

# Student Information System Guide

*To Setting Up Electronic Data Exchange*

*with Oregon ALERT Immunization Information System*

*Using HL7 Version 2.5.1*

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## Version history

Version	Date	Name	Notes
1.0	10/26/22	ALERT IIS Data Analyst – Kerry Lionadh	Author
1.1	2/27/23	OIP School Law Team	Edits to remove Z44 field requirements and other references to messages requesting immunization forecasts.
1.2	3/9/2023	OIP School Law Team	Revisions made to remove language aimed at individual schools, as primary audience is SIS developers.

## Introduction

### Purpose

Schools in Oregon are required to gather and assess immunization records for compliance with Oregon-specific immunization requirements and submit annual immunization reports. The ALERT Immunization Information System (ALERT IIS) includes a repository of Oregon immunization records. This implementation guide provides information about how school student information systems (SIS) can collect immunization records from ALERT IIS using query only (one directional) data exchange. It details Oregon and [national HL7 \(Health Language 7\) Version 2.5.1](#) requirements for Immunization Messaging, with specific focus on Oregon requirements to support query by parameter (QBP messages) to ALERT IIS.

This Guide specifies:

- Web services supporting data exchange with ALERT IIS
- Oregon and national value sets used to support HL7 messaging with the IIS.
- Message types/profiles and functions supported by the IIS.
- Messaging requirements for submission of query by parameter messages (QBP messages) to the IIS.
- Detail on response (RSP) messaging from the IIS.

This Guide details how to query the IIS for immunization information but does not cover school/child care immunization reporting and assessment. For SIS to comply with immunization assessment and reporting requirements in Oregon, the SIS must follow the process detailed [here](#)<sup>1</sup>. It is highly recommended that SIS complete the approval process for assessment and reporting prior to following this Guide for data exchange. A list of SIS currently approved for assessing records and immunization reporting can be found [here](#)<sup>2</sup>.

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1

<https://www.oregon.gov/oha/PH/PREVENTIONWELLNESS/VACCINESIMMUNIZATION/GETTINGIMMUNIZED/Documents/SchCompSysReq.pdf>

2

<https://www.oregon.gov/oha/PH/PREVENTIONWELLNESS/VACCINESIMMUNIZATION/GETTINGIMMUNIZED/Documents/SchAppvComps.pdf>

### Intended Audience

The intended audience for this Guide is the technical group from the SIS team that must implement these guidelines. It is important to note that HL7 specifies the interface between two systems. It does not specify how any given system is implemented to accomplish the goals of messaging.

### About the IIS

ALERT IIS, at [www.alertiis.org](http://www.alertiis.org), is a statewide registry that records vaccinations administered in Oregon. Certain immunizations are required by Oregon law for children in attendance at public and private schools, preschools, child care facilities, and Head Start programs in Oregon. ALERT IIS provides consolidated immunization histories that Oregon educational institutions and childcare facilities use to determine students' vaccination statuses. Standardized HL7 messaging is the format for an SIS to exchange data with ALERT IIS. ALERT IIS is designed to accept HL7 messages in real-time through a web service.

### IIS participation

State law and Oregon Administrative Rules cover collection and release of information in ALERT IIS. By law, information is confidential and can only be shared with authorized users, including an individual's health care provider, school, childcare facility, insurer, local health department, the individuals themselves or their parent/guardian if the person is a minor. Information is confidential, and the law allows immunization providers to share immunization information with ALERT IIS without consent from the immunized party.

### SIS query messaging to ALERT IIS

This HL7 Guide covers the format and content requirements for sending HL7 messages to ALERT IIS and receiving back HL7 messages with student immunization history information. The guide represents the local (Oregon) implementation of the CDC's HL7 v2.5.1 Implementation Guide. This document specifies how HL7 file messages are constructed for the purposes of ALERT IIS. It covers only a small subset of the very extensive HL7 standard. Messages constructed from the guidelines in this document will fall within the HL7 standard for immunization specific messages. Construction and submission of other HL7 messages are beyond the scope of this document.

## SIS Guide to Setting Up Electronic Data Exchange with Oregon ALERT IIS

ALERT IIS is designed to send and receive real-time, bidirectional exchange via HL7 version 2.5.1 but does have the capacity to accept “lower”, or previous, versions of HL7. ALERT IIS staff will work with your team to support data exchange with your organization.

