



**HL7 Informative Document:**  
**Use of FHIR Query & Response Paradigm for**  
**Public Health Data Exchange,**  
**Edition 1- US Realm**

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**HL7 Informative Ballot**

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SNOMED CT®	SNOMED CT® International; <a href="http://www.snomed.org/snomed-ct/get-snomed-ct">http://www.snomed.org/snomed-ct/get-snomed-ct</a> or <a href="mailto:info@ihtsdo.org">info@ihtsdo.org</a>
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International Classification of Diseases (ICD) codes	World Health Organization (WHO)
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# Helios Public Health FHIR Query & Response Informative Guidance

## Introduction

The [HL7 Helios FHIR Accelerator for Public Health](#) is looking to see how public health can leverage existing FHIR API functionality that EHRs and other health IT systems provide to support public health program use cases. Helios has been working with implementers to test and pilot the use of FHIR APIs to access patient data that was previously unavailable without more manual processes that include EHR abstraction, faxing, and phone calls.

## What is the purpose of this document?

The purpose of this document is not to describe the HL7 FHIR RESTful API but rather to describe the application of this approach to public health data sharing use cases. This approach seeks to leverage existing FHIR API support to enhance public health access to the data necessary to perform critical functions such as case investigation and the provision of services and support to impacted individuals by allowing public health programs to proactively access authorized data held by healthcare providers and other data sources. By implementing this strategy, authorized public health users can efficiently retrieve data through the use of a standardized and reusable approach and allows data sources such as healthcare providers to minimize the amount of time and effort expended on responding to data requests using manual and bespoke approaches. This approach also supports the concept of “minimum necessary data” by allowing public health to implement granular requests for only the data necessary to carry out authorized public health activities. Readers are recommended to review the base HL7 FHIR RESTful API documentation for a thorough description of FHIR as a RESTful specification.

## Roles

Several major partner roles are anticipated to be involved in the development and implementation of FHIR-based RESTful queries to exchange data for public health use cases. In later sections of this document, there is a discussion about specific expectations and activities required of each of these roles during the development and implementation process. The major roles are:

- Public health program (e.g. state, tribal, local, territorial agency)
- Data source organization (e.g. clinical healthcare organization)

- FHIR Client HIT vendor (e.g. the system requesting data)
- FHIR Server HIT vendor (e.g. the system responding to requests for data)
- Qualified Health Information Network (QHIN), Health Information Network (HIN), Health Information Exchange (HIE)

Note that both the FHIR Client and FHIR Server functionality may be directly integrated into the primary systems utilized by the public health program and data source organization or they may be less integrated (e.g., a stand-alone application, a replica data source, a FHIR facade). The technical implementation of these functionalities is independent of most of the considerations described in this document.

For different public health use cases, different types of organizations might be considered data source organizations. These include:

- Healthcare providers (e.g., hospitals and clinics)
- Payers
- Other public health programs
  - Within the jurisdiction
  - Within other jurisdictions such as a neighboring state, tribal, local or territorial agency
- Community-based organizations
- Others as determined by the public health program sharing the data
- A Health Information Network/Health Information Exchange (HIN/HIE)

## What are the benefits for FHIR Query in Public Health?

FHIR query-based data exchange presents a transformative opportunity for public health agencies to streamline access to critical health information while reducing the inefficiencies associated with manual data retrieval. Traditionally, obtaining patient data for case investigations, treatment verification, and surveillance required time-consuming processes such as EHR abstraction, faxing, and phone calls. The implementation of standardized FHIR queries enables automated, real-time access to essential health data directly from EHR systems and other health IT sources.

By leveraging existing FHIR API capabilities, public health programs can:

- **Enhance Efficiency:** Reduce administrative burden for healthcare providers by replacing manual data requests with automated queries.
- **Improve Timeliness:** Expedite case investigation and public health response by retrieving authorized data in near real-time.
- **Ensure Accuracy & Completeness:** Minimize data entry errors and missing information through structured, standardized queries.
- **Support Minimum Necessary Data Principles:** Facilitate granular and targeted data retrieval, ensuring only relevant and authorized information is accessed.

- **Strengthen Public Health Outcomes:** Improve disease surveillance, follow-up care, and outbreak response through seamless, timely data access.

With the growing emphasis on health data interoperability and regulatory support for standardized exchange mechanisms, FHIR-based querying is poised to become a cornerstone of efficient and scalable public health data access. Investing in this approach fosters collaboration across healthcare entities, optimizes resource allocation, and ultimately enhances the ability of public health agencies to safeguard community health.

## Query & Response Use Cases

List of Use cases with hyperlinks to Appendix A for a description of the use case.

[Supplemental Demographics](#)

[Newborn Screening \(EHDI & CCHD\) Use Case](#)

[Sexually Transmitted Infections \(STI\)](#)

[Latent Tuberculosis Infection \(LTBI\)](#)

[Measles Case Investigation](#)

[Respiratory Virus Hospitalization Surveillance Network \(RESP-NET\)](#)

## Policy Consideration

### Legally Appropriate Access

TEFCA encourages, but does not require, providers to respond to queries. A given healthcare provider needs information about the requestor to help them understand what should be considered to help them determine whether to respond to a public health query. Providers in some jurisdictions may have legal obligations **to respond** to some public health authorities and legal obligations **not to respond** to other public health authorities. Existing regulations, workflows, and data sharing agreements should inform which provider organizations a public health authority attempts to query for data.

Generally, FHIR can facilitate both “business-to-business” trust (between a provider organization and a PHA) and access for individual users (using SMART on FHIR). When authorizing a FHIR client, provider organizations implement these policies by choosing the conditions under which a request will be approved. For example, a provider may choose to always respond to requests from organizations within their state, and choose not to respond to requests from organizations outside their state.

## Authority to Query

Certain jurisdictions interpret governing statutes as prohibiting case investigation queries, which could create significant challenges for healthcare organizations. This interpretation hinders efforts to conduct case investigations within systems, ultimately failing to reduce the need for manual case follow-up processes performed by jurisdictions today.

Other jurisdictions have established co-operative Data Use Agreements to support public health initiatives within states [Washington's Common Agreement for OHP HIE](#) , [Maryland with CRISP](#), and across state lines [New York tri-state DUA](#), including outbreak response, cancer cases (N-IDEAS), and immunization data policy for [IZ Gateway](#). These policies enable data sharing today, and can inform new agreements under TEFCA.

## Relationship to TEFCA

Guidance on how TEFCA can be used to facilitate queries and the relationship to the TEFCA Exchange Purposes outlined in the [Public Health standard operating procedure \(SOP\)](#) may be helpful to implementers.

The Trusted Exchange Framework provides the infrastructure for patient discovery, FHIR Push, and FHIR Query capabilities. It encourages responding nodes to return, at a minimum, the USCDI v1 data classes and data elements that are maintained and requested by the Initiating Node, in accordance with Applicable Law.

