HPD in MI, NJ)

Purpose: Support statewide use cases like transitions of care and quality measures

CMS

NPPES PECOS

Purpose: Manage NPIs and Medicaid/Medicare Providers

DirectTrust

DirectTrust Directory

Purpose: Master source of truth for Direct addresses

Other Directories

e.g. FHA Pilot, Sequoia Project, commercial directories

Other Goals

CAQH

Universal Provider Directory (UPD)

Purpose: Support payers such as with provider demographics

MiHIN
Shared Services

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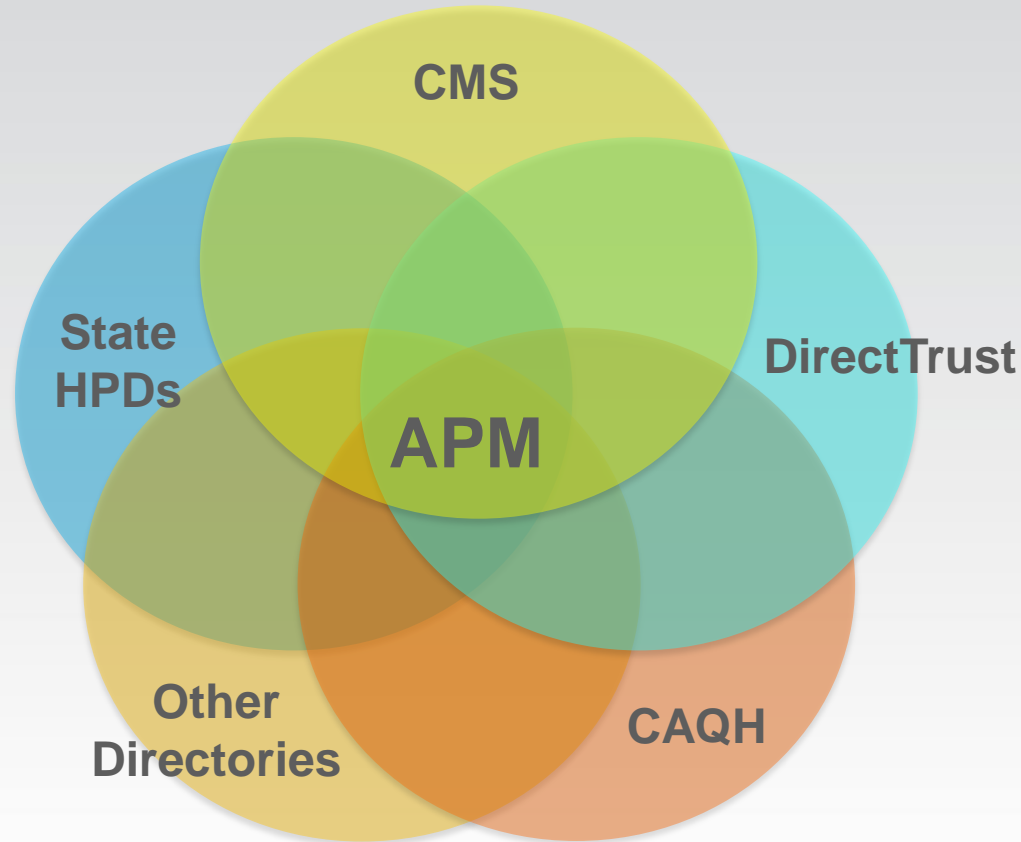
e.g. FHA Pilot, Sequoia Project

Other Goals

CAQH

Universal Provider Directory (UPD)

Purpose: Support payers with provider demographics

MiHIN Shared Services

Shared Governance, Shared Goals

Alternative Payment Models

Thank you!

Questions: livesay@mihin.org

Compliments: pletcher@mihin.org

Complaints: complaints@yahoo.com

The Office of the National Coordinator for
Health Information Technology

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