### Setting up Student Information Systems with data exchange with the IIS

To establish a data exchange interface with the IIS, the SIS complete the following steps:

1. Enroll as a data exchange partner using this [form](#).
2. Set up functionality to send queries to the IIS and receive immunization records via HL7 messaging.
3. Set up functionality to populate the student’s immunization record in the SIS from message received from the IIS. Examples include, but are not limited to:
  - A combination vaccine should populate the correct fields in the SIS. For example, a Measles/Mumps/Rubella/Varicella (MMRV) vaccine should populate the fields for MMR and Varicella.
  - New immunization dates from the IIS should integrate chronologically with the existing dates in the SIS record.
  - Dates should not be duplicated in the SIS record.
4. Determine frequency of queries. Will queries happen on a scheduled basis (e.g., overnight for all students), on an individual basis, or both.
5. Make sure auditing functionality is available so that the source of the immunization record is designated as ALERT IIS.

### Contact

Direct questions about HL7 messaging requirements and data exchange to the ALERT IIS Onboarding Analyst assigned to your project or contact the ALERT IIS data exchange team at [ALERT\\_DataExchange@odhsoha.oregon.gov](mailto:ALERT_DataExchange@odhsoha.oregon.gov)

## Web Services Supporting Data Exchange with ALERT IIS

This section is an excerpt from the [Real time data exchange guide](#)<sup>3</sup> and describes the communication process by which SIS securely exchange data with the IIS. SIS can collect student immunization histories from ALERT IIS via a secure and encrypted web communication process. In this process, data is exchanged with ALERT IIS, using HL7 version 2.5.1 through Web Service Description Language (WSDL) which is an XML based definition language used for describing the functionality of a SOAP<sup>4</sup>-based web service.

### Web Service Requests

In much the same way that one navigates to a website using an address (i.e., URL), web services requests are also made by specifying the URL at which the server hosts the web services. ALERT IIS web services are accessed using SOAP messages. If you consider website content (i.e., HTML) as the information transmitted within an HTTP/S communication, then a SOAP message is simply a different sort of content, intended for interpretation by methods on each host environment, rather than inside a web browser. SOAP-based web service communications must be handled in precise ways, as defined in a special file presented in WSDL<sup>5</sup> form.

A WSDL file is made available by a server which offers web services for consumption. The WSDL file tells the client what methods<sup>6</sup> are available, exactly how to access those methods, and what to expect, in response.

These services include methods for submission of immunization data and querying of patient history. The WSDL file contains all the information necessary for a client to invoke the methods of a web service, (such as the data types used as method parameters or return values, the individual methods names and signatures, the protocols and message formats allowed for each method, and the URLs used to access the web service).

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3

<https://www.oregon.gov/oha/PH/PREVENTIONWELLNESS/VACCINESIMMUNIZATION/ALERT/Documents/DataExchange/realtimespec.pdf>

<sup>4</sup> Simple Object Access Protocol

<sup>5</sup> Web Services Description Language

<sup>6</sup> A web service “method” is a generic term for a specific task which a client may ask the server to perform.



ALERT IIS web services implement the WSDL file promulgated by the CDC for standardization of IIS web service communications. This is known as the “common” WSDL file for IIS data exchange and is recommended for use by all web service clients<sup>7</sup>.

### Hosting Environment

In addition to the main, production hosting environment, configurations with ALERT IIS may be confirmed against the [NIST](#)<sup>8</sup> immunization test suite before being approved for the production environment. The NIST immunization test suite environment is used for set-up and confirmation of new or changed SIS client configurations.

### Service End Point

The web service URL is referred-to as an “end point.” Client SIS software<sup>9</sup> should be configured to connect to a specific web service “end point” according to the WSDL file they implement, and which hosting environment is to be accessed. The URL for the WSDL and endpoint for the ALERT IIS production environment is provided in the table below.

ALERT IIS Hosting Environment		
<b>Production Environment</b>	CDC WSDL	<a href="https://soa.alertiis.org/cdc-prd-webservices/client_Service?wsdl">https://soa.alertiis.org/cdc-prd-webservices/client_Service?wsdl</a>
	Endpoint	<a href="https://soa.alertiis.org/cdc-prd-webservices/client_Service">https://soa.alertiis.org/cdc-prd-webservices/client_Service</a>

### Connecting

Client SIS software connections must also be configured to authenticate with a valid username and password pair. These authentication credentials may be obtained by working directly with ALERT IIS Program staff, during the onboarding process.