The Common Agreement authorizes six (6) types of Exchange Purposes (XPs), of which Public Health is one. This permits entities that participate in TEFCA to appropriately share and request information to and from PHAs through a secure exchange network. Due to the complexities and variations in laws concerning exchange for public health purposes, the Common Agreement states that PHAs are not required to respond to any Queries from requesters, although they are encouraged to do so as appropriate under Applicable Law.<sup>1</sup>

## Data Governance

Data governance for public health FHIR Query and Response is essential to ensure responsible management, access, and exchange of protected health information. It establishes clear policies and procedures for data quality, security, privacy, and interoperability across participating entities. In the context of FHIR-based public health reporting, data governance helps define who can query or respond to requests for clinical data, under what conditions, and how data is standardized and validated. A common component of this governance is the use of Data Use Agreements (DUAs) or Participation Agreements (such as [New York's SCPA](#)), which outline the specific terms

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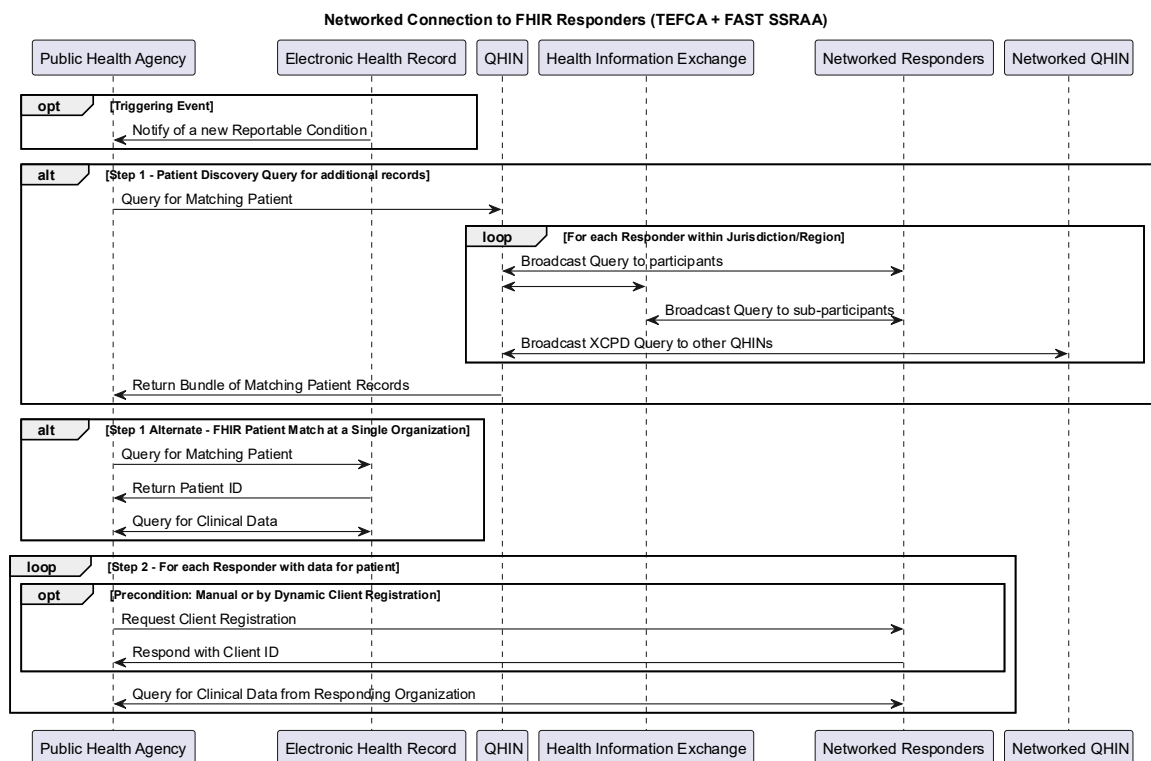
<sup>1</sup> <https://rce.sequoiaproject.org/wp-content/uploads/2024/08/XP-Implementation-SOP-Public-Health-PH.pdf>

under which data may be shared between providers and Public Health Agencies, including permitted uses and security protocols. These agreements help ensure compliance with regulations such as HIPAA, clarify roles and responsibilities among partners, and promote trust by safeguarding patient privacy while enabling accurate, timely, and actionable data sharing to improve public health surveillance and response efforts.

## Technical Concepts and Operational Expectations

### FHIR Query Basics

A public health use case FHIR query is a two-step process. As in most TEFCA Implementation Guides, the first step involves identifying which responders on the network hold data about your patient. Alternatively, if you already know which organization holds the data of interest, a targeted FHIR Query can be used to obtain the patient's FHIR ID.



## Step 1 (TEFCA Flow): Patient Discovery Query via QHIN

As part of a case investigation use case, a public health investigator uses demographic information from an initial Electronic Case Report (eICR), Electronic Lab Report (ELR), or other notification system to compose a Patient Discovery Query. Submitting this Query to the QHIN triggers an ITI-55 Cross Community Patient Discovery Request. Some QHINs support alternative patient search methods, offering Record Locator Services, Master Patient Indexes, or other mechanisms to support patient discovery.

The response to this query includes both the patient identifiers and the Home Community IDs (HCIDs) of the organizations who were able to match the provided demographics. The QHIN's role is to facilitate connectivity to the FHIR endpoints registered for those HCIDs.

## Step 1 (Alternate Flow): FHIR Patient Match at a Single Organization

As part of a case investigation use case, a public health investigator locates an individual in a provider's EHR using the [Patient search, \\$match, or \\$IDI-match operation](#). The investigator submits a FHIR search for the patient in the EHR using parameters such as the individual's name, date of birth, and at least one other data element (e.g. phone, street address, email, medical record number, master patient identifier, etc.). Success criteria for the FHIR search is the return of a single high-confidence patient match containing the Patient resource, which provides additional demographic and contact information.

## Step 2: FHIR Query for Supplemental information on a Patient

The public health investigator prepares and submits one or more FHIR queries to the provider EHR using the FHIR patient identifier retrieved in step 1 above. These queries should be designed to retrieve [minimum necessary data](#) for a given use case. As an example, queries related to Influenza-like Illness should not request lab results related to STI investigations. Distinct query templates can help case investigators ensure that they receive relevant and useful information in the FHIR response.

FHIR searches can be refined using parameters to narrow results, such as searching for Observations with specific LOINC codes, or Conditions with particular clinical status values. Multiple parameters can be combined using AND logic, and modifiers can be applied to parameters for more precise matching. For public health use cases, well-constructed searches are essential to ensure only the minimum necessary data is retrieved while still capturing all relevant clinical information.

At its core, FHIR offers two primary ways to retrieve resources:

- Read operations



- A read operation retrieves a specific resource by its unique identifier (e.g., retrieving a specific Patient resource when you already know its patient FHIR ID).
- Search operations
  - A search operation allows you to find resources that match specific criteria (e.g., finding all encounters within a specific date range, or all lab results for a given LOINC code). Search operations are particularly valuable in public health scenarios where you are searching for specific data within a patient's chart.

The [RESTful nature of FHIR](#) means that each interaction is stateless and complete, with resources being accessed through predictable URL patterns. This facilitates integration across different systems and networks, making it particularly suitable for public health agencies needing to query multiple clinical data sources.

## Data Payloads

A critical element of implementing FHIR-based query & response functionality is the mapping of data elements required or desired for a particular use case to FHIR resources. While many data elements will be easily mappable, others, particularly those related to more complex data models or those that are unique to a given use case or program, may be more difficult.

Public health staff are recommended to start by gathering the functional data element requirements of the end users as a first step. These requirements can then be compared to existing workflows at submitter sites, to understand what data is collected and how, and then mapped to FHIR resources.

