Interoperability Update for Public Health: What's In Store for the Coming Decade

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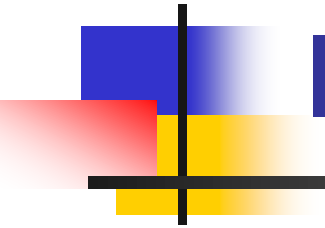
Agenda

- Introduction
- ONC March 2020 Final Rule on Interoperability
- HL7, FHIR and Public Health
- TEFCA v2 (and beyond)
- CDC's MedMorph Project
- Wrap-up



Introduction

“The Interoperability of Things”

- We can’t even agree on what Interoperability means
- It is hard to agree on scope
- Multiple world views
- Multiple audiences
- We should measure interoperability outcomes not process or capability
- Lack of a compelling business case

"The Interoperability of Things" *(continued)*

- Ambiguity over the role of HIEs (noun) and state government
- It is very hard to ignore self-interest
- We (in the US) tend to ignore the rest of the world
- We tend to reinvent the wheel
- Our timelines are too aggressive. Or are they too lax?
- The tension between being too broad versus too granular

“The Interoperability of Things” *(continued)*

- Standards change too often
- A “common data set” has limited usefulness
- Monetization of data
- Some folks just don’t get it. Or do they?
- Consent law differences are a bug to some, a feature to others
- Governance. Still.

"The Interoperability of Things" *(continued)*

- Advice:
  - Be skeptical of the notion of "consensus"
  - Leveraging the past with an eye to the future
  - Recognizing that this is more about the *pace* of change than the *substance* of change
  - In the meantime, focus on semantics!

https://www.hln.com/wp-content/uploads/2016/03/JHIM-InteroperabilityOfThings-Fall-2015.pdf

21st Century Cures Act (Dec 2016)

- Section 4001: Improve Quality of Care (reduce burdens)
- Section 4002: Fixes to CEHRT rules (info blocking, decertification)
- Section 4003: Interoperability (Definition; TEFCA; HITAC)
- Section 4004: Information Blocking Rule Required
- Section 4005: Leveraging EHRs to Promote Care
- Section 4006: Improving Patient Access
- Section 4007: GAO study on patient matching
- Section 4008: GAO study on patient access to health information

https://www.healthit.gov/sites/default/files/curesactlearningsession_1_v6_10818.pdf

ONC March 2020 Final Rule on Interoperability

Basic Facts

- ONC Improve the Interoperability of Health Information NPRM pre-released on 2/11/2019; *Federal Register* release on 3/4/2019
- Final Rule released on 3/9/2020
- ONC NPRM referred to as the "Information Blocking" rule but covers lots more
- Driven primarily by requirements of the 21st Century Cures Act
- NPRM document voluminous and confusing; FR a little better
- Remember, this is primarily about certified EHR technology, not core PH systems
- Purpose here is to help focus potential public health understanding
- Full blog at https://www.hln.com/onc-releases-final-rule-on-interoperability-how-might-it-affect-public-health/

Summary of Areas of PH Interest

- Review of **USCDI** for appropriateness for public health purposes
  - Replaced CCDS with USCDI v1 and associated “Standards Version Advancement Process” (SVAP – discussed later)
  - Public health has had little formal input to the development of USCDI
  - USCDI comes into effect through specific certification criteria and not in and of itself
  - Transmission to public health agencies – electronic case reporting” (§ 170.315(f)(5)) would be subject to USCDI compliance, but seems optional to make use of data elements that are not currently within eCR specifications
  - ONC did not update the code sets referenced for Immunization and Syndromic Surveillance conformance criteria
  - ONC did not feel compelled by objections to the NTTAA exception

Summary of Areas of PH Interest

- Replaced **NCPDP SCRIPT** version 10.6 with NCPDP SCRIPT 2017071 for ePrescribing
- EHI **Data Export**
  - Replacement of an existing C-CDA data export capability with a new, more general one until APIs mature enough for this capability to be unnecessary
  - No standard format
  - Same data set a patient can request under HIPAA
  - Not appropriate for routine PH reporting, but might be useful when a complete patient history might be desired

Summary of Areas of PH Interest

- **FHIR API**
  - Read-only method of interoperability via query/response
  - Single and multiple patient query
  - Only apply to specific API-focused certification criteria (select a patient, respond to requests for patient data)
  - FHIR v4 API selected (not widely deployed currently)
  - Very complicated rules proposed for charging fees for these capabilities so as not to engage in information blocking
  - PH reporting transactions do not appear to be directly impacted by this proposal, especially since most public health transactions are “push” transactions

Summary of Areas of PH Interest

- **Encryption:** Requires attestation for encryption and multi-factor authentication where relevant
- **Voluntary HIT for Pediatric Care Settings:** Comments acknowledged but no action taken
- Support for **Opioid Use Disorder Prevention and Treatment:** Comments acknowledged but no action taken
- Requiring **TEFCA:** Comments acknowledged but no action taken here
- **Communications** about CEHRT: May provide some opportunities for PH to be more open about CEHRT as it related to PH activities/reporting. Screen shots permissible under "fair use" doctrine
- **Real-world Testing**: PH reporting included; stress need to involve PH in this testing and limit additional burdens on PH
- **Standards Version Advancement Process** (SVAP): Promote adoption of newer standards by vendors before formal adoption by ONC. Risk of adoption of standards that PH is not prepared/funded to support. No specific recognition of public health concerns in this area was noted in the Final Rule.

Summary of Areas of PH Interest

- **Information Blocking:** A practice *likely* to interfere with access to or exchange of electronic health information (EHI)
  - Long and complex. Full extent of PH impact to be determined
  - Enforcement will not begin until HHS OIG final rule published
  - Recognition recently of COVID-19 “distraction”
  - Community-based organization excluded if they do not meet definition of “provider”
  - Applies to companies developing or offering CEHRT other than for their own use
  - PH infrastructure used to support PH reporting excluded
  - Bi-lateral, 2-party exchange excluded
  - 8 explicit exceptions
  - Routine delay in release of lab results to an EHR *not* an exception
  - Acknowledged question about whether PH onboarding queue backlog could be exempted but did not directly answer

Summary of Areas of PH Interest

- **RFI on Registries:** Comments acknowledged but no action taken
- **RFI on Patient Matching:** Comments acknowledged but no action taken

HL7, FHIR and Public Health

Health Level Seven (HL7)

- Founded 1987
- ANSI-accredited
- International
- Named after the top level of the seven-layer International Organization for Standardization (ISO) seven-layer communications model
- Hundreds of organizations and individual members
- “Open” participation
- Several core standards, several ancillary