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<sup>7</sup> Visit the CDC website at <https://www.cdc.gov/vaccines/programs/iis/technical-guidance/soap/services.html> for more details.

<sup>8</sup> <https://hl7v2-iz-r1.5-testing.nist.gov/iztool/#/home>

<sup>9</sup> For the purposes of this document, the term “client” refers to the web services client which is an application capable of sending and receiving SOAP messages to/from ALERT IIS.

### Sending Requests

Requests are sent to ALERT IIS web services host by means of HL7 data contained within SOAP messages. Requests from SIS are always a query to retrieve immunization histories.

Web services provide named “methods” for processing requests. The client SIS software indicates, in the request, which of the named methods are to be accessed. For the two possible WSDL files available for ALERT IIS web services, the method naming, and mode of access differs.

When using the CDC’s common WSDL file, a request is accessed by referring to a method, named **submitSingleMessage**.

The SOAP message sent as the request by an SIS will contain an HL7 message segment. The nature of the request is determined by the header (MSH) portion of the HL7 message segment which should indicate a QBP<sup>10</sup> type. The HL7 message segment contains the data necessary to perform the desired query operation.

There is another operation available for simply testing connectivity parameters, without making an actual request for a specific action. The method for this operation is named **connectivityTest**.

### Responses & Faults

If a successful connection to ALERT IIS web service host is made, the client SIS software may expect a response which indicates a completion status, and return data, if a query operation was requested. It is up to each individual implementation to process these responses.

Of particular importance are responses which indicate that the server encountered some manner of fault while attempting to process the incoming SOAP request message. There are three types of specific, known fault types which may be generated:

1. **Unsupported Operation**: the incoming request specified an operation (method type) which is not defined as part of the ALERT IIS – i.e., anything other than the named methods defined within each WSDL file.

2. **Security:** each request to the server must be authenticated using security credentials (username and password pair). A security fault is returned if authentication fails.
3. **Message Too Large:** the HL7 component of the request is longer than the maximum length allowed (as specified within the WSDL file).

In addition to these specific problems, if any other sort of SOAP fault is encountered during processing of the incoming request, the server will reply with an **Unknown** fault message.

### Troubleshooting

For problems which occur at the stage of processing successfully received requests, troubleshooting should be relatively straight-forward. The receipt of a SOAP fault message, returned from the server, will serve to eliminate connection problem as the fundamental issue, and provide useful insight into the nature of the problem. Typically, these problems will involve simple changes to values being sent by the client, within the request message. Other problems, however, may arise, wherein no-fault message is returned.

### Core Data Elements of an Immunization History

It is important that the following data elements are supported by both sender and receiver. Systems that support immunization information have a number of important responsibilities including:

- Consolidation of Immunization records from various sources
- Supplying consolidated immunization history to users
- Evaluating vaccine doses administered<sup>11</sup>
- Protecting the privacy of immunization data
- And many more

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<sup>10</sup> Request Immunization History (QPB-Q11)

<sup>11</sup> The ability to send in an HL7 message is required for systems that send output from clinical decisions support engines. The ability to consume is required for systems requesting evaluated history and forecast.

Each of these responsibilities requires specific data. The National Vaccine Advisory Committee (NVAC) has identified a core set of data elements to support these responsibilities. These core data elements have been used to determine the usage in this Guide. It is expected that systems that are using this Guide will be able to support these data elements and include them in a message. See Core Data Elements in Appendix B of the [CDC Guide for Immunization Messaging](#).

## HL7 Messaging Infrastructure

Health Level Seven (HL7) is a set of international standards used to provide guidance with transferring and sharing data between various healthcare providers. HL7 standards act as a bridge between modern healthcare services and advancing information technology. HL7 provides the necessary guidelines to help software vendors and healthcare providers to store and share data. This ensures that data can be integrated easily across systems, exposed in a cohesive manner, reducing administrative burden, while improving care delivery.

This section will contain a basic description of the terms and definitions, which are used in this document in order to understand the HL7 standard as it applies to immunization information systems.

The HL7 described in this Guide is consolidated from [Oregon](#)<sup>12</sup> and [national HL7 Version 2.5.1 requirements](#)<sup>13</sup> for Immunization Messaging. It focuses solely on messaging related to query from an SIS (requesting Immunization Histories) from ALERT IIS. ALERT IIS will send a response that will include receipt of query and/or immunization.