Further, it is critical to be aware that not all FHIR resources or data elements are supported by all HIT products (e.g. EHRs) and that individual variation in the implementation of an HIT product (e.g. a particular healthcare organization's EHR) will impact what data is exposed by FHIR APIs to be searched for and retrieved. In other words, not all data elements relevant to a given use case may be available via FHIR RESTful API.

Given the broad support of USCDI data elements across the healthcare space and the related representation of these data elements as profiles in the US Core FHIR Implementation Guide, public health programs are encouraged to begin implementation projects by focusing on data elements contained within USCDI before attempting to implement a comprehensive FHIR-based strategy. Implementers should also note USCDI+ data sets and the US Public Health Profiles Library (USPHL) as resources to use, but be aware that support for these is less widespread than that for USCDI and US Core. We also believe that public health will have greater success in expanding the existing suite of widely supported data elements by working collectively with federal authorities and public health associations (e.g., CSTE, ASTHO, NACCHO) to develop

standardized data element definitions than by individually making requests of HIT vendors.

## Exchange Patterns

Whereas previous interoperability standards such as HL7 v2 and CDA provided public health with the ability to receive data “pushed” by data submitters, FHIR offers exchange patterns beyond the typical messaging or document paradigm. RESTful API queries are just one example of this. While the query & response exchange pattern is a powerful tool for public health to replace existing inefficient and manual data collecting workflows it is not the only option. Public Health Agencies may also work with intermediaries such as state or regional HIEs to aggregate data to support population health and similar longitudinal use cases that exceed the scope of single patient investigations.

Query & response is the most powerful exchange pattern for satisfying the data needs of Case Investigations by Public Health, where the subject of interest is known (through an initial case report, electronic lab reporting, or other notification method), and data is held by exchange partners. This pattern complements other capabilities supported by FHIR and in some cases named in regulation. Public health agencies consider the following when implementing new FHIR capabilities:

- Local and federal priorities for data interoperability
  - At the local level, public health agencies seek to reduce administrative burden and decrease response times for case investigations
  - Federally, the [ASTP HTI-2 Final Rule](#) establishes TEFCA as the framework for future data exchange. TEFCA uses XCPD to find patients, and uses FHIR queries to retrieve patient data.
- Activity in other healthcare related spaces including data access for providers, payor and individuals
  - The broad adoption of TEFCA for Treatment and Payment purposes lay the groundwork for FHIR to be used for additional exchange purposes. As PHAs adopt TEFCA for data retrieval, they should also keep in mind *response* use cases, where the data they hold should be made available
    - The Individual Access Use Case grants patients the right to retrieve their own data from the TEFCA network. Some states like Washington, are currently in the process of adopting direct access ([WA DOH FHIR Roadmap](#)).
    - As State PHAs adopt FHIR, they can choose to enable the exchange of data with other State’s PHAs. This is useful when investigating outbreaks, consolidating data for patients who move across state lines, and for jurisdictions that experience fluctuating or traveling populations.

- Some states mandate reporting to State Public Health Authorities, who then delegate investigations to County Health Departments. If both jurisdictions are using FHIR, it simplifies and standardizes the exchange of data between them.
  - States often provide public dashboards with aggregated data to inform provider decision-making. With FHIR, it's possible for Providers to incorporate this data directly into clinical workflows (e.g. Outbreak notifications and Clinical Decision Support services)
- Requirements for data governance
  - Many organizations interpret [HIPAA's Minimum Necessary Requirement](#) as requiring PHAs to only retrieve data for patients with active cases (use individual patient query), and only retrieve minimum necessary data for those patients (using concise queries, use query parameters to restrict date range, etc.)
- The availability of a capable public health workforce and available tooling
  - CDC is actively funding the creation of tooling for Public Health Agencies and workforce education

Aligning public health activities with the broader realm of healthcare interoperability will reduce burden, not only on public health programs, but also on healthcare organizations, HIT vendors and other key partners by ensuring consistent and reusable patterns of exchange and infrastructure. The query & response pattern will undoubtedly be a critical tool as automation replaces public health data exchange via phone, fax, abstraction, and other manual methods.

## Minimization of Queries

An ideal query indicates to the EHR precisely the data necessary to satisfy the case investigation or other public health use case. Overbroad queries increase the cost and processing time for the responding system. Strategic design of the query minimizes costs and response time:

- Constraining results to a Date Range
- Searching for resources by linked Encounters
- Requesting specific resources by code

Another effective strategy is to query resources by category rather than individual codes. For instance, instead of requesting each lab test using separate LOINC codes, you can use broader categories like laboratory or vital-signs to capture a wider range of related data in a single request. This method allows you to retrieve a larger, more relevant set of data in a single call. Commonly used FHIR resources that contain category elements include:

- Observation
- Condition

- Procedure
- DiagnosticReport
- DocumentReference
- ServiceRequest

Although some FHIR servers support retrieving large amounts of data with a single operation, such as \$export or \$everything, this approach is likely to retrieve more data than is required for Case Investigation on a single patient. Population Health and Epidemiological use cases may consider the [Bulk Data](#) approach, which has its own [Helios Bulk Data Priority Area](#).

## Resources & Scalability

The [Data Modernization Implementation Center](#) program provides \$255 million dedicated to driving public health data modernization. Three implementation centers provide support to state, local and territorial jurisdictions (CRISP Shared Services; Guidehouse; Mathematica). [Chickasaw Health Consulting](#) serves as the Data Modernization Implementation Center supporting Tribes and Tribal-serving organizations.

Public Health Agencies who are not already engaged with an Implementation Center should visit: <https://www.phinfrastructure.org/opportunities/>

The roadmap for implementation and adoption begins with pilots focused on electronic case reporting, immunization, and enabling FHIR connectivity between PHAs and Provider organizations through partnership with Qualified Health Information Networks (QHINs). Joining a QHIN provides scalable connectivity to Providers, HIEs, and other QHINs under TECCA.

These pilot programs target high-volume, high-priority use cases and engage Provider organizations who wish to enable the Public Health exchange purpose. Successful implementation strategies identified by the Implementation Centers will be shared with the public and serve as a model for broader adoption.

## Point-to-Point vs Brokered/Facilitated/Networked Queries

Today, Public Health Agencies receive data from provider organizations through faxes, online portals, secure emails, and phone calls. In some states, Case Investigators are granted access directly to EHRs or HIE web portals to retrieve data manually. Data Use Agreements provide contractual authorization for PHAs to access data, and FHIR clients may be configured with matching technical authorization.

The FHIR at Scale Taskforce [Security for Scalable Registration, Authentication, and Authorization Implementation Guide](#) establishes a framework for requestors to register

themselves with a responder when connecting for the first time. It defines the data elements required to create a business-to-business trust, including the organization name, purpose of use, and consent policy. It is extensible, allowing for [third-party certifications](#) to be included during registration. For example, a multi-state region could certify “approved” applications or requestors, and those clients could present that certification when registering themselves with a FHIR responder.

Similarly, existing agreements which allow data sharing between PHAs and data aggregators, such as state or regional HIEs, can become the contractual groundwork for authorizing FHIR data exchange. Public Health Agencies do not need to wait for TEFCa to begin connecting to the FHIR capabilities of their *existing* exchange partners.