Core Standard: Messages

- Version 2.x most pervasively deployed
- Meant for machine-to-machine interoperability
- Detailed specifications for use captured in Implementation Guides (IG)
- Data format specification *divorced* from data transport options
- Common messages: ADT, VXU, ORU
- Used for many PH measures in Meaningful Use

```
MSH|^~\&|||||||VXU^V04|19970522MA53|P|2.3.1|
PID|||221345671^^^^SS||KENNEDY^JOHN^FITZGERALD^JR|BOUVIER^^^^^^M|19900607|M|||~^^^^
MA^^^BDL|
NK1|1|KENNEDY^JACQUELINE^LEE|MTH^MOTHER^HL70063|
RXA|0|1|19900607|19900607|08^HEPB-PEDIATRIC/ADOLESCENT^CVX|.5|ML^^ISO+||||||||
MRK12345||MSD^MERCK^MVX|
```

Core Standard: Documents

- Clinical Document Architecture (CDA)
- Philosophy: Capture a moment in time
- Data expressed in XML
- Machine readable *and* human readable
- Complex to properly create and consume
- Used for broader clinical data interoperability in Meaningful Use
- Challenging for EHR vendors to create
- Basis for PH reporting for Cancer and eCR

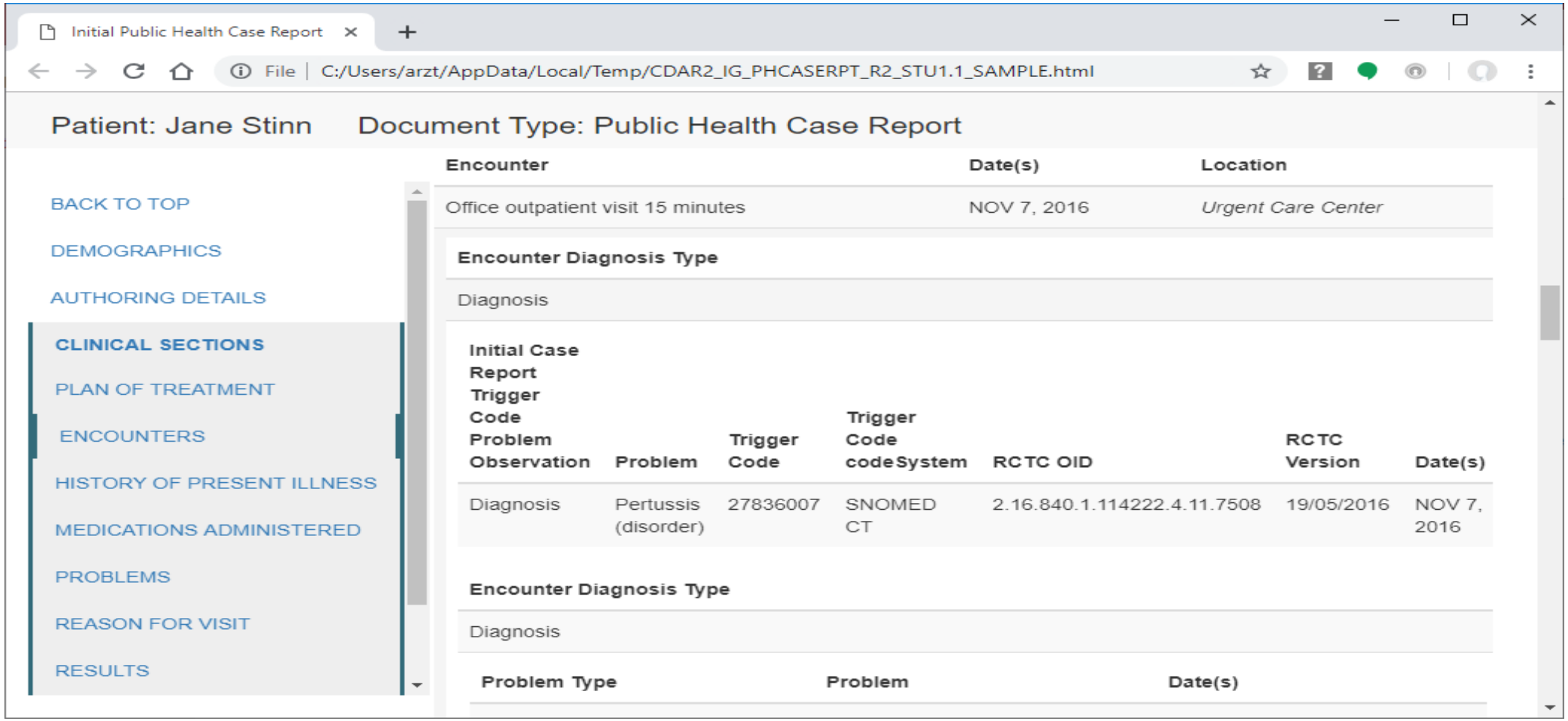
Core Standard: Documents

CDAR2_IG_PHCASERPT_R2_STU1.1_SAMPLE.xml - Notepad

File Edit Format View Help

```
            </organizer>
        </entry>
        <entry typeCode="DRIV">
            <organizer classCode="BATTERY" moodCode="EVN">
                <!-- [C-CDA R1.1] Result Organizer -->
                <templateId root="2.16.840.1.113883.10.20.22.4.1" />
                <!-- [C-CDA R2.1] Result Organizer (V3) -->
                <templateId root="2.16.840.1.113883.10.20.22.4.1" extension="2015-08-01" />
                <id root="a4307cb2-b3b4-4f42-be03-1d9077376f4a" />
                <code code="11585-7" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
                    displayName="Bordetella pertussis Ab [Units/volume] in Serum" />
                <!-- statusCode must be set to completed because the statusCode of the observation is completed -->
                <statusCode code="completed" />
                <effectiveTime>
                    <low value="20161107" />
                    <high value="20161107" />
                </effectiveTime>
                <component>
                    <!-- This observation is a trigger code final result observation -
                         only the code is a trigger code and thus
                         only the code must contain @sdtc:valueSet and @sdtc:valueSetVersion.
                         Final result is indicated by statusCode="final"  -->
                    <observation classCode="OBS" moodCode="EVN">
                        <!-- [C-CDA R1.1] Result Observation -->
                        <templateId root="2.16.840.1.113883.10.20.22.4.2" />
                        <!-- [C-CDA R2.1] Result Observation (V3) -->
                        <templateId root="2.16.840.1.113883.10.20.22.4.2" extension="2015-08-01" />
                        <!-- [eICR R2 STU1.1] Initial Case Report Trigger Code Result Observation -->
                        <templateId root="2.16.840.1.113883.10.20.15.2.3.2" extension="2016-12-01" />
                        <id root="bf9c0a26-4524-4395-b3ce-100450b9c9ad" />
                        <!-- This code is a trigger code from RCTC subset: "Trigger code for laboratory test names"
                             @sdtc:valueSet and @sdtc:valueSetVersion shall be present -->
                        <code code="11585-7" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
                            displayName="Bordetella pertussis Ab [Units/volume] in Serum" sdtc:valueSet="2.16.840.1.114222.4.11.7508"
                            sdtc:valueSetVersion="19/05/2016" />
```