## HL7 Definitions

The terms below are organized to move from the message to subsequently more granular components.

**Message:** A message is the entire unit of data transferred between systems in a single transmission and is composed of segments, fields, components, and subcomponents. It is a series of segments in a sequence defined by the message specifications. These specifications are based on constraints to the HL7 specifications, as described in this Guide.

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<sup>12</sup>

<https://www.oregon.gov/oha/PH/PREVENTIONWELLNESS/VACCINESIMMUNIZATION/ALERT/Documents/DataExchange/ALERTDXImplementationGuide.pdf>

<sup>13</sup> <https://www.cdc.gov/vaccines/programs/iis/technical-guidance/downloads/hl7guide-1-5-2014-11.pdf>

Example:

Segment	Description
MSH ...	Message header
PID ...	Patient Identifier
QPD ...	Query Parameter Definition
RCP ...	Response Control Parameter

**Segment Group:** A segment group is a logical collection of segments. Segment groups defined within a message may be required or optional, may occur only once or may be allowed to repeat.

**Segment:** A segment is a logical grouping of data fields. Segments can be thought of as containers that group like kinds of data. These data are contained in a segment's fields. Segments within a defined message may be required or optional, may occur only once, or may be allowed to repeat. Each segment is named and is identified by a segment ID, a unique 3-character code.

Example:

PID|||12322^^^Assigning authority^MR^| | Lovage^Martha^^^^L^|  
*(This PID segment includes a medical record number and a person's name.)*

**Field:** A field is a string of characters and is of a specific data type. Each field is identified by the segment it is in and its position within the segment; e.g., PID-5 is the fifth field of the PID segment. A field is preceded by the delimiter called the field separator '|'.

**Component:** A component is one of a logical grouping of items that comprise the contents of a coded or composite field. Components are the data points within fields and they are separated with the delimiter called the component separator '^'. Within a field having several components, not all components are required to be valued. For example, the following snippet of RXA-5 code is composed of 6 components, each separated by a component separator.

Example: RXA-5 administered code is composed of 6 components

Code 1^text 1^code set 1^alternate code 2^alt text 2^alt code set 2

**Empty vs. Null fields:** An empty field should not overwrite previously entered data in the field, while the null value means that any previous value in this field should be overwritten. Not all fields contain data. Empty fields are indicated by field separators with nothing in between.

A null-valued field differs from an empty field. Null fields ("" ) should not be sent in immunization messages.

**Data type:** A data type restricts the contents and format of the data field. Some data types are coded or composite types with several components. The applicable data type is listed and defined in each field definition.

**Code Sets/Systems and Value sets:** Most data elements will have associated lists of acceptable values in tables supported by a standards organization such as HL7 or CDC. These code sets will include definitions to support common usage.

**Delimiters:** Delimiter characters are used to separate segments, fields and components in an HL7 message. The delimiter values are given in MSH-2 and used throughout the message. Applications must use agreed upon delimiters to parse the message. Messages used in this Guide shall use the following delimiters:

Delimiter Character	Description
<CR>	Segment Terminator
	Field Separator
^	Component Separator
&	Sub-Component Separator
~	Repetition Separator
\	Escape Character

**Message syntax:** Each message is defined in special notation that lists the segment 3-letter identifiers in the order they will appear in the message. Braces, {}, indicate that one or more of the enclosed group of segments may repeat, and brackets, [ ], indicate that the enclosed group of segments is optional. Note that segments may be nested within the braces and

brackets. This will indicate that the nested segments are units within a subgroup of segments. Their Usage is relative to the parent segment in the group.

## Basic Message Processing Rules

### Message Acknowledgement

The conversation between a sending system (SIS) and a receiving system (IIS) consists of a Message (QBP) and a response (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. The system receiving that RSP is not expected to respond back to that RSP. Receipt and processing of RSP messages has a number of significant benefits:

- Notification of errors and rejected data alerts sender that message has errors and may require correction
- Alerting sending user that the data did not get into the receiver's system

### Encoding Rules for Sending

1. Encode each segment in the order specified in the abstract message format.
2. Place the Segment ID first in the segment.
3. Precede each data field with the field separator.
4. Encode the data fields in the order and data type specified in the segment definition table.
5. End each segment with the segment terminator (carriage return).
6. Components, subcomponents, or repetitions that are not valued at the end of a field need not be represented by component separators. The data fields below, for example, are equivalent:

|^XXX&YYY&&^| is equal to|^XXX&YYY^| |ABC^DEF^^| is equal to |ABC^DEF|

7. Components, subcomponents, or repetitions that are not valued, but precede components, subcomponents or repetitions that are valued must be represented by appropriate separators. For example, the following CE data type element has the first triplicate empty and a populated second triplicate:

|^^^ABC^Text^Codesystem|

8. If a field allows repetition (Cardinality maximum > 1), then the length of the field applies to EACH repetition.
9. No field separator is required after the last required field unless other following fields have data. The presence of a field separator after the last required field is NOT an error and may be ignored.

