Ontario Immunizations

Standards Selection Guide

Standards Selection Guide Table of Contents							
Represents a collection of the recommended Standards, Resources, Implementation Guides created to satisfy a specific set of Clinical Requirement <i>at a moment in time</i> , following the discovery process presented in the guidance section of this site.	 Standards Selection Guide Key Contributors Purpose Business Context Typical Use Cases Evaluated Standards 						
□ Under Development ✓ Pilot □ Draft For Use	 Recom Implem Existing 	mended Standards entation Resources g Implementations					
Normative Superseded (by)	Maturity	Pilot					
Retired	Status	Draft					
	Standar ds	FHIR®, SNOMED CT®, OAuth 2.0					
Effective Date	Domain	Public Health					
July, 2016	Jurisdict ion	Ontario					
	Clinical	N/A					
Key Contributors	Business	Business Requirements					
The following individuals/organizations contributed to the creation of this resource:	Technic al	Specifications					

Purpose

This guide provides an overview of the available standards and a recommended approach to support the Immunization requirements as identified below. The intent is to simplify standards selection decisions in future projects and, in turn, to promote standardization of solutions across projects by providing useful information to support decision making in a readily consumable format.

Content in this guide provides an overview of the standards selected to support the listed Use Cases.

Business Context

The use cases outlined in this Guide reflect the activities involved in tracking and managing immunizations, with a particular focus on public health. As such, many applications requiring a standard for the exchange of immunization data will be used outside of traditional care settings such as hospitals or physicians' offices.

Typical Use Cases

The use cases outlined below are intended to provide additional context and frame the needs that candidate standards must meet. The use cases here are summarized and excerpted from a discussion document of the Canada Health Infoway Immunization Interoperability Working Group[1].

For a detailed use case list and required business rules please visit the Business Requirements space:

Business Requirements
Business Interoperability

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- UC-5 Update Existing Immunization Record
- UC-6 View Immunization History (With Forecast)

These use cases do not make any assumptions about the setting in which care is being delivered (e.g. primary care physician's office, mobile immunization clinic, hospital, etc.). Although some references to software applications are specific, the preferred candidate standards should, where possible, support and enable the delivery of care in any setting, and the viewing or recording of immunization data on different hardware devices.

UC-1 Patient or Delegate Retrieves Immunization History (Yellow Card)

A user, typically a parent with a school age child, retrieves a patient's immunization history form the Immunization Connect Ontario (ICON) online or mobile application.

- User enters a patient's Ontario Immunization ID and PIN to request proof of immunization (Yellow Card) from ICON.
- ICON (and related services):
 - authenticates request,
 - queries panorama to retrieve patient immunization history, and
 - displays yellow card to user to print or download.

UC-2 Patient or Delegate Records Immunization History

A user, typically a parent with a school age child, enters a patient's immunization history into the Immunization Connect Ontario (ICON) online or mobile application.

- User enters information into ICON:
 - ° Identifying information about self (submitter),
 - Identifying information about patient, and
 - · Information about one or more immunizations.
- ICON (and related services):
 - o authenticates request,
 - ° stores information for validation by Public Health.
- Health care provider or Public Health reviews and validates information in ICON and submits information to Panorama. (Alternate flow on UC-4?)

UC-3 Health Care Provider Retrieves Immunization History

A health care provider retrieves a patient's immunization history using a clinical viewer, EMR or mobile application.

- User logs in to application, looks up patient and requests immunization history.
 - Application (and related services):
 - authenticates user using ONEID
 - ° queries panorama to retrieve patient immunization history, and
 - displays immunization history.

UC-4 Health Care Provider Records Immunization Event(s)

A health care provider enters information about a new immunization event using a clinical viewer, EMR or mobile application.

- User logs in to application, looks up patient and enters information about one or more immunization events.
- Application (and related services):
 - authenticates user using ONEID, and
 - ° stores information about immunization event in Panorama.

UC-5 Update Existing Immunization Record

A health care provider updates a patient's immunization history using a clinical viewer, EMR or mobile application.

- User logs in to application, looks up patient and immunization history, updates information about an immunization event.
 - Application (and related services):
 - authenticates user using ONEID, and
 - stores information about the updated immunization event in Panorama.

UC-6 View Immunization History (With Forecast)

Extends reports in UC-1 and UC-3 to include information about the patient's outstanding and upcoming immunizations.

Evaluated Standards

Immunization use cases cover three main areas requiring standardization:

- Messaging
- TerminologySingle Sign On (SSO)

Listed below are the available standards considered for each standardization category, the chosen alternative being highlighted.

Messaging

The following messaging standards were evaluated to support the exchange of information between front end applications and Panorama.

Standard		Fit for Purpose		Stewardship Quality				
	Fits Requirements	Implementation Type	Vendor Support	Canadian Steward	SDO Maintained	Complexity	Standard Maturity	Training, Support and Tooling
FHIR Immunization		Pilot in Canada		No	Yes		Draft for Use	
pan-Canadian Immunization Messaging Standard (Public Health MR 02.05)		Production in Canada		Yes	Localized		Normative	
Archit	ectural Constraints and	d Considerations		Secondary Benefits				
FHIR's modular components, foundation on web standards and support for RESTful architectures make the standard generally less complex and more accessible to developers of client applications than the pan-Canadian standards which are based on HL7 v3.					No notable secondary benefits.			
Recommendation						Supporting Rati	onale	
It is recommended that Panorama based new implementations adopt FHIR.				FHIR supports the use cases described above without further extension or localization. In the event that extension is required to support future requirements, FHIR provides a straightforward mechanism for creating extensions.				
					Canada-specific terminology value sets can be used while remaining "FHIR conformant", as the FHIR Immunization resource only specifies examples; implementers are free to use any value set they choose.			
				FHIR has significant momentum among vendors and developers, meaning the long- term sustainability of FHIR-based implementations will likely be superior.				s, meaning the long- superior.
				There is a simplementa	substantial eco ations for FHIR	system of open-source that implementers car	e tools and refer leverage to acc	ence celerate their projects.

