



**New York City  
Department of Health and Mental Hygiene  
Citywide Immunization Registry**

**CIR HL7 Web Service  
Integration Guide for  
Immunization Transactions  
using HL7 version 2.3.1**

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HLN Consulting, LLC  
8449 Christopher Ridge Terrace  
San Diego, CA 92127  
<http://www.hln.com/>

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# 1 Introduction

## 1.1 Citywide Immunization Registry

The New York City (NYC) Department of Health and Mental Hygiene's (DOHMH) Citywide Immunization Registry (CIR) is an electronic resource which captures and consolidates demographic and immunization records for individuals in NYC.

Immunization records for individuals age 18 and under are required to be reported to the CIR by all healthcare providers in NYC. Immunization records for individuals age 19 and above can also be reported to the CIR with written consent from the patient. Providers may report these immunizations to the CIR in three ways – by using the Online Registry (OR) web application, by submitting an electronic file (UPIF), and by utilizing the CIR HL7 Web Service to perform real-time, bi-directional data exchange with the CIR via HL7 messages.

## 1.2 Purpose

The purpose of this document is to provide the reader with all of the information that they will need to modify their systems so that they can successfully interface with the CIR HL7 Web Service. Systems that are implemented in compliance with the specifications contained within this Integration Guide will be able to electronically report immunizations to the CIR and also query the CIR for a patient's immunization history and clinical decision support regarding recommendations for additional vaccinations.

## 1.3 Intended Audience

The CIR HL7 Web Service Integration Guide is written primarily for the developers and, secondarily, for the users of the electronic health record systems and other electronic systems that will interface with the CIR HL7 Web Service. These individuals and their organizations are collectively referred to as the CIR's HL7 data exchange partners.

This document assumes that the reader has a good understanding of the CDC's *Implementation Guide for Immunization Data Transactions using Version 2.3.1 of the Health Level Seven (HL7) Standard Protocol* as well as AIRA's *IIS Data Codebook*.

## 1.4 HL7

The American National Standards Institute (ANSI) Health Level Seven (HL7) standard is widely used for exchanging health care data. The full standard is extensive and a single application is not likely to use the full range of HL7 messages. The standard is designed to enable information exchange ranging from patient care, healthcare finance, and

healthcare administration information. The Centers for Disease Control and Prevention (CDC) together with public and private healthcare professionals and software developers have worked to define a set of messages that promote standardized exchange of immunization data.

### 1.4.1 CDC's Implementation Guide

The CDC's Implementation Guide for Immunization Data Transactions using Version 2.3.1 of the Health Level Seven (HL7) Standard Protocol, Version 2.2, June 2006, (<http://www.cdc.gov/vaccines/programs/iis/stds/downloads/hl7guide.pdf>) was developed and is maintained through the efforts of a diverse, dedicated workgroup comprised of Public Health professionals from jurisdictions throughout the United States in cooperation with the CDC, American Immunization Registry Association (AIRA), HL7, vendors, and other interested parties.

### 1.4.2 AIRA's IIS Data Codebook

In 2005, the American Immunization Registry Association (AIRA), in partnership with the CDC and National Immunization Program (NIP), began working on a standardized dictionary to support IIS data sharing, both among IIS systems and between IIS systems and physician office systems. The AIRA Data Definitions Workgroup developed an Excel spreadsheet titled *IIS Data Codebook* that illustrates and documents the collected data items used in the immunization information system (IIS) community. Within the spreadsheet, data elements are defined; standard encoding for each value is specified; and examples of usage are given. The spreadsheet is intended to be used in conjunction with the CDC's Implementation Guide for Immunization Data Transactions using Version 2.3.1 of the Health Level Seven (HL7) Standard Protocol.

### 1.4.3 Links to Resources

Links to downloadable copies of the CDC's Implementation Guide and AIRA's IIS Data Codebook can be found on the AIRA website ([http://www.immregistries.org/news/hit\\_index.phtml](http://www.immregistries.org/news/hit_index.phtml)).

The full HL7 Specification is available from the HL7 organization (<http://www.hl7.org>).

## 1.5 Compliance with the CDC Implementation Guide

The CIR HL7 Web Service and this Integration Guide are based on the CDC's *Implementation Guide for Immunization Data Transactions using Version 2.3.1 of the Health Level Seven (HL7) Standard Protocol*, Implementation Guide Version 2.2, June 2006 as well as the AIRA *IIS Data Codebook* spreadsheet version 02/12/2007, both of which were described above. The CIR HL7 Web Service is designed to support

Immunization Data Transaction Messages as defined in the CDC's Implementation Guide with only minor deviations that were made in order to satisfy DOHMH specific requirements. This Integration Guide does not seek to repeat all of the information contained in the CDC's Implementation Guide. However, to the extent that the CIR HL7 Web Service deviates from the CDC's Implementation Guide, those details are included in this document.

## 1.6 Supported HL7 Message Types

The table below identifies the types of HL7 request and response messages that the CIR HL7 Web Service will support.

<b>HL7 Request Message</b>	<b>HL7 Response Messages</b>
<b>VXQ</b> - Query for Vaccination Record	<b>ACK</b> - General Acknowledgement; used to communicate errors.
	<b>QCK</b> - Query General Acknowledgement; used to communicate that no patient match was found.
	<b>VXR</b> - Vaccination Response; used to send back the matching patient record along with their immunization history and immunization recommendations.
<b>HL7 Request Message</b>	<b>HL7 Response Messages</b>
<b>VXU</b> - Unsolicited Vaccine Record Update	<b>ACK</b> - General Acknowledgement; used to communicate errors, when applicable, and the CIR patient ID if the update succeeds.

## 2 CIR HL7 Web Service Overview

### 2.1 Operations

The CIR HL7 Web Service is actually a collection of four separate operations that can be utilized by HL7 data exchanges partners. The names of the operations and their purposes are listed below.

Operation	Purpose
Web Services Description Language (WSDL)	For obtaining the Web Services Description Language definition of the CIR HL7 Web Service interface
Ping	For verifying that the CIR HL7 Web Service is accessible to the HL7 data exchange partner
SubmitPatientImmRecord	For submitting a VXU message (i.e., an Unsolicited Vaccine Record Update) and receiving an ACK message in response
QueryPatientImmRecord	For submitting a VXQ message (i.e., a Query for Vaccination Record) and receiving a VXR, QCK, or ACK message in response

The generic term “CIR HL7 Web Service” is utilized throughout this document in place of the more specific names of the individual operations. However, it should always be clear from the context which operation is being referred to. Although the four operations share some common infrastructure and attributes, such as security and authentication, there is no generic “CIR HL7 Web Service” operation. The CIR HL7 Web Service’s functionality is limited to the four operations listed above. The bulk of this document describes the SubmitPatientImmRecord operation, the QueryPatientImmRecord operation, and the messages that those operations process.

### 2.2 Web Services Description Language Operation

The Web Services Description Language operation returns the WSDL definition for the CIR HL7 Web Service and all of the operations that it supports.

See Appendix A for a copy of the WSDL.

### 2.3 Ping Operation

The Ping operation returns to the HL7 data exchange partner whatever text string the partner submits to the operation, appended with a statement of the date and time that the message was received by the service. The purpose of this operation is to enable calling systems to verify that they are able to connect to the CIR HL7 Web Service.

If a calling system receives an echo of the data that it submitted to this operation, then it confirms all of the following conditions:

- There is network connectivity between the partner's system and the CIR HL7 Web Service.
- The CIR HL7 Web Service is up and running.
- The partner's system is correctly authenticating itself to the CIR HL7 Web Service.

## 2.4 SubmitPatientImmRecord Operation

### 2.4.1 Overview

The CIR HL7 Web Service supports the processing of VXU messages via the SubmitPatientImmRecord operation. This operation takes as input an HL7 formatted VXU message as described in the sections below. This operation always returns an HL7 formatted ACK message in response to a VXU message:

- If the CIR HL7 Web Service successfully inserts or updates the Patient and their immunizations, this operation will return an HL7 formatted ACK message that contains the CIR's patient ID (also referred to as the Local Registry ID).
- If the CIR HL7 Web Service encounters errors during the processing of the VXU message, this operation will return an HL7 formatted ACK message that describes the errors.

HL7 data exchange partners can utilize VXU messages to report (i.e., add) immunizations to the CIR and also to request that the CIR delete immunizations that the partner had previously reported to the CIR. One immunization can be reported or deleted per RXA segment. Each VXU segment can have multiple RXA segments. HLN data exchange partners must utilize the RXA-21 field of each RXA segment to denote whether that RXA segment's immunization is being reported or deleted. When processing a VXU message, the CIR HL7 Web Service first processes all RXA segments that are for deleting an immunization and then processes all RXA segments that are for reporting an immunization.

The CIR HL7 Web Service does not support requests to update previously reported immunizations; however, HL7 data exchange partners can effectively perform an update by sending a message that both deletes the previously reported immunization and reports the updated immunization.

## 2.4.2 Reporting Immunizations

VXU messages are most commonly used to report immunizations to the CIR. To report an immunization, HL7 data exchange partners should set the value of the RXA-21 field to the HL7 code “A” (for Add). When the CIR HL7 Web Service receives the VXU message, it validates the message, searches for the existing patient (if any), creates a new patient (if none exists), inserts any new immunizations for that patient, and ignores any duplicate immunizations.

## 2.4.3 Deleting Previously Reported Immunizations

VXU messages can also be used to request that the CIR delete immunizations that the HL7 partner had previously reported to the CIR. HL7 data exchange partners must set the value of the RXA-21 field to the HL7 code “D” (for Delete) to request that the CIR delete a previously reported immunization that matches the patient, the vaccine, and the administered date that are specified by the RXA segment.

If a matching immunization is found and if that matching immunization had been previously reported by a facility having the same CIR issued facility ID that is specified in RXA-11.4.1 of the VXU message, then the CIR HL7 Web Service will delete the immunization from the CIR database.

If a matching immunization is found but that matching immunization had been previously reported by a facility that is different from the facility that is specified in the RXA-11.4.1 field, then the immunization will not be automatically deleted. Instead, the CIR HL7 Web Service sends an alert to CIR staff that will eventually review the request and then process it if appropriate. Within the MSA-3 field of the ACK response message, the CIR HL7 Web Service will include a deletion exception indicating the immunization delete request is under review.

If a matching immunization is not found, then the CIR HL7 Web Service ignores the corresponding RXA segment but continues processing any other RXA segments that are a part of that VXU message. Within the MSA-3 field of the ACK response message, the CIR HL7 Web Service will include a not found exception indicating the immunizations that were not found and therefore could not be deleted.

## 2.4.4 Updating Previously Reported Immunizations

HL7 data exchange partners can effectively perform an update by sending a VXU message that contains both an RXA segment that deletes a previously reported immunization and an RXA segment reporting the immunization that should replace it.

## 2.4.5 Responses to VXU Messages

Regardless of whether the HL7 data exchange partner sent a VXU message to delete an immunization, to report an immunization, or to do both, the SubmitPatientImmRecord operation will send one of two possible response messages to the HL7 data exchange partner:

- If the VXU is processed successfully:
  - The SubmitPatientImmRecord operation sends an ACK response whose MSA-3 field contains the CIR ID of the relevant patient record.
    - The HL7 data exchange partner system should store that CIR ID with the patient record and include that CIR ID (i.e., Local Registry ID) in future VXU and VXQ messages to decrease the time that it takes for the web service to process the messages and respond.
  - Under certain circumstances, a patient's CIR ID may change. The CIR HL7 Web Service will always send the most current CIR ID in the ACK response message; therefore, the CIR ID returned by the CIR HL7 Web Service within the ACK may be different from the CIR ID that the HL7 data exchange partner submitted in the VXU message.
    - The HL7 data exchange partner system should replace its existing CIR ID reference with the new CIR ID that was communicated within the ACK message.
  - If any non-fatal errors occur during processing, the ACK response message will also include information about each of the non-fatal errors in the MSA and ERR segments.
- If a fatal error occurs during processing, the SubmitPatientImmRecord operation instead sends an ACK response containing a message describing the error in the MSA and ERR segments.

## 2.5 QueryPatientImmRecords Operation

### 2.5.1 Overview

The CIR HL7 Web Service supports the processing of VXQ messages via the QueryPatientImmRecords operation. This operation takes as input an HL7 formatted VXQ message as described in the sections below. This operation always returns one of three message types in response to a VXQ message – a VXR, QCK, or ACK message:

- If the CIR HL7 Web Service locates exactly one matching patient, the interface will return an HL7 formatted VXR message that contains the CIR's patient ID, the patient's immunization history including an indicator of any immunizations that are determined to be invalid, and the recommended vaccinations including due date. Any non-fatal errors will be reported in the MSA segment.
- If the CIR HL7 Web Service cannot locate any matching patients or locates

- multiple matching patients, the interface will return an HL7 formatted QCK message. Any non-fatal errors will be reported in the MSA and ERR segments.
- If the CIR HL7 Web Service encounters fatal errors during the processing of the VXQ message, the interface will return an HL7 formatted ACK message that contains the details of the fatal errors, as well as any non-fatal errors, in the MSA and ERR segments.

## 2.5.2 Querying for Immunization History and Recommendations

VXQ messages are used to query the CIR for a patient's immunization history and immunization recommendations. The CIR has a sophisticated immunization algorithm based on the ACIP schedule that calculates immunization recommendations based on the patient's history of immunizations in the CIR database.

## 2.5.3 Responses to VXQ Messages

The QueryPatientImmRecords operation will send one of three possible response messages to the HL7 data exchange partner:

- If the CIR HL7 Web Service finds a single matching patient, then it returns a VXR message echoing back the query data submitted in the VXQ and containing the patient information listed below. In addition, if any non-fatal errors occur during processing, the VXR response message will also include information about each of the non-fatal errors in the MSA segment.
  - CIR ID
    - The HL7 data exchange partner system should store that CIR ID with the patient record and include that CIR ID in future VXU and VXQ messages to decrease the time that it takes for the web service to process the messages and respond.
  - First Name
  - Middle Name
  - Last Name
  - Date of Birth
  - Gender
  - Immunization History
    - If a patient has immunization history, the VXR will include an RXA segment for each immunization.
      - The RXA segment will include the administration date, vaccine code, and vaccine description.
      - If available, the RXA segment will also include the lot number, expiration date, and manufacturer associated with the immunization.
      - Each RXA segment will be followed by one or more OBX segments.
        - If an immunization is a multi-component vaccine,

an OBX will be included for each component. The OBX Set ID will be “1” for the first OBX segment and increment by 1 for each additional OBX associated with the multi-component vaccine.

- If the immunization is not a multi-component vaccine only one OBX segment will follow the RXA segment.
- In addition, for the fourteen vaccine groups that the CIR currently evaluates, if any immunization component is considered **not** valid based on the schedule for that vaccine, the OBX segment for the specific vaccine component will be followed by an NTE segment identifying the reason the component is invalid. For an example of this, see Example #4 in section 8.9.
- If a patient does **not** have an immunization history, the VXR will contain an RXA segment stating “no vaccine administered”.

Example:

```
RXA|0|999|20081223|20081223|998^no vaccine
administered^CVX|999|
```

- Immunization Recommendations
  - Recommendation data for the thirteen vaccine groups that the CIR currently evaluates will display in OBX segments at the end of the VXR following the immunization history. Each recommendation OBX segment will have an OBX Set ID of “0”. The recommendation data for each vaccine group will display in multiple OBX segments and will contain, along with other data, the vaccine code, the recommendation, and, when applicable, the date due.
- If the CIR HL7 Web Service is unable to find any matching patients or if it finds two or more matching patients, then it returns a QCK message indicating that no patient was found. If the CIR HL7 Web Service encounters any non-fatal errors during the processing, the QCK response message will also include information about each of the non-fatal errors in the MSA and ERR segments.
- If the CIR HL7 Web Service encounters fatal errors during the processing of the VXQ message, the interface will return an HL7 formatted ACK message that contains the details of the fatal errors, as well as any non-fatal errors, in the MSA and ERR segments.

## 2.6 Repeating Fields

Except where explicitly indicated otherwise, repeating fields are NOT supported. Although there are some exceptions that are explicitly described below, in general, the CIR HL7 Web Service processes the first field in a list of repeating fields and ignores the subsequent repeating fields.

## 2.7 Special Characters and Escape Sequences

The CIR's HL7 Data Exchange Partners must specify the special characters that their VXU and VXQ messages will utilize in the MSH-1 and MSH-2 fields of those same messages. CIR strongly recommends that the data exchange partners utilize the following special characters:

Special Character	Recommended Character
Escape character	\
Field separator	
Repetition separator	~
Component separator	^
Subcomponent separator	&

Special characters that are utilized within HL7 messages as separators (also referred to as delimiters) should not be included within those same HL7 messages as data because their presence would interfere with the parsing of the message. If an HL7 message does contain one of these special delimiter characters as part of the message content (e.g., an ampersand as part of an address: "Apartment A & B"), then the HL7 data exchange partner must utilize a special escape sequence to indicate that the character is a text character and not a delimiter; otherwise, the CIR HL7 Web Service cannot distinguish between the delimiter character and a character that is part of the text.

In order to include any one of these special characters as data within an HL7 message, those characters must be converted into a predefined sequence of characters that begin and end with the escape character "\". HL7 data exchange partners should utilize the table below to convert special characters into escape sequences when creating outbound messages to the CIR HL7 Web Service and to convert escape sequences to special characters when parsing inbound messages from the CIR HL7 Web Service:

Special Character	Recommended Character	Escape Sequence
Escape character	\	\E\
Field separator		\F\
Repetition separator	~	\R\
Component separator	^	\S\
Subcomponent separator	&	\T\

In the example below, the MSH-2 field indicates that "&" is the subcomponent separator so, in the PID-11 address field, "&" has been replaced with the escape sequence "\T\" to indicate that "&" is part of the message text rather than a subcomponent separator:

```
MSH|^~\&| PATIENTS1ST1.1|8888P22|||20110415112100||VXU^V04|113|P|2.3.1|||AL|
PID|||Smith^Tom||20080208|M|||100 Main Street^Apt A \T\ B^Anytown^NY^12345
```

## 2.8 Error Handling and Reporting

### 2.8.1 Security Fault Exception

If the data exchange partner uses the identify key version of the Web Service's interface as specified in the *Security* section of this document and does not provide a valid identity key when invoking the Web Service, then the Web Service will immediately return a Security Fault Exception without processing the HL7 message. The Security Fault Exception will be returned as an XML string, not an HL7 message. Please see *Appendix A* for a sample Security Fault Exception.

### 2.8.2 Axis Fault Exception

If a runtime error or unexpected event occurs at any point (e.g., the CIR database server goes offline), the Web Service will return an Axis Fault Exception. The Axis Fault Exception will be returned as an XML string, not an HL7 message. Please see *Appendix A* for a sample Axis Fault Exception.

### 2.8.3 HL7 Message Errors

The CIR HL7 Web Service will carefully validate every VXU and VXQ message that it processes in order to identify any errors with the content or format of the data values that the message contains. The CIR HL7 Web Service will classify the HL7 message errors as either "Fatal Errors" or "Non-Fatal Errors". Fatal errors will result in the rejection of the entire VXU or VXQ message, unless the fatal error occurs within the RXA segment of a VXU message. If the fatal error occurs within an RXA segment of a VXU message, then only the RXA segment that contains the fatal error will be rejected and any other RXA segments in that message will be processed. Non-Fatal errors will never cause a message to be rejected. In the response message that the CIR HL7 Web Service sends back to the data exchange partner, the web service will always list all of the fatal and non-fatal errors that it found in the submitted message.

#### 2.8.3.1 Fatal Errors

The CIR HL7 Web Service will reject any message or RXA segment which has any of the following fatal errors:

- The message is not formatted as a valid HL7 2.3.1 message.
- The message is missing a required segment or field.
- There is an invalid data type (e.g., there is alphanumeric data in a date field) in a required field.
- There is an invalid data code value (e.g., there is a CPT code rather than a CVX code in the RXA-5 field used to identify the vaccine type) in a required field.

- The message violates one of the validation rules which this document specifies would result in a Fatal Error. For example, the *Segment Definitions* section of this document states that if MSH-4 does not contain a valid Facility Code that was issued by the CIR, then this is a Fatal Error. This means that a message with a missing Facility Code would be rejected.
- An internal trappable runtime error occurs.

If there are any fatal errors in a VXQ message or any segment of a VXU message other than the RXA segment, then the CIR HL7 Web Service will reject that message entirely and will respond with an ACK error message. The MSA-1 field will be set to “AE” to indicate that there were fatal errors and those errors will be reported in the ERR segment in accordance with HL7 standards. In addition, the CIR HL7 Web Service will also utilize the MSA-3 free text field to report those same errors in a more user-friendly format based on a proprietary standard. See the discussion of the MSA and ERR segments in the *Segment Definition* section of this document for further details.

If the only fatal errors of a VXU message occur within the RXA segment(s) of the message, then the CIR HL7 Web Service will reject the RXA segments that contain the fatal errors, but will process the other RXA segments of the message. If the VXU message contains only one RXA segment and that RXA segment has fatal errors, the message will be rejected and the errors will be reported in the ERR segment in accordance with HL7 standards. In addition, the CIR HL7 Web Service will also utilize the MSA-3 free text field to report those same errors in a more user-friendly format based on a proprietary standard. See the discussion of the MSA and ERR segments in the *Segment Definition* section of this document for further details.

### 2.8.3.2 Non-Fatal Error

If there are any non-fatal errors in either a VXU or VXQ message, such as an invalid data type in an optional field or an invalid data code value in an optional field, the CIR HL7 Web Service will ignore those erroneous optional fields but will process the rest of that message. The non-fatal errors will not cause the CIR HL7 Web Service to reject the message. However, those non-fatal errors will be reported in both the ERR segment and the MSA-3 field of the CIR HL7 Web Service’s response message in order to facilitate the HL7 data exchange partner’s integration testing of their system with the CIR HL7 Web Service and to promote data quality. See the discussion of the MSA and ERR segments in the *Segment Definition* section of this document for further details.

## 2.9 Support for HTTP GET and HTTP POST

The CIR HL7 Web Service will support HTTP GET for development and troubleshooting. However, for security reasons, Production deployments of the web service will only support HTTP POST. Furthermore, all HLN system testing and user acceptance testing must be performed utilizing HTTP POST in order to simulate the Production environment.

## 2.10 Reliability

When sending a message, the HL7 data exchange partner should use the HTTP protocol to determine if the message has reached the CIR HL7 Web Service. If the message reached its destination the sender will receive an “HTTP 200 OK” status code as a response.

### 2.10.1 Guidelines for Resending VXU Messages

After sending a VXU message to the CIR HL7 Web Service, HL7 data exchange partners should check for an “HTTP 200:OK” acknowledgement.

If the data exchange partner does not receive the “HTTP 200 OK” acknowledgement, then it means that the CIR HL7 Web Service may not have received the VXU message and the partner can resend the VXU message if so desired. However, the data exchange partner must assign a new unique Message Control ID to MSH-10 of any messages that it resubmits so that resubmitted messages can be distinguished from previous messages.

If the data exchange partner does receive the “HTTP 200 OK” acknowledgement, then it means that the CIR HL7 Web Service received the VXU request and the data exchange partner should wait for the web service to send an ACK message response. If the data exchange partner does not eventually receive an ACK, the data exchange partner must resubmit the message because all immunizations must be reported to the CIR. There is no limit to the number of times that a VXU message can be resent. However, it is recommended that data exchanges partners wait at least 10 seconds before resubmitting VXU messages. The data exchange partner must assign a new unique Message Control ID to MSH-10 of any messages that it resubmits so that resubmitted messages can be distinguished from previous messages.

### 2.10.2 Guidelines for Resending VXQ Messages

After sending a VXQ message to the CIR HL7 Web Service, HL7 data exchange partners should check for an “HTTP 200 OK” acknowledgement.

If the data exchange partner does not receive the “HTTP 200 OK” acknowledgement, then it means that the CIR HL7 Web Service may not have received the VXQ message and the partner can resend the VXQ message if so desired. However, the data exchange partner must assign a new unique Message Control ID to the MSH-10 field of any messages that it resubmits so that resubmitted messages can be distinguished from previous messages.

If the data exchange partner does receive the “HTTP 200 OK” acknowledgement, then it means that the CIR HL7 Web Service received the VXQ request and the data exchange partner should wait for the CIR HL7 Web Service to send a VXR, QCK, or ACK message response. If the data exchange partner does not receive a VXR, QCK, or ACK

within 10 seconds, the data exchange partner may resubmit the message if so desired. However, the data exchange partner must assign a new unique Message Control ID to the MSH-10 field of any messages that it resubmits so that resubmitted messages can be distinguished from previous messages. VXQ messages should not be resubmitted more than two times (for a total of 3 message submissions) in any ten minute period.

## 2.11 Performance

It is strongly recommended that the CIR's HL7 data exchange partners include the following patient identifiers in their VXU messages and VXQ messages because it will significantly decrease the time that it takes for the CIR HL7 Web Service to process and respond to the messages:

- Local Registry ID
- Medicaid Number
- Medical Record Number

Note that the Local Registry ID must be used to communicate the CIR's unique identifier (CIR ID) for the patient. The CIR HL7 Web Service will transmit the Local Registry ID back to the HL7 data exchange partner via a VXR message in response to a VXQ message and also via an ACK message in response to a VXU message. The details of this are noted in the sections that follow. The HL7 data exchange partner should therefore make arrangements to store the Local Registry ID with their patient records and to include that identifier in subsequent VXU and VXQ messages.

## 3 Security

HL7 data exchange partners will not be able to access the CIR HL7 Web Service until they implement support for one of the three security models described in this section. CIR's preference is that the HL7 data exchange partners implement the HTTP basic authentication with X.509 client certificate security model if possible.

### 3.1 HTTP Basic Authentication with X.509 Client Certificate

For each HL7 data exchange partner using this security model, the CIR will issue an X.509 digital certificate using Open SSL as well as a username and password. CIR will deliver these to the HL7 data exchange partner through a secure channel and the partner will configure these within their EMR software. The Certificate's common name (CN) should be unique per facility code.

If two or more partners will be sharing the same EMR software and server and wish to configure their EMR software to share their certificate, username and password for ease of deployment, they can do that; however, RXA-11 of each VXU message should always be populated with the facility code of the facility that actually administered the vaccination.

When the DOH-APP server receives the client certificate, it will verify that the client is presenting a certificate which has been issued and signed by the CIR certificate authority. The Apache server will then require the requestor to perform HTTP Basic Authentication with the CIR supplied username and password. After Apache authenticates the requestor, the request will be forwarded to the Tomcat Axis2 CIR HL7 Web Service where it will read the REMOTE\_USER variable and track the requestor throughout the life cycle of the request.

### 3.2 Web Service Authentication with X.509 Client Certificate and Identity Key

For each HL7 data exchange partner using this security model, the CIR will issue an X.509 digital certificate using Open SSL as well as a 32 character hexadecimal Identity Key. CIR will deliver these to the HL7 data exchange partner through a secure channel and the partner will configure these within their EMR software. The Certificate's common name (CN) should be unique per facility code.

If two or more partners will be sharing the same EMR software and server and wish to configure their EMR software to share their certificate, username and password for ease of deployment, they can do that; however, RXA-11 of each VXU message should always be populated with the facility code of the facility that actually administered the vaccination.

When the DOH-APP server receives the client certificate, it will verify that the client is presenting a certificate which has been issued and signed by the CIR certificate authority. The Apache server will then set a request header to the CIR HL7 Web Service with the certificate common name. Apache simply forwards the request to the CIR HL7 Web Service. The HL7 data exchange partner passes the Identity Key as an argument to every CIR HL7 Web Service method call to verify that the common name set in the request header is associated with the Identity Key.

### 3.3 HTTP Basic Authentication with Identity Key

For each HL7 data exchange partner using this security model, the CIR will issue a username and password and a 32 character hexadecimal Identify Key. CIR will deliver these to the HL7 data exchange partner through a secure channel and the partner will configure these within their EMR software.

