Massachusetts Department of Public Health

Massachusetts Immunization Information System

MIIS HL7 Transfer Specifications
Version 21.1.1

Companion to

HL7 2.5.1 Implementation Guide for Immunization Messaging v21.1.1

10/07/2021

For use with:	Version
MIIS	21.1.1

Version History

VERSION	UPDATED	COMMENTS
1.0	2/25/11	Original document
2.9	10/3/2016	Add QBP and RSP profiles
2.9	10/3/2016	Add NDC codes to RXA-5 in section 6.
2.9	10/3/2016	Add Immunities to OBX in section 6.
2.9	12/19/2016	Added new Rabies codes CVX 175 and 176. CVX 18 is now retired.
3.0	1/26/2017	Revised sample RSP messages
3.0	1/26/2017	Highlighted MIIS local RSP ERR codes in section 9
3.1	03/05/2018	Deleted references of OBX3.1 for component type and updates sample VXU message in section 12.1
4.0	9/19/2019	Message Control ID
4.0	9/19/2019	BHS Batch Header Segment Optional BTS Batch Trailer Segment Optional
4.0	9/23/2019	Ability to accept TS as well as DT in OBX segment
20.2	3/30/2020	Reject `><?";/_[]{ }0123456789~!@#$% ^ in patients, caregiver and administering provider name fields
20.2	3/30/2020	Include fully encoded VIS publication string functionality
20.2	08/01/2020	Include Alias on QBP responses, if only one value exists then the repetition looks like this: lastname^fristname^^^^^L~^Alias^^^^^A
20.2	10/19/2020	Updated to accept multiple races in VXU
20.3.2	10/19/2020	Changed some AR responses to AE (anything besides structural)
20.3.2	10/19/2020	Removed BHS/BTS from our QBP responses (Z32, Z33 and Z42 responses)
20.3.2	5/5/2021	Included AA/I conditions in section 5.3
21.1	8/25/2021	QPD segment 3 change to include MIIS ID, MSH-4 may now include the "MA" prefix, caregiver name type to include spouse or partner, Refusal status
21.1.1	10/7/2021	Added demographic only updates
21.1.1	10/7/2021	New Z31 more than one match profile

Table of Contents

For information about this document, please contact:

MIIS Help Desk
tel: 617-983-4335
fax: 857-323-8321
email: miishelpdesk@mass.gov http://www.mass.gov/dph/miis

1 Introduction

1.1 Background

The Massachusetts Department of Public Health has established the Massachusetts Immunization Information System (MIIS). As a secure, web-based system, the MIIS supports the tracking of vaccine administration within the Commonwealth. While the MIIS has a graphical user interface (GUI) allowing health care providers to enter, query, and update patient immunization records, the MDPH recognizes that some provider sites already store immunization data in their own electronic health record system (EHR). To best support these provider sites, the Executive Office of Health and Human Services has also implemented the Massachusetts Health Information Highway (MA HIway). The MA HIway has the capability to accept data from existing EHR systems in real time, thus eliminating the potential burden of duplicate data entry (e.g. entering information into existing EHR systems and then also into the MIIS). The MA HIway accepts HL7 version 2.5.1 vaccine messages and fulfills one component of the "meaningful use" criteria defined for provider sites by The Health Information Technology for Economic and Clinical Health Act (HITECH).

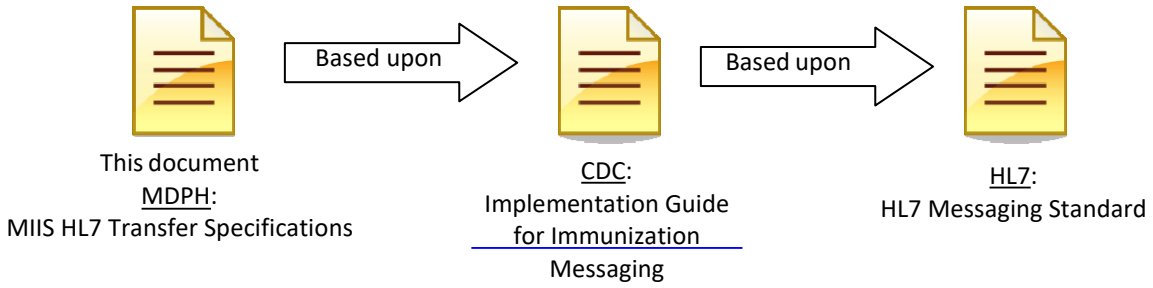
1.2 Purpose of This Document

This document should be read and understood by technical resources at provider sites who wish to establish connectivity between their Electronic Health Record System (EHR) and the MIIS. The document describes the following:

- General overview of the functionality of the MIIS MA HIway
- Technical Description of the MA HIway
- Description of the business logic used to process inbound HL7 messages
- Definition of the standard HL7 file format utilized by the MIIS

1.3 References

This document defines the specifications of data exchange specific to the MIIS and is meant as a companion to the following documents:



- **Implementation Guide for Immunization Messaging**. Published by the National Immunization Program within the Center for Disease Control and Prevention, this guide provides a national standard for states to implement HL7 messaging specific to immunization data. The guide describes how to implement messaging in compliance with the HL7 standard. It is listed as "HL7 Version 2.5.1: Implementation Guide for Immunization Messaging, Release 1.5 Published 11/05/2014" at the following website: http://www.cdc.gov/vaccines/programs/iis/technical-guidance/hl7.html

2 Supported Message Types

The MIIS supports two incoming message types: Unsolicited Vaccination Updates (VXU) and Patient Immunization Queries (QBP). In return, the MIIS supports the following response messages: Acknowledgment (ACK) and Response (RSP).

MIIS data exchange has been designed to process messages in real-time, synchronous mode, and will handle one HL7 message request at a time.

3 Steps for Technical Integration with the MIIS

The steps required for engaging with the MIIS are outlined on our website. Please access the MIIS Resource Center here .

The Massachusetts Health Information Exchange (MA HIway) uses the Direct Project standards and policies to implement a Direct based Health Information Exchange (HIE).

4 MDPH Policy on Data Sharing in the MIIS

Massachusetts health care providers have a legislative mandate to report to the MA Department of Public Health (MDPH) the immunizations they administer, to have this information stored in the MIIS, and to inform patients or guardians of the MIIS and their right to object to having their data shared in the MIIS. Once patients have been informed of the MIIS and their right to object to data sharing, it is assumed that data sharing may occur unless the individual or parent/guardian fills out an objection form.

Objecting to data sharing in the MIIS would limit data access to the MDPH and the health care provider that has reported the vaccine; immunization data would not be shared across providers or visible to other public health agencies or partners. In the situation where an individual who had previously allowed data sharing changes their mind and objects to data sharing, only MDPH and the provider who originally reported the vaccines will be able to access that individual's record. If a patient has multiple vaccines reported by different providers, then the patient record will fragment into multiple records for each provider consisting of only the vaccines that they reported for that patient.

Within the MIIS, there is a field that designates data sharing status with the value options of "Yes", "No" or "Unknown". This value can only be updated or changed via direct entry into the MIIS web application's graphical user interface (GUI).

An "Unknown" data sharing status value can only be assigned through historical data pre-loads – once a provider site is actively using the system, providers must discuss the MIIS with their clients and the client has the opportunity to object to data sharing (data sharing "No"). The designation of "Unknown" via historical pre-load will function equivalent to a "No" for data sharing, but will help both the MDPH and providers understand whether the client's data is not being shared in the MIIS because they have actively objected to data sharing or because they have not yet had a provider visit during which the MIIS was discussed. If the client does not object to data sharing, their status defaults to "Yes" once the provider site is activated in the MIIS (after the "Go-live" date).

Users of the MIIS web application (GUI) will be able to set data sharing values directly in the application.

If historical information is preloaded from other practice management systems, their client's preference will be set to "Unknown" for data sharing. As providers use the system, entry of current immunizations will trigger the system to automatically set the client record to "Yes" for data sharing. If the client objects to data sharing, then the provider will change the data sharing status field to "No" and must fax or mail a copy of the Objection form to the MDPH.

During data exchange with the practice's electronic medical record system, assignment of the data sharing status will differ based on whether or not the immunization was given (RXA-3) before or after the practice "Go-live" date with the MIIS. The reference date used to determine this value is stored as the "Go-live" date for each immunization provider. A "Go-live" date will only be available once a practice has established a systematic approach for informing patients about the MIIS and their right to object to data sharing.

For immunizations administered BEFORE "Go-live" date, the MIIS status is set to "Unknown". For immunizations administered AFTER "Go-live" date, the MIIS status is set to "Yes", provided that the individual in question has not objected to data sharing in the system. A summary of this is shown in the table below.

Vaccine Administration Date vs. Go-live Date	Current MIIS data sharing status	Final MIIS data sharing status
Before (Historic Immunizations)	None/Unknown	Unknown
Before (Historic Immunizations)	No	No (Don't Allow Sharing)
Before (Historic Immunizations)	Yes	Yes (Allow Data Sharing)
After (Current Immunizations)	None/Unknown	Yes (Allow Data Sharing)
After (Current Immunizations)	No	No (Don't Allow Sharing)
After (Current Immunizations)	Yes	Yes (Allow Data Sharing)

5 Message Specifications

This document covers the subset of HL7 that will be used for patient and immunization records exchanged between the MIIS and outside systems.

5.1 Usage Code Interpretations for Fields, Components, and Subcomponents

Usage Code	Interpretation	Comment
R	Required	• **Reject, and generate error.** The MIIS will reject the message if the required element is absent or does not meet any data type and/or code set specifications within this document. None of the data within the message will be saved.

RE	Required but may be empty	• **Accept.** MIIS will not raise an error if the "RE" element is absent or does not meet any data type and/or code set specifications described in this document. The MIIS will process the message.
		• **RE and Optional Segments**
		  • If an Optional Segment has a field marked "RE", but the sending application does not have a value to populate the RE field/s, then the segment should not be included.
		  • If an Optional Segment is used, then fields marked "RE" are required

		to be valued with a valid value for that field if the EHR system captures the relevant data field. • The element may be missing from an occasional message but must be sent by the sending application if there is relevant data.
O	Optional	• **Accept without any errors.** MIIS will not raise an error if it receives an unexpected optional element and will ignore the values if they do not meet specifications described in this document. • This element may be present if specified in local profile. Local partners may develop profiles that support use of this element. In the absence of a profile, conformant sending applications will not send the element.
CE	Conditional but may be empty	• **Accept.** MIIS will not raise an error if the "RE" element is absent or does not meet any data type and/or code set specifications described in this document. The MIIS will process the message. • This usage has an associated condition predicate. This predicate is an attribute within the message. If the predicate is satisfied: If the conforming sending application knows the required values for the element, then the application should send the element.

5.2 Rules for Message Construction

5.2.1 General Rules for Sending Systems

The following rules should be used by sending systems to construct HL7 messages.

- Each segment must begin with the 3-letter segment ID (for example RXA)
- Each field must begin with the data field separator ("|").
- BHS segment should be terminated with the data field separator ("|").
- Each segment is one line of text ending with the carriage return character, <CR>.
- The encoding characters are ("^~\&").
- The data fields must follow the order and data types specified by the segment structure definition.
- Non-Required fields that are not valued should still occupy the same field position in messages and be delimited by data field separator ("|"). Since later fields in the segment are encoded by ordinal position, fields that are not present do not reduce the number of field separators in the segment. For example, when the second and third fields are not present, the field separators maintain the ordinal position of the fourth field: |field1|||field4
- End each segment with the segment terminator (either the carriage return character, ASCII hex 0D, or <CR> tag).
- Treat data segments that are expected but not present as if all data fields in the segment were not present.
- Date data types (DT) must follow the following format: YYYYMMDD.
- Sending facility should have a valid **Vaccine Provider Identification Number (PIN)**, recognizable by MA DPH, and included in MSH-4.
- Each message must contain **exactly one** Patient Identification (PID) segment. Only **one** patient at a time may be sent in a message. These segments give identifying detail about the patient and is used to find matching patients in the registry.

  .
- Each message containing immunizations must have an ORC and RXA for each immunization
- Each RXA segment must be associated with one ORC segment, based on HL7 2.5.1 standard.