Under TEFCa, QHINs will provide a single point of connection for PHAs to reach out to the nationwide network of responders. QHINs help PHAs use FHIR to connect to a *network of networks*, Record Locator Services and a Directory of Requestors/Responders, following a federally-supported set of standards.

## Security, Authentication, Authorization, Access

The current state of Public Health data exchange relies on four different models of authorization:

1. Backend system trust
2. Patient-authorized data exchange (Individual Access Use Case)
3. Case Investigator logs in to an intermediary, such as an HIE
4. Case Investigator logs in to an EHR (including SMART on FHIR)

TEFCa defines an automated mechanism for Client Registration, but until the [FAST SSRAA Implementation Guide](#) is widely adopted, PHAs will need to manually register their clients at responding organizations or work with intermediaries who provide FHIR connectivity.

Automated data retrieval that supports a Public Health workflow, requires either:

- A backend system trust between PHAs and responders (including HIEs), or
- A patient’s authorization for data retrieval on file at the requesting organization

For example, a PHA may establish FHIR connectivity with the State HIE that receives data from member healthcare organizations. A data use agreement, signed by the PHA, HIE, and its members allows the PHA to retrieve data without requiring individual user authentication. This approach simplifies connectivity as compared to connecting to each member organization directly.

In some states, patients can initiate data sharing by authenticating themselves with a state portal and querying for their data. This is useful for preparing International Patient Summaries and consolidating immunization records, but is less useful for case investigation.

Today, most PHAs rely on manual processes to retrieve data. Case Investigators may be granted individual logins to access EHRs, web portals hosted by HIEs, or other online data repositories. Where direct logins aren't available, Case Investigators often fall back to phone calls or faxes, sharing the burden of data collection to the provider organization.

In addition to the audit and logging requirements defined in the [HIPAA Security Rule](#) and TEFCA Common Agreement, PHAs should consider implementing the [Privacy and Security requirements defined by the ASTP's Certified EHR Technology](#). Generally, this means retaining a tamper-resistant log of all transactions made to retrieve data and to access data, and assigning appropriate role-based security to Case Investigators to minimize and detect misuse.

## Workflow Considerations

### Selecting a Query Target or Targets

When a RESTful query is initiated by a FHIR client, the query must be directed to a FHIR server endpoint. The identification of one or more FHIR server endpoints to be the recipient of the query will be highly use case, and often query, specific. However, several common patterns are likely to emerge including:

- Query source system
  - In this pattern, the system which originally submitted data to public health is queried for additional information.
  - For example, a CDA-based electronic case report (eCR) is submitted from a provider site, the public health agency investigating the case queries the original provider site for additional data regarding patient hospitalization, treatment and follow-up.
- Query related system
  - In this pattern, a system related to the submitted data (but not the submitting system) is queried for additional information.
  - For example, a v2 electronic lab reporting (ELR) message is received from the performing lab, the public health agency investigating the report queries the order placer's site for additional data relating to patient demographics or treatment.
- Query consolidated data source
  - In this pattern, an external system which collates data from multiple sources, such as a local HIE, is queried for additional information.
  - For example, an ELR or ECR is received and the public health agency investigating the report queries the local HIE for data on the patient so that they can access data held by systems unrelated to the submission of the original report in the event that the patient sought treatment at a different facility.
- Query public health program

- In this pattern, a public health program queries other data sources within the jurisdiction for additional information.
- For example, the disease surveillance program investigating a report of a vaccine-preventable disease queries the local immunization information system (IIS) for the vaccination status and history of the individual of interest.
- Query public health jurisdiction
  - In this pattern, a public health program queries another jurisdiction for additional information.
  - For example, while following up a case report, a public health program queries for additional data from a neighboring state or local public health agency regarding treatment and follow up.
- Query network (fenced)
  - In this pattern, a partner network is the immediate endpoint for the query but the query is then fanned out and relayed to one or more FHIR server endpoints representing a logical group of FHIR servers which may reasonably be expected to have additional information related to the original report. A grouping may be based on a variety of different characteristics including:
    - Geography - all FHIR servers within a geographic area surrounding the patient or the reporting system
    - Referral Agreements - all FHIR servers known to be common referral receipts for the healthcare organization responsible for the original report
  - For example, an eCR which may warrant hospitalization is received from an ambulatory provider site. The public health agency investigating the case queries the all provider sites known to have referral relationships with the original provider sites for additional data regarding patient hospitalization, treatment and follow-up
- Query network (unfenced)
  - In this pattern, a partner network is the immediate endpoint for the query but the query is then fanned out and relayed to one or more FHIR server endpoints without any pre-existing assumptions about where care may be sought. This pattern may be particularly useful when travel is involved and the individual may seek care outside of their normal geographic area.
  - For example, an ELR or ECR is received and the public health agency investigating the report queries their TEFCA QHIN which in turn relays the query to all TEFCA participants and sub participants.

As a public health program implements FHIR query functionality, significant consideration will need to be given to how the target FHIR server endpoint will be chosen. The decision will depend on the nature of the use case in general but potentially also on the specifics of the information being sought.

## Query Frequency

For a given patient/case, there is no guidance for how frequently queries should be initiated. Without this guidance, we may see automated or recurring queries for individuals both too rapidly and for too long a duration, causing inefficient use of system resources. During the implementation process, the public health program should work with trading partners to optimize the frequency and volume of queries to ensure that data is retrieved in a timely fashion without placing undue stress on the system. Particularly for repeated queries to obtain updated information, the public health program should be realistic in how timely data needs to be in order to support program activities and individual follow up and services.

## Query Quantity

For a given population/condition, there is no guidance for how many individuals within the population should be queried for. Without this guidance, we may see automated queries for the entire affected population on a recurring basis, causing inefficient use of system resources. During the implementation process, the public health program should work with trading partners to ensure that queries reflect the real world usage of data by the program. For example, data which will not be actively used by the program should not be queried for simply because it is possible. For example, if a program is not going to follow up on call reports of a particular respiratory disease, then the automated triggering of a FHIR query upon receipt of a positive ELR message should not be implemented.

## Query Specificity – Designing Public Health Queries

Public Health queries, especially those which support Case Investigations, should be designed to retrieve exactly the data which is of interest to the use case. [FHIR Search Parameters](#) includes powerful syntax for specifying date ranges, categories (e.g. vital signs as a subset of Observations), and code sets (e.g. LOINC codes to specify individual DiagnosticReports).

Consider a Case Investigator following up on a report of Tuberculosis Infection. Although it's possible to query for all Observations, Medications, and Diagnostic Reports, a more specific query might target:

- Specific Observations related to

For detailed examples, see [Appendix A](#).

For the superset of conditions of interest to a public health program, consideration should be given to which conditions provide the most benefit given condition specific workflows. For example, if a particular condition is rarely followed up on, the automated triggering of FHIR queries for additional information may not be an efficient use of system resources.



## Patient Identification

The first step of any FHIR-based query exchange is likely to be the identification of the individual in the FHIR Server being queried. It is critical to establish a high confidence match between the Client and Server to ensure that data is retrieved for the correct patient. The necessary outcome of the patient identification step is the shared knowledge by both systems of the logical id of the FHIR resource for the individual (Patient.id) on the FHIR Server. The logical id of the Patient resource is central to the construction of most queries that public health will make. Note that this document does not provide guidance on the set of patient data (demographics) to use when establishing a match nor the confidence level that must be achieved before clinical data is retrieved on the individual. Implementers must establish these requirements based on workflow, need and local policy and regulation.