If two or more partners will be sharing the same EMR software and server and wish to configure their EMR software to share their username, password, and Identity Key for ease of deployment, they can do that; however, RXA-11 of each VXU message should always be populated with the facility code of the facility that actually administered the vaccination.

HTTP Basic Authentication is required by Apache for the CIR HL7 Web Service which forwards the request along with the REMOTE\_USER variable set to the CIR HL7 Web Service when provided a valid username and password. The HL7 data exchange partner passes the Identity Key as an argument to every CIR HL7 Web Service method call which will verify that the REMOTE\_USER is the user associated with the Identity Key.

## 4 Recommended Usage of CIR HL7 Web Service

Providers are required to submit immunizations to the CIR; therefore, it is recommended that HL7 Partner Systems send a VXU each time a vaccination is recorded. In addition to the new dose(s), NYC DOHMH also recommends HL7 Partner Systems send the entire patient history. Once the VXU is sent, the HL7 Partner System should wait for a response from the CIR HL7 Web Service.

If an acknowledgement is received letting the HL7 Partner System know that the VXU message was successfully received by the CIR HL7 Web Service, a VXQ can then be sent to obtain the patient's immunization history and current vaccination recommendations. If the VXQ message is successful, a VXR message will be returned that includes the immunizations given at your facility as well as immunizations given at other provider facilities, vaccine recommendations, and the patient's CIR ID. In addition to returning the immunization history (i.e., vaccine code and administration date), the service will also indicate whether each dose is valid or invalid. For doses that are invalid, an explanation for that determination will be supplied as well. The HL7 Partner System should store the CIR ID with the patient record so that this ID can be used as the Local Registry ID during future communications with the CIR HL7 Web Service. Also, NYC DOHMH recommends that you update the patient's record to reflect the immunizations given by other providers, marking them as historical records.

If an HL7 Partner System receives an ACK with errors in response to a VXU, the error condition must be resolved before sending a VXQ; otherwise, recommendations in the VXR may not be correct as they would not be based on the most current immunization information. If a VXQ is sent without first resolving the errors within the VXU, recommendations received in the VXR should be ignored.

## 5 Message Definitions

### 5.1 VXU Message

The table below specifies which VXU message segments the CIR HL7 Web Service will process, if present, and which segments will be ignored. For each of the segments that are processed, please refer to the *Segment Definitions* section of this document for additional details.

VXU Unsolicited Vaccination Update	Processed by CIR HL7Web Service
<b><i>MSH Message Header Segment</i></b>	<b><i>Yes</i></b>
<b><i>PID Patient Identification Segment</i></b>	<b><i>Yes</i></b>
[PD1] Additional Demographics	No
<b><i>[{NK1} ] Next of Kin/Associated Parties</i></b>	<b><i>Yes</i></b>
<b><i>[PV1] Patient Visit</i></b>	<b><i>Yes</i></b>
[PV2] ] Patient Visit Additional Information	No
[{IN1 Insurance	No
[IN2] Insurance Additional Information	No
[IN3] Insurance Additional Information-Cert.	No
}]	
{ [ORC] Common Order Segment	No
<b><i>RXA Pharmacy Administration</i></b>	<b><i>Yes</i></b>
[RXR] Pharmacy Route	No
[{OBX Observation/Result	No
[{NTE} ] Notes (Regarding Immunization) } ]	No
}	

## 5.2 VXQ Message

The table below specifies which VXQ message segments the CIR HL7 Web Service will process if present, and which segments will be ignored. For each of the segments that are processed, please refer to the *Segment Definitions* section of this document for additional details.

<b>VXQ Vaccination Query</b>	<b>Processed by NYC DOHMH CIR HL7 Web Service</b>
<i>MSH Message Header Segment</i>	<i>Yes</i>
<i>QRD Query Definition Segment</i>	<i>Yes</i>
<i>[QRF] Query Filter Segment</i>	<i>Yes</i>
<i>ZGR Z-Segment for Gender</i>	<i>Yes</i>

## 5.3 VXR Message

The table below specifies which VXR message segments the CIR HL7 Web Service will populate, if applicable, and which segments will always be omitted. For each of the segments that are processed, please refer to the *Segment Definitions* section of this document for additional details.

<b>VXR Response to Vaccination Query</b>	<b>Returned by NYC DOHMH CIR HL7 Web Service</b>
<i>MSH Message Header Segment</i>	<i>Yes</i>
<i>MSA Message Acknowledgement Segment</i>	<i>Yes</i>
<i>QRD Query Definition Segment</i>	<i>Yes</i>
<i>[QRF] QueryFilter Segment</i>	<i>Yes</i>
<i>PID Patient Identification Segment</i>	<i>Yes</i>
[PD1] Additional Demographics	No
[{NK1} ] Next of Kin/Associated Parties	No
[PV1] Patient Visit	No
[PV2] ] Patient Visit Additional Information	No
[{IN1 Insurance	No
[IN2] Insurance Additional Information	No
[IN3] Insurance Additional Information-Cert.	No
}}	
[ { [ORC] Common Order Segment	No

VXR Response to Vaccination Query	Returned by NYC DOHMH CIR HL7 Web Service
<i>RXA Pharmacy Administration</i>	<i>Yes</i>
[RXR] Pharmacy Route	No
<i>[[OBX Observation/Result</i>	<i>Yes</i>
<i>[[NTE] ] Notes (Regarding Immunization) ]]</i>	<i>Yes</i>
}	

## 5.4 QCK Message

The table below specifies which QCK message segments the CIR HL7 Web Service will populate. For each of the segments that are processed, please refer to the *Segment Definitions* section of this document for additional details.

QCK Query General Acknowledgment	Provided by NYC DOHMH CIR HL7 Web Service
<i>MSH Message Header</i>	<i>Yes</i>
<i>MSA Message Acknowledgment</i>	<i>Yes</i>
<i>QAK Query Acknowledgment Segment</i>	<i>Yes</i>

## 5.5 ACK Message

The table below specifies which ACK message segments the CIR HL7 Web Service will populate. For each of the segments that are processed, please refer to the *Segment Definitions* section of this document for additional details.

ACK General Acknowledgment	Provided by NYC DOHMH CIR HL7 Web Service
<i>MSH Message Header</i>	<i>Yes</i>
<i>MSA Message Acknowledgment</i>	<i>Yes</i>
<i>[ERR]</i>	<i>Yes</i>

## 6 Segment Definitions

### 6.1 Definitions

Each of the 13 segment definition tables in this section defines a message segment (e.g., PID, RXA, OBX, etc.). Many of the segments are either required or optional components of two or more of the message types that the CIR HL7 Web Service can receive or send (i.e., VXU, VXQ, VXR, QCK, and ACK). Above each segment definition table is a list of the different message types to which the defined segment may belong. Each segment definition table contains several columns of data to define the relevant segment. The name and purpose of each column is described below:

- **Segment / Field Reference** – HL7’s abbreviated reference for the segment and field. Example: “PID-3” is the reference for the third field in the PID segment.
- **Segment / Field Name** – HL7’s name of the segment and field.
- **Usage Notes** – Additional notes describing how the field is to be used by HL7 data exchange partners and by the CIR HL7 Web Service. These notes are only intended to supplement the guidelines specified in the CDC HL7 Implementation Guide Version 2.2 (<http://www.cdc.gov/vaccines/programs/iis/stds/downloads/hl7guide.pdf>). However, the usage notes take precedence over the CDC guidelines wherever there are deviations between the two documents.
- **Lookup Table** – Identifies the standard HL7 Lookup table of valid values, if any. The web service only accepts valid HL7 codes, and in some cases it only accepts a subset of the valid HL7 codes. Refer to the *Standard Code Sets - Supported* section of this document for more details.
- **Field Status** – Indicates whether the field is Required, Ignored, or Optional for the CIR HL7 Web Service.
- **In VXR Message** – The CIR HL7 Web Service will accept and absorb many more data fields via inbound VXU messages than it will share via outbound VXR messages. This “In VXR Message” column is included in the PID, RXA, and OBX segment definition tables and is valued as “Yes” or “No”. This specifies exactly which fields the CIR HL7 Web Service will populate for the purposes of sending patient demographic, immunization history, and immunization recommendation history back to HL7 data exchange partners in VXR messages. It is these fields that are marked “Yes” that contain the substantive patient data that the HL7 data exchange partner may want to utilize to update the corresponding patient record in their system.

## 6.2 Message Header Segment – (MSH)

The MSH segment is a required segment in all messages - VXU, VXQ, VXR, QCK, and ACK.

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status
MSH	Message Header Segment			Required
MSH-1	Field Separator	It is strongly recommended that the VXU and VXQ messages utilize the “ ” field separator.		Required
MSH-2	Encoding Characters	It is strongly recommended that the VXU and VXQ messages utilize the encoding characters listed in <i>Special Characters and Encoding</i> section.		Required
MSH-3	Sending Application	<p>For VXQ and VXU messages, the HL7 data exchange partner should value MSH-3.1 with the name of the sending application followed by the software version. If MSH-3.1 is not valued it will be considered a non-fatal error and a Missing Value error type reported in the ACK, VXR, or QCK.</p> <p>For VXR, ACK, and QCK messages, the CIR HL7 Web Service will value this field with “CIR HL7 Web Service x.xx”, where x.xx represents the current version number.</p>		Optional
MSH-4	Sending Facility	<p>For VXQ and VXU messages, the HL7 data exchange partner should value MSH-4.1 with the Facility Code that was assigned by the NYC DOHMH. The value in MSH-4.1 should be the same as the Facility Code associated with the HL7 account sending the message. If the Facility Code is not valid or does not match the Facility Code that is associated with the HL7 account that was used to connect to the CIR HL7 Web Service, it will be considered a fatal error.</p> <p>For VXR, ACK, and QCK messages, the CIR HL7 Web Service will value this field with “NYC DOHMH”.</p>		Required

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status
MSH-5	Receiving Application	For ACK, QCK, and VXR messages, the CIR HL7 Web Service will value this field with what was provided in MSH-3.1 of the corresponding VXU or VXQ message.		Optional
MSH-6	Receiving Facility	For ACK, QCK, and VXR messages, the CIR HL7 Web Service will value this field with what was provided in MSH-4.1 of the corresponding VXU or VXQ message.		Optional
MSH-7	Date Time of Message	Date/time the sending system created the message. This will be used for logging. The expected format is YYYYMMDDHHMMSS; for example, “20110420105234” represents April 20, 2011 at 10:52 AM and 34 seconds). Additional precision as well as the time zone, if sent, will be ignored.  If the Date Time of Message is not sent or is invalid (i.e., not a valid date or not in the correct format), a non-fatal error will be reported.		Optional
MSH-9	Message Type	For VXU messages, MSH-9.1 must be valued with message type “VXU” and MSH-9.2 valued with “V04”. For VXQ messages, MSH-9.1 must be valued with message type “VXQ” and MSH-9.2 valued with “V01”. All other values will be considered a fatal error.  For the CIR HL7 Web Service, the field must be valued with either an ACK, QCK, or VXR message type.		Required
MSH-10	Message Control ID	The sender must value this field with a unique identifier. The CIR HL7 Web Service will echo this value back in the MSA segment used in the ACK, QCK, and VXR message.		Required
MSH-11	Processing ID	Use “P” for Production and “T” for Testing, all other values will be considered a fatal error. Also, if “P” is sent for a Test message or “T” is sent for a Production message, it will be considered a fatal error.		Required
MSH-12	Version	The only version of HL7 that the CIR HL7 Web Service has been tested with and officially supports is 2.3.1. The CIR HL7 Web Service will reject any messages that are not HL7 version 2.3.1.		Required

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status
MSH-16	Application Acknowledgment Type	The CIR HL7 Web Service policy for VXU and VXQ messages requires an “AL” (Always) type in this field. All other values will be ignored and treated as if an “AL” value was provided; no error will be reported.		Required

### 6.3 Patient Identification Segment – (PID)

The PID segment is a required segment in VXU and VXR messages and is not a part of any other messages. This segment is used for identifying the patient and communicating the patient’s demographic information.

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status	In VXR Message
<b>PID</b>	<b>Patient Identification Segment</b>			<b>Required</b>	<b>Yes</b>
PID-3	Patient Identifier List	<p>Required by the CDC Implementation Guide, but optional for the CIR HL7 Web Service.</p> <p>HL7 data exchange partners should include the patient’s Local Registry Identifier, Medical Record Number, and Medicaid Number if available. These identifiers will be used to facilitate matching and will significantly enhance the performance of the CIR HL7 Web Service. See <i>Performance</i> section for details.</p> <p>If multiple identifiers of the same type are sent (e.g., multiple Medicaid Numbers), only the first identifier of that type (e.g., the first Medicaid Number) will be processed. Other identifiers of that same type will be ignored.</p>	0203	Yes – but will only return the Local Registry ID	No

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status	In VXR Message
		<p>The Medical Record Number cannot exceed 15 characters. The Medicaid Number cannot exceed 8 characters. If the field limits are exceeded the number will be ignored and reported as a non-fatal error.</p> <p>The Medicaid number must also be in the correct format, e.g., AA12345A; invalid formatting of the Medicaid number will also cause the Medicaid number to be ignored and reported as a non-fatal error.</p> <p>If a patient identifier is included (PID-3.1) but the identifier type value (PID-3.5) is missing, the identifier will be ignored and the missing type value reported as a non-fatal error.</p> <p>See the Identifier Type table in the <i>Standard Code Sets – Supported</i> section of this document for valid HL7 values supported by the CIR database.</p> <p>HL7 data exchange partners should also include the Birth Registry Number, Medicare Number, and State Registry ID in the Patient Identifier List if available. Although the CIR does not currently store these fields, it will eventually be modified to capture these fields and to utilize them to facilitate matching.</p>			

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status	In VXR Message
PID-5	Patient Name	<p>The CIR HL7 Web Service will process the first Patient name in the list of repeating names; all others will be ignored.</p> <p>The First Name, Last Name, and Middle Name must each be 25 characters or less; otherwise it will be truncated and reported as a non-fatal error.</p> <p>The Patient Last/Family Name (PID-5.1.1) and Patient First/Given Name (PID-5.2) are required. The Patient Middle Name (PID-5.3) should be included, if available.</p> <p>Other PID-5 components, (e.g., Last Name Prefix, Suffix, Prefix, Degree, and Name Type Code), are not required and, if provided, will be ignored.</p>		Required	Yes
PID-6	Mother's Maiden Name	<p>The Last/Family Name and First/Given Name must each be 25 characters or less; otherwise it will be truncated and a non-fatal error reported.</p> <p>Other PID-6 components, (e.g., Middle Name, Last Name Prefix, Suffix, Prefix, Degree, and Name Type Code), if provided, will be ignored.</p>		Optional	No

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status	In VXR Message
PID-7	Date of Birth	<p>The date must be in the YYYYMMDD format; otherwise it will be considered a fatal error. The time component of the data will be ignored if it is provided. Additional date of birth date validation rules include:</p> <ul style="list-style-type: none"> <li>• The Patient's DOB must be on or before the current date.</li> <li>• The Patient's DOB must be greater than Mother's DOB.</li> <li>• The Immunization Date must be greater or equal to the Patient's DOB.</li> <li>• The Patient's DOB and the Immunization Date must each be less than 120 years old.</li> <li>• The Patient's DOB field must be at least 10 years after the Mother's DOB.</li> </ul>		Required	Yes
PID-8	Sex	See the Sex table in the <i>Standard Code Sets – Supported</i> section of this document for valid HL7 values supported by the CIR database.	0001	Required	Yes
PID-9	Patient Alias	<p>The CIR HL7 Web Service will process the first Patient Alias in the list of repeating names; all others will be ignored. The First Name and Last Name must each be 25 characters or less; otherwise it will be truncated and a non-fatal error reported.</p> <p>Other PID-9 components, (e.g., Middle Name, Last Name Prefix, Suffix, Prefix, Degree, and Name Type Code), if provided, will be ignored.</p>		Optional	No

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status	In VXR Message
PID-10	Race	<p>The CIR HL7 Web Service will process the first Race in the list of repeating Races; all others will be ignored.</p> <p>See the Race table in the <i>Standard Code Sets – Supported</i> section of this document for valid HL7 values supported by the CIR database.</p>	0005	Optional	No
PID-11	Patient Address	<p>The CIR HL7 Web Service will process the address in the first position (which, per the CDC Implementation Guide, is reserved for the patient’s primary address). All other addresses will be ignored. If repeating fields are used to submit more than one address, subsequent addresses will also be ignored. Address Type is not required and if provided will be ignored.</p> <p>Street1 (PID-11.1) should contain the house number in the beginning of the field followed by the street name.</p> <p>Street2/Other Designation (PID-11.2) is optional, but if provided should contain the apartment or suite number.</p> <p>Street1 and Street2 will be concatenated and truncated to 40 characters and stored in the CIR’s single database field for Street.</p> <p>City (PID-11.3) cannot exceed 40 characters, otherwise it will be truncated.</p> <p>The State (PID-11.4) cannot exceed 2 characters; otherwise, the state will be set to “NY”.</p> <p>ZIP Code (PID-11.5) cannot exceed 10 characters; otherwise it will be ignored. The CIR HL7 Web Service supports the standard ZIP code formats of either ##### (5 digit ZIP only) or #####-#### (ZIP+4</p>		Optional	No

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status	In VXR Message
		including hyphen). If ZIP+4 is sent, the hyphen may be included but is not required.  Errors, (e.g., character maximum exceeded, invalid state code, ZIP less than 5 digits, etc.) will be reported as non-fatal.			
PID-13	Phone Number	The CIR HL7 Web Service will process the 6 <sup>th</sup> and 7 <sup>th</sup> components (area code and phone number) of the first phone number; all other components of the phone number will be ignored. If repeating fields are used to submit more than one phone number, subsequent phone numbers will also be ignored.  HL7 data exchange partners should include the extension (8 <sup>th</sup> component) if available; although the CIR does not currently store this field, it may eventually be modified to capture the extension.  If PID-13.6 or PID-13.7 of the first PID-13 instance contains errors, (e.g., area code is not 3 digits, phone number is not 7 digits, or area code is provided but the phone number is missing), those errors will be reported as non-fatal errors.		Optional	No
PID-15	Primary Language	See the Language table in the <i>Standard Code Sets – Supported</i> section of this document for valid HL7 values supported by the CIR database.	0296	Optional	No
PID-22	Ethnic Group	The CIR HL7 Web Service will process the first Ethnicity code. If multiple Ethnicities are submitted, all subsequent Ethnicities in the list will be ignored.  See the Ethnic Group table in the <i>Standard Code Sets – Supported</i> section of this document for valid HL7 values supported by the CIR database.	0189	Optional	No

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status	In VXR Message
PID-23	Birth Place	The Birth Place will be validated against a list of Birth Facilities in the CIR database. If the submitted Birth Place cannot be validated, it will be defaulted to “Unknown” and a non-fatal error reported.		Optional	No
PID-24	Multi Birth Indicator	Must be “Y” or “N”; all other values will be ignored and reported as a non-fatal error.	0137	Optional	No

## 6.4 Next of Kin Segment – (NK1)

The NK1 segment is an optional segment in VXU messages and is not a part of any other messages. This segment is used to communicate the name and contact information for the patient’s mother, father, and/or guardian.

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status
NK1	<b>Next of Kin (NK1) / Associated Parties Segment</b>			<b>Optional Segment</b>
NK1-1	Set ID NK1	Required by the CDC Implementation Guide, but ignored by the CIR HL7 Web Service.		Ignored
NK1-2	Name	<p>The CIR HL7 Web Service will process the first name in the list of repeating names; all others will be ignored.</p> <p>Per the CDC Implementation Guide, the first name in the list of repeating names should be the Legal name. The CIR HL7 Web Service does not validate that an HL7 Name Type of "L" for "Legal Name" is associated with the first name; the CIR HL7 Web Service considers the first name sent to be the Legal name and ignores the Name Type code associated with the NK1-2 Name field.</p> <p>The First Name, Last Name, and Middle Name must each be 25 characters or less; otherwise it will be truncated and a non-fatal error reported. Also, if additional next of kin information is provided (such as relationship type, phone number, and/or date of birth), but the name is missing, a non-fatal error will be reported because the missing name may prevent the additional data from being absorbed by the CIR.</p> <p>If a last name prefix, prefix, suffix, and/or degree is provided it will be ignored.</p>		Optional

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status
NK1-3	Relationship	<p>The CIR HL7 Web Service will support the Mother (MTH), Father (FTH), and/or Guardian (GRD) relationship types; all other HL7 relationship types will be ignored. If an invalid relationship type is provided or NK1-2 (Name) is valued but the relationship type is not valued, a non-fatal error will be reported.</p> <p>See the Relationship table in the <i>Standard Code Sets – Supported</i> section of this document for valid HL7 values supported by the CIR database.</p>	0063	Required if NK1-2 is provided
NK1-5	Phone Number	<p>The CIR HL7 Web Service will process the 6<sup>th</sup> and 7<sup>th</sup> components (area code and phone number) of the first phone number; all other components of the phone number will be ignored. If repeating fields are used to submit more than one phone number, subsequent phone numbers will also be ignored.</p> <p>If NK1-5.6 and NK1-5.7 of the first instance of NK1-5 contains errors, (e.g., area code is not 3 digits, phone number is not 7 digits, or area code is provided but the phone number is missing), those errors will be reported as non-fatal errors.</p>		Optional
NK1-6	Business Phone	<p>The CIR HL7 Web Service will process the 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> components (area code, phone number, and extension) of the first phone number; all other components of the phone number will be ignored. If repeating fields are used to submit more than one phone number, subsequent phone numbers will also be ignored.</p> <p>If NK1-6.6, NK1-6.7, or NK1-6.8 of the first instance of NK1-6 contains errors, those errors will be reported as non-fatal errors.</p>		Optional

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status
NK1-16	Date of Birth	<p>The date must be in the YYYYMMDD format and a valid date according to the CIR's date/time validation rules; otherwise it will be ignored and a non-fatal error reported. The time component of the data will be ignored if it is provided.</p> <p>Of the Relationship Types supported by the CIR HL7 Web Service (Mother, Father, and Guardian), only the Mother's date of birth will be captured if sent; date of birth for Father or Guardian, if sent, will be ignored.</p> <p>Date/time validation rules that apply to the Mother's date of birth include:</p> <ul style="list-style-type: none"> <li>• The Patient DOB field must be greater than Mother's DOB.</li> <li>• The Patient DOB field must be at least 10 years after the Mother's DOB.</li> </ul>		Optional

## 6.5 Patient Visit Segment – (PV1)

The PV1 segment is an optional segment in VXU messages and is not a part of any other messages. This segment is only used to communicate the VFC Eligibility status of the patient.

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status	In VXR Message
PV1	Patient Visit Segment			Optional Segment	
PV1-2	Patient Class	Required by the CDC Implementation Guide, but ignored by the CIR HL7 Web Service.		Ignored	

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status	In VXR Message
PV1-20	Financial Class	<p>The CIR HL7 Web Service will process the first VFC code in the list of repeating VFC codes; all others will be ignored.</p> <p>See the Financial – VFC Eligibility table in the <i>Standard Code Sets – Supported</i> section of this document for valid HL7 values supported by the CIR database. If a non-supported value is provided in PV1-20-1 a non-fatal error will be reported.</p> <p>A Financial Class effective date is not required in PV1-20-2 and if provided will be ignored.</p>	0064	Optional	

## 6.6 Pharmacy Treatment Administration Segment – (RXA)

The RXA segment is a required segment in VXU and VXR messages and is not a part of any other messages. This segment is used for reporting details of an immunization event. However, when the CIR HL7 Web Service generates a VXR response message for a patient who has a demographic record but has no immunization records in the CIR database, it will include an RXA place holder in the VXR message. For further details about RXA placeholders, see the *CDC Implementation Guide for Data Transactions using HL7 2.3.1*.

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status	In VXR Message
<b>RXA</b>	<b>Pharmacy/Treatment Administration</b>			<b>Required</b>	<b>Yes</b>
RXA-1	Give sub-ID counter	<p>For VXU messages, required by the CDC Implementation Guide, but ignored by the CIR HL7 Web Service.</p> <p>For VXR messages the CIR HL7 Web Service will return the CDC HL7 Guide recommended value of “0”.</p>		Ignored	Yes

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status	In VXR Message
RXA-2	Administration sub-ID counter	For VXU messages, required by the CDC Implementation Guide, but ignored by the CIR HL7 Web Service.  For VXR messages the CIR HL7 Web Service will return the CDC HL7 Guide recommended value of “999”.		Ignored	Yes
RXA-3	Date/Time start of administration	For a VXU message, the date must be in the YYYYMMDD format; otherwise it will be considered a fatal error. The time component of the data will be ignored if it is provided.  In a VXR, the CIR HL7 Web Service will populate this field with the date of administration.		Required	Yes
RXA-4	Date/Time end of administration	For a VXU message, required by the CDC Implementation Guide, but ignored by the CIR HL7 Web Service.  In a VXR, the CIR HL7 Web Service will populate this field with the date of administration.		Ignored	YES
RXA-5	Administered Code	This field must contain the valid HL7 CVX code for the vaccine that was administered; all others will be considered a fatal error.  See the Vaccine table in the <i>Standard Code Sets – Supported</i> section of this document for valid HL7 values supported by the CIR database.	0292	Required	Yes
RXA-6	Administered Amount	Required by the CDC Implementation Guide, but ignored by the CIR HL7 Web Service.		Ignored	No

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status	In VXR Message
RXA-9	Administration Notes	<p>For VXU messages, although this field is optional, HL7 data exchange partners are strongly encouraged to utilize it to send the Immunization Information Source. The Immunization Information Source must be one of the valid HL7 codes; otherwise the Immunization Information Source will be inferred based on the CIR’s business rules. The CIR database always stores an information source with every immunization.</p> <p>See the Immunization Information Source Type table in the <i>Standard Code Sets – Supported</i> section of this document for valid HL7 values supported by the CIR database.</p> <p>For VXR messages, the Immunization Information Source will be omitted.</p>	NIP-defined NIP001	Optional	No
RXA-10	Administering Provider	<p>In a VXU message, the CIR HL7 Web Service will look for an “Orderer” (OEI) Provider in each RXA segment.</p> <p>If an RXA segment does not contain a valid “Orderer” Provider (i.e., an OEI provider type in RXA-10.13, a valid license number in RXA-10.1, and the Provider’s first and last name within character limits in RXA-10.3 and RXA-10.2.1) then the immunization will be associated with the default provider of the facility reported in RXA-11.4.1. The corresponding non-fatal errors will be reported in the ACK to inform the HL7 Partner that the Administering Provider information could not be absorbed and a default provider was associated with the immunization.</p> <p>Generally, the CIR will maintain a record of a default provider for every facility; however, if a default provider has not been established for a facility, the error will be considered fatal and the RXA segment rejected.</p>		Optional	No

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status	In VXR Message
		<p>The CIR HL7 Web Service will process the first “Orderer” Provider. Providers of other types, (e.g., “Recorder” (REI) providers and “Vaccinator” (VEI) providers), will be ignored. If repeating RXA-10 fields are used to submit more than one “Orderer” provider, subsequent “Orderer” providers in the list will be ignored.</p> <p>The First Name and Last Name of the “Orderer” Provider must each be 25 characters or less; otherwise, the Orderer Provider will be ignored and the immunization will instead be associated with the default provider for that facility. The Middle Name, if provided, will always be ignored.</p> <p>The Identifier Number must be the Provider’s license number and cannot exceed 8 characters; otherwise the Orderer Provider will be ignored and the immunization will instead be associated with the default provider for that facility.</p> <p>The provider’s Degree will be ignored.</p> <p>If the RXA segment is for an historical immunization (indicated by the historical code provided in RXA-9) and RXA-10 is blank, the immunization will still be associated with the default provider for the facility; however, a non-fatal error will not be reported. Also, if the RXA is a delete request (indicated by a “D” in RXA-21) a non-fatal error will not be reported if RXA-10 is blank.</p>			

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status	In VXR Message
RXA-11	Administered at Location	<p>A CIR-issued facility code is required in RXA-11.4.1 when reporting new or historical immunizations.</p> <p>For a new immunization, the CIR-issued facility code of the facility at which the immunization was administered must be in RXA-11.4.1, the first position (i.e., the Namespace ID position) of the fourth component (i.e., the Facility HD component) of this field.</p> <p>For an historical immunization, the HL7 data exchange partner must provide their CIR-issued facility code in RXA-11.4.1 (as described above), indicating the location recording the historical immunization.</p>		Required	No
RXA-15	Substance Lot Number	<p>In a VXU, the Lot Number of the Vaccination cannot exceed 16 characters; otherwise, it will be ignored and a non-fatal error reported.</p> <p>In a VXR the CIR HL7 Web Service will populate this field when a lot number is associated with the vaccination.</p>		Optional	Yes
RXA-16	Substance Expiration Date	<p>In a VXU, the date must be in the YYYYMMDD format; otherwise it will be ignored and a non-fatal error reported. The time component of the data will be ignored if it is provided.</p> <p>In a VXR the CIR HL7 Web Service will populate this field when an expiration date is associated with the vaccination.</p>		Optional	Yes

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status	In VXR Message
RXA-17	Substance Manufacturer	<p>In a VXU, the Manufacturer must be one of the valid HL7 Manufacturer codes; all others will be ignored and reported as a non-fatal error.</p> <p>See the Manufacturer table in the <i>Standard Code Sets – Supported</i> section of this document for valid HL7 values supported by the CIR database.</p> <p>In a VXR, the CIR HL7 Web Service will populate this field with the manufacturer associated with the vaccination.</p>	0227	Optional	Yes
RXA-21	Action Code	<p>HL7 data exchange partners should use this field to indicate the purpose of the RXA segment.</p> <p>Set the value of this field to the HL7 code “A” (for Add) to report an immunization to the CIR.</p> <p>Set the value of this field to the HL7 code “D” (for Delete) to request that the CIR delete an immunization that the HL7 data exchange partner had previously reported.</p> <p>If this optional field is omitted or is set to anything other than “A” or “D”, then it will be assumed that the purpose is to report an immunization and the CIR HL7 Web Service will process the VXU message as such; a non-fatal error will be reported to indicate that the expected value of “A” or “D” was missing.</p>	0323	Optional	No

## 6.7 Observation/Result Segment – (OBX)

The OBX segment is an optional segment in VXR messages and is not a part of any other messages. If a VXU message contains an OBX segment, that segment of the message will be ignored. In a VXR message, this segment is used for communicating the different components of an administered vaccine as well as recommendations for immunizations that the patient needs in order to be up to date.