5.2.2 General Rules for Receiving Systems

The following rules are used by receiving systems (the MIIS and MA HIway) to process HL7 messages.

- HL7 2.5.1 is the format for acceptable messages. Any message that does not pass format validation will be rejected by the MA HIway.
- Messages that are missing values for segments and subcomponents denoted as required by HL7 standard or mandatory by the MIIS will be rejected. Certain required subcomponents may be part of an optional segment; if they are missing, the segment will be ignored. **Example:** NK1 segment is optional, but if it's present, NK1-2 is a required field that must be included.
- Data segments that are expected but not present will be treated as if all data fields in the segment were not present.
- Any data segment or subcomponent that is included but not expected will be ignored, rather than treated as an error. The HL7 message types used by the MIIS may include many segments or subcomponent besides the ones in this document; the MIIS will ignore them.

5.2 General Error Conditions

The following table identifies some general error conditions and outcomes.

#	Condition	Outcome
1	HL7 2.5.1 format not followed.	Message rejected. Error ACK sent to sending system.
2	Required segment not present.	Message rejected. Error ACK sent to sending system.
3	Segments not in correct order. Each segment must be in the order specified by the message format.	Message rejected. Error ACK sent to sending system.
4	Segment not expected.	Message rejected. Error ACK sent to sending system.
5	Non-repeating segment is repeated.	Message rejected. Error ACK sent to sending system.
6	Required segment has required fields that are not present or rejected due to errors (e.g. data type or code set).	Message accepted, need to resend when fixed. Error ACK sent to sending system.
7	Optional segment has required field that is not present or rejected due to errors.	Segment ignored and message processed. Success ACK sent to sending system.
8	Required field is not present.	Message accepted, need to resend when fixed. Error ACK sent to sending system.
9	Required field is rejected due to errors.	Message accepted, need to resend when fixed. Error ACK sent to sending system.
10	Code Set Mismatch. Incoming data value is not in the list of expected values for a field that is constrained to a list of values.	Incoming data are treated as empty. If field is required and blank, message accepted, need to resend when fixed.
11	Data fields are found at the end of a data segment that are not expect.	Ignore extra fields at the end of the segment. Success ACK sent to sending system.
12	Data Type Mismatch.	Message accepted, need to resend when fixed. Error ACK sent to sending system.
13	Field within a message has a total number of sub-components greater than those specified in the HL7 2.5.1 specification.	Message rejected. Error ACK sent to sending system.
14	Field within a message has populated valid subcomponents that are not listed in this requirements document.	Subcomponents ignored and message processed. Success ACK sent to sending system.
15	Optional field that is not supported by MIIS processing is included in message.	Ignore optional field and process message. Success ACK sent to sending system.
16	Repeatable HL7 fields/components which are repeatable, but	Use the first instance of the HL7 repeat,

#	Condition	Outcome
	the MIIS field is not repeatable.	regardless of the repeat type (e.g. “Home”, “Work”, etc.).
17	Data Length Mismatch.	Message rejected. Error ACK sent to sending system.
18	Missing MSH segment, invalid values in MSH components, or missing delimiter between MSH components.	Message rejected. Error ACK sent to sending system, without Message Control ID.
19	Missing a carriage return at the end of the message.	Message rejected. Error ACK sent to sending system, without Message Control ID.
20	Issues with required fields of BHS segment.	Message rejected. Error ACK sent to sending system, without Message Control ID.

5.3 Error Code Definition in ACKs sent in Response

Condition	ACK Code	ERR-3.1	ERR - 3.2	ERR-4	ERR-5.1	ERR-5 .2	ERR-8	QAK Code
Unsupported message type (MSH-9)	AR	200	Unsupported message type	E			Unsupported message type + the value received	AR
Unsupported event code	AR	201	Unsupported event code	E			Unsupported event code + the value received	AR
Unsupported processing ID (MSH-11)	AR	202	Unsupported processing id	E			Unsupported processing id + the value received and T or P are the legal values	AR
Missing Segment or order issue	AR	100	Segment sequence error	E			Missing segment "Segment" or out of order	
Exception During Processing (Actual internal error) Non Content /Formatting Related			Application internal error			Unexpected error while constructing the response	An appropriate message on what went wrong + message to contact the help desk…	AR
Vaccine PIN is missing	AE	101	Required field missing	E	7	Required data missing	Vaccine PIN is missing	AE
Message ID is missing	AE	101	Required field missing	E	7	Required data missing	Message ID is missing	AE
Patient MRN is missing	AE	101	Required field missing	E	7	Required data missing	Patient MRN is missing	AE
Patient Last Name is missing	AE	101	Required field missing	E	7	Required data missing	Patient Last Name is missing	AE

Patient First Name is Missing	AE	101	Required field missing	E	7	Required data missing	Patient First Name is Missing	AE
Patient Date of Birth is missing	AE	101	Required field missing	E	7	Required data missing	Patient Date of Birth is missing	AE
Missing VIS Presentation Date	AA	0	Message Accepted	I	15	Requested Data Missing	VIS Presentation Date is Missing	AA
Missing VIS Publication Date	AA	0	Message Accepted	I	15	Requested Data Missing	VIS Publication Date is Missing	AA
Missing Admin by Title	AA	0	Message Accepted	I	15	Requested Data Missing	Administered title is missing	AA
Duplicate Record received	AA	0	Message Accepted	I	14	Duplicate Data Received	Duplicate records received in MIIS	AA
Required field has illegal content/format	AE	102	Data type error	E	Appropriate code from local MIIS table	Appropriate description from	Description of the fields and formatting issue	AE
Illegal content or formatting not related to required fields	AE	207	Application internal error	W	8	Data was ignored	Data element that was ignored	AE
A match was found in the IIS but no value is returned since Data Sharing for the record is set to No	AA	0	Message accepted	I	11	No match - Data Sharing	A match was found in the MIIS but no value is returned since Data Sharing for the record is set to No	NF

A match was found in the IIS but no value is returned since Data Sharing for the record is set to Unknown	AA	0	Message accepted	I	12	No match - Data Sharing Unknown	A match was found in the MIIS but no value is returned since Data Sharing for the record is set to Unknown	NF
No Match found in the MIIS	AA	0	Message accepted	I	9	No match found	No Match found in the MIIS	NF
More than one match found in MIIS. Please re-query with more information	AA	0	Message accepted	I	10	More than one match	More than one match found in MIIS. Please re-query with more information	TM
One Record Found	AA	NA	NA	NA	NA	NA	NA	OK
If PIN is MSH-4 is associated to a PIN that is not associated with a Hierarchy Level = Vaccine Ordering	AE	101	Required Field Missing	E	3	Illogical Value Error	User Not Authorized to send Data	

6 Message Definition: VXU (Profile Z22)

This profile allows senders to send unsolicited immunization data in a VXU message. The receiver then sends an HL7 Acknowledgment (ACK). The MIIS supports the receipt and processing of a batch VXU message with the batch containing **one and only one message**.

6.1 Triggers for EHR to send HL7 message

The trigger points for the originating EHR system to send a VXU update should be the following:

1. Any new vaccine currently administered at the provider site.
2. Any historic vaccine currently entered into the EHR system at the provider site, regardless of the source of immunization.
3. Any edits or updates to existing administered vaccines or related to the immunization event in the patient record in the provider's EHR system.
4. Any edits, updates or deletes to any information that has already been submitted to MDPH. Please note, in order to use updates or deletes, unique filler ID's in ORC-3 must be used. There is also a flag on our end we have to set, so please let us know if you plan to use this functionality.
5. Any changes to the following patient fields: last name, first name, date of birth, address, city, state, zip code, phone number or email. In addition, the patient must have an immunization or a clinical comment that has been previously sent over to the MIIS from your organization. If a patient receives an immunization and a demographic has changed, please send them in a combined message.

6.2 Historical Records

Capturing Complete immunization histories within the MIIS yield accurate immunization forecasts since they are done using information from the entire immunization history.

6.3 Message Validation

The system will validate the HL7 message construction and syntax according to the HL7 2.5.1 standard described in this document and in greater detail in HL7 Implementation Guide. HL7 encoding checks will be performed for each individual message in the batch, and if any messages do not pass validation, they will be rejected. Acknowledgment messages will be generated for each processed message.

6.4 New Records and Updates to Existing Records

The MIIS requires a full VXU message to be sent with all required and recommended fields filled out. A full VXU message should be generated by the sending system for any updates to existing patient records, and should contain all segments, components, and subcomponents of a full message. The MIIS has a fully functional and configurable de-duplication algorithm that selects incoming records for comparison, compares a set of defined data elements, and takes actions to merge the records, present them for manual resolution, or maintain them as separate records. Selection criteria and business rules for these algorithms follow AIRA and ACIP guidelines for data quality and MA Immunization Program requirements.

6.5 Deletes of Individual Shots or Full Records

Full client records may only be deleted by the MA Immunization Program; this functionality is not available to providers. Individual shots may be deleted by providers due to data entry error via HL7 (RXA-21=D), or marked invalid through the application's GUI.

6.6VXU Message Segments with immunizations

The segments that are documented here are sufficient to support the principal MIIS functions of storing data about patients and immunizations.

In the table below, **Cardinality** refers to the indicator of the minimum and maximum number of times the element may appear.

- **[0..0]** Element never present.
- **[0..1]** Element may be omitted and it can have at most, one occurrence.
- **[1..1]** Element must have exactly one occurrence.
- **[0..n]** Element may be omitted or may repeat up to n times.
- **[1..n]** Element must appear at least once, and may repeat up to n times.
- **[0..*]** Element may be omitted or repeat for an unlimited number of times.
- **[1..*]** Element must appear at least once, and may repeat unlimited number of times.
- **[m..n]** Element must appear at least m and, at most, n times.

Segment	Cardinality	Usage	Comment
BHS	[1..1]	O	**Batch Header Segment**. The system supports the sending of one and only one message per batch. This functionality may change in the future.
MSH	[1..1]	**R**	**Message Header**. Every message begins with an MSH.
PID	[1..1]	**R**	**Patient Identification**. Every VXU has one PID segment.
PD1	[0..1]	RE	**Patient Additional Demographic**. Every PID segment in VXU may have one or less PD1 segment
NK1	[0..*]	RE	**Next of Kin/Associated Parties**. The PID segment in a VXU may have zero or more NK1 segments.
PV1	[0..1]	RE	**Patient Visit**. The PID segment in a VXU may have zero or one PV1 segment. Subsequent messages regarding the same patient/client may have a different PV1 segment.
IN1	[0..1]	O	**Insurance.**
{{Begin Order Group	[0..*]	RE	**Each VXU may have zero or more Orders**
ORC	[1..*]	**R**	**Order Request**. The order group in a VXU may have one or more ORC segments. ORC segments are required for each RXA segment, even if the Filler Order Number is the same. Please use unique Filler Order Numbers when possible.
RXA	[1..1]	**R**	**Pharmacy/Treatment Administration**. Each ORC segment in a VXU must have one RXA segment. Every RXA requires an ORC segment.
RXR	[0..1]	RE	**Pharmacy/Treatment Route**. Every RXA segment in a VXU may have zero or one RXR segments.
{{Begin Observation Group	[0..*]	RE	

OBX	[0..*]	RE*	**Observation/Result**. Every RXA segment in a VXU may have zero or more OBX segments. *Note that certain OBX segments are required for newly administered vaccines.
End Observation Group}}	[0..*]	RE	
End Order Group}}	[0..*]	RE	
BTS	[1..1]	**O**	**Batch Trailer Segment.**

6.6.1 VXU messages with demographic only updates

The MIIS will accept demographic updates for patients that have a history of vaccination in the MIIS. Demographic updates for patients with no immunization history in the MIIS will be discarded. A demographic update is when a patient is seen and a demographic change has happened, and no vaccine has been administered. A demographic in this context is considered any of the following for patient or next of kin/caregiver, first name, last name, date of birth, address, city, state, zip code, any phone number or email. When this happens, send the VXU message with the following segments below.

Once the demographic only update has been triggered, it should be sent with the normal queue of messages that contain immunizations. If sending a one-time bulk backfill of these updates, please coordinate with the MIIS helpdesk or one of the rollout resources you have worked with before sending these messages.