There may be scenarios where a de novo matching is not required prior to initiating queries for clinical data. One such scenario may be when the event triggering the clinical query includes the FHIR Patient resource id data element for the FHIR Server that will be queried. An example may be the receipt of a FHIR formatted electronic Case Report (eCR) by public health from the organization that will be queried for additional information. A second example may be when previous triggering events have been received for the same individual which resulted in a high confidence match in the past. Note that in this scenario the FHIR Client must retain the FHIR Patient.id value obtained by previous searches so that it is available for the upcoming queries. Implementers should also consider how long a previous match should be considered “good for”. As demographics and other data changes in the FHIR Client and/or FHIR Server systems, the quality of the match as reflected in a confidence score may change over time and a new query working with updated information in one or both systems may return a different outcome.

However, in most cases, it is expected that establishing a patient match between systems will be an integral part of a FHIR query exchange. This need may arise from the fact that the FHIR Patient.id is not expected to be a common component of non-FHIR formatted data submissions such as v2 messages, CDA documents and other input sources or simply because the FHIR Client workflow establishes the need for establishing a new match.

The FHIR standard offers several approaches to patient matching including Patient Search and the \$match operation. Both will be considered below. It may be possible to establish a patient match through out-of-band methods, that is non-FHIR approaches, however, this is not recommended as these methods are more likely to be through bespoke and/or manual processes which are likely to adversely impact broad implementation of FHIR queries for public health use cases.

A detailed discussion of the [FHIR search framework](#) is available as part of the FHIR base standard. Further Patient specific considerations are also documented as part of the

[Patient FHIR resource](#). For US Realm implementations, the [US Core Patient profile](#) also contains guidance on search parameters. Readers of this document are referred to these resources to develop a thorough understanding of the mechanics of patient matching. Note that FHIR Servers are not required to support all Patient search parameters. It is also recommended that implementers identify any FHIR Server (e.g., EHR, HIE) specific requirements imposed by either HIT vendors or the instance implementers (e.g., the healthcare organization using the EHR).

In addition to supporting searches for a Patient record, the base FHIR standard also defines a custom operation to manage patient identification. The [\\$match operation](#) is designed to use a set of patient details, in the form of a Patient resource, and output a bundle of potential matches along with a search score for each returned Patient resource. Support for the \$match operation varies between FHIR Servers, so implementers are recommended to fully understand trading partner capabilities before selecting a patient matching approach.

Regardless of the mechanism of patient matching selected, implementers must carefully consider all possible outcomes for attempts at patient matching. In the best case scenario, the matching process results in a single high confidence match between FHIR Client and Server, however other outcomes are possible including:

- Multiple high confidence matches
- A mix of high and low confidence matches
- Multiple low confidence matches
- A single low confidence match
- No matches

Implementers must carefully consider the technical and end user workflows which may be necessary when a single high confidence match is not obtained. Possible solutions may include re-querying with additional demographics information, invoking human review of the returned resources, logging an error for later resolution, and others. When seeking data from multiple responding organizations, demographic data returned by one organization may be used to augment the search criteria, allowing high-confidence matches at other organizations. As an example, an initial Electronic Case Report may contain only the patient's name, date of birth, and MRN in the ordering providers EHR. By retrieving that patient's record from the ordering provider's EHR, a Case Investigator could also obtain address, phone, and other demographics which were not provided to the lab.

Furthermore, implementers may wish to perform their own technical or human-mediated validation on the returned results to ensure that the local patient matching requirements are met before requesting clinical data from the FHIR server. Note that any human intervention in the workflow may impact the timeliness of data acquisition relative to the fully automated solution.

## Consolidation of Data from Multiple Sources

When a query is fanned out to multiple potential responders, implementers must understand the ramifications of receiving data from more than one source and the reconciliation of potentially duplicate (or conflicting) data. Decisions on how and when to consolidate data received from multiple sources is up to the implementer. General best practice suggests:

- Maintaining traceability between data and sources
- Retain sufficient metadata to reverse merges that are later discovered to have been done in error
- Preserve auditing to know what data was exposed during an access event

## Partner Engagement Strategy Considerations

The implementation of FHIR-based RESTful queries requires a close partnership between public health and data providers including healthcare providers, payors and other public health programs and jurisdictions. When engaging with potential partners, a comprehensive outreach and communication strategy should be developed. To date, the experience of public health programs engaging potential partners for FHIR-based projects has been mixed, however some common thoughts and best practices are emerging.

- Engage partners intelligently
  - Use a layered approach, leveraging existing relationships but escalating to decision makers able to approve commitment to the project and the necessary resource allocations
  - Identify technical and/or clinical champions that can help make the case for implementation
  - Consult with the legal teams from all partners early in the process
- Provide clear, concise documentation early
  - Clearly document the use case and data to be exchanged
  - Emphasize the expected benefits to all partners
  - Align project documentation with expected data use agreements and data governance processes
- Leverage policy and regulatory requirements
  - Be clear regarding the legal authority to access the requested data
  - Be aware of audit or reporting requirements for all partners
- Reuse tools and approaches
  - Leverage previous successes for new projects
  - Communication regularly with partners and colleagues in other programs or jurisdictions to replicate successful implementations

## Testing and Piloting

Upon the successful recruitment of implementation partners, a project plan must be developed to outline the requirements for a success pilot project. Section 5 of the [Public Health FHIR Playbook](#) outlines 7 steps for implementing FHIR use cases. These recommendations can help guide the development of a project plan for developing and testing the necessary tools and workflows. In addition to the development of technical capabilities to utilize RESTful API queries, significant consideration should be given to the following topics:

- Updating of existing end user workflows
- Data governance
- Test plan creation and execution
- Staff training requirements
- Change management processes

The [Helios Public Health FHIR Query & Response priority area](#) conducts regular testing sessions at Connectathons which demonstrate the latest capabilities of QHINs, interface engines, case management systems, and other FHIR clients.

## Trading Partner Expectations

The Actors section of this document describes the basic roles related to the exchange of data using FHIR RESTful queries. Here are some of the actors: Public Health Agencies, Federal Agencies, QHINs, HIEs, EHRs, and payers. Each of these roles are expected to implement basic technical and/or operational functionality in support of FHIR queries regardless of the specific technology selected by trading partners. These basic functionalities are described below. Additional requirements may also be documented on a use case specific basis.

## Foundational Technical Requirements

The FHIR Client HIT Vendor should expect to develop functionality to:

- Identify one or more query trigger events to initiate the query & response workflow.
  - The nature of the triggering event will vary by use case but may include but are not limited to the receipt and parsing of data from a submitter (e.g., v2 message, CDA), ingestion of a flat file from a data submitter or end user action in a public health system.
- Use demographics provided as part of the triggering event to execute patient look up in the FHIR Server of the data holder.
  - Support for Patient.search and/or the Patient \$match operation.
- Validate returned Patient resource(s) before searching for clinical data.

- Includes support for non-happy path outcomes which may include but are not limited to no matching patients, one or more low confidence matches, and multiple high confidence matches.
- Human input may be required to identify the appropriate Patient resource to use for clinical queries.
- Based on the nature of the triggering event, execute one or more queries for relevant clinical and/or administrative data from the FHIR server.
- Parse, store and/or display retrieved data as appropriate for the use case.