### Determining Usage of Segments, Fields and Components

Many fields and segments in HL7 are optional. This guide tightens constraints on some fields to support functionality required for meaningful use of immunization data. The following lists the rules applied to the decisions used to determine usage in this Guide.

1. Any segment, field, or component that is required by HL7 standard is required or required but may be empty.
2. Any field or component that is a required National Vaccine Advisory Committee (NVAC) Core Data element is required or required but may be empty<sup>18</sup>.
3. Any segment that contains a required NVAC Core data element is required but may be empty.
4. Any segment, field, or component that is retained for backward compatibility in Version 2.5.1 SHALL be unsupported in this Guide.
5. Any segment, field, or component that is conditional but may be empty in Version 2.5.1 shall be conditional or conditional but may be empty in this Guide, unless this conflicts with 2 or 3 above. 6. All other fields will be left optional.

## HL7 Specifications for Acknowledgement, Query, and Response Messages

### ACK Messaging from the IIS

This section provides general information on what to expect in ACK messaging from the IIS. The ACK message is used to acknowledge and respond to queries (QBP messages) that cannot be processed to support response (RSP) messaging. ALERT IIS sends an ACK or RSP message for every HL7 submission. If your organization is an SIS, IT department or other transporting agency please ensure that your end user (the school staff) receive and have visibility to these messages, as there is important information conveyed from the IIS.



The ACK message will contain one the following indicators which is key to know if the message has been successfully processed or not (listed in order of severity):

- AA - Application Accept – Good message with no problems.
- AE - Application Error – One or more ERR segments returned with at most a severity of E for Error.
- AR - Application Reject

Within an ACK message, review MSA-1 for a summary indication of the IIS processing response and sender follow-up expectations; Review ERR segment(s) within the ACK for further detail related to

- ERR-2 (Error Location) indicates the location of the error in the incoming message.
- ERR-3 (HL7 Error Code) indicates the nature of the HL7 (communication) error. Typically, these errors relate to issues with the form at and technical content of the message rather than the clinical data in the message.
- ERR-4 (Severity) indicates if the error code being returned is informational, a warning or an error. The severity specifies the nature of the expected action in response to the error.
- ERR-5 (Application Error Code) indicates the nature of the error that occurred. Typically, these errors relate to issues with the clinical or administrative content of the message. Often, these errors are the result of applying local business rules to the data in the message.
- ERR-8 (User Message) transmits a text to further explain the nature of the error.

#### Supported Query Message Types/Profiles and Functions

Specific messaging types and profiles supported by the IIS are detailed in Tables 1 and 2.

**Table 1. Messages accepted by the IIS in data exchange with SIS**

Message type	Message profile	Description	Saved/stored by the IIS?
QBP	Z34	Query by parameter; Request complete immunization history	<b>Yes</b>
<p>❖ <b>Please Note:</b> Refusals, contraindications, immunity and adverse events are stored on the IIS user interface but not returned in query messages.</p> <p>❖ <b>Please Note:</b> Data is consumed into the IIS, however the actual HL7 messages are only available in the system for 30 days. After that time period they are archived.</p>			

**Table 2. Messages returned by the IIS in data exchange with SIS**

Message type	Message profile	Description	Returned by IIS?	ALERT IIS specific notes
RSP	Z32/Z42	Return complete immunization history: vaccination event(s)	Yes	
RSP	Z32/Z42	Return complete immunization history including partially administered dose(s)	Yes	
RSP	Z32/Z42	Return complete immunization history: patient with no vaccinations	Yes	
RSP	Z33	Return message indicating a patient match could not be found	Yes	The IIS will return when there are no patient matches found and when there are too many potential matches found. Response message is returned with 'NF' value, for 'Not Found'

### Summary of Oregon Query Messaging

Tables 3 and 4 below provide a snapshot summary of Oregon requirements for QBP messaging with the IIS. These tables highlight segment- and field-level elements where usage is constrained or where usage is relaxed. Optional elements in the National Guide constrained to not supported locally (O->X) are omitted, for brevity.