Segment	Cardinality	Usage	Comment
BHS	[1..1]	O	**Batch Header Segment**. The system supports the sending of one and only one message per batch. This functionality may change in the future.
MSH	[1..1]	**R**	**Message Header**. Every message begins with an MSH.
PID	[1..1]	**R**	**Patient Identification**. Every VXU has one PID segment.
PD1	[0..1]	RE	**Patient Additional Demographic**. Every PID segment in VXU may have one or less PD1 segment
NK1	[0..*]	RE	**Next of Kin/Associated Parties**. The PID segment in a VXU may have zero or more NK1 segments.
PV1	[0..1]	RE	**Patient Visit**. The PID segment in a VXU may have zero or one PV1 segment. Subsequent messages regarding the same patient/client may have a different PV1 segment.
BTS	[1..1]	O	**Batch Trailer Segment.**

6.6.2 BHS - Batch Header Segment (OPTIONAL AND NOT REPEATABLE)

The BHS segment defines the start of a single patient record. If included, segment 1 and 2 are required.

SEQ	LEN	DT	R/RE/O	RP	HL7 TBL#	MIIS USAGE	ELEMENT NAME
1	**1**	**ST**	**R**	N		**Standard HL7**	**Batch Field Separator**
2	**3**	**ST**	**R**	N		**Standard HL7**	**Batch Encoding Characters**
3	20	HD	O	N		Validate External Site	Batch Sending Application
4	20	HD	O	N		MDPH Vaccine PIN	Batch Sending Facility
5	20	HD	O	N		Establish Routing	Batch Receiving Application
6	20	HD	O	N		Establish Routing	Batch Receiving Facility
7	26	TS	O	N			Batch Creation Date/Time
9	20	ST	O	N			Batch Name/ID/Type
11	20	ST	O	N			Batch Control ID
12	20	ST	O	N			Reference Batch Control ID

BHS-1 This field contains the separator between the segment ID and the first real field, BHS-2-batch encoding characters. As such it serves as the separator and defines the character to be used as a separator for the rest of the segment. The MIIS requires | (ASCII 124). This is a required field.

Default Value (BHS-1)	|

BHS-2 This field contains the four characters in the following order: the component separator, repetition separator, escape characters and sub-component separator. The MIIS requires ^~\&, (ASCII 94, 126, 92 and 38 respectively). This is a required field.

Required Default Value (BHS-2)	**^~\&**

BHS-3 Used to identify the technical gateway application sending this batch of records.
BHS-4 Used to identify the site sending this batch of records.
BHS-5 Used to identify receiving application for this batch.

Required Default Value (BHS-5)	**MIIS**

BHS-6 Used to identify receiving facility for this batch.

Required Default Value (BHS-6)	**99990**

BHS-7 Unique Date and Time stamp for this batch.
BHS-9 Free text, which may be included for convenience, but has no effect on processing.
BHS-11 This field is used to uniquely identify a particular batch. It can be echoed back in BHS-12-reference batch control ID if an answering batch is needed. For the MIIS purposes, the answering batch will contain ACK messages.
BHS-12 This field contains the value of BHS-11-batch control ID when this batch was originally transmitted. Not present if this batch is being sent for the first time. See definition for BHS-11-batch control ID.

6.6.3 MSH – Message Header Segment (REQUIRED AND NOT REPEATABLE)

The MSH segment defines the intent, source, destination, and some specifics of the syntax of a message. The MSH is specific to each, single immunization record and the specific clinical site responsible for the associated record.

The Message Header Segment for ACK will have the same number of fields as the VXU MSH. For ACK, the values in the fields will reflect information about a previously received, single record. The data types for each component and sub-component are the same for VXU MSH and the ACK MSH. Wherever default values are expected, the distinction will be made between VXU and ACK requirements (e.g. MSH-9).

SEQ	LEN	DT	R/RE/O	RP	HL7 TBL#	MIIS USAGE	ELEMENT NAME
1	**1**	**ST**	**R**	**N**		**Standard HL7**	**Field Separator**
2	**4**	**ST**	**R**	**N**		**Standard HL7**	**Encoding Characters**
3	20	HD	R	N		Validate External Site	Sending Application
4	**20**	**HD**	**R**	**N**		**MDPH Vaccine PIN**	**Sending Facility**
5	**30**	**HD**	**R**	**N**		**Establish Routing**	**Receiving Application**
6	**30**	**HD**	**R**	**N**		**Establish Routing**	**Receiving Facility**
7	**26**	**TS**	**R**	**N**		**Unique Time Stamp**	**Creation Date/Time**
9	**15**	**MSG**	**R**	**N**		**Identify message type**	**HL7 Message Type**
10	**199**	**ST**	**R**	**N**		**Unique message ID**	**Message Control ID**
11	**3**	**PT**	**R**	**N**			**Processing ID**
12	**20**	**VID**	**R**	**N**		**Standard HL7**	**Version ID**
15	2	ID	RE	N	0155		Accept Acknowledgment Type

MSH-1 Determines the field separator in effect for the rest of this message. This is a required field.

Required Default Value (MSH-1)	**|**

MSH-2 Determines the component separator, repetition separator, escape character, and sub-component separator in effect for the rest of this message. This is a required field.

Required Default Value (MSH-2)	**^~\&**

MSH-3 Identifies the application that sent the electronic record or batch of electronic records. This is a required field.

MSH-4 Identifies the Vaccine Provider Identification Number (PIN) of the sending facility. This value is assigned by the MIIS staff for reach clinical site during implementation. This is a required field.

Note: EHR vendors may now add MA in prefix to the pin in MSH-4. The value submitted in MSH-4 will be returned in MSH-6. The state prefix of MA will allow EHR's who submit HL7 messages to distinguish by state. Other states two digit codes will be rejected.

Example: MA11111

MSH-5 This field uniquely identifies the receiving application. This is a required field. **Required**

Default Value (MSH-5)	**MIIS**

MSH-6 This field identifies the organization responsible for the operations of the receiving application. This is a required field.

Required Default Value (MSH-6)	**99990**

MSH-7 Date and time the message was created. The degree of precision must be at least to the minute, and the time zone must be included (format YYYYMMDDHHMM[SS[.S[S[S[S]]]]]+/-ZZZZ). This is a required field.

MSH-9 Two components of this field give the HL7 message type and the HL7 triggering event. Within HL7, the triggering event is considered to be the real-world circumstance causing the message to be sent. MSH-9.1 is used to denote Message Type (i.e. VXU), MSH-9.2 denotes triggering event (i.e. V04), and MSH-9.3 denotes Message Structure (i.e. VXU_V04). This is a required field.

Required Default Value (MSH-9)	**VXU^V04^VXU_V04 (for VXU)** **ACK^O01^ACK_O01 (for ACK)** **QBP^Q11^QBP_Q11 (for QBP)** **RSP^K11^RSP_K11 (for RSP)**

MSH-10 The message control ID is a string (which may be a number) uniquely identifying the message among all those ever sent by the sending system. It is assigned by the sending system and echoed back in the ACK message sent in response to identify the specific record which contains errors. It is important to have this be an ID that the provider can use to identify the patient record. This is a required field.
MSH-11 The processing ID is reserved by the MIIS for future use, but is required by HL7 standard. This is a required field.

Required Default Value (MSH-11)	"**P**" for production processing and "**T**" for testing.

MSH-12 For the parser, the version number that is read in the first MSH segment, of the file, will be the version assumed for the whole file. Current version of the MIIS will only accept "2.5.1". If there is no version number found in the first MSH segment, a hard error will occur and the file will not be processed. This is a required field.

Required Default Value (MSH-12)	**2.5.1**

MSH-15 This field identifies the conditions under which accept acknowledgments are required to be returned in response to this message. MIIS will ignore this, since ACK will always be sent. Refer to HL7 table 0155 for values.

MSH-21 Sites may use this field to assert adherence to, or reference, a message profile. Message profiles contain detailed explanations of grammar, syntax, and usage for a particular message or set of messages. For QBP Profiles, please refer to the logic below for what needs to be populated here.

Required values for QBP and RSP (MSH-21)	**Z34^CDCPHINVS** (for Z34 profile) **Z44^CDCPHINVS** (for Z44 profile) **Z32^CDCPHINVS** (for Z32 profile) **Z42^CDCPHINVS** (for Z42profile) **Z33^CDCPHINVS** (for Z33 profile)

6.6.4 PID – Patient Identifier Segment (REQUIRED AND NOT REPEATABLE)

The PID segment is used by all applications as the primary means of communicating patient identification information. This segment contains patient identifying and demographic information.

SEQ	LEN	DT	R/RE/O	RP	HL7 TBL#	MIIS USAGE	ELEMENT NAME
1	4	SI	RE	N		Standard HL7	Set ID
3	**20**	**CX**	**R**	**N**		**Client's MRN**	**Patient Identifier List**
5	**250**	**XPN**	**R**	**Y**	**0200**	**Client's Name**	**Patient Name**
6	250	XPN	RE	N		Mother's Maiden Name	Mother's Maiden Name
7	**26**	**TS**	**R**	**N**		**Client's DOB**	**Date/Time of Birth**
8	1	IS	RE	N	0001	Client's Gender	Administrative Sex
10	250	CE	RE	Y	0005	Client's Race	Race
11	250	XAD	RE	Y	0190	Client's Address	Patient Address

13	40	XTN	RE	Y		Client's Home Phone	Phone Number - Home
22	250	CE	RE	N	0189	Client's Ethnicity	Ethnic Group
24	1	ID	RE	N	0136	Multiple Birth Indicator	Multiple Birth Indicator
25	2	NM	C(RE/O)	N		Birth Order	Birth Order
29	26	TS	RE	N		Client's Death Date	Patient Death Date
30	1	ID	RE	N	0136	Patient Status	Patient Death Indicator

PID-1 This field contains the number that identifies this transaction. For VXU, the value will always be 1, since there could only be 1 PID segment for each patient.

Required Default Value (PID-1)	**1**

PID-3 This field contains the identifier used by the healthcare facility to uniquely identify a patient. The MIIS will only recognize a Medical Record Number, marked by type "MR". If type is not specified, the number will be assumed to be a Medical Record Number. If more than one number is used, any number identified by an ID type using other than MR will be ignored. This is a required field.

Example Using the CX data type showing Patient ID, Check Digit and ID type value "MR"
PID|1||121-2201001^1^^^MR|

Required Default Value (PID-3)	**MR**

PID-5 This field contains the names of the patient, followed by the name type code. Refer to Patient/Caregiver Name Type: PID-5 (HL7 Table 0200) for valid values. When only one surname and one family name are found in this field, those names will be considered the primary, legal names.
If multiple iterations of name are sent, MIIS will prioritize based on PID-5.7 Name Type

1. If any patient names have a type of "L" – legal, take the first "L" type
2. Else (if no patients names are of "L" type), take the first value regardless of type

We are also not accepting any of these characters in this field: `><?";/_[]{ }0123456789~!@#$% ^

PID-6 This field contains the family name under which the mother was born (i.e., before marriage). **PID-7** This field contains the patient's date and time of birth. This date should be less than current date and time, and cannot be in the future. This is a required field.
PID-8 This field contains the patient's sex. Refer to Administrative Sex: PID-8 (HL7 Table 0001) for values. This is a required field.
PID-10 This field refers to the patient's race. Refer to Race: PID-10 (HL7 Table 0005) for values. Able to send multiple races with a ~ between each race segment.
PID-11 This field contains the mailing address of the patient, followed by the address type. Refer to Patient Address Type: PID-11 (HL7 Table 0190) for values. If multiple addresses for the same person are provided, only the first one will be saved in MIIS.

PID-13 This field contains the patient's personal phone numbers and email address. PID-13.2 will determine the type of phone number. Refer to HL7 Table 0201 - Telecommunication Use Code and HL7 Table 0202Telecommunication Equipment Type for valid values of RXA-2 and RXA-3.
Each telecommunication shall be in its own repetition, comprised of 13.2, 13.3, 13.6 and 13.7.