Core Standard: Documents



New Standard: FHIR

- Fast Healthcare Interoperability Resources
- Key concepts:
  - Data “bundled” into Resources
  - Resources can be assembled either into “message-like” or “document-like” packages
  - Uses REST for transport
  - Relies on a set of “services” to pass FHIR resources from one system to another
- Data encoded in XML or JSON formats
- Human readable visualization
- 80/20 Rule, but extensible

New Standard: FHIR Sample

```
<Patient xmlns="http://hl7.org/fhir">
  <id value="glossy"/>
  <meta>
    <lastUpdated value="2014-11-13T11:41:00+11:00"/>
  </meta>
  <text>
    <status value="generated"/>
    <div xmlns="http://www.w3.org/1999/xhtml">
      <p>Henry Levin the 7th</p>
      <p>MRN: 123456. Male, 24-Sept 1932</p>
    </div>
  </text>
  <extension url="http://example.org/StructureDefinition/trials">
    <valueCode value="renal"/>
  </extension>
  <identifier>
    <use value="usual"/>
    <type>
      <coding>
        <system value="http://hl7.org/fhir/v2/0203"/>
        <code value="MR"/>
      </coding>
    </type>
    <system value="http://www.goodhealth.org/identifiers/mrn"/>
    <value value="123456"/>
  </identifier>
  <active value="true"/>
  <name>
    <family value="Levin"/>
    <given value="Henry"/>
    <suffix value="The 7th"/>
  </name>
  <gender value="male"/>
  <birthDate value="1932-09-24"/>
  <careProvider>
    <reference value="Organization/2"/>
    <display value="Good Health Clinic"/>
  </careProvider>
</Patient>
```

Resource Identity & Metadata

Human Readable Summary

Extension with URL to definition

Standard Data:
- MRN
- Name
- Gender
- Birth Date
- Provider

http://hl7.org/implement/standards/fhir/summary.html

New Standard: FHIR Resources

	Individuals	Entities #1	Entities #2	Workflow	Management
Base	• Patient N • Practitioner 3 • PractitionerRole 2 • RelatedPerson 2 • Person 2 • Group 1	• Organization 3 • OrganizationAffiliation 0 • HealthcareService 2 • Endpoint 2 • Location 3	• Substance 2 • BiologicallyDerivedProduct 0 • Device 0 • DeviceMetric 1	• Task 2 • Appointment 3 • AppointmentResponse 3 • Schedule 3 • Slot 3 • VerificationResult 0	• Encounter 2 • EpisodeOfCare 2 • Flag 1 • List 1 • Library 2

	Summary	Diagnostics	Medications	Care Provision	Request & Response
Clinical	• AllergyIntolerance 3 • AdverseEvent 0 • Condition (Problem) 3 • Procedure 3 • FamilyMemberHistory 2 • ClinicalImpression 0 • DetectedIssue 1	• Observation N • Media 1 • DiagnosticReport 3 • Specimen 2 • BodyStructure 1 • ImagingStudy 3 • QuestionnaireResponse 3 • MolecularSequence 1	• MedicationRequest 3 • MedicationAdministration 2 • MedicationDispense 2 • MedicationStatement 3 • Medication 3 • MedicationKnowledge 0 • Immunization 3 • ImmunizationEvaluation 0 • ImmunizationRecommendation 1	• CarePlan 2 • CareTeam 2 • Goal 2 • ServiceRequest 2 • NutritionOrder 2 • VisionPrescription 2 • RiskAssessment 1 • RequestGroup 2	• Communication 2 • CommunicationRequest 2 • DeviceRequest 0 • DeviceUseStatement 0 • GuidanceResponse 2 • SupplyRequest 1 • SupplyDelivery 1

	Support	Billing	Payment	General
Financial	• Coverage 2 • CoverageEligibilityRequest 2 • CoverageEligibilityResponse 2 • EnrollmentRequest 0 • EnrollmentResponse 0	• Claim 2 • ClaimResponse 2 • Invoice 0	• PaymentNotice 2 • PaymentReconciliation 2	• Account 2 • ChargeItem 0 • ChargeItemDefinition 0 • Contract 1 • ExplanationOfBenefit 2 • InsurancePlan 0

http://hl7.org/implement/standards/fhir/resourcelist.html

New Standard: FHIR Operations

Base Operations (All resource types)
Validate a resource
Access a list of profiles, tags, and security labels
Add profiles, tags, and security labels to a resource
Delete profiles, tags, and security labels for a resource
Convert from one form to another
Execute a graphql statement
Return a graph of resources
Operations Defined by Resource Types
Apply
Data Requirements
Fetch a subset of the CapabilityStatement resource
Test if a server implements a client's required operations
Test if a server implements a client's required operations
Discover what versions a server supports
Apply
Submit a Claim resource for adjudication
Concept Look Up & Decomposition
Code System based Validation
Subsumption Testing
Finding codes based on supplied properties
Generate a Document
Concept Translation
Closure Table Maintenance
Submit an EligibilityRequest resource for assessment

Fetch Encounter Record
Fetch a group of Patient Records
Data Requirements
Find a functional list
Evaluate Measure
Data Requirements
Submit Data
Collect Data
Care Gaps
Fetch Product Record
Process Message
Fetch Preferred it
Observation Statistics
Last N Observations Query
Find patient matches using MPI based logic
Fetch Patient Record
Apply
Data Requirements
Build Questionnaire
Generate Snapshot
Model Instance Transformation
Value Set Expansion
Value Set based Validation

http://hl7.org/implement/standards/fhir/operationslist.html

Two other aspects...

SMART

- Method to embed FHIR app within an EHR (or other system)
- Defines a set of “profiles”
- Open standards
- Open source tools
- “Sandbox” for experimentation
- App “gallery”
- CDS Hooks extension

https://smarthealthit.org/

Argonaut

- Closed “Implementation community”
- Origins in JASON TF Report (2014)
- Develop set of FHIR IGs
  - Data Query
  - Provider Directory
  - Scheduling
  - CDS Hooks
  - Questionnaire
  - Clinical Notes

http://argonautwiki.hl7.org

Summary of Areas of PH Interest in FR

- **FHIR API**
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  - Only apply to specific API-focused certification criteria (select a patient, respond to requests for patient data)
  - FHIR v4 API selected (not widely deployed currently)
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ONC FR and FHIR: Public Health Impact

- Public health reporting transactions do not appear to be directly impacted.
- Most public health transactions are “push” transactions and the focus here seems to be on query/response.
- As FHIR becomes more pervasive in the clinical community, some public health registry activities (*e.g.,* IIS query/response) may come under pressure to support FHIR.
- Electronic case reporting (eCR) standards development *is* currently pursuing a parallel set of activities for the eICR using both C-CDA as well as FHIR (though no immediate FHIR implementation planned).
- New eCR Now project uses a “backend SMART App” based on FHIR query
- It seems appropriate that this rule requires FHIR R4 which is the first normative release.
- Note that ONC is requesting an exemption from The National Technology Transfer and Advancement Act (NTTAA) requirements.