#### HL7 Application Conformance Tables: Symbol definitions

In the tables below, the columns labeled “National Guide Usage” and “ALERT IIS Usage” contain one of the following symbols: R, RE, or X. R = Required, RE = Required but may be empty, and X = Not supported in this guide.

**Table 3. List of field-level usage differences from the National Guide for QBP messaging, request complete immunization history (Z34)**

Segment	Seq	Element Name	National IG Usage	ALERT IIS Usage	ALERT IIS specific Notes
MSH	4	Sending Facility	RE	R	IIS will process both MSH-4 and MSH-22 if sent in a message
MSH	5	Receiving Application	RE	X	Ignored
MSH	6	Receiving Facility	RE	X	Ignored

RE = Required but may be empty, R= Required, X= Not supported in this guide

### QBP Messaging

Use the following specifications to produce QBP messages in compliance with Oregon ALERT IIS HL7 messaging requirements.

#### Oregon QBP segment requirements

Table 5 details segment-level requirements for QBP messaging. Oregon usage is only noted where it is different from the National Guide.

**Table 5. List of Oregon QBP segment requirements for query ID<sup>14</sup>**

Segment	Nat'l IG Cardinality	Nat'l IG Usage	Nat'l IG Conformance/ Value Set	ALERT IIS Usage*	ALERT IIS Conformance Notes
MSH – Message Header Segment	[1..1]	R			
QPD – Query Parameter Definition	[1..1]	R			
RCP – Response Control Parameter	[1..1]	R			

R= Required

\*Only noted if different from the National Guide.

*QBP segment notes*

- None

Oregon QBP: Z34 field requirements by segment (Request complete immunization history)

The following tables detail field-level requirements for QBP messaging, in particular, the Z34 profile, presented by segment.

Oregon usage is only noted where it is different from the National Guide.

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<sup>14</sup> Derived from Table 7-3, Request Complete Immunization History and Table 11-4, Request Evaluated Immunization History and Forecast in the National IG.

MSH – Message Header Segment

**Table 6. Local MSH field-level requirements for QBP messaging, request complete immunization history (Z34)<sup>15</sup>**

Seq	Element Name	Nat'l IG Cardinality	Nat'l IG Usage	Nat'l IG Conformance/ Value Set	Oregon Usage*	Local Conformance Notes
1	Field Separator	[1..1]	R	Shall be “ ”		
2	Encoding Characters	[1..1]	R	Shall be “^~\&”		
3	Sending Application	[0..1]	RE			
4	Sending Facility	[0..1]	RE			Shall be valued “ALERT IIS Organization ID (ALERT #)”  Please work directly with your Oregon Onboarding Data Exchange Analyst for the correct organizational Identification Number
5	Date/Time of Message	[1..1]	R	The degree of precision must be at least to the second, (format YYYYMMDDHHMMSS+/-ZZZZ)		
6	Message Type	[1..1]	R	Shall be “QBP^Q11^QBP_Q11”		
7	Message Control ID	[1..1]	R			
8	Processing ID	[1..1]	R			
9	Version ID	[1..1]	R	Shall be “2.5.1”		
10	Accept Acknowledgment Type	[1..1]	R	Shall be “ER”		

<sup>15</sup> Derived from Table 7-4, MSH Specification for Request Complete Immunization History in the National Guide.

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11	Application Acknowledgment Type	[1..1]	R	Shall be "AL"		
12	Message Profile Identifier	[1..*]	R	Shall be "Z34^CDCPHINVS"		
13	Sending Responsible Organization	[0..1]	RE			Shall be valued "ALERT IIS Organization ID (ALERT #)"  Please work directly with your Oregon Onboarding Data Exchange Analyst for the correct organizational Identification Number
14	Receiving Responsible Organization	[0..1]	RE			

RE = Required but may be empty, R= Required

\*Only noted if usage differs from the National Guide.