PID-22 This field contains the patient's ethnic group. Refer to Ethnic Group: PID-22 (HL7 Table 0189) for values. The third triplet of the CE data type for ethnic group (alternate identifier, alternate text, and name of alternate coding system) is reserved for governmentally assigned codes. The MIIS supports repetition of this field.

PID-24 This field indicates whether the patient was part of a multiple birth. Refer to HL7 Table 0136 - Yes/No Indicator for valid values. Y the patient was part of a multiple birth N the patient was a single birth Empty field multiple birth status is undetermined.

PID-25 When a patient was part of a multiple birth, a value (number) indicating the patient's birth order is entered in this field. If PID-24 is populated, then this field should be populated.

PID-29 This field contains the patient's date and time of death. This date cannot be in the future. A valid value in this field will set the Patient Status in MIIS to "Inactive – Deceased" and will lock the record for further editing.

PID-30 This field indicates whether the patient is deceased. Refer to Yes/No Indicator: PID-30 (HL7 Table 0136) for valid values. The "Y" value will set the Patient Status in MIIS to "Inactive – Deceased" for all associated provider sties and will lock the record for further editing.

6.6.5 PD1 – Demographic Segment (OPTIONAL AND NOT REPEATABLE)

The PD1 segment carries additional patient demographic information that is likely to change. This segment is optional, and if any fields are absent or not formatted correctly, MIIS will ignore them but will still process the rest of the HL7 message.

SEQ	LEN	DT	R/RE/O	RP	HL7 TBL#	MIIS USAGE	ELEMENT NAME
3	250	XON	O	N		MRN Facility	Patient Primary Facility
4	250	XCN	O	N		PCP Name	PCP Name and ID
16	2	IS	RE	N	0441	Client's Status	Immunization Registry Status

PD1-3 This field contains the name and identifier that specifies the "primary care" healthcare facility selected by the patient, and should contain a Vaccine Provider Identification Number (PIN) of the facility. If this number matches the one in MSH-4, then this facility will be set as the Primary Care Facility for the patient, and will be associated with MRN number in PID-3. If the number here does not match MSH-4 or is missing, the Facility set in MSH-4 is still associated with the patient, but is not marked as a Primary Care Facility.

PD1-4 This field is an identifier for primary care provider.

PD1-16 This field identifies the current status of the patient in relation to the sending provider organization. This field captures whether the sending provider organization considers this an active patient.

6.6.6 NK1 – Next of Kin Segment (OPTIONAL AND REPEATABLE)*

*Caregiver information is required for new shots, unless your EHR does not capture this data.

The NK1 segment contains information about the patient's caregivers. This field is intended primarily for pediatric reporting. The caregiver is not necessarily the emergency contact or the guarantor for billing. *If you do not store the true caregiver (person(s) responsible for the patient's healthcare in your EMR*, please discuss with the MIIS team. For any single record, the NK1 segment can repeat to carry information about multiple care givers associated with this patient. This segment is optional and repeatable.

SEQ	LEN	DT	R/RE/O	RP	HL7 TBL#	MIIS USAGE	ELEMENT NAME
1	**4**	**SI**	**R**	**Y**		**Standard HL7**	**Set ID**
2	**250**	**XPN**	**R**	**Y**	**0200**	**Caregiver's Name**	**Name**
3	60	CE	RE	Y	0063	Caregiver Type	Relationship
4	250	XAD	RE	Y		Caregiver's Address	Address
5	40	XTN	RE	Y		Caregiver's Phone	Phone Number
22	2	CE	O	N	0215	Reminder/Recall	Publicity Code

NK1-1 This field contains the number that identifies this NK1 segment among additional NK1 segments (if present). For the first occurrence of the segment, the sequence number shall be one, for the second occurrence, the sequence number shall be two, etc.

NK1-2 This field contains the name of the next of kin or associated party, followed by the name type. Multiple names for the same person are allowed, but the legal name must be sent in the first sequence. If there is only a single name, it is assumed to be the legal name of this single care giver and does not need a name type identifier. If there is more than one name, then identifiers are required for both or all names. We are not accepting these characters in this field: `><?";/_[]{ }0123456789~!@#$% ^

NK1-3 This field contains the actual personal relationship that the next of kin/associated party has to the patient.

NK1-4 This field contains the address of the next of kin/associated party. Multiple addresses are allowed for the same person. The mailing address must be sent in the first sequence. If the mailing address is not sent, then the repeat delimiter must be sent in the first sequence.

NK1-5 This field contains the telephone number of the next of kin/associated party. Multiple phone numbers are allowed for the same person. The primary telephone number must be sent in the first sequence. If the primary telephone number is not sent, then the repeat delimiter must be sent in the first sequence. Secondary phone numbers (mobile, business, etc.) should be included in this field, if available.

NK1-22 Controls whether reminder/recall notices are sent. The MIIS will recognize "01" to indicate no reminder/recall notices or "02" reminder/recall notices any method.

6.67 PV1 – Patient Visit Segment (OPTIONAL AND NOT REPEATABLE)

The PV1 segment is used to convey visit specific information. The primary use in immunization messages is to carry information about the client's eligibility status. This segment is optional, and if any fields are absent or not formatted correctly, MIIS will ignore them but will still process the rest of the HL7 message.

It is mandatory to report VFC status. Shot level VFC is now reported in the OBX.

SEQ	LEN	DT	R/RE/O	RP	HL7 TBL#	MIIS USAGE	ELEMENT NAME
1	4	SI	O	Y		Standard HL7	Set ID
2	1	IS	RE	Y		Standard HL7	Patient Class
20	50	FC	RE	Y	0064	Client's VFC Status	Financial Class (VFC Status)

PV1-1 This field contains the number that identifies this PV1 segment among additional PV1 segments (if present). Current implementation of MIIS requires that there is only one PV1 segment.

Required Default Value (PV1-1)	**1**

PV1-2 This field is required by HL7 but ignored by the MIIS. Mark this as an R for recurring patient.

Required Default Value (PV1-2)	**R**

PV1-20 VFC information must be submitted at the vaccine level. Please ensure to submit VFC data using the OBX segment, not PV1-20.

6.6.8 IN1 – Insurance Segment (OPTIONAL AND REPEATABLE)

Insurance information is requested for newly administered shots, unless your EHR does not capture this data.

The IN1 segment contains information about the patient's health insurance. This segment is optional, and if any fields are absent or not formatted correctly, MIIS will ignore them but will still process the rest of the HL7 message.

SEQ	LEN	DT	R/RE/O	RP	HL7 TBL#	MIIS USAGE	ELEMENT NAME
3	2	XON	RE	N	UD01	Insurance	Insurance Company ID Number
4	250	ST	O	N			Insurance Company Name

IN1-3 This field contains the ID number of the health insurance company. Name must match one of the values in the insurance company table processed by the MIIS, or will be ignored. No partial matches will be processed. Refer to Insurance Company Name: IN1-3 (User-defined table UD01) for values.
IN-4 This field contains the name of the insurance company.

6.6.9 ORC – Order Request Segment (REQUIRED AND REPEATABLE)

The Common Order segment (ORC) is used to transmit fields that are common to all orders (all types of services that are requested). A message may have 0 or more order groups. An ORC segment is required for each order group that is included in the message. Each RXA segment must be associated with one ORC, based on HL7 2.5.1 standard. If the RXA segment is coded with "No vaccine administered", then the ORC-3 shall be **9999**. **Example:**
ORC|RE|9999|||||||||

SEQ	LEN	DT	R/RE/O	RP	HL7 TBL#	MIIS USAGE	ELEMENT NAME
1	**2**	**ID**	**R**	**Y**		**Standard HL7**	**Order Control**
3	**75**	**EI**	**R**	**Y**		**Used for message processing**	**Filler Order Number**

ORC-1 Determines the function of the order segment. The value for VXU shall be RE.

Required Default Value (ORC-1)	**RE**

ORC-3 The filler order number is used to uniquely identify this immunization event among all immunization event histories sent by a single provider organization that "filled the order". Use of this unique identifying key will allow the initiating sending system to accurately identify the previously sent immunization record, facilitating update or deletion of that record. In the case where a historic immunization is being recorded from an immunization card), the sending system SHALL assign an identifier as if it were an immunization administered by a provider associated with the provider organization owning the sending system. In the case where an RXA is conveying information about an immunization which was **not given** (e.g. refusal) the filler order number shall be **9999**. Updates and Deletes must use this ORC-3 value from the original shot in order for them to take effect.

6.6.10 RXA - Pharmacy/Treatment Administration Segment (REQUIRED AND REPEATABLE)

The RXA	LEN	DT	R/RE/O	RP	HL7 TBL#	MIIS USAGE	ELEMENT NAME
1	**4**	**NM**	**R**	**N**		**Standard HL7**	**Give Sub-ID Counter**
2	**4**	**NM**	**R**	**N**		**Standard HL7**	**Administration Sub-ID Counter**
3	**26**	**TS**	**R**	**N**		**Vaccination Date**	**Date/Time Start of Administration**
5	**100**	**CE**	**R**	**N**	**UD02**	**CVX Code**	**Administered Code (CVX) is required. NDC may also be present. See details below.**
6	**20**	**NM**	**R**	**N**		**Vaccine Dose**	**Administered Amount**

7	60	CE	RE	N		Units	Administered Units
9	200	CE	RE	Y	0001	Record Source	Administration Notes
10	200	XCN	RE	N		Administered By	Administering Provider
11	200	LA2	C(RE/O)	N		Site shot given	Administered at Location
15	20	ST	RE	Y		Lot Number	Substance Lot Number
16	26	TS	C(RE/O)	N		Expiration Date	Substance Expiration Date
17	200	CE	RE	Y	0227	Vaccine Manufacturer	Substance Manufacturer Code
18	60	CE	O	Y	NIP002	Refusal Status	Refusal Status
20	2	ID	RE	N	0322	Complete Dose	Completion Status
21	2	ID	RE	N	0323	Action Code	Action Code

RXA-1 This field is used to match an RXA. Constrain to 0 (zero).

Required Default Value (RXA-1)	**0**

RXA-2 This field is used to track multiple RXA under an ORC. Since each ORC has only one RXA in immunization messages, constrain to 1. This should not be used for indicating dose number, which belongs in an OBX.

Required Default Value (RXA-2)	**1**

RXA-3 The date this vaccination occurred.

RXA-5 This field identifies the medical substance administered. If the substance administered is a vaccine, CVX codes are required. Refer to the CDC website here for the latest listing of CVX codes for values. The MIIS will only process CVX codes, which is the required code system. If no vaccine has been administered, CVX code of 998 should be used.

While CVX codes are required in either 5.1 or 5.4, NDC codes may also be present.

MIIS will look for coding system identified in either RXA-5.3 or 5.6. This position should indicate either CVX or NDC as coding system. If blank, the coding system defaults to CVX. MIIS will require that a NDC or CVX code be present in 5.1, but will allow blanks in 5.4. If neither RXA-5.1 nor RXA-5.4 can be validated as a CVX code, the message will not persist.

RXA-5 administered code is composed of 6 components.
Code 1^text 1^code set 1^alternate code 2^alt text 2^alt code set 2

Example of RXA-5 with CVX only

The current process of accepting CVX codes will continue. Not all EHRs are expected to be capable of NDC codes.

RXA|0|1|20160708000000|20160708000000|**120^DTaP-Hib-IPV^CVX**|0.5|ml^MilliLiter [SI Volume Units]^UCUM||00^New Immunization^NIP001|NPI001^LastName^ClinicianFirstName^^^^Title^^AssigningAuthority|14509|||C5028AA|20170418000000|PMC^Sanofi Pasteur^MVX|||CP|A|20160708105931

Example of RXA-5 with NDC and CVX.

RXA|0|1|20160708000000|20160708000000|**49281-0560-05^Pentacel^NDC^120^DTaP-Hib-IPV^CVX|0.5|ml^MilliLiter [SI Volume Units]^UCUM||00^New Immunization^NIP001|NPI001^LastName^ClinicianFirstName^^^^Title^^AssigningAuthority|14509|||C5028AA|20170418000000|PMC^Sanofi Pasteur^MVX|||CP|A|20160708105931**

RXA-6 This field records the amount of pharmaceutical administered. The units are expressed in the next field, RXA-7. If the dose is unknown, or if systems do not collect the administered amount, the value "**999**" should be recorded in this field.