The FHIR Server HIT Vendor should expect to develop functionality to:

- Respond to Patient.search and/or the Patient \$match operation request from the FHIR Client
- Respond to queries from the FHIR Client for relevant clinical and/or administrative data

## Foundational Operational Requirements

The public health program should expect to develop processes and functionality to work with the data source organization to:

- Implement any data use agreements required to exchange data via FHIR query.
  - May include data governance and data use agreements.
- Map required data elements to one or more queries for FHIR resources.
  - This includes any parameters used by the queries to limit data requests to minimum necessary data.
- Implement functionality and workflows to address ambiguous patient look up outcomes prior to subsequent queries.
- Implement functionality and workflows to utilize returned data by end users or public health systems.

The Authorized User organization should expect to develop processes and functionality to work with the public health program to:

- Implement any data use agreements required to exchange data via FHIR query
  - May include data governance and data use agreements
- Clearly document scope of data available through FHIR query

## Additional Resources and Support

- Contact HL7 Helios FHIR Accelerator for Public Health: [helios@hl7.org](mailto:helios@hl7.org)
- HL7 Helios FHIR Accelerator for Public Health listserv: [helios@lists.hl7.org](mailto:helios@lists.hl7.org)
  - [Join Helios listserv:](#)

- HL7 Helios FHIR Accelerator for Public Health confluence homepage:  
<https://confluence.hl7.org/display/PH/Helios+FHIR+Accelerator+for+Public+Health+Home>
- HL7 Helios FHIR Accelerator for Public Health: Query & Response Priority Area confluence pages:  
<https://confluence.hl7.org/pages/viewpage.action?pageId=216238674>
- HL7 Helios FHIR Accelerator for Public Health: Query & Response Priority Area Calls (upcoming and archive of past meetings, recordings, and materials):  
<https://confluence.hl7.org/pages/viewpage.action?pageId=216238678>
- HL7 Zulip Channels (chat.fhir.org) :
  - Public Health Stream: <https://chat.fhir.org/#narrow/channel/379724-Public-Health>
  - Helios Accelerator Stream: <https://chat.fhir.org/#narrow/channel/307807-Helios-Accelerator>
  - Helios Query & Response Stream:  
<https://chat.fhir.org/#narrow/channel/416755-Helios-Query-.26-Response>
- HL7 Public Health Work Group Confluence Homepage:  
<https://confluence.hl7.org/display/PHWG/Public+Health+Work+Group>
- HL7 Public Health Work Group Meetings:
  - <https://confluence.hl7.org/display/PHWG/Upcoming+Meeting+Agendas>
- Public Health FHIR Implementation Collaborative (PHFIC) Playbook:  
[https://www.cdc.gov/data-interoperability/media/pdfs/PHFIC\\_Public-Health-FHIR-Playbook.pdf](https://www.cdc.gov/data-interoperability/media/pdfs/PHFIC_Public-Health-FHIR-Playbook.pdf)
- Public Health Law Center Executing DUA Resource Roundup:  
<https://www.publichealthlawcenter.org/resources/executing-data-use-agreements-resource-roundup>

## Appendix A: Use Case Descriptions

### Supplemental Demographics

#### Description

Public Health often receives incomplete demographics information as part of data submissions. This can be due to a variety of reasons including:

- The data submitter lacks the full set of demographics when the missing data is not applicable to the role played by the submitter. For example, a laboratory submitting an ELR message may not have data on race or ethnicity where it is not relevant to performing the test.
- Supplemental data beyond that included in the original submission are necessary for public health activities. For example, patient occupation and industry captured by a provider may not have been included as part of an original report.

- Additional data is necessary for long term follow up. For example, data regarding a caregiver or guardian of a minor may be necessary to provide services or support.
- Many demographics data elements are fluid over time and may change. For example, patient address may change but is critical for public health activities.

By querying a reliable source of demographics data, a public health program can acquire complete and up-to-date demographics for individuals of interest.

## Actors

Any public health system may act as the FHIR client and query a reliable data source for demographics data. The query may be generated from the system itself or from an intermediary acting on behalf of the public health system.

Any system likely to be a reliable and accurate source of demographics data may play the role of the FHIR server. As noted in the examples above, the original submitter of data to the public health program may not be the query target as the submitter may be lacking the data necessary (as in the lab example). Potential data sources may include EHR systems in use by healthcare organizations with an established relationship with the individual, a local Health Information Exchange (HIE) or a jurisdictional master patient index (MPI). Further, a Record Locator Service (RLS) may be of assistance in identifying potential data sources.

## Benefits

Accurate and up-to-date demographics, including contact information, makes it easier for public health programs to contact individuals for treatment and services purposes. Demographic elements such as race and ethnicity, address and age also play a significant role in public health data analysis to support allocation of resources. Certain data elements, such as occupation, can also support personalized care such as occupation related immunization recommendations.

## Triggering Event

Many events may trigger a FHIR query for supplemental demographics including:

- Receipt of data, such as an ELR message, which is lacking important data elements
- Initiation of activities to contact the individual to offer services and support
- Initiation of data analytics which rely on complete and accurate demographics

## Query Content

Supplemental demographics are largely contained within the Patient resource, although additional resource types such as RelatedPerson or Observation (for data elements such as occupation) may also be relevant. The contents of the USCDI Patient

Demographics/Information data class are likely to be directly relevant to public health activity.

## Data Usage

Complete and accurate patient demographics underlie a wide variety of public health activities including provision of support and services, data analytics, resource allocation and planning and reporting. Demographics are critical to virtually all public health programs that deal with identifiable data.

## Newborn Screening (EHDI & CCHD) Use Case:

### Description

The goal of the Newborn Screening (NBS) query use case is to ensure that public health programs have access to the data they need to effectively care for newborns with potential hearing and cardiac conditions. The application of the FHIR query & response paradigm can help to ensure that newborns identified for follow-up through bedside screening at birthing facilities receive the follow up and care they require. These results typically come in the form of an interpretation of screening data resulting in a value of either “pass” or “refer”, where “refer” often triggers further diagnostic testing and/or services provided to the newborn and their family. While HL7 version 2 (v2) standards for transmitting early hearing detection and intervention (EHDI) and critical congenital heart disease (CCHD) results from EHRs to public health systems have existed for many years, there is very little practical implementation of these standards and data is still largely exchanged through manual and paper-based workflows.

FHIR offers new opportunities for NBS programs to proactively access screening results captured by birthing facilities. The data exchange pattern described here can be extended to additional reportable conditions, such as cystic fibrosis or other congenital diagnoses.

### Actors

The newborn screening system in use by the jurisdictional program will play the role of the FHIR client querying for data. Alternatively, an intermediary system (such as an integration engine) or third-party tool may play the role of the FHIR client on behalf of the NBS system. The EHR system in use at a birth facility will play the role of the FHIR server. Intermediaries such as a Health Information Network (HIN) may facilitate the FHIR query.

### Benefits

Benefits for NBS programs include improving the accuracy, completeness and



timeliness of EHDI and CCHD reporting as well as saving staff time by replacing manual processes with automated ones. Benefits for birthing facilities include the automation of existing manual reporting processes, a reduction in redundant documentation of screening results in multiple systems, and ensuring the best care for newborns with potential hearing or cardiac conditions.