Terminology

The following terminology standards were evaluated to support the exchange of information between front end applications and Panorama.

Standard	Fit f	pose	Stew	vardship	Quality				
	Fits Requirements	Im ple me nta tion Ty pe	Vendor Support	Canadian Steward	SDO Maintained	Complexity	Standard Maturity	Training, Support and Tooling	
pan-Canadian Public Health Immunization Subsets (SNOMED- CT)		Pro duc tion in Ca na da		Yes	Localized		Normative		
iTerm ValueSet		Cu sto m		Yes	No		N/A		
Architectural Constraints and Considerations				Secondary Benefits					
Both options were designed to support Panaroma's data model.				Using pan-Canadian terminology subsets supports inter-jurisdictional interoperability. SNOMED CT's terminology model can be leveraged to support aggregation and analysis of the information captured within vaccination records.					
Recommendation				Supporting Rationale					

The pan-Canadian Public Health Immunization Subsets reflect Canadian requirements (e.g. Canadian vaccine lists), and is aligned with the PHAC Canadian Immunization Guide. It is being adopted in additional projects across Canada (including AB, SK, MB, Canadian Forces, CIHI), so additional implementations that adopt the Ontario standard will be well positioned for interoperability with these groups or organizations.

Single Sign On (SSO)

The following security frameworks were considered to provide SSO access to protected data through via FHIR resources.

Standard		Fit for Purpose		Stewardship		Quality		
	Fits Requirements	Implementation Type	Vendor Support	Canadian Steward	SDO Maintained	Complexity	Standard Maturity	Training, Support and Tooling
OAuth 2.0		Production		No	Yes		Normative	
SAML 2.0		Production		No	Yes		Normative	
Architectural Constraints and Considerations					Secondary Benefits			
OAuth 2.0 provid	OAuth 2.0 provides better support for mobile applications.							
Recommendation Supporting Rationale								
It is recommended that OAuth 2.0 be used to provide SSO access to protected data through FHIR resources.				Better support for mobile applications.				

Recommended Standards

The following standards and related specifications were identified as the recommended approach to support the in-scope requirements. The table lists the summary with the rationale.

Standa rdizatio n Requir ement	Options	C h o ice	Rationale
Messa	FHIR Immunization	x	The FHIR Immunization Resource supports the use cases described above without further extension or localization. In the event
ging	Canada Health Infoway pan- Canadian Immunization Standard		Canada-specific terminology value sets can be used while remaining "FHIR conformant", as the FHIR Immunization resource only specifies examples; implementers are free to use any value set they choose. FHIR has significant momentum among vendors and developers, meaning the long-term sustainability of FHIR-based implementations will likely be superior. There is a substantial ecosystem of open-source tools and reference implementations for FHIR that implementers can leverage to accelerate their projects.
Termin ology	pan-Canadian Public Health Immunization Subsets (SNOME D-CT)	x	The pan-Canadian Public Health Immunization Subsets reflect Canadian requirements (e.g. Canadian vaccine lists), and is aligned with the PHAC Canadian Immunization Guide. It is being adopted in additional projects across Canada (including AB, SK, MB, Canadian Forces, CIHI), so additional implementations that adopt the Ontario standard will be well positioned for interoperability with these groups or organizations.
Single		v	Outh provides better support for mobile applications
Sign On (SSO)	SAML 2.0	^	

Implementation Resources

Community Pages

Immunization related work is handled through an active Community on InfoCentral. Please visit their sites to learn more.

InfoCentral - Community Pages
Public Health Surveillance - Community
Immunization Interoperability - Working Group
Immunization Terminology - Working Group

Interoperability Specifications

For detailed Implementation Specifications please visit the InfoScribe space:

InfoScribe - Specifications	
Immunization Connect - Specifications	

Implementation Guides

For FHIR Resource and Profile Definitions related to this implementation please consult the "Panorama ICON FHIR Implementation Guide":

InfoScribe - Implementation Guides

FHIR Implementation Guide for Immunization Connect

Technical Resources

Documentation and implementation resources are available directly from HL7 International through the FHIR website.

- FHIR
 - Test Servers http://fhirtest.uhn.ca/ - University Health Network public FHIR test server
 - http://fhir3.healthintersections.com.au/open Grahame Grieve's (FHIR creator) public FHIR test server
- Open source reference implementations
 - https://github.com/jamesagnew/hapi-fhir Java
 https://github.com/ewoutkramer/fhir-net-api .NET

 - https://github.com/smart-on-fhir/client-js JavaScript

For further technical support please contact project teams listed in the header section or seek support through the community site.

Existing Implementations

The following organizations are known to have implemented the FEM solution outlined in this guide:

Implementing Organization	Contact Information	Notes
Ontario Ministry of Health and Long Term Care (<i>MOHLTC</i>)	Chris Pentleton (FHIR), Karen Hay (Terminolog y)	MOHLTC is using FHIR to provide interoperability between Panorama and mobile or web apps supporting public health immunization programs. MOHLTC is also responsible for developing the Ontario vaccine terminology standard