FHIR Recommendations: Public Health

- Start learning!
  - Read up on FHIR
  - Participate in HL7 PH WG as it turns to FHIR
  - Attend HL7 events (WGM, Connect-a-thon, “FHIR Days”)
- Look for potential applications in your agency
  - Especially ones with EHR data access like IIS query, clinical decision support
  - Focus nationally is on query/response but FHIR *can* also be used for “push” transactions
- Consider funding implication of using this newer technology

TEFCA

TEFCA 2.0: Basic Facts

- Trusted Exchange Framework and Common Agreement
- Released April 17, 2019 as second draft
- Initial version in January 2018 (see blog)
- Required by Congress in 21st Century Cures Act
- Three main objectives:
  - Provide a single “on-ramp” to nationwide connectivity
  - Enable EHI to securely follow the patient when and where it is needed
  - Support nationwide scalability
- Three parts
  - **Trusted Exchange Framework** (TEF)
  - **Minimum Required Terms & Conditions** (MRTC)
  - **QHIN Technical Framework** (QTF)

Trusted Exchange Framework (TEF)

- Six core principles
  1. **Standardization** - Adhere to industry and federally recognized standards, policies, best practices, and procedures.
  2. **Transparency**: Conduct all exchange and operations openly and transparently.
  3. **Cooperation and Non-Discrimination**: Collaborate with stakeholders across the continuum of care to exchange EHI, even when a stakeholder may be a business competitor.
  4. **Privacy, Security, and Patient Safety**: Exchange EHI securely and in a manner that promotes patient safety, ensures data integrity, and adheres to privacy policies.
  5. **Access**: Ensure that individuals and their authorized caregivers have seamless access to their EHI.
  6. **Population Level Data**: Exchange multiple records for a cohort of individuals at one time in accordance with applicable law to enable identification and trending of data to lower the cost of care and improve the health of the population.

Minimum Required Terms & Conditions (MRTC)

- Covers all actors in trusted exchange (Qualified Health Information Networks (QHINs), participants connected to QHINs, or members and individual users connected directly to QHINs or to participants)
- Defines relevant terms
- Describes a proposed process for designating QHINs including a new designation of “provisional QHINs”
- Defines the “rules of the road” for applicable transactions, including
  - Basic operations
  - Data quality
  - Transparency
  - Cooperation and non-discrimination
  - Privacy, security and patient safety
  - Minimum obligations for participants and members

QHIN Technical Framework (QTF)

- Describes *how* trusted exchange might be implemented
- Includes some sample scenarios, or use cases
- Includes specified and alternate standards (when available)
- Proposes a set of functions and the technology to support exchange, including
  - Digital certificate policy
  - Encrypted transmission
  - User authentication and authorization
  - Query
  - Message delivery
  - Record location
  - Directory services
  - Privacy preferences
  - Auditing
  - Error handling
- Thirteen requests for comment (RFC) on specific aspects of the technology and standards

How Will This All Work?

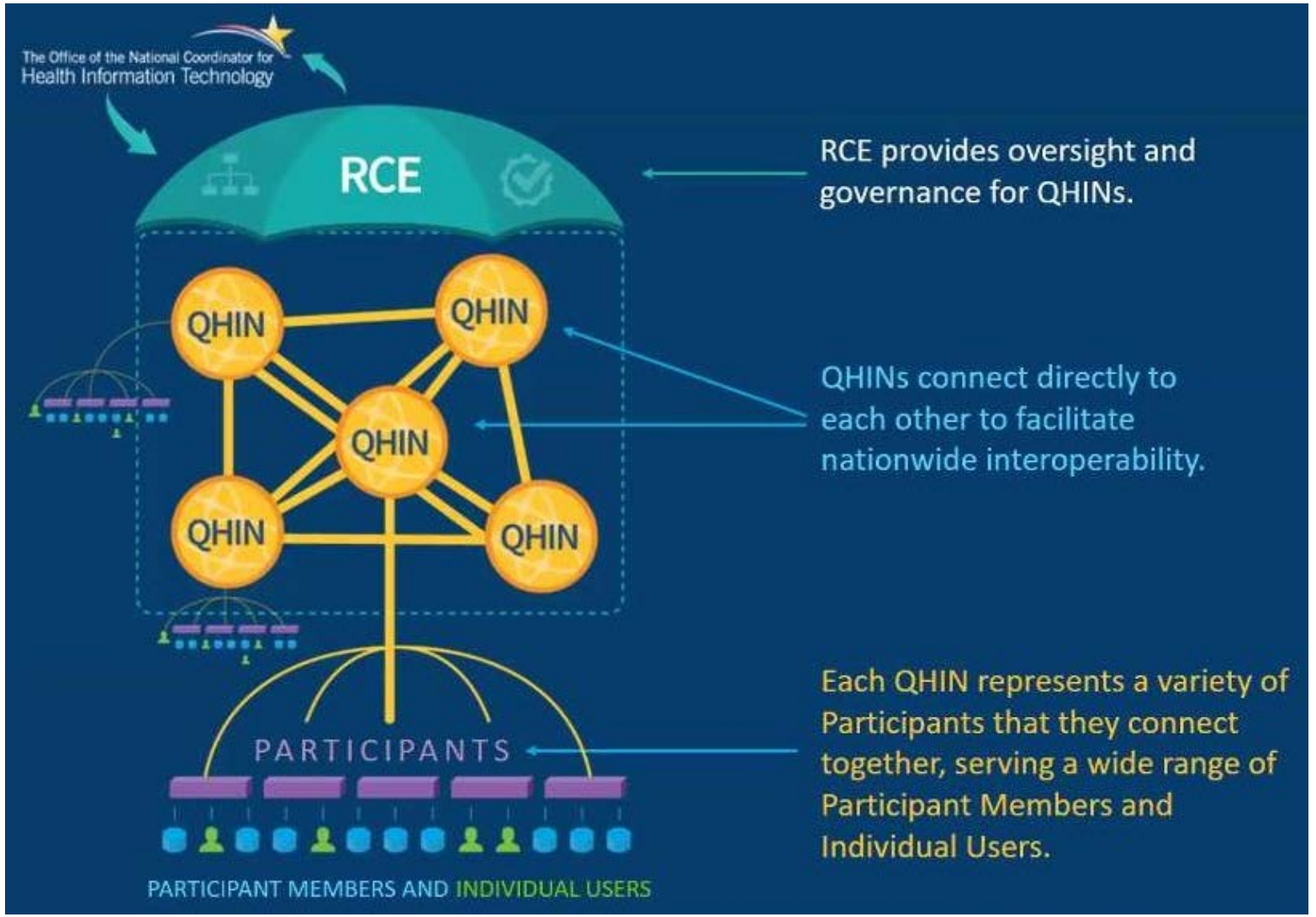


Diagram c/o ONC

Major Changes from Version 1

- Narrowing of the exchange “purposes” covered by TEFCA to align better with HIPAA
  - Less ambitious agenda for initial implementation
- Removal of population-level data exchange
- Addition of a message delivery (or “push”)
- Removal of the technical standards from within the TEF itself into a separate QTF
- Broadening of the definition of a QHIN
- Change in the timelines associated with implementation
  - Placing much of the decision-making for the implementation timeline in the hands of the Recognized Coordinating Entity (RCE)
- Some slight changes to rules around QHINs and charging fees
  - Removal of explicit language stating that QHINs cannot charge to respond to queries for public health