RXA-7 This field is conditional because it is required if the administered amount code does not imply units. The MIIS will only process ML. This field is not required if the previous field is populated with 999. If the field is empty, the MIIS will assume the units are milliliters.

Required Default Value (RXA-7)	**ML**

RXA-9 This field is used to indicate whether this immunization record is based on a historical record or was given by the reporting provider. The first component shall contain the code, the second the free text and the third shall contain the name of the code system. NOTE: If this field is left blank, the immunization will be recorded as administered (i.e. owned by the sending organization) in the MIIS. All immunizations that were administered in your provider office should be recorded as "00" to ensure that the record is correctly associated with your organization in the MIIS.

RXA-10 This field is intended to contain the name, provider ID and title of the person physically administering the pharmaceutical. This field may also contain The National Provider Identifier (NPI), if it is available.

Example: |NPI^LastName^FirstName^^^^title (RN,MD etc.).

Please note: We are not accepting any of these characters in this field: `><?";/_[]{ }0123456789~!@#$% ^

RXA-11 This field contains the site/clinic where the vaccine was administered, this field is conditional depending on whether the shot was administered by your organization. If the first occurrence of RXA-9.1 is valued "00" and RXA-20 is valued "CP" or "PA". RXA-11.4.2 will equal the Vaccine PIN of the administrating site.

RXA-15 This field contains the lot number of the medical substance administered. It may remain empty if the dose is from a historical record.

RXA-16 This field contains the expiration date of the medical substance administered. This field is conditional, depending on whether the shot was administered by your organization. If the first occurrence of RXA-9.1 is valued "00" and RXA-20 is valued "CP" or "PA"

RXA-17 This field contains the manufacturer of the medical substance administered. For vaccines, code system MVX should be used to code this field. Refer to the CDC manufacturers listing here for values. Sites should only submit the first subcomponent, RXA 17- 1, the Manufacturer Code. Do not submit a "Description" in subcomponent 17-2. For component 17-3, a valid Name of coding system is acceptable.

RXA-18 This field contains the reason the patient refused the medical substance/treatment. If this field is populated RXA-20, completion status shall be populated with RE. ORC-3 value should be 9999

RXA-20 This field indicates if the dose was successfully given. If a dose was not completely administered or if the dose were not potent this field may be used to label the immunization. Use the value "PA" for doses which are partially administered. A partially administered dose can refer to a scenario where the patient jumps and the needle breaks, or a dose using any other vaccine administration method, like inhalers results in an unknown quantity of vaccine entering the patient's system. If the value is "PA" for Partially Administered, then the MIIS sets the value of Incomplete Dose=Yes. If Completion Status = "NA" for Not Administered, then only that immunization will not be saved by the system. The rest of the information in the HL7 message will be saved.

RXA-21 This field indicates the action expected by the sending system. It can facilitate Add, Update or Deletion of immunization records. If left empty, the usage code will default to Add/Update. MDPH requires that sites have the ability to send updated data.

Note: Your EHR must demonstrate during testing that updated and deleted shots can be recorded and sent to MDPH.

6.6.11 RXR - Pharmacy/Treatment Route Segment (OPTIONAL AND NOT REPEATABLE)

The Pharmacy/Treatment Route segment contains the alternative combination of route, site, administration device, and administration method that are prescribed as they apply to a particular order. This segment is required for new shots, but optional for historical shots.,

SEQ	LEN	DT	R/RE/O	RP	HL7 TBL#	MIIS USAGE	ELEMENT NAME
1	60	CE	RE	N	0162	Vaccine Route	Route
2	60	CWE	RE	N	0163	Vaccine Site	Administration Site

RXR-1 This field is the route of administration. We support both NCIT codes and HL7 table 0162.
RXR-2 This field contains the site of the vaccine administration.

6.6.12 OBX – Observation Result Segment (REQUIRED AND REPEATABLE)

The observation result segment has many uses. It carries observations about immunization event/visit associated with the RXA segment. The basic format is a question (OBX-3) and an answer (OBX-5). This segment is required when vaccines have been administered for VFC Eligibility and Funding source of the vaccine.

SEQ	LEN	DT	R/RE/O	RP	TBL#	MIIS USAGE	ELEMENT NAME
1	**4**	**SI**	**R**	**N**		**Standard HL7**	**Set ID - OBX**
2	**2**	**ID**	**R**	**N**		**Standard HL7**	**Value Type**
3	80	CE	RE	N	NIP003	Standard HL7	Observation Identifier
4	20	ST	RE	N		Standard HL7	Observation Sub ID
5	60		RE	N		varies	Observation Value
11	**1**	**ID**	**R**	**N**		**Standard HL7**	**Observation Result Status**
14	**26**	**TS or DT**	**R**	**N**		**Standard HL7**	**Date/Time of the Observation**

OBX-1 This field contains the sequence number. The first instance shall be set to 1 and each subsequent instance shall be the next number in sequence.
OBX-2 This field contains the format of the observation value in OBX. If the value is **CE** then the result must be a coded entry.
OBX-3 This field contains a unique identifier for the observation. The format is that of the Coded Element (CE). **Example: |30963-3^Vaccine purchased with^LN|**. Corresponding data type should be defined in

OBX 2 and populated in OBX 5.

In most systems the identifier will point to a master observation table that will provide other attributes of the observation that may be used by the receiving system to process the observations it receives. This may be thought of as a question that the observation answers. In the example above, the question is “how was this immunization paid for”.

MIIS Supported Values of OBX-3 (Table NIP003)

CODE (OBX-3.1)	DESCRIPTION (OBX-3.2)	Corresponding data type (indicate in OBX-2)
29768-9	Date Vaccine Information Statement Published	(TS and DT)
69764-9	Date Vaccine Information Statement Published	(CE)
29769-7	Date Vaccine Information Statement Presented	(TS or DT)
30963-3	Vaccine funding source	(CE)
64994-7	Vaccine funding program eligibility category	(CE)
59784-9	Disease with presumed immunity	(CE)
75505-8	Serological Evidence of Immunity	(CE)

*Introduces one of x number of components in a single dose for which other Observations will follow: Example: DTAP-HepB-IPV

OBX-4 This field is used to group related observations by setting the value to the same number. For example, recording VIS date and VIS receipt date for a vaccination requires 3 OBX segments. One OBX would indicate the vaccine group. It would have a pair of OBX indicating the VIS publication date and the VIS receipt date. These would have the same OBX-4 value to allow them to be linked.

Example:
OBX|2|TS|29768-9^DATE VACCINE INFORMATION STATEMENT PUBLISHED^LN|**1**|20010711|||||F|||20110705162431<CR>
OBX|3|TS|29769-7^DATE VACCINE INFORMATION STATEMENT PRESENTED^LN|**1**|19901207|||||F|||20110705162431<CR>

OBX-5 This field contains the value observed by the observation producer. OBX-2-value type contains the data type for this field according to which observation value is formatted. This field contains the value of OBX-3-observation identifier of the same segment. Depending upon the observation, the data type may be a number (e.g., dose number), a coded answer (e.g., a vaccine), or a date/time (the date/time that the VIS was given to the client/parent). An observation value is always represented as the data type specified in OBX-2-value type of the same segment. Whether numeric or short text, the answer shall be recorded in ASCII text. When an OBX segment contains values of CE data types, the observations are stored as a combination of codes and/or text. For values referencing vaccine funding source, see Observation Value: OBX-5 (Vaccine Funding Source only) below for reference.

MIIS Supported Values of OBX-5

CODE (OBX-5.1)	DESCRIPTION (OBX-5.2)	DEFINITION	HL7 Table
CVX^VaccineDescription^CVX	Component vaccine type*	The single antigen of a multi-antigen (component) vaccine	CVX
CVX^Group Name^CVX	Vaccine type (vaccine group or family)	The single component vaccine for this observation.	CVX
VIS String^Concept Name^ cdcgs1vis	Concept Name	VIS-Fully-encoded text string	Value Set Code – PHVS_VISBarcodes_IIS

CODE (OBX-5.1)	DESCRIPTION (OBX-5.2)	DEFINITION	HL7 Table
YYYYMMDD	Date VIS Presented	The date that the VIS for this single antigen of a multi-antigen vaccine was presented	None
YYYYMMDD	Date Vaccine Information Statement Published	The date that the VIS for this single antigen of a multi-antigen vaccine was published	None
PHC70	Private funds	Immunization was funded by private funds, including insurance.	CDCPHINVS
VXC2	State funds	Immunization was funded with public funds from a state.	CDCPHINVS
38907003	Varicella (disorder)	History of Varicella infection.	SCT
371113008	Varicella (finding)	Serology confirmed varicella	SCT
278968001	Rubella (finding)	Serology confirmed rubella	SCT
278971009	Hepatitis A (finding)	Serology confirmed hepatitis A	SCT
271511000	Hepatitis B (finding)	Serology confirmed hepatitis B	SCT
371111005	Measles (finding)	Serology confirmed measles	SCT
341112003	Mumps (finding)	Serology confirmed mumps	SCT

OBX-11 This field contains the observation result status. The expected value is F or final.

Required Default Value (OBX-11)	F

OBX-14 Records the time of the observation. It is the physiologically relevant date-time or the closest approximation to that date-time of the observation.

6.6.13 BTS - Batch Trailer Segment (OPTINAL AND NOT REPEATABLE)

The BTS segment defines the end of a batch.

SEQ	LEN	DT	R/RE/O	RP	HL7 TBL#	MIIS USAGE	ELEMENT NAME
1	10	ST	O	N		Number of records	Batch Message Count
2	80	ST	O	N			Batch Comment

BTS-1 This field contains the count of the individual messages contained within the batch.
BTS-2 Free text, which can be included for convenience, has no effect on processing.

7 Message Definition: ACK (Profile Z23)

The HL7 message ACK type will be generated by the MIIS application for each transmitted VXU message, whether it was successfully processed, failed, or was rejected along the way. Successful processing of HL7 message will result in technical acknowledgement that signifies that message was processed. Acknowledgment messages signifying failure will be generated only due to incorrect HL7 format or invalid content, not due to any infrastructure issues. ACK messages will supply a code in the MSA-1 subcomponent to signify Application Accept or Application Error.

Acknowledgment messages will be sent by the MA HIway to the external system in a synchronous mode. Since HL7 messages are processed in a real-time mode (synchronous), the ACK will be sent as soon as the message is accepted or rejected by the MA HIway or MIIS; this occurs within the same transaction session.

The lack of an acknowledgment message sent to the originating EHR system signifies an infrastructure issue, and requires the provider to re-send the messages. All other messages that generated a success acknowledgment will be stored in the MIIS. The hosting provider ensures that databases are backed up on the regular basis, and disaster recovery plans are in place to ensure that application is up and accessible 24/7.

7.1 ACK Message Segments

The segments that are documented here are sufficient to support the principal MIIS function of requesting immunization data from the MIIS.

SEGMENT	CARDINALITY	QUERY GRAMMAR	USAGE
MSH	[1..1]	Message Header Segment	R
MSA	[1..1]	Message Acknowledgment Segment	R
ERR	[0..*]	Error Segment	RE

8 Message Definition: QBP (Profile Z34/Z44)

The Query by Parameter (QBP) message type enables Providers to request the information history of a patient, provided there is one exact match in the MIIS. The MIIS accepts two types of requests within the QBP:

- Request for a Complete Immunization History (Profile Z34)
- Request for an Evaluated History with Forecast (Profile Z44)

The value sent in MSH-21 field is used by the MIIS to recognize the type of request to process.

The QBP returns a message response of RSP. If the QBP is malformed and cannot be parsed, an ACK will be returned.

8.1 QBP Message Segments

The segments that are documented here are sufficient to support the principal MIIS function of requesting immunization data from the MIIS.

SEGMENT	CARDINALITY	QUERY GRAMMAR	USAGE
BHS	[1..1]	Batch Header Segment	O
MSH	[1..1]	Message Header Segment	R
QPD	[1..1]	Query Parameter Definition	R
RCP	[1..1]	Response Control Parameter	R
BTS	[1..1]	Batch Trailer Segment	O

8.1.1 BHS - Batch Header Segment (OPTIONAL AND NOT REPEATABLE)

The BHS segment defines the start of a single patient record.