*QBP (Z34) MSH notes*

- MSH-4: The sending organization code (AL#, provided by ALERT IIS) unless there is no sending organization. If there is no sending organization, the school site level code (SC#, provided by ALERT IIS) must be sent in MSH-4. Ensure that each site has an established site agreement with ALERT IIS.
- MSH-9: Shall contain the constant value "QBP^Q11^QBP\_Q11"
- MSH-21: Shall contain the value "Z34^CDCPHINVS"
- MSH-22: **If** MSH-4 includes the sending organization code (AL#, provided by ALERT IIS), the school site level code (SC#, provided by ALERT IIS) must be sent in the MSH-22

*QBP (Z34) Example*

Request Immunization History  
For Bart Simpson, DOB: 01/01/1999 (QBP)

```
MSH|^~\&|MYEHR|ALXXXX|ALERT IIS|ALERT IIS|20060201000000-
0800||QBP^Q11^QBP_Q11|XX999938854000000232|P|2.5.1|||ER|AL|||Z34^CDCPHINVS|SCXXXX
QPD|Z34^Request Immunization
History^CDCPHINVS|querytag|01234^^^ORA^MR|SIMPSON^BART^A^^^L|Maiden^Mother^B^^^M|19990101|M|123 TEST
AVENUE^SUITE 5^TEST CITY^OR^33333^USA^H|^PRN^PH^^^333^3333333^333333|
RCP||5^RD&records&HL70126|R^real-time^HL70394
```

QPD – Query Parameter Definition

**Table 7. Oregon QPD field-level requirements for QBP messaging, request complete immunization history (Z34)<sup>16</sup>**

Seq	Element Name	Nat'l IG Cardinality	Nat'l IG Usage	Nat'l IG Conformance/ Value Set	Oregon Usage*	Local Conformance Notes
1	Message Query Name	[1..1]	R	Shall be "Z34^Request Immunization History^CDCPHINVS"		
2	Query Tag	[1..1]	R			
3	Patient List	[0..*]	RE			
4	Patient Name (PID-3)	[0..1]	RE			
5	Patient Mother Maiden Name (PID-6)	[0..1]	RE			
6	Patient Date of Birth (PID-7)	[0..1]	RE			
7	Patient Sex (PID-8)	[0..1]	RE	See HL70001		
8	Patient Address (PID-11)	[0..1]	RE			
9	Patient Home Phone (PID-13)	[0..1]	RE			

<sup>16</sup> Derived from Table 7-5, QPD Input Parameter Specification, Table 7-6 QPD Input Parameter Field Description and Commentary and accompanying notes in the National Guide.

Seq	Element Name	Nat'l IG Cardinality	Nat'l IG Usage	Nat'l IG Conformance/ Value Set	Oregon Usage*	Local Conformance Notes
10	Patient Multiple Birth Indicator (PID-24)	[0..1]	RE	See HL70136		
11	Patient Birth Order (PID-25)	[0..1]	RE			

RE = Required but may be empty, R= Required

\*Only noted if usage differs from the National IG.

*QBP (Z34) QPD notes*

- None

*QBP (Z34) Example*

Request Immunization History  
 For Bart Simpson, DOB: 01/01/1999 (QBP)

```
MSH|^~\&|MYEHR|ALXXXX|ALERT IIS|ALERT IIS|20060201000000-0800||QBP^Q11^QBP_Q11|XX999938854000000232|P|2.5.1|||ER|AL|||Z34^CDCPHINVS|SCXXXX
QPD|Z34^Request Immunization
History^CDCPHINVS|querytag|01234^^^ORA^MR|SIMPSON^BART^A^^^L|Maiden^Mother^B^^^M|19990101|M|123 TEST
AVENUE^SUITE 5^TEST CITY^OR^33333^USA^H|^PRN^PH^^^333^3333333^333333|
RCP|||5^RD&records&HL70126|R^real-time^HL70394
```

RCP – Response Control Parameter

The RCP segment is used to restrict the amount of data that should be returned in response to query. It lists the segments to be returned.

**Table 8. Oregon RCP field-level requirements for QBP messaging, request complete immunization history (Z34)<sup>17</sup>**

<sup>17</sup> Derived from Table 7-7, Response Control Parameter, and corresponding notes in the National Guide.



Seq	Element Name	Nat'l IG Cardinality	Nat'l IG Usage	Nat'l IG Conformance/ Value Set	Oregon Usage*	Local Conformance Notes
1	Query Priority	[0..1]	RE	Shall be "I"		
2	Quantity Limited Request	[0..1]	RE	See HL70126		

RE = Required but may be empty

\*Only noted if usage differs from the National Guide.

