

HL7 V2.7.1 Implementation Guide -- Get Official Immunization History Document II

Subtitle Profile Z94 - Request Official Immunization History Document Profile Z92 - Return Official Immunization History Document

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# Introduction

Immunization Information Systems (IIS) are centralized population based repositories of immunization related information. They receive and share data on individual clients/patients with a number of other systems, including Electronic Health Record systems (EHR-S). IIS have functionality that evaluates the recorded immunization history for a person. It determines if the doses recorded were given appropriately and forecasts when next doses are due, based on guidance from the Advisory Committee on Immunization Practices (ACIP).

Health Level Seven (HL7) is a nationally recognized standard for electronic data exchange between systems housing health care data. The HL7 standard is a key factor that supports this two-way exchange of information because it defines a syntax or grammar for formulating the messages that carry this information. It further describes a standard vocabulary that is used in these messages. It does not depend on specific software, that is, it is platform independent.

This Guide and its associated profiles was developed using a tool developed by the National Institute of Standards and Testing (NIST). IGAMT captures the specifications for the messages in profiles. These profiles may be imported into another NIST developed tool, TCAMT, which tests conformance of the message against the profile.

## Purpose

This set of profiles will support requesting an Official Immunization History and Forecast from IIS. It will use HL7 Version 2.5.1 messages, but will preadapt some features of Version 2.7.1. The Official Immunization History will be in the form of a PDF document. It is based on a set of requirements first developed in Michigan by the Michigan Care Improvement Registry (MCIR).

## Audience

This Guide has two audiences. The first is the system managers that must understand this process at a high level. The second is the technical group from IIS and EHR-S that must implement these guidelines. For them we strive for an unambiguous specification for creating and interpreting messages. Our goal is for this Guide to be a bridge between the two.

It is important to note that HL7 specifies the interface between 2 systems. It does not specify how any given system is implemented to accomplish the goals of messaging.

## Organization of this guide

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## Referenced profiles - antecedents

The profiles defined in this Guide are built on the profiles documented in the HL7 Implementation Guide for Immunization Messaging, Release 1.5. These profiles are constrained to meet the more limited needs of this Guide.

## Scope

### In Scope

This Implementation Guide is intended to support the following:

* request for an official immunization history for a specific person
* the return of that history
* Return of notification of an unsuccessful search the specified person
* Return of an acknowledgement of errors in the requesting query

### Out of Scope

The following are out of scope for this Guide:

* technical details of the transport layer used to connect systems
* technical details regarding security
* technical details on the process for evaluating the immunization history and forecast of next doses due
* the format and content of the PDF document returned
* how the document is presented to the requester

## Key technical decisions

**Message Profiles**

This implementation guide defines a number of implementable profiles. These profiles will be identified in the Message Header (MSH-21).

### Use of Vocabulary Standards

**Use of Vocabulary Standards**

This guide calls for specific vocabulary standards for the exchange of immunization information such as LOINC and SNOMED. Standard vocabularies enable automated decision support for patient healthcare, as well as for public health surveillance of populations. Terminology is updated periodically and it is best practice to use the most current version of the coding system.

### Conventions

This guide adheres to the following conventions:

* The guide is constructed assuming the implementer has access to the Version 2.7.1 of the HL7 Standard and the HL7 Implementation Guide for Immunization Messaging. Although some information from the standard is included in this implementation guide, much information from the standard has not been repeated here.
* Data types have been described separately from the fields that use the data types.
* Segments, Data types and Value sets that are constrained versions of those in the base standard are uniquely identified, by name.
* No conformance information is provided for optional message elements. This includes length, usage, cardinality, value sets and descriptive information. Implementers who want to use optional message elements should refer to the base HL7 V2.7.1 Standard to determine how these optional message elements will be used.
* This guide uses X as a conformance usage indicator to indicate that the element is not supported in these profiles.

# Use Cases

A use case is a tool to describe the goals of the messaging. It includes the actors (systems involved in the interaction), their goals for the interaction and assumptions associated with these interactions. The Use Case in this Implementation Guide will include both sides of the transaction to request and receive an Official Immunization History document.

## Actors

There are two primary actors involved in the interactions defined in this Guide. These are a health information system and an immunization information system (IIS). There are secondary actors, like a person who uses the health information system to access the IIS to get an official immunization history. The following table list the responsibilities and messaging goals for the primary actors as they relate to the interactions specified in this Guide.

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| **Actor** | **Responsibility** | **Goals** |
| Immunization Information System | Provide access to a complete, consolidated immunization record for each person in its catchment area    Supply individual immunization records to authorized users and systems    Evaluate immunization history and make recommendations for next doses | Receive requests for official immunization history for an individual    Return an official immunization history and forecast for a specific individual.    Acknowledge receipt of message when no matching person is found.    Report processing errors from receipt of message |
| Electronic Health Information System | Make a persons official immunization history record available to authorized persons | Request evaluation on an immunization history and recommendations for next dose on a given Schedule, such as ACIP    Receive an official immunization history and present to requesting person. |

## Use Case -- Get Official Immunization History

The goal of this use case is to allow an authorized user to get an official immunization history document from an IIS through an electronic health record system.