Public Health Observations

- Public health continues to play a conspicuous role
- Explicit presence in the list of stakeholders
- Inclusion in the exchange purposes
- Recognition of the role of existing state and local consent laws as they affect information exchange
- Document and supporting material is well written
- Separation of the technical framework from the TEF into the QTF is also a big improvement
- General rubric of how the Common Agreement will work – it's essential hub and spoke design – is cleanly laid out and relatively straightforward

“Push” Transaction

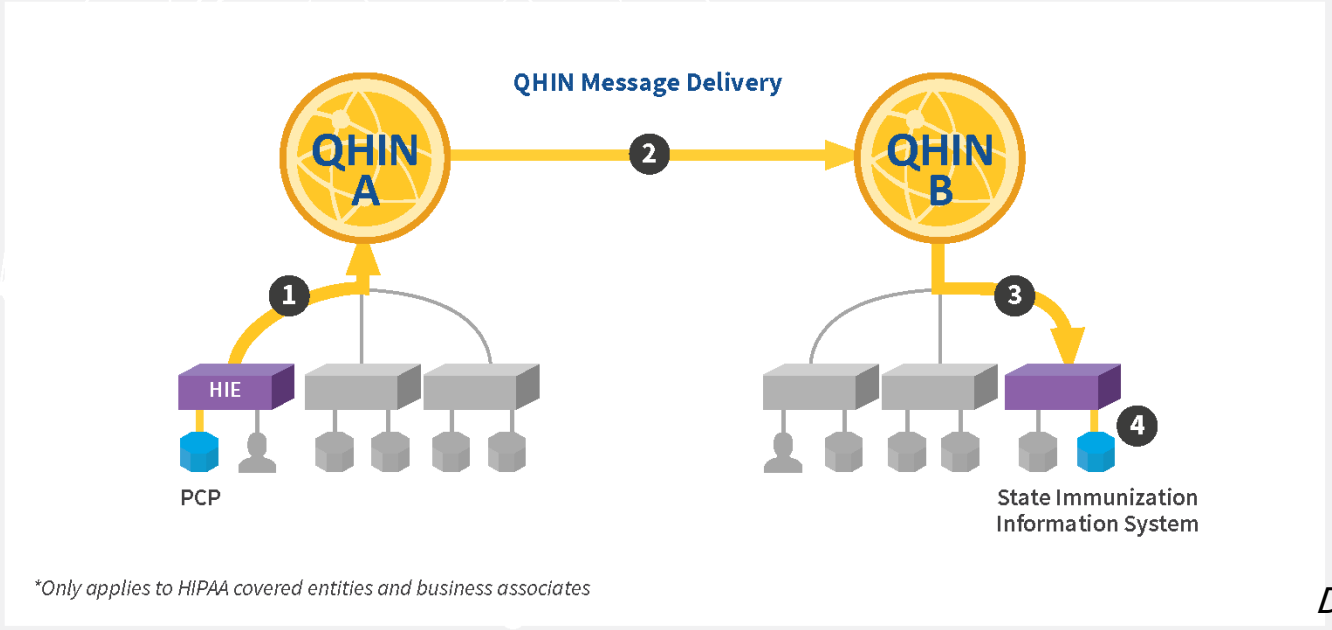
What can the Common Agreement be used for?

The Office of the National Coordinator for Health Information Technology

Exchange Purpose Example

PUBLIC HEALTH*

1. Primary Care Provider (PCP) (Participant Member) provides an immunization to a patient and sends immunization record to QHIN A for Public Health
2. QHIN A initiates QHIN Message Delivery to send the immunization record to the appropriate QHIN B
3. QHIN B sends immunization record to the appropriate Participant
4. Participant delivers immunization record to the appropriate State Immunization Information System (Participant Member)



*Only applies to HIPAA covered entities and business associates

Diagram c/o ONC

PREVIOUS 29 NEXT

More Recent Developments

- Sequoia Project chosen as the RCE

Common Agreement

- Completed ONC-RCE contract language review sessions
- Completed MRTC policy topic research
- Drafted and reviewed ARTCs with ONC
- Launched Common Agreement Work Group (CAWG)
- Assembled initial working draft of Common Agreement for CAWG review

Stakeholder Engagement

- Launched stakeholder engagement in November '19
- Facilitated more than two dozen stakeholder meetings
- Started monthly informational calls in April, with strong stakeholder interaction
- Building understanding and value proposition for TEFCA
- Planning for next phase

QHIN Technical Framework (QTF)

- Facilitated public input to inform the QTF
- Defined scope (document-based queries and message delivery, with FHIR v4 as road map)
- Submitted Draft QTF v2 and reviewed with ONC
- Submitted revised Draft QTF v2 to ONC on 6/5/20
- ONC review under way

Content c/o The Sequoia Project

TEFCA Value Proposition

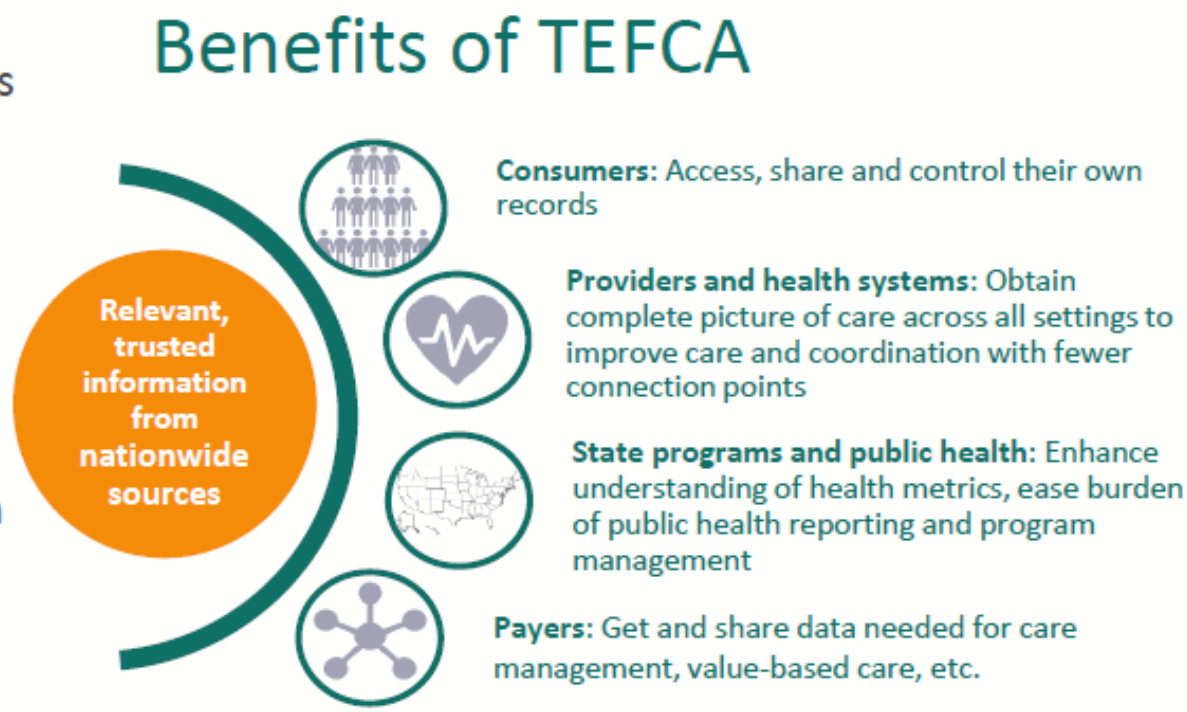
Overall value proposition

- Benefits of nationwide scale
- Benefits of single on-ramp
- Benefits of standardized approaches to trust frameworks and technical standards