See field definitions for BHS under Profile Z22.

8.1.2 MSH – Message Header Segment (REQUIRED AND NOT REPEATABLE)

The MSH segment defines the intent, source, destination and some specifics of the syntax of a message. The MSH is specific to each, single immunization record and the specific clinical site responsible for the associated record.

The Message Header Segment for QBP will have the same number of fields as the VXU MSH. The data types for each component and sub-component are the same for VXU MSH and the QBP MSH. Please note that MSH-21 is used in QBP and RSP, but not VXU. Wherever default values are expected, the distinction will be made between VXU and QBP requirements (e.g. MSH-9 and MSH-21).

See field definitions for MSH under Profile Z22.

8.1.3 MSA – Message Acknowledgment Segment (REQUIRED AND NOT REPEATABLE)

SEQ	LEN	DT	R/RE/O	RP	HL7 TBL#	MIIS USAGE	ELEMENT NAME
1	**2..2**	**ID**	**R**	**N**		Acknowledgment Code	
2	**1..199**	**ST**	**R**	**N**		Message Control ID	
3		ST	X	N		Text Message	
4		NM	O	N		Expected Sequence Number	
5			O	N		Delayed Acknowledgment Type	
6		CE	X	N		Error Condition	

MSA-1 This field contains an acknowledgment code, see message processing rules. Refer to HL7 Table 0008 - Acknowledgment code for valid values.

MSA-2 This field contains the message control ID of the message sent by the sending system. It allows the sending system to associate this response with the message for which it is intended. This field echoes the message control id sent in MSH-10 by the initiating system.

8.1.4 QAK - Query Acknowledgement Segment (REQUIRED AND NOT REPEATABLE)

SEQ	LEN	DT	R/RE/O	RP	HL7 TBL#	MIIS USAGE	ELEMENT NAME
1		**ST**	**R**			**Standard HL7 Usage**	**Query Tag**
2	32	ID	RE			Unique to each query message instance.	Query Response Status
3		CE	R				Message Query Name
4		NM	O				Hit Count

SEQ	LEN	DT	R/RE/O	RP	HL7 TBL#	MIIS USAGE	ELEMENT NAME
5		NM	O				This payload
6		NM	O				Hits remaining

QAK-1 This field contains the value sent in QPD-2 (query tag) by the initiating system, and will be used to match response messages to the originating query. The responding system is required to echo it back as the first field in the query acknowledgement segment (QAK).

QAK-2 This field allows the responding system to return a precise response status. It is especially useful in the case where no data is found that matches the query parameters, but where there is also no error. It is defined with HL7 Table 0208 - Query Response Status.

QAK-3 This field contains the name of the query. This shall mirror the QPD-1 (Message Query Name) found in the query message that is being responded to.

8.1.5 QPD – Input Parameter Definition Segment (REQUIRED AND NOT REPEATABLE)

SEQ	LEN	DT	R/RE/O	RP	HL7 TBL#	MIIS USAGE	ELEMENT NAME
1		**CE**	**R**			**Standard HL7 Usage**	**Message Query Name**
2	**32**	**ST**	**R**			**Unique to each query message instance.**	**Query Tag**
3	20	CX	RE			Client's MRN or MIIS ID	Patient Identifier List
4	250	XPN	RE		0200	Client's Name	Patient Name
5	250	XPN_M	RE			Mother's Maiden Name	Patient Mother Maiden Name
6	**26**	**TS_NZ**	**R**			**Client's DOB**	**Patient Date of Birth**
7	1	IS	RE		0001	Client's Gender	Patient Sex
8	250	XAD	RE		0190	Client's Address	Patient Address
9	40	XTN	RE			Client's Home Phone Number	Patient home phone
10	1	ID	RE		0136	Standard HL7 Usage	Patient multiple birth indicator
11	2	NM	C(RE/O)			Standard HL7 Usage	Patient birth order

QPD-1: This field will contain the type of QBP request that the response is required for.

If request is of type Z34, then Value = **Z34^Request Immunization History^CDCPHINVS**

Else if request is of type Z44, then Value = **Z44^Request Immunization History^ CDCPHINVS**

QPD-2: This value is unique to each query message instance.

QPD-3: This field contains the identifier used by the healthcare facility to uniquely identify a patient. The MIIS will recognize a Medical Record Number, marked by type "MR" or the MIIS ID marked by type "SR". This is a required field. MRN will be the more common way of sending an identifier in the QBP.

QPD-4: This field contains the names of the patient, followed by the name type code. Refer to Patient/Caregiver Name Type: QPD-4 (HL7 Table 0200) for valid values. When only one surname and one family name are found in this field, those names will be considered the primary, legal names. Although this is a required field, middle name, suffix, and/or alias are optional and only first and last names are required.
If multiple iterations of name are sent, MIIS will prioritize based on PID-5.7 Name Type

3. If any patient names have a type of "L" – legal, take the first "L" type
4. Else (if no patient's names are of "L" type), take the first value regardless of type

QPD-5: This field contains the family name under which the mother was born (i.e., before marriage).

QPD-6: This field contains the patient's date and time of birth. This date should be less than current date and time, and cannot be in the future. This is a required field.

QPD-7: This field contains the patient's sex. Refer to Administrative Sex: (HL7 Table 0001) for values. This is a required field.

QPD-8: This field contains the mailing address of the patient, followed by the address type. Refer to Patient Address Type: (HL7 Table 0190) for values. If multiple addresses for the same person are provided, only the first one will be saved in MIIS

QPD-9: This field contains the patient's personal phone numbers and email address. PID-13.2 will determine the type of phone number. Refer to HL7 Table 0201 - Telecommunication Use Code and HL7 Table 0202 - Telecommunication Equipment Type for valid values of RXA-2 and RXA-3.

Each telecommunication shall be in its own repetition, comprised of 9.2, 9.3, 9.6 and 9.7. In the absence of 9.6 and 9.7, the system shall use 9.1, if populated.

QPD-10: This field indicates whether the patient was part of a multiple birth. Refer to HL7 Table 0136 - Yes/No Indicator for valid values. Y the patient was part of a multiple birth N the patient was a single birth Empty field multiple birth status is undetermined.

QPD-11: When a patient was part of a multiple birth, a value (number) indicating the patient's birth order is entered in this field. If PID-24 is populated, then this field should be populated.

8.1.6 RCP – Response Control Parameter Segment (REQUIRED AND NOT REPEATABLE)

SEQ	LEN	DT	R/RE/O	RP	MIIS USAGE	ELEMENT NAME
1		ID	RE	N	Standard HL7 Usage	Query Priority

SEQ	LEN	DT	R/RE/O	RP	MIIS USAGE	ELEMENT NAME
2		CQ	RE	N	Standard HL7 Usage	Quantity Limited Requested

RCP-1: This field contains the time frame in which the response is expected. Refer to HL7 Table 0091 - Query priority for valid values. Table values and subsequent fields specify time frames for response. Only "I" (for immediate shall) be used for this field.

RCP-2: This field may contain a maximum number of records that may be returned. The first component contains the count and the second contains "RD" for records.

8.1.7 BTS - Batch Trailer Segment (OPTIONAL AND NOT REPEATABLE)

The BTS segment defines the end of a batch. See

field definitions for BTS under Profile Z22.

9 Message Definition: RSP (Profile Z32/Z42)

The response to a Query by Parameter (RSP) is a message type that the MIIS generates in response to a request sent by a Provider. The MIIS responds with 3 types of responses, depending on the type of request in the QBP request and whether or not an exact match was found for the request.

If one exact match is found:

- Respond with Complete Immunization History (Profile Z32)
- Respond with Evaluated History with Forecast (Profile Z42)

If no exact match is found or if there are processing issues with the incoming QBP request

- Respond with no match found (Profile Z33 below)

NOTE: The MIIS has several locally defined ERR codes found in HL7 Table 0533 of this document. You will also find sample RSP messages in Appendix II of this document.

9.1 RSP Message Segments

SEGMENT	CARDINALITY	QUERY GRAMMAR	USAGE
MSH	[1..1]	Message Header Segment	R
MSA	[1..1]	Message Acknowledgement Segment	R
QAK	[1..1]		R
QPD	[1..1]	Query Parameter Definition Segment	R
PID	[1..1]	Patient Identifier Segment	R
[{	[0..*]	Begin Order	RE
ORC	[1..1]	Required if client has immunization records (RXA). There is one ORC for each RXA	R
RXA	[1..1]		R
[RXR]	[0..1]		RE
[{	[0..*]	Begin Observation	RE
OBX	[1..1]		R
}]		End observation	
}]		End Order	

9.1.1 MSH – Message Header Segment (REQUIRED AND NOT REPEATABLE)

The MSH segment defines the intent, source, destination, and some specifics of the syntax of a message. The MSH is specific to each, single immunization record and the specific clinical site responsible for the associated record.

The Message Header Segment for RSP will have the same number of fields as the VXU MSH. The data types for each component and sub-component are the same for VXU MSH and the RSP MSH. Please note that MSH-21 is used in QBP and RSP, but not VXU. Wherever default values are expected, the distinction will be made between VXU and QBP requirements (e.g. MSH-9 and MSH-21).

See field definitions for MSH under Profile Z22.

9.1.2 MSA – Message Acknowledgement Segment (REQUIRED AND NOT REPEATABLE)

MSA-1: This field contains an acknowledgment code, see message processing rules. Refer to HL7 Table 0008 - Acknowledgment code for valid values.

MSA-2: This field contains the message control ID of the message sent by the sending system. It allows the sending system to associate this response with the message for which it is intended. This field echoes the message control id sent in MSH-10 by the initiating system.

9.1.3 QAK – Query Acknowledgement Segment (REQUIRED AND NOT REPEATABLE)

QAK-1: This field contains the value sent in QPD-2 (query tag) by the initiating system and will be used to match response messages to the originating query. The responding system is required to echo it back as the first field in the query acknowledgement segment (QAK).

QAK-2: his field allows the responding system to return a precise response status. It is especially useful in the case where no data is found that matches the query parameters, but where there is also no error. It is defined with HL7 Table 0208 - Query Response Status.

QAK-3: This field contains the name of the query. This shall mirror the QPD-1 (Message Query Name) found in the query message that is being responded to.

9.1.4 QPD – Input Parameter Definition Segment

SEQ	LEN	DT	R/RE/O	RP	HL7 TBL#	MIIS USAGE	ELEMENT NAME
1		**CE**	**R**			**Standard HL7 Usage**	**Message Query Name**
2	**32**	**ST**	**R**			**Unique to each query message instance.**	**Query Tag**
3	20	CX	RE			Client's MRN or MIIS ID	Patient Identifier List
4	250	XPN	RE		0200	Client's Name	Patient Name
5	250	XPN_M	RE			Mother's Maiden Name	Patient Mother Maiden Name
6	**26**	**TS_NZ**	**R**			**Client's DOB**	**Patient Date of Birth**
7	1	IS	RE		0001	Client's Gender	Patient Sex
8	250	XAD	RE		0190	Client's Address	Patient Address
9	40	XTN	RE			Client's Home Phone Number	Patient home phone
10	1	ID	RE		0136	Standard HL7 Usage	Patient multiple birth indicator
11	2	NM	C(RE/O)			Standard HL7 Usage	Patient birth order

QPD-1: This field will contain the type of QBP request that the response is required for.

If request is of type Z34, then Value = **Z34^Request Immunization History^ CDCPHINVS**

Else if request is of type Z44, then Value = **Z44^Request Immunization History^ CDCPHINVS**

QPD-2: This value is unique to each query message instance.

QPD-3: This field contains the identifier used by the healthcare facility to uniquely identify a patient. The MIIS will recognize a Medical Record Number, marked by type "MR" or the MIIS ID marked by type "SR". This is a required field. MRN will be the more common way of sending an identifier in the QBP. Providers can also send both of these values for the best matching practice. If the MIIS ID and date of birth match, then a response will be sent back. If they don't match, then it will use the MRN to find a match.