### User Story

A parent needs an official copy of his/her child's immunization record for camp. The parent logins into the public access portal of their clinic's EHR and requests an official immunization history document. The EHRs creates and sends a query to the immunization information system (IIS). The IIS searches and finds the child's records. The IIS applies the guidance of ACIP to evaluate the immunization history and forecasts next doses due. The IIS creates a PDF document of the official immunization history and returns it to the EHR. The EHR presents the official immunization history to the parent. He/she prints the document for the camp application.

### Assumptions

* The requesting system is responsible for authenticating the requesting user and assuring that only authorized persons have access to a specific person's immunization history.
* The requesting system has a function that allows creation of a query to request a person's official immunization history.
* The requesting system has the ability to present the returned document in an appropriate way.
* The base Version 2.7.1 of the HL7 standard is the foundation of these profiles
* Infrastructure is in place to allow accurate and secure information exchange between information systems.
* Providers access official immunization history through either an EHR-S or immunization information system (IIS).
* Privacy and security has been implemented at an appropriate level.
* Legal and governance issues regarding data access authorizations, data ownership and data use are outside the scope of this document.
* The immunization record and demographic record for each patient contains sufficient information for the sending system to construct the query.

#### **Pre-conditions**

* An authorized person requests a specific person's official immunization history
* The requesting system has the information needed to create a well-formed query

#### **Post-conditions**

The requestor has received one of the following responses:

* An official immunization history and forecast as PDF for the person requested
* Acknowledgement that the person was not found or their record is not available
* Acknowledgement that the query had an error that prevented processing

### Scenario

[ I have moved the interaction models under each scenario]

#### **Request**

1. User selects a person that will be the subject of a request query.
2. User triggers a request query.
3. Sending system constructs an HL7 query.
4. Sending system sends query across transport layer to IIS.
5. Sending system awaits response.

#### **Success**

1. The IIS receives the request message.
2. the IIS parses the message and assures conformance to profile.
3. The IIS finds the requested person's record.
4. The IIS evaluates the immunization record and forecasts next doses due.
5. The IIS creates a PDF document of the official immunization history.
6. The IIS returns that PDF to the requesting system.
7. The requesting system presents the PDF to the person making request.

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#### **No Match Returned**

* The IIS receives the request message.
* the IIS parses the message and assures conformance to profile.
* The IIS does not find the requested person's record.
* The IIS creates a response indicating that no match was found.

Note that if a person has a record in the IIS, but does not wish to allow others to see it, the results are the same as if no record was found.

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#### **Application Error**

1. The IIS receives the request.
2. The IIS parses the message.
3. The IIS determines that the message does not conform to the profile.
4. The IIS creates a response message indicating error.
5. The IIS returns the message to the requesting system.
6. The requesting system presents the error message to the requester.

[MISSING IMAGE: , ]

#### **Accept Error**

1. The IIS receives the request.
2. The IIS determines that the message has one of the following errors:
   1. Unsupported message type
   2. Unsupported event code
   3. Unsupported processing ID
   4. Unable to process for reasons unrelated for format or content
3. IIS returns Accept Error
4. Requesting system receives accept error message
5. Requesting system notifies requesting user.

### Use Case Realization

**Trigger Event:** A user or other actor or process requests an Official Immunization History document.

**Initial Message Profiles:** Z94 (QBP^Q11)

**Responding System Outcome:** The responding system processes the Z94 message and searches for the requested person's immunization history. and returns an acknowledgement message, including errors if any

**Response Message Profile:**Z23 (ACK)

**Initiating System Outcome:**The initiating system processes the Z23 acknowledgement message.

**Processing Mode:** The goal of a Z22 message is to send up-to-date information about a vaccination event and the patient receiving the vaccine. A conformant message may contain a view of the entire patient vaccination history as known by the system originating the VXU^V04 message, but it is not required to do so. In other words, a given Z22 conformant message may contain only a subset of all vaccinations events on the patient record, typically only those that have been added, updated or deleted as part of the event leading to the triggering of a message. The responding system is responsible for applying business rules to integrate the data received but should not assume that the message being processed represents the entire patient vaccination history. The data within any single order group (set of one ORC segment, one RXA segment and associated RXR and OBX segments, if any) should represent the complete set of data, as defined by the required (as per this implementation guide) and locally agreed to data elements, about the vaccination event as known by the system originating the message.

# Application Error

# Message Profiles

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Message Acknowledgement

Original Mode processing is supported by this Implementation Guide. Enhanced Mode Acknowledgement is not supported.

The conversation between a sending system and a receiving system consists of a Message (QBP) and a response (ACK, RSP). Receiving systems are expected to process the message and send a response. The system receiving the acknowledgement response does not acknowledge the response. In other words, the system receiving a QBP is expected to return an RSP or ACK. The system receiving that RSP or ACK is not expected to respond back.

Some messages pass through intermediary systems like a Health Information Exchange (HIE). It is important that the intermediary system pass the ACK back to the sending system to allow the sending system to be aware of and deal with messaging errors.

The HL7 Standard has two ways to convey acknowledgements: standard mode and enhanced mode. The scope of this document includes only standard mode acknowledgments, i.e. "application acknowledgements" only, which means that the receiving system accept responsibility for the data or identify the error in the message or reject the message for a reason not related to the message itself.

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# Message Infrastructure

## Conformance Profiles

## Segments and Field Descriptions

## Datatypes

## Value Sets