Implications unique to stakeholder groups

- Health information networks
- Providers
- Local government and public health
- Consumers
- Payers
- State government

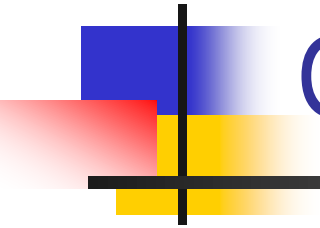
Build from stakeholder views



Content c/o The Sequoia Project

Issue to be Addressed

- Initial implementation in QTF based on IHE standards
- Nominal recognition of HL7 FHIR as alternative
- Even if public health not required to use IHE intermediation by QHINs would "complicate" most current transactions
  - Note: National implementation of electronic case reporting (eCR) *does* support IHE XDR
- EHI not clearly defined
- Proposes to extend HIPAA privacy and security regulations to *all* TEFCA participants. Even public health?
- Issue of patient matching across the healthcare ecosystem continues to be a serious obstacle
- "Meaningful choice" is all or nothing – will consumer choice not to participate mean public health reporting be the "baby thrown out with the bath water"?



CDC MedMorph

Making EHR Data More Available for Research and Public Health

- Problem Statement
  - Public health professionals and patient-centered outcomes researchers need better ways to access data from different electronic health record (EHR) systems without posing an additional burden on health care providers
  - Interoperability challenges preclude a consistent and reliable standard method of fulfilling this need, and data exchange from clinical to research and public health settings often remains a labor-intensive, manual process
- Goal
  - Develop a standards-based reference architecture to achieve clinical data exchange between EHR systems and public health and research systems for multiple conditions and uses

Content c/o CDC MedMorph Project

Making **E**HR **D**ata **Mo**re **A**vailable for **R**esearch and **P**ublic **H**ealth

- Guiding Principles
  - Harmonize with national health IT policies
  - Align with data content standards (*i.e.,* CCDS, U.S. Core Data for Interoperability [USCDI])
  - Align with interoperability standards (*e.g.,* FHIR, API)
  - Build on a policy and data authorities' architecture
  - Reuse instead of *de novo* development, wherever possible
  - Build data capacity in public health and research
  - Work towards a flexible solution and "as needed" workflows

Content c/o CDC MedMorph Project

Making EHR Data More Available for Research and Public Health

- Approach
  - Project team under contract
  - Technical Expert Panel (TEP) to inform and guide the interoperable solution and technological approach (meets monthly)
  - Working groups that meet as often as weekly
  - Develop 3 diverse use cases (hepatitis C virus [HCV], cancer, healthcare surveys)
  - Design a reference architecture to facilitate data exchange
  - Identify, develop, and ballot standards in HL7
  - Develop reference implementation to pilot and test approach

Content c/o CDC MedMorph Project

MedMorph Abstract Model

Provider

EHR (FHIR Enabled)

Metadata Repository

Research Organization

Labs

PHA

Backend Service App

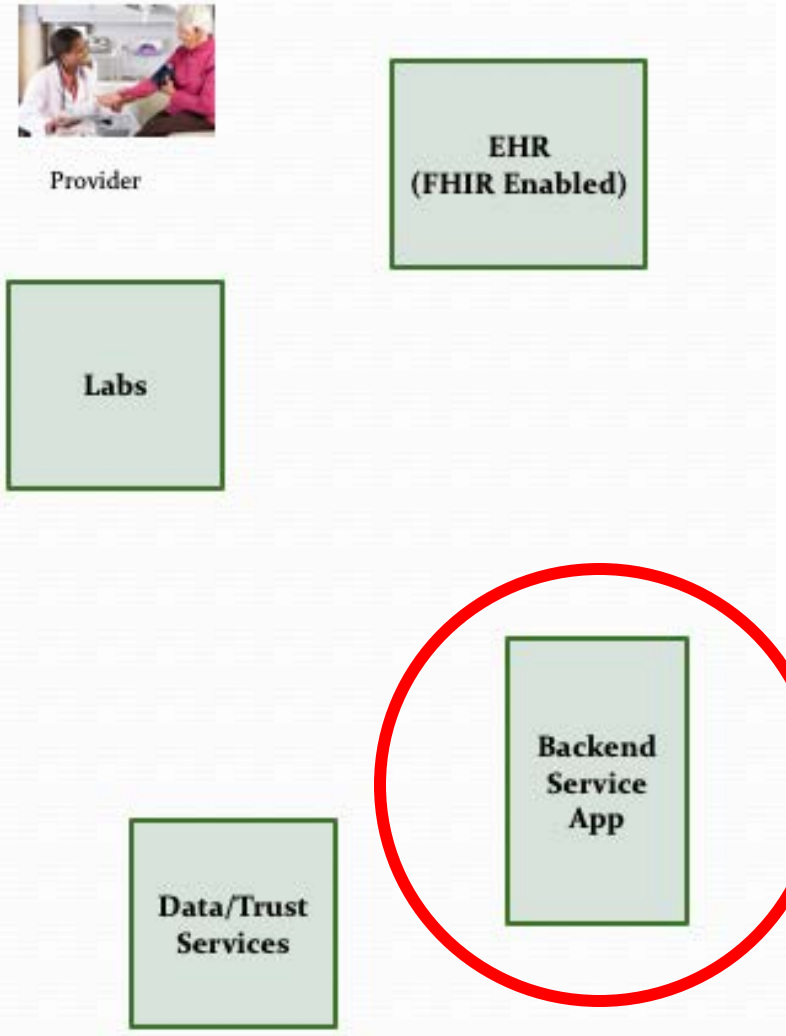
Trusted Third Party

Data Repository

Data/Trust Services

Content c/o CDC MedMorph Project

MedMorph Abstract Model



Resides within the clinical care setting and performs the reporting functions to public health and/or research registries. Uses the information supplied by the metadata repository to determine when reporting needs to be done, what data needs to be reported, how the data needs to be reported and to whom the data should be reported. Does not require user intervention to perform reporting. EHR enables the Backend Service App to use the EHR's FHIR APIs to access data. Healthcare organization is the one who is responsible for implementing the Backend Service App within the organization.