QPD-4: This field contains the names of the patient, followed by the name type code. Refer to Patient/Caregiver Name Type: QPD-4 (HL7 Table 0200) for valid values. When only one surname and one family name are found in this field, those names will be considered the primary, legal names. Although this is a required field, middle name, suffix, and/or alias are optional and only first and last names are required.
If multiple iterations of name are sent, MIIS will prioritize based on PID-5.7 Name Type

5. If any patient names have a type of "L" – legal, take the first "L" type
6. Else (if no patient's names are of "L" type), take the first value regardless of type

QPD-5: This field contains the family name under which the mother was born (i.e., before marriage).

QPD-6: This field contains the patient's date and time of birth. This date should be less than current date and time, and cannot be in the future. This is a required field.

QPD-7: This field contains the patient's sex. Refer to Administrative Sex: (HL7 Table 0001) for values. This is a required field.

QPD-8: This field contains the mailing address of the patient, followed by the address type. Refer to Patient Address Type: (HL7 Table 0190) for values. If multiple addresses for the same person are provided, only the first one will be saved in MIIS

QPD-9: This field contains the patient's personal phone numbers and email address. PID-13.2 will determine the type of phone number. Refer to HL7 Table 0201 - Telecommunication Use Code and HL7 Table 0202 - Telecommunication Equipment Type for valid values of RXA-2 and RXA-3.

Each telecommunication shall be in its own repetition, comprised of 9.2, 9.3, 9.6 and 9.7. In the absence of 9.6 and 9.7, the system shall use 9.1, if populated.

QPD-10: This field indicates whether the patient was part of a multiple birth. Refer to HL7 Table 0136 - Yes/No Indicator for valid values. Y the patient was part of a multiple birth N the patient was a single birth Empty field multiple birth status is undetermined.

QPD-11: When a patient was part of a multiple birth, a value (number) indicating the patient's birth order is entered in this field. If PID-24 is populated, then this field should be populated.

9.1.5 PID – Patient Identifier Segment (REQUIRED AND NOT REPEATABLE)

The PID segment is used by all applications as the primary means of communicating patient identification information. This segment contains permanent patient identifying and demographic information that, for the most part, is not likely to change frequently.

See field definitions for PID under Profile Z22 above.

9.1.6 ORC – Order Request Segment

The Common Order segment (ORC) is used to transmit fields that are common to all orders (all types of services that are requested). While not all immunizations recorded in an immunization message are able to be associated with an order, each RXA must be associated with one ORC, based on HL7 2.5.1 standard. If the RXA segment is coded with "No vaccine administered", then the ORC-3 shall be **9999**. **Example: ORC|RE|9999|||||||||** This segment is required and repeatable, and if any fields are absent or not formatted correctly, then the system shall reject that particular segment along with associated RXA and RXR segments, but still process the rest of the message, including any other repeat ORC segments. If the message does not have at least one valid ORC segment, then the entire message will be rejected.

SEQ	LEN	DT	R/RE/O	RP	HL7 TBL#	MIIS USAGE	ELEMENT NAME
1	**2**	**ID**	**R**	**Y**		**Standard HL7**	**Order Control**
3	**75**	**EI**	**R**	**Y**		**MIIS ID**	**Filler Order Number**

ORC-1: Determines the function of the order segment. The value for VXU shall be RE.

Required Default Value (ORC-1)	**RE**

ORC-3: This field will be populated with the MIIS ID of the patient receiving the immunization.

9.1.7 RXA – Pharmacy/Treatment Administration Segment (REQUIRED AND REPEATABLE)

The RXA carries pharmacy/immunization administration data. It is a child of an ORC segment, which is a repeating segment in the VXU message. Because ORC are allowed to repeat, an unlimited numbers of vaccinations may be included in a message.

See field definitions for RXA under Profile Z22 above.

9.1.8 RXR – Pharmacy/Treatment Route Segment (REQUIRED AND REPEATABLE)

The Pharmacy/Treatment Route segment contains the alternative combination of route, site, administration device, and administration method that are prescribed as they apply to a particular order.
See field definitions for RXR under Profile Z22 above.

9.1.9 OBX – Observation Result Segment (REQUIRED AND REPEATABLE)

The observation result segment has many uses. It carries observations about immunization event/visit associated with the RXA segment. The basic format is a question (OBX-3) and an answer (OBX-5). This segment is required and repeatable for new shots, but optional for historical shots. If any fields are absent or not formatted correctly, MIIS will ignore them but will still process the rest of the HL7 message, including any other repeats OBX segments.

SEQ	LEN	DT	R/RE/O	RP	HL7 TBL#	MIIS USAGE	ELEMENT NAME
1	**4**	**SI**	**R**	**N**		**Standard HL7**	**Set ID - OBX**
2	**2**	**ID**	**R**	**N**		**Standard HL7**	**Value Type**
3	80	CE	RE	N		Standard HL7	Observation Identifier
4	20	ST	RE	N		Standard HL7	Observation Sub ID
5	60		RE	N		varies	Observation Value
11	**1**	**ID**	**R**	**N**		**Standard HL7**	**Observation Result Status**
14	**26**	**TS**	**R**	**N**		**Standard HL7**	**Date/Time of the Observation**

OBX-1 This field contains the sequence number. The first instance shall be set to 1 and each subsequent instance shall be the next number in sequence.
OBX-2 This field contains the format of the observation value in OBX. If the value is **CE** then the result must be a coded entry.
OBX-3 This field contains a unique identifier for the observation. The format is that of the Coded Element (CE). **Example: |30963-3^Vaccine purchased with^LN|**. Corresponding data type should be defined in OBX 2 and populated in OBX 5.
In most systems the identifier will point to a master observation table that will provide other attributes of the observation that may be used by the receiving system to process the observations it receives. This may be thought of as a question that the observation answers. In the example above, the question is “how was this immunization paid for”. Refer to Observation Identifiers: OBX-3 (Subset of HL7 Table NIP003) for values.

MIIS Supported Values of OBX-3

It is mandatory to report VFC status and optional to report VIS dates.
Funding source is also required if your organization receives state supplied vaccines.

CODE (OBX-3.1)	DESCRIPTION (OBX-3.2)	Corresponding data type (indicate in OBX-2)
29768-9	Date Vaccine Information Statement Published	(TS or DT)
69764-9	Date Vaccine Information Statement Published	(CE)
29769-7	Date Vaccine Information Statement Presented	(TS or DT)
30963-3	Vaccine funding source	(CE)
30956-7	Vaccine type (vaccine group or family)	(CE)
38890-0	Component vaccine type*	(CE)
64994-7	Vaccine funding program eligibility category	(CE)

*Introduces one of x number of components in a single dose for which other Observations will follow: Example: DTAP-HepB-IPV

OBX-4 This field is used to group related observations by setting the value to the same number. For example, recording VIS date and VIS receipt date for a vaccination requires 3 OBX segments. One OBX would indicate the vaccine group. It would have a pair of OBX indicating the VIS publication date and the VIS receipt date. These would have the same OBX-4 value to allow them to be linked.

Example:
OBX|1|CE|38890-0^COMPONENT VACCINE TYPE^LN|**1**|45^HEP B, NOS^CVX|||||F|||20110705162431<CR>
OBX|2|TS|29768-9^DATE VACCINE INFORMATION STATEMENT PUBLISHED^LN|**1**|20010711|||||F|||20110705162431<CR>
OBX|3|TS|29769-7^DATE VACCINE INFORMATION STATEMENT PRESENTED^LN|**1**|19901207|||||F|||20110705162431<CR>

OBX-5 This field contains the value observed by the observation producer. OBX-2-value type contains the data type for this field according to which observation value is formatted. This field contains the value of OBX-3-observation identifier of the same segment. Depending upon the observation, the data type may be a number (e.g., dose number), a coded answer (e.g., a vaccine), or a date/time (the date/time that the VIS was given to the client/parent). An observation value is always represented as the data type specified in OBX-2-value type of the same segment. Whether numeric or short text, the answer shall be recorded in ASCII text. When an OBX segment contains values of CE data types, the observations are stored as a combination of codes and/or text.

OBX-11 This field contains the observation result status. The expected value is F or final.

Required Default Value (OBX-11)	**F**

OBX-14 Records the time of the observation. It is the physiologically relevant date-time or the closest approximation to that date-time of the observation. The value will only be retuned if codes 59784-9 and 75505-8 are sent in OBX-3.1.

9.1.10.1 OBX Code set included in Response (RSP)

** Forecasting information is only returned in the Z42 profile.
All other OBX codes may be included in either Z32 or Z42 profiles.

CODE (OBX-3.1)	DESCRIPTION (OBX-3.2)	DATA TYPE (OBX-2)	Value in OBX-5
30956-7	Vaccine type (vaccine group or family)	(CE)	CVX^Group Name^CVX
38890-0	Component vaccine type*	(CE)	CVX^VaccineDescription^CVX
30981-5**	Earliest date dose should be given	(TS_NZ)	YYYYMMDD
30980-7**	Date next dose recommended	(TS_NZ)	YYYYMMDD
59777-3**	Latest date next dose should be given	(TS_NZ)	YYYYMMDD
59778-1**	Date dose is overdue	(TS_NZ)	YYYYMMDD
59779-9**	Immunization Schedule used	(CE)	VXC16^ACIP Schedule^CDCPHINVS
30979-9**	Vaccines due next	(CE)	CVX Code
59781-5**	Dose validity	(ID)	Y, N or empty
59780-7**	Immunization Series name	(CE)	<Locally Defined Codes>
59784-9	Disease with presumed immunity	(CE)	38907003^ History of Varicella infection.
75505-8	Serological Evidence of Immunity	(CE)	371113008^ Serology confirmed varicella
75505-8	Immunity to rubella (serologic)	(CE)	278968001^ Serology confirmed rubella
75505-8	Immunity to hepatitis A (serologic)	(CE)	278971009^ Serology confirmed hepatitis A
75505-8	Immunity to hepatitis B (serologic)	(CE)	271511000^ Serology confirmed hepatitis B
75505-8	Immunity to measles (serologic)	(CE)	371111005^ Serology confirmed measles
75505-8	Immunity to mumps (serologic)	(CE)	341112003^ Serology confirmed mumps

10 Message Definition: RSP (Profile Z33)

The response to a Query by Parameter (RSP) is a message type that the MIIS generates in response to a request sent by a Provider. If no exact match is found or if there are processing issues with the incoming QBP request

- Respond with no match found

10.1 RSP Message Segments (Profile Z33)

SEGMENT	CARDINALITY	QUERY GRAMMAR	USAGE
MSH	**[1..1]**	**Message Header Segment**	**R**
MSA	**[1..1]**	**Message Acknowledgement Segment**	**R**
[ERR]	[0..1]	If errors exist, this segment is populated.	RE
QAK	**[1..1]**		**R**
QPD	**[1..1]**	**Query Parameter Definition Segment**	**R**

See field definitions under Profile Z32/42

11 RSP Return List of Candidates (Profile Z31)

The response to a Query by Parameter (RSP) is a message type that the MIIS generates in response to a request sent by a Provider. Z31 will allow anyone requesting QBP/RSP from the MIIS to receive up to 5 candidate profiles that match the QBP demographic criteria. If interested in this change, please update the RCP2 segment value as anything more than 1. The following PID information with only be sent back for each of the patients:

- Last Name
- First Name
- Date of Birth
- MIIS ID
- Mother's Last Name
- Street address one
- City
- MRN - only returns if it matches the MRN that was sent, otherwise MRN will not be sent returned

Please refer to section 9 for anyone field specifications.

11.1 RSP Message Segments (Profile Z33)

SEGMENT	CARDINALITY	QUERY GRAMMAR	USAGE
MSH	**[1..1]**	**Message Header Segment**	**R**
MSA	**[1..1]**	**Message Acknowledgement Segment**	**R**
QAK	**[1..1]**		**R**
QPD	**[1..1]**	**Query Parameter Definition Segment**	**R**
{	**[1..5]**	**Begin patient identifier list**	**R**
PID	**[1..1]**	**Patient identifiers**	**R**
}		**Response end**	

12 Appendix I: HL7 and User-Defined Tables

The following section presents vocabulary and code tables used in VXU_V04 2.5.1 messages processed by the MIIS. Only the values listed here are processed by the MIIS. Tables that contain only a selection of values described in the HL7 2.5.1 Implementation Guide are marked as a "subset" in the title, with the reference to the full table). User-defined tables present values defined by the MIIS.