## Triggering Event

The query for newborn screening results may be initiated by any number of triggering events that notify the NBS program of the birth of the child. This may include HL7v2 ADT messages, the receipt of a dried blood spot order or specimen or notification from the local Vital Records Office. Any triggering event must contain enough demographic information on the newborn to be able to uniquely identify the patient in the birthing facility EHR system.

## Query Content

The first FHIR interaction is for positive identification of the newborn in the birthing facility EHR system. Demographics from the triggering event are used by the FHIR client to formulate a FHIR query to retrieve the Patient resource. Depending on the capabilities of the FHIR server, this may use either a standard Patient search or the \$match operation. Once a matching Patient resource has been returned to the FHIR client, one or more subsequent queries for clinical data are constructed. Common Observations queried for, typically via LOINC code, include:

- CCHD
  - CCHD Newborn Screening Interpretation (LOINC: 73700-7)
  - Infant factors that affect newborn screening interpretation (LOINC: 57713-0)
  - Birth weight (LOINC: 8339-4)
- EHDI
  - Newborn hearing screen of Ear - right (LOINC: 54109-4)
  - Newborn hearing screen of Ear - left (LOINC: 54108-6)
  - Hearing loss risk indicators [Identifier] (LOINC: 58232-0)

## Data Usage

The triggering events received by the NBS program contribute to the denominator of infants in the jurisdiction. NBS staff use the data returned by the FHIR queries to ensure that all infants have received screening (or have been identified as abstaining from screening) and ensure that additional diagnostic testing is provided to those newborns who have outcomes of “refer”.

## Sexually Transmitted Infections (STI) Use Case:

### Description

When a reportable STI case is received by a public health agency—via electronic laboratory reporting (ELR), electronic case reporting (eCR), or manual reporting—public health case investigators may require supplemental clinical and epidemiological data from healthcare providers to complete case evaluation. This data supports accurate case classification, appropriate treatment verification, and partner services coordination.

Traditionally, investigators obtain this supplemental information through manual processes such as telephone outreach, fax, secure email, or direct access to provider electronic health record systems. These methods are often time-consuming and resource-intensive.

FHIR provides a standardized framework to enable automated querying of provider EHR systems for supplemental case data. Implementing FHIR-based workflows can significantly reduce manual workload, improve data completeness and timeliness, and enhance public health response efficiency.

### Actors

The FHIR client responsible for querying supplemental data can be implemented in several forms:

- A dedicated third-party application with a user interface may be hosted by the public health agency to facilitate query initiation and data review.
- An integration engine may act as the FHIR client, automatically initiating queries based on predefined triggers, such as the receipt of an ELR message.
- The disease surveillance system itself may be configured to function as a FHIR client, initiating queries based on triggers defined within its database or workflow engine.

In all cases, the healthcare provider's electronic health record (EHR) system functions as the FHIR server, responding to authorized query requests from the FHIR client.

### Benefits

Using FHIR queries to retrieve supplemental data for STI investigations offers several key benefits. It improves timeliness and efficiency by automating data retrieval, reducing reliance on manual processes like phone or fax. FHIR enables standardized, real-time access to structured clinical information such as symptoms, treatment, and pregnancy status, leading to more complete and accurate case assessments. This approach reduces the burden on case investigators and health care providers, supports faster treatment verification and partner services, and enhances the overall public health

response. Additionally, it provides a scalable solution that can be applied across multiple diseases and healthcare systems.

### Triggering Event

The primary trigger for retrieving supplemental data in an STI case investigation is the receipt of a reportable condition notification, typically through an electronic laboratory report (ELR). This prompts the public health system to identify missing clinical or epidemiological information needed for case completion. Additional triggers may include receipt of an electronic case report (eCR), manual case entry, or automated detection of incomplete data within the surveillance system. Once triggered, a FHIR query can be initiated to retrieve the missing information directly from the provider's EHR.

### Data Content

The supplemental data elements typically requested for STI cases include:

- Full Patient demographics such as name, age, gender, ethnicity, address, phone number, etc
- Reason for Visit
- Risk History
- Clinical Symptoms
- Pregnancy status
- Diagnosis
- Treatment
- Medications

### Data Usage

Public health agencies rely on this supplemental information to implement effective strategies for controlling STIs, improving health outcomes, preventing transmission, and addressing the social and structural factors that contribute to higher risks of infection.

## Latent Tuberculosis Infection (LTBI) Use Case:

### Description

Tuberculosis (TB) is a life-threatening disease transmitted through the air with extensive medical and economic consequences. Every year, about 10,000 people in the U.S. are diagnosed with TB. Of these diagnoses, 87% are the result of progression of latent TB infection (LTBI) to TB disease. Thus, efficient screening for and treatment of LTBI will prevent most cases of TB disease. Unfortunately, based on data from local clinics and

health systems, very few people at risk of LTBI are tested and even fewer receive appropriate treatment.

The interferon-gamma release assay (IGRA) is a blood test for TB infection and an important component of an LTBI diagnosis. However, the IGRA alone is not sufficient to diagnose LTBI; a chest x-ray is needed to determine whether a person with a positive IGRA has TB disease or LTBI. Once LTBI is diagnosed, a full course of treatment is needed to resolve the infection and prevent TB disease.

At present, the IGRA result is the only data available to the public health system; chest x-ray and treatment data are not reported. The only recourse to confirm that an individual has had an LTBI diagnosis and sufficient treatment is for local health departments to follow-up with patients and medical providers directly, either by phone or faxed form. These methods are time-consuming and resource-intensive. Because of the inefficiency of this data collection, very few patients can be assisted in confirming their LTBI diagnosis are receiving appropriate treatment.

In addition, the electronic laboratory report of the IGRA has very limited information on risk factors for LTBI and TB disease. As a result, the public health system cannot prioritize outreach to those patients who are more likely to develop TB disease.

LTBI generally only needs to be tested for and treated once. Having full capture of testing and treatment information that is available to the public health system could reduce unnecessary testing and treatment.

The FHIR Query and Response paradigm provides a standardized framework to enable automated querying of provider EHR systems for supplemental screening and case data to identify patients who need support in completing LTBI screening and LTBI treatment. Implementing FHIR-based workflows can significantly reduce manual workload, improve processes to collect screening and treatment data, and enhance public health response efficiency.

## Actors

**FHIR exchange mechanism:** In this example scenario the public health agency and the healthcare provider agree to use PULL exchange because the provider's EHR supports FHIR-based queries from authorized entities.

**Data source system:** The healthcare provider's EHR, which includes a FHIR server.

**Data destination system:** The public health agency's infectious disease surveillance system, data warehouse and FHIR client. In this use case, the public health agency is using an enterprise-level integration engine as a FHIR client/FHIR façade.

## Benefits

Using FHIR Query and Response for LTBI screening offers several benefits, primarily centered around enhanced data interoperability and efficiency. Specifically, FHIR facilitates the secure and timely exchange of patient data between healthcare and public health systems, allowing for a more comprehensive and accurate assessment of individuals at risk for LTBI. This includes quicker access to patient records and lab results, leading to better decision-making and improved patient care.

## Triggering Event

The triggering event includes receipt of a positive TB IGRA to the public health infectious disease surveillance system. This prompts the public health system to query for supplemental information needed for case investigation.