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status	In VXR Message
<b>OBX</b>	<b>Observation / Result Segment</b>			<b>Optional</b>	<b>Yes</b>
OBX-1	Set ID-OBX	CIR HL7 Web Service will increment by “1” for each record that is returned.		Optional	Yes
OBX-2	Value Type	CIR HL7 Web Service will use “CE” and “TS” types.		Required	Yes
OBX-3	Observation Identifier	<p>The CIR HL7 Web Service will populate this field with the identifier for one of the four kinds of observations that the CIR HL7 Web Service will return in an OBX segment.</p> <ul style="list-style-type: none"> <li>• 30979-9^Vaccine due next^LN</li> <li>• 30979-9&amp;30982-3^Reason applied by forecast to project this vaccine^LN</li> <li>• 30979-9&amp;30980-7^Date vaccine due^LN</li> <li>• 30979-9&amp;30999-1^Vaccine Group Recommendation Status^NYCDOHVCGPST</li> <li>• 38890-0^Component Vaccine Type^LN</li> </ul> <p>The “30979-9&amp;30980-7^Date vaccine due^LN” is a “TS” data type. The other four observation identifiers above are “CE” data types.</p> <p>The “30979-9&amp;30999-1^Vaccine Group Recommendation Status^NYCDOHVCGPST” is a custom identifier created by the CIR because there is no corresponding LOINC code for this kind of observation. The other observation identifiers are all valid LOINC</p>	LOINC-Code and CUSTO M	Required	Yes

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status	In VXR Message
		codes.			
OBX-4	Observation sub-ID	Groups “CE” and “TS” fields together.		Required	Yes
OBX-5	Observation value	<p>The CIR HL7 Web Service will populate this field with the observation value that corresponds to the observation type that was specified in the OBX-3 field. This means that the observation value will always be one of these values:</p> <ul style="list-style-type: none"> <li>• Component Vaccine Type</li> <li>• Vaccine due next - The CVX code of the vaccine that is due</li> <li>• Date vaccine due - The date that the vaccine is due</li> <li>• Reason applied by forecast to project this vaccine - The reason that the vaccine is due. (Currently, when the CIR HL7 Web Service uses this field to specify the reason, it populates this field with a generic reference to the ACIP schedule that the CIR’s immunization calculation engine is based on).</li> <li>• Vaccine Group Recommendation Status - The recommendation status for the vaccine group (if no vaccine is due). This is a complex data type. The first component will be the Vaccine Group, the second component will be the Recommendation Status, and the third component will be the coding system.</li> </ul> <p>&lt;vaccine group (ST)&gt;^&lt;vaccine group status (ST)&gt;^&lt;name of coding system (ST)&gt;</p>		Required	Yes
OBX-11	Observation Result status	The field will be valued with an “F”.		Required	Yes

## 6.8 Query Definition Segment – (QRD)

The QRD segment is a required segment in VXQ and VXR messages and is not a part of any other messages.

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status
QRD	Query Definition Segment			Required
QRD-1	Query Date Time	In the VXQ, this field should be valued with a valid date time.  In a VXR, the CIR HL7 Web Service will echo back what was received in the VXQ. Note that if the date time in the VXQ is missing or invalid, then the CIR Web Service will internally log the query date time as the current system date and time.		Required
QRD-2	Query Format Code	The field must be valued with an “R” (Response is record oriented). All other codes will be treated as a fatal error.	0106	Required
QRD-3	Query Priority	Identifies the time frame in which the response is expected. The field must be valued with an “I” (Immediate); all other values will be ignored and will be treated as “I”.	00027	Required
QRD-4	Query ID	A unique identifier for the query which is assigned by the HL7 data exchange partner that sent the VXQ message. The CIR HL7 Web Service will echo this value in the VXR message. If this field is missing it will be treated as a fatal error.		Required
QRD-7	Quantity Limited Request	Required by the CDC Implementation Guide, but ignored by the CIR HL7 Web Service. If this field is populated in a VXQ that results in a VXR, the CIR HL7 Web Service will echo back the QRD-7 value in the corresponding VXR.		Ignored

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status
QRD-8	Who Subject Filter	<p>In this QRD-8 field, the CIR HL7 Web Service supports the search criteria listed immediately below. (In addition, other types of search criteria are supported via the QRF-5 field).</p> <ul style="list-style-type: none"> <li>• Patient First Name</li> <li>• Patient Middle Name</li> <li>• Patient Last Name</li> <li>• Local Registry ID (i.e., CIR ID)</li> <li>• Medical Record Number</li> </ul> <p>This field, QRD-8, supports repeating XCN values/records. However, the HL7 data exchange partner should send at most two XCN records in the QRD-8 field. If the patient name is one of the search criteria then it should be included in the first XCN record. If either the Local Registry ID or the Medical Record Number is part of the search criteria then it should also be included in the first XCN record. If <i>both</i> identifiers are part of the search criteria, then one identifier should be included in the first XCN record and the other identifier should be included in the second XCN record. The CIR HL7 Web Service will process the first XCN records that contain the Patient Name, Local Registry ID, and Medical Record Number and will ignore any additional XCN records.</p> <p>The Identifier Type for the specified ID must be "LR" (Local Registry), and/or "MR" (Medical Record Number). The First Name, Last Name, and Middle Name must each be 25 characters or less; otherwise it will be truncated and a non-fatal error reported. The Identifier value cannot exceed 15 characters; otherwise it will be ignored and a non-fatal error reported.</p> <p>To maximize performance it is recommended that the HL7 data exchange partner send the Local Registry ID and the Medical Record Number.</p>		Required

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status
QRD-9	What Subject Filter	Required by the CDC Implementation Guide, but ignored by the CIR HL7 Web Service. If this field is populated in a VXQ that results in a VXR, the CIR HL7 Web Service will echo back the QRD-9 value in the corresponding VXR.	0048	Ignored
QRD-10	What Department Data	Required by the CDC Implementation Guide, but ignored by the CIR HL7 Web Service. If this field is populated in a VXQ that results in a VXR, the CIR HL7 Web Service will echo back the QRD-10 value in the corresponding VXR.		Ignored

## 6.9 Query Filter Segment – (QRF)

The QRF segment is an optional segment in VXQ messages. If a QRF segment is supplied in a VXQ that results in a VXR, the QRF segment will be echoed back in the VXR. The QRF segment is not a part of any other messages.

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status
<b>QRF</b>	<b>Query Definition Filter</b>			<b>Required</b>
QRF-1	Where Subject	Required by the CDC Implementation Guide, but ignored by the CIR HL7 Web Service. If this field is populated in a VXQ that results in a VXR, the CIR HL7 Web Service will echo back the QRF-1 value in the corresponding VXR.		Ignored
QRF-5	Other query subject filter	The usage notes for the QRF-5 field are extensive. Instead of displaying the usage notes here, those QRF-5 usage notes are displayed in their own section of the document immediately below this table.		Optional

## 6.9.1 Other Query Subject Filter – (QRF-5)

The CIR HL7 Web Service version 7.5 supports an expanded list of search criteria in the QRF-5 field. The full list of supported search criteria is provided in the following table.

All other search criteria values in QRF-5 will be ignored. (Other types of search criteria, such as the Patient's Name and Local Registry ID, are supported via the QRD-8 field.)

In any list of repeating fields in QRF-5, the CIR HL7 Web Service will process the first set of fields and ignore the remaining fields.

See the *Standard Code Sets – Supported* section of this document for valid HL7 values supported by the CIR database.

When submitting a VXQ message, HL7 data exchange partners should include as much of the supported search criteria as possible to facilitate finding a single matching patient. The patient's date of birth and sex, when known, should always be included.

The position of the components within QRF-5, which is critical, follows the CDC 2.3.1 specification and is provided in the table below for convenience as well as to show the correct position for additional search criteria supported by the CIR Web Service but not included in the CDC specification.

If the QRF-5 field is populated in a VXQ that results in a VXR, the CIR HL7 Web Service will echo back the QRF-5 values in the corresponding VXR.

Position	Search Criteria Component
1	Patient SSN
2	Patient DOB
3	Patient Birth State
4	Patient Birth Registration Number
5	Patient Medicaid Number
6.1	Mother's Last Name
6.2	Mother's First Name
6.3	Mother's Middle Name
6.7	Mother's Home Phone – Area Code
6.8	Mother's Home Phone – Phone Number
6.9	Mother's Work Phone – Area Code
6.10	Mother's Work Phone – Phone Number
6.11	Mother's Work Phone – Extension
7	Mother's Maiden Name
8	Mother's SSN
9.1	Father's Last Name
9.2	Father's First Name
9.3	Father's Middle Name

Position	Search Criteria Component
9.7	Father's Home Phone – Area Code
9.8	Father's Home Phone – Phone Number
9.9	Father's Work Phone – Area Code
9.10	Father's Work Phone – Phone Number
9.11	Father's Work Phone – Extension
10	Father's SSN
11.1	Guardian's Last Name
11.2	Guardian's First Name
11.3	Guardian's Middle Name
11.7	Guardian's Home Phone – Area Code
11.8	Guardian's Home Phone – Phone Number
11.9	Guardian's Work Phone – Area Code
11.10	Guardian's Work Phone – Phone Number
11.11	Guardian's Work Phone – Extension
12	Guardian's SSN
13.1	Patient Gender (M, F)

Position	Search Criteria Component
13.2	Patient's Alternate Last Name
13.3	Patient's Alternate First Name
13.4	Patient Multiple Birth (Y or N)
14	Mother's DOB
15.1	Patient's Address - House #
15.2	Patient's Address – Apartment #
15.3	Patient's Address – Street Name
15.4	Patient's Address – City
15.5	Patient's Address – State
15.6	Patient's Address – Zip Code
15.7	Patient's Address – Zip4
15.8	Patient Home Phone – Area Code
15.9	Patient Home Phone – Number
16.1	Patient Birth Facility Code
16.2	Patient Birth Country Code
16.3	Patient Ethnicity Code
16.4	Patient Language Code
16.5	Patient Race Code
16.6	Patient VFC Eligibility
17	Patient Vital Record Number

Search criteria, when provided in QRF-5, must confirm to the following rules; otherwise, that search criteria will be ignored (or in the case of names, truncated) and a non-fatal error reported:

- The Social Security Number must contain 9 digits and no hyphens.
- The Date of Birth must be in the yyyyddmm format, must be a valid date, and cannot be a future date. Also, the Mother's DOB must be 10 years or more before the Patient's DOB.
- The Birth State code must be a valid two letter postal state code that the CIR supports.
- The Medicaid Number cannot exceed 8 characters and must be in the proper format for Medicaid numbers (e.g., AA12345A).
- Any name must be 25 characters or less.
- An Area Code must be 3 digits.
- A Phone Number must be 7 digits. Also, if an Area Code is provided but the corresponding Phone Number is not, a non-fatal error will be reported.
- The Phone Number Extension must be 5 digits or less.
- The Gender must be either M (for Male) or F (for Female). HL7 data exchange partners are encouraged to use QRF-5 for including gender as one of the search criterion in a VXQ message; however, the CIR HL7 Web Service will continue to also support the use of ZGR-1. If gender is sent in both QRF-5 and ZGR-1, the CIR HL7 Web Service will utilize the gender provided in QRF-5 and ignore the gender provided in ZGR-1.
- The Patient Multiple Birth must be either Y (for Yes) or N (for No).
- The Patient's Address – House # must be numeric and not exceed 10 digits.
- The Patient's Address – Apartment # must not exceed 10 characters.
- The Patient's Address – Street Name must not exceed 40 characters.
- The Patient's Address – City must not exceed 40 characters.
- The Patient's Address – State must be a valid two letter postal state code that the CIR supports.
- The Patient's Address – Zip Code must be 5 digits. If a Zip4 is provided but the Zip Code is not, a non-fatal error will be reported.
- The Patient's Address – Zip4 must be 4 digits.
- The Birth Facility Code must be a Facility code supported by the CIR.
- The Birth Country Code must be a valid HL7 Country code supported by the CIR.
- The Patient Ethnicity Code must be a valid HL7 Ethnicity code supported by the CIR.
- The Patient Language Code must be a valid HL7 Language code supported by the CIR.
- The Patient Race Code must be a valid HL7 Race code supported by the CIR.

- The Patient VFC Eligibility must be a valid HL7 Financial Class code that the CIR supports.
- The Patient Vital Record Number must not exceed 15 characters.

HL7 data exchange partners should include the Birth Registration Number, if available. Because the CIR does not currently store this field, no validation will be performed on this search criterion. However, the CIR will eventually be modified to capture Birth Registration Number and utilize it as a search criterion to facilitate matching.

### 6.10 Z-Segment for Gender (ZGR)

The ZGR segment is an optional segment in VXQ messages and is not a part of any other messages. This custom segment is optional and can be used to include gender as one of the search criterion in a VXQ message. HL7 data exchange partners are encouraged to use QRF-5 for including gender as a search criterion in a VXQ message; however, the CIR HL7 Web Service will continue to also support ZGR-1.

Segment / Field Reference	Segment / Field Name	Date Value	Lookup Table	Field Status
ZGR	Z-Segment for Gender			Optional
ZGR-1	Gender	If valued, this field must contain an “M” for “Male” or “F” for Female; all other values will be ignored and reported as a non-fatal error. If gender is sent in both QRF-5 and ZGR-1, the CIR HL7 Web Service will utilize the gender provided in QRF-5 and ignore the gender provided in ZGR-1.		Optional

## 6.11 Message Acknowledgement Segment – (MSA)

The MSA segment is a required segment in VXR, QCK, and ACK messages.

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status
MSA	Message Acknowledgement Segment			Required
MSA-1	Acknowledgment Code	The CIR HL7 Web Service will value this field with an “AA” if the message was accepted or “AE” if the message was rejected.	0008	Required
MSA-2	Message Control ID	The CIR HL7 Web Service will echo the Message Control ID of the message sent by the sending system.		Required
MSA-3	Text Message	The usage notes for the MSA-3 field are extensive. Instead of displaying those usage notes here, those MSA-3 usage notes are displayed in their own section of the document immediately below this table.		Optional

### 6.11.1 Usage Notes for the MSA-3 Field

#### Overview of the MSA-3 Field

For each VXU or VXQ message that the HL7 data exchange partner submits, the CIR HL7 Web Service will inform the HL7 data exchange partner whether the message was accepted or rejected and what errors the submitted message contained. The CIR HL7 Web Service will communicate this via the MSA-3 field of the response message that it sends back to the HL7 data exchange partner.

The MSA-3 field is a free text field that the CIR HL7 Web Service populates with a string that strictly adheres to a proprietary format that the CIR has created and is described below. The CIR adheres to this format so that its HL7 data exchange partners can implement text parsers that will be able to reliably read and process the information in the MSA-3 field. Although the HL7 specification for version 2.3.1 states that the MSA-3 field shall be limited to 80 characters, the CIR HL7 Web Service does *not* limit itself to 80 characters because more than 80 characters may be required to list all of the errors that the CIR HL7 Web Service identifies in the VXU or VXQ message. Therefore, HL7 data exchange partners should

process the entire contents of the MSA-3 field in the response messages that the CIR HL7 Web Service sends back, rather than just the first 80 characters.

## Format of the MSA-3 Field

The MSA-3 field of each response message will be a single string consisting of two consecutive parts – a status report string, which is always included, concatenated with an optional error report string, which is included only if the submitted VXU or VXQ message contained any errors. See the *HL7 Message Errors* section for more information about errors.

The first part, the status report string, must always be exactly one of the four strings shown in Table #1 below. This status report string indicates if the submitted message was accepted or rejected. It also specifies the local registry ID of the corresponding CIR patient so that the HL7 data exchange partner can store that identifier in its system and then include that ID in future VXU or VXQ messages that it submits to the CIR HL7 Web Service about that specific patient.

Status Report String	Purpose
MESSAGE ACCEPTED;LR=#####;	Indicates that the submitted VXU or VXQ was accepted. It also specifies the CIR's unique identifier (i.e., local registry ID) for the corresponding patient. In a real message, the "#####" will be replaced with an ID number.
MESSAGE ACCEPTED;PATIENT NOT FOUND;	Indicates that the submitted VXQ was accepted but that no matching patient was found in the CIR.
LR=#####;RXAs REJECTED=#;	Indicates that one or more of the RXA segments in the submitted VXU message were rejected due to fatal errors within those specific RXA segments. The "#" in "RXAs REJECTED=#;" is a placeholder that in a real response message would be replaced with the precise number of RXA segments that were rejected. (The error report string which is described further below will identify precisely which RXA segments were rejected and why). The status report string does not state anything about the RXA segments that were processed successfully. It should simply be understood that any RXA segment that is not indicated as rejected was processed successfully. In addition, this status report string indicates the CIR's unique identifier. (i.e., local registry ID) for the patient associated with the submitted VXU message. The "#####" in "LR=#####;" is a placeholder that in a real response message would be replaced with the CIR's unique identifier.
MESSAGE REJECTED;	Indicates that the submitted VXU or VXQ message was rejected in its entirety due to one or more fatal errors which will be described in the error report string.

If there are any errors to report, an error report string will be appended to the end of the status report string. If included, the error report string will have exactly one of the two formats that are listed immediately below. In the description of the formats in the table below, the brackets “[ ]” denote optional elements, while the braces “{ }” denote repeating attributes.

Error Report String	Purpose
<p>[(FATAL ERRORS: {Segment FieldName ErrorType [Position];})]                      [(NON-FATAL ERRORS: {Segment FieldName ErrorType [Position];})]                      [(DELETE EXCEPTIONS: {Segment ExceptionType [Position];})]</p>	<p>Provides a list of fatal errors (if any), followed by a list of non-fatal errors (if any), and then followed by a list of delete exceptions (if any). The description of each fatal error and non-fatal error consists of the name of the segment, the name of the field, and the type of error. If the error occurred within a repeating segment (such as an RXA or NK1) or a repeating field, then the description of that error also includes the position number of that segment within the set of repeating segments or repeating fields.</p> <p>Position - When reporting the position, the format is Segment Sequence.Segment Field Index.Segment Field Position. Here are two examples:</p> <ul style="list-style-type: none"> <li>• The position “6.1.3” in “RXA Immunization Date Required Field 6.1.3” is reporting that the error is in the 6th RXA segment and the 1st instance of field RXA-3.</li> <li>• The position “1.3.3.1” in “PID Medicaid_Number ValueExceedMaxLen 1.3.3.1” is reporting that the error is in the 1st PID segment and the 3rd instance of repeating field PID-3.1.</li> </ul> <p>ErrorType - The types of errors that are included in this error report string are errors with the format or content of the VXU or VXQ message. Fatal errors and non-fatal errors are discussed further in the <i>HL7 Message Errors</i> section and a comprehensive list of the ErrorTypes is shown below this table.</p> <p>ExceptionType - The DELETE EXCEPTIONS section of this error report string is used if necessary to report two types of problems that</p>

Error Report String	Purpose
	<p>can occur when the CIR attempts to delete an immunization as specified by an RXA segment in a submitted VXU message. When an RXA requests the deletion of an immunization that cannot be found in the CIR, a “Vaccination_Not_Found” exception is reported. When an RXA requests the deletion of an immunization and the value in the RXA administering facility field does not match the ID of the CIR Facility that was originally reported to have administered the vaccine, then a “Vaccination_Delete_Under_Review” exception is reported and CIR staff will manually review the deletion request at a later date and carry out the deletion if it is warranted.</p> <p>Note that although the error report string at left occupies several lines of text, there are no carriage returns or line feed characters in this string.</p>
<p>[(FATAL ERRORS: GENERAL a free text description of a single error goes here];;)]</p>	<p>Identifies a single fatal error in the submitted VXU or VXQ message. These general errors occur at the message level (rather than the field level) and will always result in the message being rejected. Such an error typically occurs when the submitted message is improperly formatted (i.e., the submitted message is not a valid HL7 version 2.3.1 message and therefore cannot be parsed).</p> <p>Examples include:</p> <ul style="list-style-type: none"> <li>• Message Type NOT SUPPORTED</li> <li>• Header segment ‘MSH’ not present in message</li> <li>• PID was expected but not found</li> <li>• RXA was expected but not found</li> <li>• Segment has no identifier</li> <li>• Account not authorized</li> <li>• Internal Application Error</li> </ul> <p>The keyword GENERAL is followed by a sentence of error text that</p>

Error Report String	Purpose
	describes the error. Therefore, any space characters should be interpreted as being part of the sentence of error text and not as a delimiting character which is how spaces are used within the other error report string that is described immediately above. Fatal errors are discussed further in the <i>HL7 Message Errors</i> section.

### Error Types (Fatal and Non-Fatal)

Error Type	Fatal / Non-Fatal	Description / Examples
BadDateTime	Dependent upon the field in which the error occurs. Generally, the error will be fatal if the field is required; otherwise, it will be non-fatal.	This error type is reported when a date is not in the expected YYYYMMDD format or is an invalid date.  If this error is associated with a required field, such as Patient's DOB (PID-7.1) or the immunization administration date (RXA-3.1), it will be a fatal error. If this error is associated with an optional field, such as the Next of Kin DOB (NK1-16), it will be a non-fatal error
BadFormat	Dependent upon the field in which the error occurs. Generally, the error will be fatal if the field is required; otherwise, it will be non-fatal.	This error type is returned when a field contains a value that is not in the expected format, such as an area code with only 2 digits, a zip code with only 4 digits, a zip4 that has 5 digits, or a Medicaid number not in the AA12345A format. In these examples, since the fields are optional, the error would be non-fatal.
BadNumber	Dependent upon the field in which the error occurs. Generally, the error will be fatal if the field is required; otherwise, it will be non-fatal.	This error type is associated with numeric fields (such as zip code (PID-11.5), phone number (PID-13, NK1-5, QRF-5), identifier (PID-3.1, RXA-10.1), or Social Security Number (QRF-5)) when the submitted value contains too few or too many digits, letters, or other non-allowed characters. This error type is also returned when the Financial Class Code (PV1-20.1) is a valid HL7 code but one that the CIR does not accept. In these examples, since the fields are optional, the error would be non-fatal.

Error Type	Fatal / Non-Fatal	Description / Examples
DateInTheFuture	Dependent upon the field in which the error occurs. Generally, the error will be fatal if the field is required; otherwise, it will be non-fatal.	As expected, this error type is returned when a future date is submitted in any date field other than the Substance Expiration Date (RXA-16.1) field.
ImmunizationDateBeforePatientDOB	Fatal	As expected, this error type is returned when the immunization administration date (RXA-3.1) is prior to the patient's date of birth (PID-7.1).
InternalDbConfigError	Fatal	This error type indicates a problem with the CIR database.
MedicaidInEMIErrorsList	Non-fatal	This error is returned when an HL7 Partner submits a Medicaid number that is in the CIR EMI_MEDICAID_NUMBER_ERROR_LIST table. This table contains a list of invalid "default" values, such as "XX99999X".
MedicalRecordInEMIErrorsList	Non-fatal	This error is returned when an HL7 Partner submits a Medical Record number that is in the CIR EMI_PATIENT_NUMBER_ERROR_LIST table. This table contains a list of invalid "default" values, such as "by last name".
Mismatch	Fatal	This error type is reported when the code in the Sending Facility field (MSH-4.1) does not match the facility code associated with the account sending the message.
MomNotOldEnough	Non-fatal	This error type is reported when the Mother's date of birth (NK1-16.1) is less than 10 years before the Patient's date of birth (PID-7.1). Since NK1-16 is an optional field, this is a non-fatal error.
MotherMaidenInEMIErrorsList	Non-fatal	This error is returned when an HL7 Partner submits a mother's maiden name that is in the CIR EMI_MOTHER_MAIDEN_NAME table. This table contains a list of invalid "default" values, such as "NA" or "UNK".
Over120YearsOld	Fatal	This error is returned when the date of the patient's birth (PID-7.1) indicates that the patient is over 120 years old at time of the immunization. (This, most likely, is a date of birth error.)