*QBP (Z34) RCP notes*

- RCP-1: Immediate priority is expected.
- RCP-2: This field may contain a maximum number of records that may be returned. The first component contains the count and the second contains "RD" for records.
  - ALERT IIS has a system limit of 10 maximum patients. If the value is 0 or >10, ALERT IIS will only send up to 10 patients.

## Response (RSP) Messaging from the IIS

This section provides general information on what to expect in RSP (Response) messaging from the IIS. The RSP message is used to respond to a query message (when the query message can be adequately processed for response).

ALERT IIS sends RSP message for every HL7 submission. If your organization is an SIS, IT department or other transporting agency please ensure that the administrative staff receive and have visibility to these messages, as there is important information conveyed from the IIS.

## Appendices

### Appendix A. Key Oregon Values and Codes

The following tables provide information about key values and codes accepted by ALERT IIS as well as additional information about IIS processing and use of these values/codes

#### Administrative sex – User-defined Table 0001

Use in PID-8 and NK1-15 to reflect self-reported gender.

**Table 12. Administrative sex values<sup>18</sup>**

Value	Nat'l Description	Saved/stored by IIS?	Oregon Notes
F	Female	Yes	
M	Male	Yes	
U	Unknown/ Undifferentiated	Yes	
X		No	<b>Please Note:</b> Oregon does NOT accept the X value at this time.

#### Immunization registry status – User-defined Table 0441

Use in PD1-16 to identify the status of the patient in relation to the sending provider organization.

**Table 13. Immunization registry status values<sup>19</sup>**

Value	Nat'l Description	Saved/stored by IIS?	Oregon Notes
A	Active	Yes	
I	Inactive - Unspecified	Yes	

<sup>18</sup> See User-defined Table 0001 – Sex within Appendix A of the National Guide.

<sup>19</sup> See User-defined Table 0441 – immunization registry status within Appendix A of the National Guide.

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L	Inactive – Lost to follow-up (cannot contact)	<b>Yes</b>	
M	Inactive – Moved or gone elsewhere (transferred)	<b>Yes</b>	
P	Inactive – Permanently inactive (do not re-activate or add new entries to this record)	<b>Yes</b>	
U	Unknown	<b>Yes</b>	

## Appendix B. Sample Messages

### Sample QBP messages

Request complete immunization history (Z-34)

```
MSH|^~\&|MYEHR|ALXXXX|ALERTIIS|^ISO|20211115141222||QBP^Q11^QBP_Q11|000  
000116|P|2.5.1|||NE|AL|||Z34^CDCPHINVS|SCXXX  
QPD|Z34^Request Immunization  
History^HL70471|1000110092|U1000110092^^^MR|Tester^Hobbs^^^^L||20000702|M  
|999 E BUTLER PLACE^^PORTLAND^OR^97035^^L  
RCP|||20^RD
```

## Appendix C. National and Oregon Immunization Data Exchange Resources

### Guidance, specifications, and codes

- [IIS Technical Guidance: HL7 Implementation](#)  
CDC webpage listing key resources for HL7 immunization messaging, including:
  - [HL7 Version 2.5.1 Implementation Guide for Immunization Messaging, Release 1.5, 2018 Update](#)
  - CDC and AIRA Standards and Interoperability Committee (SISC) guidance on HL7 immunization messages
  - National Institute of Standards and Technology (NIST) tools, including the [Immunization Test Suite](#)
- [IIS Technical Guidance: Transport \(SOAP\)](#)  
CDC webpage with information and specifications for using Simple Object Access Protocol (SOAP) web services to support transport of immunization data via HL7 messaging.
- [Immunization Data Code Sets](#)  
CDC webpage with current immunization-related code sets from the CDC. Included CVX codes, MVX codes, NDC crosswalk tables, and more. Subscribe to receive updates when codes are updated.

### Training and education

- [Technical Assistance Training Videos](#)  
Short videos from AIRA explaining several technical aspects of IIS and immunization data exchange, including Transport 101, SOAP WSDL 101, and NIST Test Suite.
- [IIS Learning Hub](#)  
Trainings, learning solutions and resources from the Public Health Informatics Institute for public health staff and partners supporting and using IIS. Includes eLearning modules on Fundamentals of IIS (addressing interoperability and HL7) and Advanced HL7. Also includes Quick Reference Guides on [Breaking Down an HL7 Message](#), [HL7 Messaging Acronyms](#), [HL7 Message Profiles](#), and [HL7 Conformance Specification Parameters](#).