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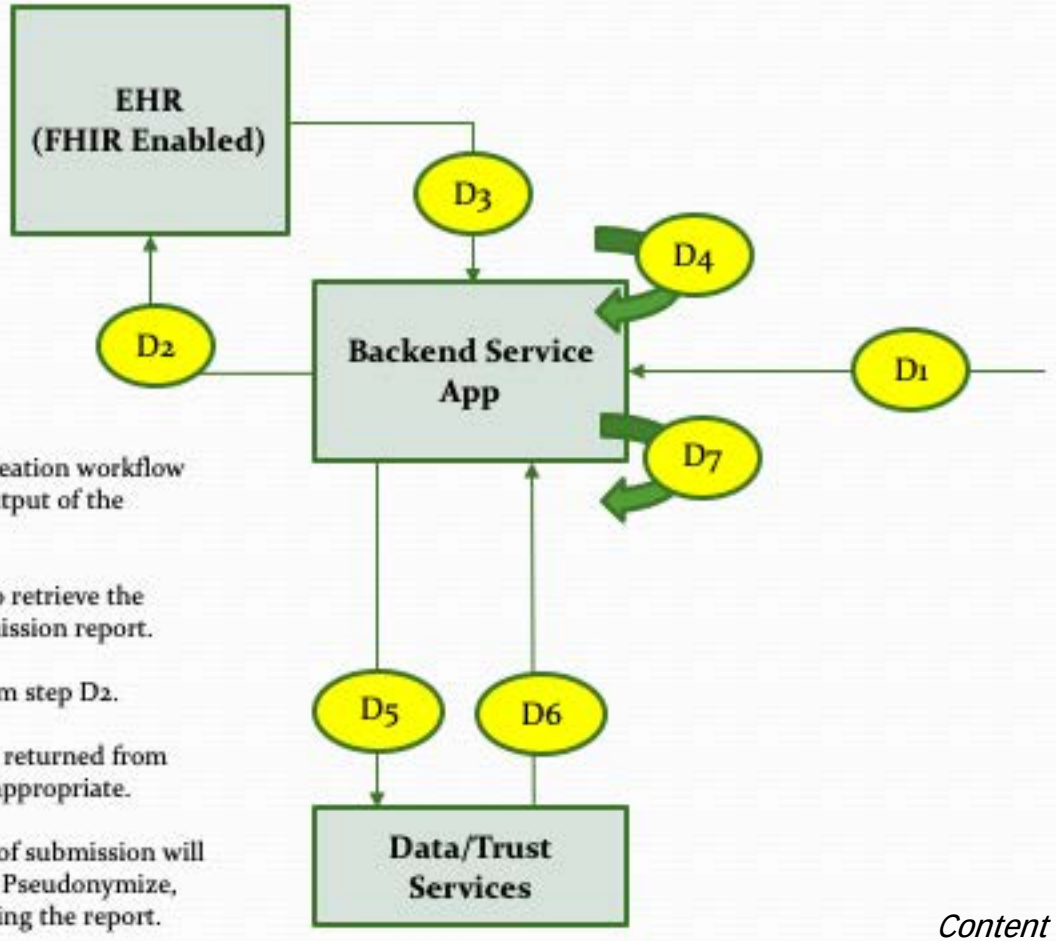
Data Collection/Submission Workflow

Activities that collect the necessary data from the EHR and create the reports for submission to PHA and/or Research Organizations



Description of Interaction Steps:

D1. The data collection and submission report creation workflow is triggered for a specific patient based on the output of the Notification workflow.

D2. The Backend Service App queries the EHR to retrieve the necessary data for the patient to create the submission report.

D3. The EHR returns the data for the queries from step D2.

D4: The Backend Service App processes the data returned from the EHR, applying necessary filters and logic as appropriate.

D5. The Backend Service App based on the type of submission will invoke the Data/Trust Services to De-identify or Pseudonymize, or Anonymize the collected data. Before generating the report.

D6. The Data/Trust Services return after De-identifying or Pseudonymizing or Anonymizing the data based on the request in Step D5.

D7. The Backend Service App creates the Submission report from the data collected for submission.

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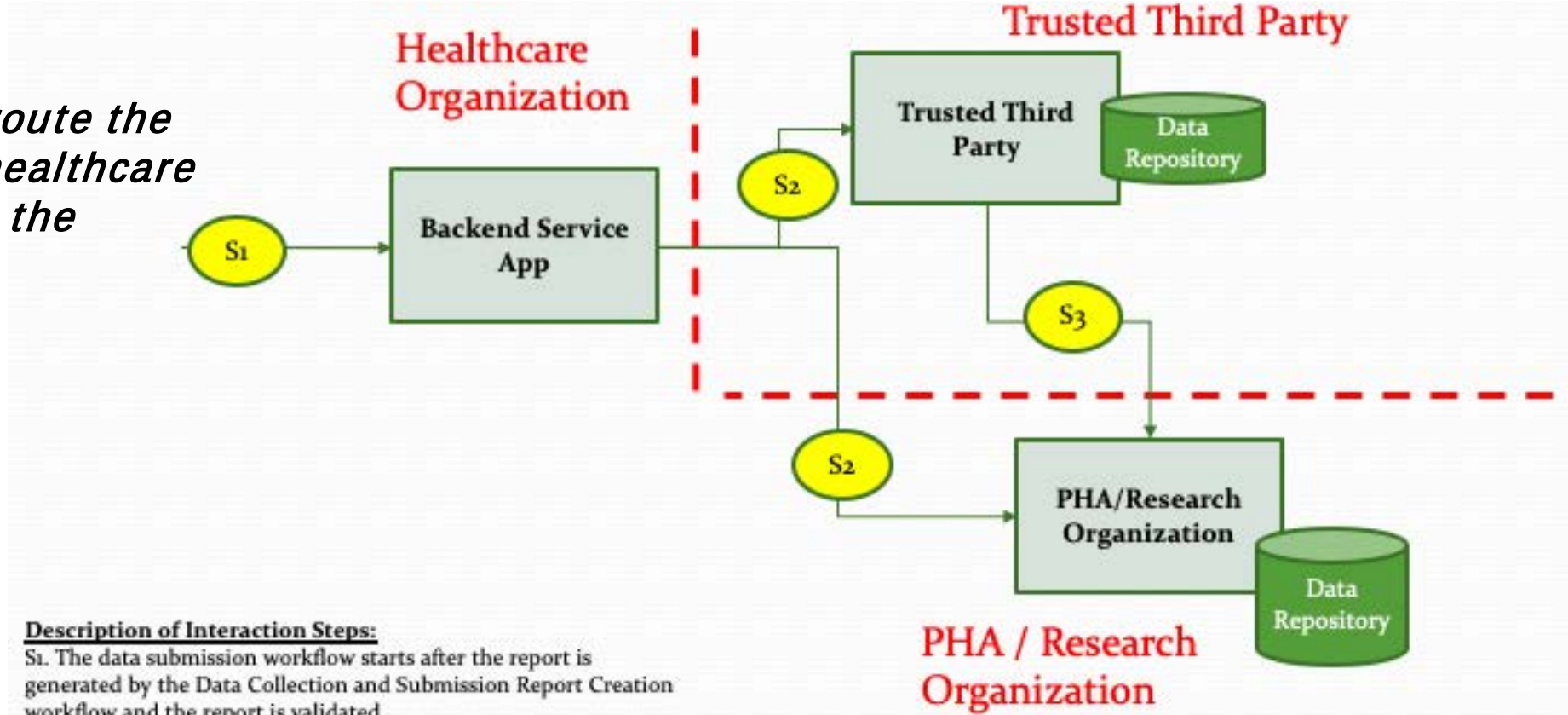
Data Submission Workflow

Activities that route the data from the healthcare organization to the PHA/Research Organization



Description of Interaction Steps:

S1. The data submission workflow starts after the report is generated by the Data Collection and Submission Report Creation workflow and the report is validated.