Error Type	Fatal / Non-Fatal	Description / Examples
RequiredField	Fatal	This error type is reported when a required field is not valued or cannot be processed due to an invalid value. If this required field is in an RXA segment, that RXA will be rejected (not be processed) and, if that is the only RXA in the message, the entire message will be rejected. If the error is in the patient demographics (PID) or message header (MSH) segment, both of which are required segments, the entire message will be rejected.
RXA Delete exception	Not categorized as Fatal or Non-fatal.	<p>If an HL7 Partner requests that an immunization be deleted and a matching immunization is not found, then the CIR HL7 Web Service returns this error type as “Delete Exception: Vaccination_Not_Found”.</p> <p>If a matching immunization is found but that matching immunization had been previously reported by a facility that is different from the facility that is specified in RXA-11, then the immunization will not be automatically deleted. Instead, the CIR HL7 Web Service returns this error type as “Delete Exceptions: Delete_Under_Review”. The CIR HL7 Web Service also sends an alert to CIR staff that will eventually review the request and then process it if appropriate.</p>
TableValueNotFound	Dependent upon the field in which the error occurs. Generally, the error will be fatal if the field is required; otherwise, it will be non-fatal.	This error type is returned when a submitted code value, such as a vaccine code (RXA-5.1), manufacturer code (RXA-17.1), language code (PID-15.1), race code (PID-10.1, QRF-5), relationship code (NK1-3.1), financial class code (PV1-20), or identifier type (PID-3.5), is not listed as a valid code in the corresponding HL7 code table in the CIR database.
UnknownKeyIdentifier	Dependent upon the field in which the error occurs. Generally, the error will be fatal if the field is required; otherwise, it will be non-fatal.	<p>The following are examples of unknown/invalid key data that will result in the return of this error type:</p> <ul style="list-style-type: none"> <li>Invalid/unknown CIR facility code in Sending Facility (MSH-4.1) (Fatal)</li> <li>Invalid/unknown CIR facility code in Patient Birth Place (PID-23) (Non-fatal)</li> <li>A valid CVX code but one that the CIR does not accept in Administered Code Identifier (RXA-5.1) (Fatal)</li> </ul>

Error Type	Fatal / Non-Fatal	Description / Examples
UnsupportedProcessingId	Fatal	This error type will be returned when an HL7 Partner submits a Processing ID (MSH-11.1) value other than “P” (for a Production message) or “T” (for a Test message), since they are the only Processing IDs that the CIR HL7 Web Service supports.
UnsupportedValue	Dependent upon the field in which the error occurs. Generally, the error will be fatal if the field is required; otherwise, it will be non-fatal.	<p>This error type, for example, will be returned as a non-fatal error when a coding system name other than “CVX” is submitted as the immunization Administered Code – Name of Coding System (RXA-5.3) in a VXU message. However, even if the coding system field contains an unsupported value, such as “CPT”, the CIR HL7 Web Service will still try to match the code to the list of valid codes for the coding system expected, e.g., CVX codes accepted by the CIR, and if found will process the submitted code.</p> <p>For VXQ messages, the Query Format Code field (QRD-2) must contain an “R” and the Query Priority Field (QRD-3) must contain an “I”; if these fields are populated with any other value, an UnsupportedValue error type will be returned as a non-fatal error and the submitted values ignored and treated as if the expected values were submitted.</p>
UnsupportedVersionId	Fatal	This error type will be returned when an HL7 Partner submits a Version ID (MSH-12.1) value other than “2.3.1” as this is the only version of HL7 that the CIR HL7 Web Service currently supports.
ValueExceedMaxLen	Dependent upon the field in which the error occurs. Generally, the error will be fatal if the field is required; otherwise, it will be non-fatal. See the Description notes for an exception (required field / non-fatal error).	<p>This error type is returned when the value submitted exceeds the maximum character length allowed by the CIR database.</p> <p>In some cases, such as a patient name or street address submitted in a VXU, the submitted value is truncated to the maximum length allowed and the remaining characters are processed. As a result, the error is non-fatal even if the field is required, such as the patient’s last name.</p> <p>In other cases, such as a medical record number, Medicaid number, lot number, SSN, zip code, or provider name, the value is ignored.</p>

Error Type	Fatal / Non-Fatal	Description / Examples
ValueMissing	Non-fatal	<p>There are some fields that are not required but are standard in an HL7 2.3.1 message, for example Sending Application (MSH-3.1) and Date Time of Message (MSH-7.1); if these standard fields are not populated a non-fatal ValueMissing error type will be returned. Also, if the RXA-21 Action code is omitted or populated with any value other than “A” or “D” this error type will be returned.</p> <p>Additionally, there are other values (also optional) that must be supplied in combination in order for the data to be used by the CIR HL7 Web Service when searching for the patient and/or absorbed by the CIR database. For example, if a patient identifier is sent in PID-3.1 but the identifier type is missing in PID-3.5, (which would identify the number as a Medicaid, Medical Record, Local Registry ID, or some other identifier type), the patient identifier cannot be used to locate the patient or absorbed into the database and a ValueMissing error type will be reported. Another example is an NK1 segment that contains the next of kin data (name, phone number, date of birth, etc.) but does not include a relationship code to identify the next of kin as mother, father, or guardian.</p> <p>In general, if the CIR HL7 Web Service detects that an HL7 Partner is attempting to supply data but that data cannot be used or absorbed because corresponding data is missing, a ValueMissing error will be returned. If a value is missing in a required field, a RequiredField error type will be returned.</p>

## Sample MSA-3 Values

Listed below are some sample MSA-3 values that all conform to the MSA-3 format that is specified immediately above:

- MESSAGE ACCEPTED;LR=#####;
- MESSAGE ACCEPTED;LR=43458287;(NON-FATAL ERRORS: QRF Patient\_Birth\_Date BadDateTime 2)|
- MESSAGE ACCEPTED;PATIENT NOT FOUND;
- MESSAGE ACCEPTED;PATIENT NOT FOUND;(NON-FATAL ERRORS: QRD Query\_Identifier BadNumber 1;QRF Patient\_Birth\_Date BadDateTime 2)|
- MESSAGE ACCEPTED;LR=43458287;RXA EXCEPTIONS: RXA Vaccination\_Delete\_Under\_Review 2;)|
- LR=843703751;RXAs REJECTED=1; (FATAL ERRORS: RXA Vaccine\_Code TableValueNotFound 3;RXA Vaccine\_Code RequiredField 3) (NON-FATAL ERRORS: PID Patient\_Home\_AreaCode BadNumber;PID Patient\_Home\_Phone BadNumber;NK1 Father\_Home\_AreaCode BadNumber 1;NK1 Father\_Home\_Phone BadNumber 1;NK1 Mother\_Home\_AreaCode BadNumber 2;NK1 Mother\_Home\_Phone BadNumber 2;NK1 Mother\_Bus\_AreaCode BadNumber 2;NK1 Mother\_Bus\_Phone BadNumber 2;NK1 Mother\_Bus\_Ext BadNumber 2;RXA Immunization\_ActionCode TableValueNotFound 1);(RXA EXCEPTIONS: RXA Vaccination\_Delete\_Under\_Review 2;)|
- MESSAGE REJECTED;(FATAL ERRORS: MSH Message\_Control\_Id RequiredField;QRD Query\_Id RequiredField)(NON-FATAL ERRORS: QRD Query\_Identifier BadNumber 1;QRF Patient\_Birth\_Date BadDateTime 2)|
- MESSAGE REJECTED;(FATAL ERRORS: GENERAL Required segment Message.QRD was expected but not found at the position specified in the message grammar MSH QRD [QRF] )|

## 6.12 Error Segment – (ERR)

The ERR segment is an optional segment in ACK and QCK messages and is not a part of any other messages.

Segment / Field Reference	Segment / Field Name	Usage Notes	Lookup Table	Field Status
<b>ERR</b>	<b>Error Segment</b>			<b>Optional</b>
ERR-1	Error Code and Location	The CIR HL7 Web Service will value this field in accordance with the CDC HL7 Implementation Guide Version 2.1		Required

## 6.13 Query Acknowledgement Segment – (QCK)

The QAK segment is an optional segment in QCK messages and is not a part of any other messages.

Segment / Field Reference	Segment / Field Name	Date Value	Lookup Table	Field Status
<b>QAK</b>	<b>Query Acknowledgment Segment</b>			<b>Optional</b>
QAK-1	Query Tag	The CIR HL7 Web Service will use this field to echo back the value that the HL7 data exchange partner sent in the QRD-4 field.		Required
QAK-2	Query Response Status	The CIR HL7 Web Service will value this field with “NF” for not found to indicate that the VXQ message did not find exactly one matching patient in the CIR database.	0208	Required

## 6.14 Notes and Comments Segment – (NTE)

The NTE segment is an optional segment in VXR messages and is not a part of any other messages. If a VXU message contains an NTE segment, that segment of the message will be ignored. In a VXR message, this segment is used by the CIR HL7 Web Service to specify if the corresponding immunization components are valid or invalid based on the ACIP schedule as implemented by the NYC DOHMH immunization algorithm.

Segment / Field Reference	Segment / Field Name	Date Value	Lookup Table	Field Status
QAK	Query Acknowledgment Segment			Optional
NTE-1	Set ID-NTE	CIR HL7 Web Service will increment by “1” for each NTE segment associated with the vaccine component.		Optional
NTE-3-1	Comment	CIR HL7 Web Service will populate this field with “Invalid Shot”.		Optional
NTE-3-2	Comment	CIR HL7 Web Service will populate this field with the CIR invalid reason code.		Optional
NTE-3-3	Comment	CIR HL7 Web Service will populate this field with the CIR invalid reason description.		Optional
NTE-3-4	Comment	CIR HL7 Web Service will populate this field with the CIR invalid reason coding system “NYCDOHINVSHOTCODES”.		Optional

## 7 Standard Code Sets - Supported

The following code sets, unless otherwise noted, are taken from the AIRA IIS Data Codebook dated 2/12/2007. This AIRA spreadsheet can be downloaded from the AIRA website at [http://www.immregistries.org/news/hit\\_index.phtml](http://www.immregistries.org/news/hit_index.phtml) . Each code set table below references the corresponding HL7 code table number, if applicable.

The CIR HL7 Web Service was designed to process these standard codes (or in some cases, subsets of the standard codes) and is expecting that the submitted VXU and VXQ messages will utilize these codes in the relevant fields. Failure to use the codes listed below will result in a TableValueNotFound error which can be either a fatal error or non-fatal error depending on which field the error occurred in. See the *Error Handling and Reporting* section for more details.

### 7.1 Sex

HL7 Table #	Table Name	Code Value	Description
<b>0001</b>	<b>Sex</b>		
		F	Female
		M	Male

The CIR database does not currently utilize the valid HL7 codes of O for Other and U for Unknown.

If a VXU message is received with an HL7 sex code of “O” or “U”, the CIR HL7 Web Service will:

- Utilize a name to gender (sex) mapping process to attempt to identify the sex.
  - If a sex can be determined based on the person’s name, the CIR HL7 Web Service will update the gender field accordingly to reflect either Female or Male.
  - If the sex cannot be determined based on the person’s name (i.e., the name is not in the name to gender dictionary), **the message will be rejected.**

If a VXQ message is received with an HL7 gender code “O” or “U”, the CIR HL7 Web Service will drop sex from the query. A minimum amount of additional search criteria would need to be provided in order to perform a valid search.

## 7.2 Race

HL7 Table #	Table Name	Code Value	Description
<b>0005</b>	<b>Race</b>		
		1002-5	American Indian or Alaska Native
		2028-9	Asian
		2076-8	Native Hawaiian or Other Pacific Islander
		2054-5	Black or African-American
		2106-3	White
		2186-5	Other race
		2131-1	Unknown

The CIR HL7 Web Service does not support race code 2135-2 (Hispanic or Latino). This race code, if received, will be ignored.

Partners are encouraged to report Hispanic or Latino as an ethnicity, which is supported by the CIR HL7 Web Service.

## 7.3 Relationship

HL7 Table #	Table Name	Code Value	Description
<b>0063</b>	<b>Relationship</b>		
		FTH	Father
		GRD	Guardian
		MTH	Mother

CIR does not utilize all of the standard HL7 relationship values. The CIR HL7 Web Service will ignore all HL7 relationship codes other than the ones listed above.

## 7.4 Financial – VFC Eligibility

HL7 Table #	Table Name	Code Value	Description
<b>0064</b>	<b>Financial - VFC Eligibility Codes</b>		
		V00	VFC eligibility not determined/unknown
		V01	Not VFC eligible
		V02	VFC eligible-Medicaid/Medicaid Managed Care
		V03	VFC eligible- Uninsured
		V04	VFC eligible- American Indian/Alaskan Native
		V05	VFC eligible-Federally Qualified Health Center Patient (under-insured)
		V06	State specific eligibility code. Use this code for "CHPLUS B" patients.
		V00	VFC eligibility not determined/unknown

CIR does not utilize all of the standard HL7 financial - VFC eligibility values. The CIR HL7 Web Service will ignore all HL7 financial - VFC eligibility codes other than the ones listed above. Example: HL7 code "V07" (VFC eligibility- Local-specific eligibility) will be ignored.

## 7.5 Ethnic Group

HL7 Table #	Table Name	Code Value	Description
<b>0189</b>	<b>Ethnic Group</b>		
		H	Hispanic or Latino
		N	Not Hispanic or Latino
		U	Unknown

## 7.6 Identifier Type

HL7 Table #	Table Name	Code Value	Description
<b>0203</b>	<b>Identifier Type</b>		
		LN	License Number
		LR	Local Registry ID
		MA	Medicaid Number
		MR	Medical Record Number
		OEI	Order Employee Number

CIR does not utilize all of the standard HL7 Identifier Type values. The CIR HL7 Web Service will ignore all HL7 Identifier Type codes other than the ones listed above.

However, HL7 data exchange partners should also include, if available, the Birth Registry Number, Medicare Number, and State Registry ID in the Patient Identifier List. Although the CIR does not currently store these fields, it will eventually be modified to capture these fields and to utilize them to facilitate matching. The corresponding HL7 Identifier Type values are as follows:

- Birth Registry – BRO
- Medicare Number - MC
- State Registry ID - SR

## 7.7 Manufacturer of Vaccine

HL7 Table #	Table Name	Code Value	Description
<b>0227</b>	<b>Manufacturer of Vaccine</b>		
		AB	Abbot Laboratories (includes Ross Products Division)
		AD	Adams Laboratories, Inc.
		ALP	Alpha Therapeutic Corporation
		AR	Armour [inactive use ZLB]
		AVB	Aventis Behrig L.L.C. (formerly Centeon L.L.C.;includes Armour Pharmaceutical Company) [inactive use ZLB]
		AVI	Aviron
		BA	Baxter Healthcare Corporation [inactive use BAH]
		BAH	Baxter Healthcare Corporation (includes Hyland Immuno, Immuno International AG, and North American Vaccine, Inc.)
		BAY	Bayer Corporation (includes Miles, Inc. and Cutter Laboratories)
		BP	Berna Products [inactive use BPC]
		BPC	Berna Products Corporation (includes Swiss Serum and Vaccine Institute Berne)
		CNJ	Cangene Corporation
		CEN	Centeon L.L. C. [inactive use ZLB]
		CHI	Chiron Corporation [Inactive use NOV]
		CMP	Caltech Medeva Pharmaceuticals [inactive use NOV]
		CON	Connaught [inactive use PMC]
		CSL	CSL Biotherapies
		DVC	DynPort Vaccine Company, LLC
		EVN	Evans Medical Limited [inactive use NOV]
		GEO	GeoVax Labs, Inc

HL7 Table #	Table Name	Code Value	Description
<b>0227</b>	<b>Manufacturer of Vaccine</b>		
		GRE	Greer Laboratories, Inc.
		IAG	Immuno International AG [inactive use BAH]
		IM	Merieux [inactive use PMC]
		IUS	Immuno-U.S.,Inc.
		JPN	The Research Foundation for Microbial Diseases of Osaka University (BIKEN)
		KGC	Korea Green Corss Corporation
		LED	Lederle [inactive use WAL]
		MA	Massachusetts Public Health Biological Laboratories [inactive use MBL]
		MBL	Massachusetts Biological Laboratories (formerly Massachusetts Public Health Biologic Laboratories)
		MED	MedImmune, Inc.
		MIL	Miles [inactive use BAY]
		MIP	BioPort Corporation (formerly Michigan Biologic Products Institute)
		MSD	Merck & Co, Inc.
		NAB	NABI (formerly Michigan Biologic Products Institute)
		NYB	New York Blood Center
		NAV	North American Vaccine, Inc. [inactive use BAH]
		NOV	Novartis Pharmaceutical Corporation (includes Celltech Medeva Vaccines and Evans Medical Limited)
		NVX	Novavax, Inc
		OTC	Organon Teknika Corporation
		ORT	Ortho-Clinical Diagnostics (formerly Ortho Diagnostic Systems, Inc)
		OTH	Other

HL7 Table #	Table Name	Code Value	Description
<b>0227</b>	<b>Manufacturer of Vaccine</b>		
		PD	Parkedale Pharmaceuticals (formerly Parke-Davis)
		PMC	Aventis Pasteur Inc. (formerly Pasteur Merieux Connaught; includes Connaught Laboratories and Pasteur Merieux)
		PRX	Praxis Biologics [inactive use WAL]
		PWJ	PowerJect Pharmaceuticals (includes Celtech Medeva Vaccines and Evans Medical Limited) [Inactive use NOV]
		SCL	Sclavo, Inc.
		SI	Swiss Serum and Vaccine Inst. [inactive use BPC]
		SKB	GlaxoSmithKline (formerly SmithKline Beecham; includes SmithKline Beecham and Glaxo Wellcome)
		SOL	Solvay Pharmaceuticals
		TAL	Talecris
		USA	United States Army Medical Research and Material Command
		UNK	Unknown
		VXG	VaxGen
		WA	Wyeth-Ayerst [inactive use WAL]
		WAL	Wyeth-Ayerst (includes Wyeth-Lederke Vaccines and Pediatrics, Wyeth Laboratories, Lederle Laboratories, and Praxis Biologics)
		ZLB	ZLB Behring (includes Aventis Behring and Armour Pharmaceutical Company)

As of the distribution date of this Guide, the CIR HL7 Web Service will accept the above MVX codes; all other valid MVX codes will be stored as “Unknown Manufacturer”. Over time, additional MVX codes may be supported.

## 7.8 Vaccine

HL7 Table #	Table Name	Code Value	Description
<b>0292</b>	<b>Vaccine Codes</b>		
		24	Anthrax
		19	BCG
		27	botulinum antitoxin
		26	Cholera
		29	CMVIG
		12	diphtheria antitoxin
		28	DT (pediatric)
		20	DTaP
		106	DTaP, 5 pertussis antigen
		107	DTaP, NOS
		110	DTaP/HepB/IPV (Pediatrix)
		50	DTaP-Hib
		120	DTaP-IPV/Hib (Pentacel)
		130	DTaP-IPV
		01	DTP
		22	DTP-Hib
		127	H1N1-09, Injectable
		125	H1N1-09, Nasal
		128	H1N1-09 NOS
		126	H1N1-09, Preservative Free
		52	Hep A, adult
		83	Hep A, ped/adol, 2 dose
		84	Hep A, ped/adol, 3 dose

HL7 Table #	Table Name	Code Value	Description
<b>0292</b>	<b>Vaccine Codes</b>		
		31	Hep A, pediatric, NOS
		104	Hep A- Hep B
		30	HBIG
		08	Hep B, adolescent or pediatric
		42	Hep B, adolescent /high risk infant
		43	Hep B, adult
		44	Hep B, dialysis
		45	Hep B, NOS
		46	Hib (PRP-D)
		47	Hib (HbOC)
		48	Hib (PRP-T)
		49	Hib (PRP-OMP)
		17	Hib, NOS
		51	Hib-Hep B
		118	HPV, bivalent (HPV2-Cervarix)
		62	HPV, quadrivalent (HPV4-Gardasil)
		137	Human Papillomavirus NOS
		14	IG, NOS
		135	Influenza-High-Dose
		140	Influenza-injectable preservative free
		141	Influenza-injectable
		15	influenza, split (incl. purified surface antigen)
		88	Influenza NOS
		111	Influenza-intranasal

HL7 Table #	Table Name	Code Value	Description
<b>0292</b>	<b>Vaccine Codes</b>		
		15	influenza, split (incl. purified surface antigen)
		16	influenza, whole
		10	IPV
		02	OPV
		39	Japanese encephalitis
		66	Lyme disease
		03	MMR
		04	M/R
		94	MMRV
		05	measles
		103	Meningococcal C conjugate
		136	Mening conj (MCV4 Menveo 11-55 yrs.)
		114	meningococcal (MCV4)
		32	Meningococcal (MPSV4)
		108	meningococcal, NOS
		07	mumps
		11	pertussis
		23	plague
		33	pneumococcal-polysaccharide
		100	pneumococcal conjugate
		133	Pneum Conj (PCV13)
		109	pneumococcal, NOS
		89	polio, NOS
		18	rabies, intramuscular injection

HL7 Table #	Table Name	Code Value	Description
<b>0292</b>	<b>Vaccine Codes</b>		
		40	rabies, intradermal injection
		34	RIG
		119	rotavirus, monovalent
		122	rotavirus, NOS
		116	rotavirus, pentavalent
		74	rotavirus
		71	RSV-IGIV
		93	RSV-Mab
		06	rubella
		38	rubella/mumps
		09	Td
		113	Td, preservative free
		115	Tdap
		35	tetanus toxoid
		13	TIG
		25	typhoid, oral
		41	typhoid parenteral
		101	typhoid, ViCPs
		75	Vaccinia (smallpox)
		21	varicella
		36	VZIG
		37	yellow fever
		121	Zoster

As of the distribution date of this Guide, the CIR HL7 Web Service will accept the above CVX codes. The CIR HL7 Web Service will reject any VXU message received with a CVX code other than the codes listed above. Over time, additional CVX codes may be supported.

## 7.9 Language

HL7 Table #	Table Name	Code Value	Description
<b>0296</b>	<b>Language</b>		
		Ar	Arabic
		Hy	Armenian
		Bn	Bengali
		Km	Cambodian
		CJD	Chamorro
		YUH	Chinese, Cantonese
		zh	Chinese, Mandarin
		hr	Croatian
		cs	Czech
		nl	Dutch
		en	English
		fa	Farsi (Persian)
		fr	French
		de	German
		el	Greek
		hi	Hindi
		BLU	Hmong
		hu	Hungarian
		ILO	Ilocano
		id	Indonesian

HL7 Table #	Table Name	Code Value	Description
<b>0296</b>	<b>Language</b>		
		it	Italian
		ja	Japanese
		ko	Korean
		lo	Loatian
		pl	Polish
		pt	Portuguese
		ro	Romanian
		ru	Russian
		sm	Samoan
		sr	Serbian
		sk	Slovak
		so	Somali
		es	Spanish
		tl	Tagalog
		th	Thai
		to	Tongan
		uk	Ukranian
		ur	Urdu
		vi	Vietnamese
		yi	Yiddish
		OTH	Other (must add text component of the CE field with description)

## 7.10 Country

HL7 Table #	Table Name	Code Value	Description
<b>0399</b>	<b>Country</b>		
		AFG	Afghanistan
		ALB	Albania
		AND	Andorra
		ARG	Argentina
		ARM	Armenia
		AZE	Azerbaijan
		BEL	Belgium
		BEN	Benin
		BHR	Bahrain
		BOL	Bolivia, Plurinational State of
		BRA	Brazil
		CAN	Canada
		CHL	Chile
		COL	Colombia
		COM	Comoros
		CUB	Cuba
		CYP	Cyprus
		CZE	Czech Republic
		DJI	Djibouti
		DOM	Dominican Republic
		ECU	Ecuador
		EGY	Egypt
		EST	Estonia

HL7 Table #	Table Name	Code Value	Description
<b>0399</b>	<b>Country</b>		
		ETH	Ethiopia
		FIJ	Fiji
		FIN	Finland
		FRA	France
		GAB	Gabon
		GEO	Georgia
		GHA	Ghana
		GIB	Gibraltar
		GRD	Grenada
		GRL	Greenland
		GUM	Guam
		GUY	Guyana
		HUN	Hungary
		IND	India
		IRN	Iran, Islamic Republic of
		IRQ	Iraq
		ISR	Israel
		ITA	Italy
		JAM	Jamaica
		JOR	Jordan
		KAZ	Kazakhstan
		KEN	Kenya
		KIR	Kiribati
		KOR	Korea, Republic of

HL7 Table #	Table Name	Code Value	Description
<b>0399</b>	<b>Country</b>		
		LAO	Laos
		LBY	Libyan Arab Jamahiriya
		LIE	Liechtenstein
		LUX	Luxembourg
		MAC	Macao
		MEX	Mexico
		MOZ	Mozambique
		NAM	Namibia
		NGA	Nigeria
		NIC	Nicaragua
		NOR	Norway
		PAK	Pakistan
		PAN	Panama
		PER	Peru
		POL	Poland
		QAT	Qatar
		RUS	Russian Federation
		RWA	Rwanda
		SAU	Saudi Arabia
		SEN	Senegal
		SOM	Somalia
		SUR	Suriname
		SWE	Sweden
		SYR	Syria

HL7 Table #	Table Name	Code Value	Description
<b>0399</b>	<b>Country</b>		
		THA	Thailand
		TON	Tonga
		TUN	Tunisia
		TUR	Turkey
		UGA	Uganda
		UKR	Ukraine
		USA	United States
		UZB	Uzbekistan
		VAT	Holy See (Vatican City State)
		VEN	Venezuela
		YEM	Yemen

As of the distribution date of this Guide, the CIR does not utilize the entire set of HL7 (ISO 3166 alpha-3) country codes. When including birth country as a search criterion in a VXU, only codes from the above list should be utilized. Over time, additional HL7 country codes may be supported.

## 7.11 Immunization Information Source

HL7 Table #	Table Name	Code Value	Description
<b>NIP001</b>	<b>Immunization Information Source</b>		
		00	New immunization record
		01	Historical information-source unspecified
		02	Historical information- from other provider
		03	Historical information-from parent's written record
		04	Historical information-from parent's recall
		05	Historical information- from other registry
		06	Historical information- from birth certificate
		07	Historical information- from school record

## 7.12 Health Plan / Insurance

Standard HL7 Health Plan (Insurance) codes are included in neither the AIRA IIS Data Codebook (dated 2/12/2007) nor the CDC's *Implementation Guide for Immunization Data Transactions using Version 2.3.1 of the Health Level Seven (HL7) Standard Protocol*. Health plan information will be ignored by the CIR HL7 Web Service if received as part of a VXU message and will not be sent by the CIR HL7 Web Service as part of a VXR message.

## 8 Message Examples

This chapter provides the following examples of VXU and VXQ messages and their corresponding responses:

Example 1	VXU and ACK Message Pair	<p>Each example shows a successful VXU message with no errors followed by an acknowledgement.</p> <ul style="list-style-type: none"> <li>• Example 1A: Immunization Add</li> <li>• Example 1B: Immunization Delete and Update</li> </ul>
Example 2	VXU (with Errors) and ACK Message Pair	<p>Each example shows a VXU message with errors followed by an acknowledgement providing error details.</p> <ul style="list-style-type: none"> <li>• Example 2A: Non-Fatal Errors Only</li> <li>• Example 2B: Fatal Errors on One of the RXA Segments</li> <li>• Example 2C: Fatal Errors Outside of an RXA Segment</li> <li>• Example 2D: Delete Exception Message</li> </ul>
Example 3	VXQ and QCK Message Pair	<p>This example shows a VXQ message followed by a QCK message indicating the patient was not found.</p>
Example 4	VXQ and VXR Message Pair	<p>This example shows a successful VXQ message followed by a VXR message.</p>

Each example provides the following:

- Sample Message
- Message Narrative
- Segment Details

The *Sample Message* provides the entire message string. In actuality, each segment of the message is one line in length; however, in the examples that follow, segments that are longer than the width of the page are artificially broken into multiple lines for display purposes. Each segment is separated by a carriage return. Also, to further help identify the segments, each segment name, e.g., “PID”, is bolded.

The *Message Narrative* tells the story of the message. While the narrative does not capture every detail of each message segment, it provides a highlight of the information being transmitted.

The *Segment Details* section lists each message segment, such as the Message Header (MSH) segment, contained in the sample message, the fields contained in that segment, and the data (from the sample message) provided in each field.

## 8.1 Example 1A – VXU and ACK Message Pair

Example 1A shows a successful VXU message with no errors followed by an acknowledgement. In this VXU message a single immunization event is being reported.

### 8.1.1 VXU

The NYC DOHMH requires that Queens Clinic send client and immunization information to the CIR to help ensure that their patients' immunization records are kept up-to-date. The CIR has assigned Queens Clinic a facility identifier of "8000N70". Queens Clinic is using version 1.1 of the electronic medical record (EMR) application "Patients1st".

The example message below illustrates a VXU message from Queens Clinic requesting that immunization information be added for the specified patient. Both the required and optional fields are populated in this VXU message. Fields that are ignored by the CIR HL7 Web Service are not populated in this example message. This VXU message does not contain errors.

When the CIR HL7 Web Service receives this message it will return an acknowledgement (ACK) message indicating that the VXU was successfully received.