## Query Content

The query content includes supplemental demographic, risk, and treatment information and may include:

- Race and Ethnicity
- Place of birth (i.e. born outside of US)
- Preferred language
- Immune-compromising conditions
- Previous TB exposure
- Homelessness
- Incarceration
- Chest x-ray
- LTBI treatment

## Data Usage

An estimated 87% of TB disease cases are caused by progression of LTBI to TB disease. This means that efficient screening for and treatment of LTBI will prevent most cases of TB disease and the associated devastating consequences.

## Measles Case Investigation Use Case:

### Description

Because measles is so highly contagious, healthcare providers often notify PHAs by phone as soon as measles is suspected instead of waiting for a confirmatory lab result. During this initial call, basic patient contact information is manually recorded to facilitate timely follow-up. Once the test result is available and returns positive, an Electronic Laboratory Report (ELR) is transmitted to the PHA for further investigation.

To assess exposure risk and identify possible transmission chains, case investigators conduct interviews with the patient or their caregiver as well as anyone they have come in contact with during their infectious period. This may include family members, coworkers, classmates, or other patients in a clinic waiting room, creating significant burden for both case investigators and reporters. Additional context may be needed from the treating provider, especially for information not captured in ELRs. Key data collected at the point of care could be accessible via FHIR query, eliminating some need for manual collection.

## Actors

- EHR: Responds to FHIR queries from PHA and supplies patient, encounter, and clinical data.
- PHA Case Investigation System: Issues FHIR queries to retrieve relevant information from provider systems.

## Benefits

By automating data retrieval from EHR systems, the need for manual outreach to providers is reduced, saving time and effort for both clinical staff and case investigators. Structured queries also ensure higher data accuracy, as information is pulled directly from the medical record without manual transcription.

For a highly contagious disease like measles, rapid access to relevant patient and encounter data is critical. This enables PHAs to identify exposure settings, trace contacts, assess risk to vulnerable populations, and initiate timely containment measures.

## Triggering Event

FHIR queries related to measles investigations could be initiated through both automated and manual triggers:

- Automated: Receipt of a positive lab result for measles
- Manual: Case investigator flags a case for follow-up

## Query Content

The content of the FHIR queries focuses on retrieving clinical and contextual data relevant to measles exposure and transmission, including:

- Patient Demographics: Name, address, phone number, email, race/ethnicity
- Encounter Data: Visit dates, facility and provider information
- Immunization Records: Measles/Mumps/Rubella (MMR) vaccination history
- Travel History: Recent travel to areas with active outbreaks
- Occupation and Employer: Especially if working in schools, daycare centers, healthcare facilities, or other high-risk environments
- Social and Religious History: Attendance at group events, religious services, or community gatherings
- Pregnancy Status: To inform follow-up care and risk mitigation

- **Provider Notes:** Free-text entries that may contain additional exposure information

## Data Usage

The information retrieved through FHIR queries can be used to support many aspects of measles case investigation and public health response. Once incorporated into the case management system, the data help investigators confirm diagnoses, identify potential exposure sites, and conduct effective contact tracing. Exposure context can be identified more quickly when these data are retrieved directly from the medical record.

## Respiratory Virus Hospitalization Surveillance Network (RESP-NET):

In addition to supporting individual case follow-up, the data also contribute to outbreak management by identifying transmission patterns and clusters. This enables PHAs to initiate community-based responses such as targeted immunization campaigns or public advisories. RESP-NET modernized with Health Information Exchange: Proof of Concept

## Description

The Respiratory Virus Hospitalization Surveillance Network (RESP-NET) monitors hospitalizations related to COVID-19, RSV, and influenza. This data comes from Syndromic Surveillance (SS), Electronic Laboratory Reporting (ELR), or from Local Health Jurisdictions (LHJs) adding in missing cases. Currently, any cases obtained from SS that do not have confirmed laboratory diagnoses must be sent back to LHJs where they must manually follow up on the case to find the necessary data before it can be sent back for reporting to RESP-NET. To improve this process, the Washington State Department of Health (DOH) and King County plan to test an automated system for querying Qualified Health Information Networks (QHINs) under the Trusted Exchange Framework and Cooperative Agreement (TEFCA) using Skylight's Query Connector.

## Actors

- **FHIR Exchange Mechanism:** WA DOH queries a QHIN using demographics from V2 or FHIR messages through CDC's Query Connector. The QHIN sends the query to the EHRs specified within the query and the response is sent back to WA DOH.
- **Data Source System:** Healthcare provider EHRs, connected through a QHIN
- **Data Destination System:** WA DOH's Aidbox FHIR server.

## Benefits

Using Query and Response for reporting cases to CDC's RESP-NET will help in reducing manual efforts for WA DOH and the State's participating jurisdictions through query automation while providing more comprehensive data for analysis and reporting.

## Triggering Event

The triggering event is receipt of a HL7 V2 SS or ELR message being received through the Syndromic Surveillance system or the RAINIER suite as the data pipeline for Washington Disease Reporting System (WDRS).

## Data Content

The query content includes demographics data, and the response contains all relevant information related to their test results and/or hospital stay. This includes, but is not limited to:

- Demographics
- Lab test results
- Conditions (i.e. RSV, FLU, or COVID-19)
- Observations
- Hospitalization status

## Data Usage

The returned data will be used by WA DOH for enhancing the respiratory surveillance system through automation and more complete data gathering

# Appendix B: Regulation

## Federal Regulatory Requirements, HIT Certification

A description of the existing HTI-1/HTI-2 (g)(10) and (g)(20) certification requirements for HIT (both Public Health and EHR), United States Core Data for Interoperability (USCDI), and CMS Interoperability and Prior Authorization final rules, should be discussed as a means of outlining the types of data likely to be available via FHIR API query. Details may be found in the documentation linked below.

Assistant Secretary for Technology Policy (ASTP) Health Data, Technology, and Interoperability: Certification Program Updates, Algorithm Transparency, and Information Sharing (HTI-1): <https://www.healthit.gov/topic/laws-regulation-and-policy/health-data-technology-and-interoperability-certification-program>

HTI-1 Federal Register:  
<https://www.federalregister.gov/documents/2024/01/09/2023-28857/health-data-technology-and-interoperability-certification-program-updates-algorithm-transparency-and>

Assistant Secretary for Technology Policy (ASTP) Health Data, Technology, and Interoperability: Trusted Exchange Framework and Common Agreement (TEFCA)



(HTI-2) Final Rule Homepage: <https://www.healthit.gov/topic/laws-regulation-and-policy/health-data-technology-and-interoperability-trusted-exchange>

HTI-2 Federal Register:

<https://www.federalregister.gov/documents/2024/12/16/2024-29163/health-data-technology-and-interoperability-trusted-exchange-framework-and-common-agreement-tefca>

ASTP United States Core Data for Interoperability (USCDI):

<https://www.healthit.gov/isp/united-states-core-data-interoperability-uscdi>

Centers for Medicare & Medicaid Services (CMS) Interoperability and Prior Authorization Final Rule (CMS-0057-F): <https://www.cms.gov/priorities/key-initiatives/burden-reduction/interoperability/policies-and-regulations/cms-interoperability-and-prior-authorization-final-rule-cms-0057-f>

CMS-0057-F Federal Register:

<https://www.federalregister.gov/documents/2024/02/08/2024-00895/medicare-and-medicaid-programs-patient-protection-and-affordable-care-act-advancing-interoperability>