S2. The Backend Service App uses the FHIR APIs to submit the report to the Trusted Third Party or to the PHA/Research Organization directly based on authorities and policies.

S3. The Trusted Third Party forwards the data to the PHA/Research Organization based on authorities and policies.

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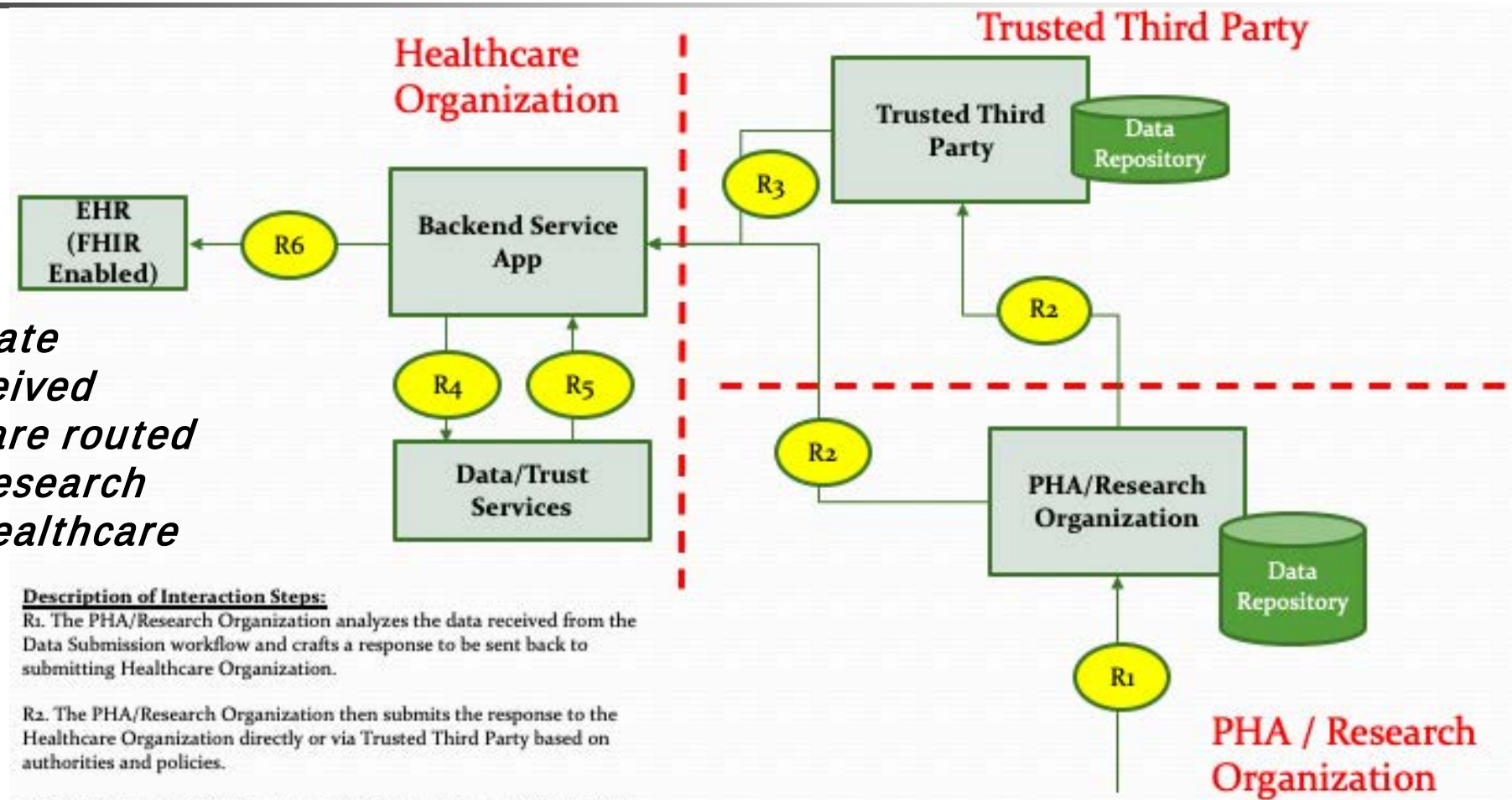
Receiving Response/Acknowledgement

Activities that create responses for received submissions and are routed back from PHA/Research Organization to healthcare



Description of Interaction Steps:

R1. The PHA/Research Organization analyzes the data received from the Data Submission workflow and crafts a response to be sent back to submitting Healthcare Organization.

R2. The PHA/Research Organization then submits the response to the Healthcare Organization directly or via Trusted Third Party based on authorities and policies.

R3. The Trusted Third Party routes the response back received from the PHA/Research Organization to the Healthcare Organization.

R4, R5. The Backend Service App receives the Response and re-identifies the data as needed.

R6. The Backend Service App forwards the response back to the EHR.

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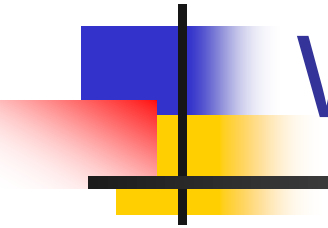

Wrap-up

Final Observations

- Action has shifted to EHR-public health boundary
- Technology seems to be shifting to FHIR
- Public health has a large installed base of interfaces based on earlier technologies
- Public health continues to have challenges organizing itself and maintaining a seat at the table
- COVID-19 response has been a good opportunity to exercise some of these new approaches

Resources

- ONC Final Rule
  - https://www.healthit.gov/curesrule/
- FHIR
  - https://corepointhealth.com/wp-content/uploads/hl7-fhir-primer.pdf
  - http://hl7.org/fhir/
  - https://www.fhir.org/
- TEFCA
  - https://www.healthit.gov/topic/interoperability/trusted-exchange-framework-and-common-agreement
  - https://rce.sequoiaproject.org/
- Blogs
  - https://www.hln.com/onc-releases-new-nprm-on-interoperability-how-might-it-affect-public-health/
  - https://www.hln.com/onc-gets-it-mostly-right-with-tefca-2-0/

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