#### 8.1.1.1 Sample Message

```
MSH|^~\&|Patients1ST1.1|8000N70|||20110424162946||VXU^V04|578438|P|2.3.1|||AL|
PID||531151424^^^^LR~BB7777B^^^^MA~221345671^^^^MR||Carry^John^J|Walter
s^Mary |19991125|M| Carrie^Johnny|2106-3^White^HL70005|1907 Crumpton
Road^APT
3B^Jamacia^NY^11423||^617^5551212||EN^English^HL70296|||||N^Not Hispanic
or Latino ^HL70189|11116|N|
NK1||Jones^Mary^Ann|MTH^Mother^HL70063||^212^5218118|^212^7771212
^497|||||19781115|
PV1|||||V02
RXA||20110417||08^HEP B^CVX|||00^New Immunization
Record^NIP0001|6145123^Jones^Lisa^^^^^^^^^OEI|^8000N70|||W2348796456|201
10731|MSD^Merck^MVX|||A
```

#### 8.1.1.2 Message Narrative

The first segment of the message, the Message Header (MSH) segment, identifies the message as being sent from Queens Clinic, registered with the CIR as facility number "8000N70", which is also the facility code associated with Queens Clinic's CIR HL7 Web Service account. The MSH segment also lets the CIR HL7 Web Service know that

Queens Clinic is using version 1.1 of the EMR application “Patients 1<sup>st</sup>” and that the message will contain the standard separator of “|” and encoding characters of “^~\ &”. This message was created on 4/24/2011 at approximately 4:30 PM (16:29:46 to be exact), and is a VXU V04 (i.e., unsolicited vaccination update) message. Queens Clinic has assigned the unique message ID of “578438” to this VXU message; the CIR HL7 Web Service will echo this unique ID back in the response message. The “P” that follows the unique message ID indicates that this is a production, rather than a test message. The Version field, the next to last field in this segment, identifies that Queens Clinic is using HL7 version 2.3.1. This is the only version of HL7 that the CIR HL7 Web Service officially supports. In the Application Acknowledgment Type field, the last field shown in this segment, Queens Clinic has sent an “AL” meaning that an acknowledgement is always required. For VXU messages, the CIR HL7 Web Service requires an “AL” (Always) type in this field.

The next segment of the message is the Patient Identification (PID) segment. This VXU message is for John J. Carry. Queens Clinic is reporting John’s personal identifiers – Local Registry ID (531151424), Medicaid number (BB77777B), and Medical Record number (221345671) – as well as his date of birth, gender, race, ethnicity, and language. Queens Clinic includes the patient’s Local Registry Identifier (i.e., the patient’s CIR ID), when available, because they know that including the patient’s CIR identifier significantly enhances the CIR HL7 Web Service’s performance. In addition, his current permanent address and contact phone number are included as well as his place of birth.

In the following segment, Next of Kin (NK1), information is provided regarding John’s mother, Mary Ann Jones. A Set ID was not provided; the Set ID is required by the CDC Implementation Guide, but is ignored by the CIR HL7 Web Service.

The Patient Visit (PV1) segment lets the CIR know that John was identified as being eligible for the Vaccines for Children program, based on his Medicaid eligibility. The Patient Class was not provided; this code is required by the CDC Implementation Guide, but is ignored by the CIR HL7 Web Service.

The next segment, the Pharmacy/Treatment Administration (RXA), contains immunization event data and an Action Code of “A”. This action code instructs the CIR HL7 Web Service to add to the patient’s record the immunization data contained in this RXA segment. This RXA segment lets the CIR HL7 Web Service know that John received a HEP B vaccination (CVX code 08) on 4/17/2011 that was ordered by Lisa Jones, license number 6145123. The vaccine was administered at Queens Clinic, indicated by the facility ID “8000N70”. The “orderer” provider (which includes the provider license number, provider first and last name, and provider type “OEI”) should always be provided for new immunizations and, when available, for historical immunizations. The manufacture, lot number, and expiration date of the vaccine are also provided. The amount of vaccine administered was not provided. The administered amount is required by the CDC Implementation Guide, but is ignored by the CIR HL7 Web Service. While the message includes the *start* date of the immunization administration (4/17/2011), the message does not include the *end* date/time of the immunization administration; administration end date/time is required by the CDC

Implementation Guide, but is ignored by the CIR HL7 Web Service. Also, the Give Sub-ID Counter and Administration Sub-ID Counter were not provided. These values are also required by the CDC Implementation Guide, but ignored by the CIR HL7 Web Service.

When the CIR HL7 Web Service receives this message it will return an acknowledgement (ACK) message indicating that this message was successfully received.

### 8.1.1.3 Segment Details

#### ***8.1.1.3.1 Message Segment Header Details***

MSH-1 Field Separator: |

MSH-2 Encoding Characters: ^~\&

MSH-3.1 Sending Application – Namespace ID: PATIENTS1ST1.1

MSH-4.1 Sending Facility – Namespace ID: 8000N70

MSH-7.1 Date Time of Message: 20080424162946 (4/24/2008 at 16:29:46)

MSH-9 Message Type

MSH-9.1 Message Type: VXU

MSH-9.2 Trigger Event: V04

MSH-10 Message Control ID: 578438

MSH-11 Processing ID: P

MSH-12 Version ID: 2.3.1

MSH-16 Application Acknowledgment Type: AL

#### ***8.1.1.3.2 Patient Identification Segment Details***

PID-3: Patient Identifier List

(1) PID-3.1 Identifier: 531151424

(1) PID-3.5 Type: LR (Local Registry ID)

(2) PID-3.1 Identifier: BB77777B

(2) PID-3.5 Type: MA (Medicaid Number)

(3) PID-3.1 Identifier: 221345671

(3) PID-3.5 Type: MR (Medical Record)

PID-5 Patient Name

PID-5.1.1 Last (Family) Name: Carry

PID-5.2 First (Given) Name: John

PID-5.3 Middle Initial or Name: J

PID-6 Mother's Maiden Name

PID-6.1.1 Last (Family Name: Walters

PID-6.2 First (Given) Name: Mary

PID-7.1 DOB: 19991125 (11/25/1999)

PID-8 Gender (Sex): M (Male)

PID-9 Patient Alias

PID-9.1.1 Last (Family) Name: Carrie

PID-9.2 First (Given) Name: Johnny

PID-10 Race

PID-10.1 Identifier: 2106-3

PID-10.2 Text: White  
PID-10.3 Coding System: HL70005  
PID-11 Patient Address  
PID-11.1 Street Address: 1907 Crumpton Road  
PID-11.2 Other Designation: Apt 3B  
PID-11.3 City: Jamaica  
PID-11.4 State: NY  
PID-11.5 Zip 11423  
PID-13 Home Phone Number  
PID-13.6 Area Code: 617  
PID-13.7 Phone Number: 5551212  
PID-15 Primary Language  
PID-15.1 Identifier: EN  
PID-15.2 Text: English  
PID-15.3 Coding System: HL70296  
PID-22 Ethnic Group  
PID-15.1 Identifier: N  
PID-15.2 Text: Not Hispanic or Latino  
PID-15.3 Coding System: HL70189  
PID-23 Birth Place: 11116 (the code for Columbus Hospital)  
PID-24 Multi Birth Indicator: N

#### ***8.1.1.3.3 Next of Kin/Associated Parties Segment Details***

NK1-2 Name  
NK1-2.1.1 Last (Family) Name: Jones  
NK1-2.2 First (Given) Name: Mary  
NK1-2.3 Middle Initial or Name: Ann  
NK1-3 Relationship  
NK1-3.1 Identifier: MTH  
NK1-3.2 Text: Mother  
NK1-3.3 Coding System: HL70063  
NK1-5 Phone Number  
NK1-5.6 Area Code: 212  
NK1-5.7 Phone Number: 5218118  
NK1-6 Business Phone:  
NK1-5.6 Area Code: 212  
NK1-5.7 Phone Number: 7771212  
NK1-5.8 Extension: 497  
NK1-16.1 DOB: 19781115 (11/15/1978)

#### ***8.1.1.3.4 Patient Visit Segment Details***

PV1-20.1 Financial Class: V02 (code for VFC Eligible – Medicaid)

#### ***8.1.1.3.5 Pharmacy/Treatment Administration Segment Details***

RXA-3.1 Date/time Start of administration: 20110417 (4/17/2011)  
RXA-5 Administered Code

RXA-5.1 Identifier: 08  
 RXA-5.2 Text: HEP B  
 RXA-5.3 Coding System: CVX  
 RXA-9 Administration Notes  
 RXA-9.1 Identifier: 00  
 RXA-9.2 Text: New Immunization Record  
 RXA-9.3 Coding System: NIP0001  
 RXA-10 Administering Provider  
 RXA-10.1 Administering Provider – License Number: 6145123  
 RXA-10.2.1 Administering Provider – Last (Family) Name: Jones  
 RXA-10.3 Administering Provider – First (Given) Name: Lisa  
 RXA-10.13 Administering Provider – Provider Type: OEI (Orderer)  
 RXA-11-4.1 Administered at Location – Namespace ID: 8000N70 (Facility Code)  
 RXA-15 Substance Lot Number: W2348796456  
 RXA-16.1 Substance Expiration Date: 20110731 (7/31/2011)  
 RXA-17 Substance Manufacturer  
 RXA-17.1 Identifier: MSD  
 RXA-17.2 Text: Merck  
 RXA-17.3 Coding System: MVX  
 RXA-21 Action Code: A (Add)

## 8.1.2 ACK Response

When the above VXU message is received, the CIR HL7 Web Service will return the following acknowledgement (ACK) message to Queens Clinic.

### 8.1.2.1 Sample Message

```
MSH|^~\&|CIR HL7 Web Service 1.75|NYC DOHMH|
PATIENTS1ST1.1|8000N70|20110424162956||ACK^V04|20110424162956CIR-
WS|P|2.3.1|||AL|
```

```
MSA|AA|578438|MESSAGE ACCEPTED;LR=531151424;|
```

### 8.1.2.2 Message Narrative

The VXU message sent by Queens Clinic was successfully received and processed by the CIR HL7 Web Service. The CIR HL7 Web Service searched for and found a matching patient record for John Carry in the CIR database and then added the Hep B immunization to the CIR database. The CIR HL7 Web Service returns an acknowledge message to Queens Clinic letting them know that the message was successfully received.

The Message Header (MSH) segment lets Queens Clinic know that this acknowledgement (ACK) message is coming from the New York City Department of Health and Mental Hygiene, that the sending application is version 1.75 of the CIR HL7 Web Service, and that the CIR HL7 Web Service uses the standard separator of “|” and

encoding characters of “^~\&”. The message control ID provided in the MSH segment, “20110424162956CIR-WS”, is the unique ID assigned by the CIR HL7 Web Service.

In the Message Acknowledgement (MSA) segment, the CIR HL7 Web Services echoes back the message control ID that Queens Clinic used to identify the VXU message they sent. The Acknowledgement Code is “AA”, letting the Queens Clinic know that the CIR HL7 Web Service has received and successfully processed the VXU message. The MSA segment also provides Queens Clinic with the Patient’s Local Registry ID, “531151424”. Upon receiving the ACK message, the facility should then store this patient identifier with the corresponding patient’s record and then include it in subsequent messages that it sends to the CIR HL7 Web Service.

There were no errors in this message, so no error details were provided in the MSA segment.

### 8.1.2.3 Segment Details

#### ***8.1.2.3.1 Message Segment Header Details***

MSH-1 Field Separator: |

MSH-2 Encoding Characters: ^~\&

MSH-3.1 Sending Application: CIR HL7 Web Service 1.1

MSH-4.1 Sending Facility: NYC DOHMH

MSH-7.1 Date Time of Message: 20110424163356 (4/24/2011 at 4:29:56 PM)

MSH-9 Message Type

MSH-9.1 Message Type: ACK

MSH-9.2 Trigger Event: V04

MSH-10 Message Control ID: 20110424162956CIR-WS

MSH-11.1 Processing ID: P

MSH-12.1 Version ID: 2.3.1

MSH-16 Application Acknowledgment Type: AL

#### ***8.1.2.3.2 Message Acknowledgement Segment Details***

MSA-1 Acknowledgment Code: AA

MSA-2 Message Control ID: 578438

MSA-3 Text Message: MESSAGE ACCEPTED; LR=531151424; (*The MESSAGE ACCEPTED text indicates that the Message was accepted by the CIR HL7 Web Service. The “531151424” Identifies the NYC DOHMH Local Registry ID for the Patient.*)

## 8.2 Example 1B – VXU and ACK Message Pair – Add, Delete, and Update Immunizations

Example 1B shows a successful VXU message used to delete and update immunization events. This VXU has no errors and is followed by an acknowledgement.

## 8.2.1 VXU

Melinda and her older brother Mark were previous patients at Queens Clinic and have returned for a visit. In reviewing Melinda and Mark's medical records, Queens Clinic finds several data entry errors:

1. The date of administration for Melinda's Heb B vaccine is listed as 1/10/20011 when Queens Clinic actually administered this vaccine on 1/9/20011.
2. Also, Melinda's record shows an MMR vaccination on 1/10/20011; however, it was actually Melinda's older brother Mark, not Melinda, that received the MMR vaccine on 1/10/20011 from Queens Clinic.

These data entry errors have been corrected in Melinda and Marks medical records and now must be reported to the CIR.

The example message below illustrates the VXU message from Queens Clinic for Melinda requesting the deletion of the MMR vaccination and the correction of the Heb B date of service.

When the CIR HL7 Web Service receives this message it will return an acknowledgement (ACK) message indicating that the VXU was successfully received.

Although not shown in this example, Queens Clinic would also need to send a separate VXU for Mark to add the MMR vaccine he received on 1/10/2011.

### 8.2.1.1 Sample Message

**MSH**|^~&|PATIENTS1ST1.1|8000N70|||20110331122319||VXU^V04|20110331976A9  
C|P|2.3.1|||AL|

**PID**|||43666536^^^^LR||Howard^Melinda^C|Massengill^Carol|20060523|F|Boward^Lind  
ie |2106-3^White^HL70005|184 East 86th Street^APT 3B^New  
York^NY^10092||^212^5551212||EN^English^HL70296|||N^Not Hispanic or  
Latino^HL70189|11116|N|

**NK1**||Howard^Carol^Ann|MTH^Mother^HL70063||^212^1234567|^212^33344  
44^123|||19800124|

**NK1**||Howard^Richard^Leo|FTH^Father^HL70063||^212^1234567|^317^11144  
44^123|||19790510|

**PV1**|||||V01

**RXA**|||20110110||03^MMR^CVX|||00^New Immunization  
Record^NIP0001|9932234^Smith^Freed^^^^^^^OEI|^8000N70|||M3874056|20110  
831|MSD^Merck^MVX|||D

**RXA**|||20110110||08^HEP B^CVX|||00^New Immunization  
 Record^NIP0001|9932234^Smith^Freed^^^^^^^^^^^OEI|^^^8000N70|||H83254689|2011  
 0731|MSD^MERCK^MVX|||D

**RXA**|||20110109||08^HEP B^CVX|||00^New Immunization  
 Record^NIP0001|9932234^Smith^Freed^^^^^^^^^^^OEI|^^^8000N70|||H83254689|2011  
 0731|MSD^Merck^MVX|||A

### 8.2.1.2 Message Narrative

This message narrative focuses on the three Pharmacy/Treatment Administration (RXA) segments.

Two of these RXA segments are being submitted for the purpose of deleting information and have an Action Code of “D” for delete. One RXA segment is being submitted for the purpose of adding information and that RXA segment has an Action Code of “A” for add. The CIR HL7 Web Service always processes RXA segments containing an Action Code of “D” (for delete) prior to processing any RXA segments with an action code of “A” (for add).

The first RXA segment has an Action Code of “D” and is instructing the CIR HL7 Web Service to delete from the patient’s record the immunization data for the 1/10/2011 MMR. Queens Clinic previously reported this MMR for Melinda in error. The MMR was actually given to her older brother Mark on 1/10/2011. A separate VXU message must be sent to the CIR to report the MMR given to Mark. When the CIR HL7 Web Service receives and processes this RXA segment, the CIR will search for the matching immunization record previously submitted by Queens Clinic. Once the matching immunization record is found, it will be deleted. If the matching record could not be found, this RXA segment would be ignored by the CIR HL7 Web Service.

The second and third RXA segments will work together to correct the date of administration of the Heb B vaccination. Queens Clinic originally reported the administration date as 1/10/2011 for Melinda’s Heb B vaccination when the correct administration date was 1/9/2011. The CIR HL7 Web Service does not allow for updates, meaning Queens Clinic cannot simply report the updated administration date. Queens Clinic must first submit a request to delete the immunization event data associated with the Heb B vaccination on 1/10/2011 and then resubmit all of the immunization event data including the correct administration date of 1/9/2011.

The second RXA segment has an Action Code of “D” and is instructing the CIR HL7 Web Service to delete from the patient’s record the immunization data for the 1/10/2011 Heb B.

The third RXA segment has an Action Code of “A” and provides the entire immunization event data associated with the Heb B vaccination, including the corrected administration date of 1/9/2011.

The CIR HL7 Web Service will first process all RXA segments with an Action Code of “D” (for delete) and then will process any RXA segments with an Action Code of “A” for add. This will result in an update to the Heb B vaccine date of administration.

When the CIR HL7 Web Service receives this message it will return an acknowledgement (ACK) message indicating that this message was successfully received.

### 8.2.1.3 Segment Details (for RXA Segments)

The details below focus on the RXA segments; other segments within the message are not shown. (For a complete description of all segments and their corresponding fields, see VXU example 1A.)

#### 8.2.1.3.1 *First RXA*

RXA-3.1 Date/Time Start of Administration: 20110110 (1/10/2011)

RXA-5 Administered Code

RXA-5.1 Identifier: 03

RXA-5.2 Text: MMR

RXA-5.3 Coding System: CVX

RXA-9 Administration Notes

RXA-9.1 Identifier: 00

RXA-9.2 Text: New Immunization Record

RXA-9.3 Coding System: NIP0001

RXA-10 Administering Provider

RXA-10.1 Administering Provider – License Number: 9932234

RXA-10.2.1 Administering Provider – Last (Family) Name: Smith

RXA-10.3 Administering Provider – First (Given) Name: Freed

RXA-10.13 Administering Provider – Provider Type: OEI (Orderer)

RXA-11-4.1 Administered at Location – Namespace ID: 8000N70 (Facility Code)

RXA-15 Substance Lot Number: M3874056

RXA-16.1 Substance Expiration Date: 20110831 (8/31/2011)

RXA-17 Substance Manufacturer

RXA-17.1 Identifier: MSD

RXA-17.2 Text: Merck

RXA-17.3 Coding System: MVX

RXA-21 Action Code: D (Delete)

#### 8.2.1.3.2 *Second RXA*

RXA-3.1 Date/Time Start of Administration: 20110110 (1/10/2011)

RXA-5 Administered Code

RXA-5.1 Identifier: 08

RXA-5.2 Text: HEP B

RXA-5.3 Coding System: CVX

RXA-9 Administration Notes

RXA-9.1 Identifier: 00

RXA-9.2 Text: New Immunization Record  
RXA-9.3 Coding System: NIP0001  
RXA-10 Administering Provider  
RXA-10.1 Administering Provider – License Number: 9932234  
RXA-10.2.1 Administering Provider – Last (Family) Name: Smith  
RXA-10.3 Administering Provider – First (Given) Name: Freed  
RXA-10.13 Administering Provider – Provider Type: OEI (Orderer)  
RXA-11-4.1 Administered at Location – Namespace ID: 8000N70 (Facility Code)  
RXA-15 Substance Lot Number: H83254689  
RXA-16.1 Substance Expiration Date: 20110731 (7/31/2011)  
RXA-17 Substance Manufacturer  
RXA-17.1 Identifier: MSD  
RXA-17.2 Text: Merck  
RXA-17.3 Coding System: MVX  
RXA-21 Action Code: D (Delete)

### **8.2.1.3.3 Third RXA**

RXA-3.1 Date/Time Start of Administration: 20110109 (1/09/2011)  
RXA-5 Administered Code  
RXA-5.1 Identifier: 08  
RXA-5.2 Text: HEP B  
RXA-5.3 Coding System: CVX  
RXA-9 Administration Notes  
RXA-9.1 Identifier: 00  
RXA-9.2 Text: New Immunization Record  
RXA-9.3 Coding System: NIP0001  
RXA-10 Administering Provider  
RXA-10.1 Administering Provider – License Number: 9932234  
RXA-10.2.1 Administering Provider – Last (Family) Name: Smith  
RXA-10.3 Administering Provider – First (Given) Name: Freed  
RXA-10.13 Administering Provider – Provider Type: OEI (Orderer)  
RXA-11-4.1 Administered at Location – Namespace ID: 8000N70 (Facility Code)  
RXA-15 Substance Lot Number: H83254689  
RXA-16.1 Substance Expiration Date: 20110731 (July 31, 2011)  
RXA-17 Substance Manufacturer  
RXA-17.1 Identifier: MSD  
RXA-17.2 Text: Merck  
RXA-17.3 Coding System: MVX  
RXA-21 Action Code: A (Add)

## **8.2.2 ACK Response**

When the above VXU message is received, the CIR HL7 Web Service will return the following acknowledgement (ACK) message to Queens Clinic.

### 8.2.2.1 Sample Message

```
MSH|^~\&|CIR HL7 Web Service 1.75|NYC DOHMH|
PATIENTS1ST1.1|8000N70|20110331132319||ACK^V04|20110331155311CIR-
WS|P|2.3.1|||AL|
```

```
MSA|AA|20080331976A9C |MESSAGE ACCEPTED;LR=43666536;|
```

### 8.2.2.2 Message Narrative

The VXU message sent by Queens Clinic was successfully received and processed by the CIR HL7 Web Service. The CIR HL7 Web Service searched for and found a matching patient record for Melinda Howard in the CIR database. The CIR HL7 Web Service then searched for and found the MMR and Hep B vaccines records that Queens Clinic requested to be deleted. Since the administering facility on record in the CIR database was the same as the administering facility on each of the RXA segments (e.g., 8000N70), the MMR and Hep B vaccination events were deleted from Melinda's record in the CIR database. Once the deletions were processed, then, the Hep B vaccine (with the correct date of administration) was added to the CIR database. The CIR HL7 Web Service returns an acknowledge message to Queens Clinic letting them know that the message was successfully received.

If the administering facility on record had been different from the administering facility in each of the deletion RXA segments in the VXU message, the two immunizations would not have been immediately deleted. The CIR HL7 Web Service would first send a message to CIR staff. The CIR staff would review the delete requests and process them if appropriate. If the deletions were delayed for review the ACK message would include a Delete Exception error message to advise Queens Clinic of the delay.

In the Message Acknowledgement (MSA) segment, the CIR HL7 Web Services provides Queens Clinic with the Patient's Local Registry ID, "43666536". Upon receiving the ACK message, Queens Clinic should then store this patient identifier with the corresponding patient's record and include it in subsequent messages that it sends to the CIR HL7 Web Service.

There were no errors in this message, so no error details were provided in the MSA segment.

### 8.2.2.3 Segment Details

#### ***8.2.2.3.1 Message Segment Header Details***

MSH-1 Field Separator: |

MSH-2 Encoding Characters: ^~\&

MSH-3 Sending Application: CIR HL7 Web Service 1.75

MSH-4 Sending Facility: NYC DOHMH  
 MSH-7 Date/Time of Message: 200110331155311 (3/31/2011 15:53:11)  
 MSH-9 Message Type  
     MSH-9.1 Message Type: ACK  
     MSH-9.2 Trigger Event: V04  
 MSH-10 Message Control ID: 20110331155311CIR-WS  
 MSH-11 Processing ID: P  
 MSH-12 Version ID: 2.3.1  
 MSH-16 Application Acknowledgment Type: AL

### 8.2.2.3.2 Message Acknowledgement Segment Details

MSA-1 Acknowledgment Code: AA  
 MSA-2 Message Control ID: 20110331155311CIR-WS  
 MSA-3 Text Message: "43666536" Identifies the NYC DOHMH Local Registry ID for the Patient.

## 8.3 Example 2A - VXU (with Non-Fatal Errors) and ACK Message Pair

Example 2A illustrates a VXU message that contains non-fatal errors (i.e., errors in optional fields).

### 8.3.1 VXU

Queens Clinic is sending a VXU message that contains errors in optional fields resulting in non-fatal errors. If there are non-fatal errors in a VXU message the CIR HL7 Web Service will ignore those erroneous optional fields and process the remainder of the VXU message. When the CIR HL7 Web Service receives this message it will return an acknowledgement (ACK) advising the message was accepted and describing the non-fatal errors.

#### 8.3.1.1 Sample Message

**MSH|^~\&|Patients1ST1.1|8000N70||20110426155034||VXU^V04|2011042155083484368|P|2.3.1|||AL|**

**PID|||BB77733B^^^^MA~73487523^^^^||Fernandez^William||20010402|M|1||||||||||**

**NK1||Fernandez^Marc |FTH^Father^HL70063||^434^73961111^123||||||||||**

**NK1|^|MTH^MOTHER^HL70063||^212^||||||||||19xx1115|**

**RXA|||20020607||03^MMR^CVX|||01^Historical Immunization Record- Source Unspecified^NIP0001||^8000N70||||||**

**RXA**|||20110426||08^HEP B^CVX|||00^New Immunization  
 Record^NIP0001|9312398^Smith^Gai|^^^^^^^^^^^VEI~9412390^^^^^^^^^^^^^^^OEI|^^^8  
 000N70|||W2348796456|20121230|XXX^Merck^MVX|||A

### 8.3.1.2 Message Narrative

This narrative focuses on the segments that contain non-fatal errors. (For a complete description of all segments and their corresponding fields, see VXU example 1A.)

In the Patient Identification (PID) segment of this VXU message, Queens Clinic is reporting the Medicaid and Medical Record numbers as well as the race of the patient, William Fernandez. However, for the Medical Record number, the corresponding patient identifier type (MR) was not provided to identify “73487523” as a Medical Record number. The missing identifier type will cause the “73487523” patient identifier to be ignored and a non-fatal error reported. Also, the provided race code (1) is not a valid HL7 race code; this will be reported as a non-fatal error. The Clinic also did not include William’s Local Registry ID. While omitting the Local Registry ID will not be considered an error, including this information may significantly increase the performance of the CIR HL7 Web Service.

The first Next of Kin (NK1) segment provides information about William’s father, Marc. This NK1 segment attempts to provide Marc’s business phone number. However, the phone number is not in the correct format; the area code contains too few digits and the phone number contains too many digits. The business phone number will be ignored and the non-fatal errors reported.

The second NK1 segment attempts to provide information about William’s mother; however, the mother’s name is missing. Without a name, other next of kin information, such as home phone number, work phone number, and/or date of birth, cannot be absorbed into the CIR database. A non-fatal error will be reported for the missing names. Also, this NK1 segment attempts to provide the mother’s home phone number; however, only the area code is provided. If the area code is provided but the phone number is missing, the phone number will be ignored and a non-fatal error reported. The mother’s date of birth is also provided. The date of birth, however, is not in the correct format; it contains letters. This will also be reported as a non-fatal error.

The first Pharmacy/Treatment Administration (RXA) segment reports an historical MMR vaccination (CVX code 03) given to William on 6/7/2002. Queens Clinic does not know the location where this vaccine was administered to William; however, the Administered at Location is always required (even for historical immunizations). Queens Clinic will value the Administered at Location with their facility ID (8000N70). Queens Clinic also does not know the name and license number of the provider that ordered this vaccination; so, the Administering Provider field was not valued. An empty Administering Provider field will be accepted for historical immunizations and not reported as a non-fatal error. If Queens Clinic had known the facility ID for the location that administered the vaccine and the name and license number of the provider that ordered the vaccination, this

information would have been included in this RXA segment. There is one error in this RXA segment. The Action Code was not valued. The CIR HL7 Web Service will assume the purpose of this RXA is to report the immunization and will process the RXA as if an “A” (for Add) had been provided. Although RXA-21 is a required field, since the CIR HL7 Web Service will treat the RXA segment as if an “A” was sent, this error will be considered non-fatal. A non-fatal error will be reported to indicate to Queens Clinic that the Action Code was missing.

The second RXA segment lets the CIR HL7 Web Service know that William received a Hep B vaccination (CVX code 08) on 4/26/2011 and that the vaccine was administered at the Queens Clinic, indicated by the facility ID “8000N70”. This vaccination was ordered by a provider with the license number “9412390”. However, since this RXA segment does not provide the first and last name of the provider that ordered the vaccine (i.e., the “OEI” provider), the vaccination will be associated with the default provider for the administered location (8000N70) and non-fatal errors reported for the missing name. The manufacture is also provided; however, the manufacture code (XXX) is not a valid MVX code and results in another non-fatal error.

These non-fatal errors are reported to assist Queens Clinic in improving their data quality on these optional fields. Reporting these non-fatal errors also alerts Queens Clinic that data they have submitted, such as a parent’s date of birth or a patient identifier, may not have been absorbed by the CIR due to the errors. The non-fatal errors will not stop the message from being processed.

When the CIR HL7 Web Service receives this message it will return an acknowledgement (ACK) message with an explanation of the non-fatal errors.

### 8.3.1.3 Segment Details (for Segments with Non-Fatal Errors)

The details below focus on the segments containing non-fatal errors; other segments within the message are not shown. (For a complete description of all segments and their corresponding fields, see VXU example 1A.)

#### ***8.3.1.3.1 Patient Identification Segment Details***

PID-3: Patient Identifier List

- (1) PID-3.1 Identifier: BB77733B
- (1) PID-3.5 Type: MA (Medicaid Number)
- (2) PID-3.1 Identifier: 73487523
- (2) PID-3.5 Type: (not sent)

PID-5 Patient Name

- PID-5.1.1 Last (Family) Name: Fernandez
- PID-5.2 First (Given) Name: William

PID-7.1 DOB: 20010402

PID-8 Gender (Sex): M

PID-10 Race

- PID-10.1 Identifier: 1 (invalid race code)

### ***8.3.1.3.2 Next of Kin/Associated Parties Segment Details***

#### **8.3.1.3.2.1 First NK1**

NK1-2 Name

NK1-2.1.1 Last (Family) Name: Fernandez

NK1-2.2 First (Given) Name: Marc

NK1-3 Relationship

NK1-3.1 Identifier: FTH

NK1-3.2 Text: Father

NK1-3.3 Coding System: HL70063

NK1-6 Business Phone Number

NK1-6.6 Area Code: 34 (area code is less than 3 digits)

NK1-6.7 Phone Number: 63961111 (phone number exceeds 7 digits)

NK1-6.8 Extension: 123

#### **8.3.1.3.2.2 Second NK1**

NK1-2 Name

NK1-2.1.1 Last (Family) Name: (not sent)

NK1-2.2 First (Given) Name: (not sent)

NK1-3 Relationship

NK1-3.1 Identifier: MTH

NK1-3.2 Text: Mother

NK1-3.3 Coding System: HL70063

NK1-5 Phone Number

NK1-5.6 Area Code: 212

NK1-5.7 Phone Number: (not sent)

NK1-16.1 DOB: 19xx1115 (invalid date of birth; year field contains letters)

### ***8.3.1.3.3 Pharmacy/Treatment Administration Segment Details***

#### **8.3.1.3.3.1 First RXA**

RXA-3.1 Date/time start of administration: 20020607

RXA-5 Administered Code

RXA-5.1 Identifier: 03

RXA-5.2 Text: MMR

RXA-5.3 Coding System: CVX

RXA-9 Administration Notes

RXA-9.1 Identifier: 01

RXA-9.2 Text: Historical Immunization Record – Source Unspecified

RXA-9.3 Coding System: NIP0001

RXA-11-4.1 Administered at Location – Namespace ID: 8000N70

RXA-21 Action Code: (not sent)

#### **8.3.1.3.3.2 Second RXA**

RXA-3.1 Date/time start of administration: 20110426

RXA-5 Administered Code

RXA-5.1 Identifier: 08  
 RXA-5.2 Text: HEP B  
 RXA-5.3 Coding System: CVX  
 RXA-9 Administration Notes  
   RXA-9.1 Identifier: 00  
   RXA-9.2 Text: New Immunization Record  
   RXA-9.3 Coding System: NIP0001  
 RXA-10 Administering Provider  
   (1) RXA-10.1 Provider – License Number: 9412390 (VEI provider is ignored)  
   (1) RXA-10.2.1 Provider – Last (Family) Name: Smith (VEI provider is ignored)  
   (1) RXA-10.3 Provider – First (Given) Name: Gail (VEI provider is ignored)  
   (1) RXA-10.13 Provider – Provider Type: VEI (VEI provider is ignored)  
   (2) RXA-10.1 Provider – License Number: 9412390  
   (2) RXA-10.2.1 Provider – Last (Family) Name: (not sent)  
   (2) RXA-10.3 Provider – First (Given) Name: (not sent)  
   (2) RXA-10.13 Provider – Provider Type: OEI  
 RXA-11-4.1 Administered at Location – Namespace ID: 8000N70  
 RXA-15 Substance Lot Number: W2348796456  
 RXA-16.1 Substance Expiration Date: 20121230  
 RXA-17 Substance Manufacturer  
   RXA-17.1 Identifier: XXX (invalid HL7 manufacturer code)  
   RXA-17.2 Text: Merck  
   RXA-17.3 Coding System: MVX  
 RXA-21 Action Code: A (Add)

## 8.3.2 ACK Response

When the above VXU message is received, the CIR HL7 Web Service will return the following acknowledgement (ACK) message to Queens Clinic detailing the non-fatal errors.

### 8.3.2.1 Sample Message

```
MSH|^~\&|CIR HL7 Web Service 1.75|NYC
DOHMH|PATIENTS1ST1.1|8000N70|20110426165007||ACK^V04|20110426165007CI
R-WS|P|2.3.1|||AL|
```

```
MSA|AA|2011042155083484368|MESSAGE ACCEPTED;LR=43666648;(NON-
FATAL ERRORS: PID Race TableValueNotFound 1.1.10.1;PID Patient_Identifier_Type
ValueMissing 1.2.3.5;NK1 Mother_FirstName ValueMissing 2.1.2.2;NK1
Mother_LastName ValueMissing 2.1.2.1.1;NK1 Mother_DOB BadDateTime
2.1.16.1;NK1 Mother_Home_Phone ValueMissing 2.1.5.7;NK1 Father_Bus_AreaCode
BadFormat 1.1.6.6;NK1 Father_Bus_Phone ValueExceedMaxLen 1.1.6.7;RXA
Immunization_ActionCode ValueMissing 1.1.21;RXA Vaccine_Lot_Manufacturer
TableValueNotFound 2.1.17.1;RXA Provider_FirstName ValueMissing 2.2.10.3;RXA
Provider_LastName ValueMissing 2.2.10.2.1)|
```

**ERR|**PID^1^10.1^103~PID^1^3.5^102~NK1^2^2.2^102~NK1^2^2.1.1^102~NK1^2^16.1^102~NK1^2^5.7^102~NK1^1^6.6^102~NK1^1^6.7^102~RXA^1^21^102~RXA^2^17.1^103~RXA^2^10.3^102~RXA^2^10.2.1^102|

### 8.3.2.2 Message Narrative

The VXU message sent by Queens Clinic was successfully received and accepted by the CIR HL7 Web Service; however, the message did contain non-fatal errors that are reported back to Queens Clinic in the hopes of improving data quality. This narrative focuses on those non-fatal errors.

The MSA segment informs Queens Clinic that, although the message was accepted, the VXU message contained non-fatal errors. The MSA segment provides a human-readable description of each error, including the position where the error occurred within the message. For example, “RXA Provider\_FirstName ValueMissing 2.2.10.3” first gives the name of the segment (RXA), followed by the field name (Provider\_FirstName), then the error type (ValueMissing), and finally the position of the error within the message (2.2.10.3). The position “2.2.10.3” in “RXA Provider\_FirstName ValueMissing 2.2.10.3” is reporting that the error is in the 2nd RXA segment and the 2nd instance of 10.3.

The PID segment, shown below, had two non-fatal errors. These errors were reported in the MSA as “PID Race TableValueNotFound 1.1.10.1” and “PID Patient\_Identifier\_Type ValueMissing 1.2.3.5”. The race code (1) in PID-10.1 was not found in the table of valid HL7 race codes supported by the CIR HL7 Web Service. Also, a patient identifier type is missing from the 2<sup>nd</sup> instance of PID-3.5, but is needed to identify that the patient identifier (73487523) is a medical record number.

**PID||**BB77733B^^^^MA~73487523^^^^||Fernandez^William||20010402|M||1|

The two NK1 segments, shown below in the order in which they appeared in the message, had a total of six non-fatal errors; two in the first NK1 and four in the second NK1. The errors in the first NK1 segment were reported in the MSA as: “NK1 Father\_Bus\_AreaCode BadFormat 1.1.6.6” and “NK1 Father\_Bus\_Phone ValueExceedMaxLen 1.1.6.7”. A bad format error was reported for the father’s business phone area code (34) because it has too few digits. A maximum value exceeded error was reported for the business phone number (73961111) because it has too many digits. The errors in the second NK1 segment were reported in the MSA as: “NK1 Mother\_FirstName ValueMissing 2.1.2.2; NK1 Mother\_LastName ValueMissing 2.1.2.1.1; NK1 Mother\_DOB BadDateTime 2.1.16.1; NK1 Mother\_Home\_Phone ValueMissing 2.1.5.7”. A missing value error was reported for the mother’s first and last name. Also, a missing value error was reported on the home phone number because an area code (212) was provided, but the corresponding phone number was missing. The mother’s date of birth (19xx1115) was reported as a bad date because it contained letters.

**NK1||**Fernandez^Marc |FTH^Father^HL70063||^34^73961111^123|||||||

**NK1||** ^ |MTH^MOTHER^HL70063||^212^|||||||19xx1115|



BadFormat 1.1.6.6;NK1 Father\_Bus\_Phone ValueExceedMaxLen 1.1.6.7;RXA Immunization\_ActionCode ValueMissing 1.1.21;RXA Vaccine\_Lot\_Manufacturer TableValueNotFound 2.1.17.1;RXA Provider\_FirstName ValueMissing 2.2.10.3;RXA Provider\_LastName ValueMissing 2.2.10.2.1)| (See the Message Narrative for a description of each error.)

### 8.3.2.3.3 Error Segment Details

ERR-1 Location and Error Code:

PID^1^10.1^103~PID^1^3.5^102~NK1^2^2.2^102~NK1^2^2.1.1^102~NK1^2^16.1^102~NK1^2^5.7^102~NK1^1^6.6^102~NK1^1^6.7^102~RXA^1^21^102~RXA^2^17.1^103~RXA^2^10.3^102~RXA^2^10.2.1^102| (Error code 103 indicates a table value was not found, such as the invalid race code in PID-10.1 and, in the 2<sup>nd</sup> RXA segment, the invalid manufacturer code in RXA-17.1. Error code 102 indicates a data error, such as the invalid date of birth in NK1-16.1 of the 2<sup>nd</sup> NK1 segment and the invalid area code and phone number in NK1-6.6 and NK1-6.7 of the 1<sup>st</sup> NK1 segment.)

## 8.4 Example 2B - VXU (with Fatal Errors in an RXA) and ACK Message Pair

Example 2B illustrates a VXU message that contains fatal errors (i.e., errors in required fields) within the RXA segment (the segment that transmits vaccine event information).

### 8.4.1 VXU

The example message below illustrates a VXU message from Queens Clinic that contains fatal errors in one of the RXA segments. There are no additional fatal or non-fatal errors in this message. When a VXU contains fatal errors in one of the RXA segments but no other fatal errors within the message, the RXA segment with the fatal error will be ignored while the remainder of the message will be processed.

When the CIR HL7 Web Service receives this message it will return an acknowledgement (ACK) message describing the fatal errors in the RXA segment.

#### 8.4.1.1 Sample Message

**MSH|^~\&|Patients1ST1.1|8000N70|||20110429124934||VXU^V04|201104291249348436N8P|2.3.1|||AL|**

**PID|||43666863^^^LR~BB23733B^^^MA~73487523^^^MR||Williams^James^Kenneth ||20020324|M|^Jimmy|2106-3^WHITE^HL70005|||EN^English^HL70296|||N^Not Hispanic or Latino|11116|N|**

**RXA**|||20080607||03^MMR^CVX|||07^Historical Information- from school  
 record^NIP001|9412390^Smith^Bob^^^^^^^^^^^OEI|^8119N70|||W2378793452|20080  
 825|MSD^Merck^MVX|||A

**RXA**|||20080607||A^HEP B^CVX|||07^Historical Information- from school  
 record^NIP001|9412390^Smith^Bob^^^^^^^^^^^OEI|^8119N70|||W2348796456|20080  
 820|MSD^Merck^MVX|||A

#### 8.4.1.2 Message Narrative

This message narrative focuses on the RXA segment containing the fatal error. (For a complete description of other segments and their corresponding fields, see VXU example 1A.)

The first Pharmacy/Treatment Administration (RXA) segment contains an Action Code of “A” for add and lets the CIR HL7 Web Service know that, based on the parent’s school record, James received a MMR vaccination on 6/7/2008 that was ordered by Bob Smith, license number 9412390, and administered at the Bronx Clinic, indicated by the facility ID “8110N70”. The manufacture, lot number, and expiration date of the vaccine are also provided. There are no errors in this RXA segment.

The second RXA segment contains a fatal error that will cause this RXA segment to be ignored by the CIR HL7 Web Service. This RXA segment contains an Action Code of “A” (for add) and lets the CIR HL7 Web Service know that, based on the patient’s school record, James received a vaccine on 6/7/2008 that was ordered by Bob Smith, license number 9412390, and administered at the Bronx Clinic, indicated by the facility ID “8110N70”. The manufacture, lot number, and expiration date of the vaccine are also provided. A valid vaccine code was not included in this RXA segment. Since a valid CVX code is required, this is a fatal error. This RXA segment will be ignored by the CIR HL7 Web Service.

When the CIR HL7 Web Service receives this message it will return an acknowledgement (ACK) message describing the fatal error in the first RXA segment.

#### 8.4.1.3 Segment Details for RXA Segments

The details below focus on the RXA segments within the message; other segments within the message are not shown. (For a complete description of all segments and their corresponding fields, see VXU example 1A.)

##### **8.4.1.3.1 First RXA**

RXA-3.1 Date/Time Start of Administration: 20080607

RXA-5 Administered Code

RXA-5.1 Identifier: 03

RXA-5.2 Text: MMR

RXA-5.3 Coding System: CVX

RXA-9 Administration Notes

RXA-9.1 Identifier: 07  
RXA-9.2 Text: Historical Information – from school record  
RXA-9.3 Coding System: NIP0001  
RXA-10 Administering Provider  
RXA-10.1 Provider – License Number: 9412390  
RXA-10.2.1 Provider – Last (Family) Name: Smith  
RXA-10.3 Provider – First (Given) Name: Bob  
RXA-10.13 Provider – Provider Type: OEI  
RXA-11-4.1 Administered at Location – Namespace ID: 8119N70  
RXA-15 Substance Lot Number: W2378793452  
RXA-16.1 Substance Expiration Date: 20080825  
RXA-17 Substance Manufacturer  
RXA-17.1 Identifier: MSD  
RXA-17.2 Text: Merck  
RXA-17.3 Coding System: MVX  
RXA-21 Action Code: A (Add)

#### **8.4.1.3.2 Second RXA**

RXA-3.1 Date/Time Start of Administration: 20080607  
RXA-5 Administered Code  
RXA-5.1 Identifier: A (invalid CVX code)  
RXA-5.2 Text: HEP B  
RXA-5.3 Coding System: CVX  
RXA-9 Administration Notes  
RXA-9.1 Identifier: 07  
RXA-9.2 Text: Historical Immunization – from school record  
RXA-9.3 Coding System: NIP0001  
RXA-10 Administering Provider  
RXA-10.1 Provider – License Number: 9412390  
RXA-10.2.1 Provider – Last (Family) Name: Smith  
RXA-10.3 Provider – First (Given) Name: Bob  
RXA-10.13 Provider – Provider Type: OEI  
RXA-11-4.1 Administered at Location – Namespace ID: 8119N70  
RXA-15 Substance Lot Number: W2348796456  
RXA-16.1 Substance Expiration Date: 20080820  
RXA-17 Substance Manufacturer  
RXA-17.1 Identifier: MSD  
RXA-17.2 Text: Merck  
RXA-17.3 Coding System: MVX  
RXA-21 Action Code: A (Add)

## **8.4.2 ACK Response**

When the above VXU message is received, the CIR HL7 Web Service will return the following acknowledgement (ACK) message to Queens Clinic detailing the fatal errors in the RXA segment.

### 8.4.2.1 Sample Message

```
MSH|^~\&|CIR HL7 Web Service 1.75|NYC
DOHMH|Patients1ST1.1|8000N70|20110429124949||ACK^V04|20110429124949CIR-
WS|P|2.3.1|||AL|
```

```
MSA|AE|201104291249348436N8|LR=43666863;RXAs REJECTED=1;(FATAL
ERRORS: RXA Vaccine_Code TableValueNotFound 2.1.5.1;RXA Vaccine_Code
RequiredField 2.1.5.1)|
```

```
ERR|RXA^2^5.1^103~RXA^2^5.1^101|
```

### 8.4.2.2 Message Narrative

The VXU message sent by Queens Clinic was successfully received and processed by the CIR HL7 Web Service. The CIR HL7 Web Service searched for and found a matching patient record in the CIR database and then added the MMR immunization to the CIR database. However, because there were fatal errors (invalid CVX code) in the RXA segment for the Hep B vaccination, this RXA segment was ignored and the Hep B vaccination was not added to the CIR database. The CIR HL7 Web Service returns an acknowledge message to Queens Clinic letting them know that the message was processed, except for the RXA segment containing fatal errors. The MSA segment of the response message describes the fatal errors contained in the RXA segment.

The Message Header (MSH) segment lets Queens Clinic know that this acknowledgement (ACK) message is coming from the New York City Department of Health and Mental Hygiene and that the sending application is version 1.75 of the CIR HL7 Web Service. The message control ID provided in the MSH segment, “20110429124949CIR-WS”, is the unique ID assigned by the CIR HL7 Web Service.

In the Message Acknowledgement (MSA) segment, the CIR HL7 Web Service echoes back the message control ID that Queens Clinic used to identify the VXU message and lets Queens Clinic know that the VXU message was received with errors (AE). Next in the MSA segment is the Patient’s Local Registry ID (43666863). Upon receiving the ACK message, Queens Clinic should then store this patient identifier with the corresponding patient’s record and include it in subsequent messages that it sends to the CIR HL7 Web Service. Following the Local Registry ID, the CIR HL7 Web Service lets Queens Clinic know how many RXA segments were rejected, (in this message, a total of one RXA segment was rejected), and provides a description of the fatal errors that occurred within the 2nd RXA segment. The vaccine code was required but a valid code was not received. Since the vaccine code is a required field, the 2<sup>nd</sup> RXA segment has been ignored by the CIR HL7 Web Service. Queens Clinic will need to correct the error and resubmit the message.

While the MSA segment provides the human-readable description of the non-fatal errors, the next segment, the ERR segment, provides the corresponding error codes.

### 8.4.2.3 Segment Details

#### **8.4.2.3.1 Message Segment Header Details**

MSH-1 Field Separator: |

MSH-2 Encoding Characters: ^~\&

MSH-3.1 Sending Application: CIR HL7 Web Service 1.75

MSH-4.1 Sending Facility: NYC DOHMH

MSH-7.1 Date/Time of Message: 20110429124949 (4/29/2011 at 12:49:49 PM)

MSH-9 Message Type

MSH-9.1 Message Type: ACK

MSH-9.2 Trigger Event: V04

MSH-10 Message Control ID: 20110426165007CIR-WS

MSH-11.1 Processing ID: P

MSH-12.1 Version ID: 2.3.1

MSH-16 Application Acknowledgment Type: AL

#### **8.4.2.3.2 Message Acknowledgement Header Details**

MSA-1 Acknowledgment Code: AE

MSA-2 Message Control ID: 201104291249348436N8

MSA-3 Text Message: LR=43666863;RXAs REJECTED=1;(FATAL ERRORS: RXA Vaccine\_Code TableValueNotFound 2.1.5.1;RXA Vaccine\_Code RequiredField 2.1.5.1)|  
(One RXA was rejected. In the 2<sup>nd</sup> RXA, there was a table value not found fatal error and a missing required value fatal error type in the Vaccine Code / RXA-5.1 field.)

#### **8.4.2.3.3 Error Segment Details**

ERR-1 Location and Error Code: RXA^2^5.1^103~RXA^2^5.1^101| (2<sup>nd</sup> RXA, RXA-5.1, Error Code 103 indicates table value was not found and Error Code 101 indicates a required field.)

## 8.5 Example 2C - VXU (with Fatal Errors) and ACK Message Pair

Example 2C illustrates a VXU message that contains fatal errors (i.e., errors in required fields) in the PID (Patient Identification) segment which causes the message to be rejected.

### 8.5.1 VXU

The example message below illustrates a VXU message from Queens Clinic that contains fatal errors. When the CIR HL7 Web Service receives this message it will return an acknowledgement (ACK) message with error descriptions. One or more fatal errors cause the VXU message to be rejected.

### 8.5.1.1 Sample Message

**MSH|^~\&|Patients1.1|8000N70|||20110502143634||VXU^V04|201105021427368436N8|P|2.3.1|||AL|**

**PID|||43666863^^^^LR~BB23733B^^^^MA~734873^^^^MR||Williams^James^V|||^Jim|2106-3^WHITE^HL70005||||EN^ENGLISH^HL70296|||||N^NOT HISPANIC OR LATINO|11116|N|**

**RXA|||20110501||03^MMR^CVX||||00^New Immunization Record^NIP001|9412390^SMITH^BOB^^^^^^^^^^^^^OEI|^8000N70|||W2348796456|20110820|MSD^MERCK^MVX|||A**

### 8.5.1.2 Message Narrative

This narrative focuses on the segments that contain fatal errors. (For a complete description of all segments and their corresponding fields, see VXU example 1A.)

The Patient Identification (PID) segment indicates this VXU message is for James V. Williams. Queens Clinic is reporting James' Local Registry ID, Medicaid, and Medical Record number as well as his language, ethnicity, and place of birth. Queens Clinic is reporting that James also goes by the name of Jim. The Clinic, however, did not include James' date of birth or his sex in this VXU message; this will be considered a fatal error since the patient's date of birth and sex are required fields in the PID segment.

The next segment, the Pharmacy/Treatment Administration (RXA) segment, indicates that James received an MMR vaccination (CVX code 03) on 5/1/2011. However, this vaccination will not be added to James' immunization history because the fatal errors in the PID segment will cause the message to be rejected.

When the CIR HL7 Web Service receives this message it will return an acknowledgement (ACK) message with errors.

### 8.5.1.3 Segment Details for Segment with Fatal Errors

The details below focus on the PID segment containing the fatal errors; other segments within the message are not shown. (For a complete description of all segments and their corresponding fields, see VXU example 1A.)

#### ***8.5.1.3.1 Patient Identification Segment Details***

PID-3: Patient Identifier List

- (1) PID-3.1 Identifier: 43666863
- (1) PID-3.5 Type: LR (Local Registry ID / CIR Patient ID)
- (2) PID-3.1 Identifier: BB23733B
- (2) PID-3.5 Type: MA (Medicaid Number)
- (3) PID-3.1 Identifier: 734873
- (3) PID-3.5 Type: MR (Medical Record Number)

PID-5 Patient Name  
     PID-5.1.1 Last (Family) Name: Williams  
     PID-5.2 First (Given) Name: James  
     PID-5.3 Middle Initial or Name: V  
 PID-7.1 DOB: (not sent)  
 PID-8 Gender (Sex): (not sent)  
 PID-9 Patient Alias  
     PID-9.2 First (Given) Name: Jim  
 PID-10 Race  
     PID-10.1 Identifier: 2106-3  
     PID-10.2 Text: White  
     PID-10.3 Coding System: HL70005  
 PID-15 Primary Language  
     PID-15.1 Identifier: EN  
     PID-15.2 Text: English  
     PID-15.3 Coding System: HL70296  
 PID-22 Ethnic Group  
     PID-15.1 Identifier: N  
     PID-15.2 Text: Not Hispanic or Latino  
     PID-15.3 Coding System: HL70189  
 PID-23 Birth Place: 11116 (the code for Columbus Hospital)  
 PID-24 Multi Birth Indicator: N

## 8.5.2 ACK Response

When the above VXU message is received, the CIR HL7 Web Service will return the following acknowledgement (ACK) message to Queens Clinic advising that the message has been rejected due to fatal errors found in the submitted VXU message.

### 8.5.2.1 Sample Message

```
MSH|^~\&|CIR HL7 Web Service 1.75|NYC
DOHMH|Patients1.1|8000N70|20110502142726||ACK^V04|20110502142726CIR-
WS|P|2.3.1|||AL|
```

```
MSA|AE|201105021427348436N8|MESSAGE REJECTED;(FATAL ERRORS: PID
Patient_DOB RequiredField 1.1.7.1;PID Patient_Sex RequiredField 1.1.8)|
```

```
ERR|PID^1^7.1^101~PID^1^8^101||
```

### 8.5.2.2 Message Narrative

The VXU message sent by Queens Clinic was not successfully received by the CIR HL7 Web Service due to the fatal errors contained in the message. The CIR HL7 Web Service returns an acknowledge message to Queens Clinic letting them know the fatal errors that were found.

In the Message Acknowledgement (MSA) segment, the CIR HL7 Web Services echoes back the message control ID that Queens Clinic used to identify the VXU message and lets Queens Clinic know that the VXU message was received by the CIR HL7 Web Service but that the message contained fatal errors and, therefore, was rejected. The MSA segment provides Queens Clinic with the fatal error descriptions including the location where the error occurred. In both cases, according to the error description, the error resulted from a required value not being received.

While the MSA segment provides the human-readable error explanations, the ERR segment provides the error codes. For both PID-7.1 and PID-8 the error code is 101, which is the code indicating information is required but missing.

### 8.5.2.3 Segment Details

#### 8.5.2.3.1 Message Segment Header Details

MSH-1 Field Separator: |  
MSH-2 Encoding Characters: ^~\&  
MSH-3.1 Sending Application: CIR HL7 Web Service 1.75  
MSH-4.1 Sending Facility: NYC DOHMH  
MSH-7.1 Date/Time of Message: 20110502142726 (5/02/2011 at 2:27:26 PM)  
MSH-9 Message Type  
    MSH-9.1 Message Type: ACK  
    MSH-9.2 Trigger Event: V04  
MSH-10 Message Control ID: 20110502142726CIR-WS  
MSH-11.1 Processing ID: P  
MSH-12.1 Version ID: 2.3.1  
MSH-16 Application Acknowledgment Type: AL

#### 8.5.2.3.2 Message Acknowledgement Header Details

MSA-1 Acknowledgment Code: AE  
MSA-2 Message Control ID: 201105021427348436N8  
MSA-3 Text Message: MESSAGE REJECTED;(FATAL ERRORS: PID Patient\_DOB RequiredField 1.1.7.1;PID Patient\_Sex RequiredField 1.1.8)| *(The message was rejected. In the PID segment, there was a missing required value in the Patient DOB / PID 7.1 field as well as in the Patient Sex / PID-8 field.)*

#### 8.5.2.3.3 Error Segment Details

ERR-1 Location and Error Code: PID^1^7.1^101~PID^1^8^101 *(PID-7 and PID-8 are required fields and are missing from the segments.)*

## 8.6 Example 2D - ACK Message with Delete Exceptions

If a VXU message is submitted containing a request to delete immunization information (RXA Action Code of “D” for delete), the CIR HL7 Web Service will search for a

matching record for the submitted patient. If no matching record is found, the CIR HL7 Web Service will return a delete exception in the ACK message advising that the vaccination could not be found. If a matching record is found, but it was a different facility that had previously been reported as the administering facility for the immunization, then the CIR HL7 Web Service will not automatically delete the immunization event record. Rather, the CIR HL7 Web Service will send an alert to CIR staff. CIR staff will review the delete request and then process it if appropriate. When the deletion is delayed due to review, the CIR HL7 will include a delete exception in the ACK message advising that the deletion is under review.

### 8.6.1 Sample Message

```
MSH|^~\&|CIR HL7 Web Service 1.75|NYC  
DOHMH|Patients1.1|8000N70|20110502155656||ACK^V04|20110502155656CIR-  
WS|P|2.3.1|||AL|
```

```
MSA|AA|201105021556348436N8|MESSAGE ACCEPTED;LR=43666863;(RXA  
DELETE EXCEPTIONS: RXA Vaccination_Not_Found 1;RXA  
Vaccination_Delete_Under_Review 2)|
```

### 8.6.2 Message Narrative

Queens Clinic submitted a VXU (not shown in this example) that included two RXA segments, each requesting the deletion of a vaccination event. When the CIR HL7 Web Service processed the first RXA segment, a matching record could not be found. When the CIR HL7 Web Service processed the second RXA segment, a matching record was found but with a different administering facility on record for that vaccination event. The CIR HL7 Web Service has sent an alert to CIR staff that will review the delete request in the second RXA segment and then process it if appropriate. The CIR HL7 Web Service also returned an ACK message that includes a deletion exception for each of the RXA segments.

The Message Header (MSH) segment lets Queens Clinic know that this acknowledgement (ACK) message is coming from the New York City Department of Health and Mental Hygiene and that the sending application is version 1.75 of the CIR HL7 Web Service. The message control ID provided in the MSH segment is the unique ID assigned by the CIR HL7 Web Service.

In the Message Acknowledgement (MSA) segment, the CIR HL7 Web Services echoes back the message control ID that Queens Clinic used to identify the VXU message and lets Queens Clinic know that the VXU message was received and accepted by the CIR HL7 Web Service. Following the Patient's Local Registry ID, which Queens Clinic should store with the corresponding patient's record and include it in subsequent messages, is text that alerts Queens Clinic that deletion exceptions have occurred. The MSA provides the corresponding RXA sequence number and type of deletion exception.

For the 1<sup>st</sup> RXA submitted in the VXU message, the vaccination could not be deleted because the vaccination not found. For the 2<sup>nd</sup> RXA submitted in the VXU message, the deletion is under review.

## 8.6.3 Segment Details

### 8.6.3.1 Message Segment Header Details

MSH-1 Field Separator: |  
MSH-2 Encoding Characters: ^~\&  
MSH-3.1 Sending Application: CIR HL7 Web Service 1.75  
MSH-4.1 Sending Facility: NYC DOHMH  
MSH-7.1 Date/Time of Message: 20110502155656 (5/02/2011 at 3:56:56 PM)  
MSH-9 Message Type  
    MSH-9.1 Message Type: ACK  
    MSH-9.2 Trigger Event: V04  
MSH-10 Message Control ID: 20110502155656CIR-WS  
MSH-11.1 Processing ID: P  
MSH-12.1 Version ID: 2.3.1  
MSH-16 Application Acknowledgment Type: AL

### 8.6.3.2 Message Acknowledgement Header Details

MSA-1 Acknowledgment Code: AE  
MSA-2 Message Control ID: 201105021556348436N8  
MSA-3 Text Message: MESSAGE ACCEPTED;LR=43666863;(RXA DELETE EXCEPTIONS: RXA Vaccination\_Not\_Found 1;RXA Vaccination\_Delete\_Under\_Review 2)

## 8.7 Example 3 – VXQ and QCK Message Pair

This example shows a VXQ message followed by a QCK message indicating the patient was not found.

### 8.7.1 VXQ

Queens Clinic is authorized to send vaccine queries to the CIR to determine if the registry has a particular patient in their database. The CIR has assigned Queens Clinic with a facility identifier of “8000N70”. Queens Clinic is using version 1.1 of the electronic medical record (EMR) application “Patients1st”. When the CIR HL7 Web Service receives this message, it will search for the patient. If a single patient is found, the CIR HL7 Web Service will return a VXR message. However, if the CIR HL7 Web Service is unable to find any matching patients or if it finds two or more matching patients, then it returns a QCK message indicating that no patient was found.

### 8.7.1.1 Sample Message

```
MSH|^~\&|Patients1st1.1|8000N70||20110510104534||VXQ^V01|843671|P|2.3.1||AL|
```

```
QRD|20110510104534|R|I|843671|||^\^Agathon^\^Harra^\^A||
```

### 8.7.1.2 Message Narrative

The Message Header (MSH) segment identifies the message as being sent from Queens Clinic, registered with the CIR as facility number “8000N70”. The MSH segment also lets the CIR HL7 Web Service know that Queens Clinic is using version 1.1 of the EMR application “Patients 1<sup>st</sup>” and that the message will contain the standard separator of “|” and encoding characters of “^~\&”. The MSH segment includes the date and time the message was created (May 10, 2011 at 10:45:34) as well as the message type (VXQ V01). Queens Clinic has assigned the unique message ID of “843671” to this VXQ message; the CIR HL7 Web Service will echo this unique ID back in their response message. The “P” that follows the unique message ID indicates that this is a production, rather than a test message. In the Application Acknowledgment Type field, the last field shown in this segment, Queens Clinic has sent an “AL” meaning that an acknowledgement is always required. This is the only Application Acknowledgment Type field that the CIR HL7 Web Service supports for VXQ messages.

The next segment of the message is the Query Definition (QRD) segment. In this segment, Queens Clinic lets the CIR HL7 Web Service know that they are searching for the patient Harra A. Agathon. Queens Clinic did not include the Local Registry ID for this patient, which would greatly assist in locating the patient. Also, Harra’s Medical Record Number was not provided. If available, the Clinic should include the patient’s name and their Local Registry ID in the first QRD-8 field and the Medical Record Number in the second QRD-8 field. Queens Clinic provides a Query Format Code of “R” since any other value would result in a fatal error preventing the CIR HL7 Web Service from processing the VXQ message. Also the clinic has assigned and provided a unique identifier (843671) for this query; this is a required field and, if missing, would result in a fatal error causing the VXQ message to be rejected.

Queens Clinic did not include a Query Filter (QRF) segment, which could provide additional search criteria such as the patient’s date of birth and the patient’s gender. Without this additional search criterion it is unlikely that a matching patient will be found.

Using the above information, the CIR HL7 Web Service will search for the patient. If a single patient is found, the CIR HL7 Web Service will return a VXR message. However, if the CIR HL7 Web Service is unable to find any matching patients or if it finds two or more matching patients, then it returns a QCK message indicating that no patient was found.

### 8.7.1.3 Segment Details

#### **8.7.1.3.1 Message Segment Header Details**

MSH-1 Field Separator: |  
 MSH-2 Encoding Characters: ^~\&  
 MSH-3.1 Sending Application: Patients1st 1.1  
 MSH-4.1 Sending Facility: 8000N70  
 MSH-7.1 Date/Time of Message: 20110510104534 (5/10/2011 at 10:45:34)  
 MSH-9 Message Type  
     MSH-9.1 Message Type: VXQ  
     MSH-9.2 Trigger Event: V01  
 MSH-10 Message Control ID: 843671  
 MSH-11.1 Processing ID: P  
 MSH-12.1 Version ID: 2.3.1  
 MSH-16 Application Acknowledgment Type: AL

#### **8.7.1.3.2 Query Definition Segment Details**

QRD-1 Query Date Time: 20110510104534 (5/10/2011 at 10:45:34)  
 QRD-2 Query format code: R  
 QRD-3 Query priority: I  
 QRD-4 Query ID: 843671  
 QRD-8 Who Subject Filter:  
     QRD-8.2.1 Last (Family) Name: Agathon  
     QRD-8.3 First (Given) Name: Harra  
     QRD-8.4 Middle Initial or Name: A

### 8.7.2 QCK Response

After searching for the patient using the information received in the above VXQ message, the CIR HL7 Web Service was unable to locate the patient and is returning the following acknowledgement (QCK) message to Queens Clinic indicating that the patient could not be found.

#### 8.7.2.1 Sample Message

**MSH|^~\&|CIR HL7 Web Service 1.75|NYC DOHMH|Patients1st1.1|  
 8000N70|20110510114646||QCK|20110510104646CIR-WS|P|2.3.1|||AL|**

**MSA|AA|843671|MESSAGE ACCEPTED;PATIENT NOT FOUND;|**

**QAK|843671|NF|**

## 8.7.2.2 Message Narrative

The search criteria sent in the VXQ message by Queens Clinic did not result in the identification of a single patient. The CIR HL7 Web Service returns an acknowledge message to Queens Clinic letting them know that a patient was not found.

The Message Header (MSH) segment lets Queens Clinic know that this acknowledgement (QCK) message is coming from the New York City Department of Health and Mental Hygiene and that the sending application is version 1.75 of the CIR HL7 Web Service. The message control ID (20110510114646CIR-WS) provided in the MSH segment is the unique ID assigned by the CIR HL7 Web Service.

In the Message Acknowledgement (MSA) segment, the CIR HL7 Web Services echoes back the message control ID that Queens Clinic used to identify the VXQ message that they sent and the MSA text lets the Clinic know that the patient was not found. While the MSA segment contains the text description, the Query Acknowledgement segment (QAK) contains the corresponding code (NF) confirming that the patient was not found. The QAK segment QAK-1 also echoes back Queens Clinic's Query ID (843671).

## 8.7.2.3 Segment Details

### ***8.7.2.3.1 Message Segment Header Details***

MSH-1 Field Separator: |  
MSH-2 Encoding Characters: ^~\&  
MSH-3.1 Sending Application: CIR HL7 Web Service 1.75  
MSH-4.1 Sending Facility: NYC DOHMH  
MSH-7.1 Date/Time of Message: 20110510104646 (5/10/2011 at 10:46:36)  
MSH-9.1 Message Type: QCK  
MSH-10 Message Control ID: 20110510114646CIR-WS  
MSH-11.1 Processing ID: P  
MSH-12.1 Version ID: 2.3.1  
MSH-16 Application Acknowledgment Type: AL

### ***8.7.2.3.2 Message Acknowledgement Header Details***

MSA-1 Acknowledgment Code: AA  
MSA-2 Message Control ID: 8436N8  
MSA-3 Text: MESSAGE ACCEPTED;PATIENT NOT FOUND

### ***8.7.2.3.3 Query Acknowledgement Segment***

QAK-1 Query Tag: 843671  
QAK-2 Query Response Status: NF (Not Found)

## 8.8 Example 4 – VXQ and VXR Message Pair

A VXQ message was received from Queens Clinic that utilized all of CIR HL7 Web Service supported search criteria fields. When the CIR HL7 Web Service received this message, a patient search was initiated and a single patient was found.

### 8.8.1 VXQ

#### 8.8.1.1 Sample Message

```
MSH|^~\&|Patients1st1.1|8000N70|||20110510115302||VXQ^V01|843672|P|2.3.1|||AL|
```

```
QRD|20110510115302|R|I|843672|||43816836^Agathon^Harra^A^^^^^^^^^LR~889887
^^^^^^^^^^^^^MR|
```

```
QRF||||222228888~20110101~NY~888~CC88888C~Agathon^Sharon^Athena^^^972^
6688888^972^6680072^888~VALERII~123458888~Agathon^Karl^Helo^^^972^66888
88^972^6684356^2749~734331234~Exodus^Maya^Isis^^^423^5551212^972^6684747
^12345~123456789~F^Valerii^Hera^N~19800710~101^C-9^BSG
Way^Caprica^NY^11111^4444^972^6680072~31569^USA^N^EL^2028-
9^V01~6234234234|
```

#### 8.8.1.2 Message Narrative

Queens Clinic resubmitted their VXQ message, this time adding additional information in the Query Definition (QRD) and Query Filter (QRF) segments, which allowed the CIR HL7 Web Service to find the correct patient.

In the QRD segment, Queens Clinic lets the CIR HL7 Web Service know that they are searching for the patient Harra A Agathon, with a Local Registry ID of 43816836 and a Medical Record ID of 889887. If available, the Clinic should always include the patient's name and their Local Registry ID in the first QRD-8 field (Who Subject Filter) and the Medical Record Number in the second QRD-8 field. No more than two Who Subject Filter records should be sent; once the Patient Name, Local Registry ID, and Medical Record Number are located, the CIR HL7 Web Service will ignore any additional repetitions of QRD-8.

In the QRF segment, Queens Clinic provides the CIR HL7 Web Service with additional search criteria. The Clinic is searching for the female patient whose date of birth is 01/01/2011, has a Medicaid number of CC88888C, and is also known as Hera N Valerii. The patient's mother is Sharon Athena Agathon, maiden name Valerii, and the patient's father is Karl Helo Agathon. The QRF segment provides additional search criteria, such as the patient's address, patient's phone number, parent's phone numbers, etc. (For a full list of the search criteria provided in the QRF segment, see the *Segment Details* section that follows.)

While the Clinic is utilizing the newly implemented method of specifying the patient's gender in the QRF segment, the CIR HL7 Web Service will also continue to support specifying the gender in the ZGR segment as shown below:

## **ZGR|F**

### 8.8.1.3 Segment Details

#### **8.8.1.3.1 Message Segment Header Details**

MSH-1 Field Separator: |  
MSH-2 Encoding Characters: ^~\&  
MSH-3.1 Sending Application: Patients1st 1.1  
MSH-4.1 Sending Facility: 8000N70  
MSH-7.1 Date/Time of Message: 20110510115302 (5/10/2011 at 11:53:02)  
MSH-9 Message Type  
    MSH-9.1 Message Type: VXQ  
    MSH-9.2 Trigger Event: V01  
MSH-10 Message Control ID: 843672  
MSH-11.1 Processing ID: P  
MSH-12.1 Version ID: 2.3.1  
MSH-16 Application Acknowledgment Type: AL

#### **8.8.1.3.2 Query Definition Segment Details**

QRD-1 Query Date/Time: 20110510115302 (5/10/2011 at 11:53:02)  
QRD-2 Query format code: R  
QRD-3 Query priority: I  
QRD-4 Query ID: 843672  
QRD-8 Who Subject Filter:  
    (1) QRD-1 ID Number: 43816836  
    (1) QRD-8.2.1 Last (Family) Name: Agathon  
    (1) QRD-8.3 First (Given) Name: Harra  
    (1) QRD-8.4 Middle Initial or Name: A  
    (1) QRD-8.13 Identifier Type: LR (Local Registry ID / CIR Patient ID)  
    (2) QRD-1 ID Number: 889887  
    (2) QRD-8.13 Identifier Type: MR (Medical Record Number)

#### **8.8.1.3.3 Query Filter Segment Details**

QRF-5 Other Query Subject Filter:  
    (1) QRF-5.1 Patient Social Security Number: 222228888  
    (2) QRF-5-1 Patient DOB: 20110101 (01/01/2011)  
    (3) QRF-5-1 Patient Birth State: NY  
    (4) QRF-5-1 Patient Birth Registration Number: 888  
    (5) QRF-5-1 Patient Medicaid Number: CC88888C  
    (6) QRF-5-1 Mother's Last Name: Agathon  
    (6) QRF-5-2 Mother's First Name: Sharon  
    (6) QRF-5-3 Mother's Middle Name: Athena

- (6) QRF-5-7 Mother's Home Phone – Area Code: 972
- (6) QRF-5-8 Mother's Home Phone – Phone Number: 6688888
- (6) QRF-5-9 Mother's Work Phone – Area Code: 972
- (6) QRF-5-10 Mother's Work Phone – Phone Number: 6680072
- (6) QRF-5-11 Mother's Work Phone – Extension: 888
- (7) QRF-5-1 Mother's Maiden Name: VALERII
- (8) QRF-5-1 Mother's Social Security Number: 123458888
- (9) QRF-5-1 Father's Last Name: Agathon
- (9) QRF-5-2 Father's First Name: Karl
- (9) QRF-5-3 Father's Middle Name: Helo
- (9) QRF-5-7 Father's Home Phone – Area Code: 972
- (9) QRF-5-8 Father's Home Phone – Phone Number: 6688888
- (9) QRF-5-9 Father's Work Phone – Area Code: 972
- (9) QRF-5-10 Father's Work Phone – Phone Number: 6684356
- (9) QRF-5-11 Father's Work Phone – Extension: 2749
- (10) QRF-5-1 Guardian's Social Security Number: 734331234
- (11) QRF-5-1 Guardian's Last Name: Exodus
- (11) QRF-5-2 Guardian's First Name: Maya
- (11) QRF-5-3 Guardian's Middle Name: Isis
- (11) QRF-5-7 Guardian's Home Phone – Area Code: 423
- (11) QRF-5-8 Guardian's Home Phone – Phone Number: 5551212
- (11) QRF-5-9 Guardian's Work Phone – Area Code: 972
- (11) QRF-5-10 Guardian's Work Phone – Phone Number: 6684747
- (11) QRF-5-11 Guardian's Work Phone – Extension: 12345
- (12) QRF-5-1 Guardian's Social Security Number: 123456789
- (13) QRF-5.1 Patient Gender: F (Female)
- (13) QRF-5.2 Patient's Alternate Last Name: Valerii
- (13) QRF-5.3 Patient's Alternate First Name: Hera
- (13) QRF-5.3 Patient Multiple Birth: N (No)
- (14) QRF-5.1 Mother's Date of Birth: 19800710 (7/10/1980)
- (15) QRF-5.1 Patient's Address – House #: 101
- (15) QRF-5.2 Patient's Address – Apartment #: C-9
- (15) QRF-5.3 Patient's Address – Street Name: BSG Way
- (15) QRF-5.4 Patient's Address – City: Caprica
- (15) QRF-5.5 Patient's Address – State: NY
- (15) QRF-5.6 Patient's Address – Zip Code: 11111
- (15) QRF-5.7 Patient's Address – Zip4: 4444
- (15) QRF-5.8 Patient's Home Phone – Area Code: 972
- (15) QRF-5.9 Patient's Home Phone – Phone Number: 6680072
- (16) QRF-5.1 Patient Birth Facility Code: 31569
- (16) QRF-5.2 Patient Birth Country Code: USA
- (16) QRF-5.3 Patient Ethnicity Code: N (code for Not Hispanic or Latino)
- (16) QRF-5.4 Patient Language Code: EL (code for English)
- (16) QRF-5.5 Patient Race Code: 2028-9 (code for Asian)
- (16) QRF-5.6 Patient VFC Eligibility Code: V01 (code for Not VFC Eligible)
- (17) QRF-5.6 Patient Vital Record Number: 6234234234

## 8.8.2 VXR Response

This example illustrates a VXR message in response to a VXQ message where a single patient was successfully located.

### 8.8.2.1 Sample Message

```

MSH|^~\&|CIR HL7 Web Service 1.75|NYC
DOHMH|PATIENTS1ST1.1|8000N70|20110510115312||VXR^V03|20110510115312CI
R-WS|P|2.3.1|||AL|
MSA|AA|843672|MESSAGE ACCEPTED;LR=43816836;|
QRD|20110510115302|R||843672|||43816836^Agathon^Harra^A^^^^^^^^^LR~889887
^^^^^^^^^^^^^MR|
QRF||||222228888~20110101~NY~888~CC88888C~Agathon^Sharon^Athena^^^^972^
6688888^972^6680072^888~VALERII~123458888~Agathon^Karl^Helo^^^^972^66888
88^972^6684356^2749~734331234~Exodus^Maya^Isis^^^^423^5551212^972^6684747
^12345~123456789~F^Valerii^Hera^N~19800710~101^C-9^BSG
Way^Caprica^NY^11111^4444^972^6680072~31569^USA^N^EL^2028-
9^V01~6234234234|
PID|||43816836^^^^LR||AGATHON^HARRA^ATHENA||20110101|F|
RXA|0|999|20110301|20110301|106^DTaP, 5 pertussis
antigen^CVX|999||||||DTPA634A2|20120826|SKB^GlaxoSmithKline (formerly
SmithKline Beecham; includes SmithKline Beecham and Glaxo Wellcome)|
OBX|1|CE|38890-0^Component Vaccine Type^LN|1|106^DTaP, 5 pertussis
antigen^CVX|||||F|
RXA|0|999|20110301|20110301|10^IPV^CVX|999||||||1032P|20120513|MSD^Merck
Co, Inc.|
OBX|1|CE|38890-0^Component Vaccine Type^LN|2|10^IPV^CVX|||||F|
RXA|0|999|20110307|20110307|22^DTP-Hib^CVX|999||||||DH-923740-
P|20121126|UNK^Unknown Manufacturer|
OBX|1|CE|38890-0^Component Vaccine Type^LN|3|48^Hib (PRP-T)^CVX|||||F|
OBX|2|CE|38890-0^Component Vaccine Type^LN|4|01^DTP ^CVX|||||F|
NTE|1||Shot is invalid^1004^This immunization event occurred prior to the
recommended age or recommended interval for this dose.^NYCDOHINVSHOTCODES|
OBX|0|CE|30979-9^Vaccine due next^LN|5|88^influenza, NOS^CVX|||||F|
OBX|0|TS|30979-9&30980-7^Date vaccine due^LN|5|20110702|||||F|
OBX|0|CE|30979-9&30982-3^Reason applied by forecast logic to project this
vaccine^LN|5|^ACIP Schedule|||||F|

```

**OBX|0|CE|30979-9^Vaccine due next^LN|6|08^Hep B, adolescent or pediatric^CVX|||||F|**

**OBX|0|TS|30979-9&30980-7^Date vaccine due^LN|6|20110101|||||F|**

**OBX|0|CE|30979-9&30982-3^Reason applied by forecast logic to project this vaccine^LN|6|^ACIP Schedule|||||F|**

**OBX|0|CE|30979-9&30999-1^Vaccine Group Recommendation Status^NYCDOHVCGPST|7|Rotavirus^Age Limit for Recommendation^NYCDOHVCGPST|||||F|**

**OBX|0|CE|30979-9&30982-3^Reason applied by forecast logic to project this vaccine^LN|7|^ACIP Schedule|||||F|**

**OBX|0|CE|30979-9^Vaccine due next^LN|8|20^DTaP^CVX|||||F|**

**OBX|0|TS|30979-9&30980-7^Date vaccine due^LN|8|20110503|||||F|**

**OBX|0|CE|30979-9&30982-3^Reason applied by forecast logic to project this vaccine^LN|8|^ACIP Schedule|||||F|**

**OBX|0|CE|30979-9^Vaccine due next^LN|9|48^Hib (PRP-T)^CVX|||||F|**

**OBX|0|TS|30979-9&30980-7^Date vaccine due^LN|9|20110503|||||F|**

**OBX|0|CE|30979-9&30982-3^Reason applied by forecast logic to project this vaccine^LN|9|^ACIP Schedule|||||F|**

**OBX|0|CE|30979-9^Vaccine due next^LN|10|133^Pneumococcal, PCV-13^CVX|||||F|**

**OBX|0|TS|30979-9&30980-7^Date vaccine due^LN|10|20110303|||||F|**

**OBX|0|CE|30979-9&30982-3^Reason applied by forecast logic to project this vaccine^LN|10|^ACIP Schedule|||||F|**

**OBX|0|CE|30979-9^Vaccine due next^LN|11|10^IPV^CVX|||||F|**

**OBX|0|TS|30979-9&30980-7^Date vaccine due^LN|11|20110503|||||F|**

**OBX|0|CE|30979-9&30982-3^Reason applied by forecast logic to project this vaccine^LN|11|^ACIP Schedule|||||F|**

**OBX|0|CE|30979-9^Vaccine due next^LN|12|03^MMR^CVX|||||F|**

**OBX|0|TS|30979-9&30980-7^Date vaccine due^LN|12|20120101|||||F|**

**OBX|0|CE|30979-9&30982-3^Reason applied by forecast logic to project this vaccine^LN|12|^ACIP Schedule|||||F|**

**OBX|0|CE|30979-9^Vaccine due next^LN|13|21^varicella^CVX|||||F|**

**OBX|0|TS|30979-9&30980-7^Date vaccine due^LN|13|20120101|||||F|**

**OBX|0|CE|30979-9&30982-3^Reason applied by forecast logic to project this vaccine^LN|13|^ACIP Schedule|||||F|**

**OBX|0|CE|30979-9^Vaccine due next^LN|14|83^Hep A, ped/adol, 2 dose^CVX|||||F|**

**OBX|0|TS|30979-9&30980-7^Date vaccine due^LN|14|20120101|||||F|**

**OBX|0|CE|30979-9&30982-3^Reason applied by forecast logic to project this vaccine^LN|14|^ACIP Schedule|||||F|**

**OBX|0|CE|30979-9^Vaccine due next^LN|15|114^meningococcal (MCV4)^CVX|||||F|**

**OBX|0|TS|30979-9&30980-7^Date vaccine due^LN|15|20220101|||||F|**

**OBX|0|CE|30979-9&30982-3^Reason applied by forecast logic to project this vaccine^LN|15|^ACIP Schedule|||||F|**

**OBX|0|CE|30979-9^Vaccine due next^LN|16|137^HPV^CVX|||||F|**

**OBX|0|TS|30979-9&30980-7^Date vaccine due^LN|16|20220101|||||F|**

**OBX|0|CE|30979-9&30982-3^Reason applied by forecast logic to project this vaccine^LN|16|^ACIP Schedule|||||F|**

**OBX|0|CE|30979-9^Vaccine due next^LN|17|33^pneumococcal-polysaccharide^CVX|||||F|**

**OBX|0|TS|30979-9&30980-7^Date vaccine due^LN|17|20760101|||||F|**

**OBX|0|CE|30979-9&30982-3^Reason applied by forecast logic to project this vaccine^LN|17|^ACIP Schedule|||||F|**

**OBX|0|CE|30979-9&30999-1^Vaccine Group Recommendation Status^NYCDOHVCGPST|18|H1N1 Influenza^Not Recommended^NYCDOHVCGPST|||||F|**

**OBX|0|CE|30979-9&30982-3^Reason applied by forecast logic to project this vaccine^LN|18|^ACIP Schedule|||||F|**

### 8.8.2.2 Message Narrative

The search criteria sent in the VXQ message by Queens Clinic resulted in the successful identification of a single patient. The CIR HL7 Web Service returns a VXR message to Queens Clinic providing the patient data that the CIR is permitted to share:

- Patient Identifiers (Local Registry ID, Medical Record Number, Medicaid Number)
- First Name
- Middle Name
- Last Name
- DOB
- Sex
- Immunization History
  - Vaccine Codes and Descriptions
  - Administration Dates
  - Lot Numbers, Expiration Dates, and Manufacturers (if available)
  - In addition, for the thirteen vaccine groups that the CIR currently evaluates, if any immunization components were **not** valid based on the schedule for that vaccine, the Invalid Reason will be listed in the corresponding notes and comments (NTE) segment.

- Immunization Recommendations (for the thirteen vaccine groups that the CIR currently evaluates)
  - Vaccine Codes and Descriptions
  - Due Dates

The Message Header (MSH) segment lets Queens Clinic know that this acknowledgement (VXR) message is coming from the New York City Department of Health and that the sending application is version 1.75 of the CIR HL7 Web Service. The message control ID provided in the MSH segment, “20110510115312CIR-WS”, is the unique ID assigned by the CIR HL7 Web Service.

In the Message Acknowledgement (MSA) segment, the CIR HL7 Web Services echoes back the message control ID (843672) that Queens Clinic used to identify the VXQ message. There were no errors in the VXQ message that Queens Clinic sent; however, if there had been non-fatal errors, the MSA segment would include information about those non-fatal errors.

The QRD and QRF segments echo back the search criteria provided in the corresponding segments in the VXQ. The information in the QRD and QRF segments was utilized to locate this patient.

In the next segment, the Patient Identification (PID) segment, the CIR HL7 Web Service provides Queens Clinic with Harra’s name (last, first, and middle), Local Registry ID (also referred to as her “CIR ID”), her date of birth, and her sex. Additional patient information, such as race, language, ethnicity, and demographic information is not provided.

Following the PID segment are Pharmacy/Treatment Administration (RXA) segments for each of the vaccines Harra has received. The RXA segments in this VXR message let Queens Clinic know that Harra has received three vaccines so far: DTaP on 3/1/2011, IPV on 3/1/2011, and DTP-Hib on 3/7/2011. For each RXA there is at least one corresponding Observation/Result (OBX) segment. These OBX segments provide the vaccine code and vaccine description of each component of the vaccine. If a component is considered invalid, based on the schedule for that vaccine, a corresponding Notes (NTE) segment is provided that lets the Clinic know the component is invalid along with the invalid code and reason description. In Harra’s case, the DTP portion of the DTP-Hib vaccine administered on 3/7/2011 was not valid. If Harra did not have any immunizations on record, the VXR would have contained a single RXA segment stating “no vaccine administered”.

The first RXA segment lets Queens Clinic know that Harra received a DTaP (CVX code 20) vaccine on 03/01/2011 for which the lot number was DTPA634A2, the expiration date was 8/26/2012, and the manufacturer was GlaxoSmithKline. The corresponding OBX segment shows that this was a single component vaccine and repeats the vaccine code and description. There is no corresponding NTE segment since, based on the corresponding schedule for this vaccine, the vaccination was determined to be valid.

The second RXA segment lets Queens Clinic know that Harra also received an IPV vaccine (CVX code 10) on 03/01/2011 and provides the corresponding lot number

(1032P), expiration date (5/13/2012), and manufacturer (Merck). This, too, was a single component vaccine as shown in the corresponding OBX. There is no corresponding NTE segment since, based on the schedule for this vaccine, the vaccination was determined to be valid.

The third RXA segment lets Queens Clinic know that on 3/7/2011 Harra received a DTP-Hib vaccine (CVX code 22) and provides the corresponding lot number, expiration date, and manufacturer. This RXA segment is followed by two OBX segments, one for each component of the vaccine. The first OBX segment is for the Hib (CVX code 48) component. The absence of a corresponding NTE segment lets Queens Clinic know the Hib vaccination was considered valid based on the schedule for this vaccine. The second OBX segment is for the DTP (CVX code 01) component. The corresponding NTE segment tells Queens Clinic that the DTP vaccination is invalid because it was given prior to the recommended age or interval for this dose (invalid reason code 1004).

Following Harra's immunization history (i.e., the RXA segments, corresponding OBX segments and, where applicable, NTE segments), Harra's vaccination recommendations for the fourteen vaccine groups that the CIR currently evaluates are displayed in recommendation OBX segments. Each recommendation OBX segment has an OBX Set ID of "0". The recommendation data for each vaccine group displays in multiple OBX segments and contains, along with other data, the vaccine code, the recommendation, and, when applicable, the date due. For example, according to the ACIP schedule, Harra is due for her HepB (CVX code 08) vaccine as of 1/1/2011.

### 8.8.2.3 Segment Details

#### ***8.8.2.3.1 Message Segment Header Details***

MSH-1 Field Separator: |  
MSH-2 Encoding Characters: ^~\&  
MSH-3.1 Sending Application: CIR HL7 Web Service 1.75  
MSH-4.1 Sending Facility: 8000N70  
MSH-7.1 Date/Time of Message: 20110510115312 (5/10/2011 at 11:53:12)  
MSH-9 Message Type  
    MSH-9.1 Message Type: VXR  
    MSH-9.2 Trigger Event: V03  
MSH-10 Message Control ID: 20110510115312CIR-WS  
MSH-11.1 Processing ID: P  
MSH-12.1 Version ID: 2.3.1  
MSH-16 Application Acknowledgment Type: AL

#### ***8.8.2.3.2 Message Acknowledgement Header Details***

MSA-1 Acknowledgment Code: AA  
MSA-2 Message Control ID: 843672  
MSA-3 Text: MESSAGE ACCEPTED;LR=43816836

#### ***8.8.2.3.3 Query Definition Segment Details***

QRD-1 Query Date/Time: 20110510115302 (5/10/2011 at 11:53:02)

QRD-2 Query format code: R

QRD-3 Query priority: I

QRD-4 Query ID: 843672

QRD-8 Who Subject Filter:

(1) QRD-1 ID Number: 43816836

(1) QRD-8.2.1 Last (Family) Name: Agathon

(1) QRD-8.3 First (Given) Name: Harra

(1) QRD-8.4 Middle Initial or Name: A

(1) QRD-8.13 Identifier Type: LR (Local Registry ID / CIR Patient ID)

(2) QRD-1 ID Number: 889887

(2) QRD-8.13 Identifier Type: MR (Medical Record Number)

#### **8.8.2.3.4 Query Filter Segment Details**

QRF-5 Other Query Subject Filter:

(1) QRF-5.1 Patient Social Security Number: 222228888

(2) QRF-5-1 Patient DOB: 20110101 (01/01/2011)

(3) QRF-5-1 Patient Birth State: NY

(4) QRF-5-1 Patient Birth Registration Number: 888

(5) QRF-5-1 Patient Medicaid Number: CC88888C

(6) QRF-5-1 Mother's Last Name: Agathon

(6) QRF-5-2 Mother's First Name: Sharon

(6) QRF-5-3 Mother's Middle Name: Athena

(6) QRF-5-7 Mother's Home Phone – Area Code: 972

(6) QRF-5-8 Mother's Home Phone – Phone Number: 6688888

(6) QRF-5-9 Mother's Work Phone – Area Code: 972

(6) QRF-5-10 Mother's Work Phone – Phone Number: 6680072

(6) QRF-5-11 Mother's Work Phone – Extension: 888

(7) QRF-5-1 Mother's Maiden Name: VALERII

(8) QRF-5-1 Mother's Social Security Number: 123458888

(9) QRF-5-1 Father's Last Name: Agathon

(9) QRF-5-2 Father's First Name: Karl

(9) QRF-5-3 Father's Middle Name: Helo

(9) QRF-5-7 Father's Home Phone – Area Code: 972

(9) QRF-5-8 Father's Home Phone – Phone Number: 6688888

(9) QRF-5-9 Father's Work Phone – Area Code: 972

(9) QRF-5-10 Father's Work Phone – Phone Number: 6684356

(9) QRF-5-11 Father's Work Phone – Extension: 2749

(10) QRF-5-1 Guardian's Social Security Number: 734331234

(11) QRF-5-1 Guardian's Last Name: Exodus

(11) QRF-5-2 Guardian's First Name: Maya

(11) QRF-5-3 Guardian's Middle Name: Isis

(11) QRF-5-7 Guardian's Home Phone – Area Code: 423

(11) QRF-5-8 Guardian's Home Phone – Phone Number: 5551212

(11) QRF-5-9 Guardian's Work Phone – Area Code: 972

(11) QRF-5-10 Guardian's Work Phone – Phone Number: 6684747

(11) QRF-5-11 Guardian's Work Phone – Extension: 12345

- (12) QRF-5-1 Guardian's Social Security Number: 123456789
- (13) QRF-5.1 Patient Gender: F (Female)
- (13) QRF-5.2 Patient's Alternate Last Name: Valerii
- (13) QRF-5.3 Patient's Alternate First Name: Hera
- (13) QRF-5.3 Patient Multiple Birth: N (No)
- (14) QRF-5.1 Mother's Date of Birth: 19800710 (7/10/1980)
- (15) QRF-5.1 Patient's Address – House #: 101
- (15) QRF-5.2 Patient's Address – Apartment #: C-9
- (15) QRF-5.3 Patient's Address – Street Name: BSG Way
- (15) QRF-5.4 Patient's Address – City: Caprica
- (15) QRF-5.5 Patient's Address – State: NY
- (15) QRF-5.6 Patient's Address – Zip Code: 11111
- (15) QRF-5.7 Patient's Address – Zip4: 4444
- (15) QRF-5.8 Patient's Home Phone – Area Code: 972
- (15) QRF-5.9 Patient's Home Phone – Phone Number: 6680072
- (16) QRF-5.1 Patient Birth Facility Code: 31569
- (16) QRF-5.2 Patient Birth Country Code: USA
- (16) QRF-5.3 Patient Ethnicity Code: N (code for Not Hispanic or Latino)
- (16) QRF-5.4 Patient Language Code: EL (code for English)
- (16) QRF-5.5 Patient Race Code: 2028-9 (code for Asian)
- (16) QRF-5.6 Patient VFC Eligibility Code: V01 (code for Not VFC Eligible)
- (17) QRF-5.6 Patient Vital Record Number: 6234234234

#### ***8.8.2.3.5 Patient Identification Segment Details***

PID-3: Patient Identifier List

PID-3.1 Identifier: 43816836

PID-3.5 Type: LR (Local Registry ID / CIR Patient ID)

PID-5 Patient Name

PID-5.1.1 Last (Family) Name: Agathon

PID-5.2 First (Given) Name: Harra

PID-5.3 Middle Name: Athena

PID-7.1 DOB: 20110101 (1/1/2011)

PID-8 Gender (Sex): F (Female)

#### ***8.8.2.3.6 Pharmacy/Treatment Administration Segment Details***

(1) RXA-1 Give Sub-ID Counter: 0

(1) RXA-2 Administration Sub-ID Counter: 999

(1) RXA-3.1 Date/Time Start of Administration 20110301 (03/01/2011)

(1) RXA-4.1 Date/Time End of Administration: 20110301 (03/01/2011)

(1) RXA-5 Administered Code

RXA-5.1 Identifier: 20

RXA-5.2 Text: DTaP

RXA-5.3 Coding System: CVX

(1) RXA-6 Administered Amount: 999

(1) RXA-15 Substance Lot Number: DTPA634A2

(1) RXA-16.1 Substance Expiration Date: 20120826 (8/26/2012)

- (1) RXA-17 Manufacturer:
  - RXA-17.1 Identifier: SKB
  - RXA-17.2 Text: GlaxoSmithKline
  
- (2) RXA-1 Give Sub-ID Counter: 0
- (2) RXA-2 Administration Sub-ID Counter: 999
- (2) RXA-3.1 Date/Time Start of Administration 20110301 (03/01/2011)
- (2) RXA-4.1 Date/Time End of Administration: 20110301 (03/01/2011)
- (2) RXA-5 Administered Code
  - RXA-5.1 Identifier: 10
  - RXA-5.2 Text: IPV
  - RXA-5.3 Coding System: CVX
- (2) RXA-6 Administered Amount: 999
- (2) RXA-15 Substance Lot Number: 1032P
- (2) RXA-16.1 Substance Expiration Date: 20120513 (5/13/2012)
- (2) RXA-17 Manufacturer:
  - RXA-17.1 Identifier: MSD
  - RXA-17.2 Text: Merck Co, Inc.

- (3) RXA-1 Give Sub-ID Counter: 0
- (3) RXA-2 Administration Sub-ID Counter: 999
- (3) RXA-3.1 Date/Time Start of Administration 20110301 (03/01/2011)
- (3) RXA-4.1 Date/Time End of Administration: 20110301 (03/01/2011)
- (3) RXA-5 Administered Code
  - RXA-5.1 Identifier: 22
  - RXA-5.2 Text: DTP-Hib
  - RXA-5.3 Coding System: CVX
- (3) RXA-6 Administered Amount: 999
- (3) RXA-15 Substance Lot Number: DH-923740-P
- (3) RXA-16.1 Substance Expiration Date: 20121126 (11/26/2012)
- (3) RXA-17 Manufacturer:
  - RXA-17.1 Identifier: UNK
  - RXA-17.2 Text: Unknown Manufacturer

#### ***8.8.2.3.7 Observation/Result Segment***

- (1) OBX-1 Set-ID-OBX: 1
- (1) OBX-2 Value Type: CE
- (1) OBX-3 Observation Identifier: 38890-0^Component Vaccine Type^LN
- (1) OBX-4 Observation Sub-ID: 1
- (1) OBX-5 Observation Value: 106^DTaP, 5 pertussis antigen^CVX
- (1) OBX-10 Observation Result Status: F
  
- (2) OBX-1 Set-ID-OBX: 1
- (2) OBX-2 Value Type: CE
- (2) OBX-3 Observation Identifier: 38890-0^Component Vaccine Type^LN
- (2) OBX-4 Observation sub-ID: 2

- (2) OBX-5 Observation value: 10^IPV^CVX
- (2) OBX-10 Observation result status: F
  
- (3) OBX-1 Set-ID-OBX: 1
- (3) OBX-2 Value Type: CE
- (3) OBX-3 Observation Identifier: 38890-0^Component Vaccine Type^LN
- (3) OBX-4 Observation sub-ID: 3
- (3) OBX-5 Observation value: 48^Hib (PRP-T)
- (3) OBX-10 Observation result status: F
  
- (4) OBX-1 Set-ID-OBX: 2
- (4) OBX-2 Value Type: CE
- (4) OBX-3 Observation Identifier: 38890-0^Component Vaccine Type^LN
- (4) OBX-4 Observation sub-ID: 4
- (4) OBX-5 Observation value: 01^DTP ^CVX
- (4) OBX-10 Observation result status: F
  
- (5) OBX-1 Set-ID- OBX: 0
- (5) OBX-2 Value Type: CE
- (5) OBX-3 Observation Identifier: 30979-9^Vaccine due next^LN
- (5) OBX-4 Observation sub-ID: 5
- (5) OBX-5 Observation value: 88^influenza, NOS^CVX
- (5) OBX-10 Observation result status: F
- (6) OBX-1 Set-ID- OBX: 0
- (6) OBX-2 Value Type: TS
- (6) OBX-3 Observation Identifier: 30979-9&30980-7^Date vaccine due^LN
- (6) OBX-4 Observation sub-ID: 5
- (6) OBX-5 Observation value: 20110702 (7/2/2011)
- (6) OBX-10 Observation result status: F
  
- (7) OBX-1 Set-ID- OBX: 0
- (7) OBX-2 Value Type: CE
- (7) OBX-3 Observation Identifier: 30979-9&30982-3^Reason applied by forecast logic to project this vaccine^LN
- (7) OBX-4 Observation sub-ID: 5
- (7) OBX-5 Observation value: ACIP Schedule
- (7) OBX-10 Observation result status: F
  
- (8) OBX-1 Set-ID- OBX: 0
- (8) OBX-2 Value Type: CE
- (8) OBX-3 Observation Identifier: 30979-9^Vaccine due next^LN
- (8) OBX-4 Observation sub-ID: 6
- (8) OBX-5 Observation value: 08^Hep B, adolescent or pediatric
- (8) OBX-10 Observation result status: F

(9) OBX-1 Set-ID- OBX: 0  
(9) OBX-2 Value Type: TS  
(9) OBX-3 Observation Identifier: 30979-9&30980-7^Date vaccine due^LN  
(9) OBX-4 Observation sub-ID: 6  
(9) OBX-5 Observation value: 20110101 (1/1/2011)  
(9) OBX-10 Observation result status: F

(10) OBX-1 Set-ID- OBX: 0  
(10) OBX-2 Value Type: CE  
(10) OBX-3 Observation Identifier: 30979-9&30982-3^Reason applied by forecast logic to project this vaccine^LN  
(10) OBX-4 Observation sub-ID: 6  
(10) OBX-5 Observation value: ACIP Schedule  
(10) OBX-10 Observation result status: F

Note: This VXR contains additional OBX recommendation segments for the remainder of the vaccine groups that the CIR evaluates. These additional OBX recommendation segments, while not detailed here, follow the same format as the examples shown above.

#### **8.8.2.3.8 Notes Segment**

NTE-1 Set-ID: 1

NTE-3 Comment: Shot is invalid^1004^This immunization event occurred prior to the recommended age or recommended interval for this dose.^NYCDOHINVSHOTCODES

## **9 Appendix A**

### **9.1 WSDL**

The interface for the CIR HL7 Web Service is specified by the Web Services Description Language (WSDL) file which is shown below and can also be accessed at the following URLs.

For UAT (the test environment):

- Use this URL to get the WSDL:

<https://a816-healthpsi.nyc.gov/hl7-service-uat/services/VaccineService.wsdl>

- The Service End Point is:

<https://a816-healthpsi.nyc.gov/hl7-service-uat/services/VaccineService>

For Production:

- Use this URL to get the WSDL:

<https://a816-healthpsi.nyc.gov/hl7-service-prod/services/VaccineService.wsdl>

- The Service End Point is:

<https://a816-healthpsi.nyc.gov/hl7-service-prod/services/VaccineService>

```
<?xml version="1.0" encoding="UTF-8"?>
<wsdl:definitions name="VaccineService"
targetNamespace="http://nyc.gov.doh.cir.vaccineservice"
xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
xmlns:tns="http://nyc.gov.doh.cir.vaccineservice"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/">
  <wsdl:types>
    <xsd:schema targetNamespace="http://nyc.gov.doh.cir.vaccineservice"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">

      <xsd:complexType name="Message">
        <xsd:sequence>
          <xsd:element name="message" nillable="false"
type="xsd:string"/>
        </xsd:sequence>
      </xsd:complexType>

      <xsd:complexType name="MessageWithIdentityKey">
        <xsd:complexContent>
          <xsd:extension base="tns:Message">
            <xsd:sequence>
              <xsd:element name="identityKey"
nillable="false" type="xsd:string"/>
            </xsd:sequence>
          </xsd:extension>
        </xsd:complexContent>
      </xsd:complexType>

      <xsd:element name="SubmitPatientImmRequest">
        <xsd:complexType>
          <xsd:sequence>
            <xsd:element name="vxuInMessage" nillable="false"
type="tns:MessageWithIdentityKey"/>
          </xsd:sequence>
        </xsd:complexType>
      </xsd:element>

      <xsd:element name="SubmitPatientImmRequestNoKey">
        <xsd:complexType>
          <xsd:sequence>
            <xsd:element name="vxuInMessage" nillable="false"
type="tns:Message"/>
          </xsd:sequence>
        </xsd:complexType>
      </xsd:element>
    </xsd:schema>
  </wsdl:types>
</wsdl:definitions>
```

```
<xsd:element name="SubmitPatientImmResponse">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="vxuOutMessage" nillable="false"
type="tns:Message"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>

<xsd:element name="QueryPatientImmRequest">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="vxqInMessage" nillable="false"
type="tns:MessageWithIdentityKey"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>

<xsd:element name="QueryPatientImmRequestNoKey">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="vxqInMessage" nillable="false"
type="tns:Message"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>

<xsd:element name="QueryPatientImmResponse">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="vxqOutMessage" nillable="false"
type="tns:Message"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>

<xsd:element name="PingRequest">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="inMessage" nillable="false"
type="tns:MessageWithIdentityKey"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>

<xsd:element name="PingRequestNoKey">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="inMessage" nillable="false"
type="tns:Message"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>

<xsd:element name="PingResponse">
  <xsd:complexType>
```

```

        <xsd:sequence>
        <xsd:element name="outMessage" nillable="false"
type="tns:Message" />
        </xsd:sequence>
    </xsd:complexType>
</xsd:element>

    <xsd:element name="SecurityFault">
        <xsd:complexType>
            <xsd:sequence>
                <xsd:element name="Reason" type="xsd:string" />
            </xsd:sequence>
        </xsd:complexType>
    </xsd:element>

</xsd:schema>
</wsdl:types>
<wsdl:message name="QueryPatientImmRequestMessageNoKey">
    <wsdl:part name="part" element="tns:QueryPatientImmRequestNoKey">
    </wsdl:part>
</wsdl:message>
<wsdl:message name="QueryPatientImmResponseMessage">
    <wsdl:part name="part" element="tns:QueryPatientImmResponse">
    </wsdl:part>
</wsdl:message>
<wsdl:message name="QueryPatientImmRequestMessage">
    <wsdl:part name="part" element="tns:QueryPatientImmRequest">
    </wsdl:part>
</wsdl:message>
<wsdl:message name="SubmitPatientImmResponseMessage">
    <wsdl:part name="part" element="tns:SubmitPatientImmResponse">
    </wsdl:part>
</wsdl:message>
<wsdl:message name="PingRequestMessage">
    <wsdl:part name="part" element="tns:PingRequest">
    </wsdl:part>
</wsdl:message>
<wsdl:message name="PingResponseMessage">
    <wsdl:part name="part" element="tns:PingResponse">
    </wsdl:part>
</wsdl:message>
<wsdl:message name="SubmitPatientImmRequestMessage">
    <wsdl:part name="part" element="tns:SubmitPatientImmRequest">
    </wsdl:part>
</wsdl:message>
<wsdl:message name="SecurityFaultMessage">
    <wsdl:part name="fault" element="tns:SecurityFault">
    </wsdl:part>
</wsdl:message>
<wsdl:message name="PingRequestMessageNoKey">
    <wsdl:part name="part" element="tns:PingRequestNoKey">
    </wsdl:part>
</wsdl:message>
<wsdl:message name="SubmitPatientImmRequestMessageNoKey">
    <wsdl:part name="part" element="tns:SubmitPatientImmRequestNoKey">
    </wsdl:part>
</wsdl:message>

```

```
<wsdl:portType name="VaccineServicePort">
  <wsdl:operation name="SubmitPatientImmRecord">
    <wsdl:input message="tns:SubmitPatientImmRequestMessage">
    </wsdl:input>
    <wsdl:output message="tns:SubmitPaientImmResponseMessage">
    </wsdl:output>
    <wsdl:fault name="SecurityException"
message="tns:SecurityFaultMessage">
    </wsdl:fault>
  </wsdl:operation>
  <wsdl:operation name="SubmitPatientImmRecordNoKey">
    <wsdl:input message="tns:SubmitPatientImmRequestMessageNoKey">
    </wsdl:input>
    <wsdl:output message="tns:SubmitPaientImmResponseMessage">
    </wsdl:output>
    <wsdl:fault name="SecurityException"
message="tns:SecurityFaultMessage">
    </wsdl:fault>
  </wsdl:operation>
  <wsdl:operation name="QueryPatientImmRecord">
    <wsdl:input message="tns:QueryPatientImmRequestMessage">
    </wsdl:input>
    <wsdl:output message="tns:QueryPatientImmResponseMessage">
    </wsdl:output>
    <wsdl:fault name="SecurityException"
message="tns:SecurityFaultMessage">
    </wsdl:fault>
  </wsdl:operation>
  <wsdl:operation name="QueryPatientImmRecordNoKey">
    <wsdl:input message="tns:QueryPatientImmRequestMessageNoKey">
    </wsdl:input>
    <wsdl:output message="tns:QueryPatientImmResponseMessage">
    </wsdl:output>
    <wsdl:fault name="SecurityException"
message="tns:SecurityFaultMessage">
    </wsdl:fault>
  </wsdl:operation>
  <wsdl:operation name="Ping">
    <wsdl:input message="tns:PingRequestMessage">
    </wsdl:input>
    <wsdl:output message="tns:PingResponseMessage">
    </wsdl:output>
    <wsdl:fault name="SecurityException"
message="tns:SecurityFaultMessage">
    </wsdl:fault>
  </wsdl:operation>
  <wsdl:operation name="PingNoKey">
    <wsdl:input message="tns:PingRequestMessageNoKey">
    </wsdl:input>
    <wsdl:output message="tns:PingResponseMessage">
    </wsdl:output>
    <wsdl:fault name="SecurityException"
message="tns:SecurityFaultMessage">
    </wsdl:fault>
  </wsdl:operation>
</wsdl:portType>
```

```
<wsdl:binding name="VaccineServiceSOAPBinding"
type="tns:VaccineServicePort">
  <soap:binding style="document"
transport="http://schemas.xmlsoap.org/soap/http"/>
  <wsdl:operation name="SubmitPatientImmRecord">
    <soap:operation
soapAction="http://nyc.gov.doh.cir.vaccineservice/SubmitPatientImmRecord" />
    <wsdl:input>
      <soap:body use="literal"/>
    </wsdl:input>
    <wsdl:output>
      <soap:body use="literal"/>
    </wsdl:output>
    <wsdl:fault name="SecurityException">
      <soap:fault name="SecurityException" use="literal"/>
    </wsdl:fault>
  </wsdl:operation>
  <wsdl:operation name="SubmitPatientImmRecordNoKey">
    <soap:operation
soapAction="http://nyc.gov.doh.cir.vaccineservice/SubmitPatientImmRecordNoKey" />
    <wsdl:input>
      <soap:body use="literal"/>
    </wsdl:input>
    <wsdl:output>
      <soap:body use="literal"/>
    </wsdl:output>
    <wsdl:fault name="SecurityException">
      <soap:fault name="SecurityException" use="literal"/>
    </wsdl:fault>
  </wsdl:operation>
  <wsdl:operation name="QueryPatientImmRecord">
    <soap:operation
soapAction="http://nyc.gov.doh.cir.vaccineservice/QueryPatientImmRecord" />
    <wsdl:input>
      <soap:body use="literal"/>
    </wsdl:input>
    <wsdl:output>
      <soap:body use="literal"/>
    </wsdl:output>
    <wsdl:fault name="SecurityException">
      <soap:fault name="SecurityException" use="literal"/>
    </wsdl:fault>
  </wsdl:operation>
  <wsdl:operation name="QueryPatientImmRecordNoKey">
    <soap:operation
soapAction="http://nyc.gov.doh.cir.vaccineservice/QueryPatientImmRecordNoKey" />
    <wsdl:input>
      <soap:body use="literal"/>
    </wsdl:input>
    <wsdl:output>
      <soap:body use="literal"/>
    </wsdl:output>
    <wsdl:fault name="SecurityException">
```

```
        <soap:fault name="SecurityException" use="literal"/>
    </wsdl:fault>
</wsdl:operation>
<wsdl:operation name="Ping">
    <soap:operation
soapAction="http://nyc.gov.doh.cir.vaccineservice/Ping"/>
    <wsdl:input>
        <soap:body use="literal"/>
    </wsdl:input>
    <wsdl:output>
        <soap:body use="literal"/>
    </wsdl:output>
    <wsdl:fault name="SecurityException">
        <soap:fault name="SecurityException" use="literal"/>
    </wsdl:fault>
</wsdl:operation>
<wsdl:operation name="PingNoKey">
    <soap:operation
soapAction="http://nyc.gov.doh.cir.vaccineservice/PingNoKey"/>
    <wsdl:input>
        <soap:body use="literal"/>
    </wsdl:input>
    <wsdl:output>
        <soap:body use="literal"/>
    </wsdl:output>
    <wsdl:fault name="SecurityException">
        <soap:fault name="SecurityException" use="literal"/>
    </wsdl:fault>
</wsdl:operation>
</wsdl:binding>
<wsdl:service name="VaccineService">
    <wsdl:port name="VaccineServiceSOAP"
binding="tns:VaccineServiceSOAPBinding">
        <soap:address location="https://a816-healthpsi.nyc.gov/hl7-
service-uat/services/VaccineService"/>
    </wsdl:port>
</wsdl:service>
</wsdl:definitions>
```

## 9.2 Security Fault Exception

If the data exchange partner does not provide a valid identity key a security fault exception will be returned. An example of one is displayed below:

```
<?xml version='1.0' encoding='utf-8'?><soapenv:Envelope
xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"><soapenv:Body><soapenv
:Fault><faultcode>soapenv:Server</faultcode><faultstring>Authorization
Violated</faultstring><detail><ns1:SecurityFault
xmlns:ns1="http://nyc.gov.doh.cir.vaccineservice"><Reason>Account not
authorized!</Reason></ns1:SecurityFault></detail></soapenv:Fault></soapenv:Body></
soapenv:Envelope>
```

## 9.3 Axis Fault Exception

If a runtime error occurs or an unexpected event an Axis Fault Exception will be generated. An example of one is displayed below:

```
<?xml version='1.0' encoding='utf-8'?><soapenv:Envelope
xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"><soapenv:Body><soapenv
:Fault><faultcode>soapenv:Server</faultcode><faultstring>Can not serialize OM
Element Envelope</faultstring><detail
/></soapenv:Fault></soapenv:Body></soapenv:Envelope>
```