12.1 HL7 Table 0001 - Administrative Sex: PID-8

In PID-8 only value shown in the table should be used.

VALUE (PID-8)	DESCRIPTION
F	Female
M	Male
U	Unknown/Undifferentiated

12.2 HL7 Table 0005 - Race: PID-10

PID-10 is a CE data type; a triplet of values should be used, if available. In PID-10 both value (PID-10.1) and description (PID-10.2) should be used. This field can be sent as a repetition if the patient has more than one race. Please don't send Other Race as multiple races, send all races as a repetition. If race isn't captured, or patient refuses to share the information, please send an empty field.

VALUE (PID-10.1)	DESCRIPTION (PID-10.2)
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
2131-1	Other Race
<empty field>	Unknown/undetermined

12.3 HL7 Table 0063 Subset - Next of Kin Relationship: NK1-3

NK1-3 is a CE data type; a triplet of values should be used, if available. In NK1-3 both value (NK1-3.1) and description (NK1-3.2) should be used. Refer to Coding System (HL7 Table 0396) for options for the 3rd sequence (NK1-3.3). Suggested value is "HL70063".

VALUE (NK1-3.1)	DESCRIPTION (NK1-3.2)
BRO	Brother
CGV	Care giver
CHD	Child
FCH	Foster child
FTH	Father
GRD	Guardian
GRP	Grandparent
MTH	Mother
OTH	Other
PAR	Parent
SCH	Stepchild
SEL	Self

SIB	Sibling
SIS	Sister
SPO	Spouse

12.4 HL7 Table 0064 - Financial Class: PV1-20 and OBX-5

VFC information must be submitted at the vaccine level. Please ensure to submit VFC data using OBX segment: Only value shown in the table below should be used.

VALUE (PV1-20)	LABEL	DEFINITION
V01	Not VFC eligible	Client does not qualify for VFC because they do not have one of the statuses below. This category does not include the underinsured (see V08).
V02	VFC eligible - Medicaid/Medicare Managed Care	Client is currently on Medicaid or Medicare managed care.
V03	VFC eligible - Uninsured	Client does not have insurance coverage for vaccinations.
V04	VFC eligible - American Indian/Alaskan Native	Client is a member of a federally recognized tribe.
V05	VFC eligible - Federally Qualified Health Center Patient (under-insured)	Client has insurance that partially covers vaccines received on visit and so is eligible for VFC coverage at a Federally Qualified Health Center. The client must be receiving the immunizations at the FQHC.
V22	Chip	Client is eligible to receive vaccines under the state/program immunization policy and the vaccine administered is eligible for 317 funding
V23	317	Client is enrolled in Medicare
V24	Medicare	Client is eligible for a state vaccine program
V25	State Program eligibility	Financial Class (HL7)

12.5 HL7 Table 0136 - Yes/No Death Indicator: PID-30

In PID-30 only value shown in the table should be used.

VALUE (PID-30)	DESCRIPTION
Y	Yes
N	No

12.6 HL7 Table 0155 - Accept Acknowledgment Type: MSH-15

In MSH-15 only the value shown in the table should be used.

VALUE (MSH-15)	DESCRIPTION
AL	Always

12.7 HL7 Table 0162 - Route: RXR-1

RXR-1 is a CE data type; a triplet of values should be used, if available. In RXR-1 both code (RXR-1.1) and value (RXR-1.2) should be used. The MIIS accepts coded values from either the FDA/HCIT "C" codes or the standard HL7

codes listing below.

Using FDA/NCIT Coding
Example: RXR|**C38299^SC^NCIT**|RT||||
Suggested value of RXR-1.3 is "NCIT"

CODE (RXR-1.1) RXR-1.1	VALUE RXR-1.2	DESCRIPTION (Informational only)
C38238	ID	Intradermal
C28161	IM	Intramuscular
C38284	NS	Nasal
C38284	IN	Intranasal
C38276	IV	Intravenous
C38288	PO	Oral
C38676	OTH	Other/Miscellaneous
C38299	SC	Subcutaneous
C38305	TD	Transdermal

Using HL7 coding
Example: RXR|**ID^ Intradermal ^HL7**|RT||||
Suggested value of RXR-1.3 is "HL70162".

VALUE RXR-1.1	DESCRIPTION RXR-1.2
ID	Intradermal
IM	Intramuscular
NS	Nasal
IN	Intranasal
IV	Intravenous
PO	Oral
OTH	Other/Miscellaneous
SC	Subcutaneous
TD	Transdermal

12.8 HL7 Table 0163 - Administration Site: RXR-2

RXR-2 is a CE data type; a triplet of values should be used, if available. In RXR-2 both value (RXR-2.1) and description (RXR-2.2) shown in the table should be used. Refer to Coding System (HL7 Table 0396) for options for the 3rd sequence (RXR-1.3). Suggested value is "HL70163".

VALUE (RXR-2.1)	DESCRIPTION (RXR-2.2)
LT	Left Thigh
LA	Left Upper Arm
LD	Left Deltoid
LG	Left Gluteus Medius
LVL	Left Vastus Lateralis
LLFA	Left Lower Forearm
RA	Right Upper Arm
RT	Right Thigh

RVL	Right Vastus Lateralis
RG	Right Gluteus Medius
RD	Right Deltoid
RLFA	Right Lower Forearm

12.9 HL7 Table 0190 - Patient Address Type: PID-11

In PID-11 only value (PID-11.7) shown in the table should be used.

VALUE (PID-11.7)	DESCRIPTION
C	Current or temporary
P	Permanent
M	Mailing
B	Firm/Business
O	Office
H	Home
L	Legal address
BDL	Birth delivery location [*use for birth facility*]

12.10 HL7 Table 0200 - Patient/Caregiver Name Type: PID-5 or NK1-2

In PID-5 or in NK1-2 only value shown in the table should be used in PID-5.7 or NK1-2.7.

VALUE (PID-5.7 or NK1-2.7)	DESCRIPTION	DEFINITION
A	Alias name	This is a nickname or another assumed name.
L	Legal name	This is a person's official name. It is the primary name recorded in the
M	Maiden name	This is a woman's name before marriage.
P	Name of partner/spouse	This is the spouse name

12.11 HL7 Table 0189 - Ethnic Group: PID-22

PID-22 is a CE data type; a triplet of values should be used, if available. In PID-22 both value (PID-22.1) and description (PID-22.2) shown in the table should be used. Refer to Coding System (HL7 Table 0396) for options for the 3rd sequence (PID-22.3). Suggested value is "HL7". If ethnicity is unknown, or patient refuses to share the information, please send the value as blank.

VALUE (PID-22.1)	DESCRIPTION (PID-22.2)
2135-2	Hispanic or Latino
2186-5	not Hispanic or Latino
Empty value. <empty field>	Unknown

12.12 HL7 Table 0201 - Telecommunication Use Code: PID-13.2

In PID-13 only value (PID-13.2) shown in the table should be used.

VALUE (PID-13.2)	DESCRIPTION
PRN	Primary Residence Number
RN	Other Residence Number
WPN	Work Number
PRS	Personal
NET	Email

12.13HL7 Table 0202 - Telecommunication Equipment Type: PID-13.3

In PID-13 only value (PID-13.2) shown in the table should be used.

VALUE (PID-13.2)	DESCRIPTION

PH	Telephone
CP	Cellular or Mobile Phone
X.400	X.400 email address

12.14 HL7 Table 0215 Subset - Publicity Code: PD1-11 and NK1-22

PD1-11 and NK1-22 are both a CE data type; a triplet of values should be used, if available. Both value (PD1-11.1 or NK1-22.1) and description (PD1-11.2 or NK1-22.2) shown in the table should be used. Refer to Coding System (HL7 Table 0396) for options for the 3rd sequence (PD1-11.3 or NK1-22.3). Suggested value is "HL70215".

VALUE (PD1-11.1 or NK1-22.1)	DESCRIPTION (PD1-11.2 or NK1-22.2)
01	No reminder/recall
02	Reminder/recall - any method
03	Reminder/recall - no calls
04	Reminder only - any method
05	Reminder only - no calls
06	Recall only - any method
07	Recall only - no calls
08	Reminder/recall - to provider
09	Reminder to provider
10	Only reminder to provider, no recall
11	Recall to provider
12	Only recall to provider, no reminder

12.15 HL7 Table 0227 - Substance Manufacturer Name: RXA-17

A complete list of manufacturer codes can be found on the CDC website here.

RXA-17 is a CE data type; a triplet of values should be used, if available. In RXA-17 both value (RXA-17.1) and description (RXA-17.2) shown in the table should be used. Refer to Coding System (HL7 Table 0396) for options for the 3rd sequence (RXA-17.3). Suggested value is "HL70227". For current vaccines, only active codes (ACTIVE = Y) should be used.

NOTE: The MVX table reflects name changes and changes in corporate status. Where there have been company mergers/acquisitions, the affected old codes have been labeled "inactive". The inactive manufacturer codes are retained to allow manufacturer to be identified for historic immunization records. They should not be used for current immunizations. Inactive codes should not be cross-walked to the code for the current manufacturer.

12.16 HL7 Table NIP002 – Refusal Status: RXA - 18

Substance refusal reason may be submitted in RXA-18. Any entry in the field indicates that the patient did not receive an administered vaccine. If the patient refused the vaccine, RXA-20 completion status, shall be populated with RE.

VALUE (RXA-18)	DESCRIPTION
00	Parental decision
01	Religious exemption
02	Other (must add text component of the CE field with description)
03	Patient decision

12.17 HL7 Table 0322 Completion Status: RXA-20

In RXA-20 only the value shown in the table should be used.

RXA-20.1is a CE data type; a triplet of values should be used, if available. In RXA-20 both value (RXA-20.1) and description (RXA-20.2) shown in the table should be used. Refer to Coding System (Table NIP002) for options for the 3rd sequence (RXA-21.1). Suggested value is "HL7".

VALUE (RXA-20)	DESCRIPTION
CP	Complete
PA	Partially Administered

12.18 HL7 Table 0323 - Action Code: RXA-21

In RXA-21 only the value shown in the table should be used.

RXA-21.1is a CE data type; a triplet of values should be used, if available. In RXA-20 both value (RXA-21.1) and description (RXA-21.2) shown in the table should be used. Refer to Coding System (Table NIP002) for options for the 3rd sequence (RXA-21.3). Suggested value is "HL7".

VALUE (RXA-21)	DESCRIPTION
A	Add
U	Update
D	Delete

12.19 HL7 Table 0357 –Message Error Status Codes

Used in ERR-3

***Please note locally defined code.**

Code	Value
0	Message Accepted
100	Segment Sequence Error
101	Required Missing Field
102	Date Type Error

103	Table Value Not Found
200	Unsupported Message Type
201	Unsupported Event Code
202	Unsupported Processing Id
203	Unsupported Version Id
204	Unknown Key Identifier
205	Duplicate Key Identifier
206	Application Record Locked
207	Application Internal Error
900	Receiving System Unresponsive*

12.20 HL7 Table 0441 - Immunization Registry Status: PD1-16

In PD1-16 only value shown in the table should be used.

VALUE (PD1-16)	DESCRIPTION
A	Active
I	Inactive--Unspecified
L	Inactive-Lost to follow-up (cannot contact)
M	Inactive-Moved or gone elsewhere (transferred)
P	Inactive-Deceased
U	Unknown

12.21 HL7 Table 0533 – Application Error Codes

Used in ERR-5.

* Please note several locally defined codes.

* Locally defined by the MIIS

Code	Value
1	Illogical Date Error
2	Invalid Date
3	Illogical Value Error
4	Invalid Value
5	Table Value Not Found
6	Required Observation Missing
7	Required Data Missing *
8	Data Was Ignored *
9	No Match Found *
10	More Than One Match *
11	No Match – Data Sharing No *
12	No Match – Data Sharing Unknown *
13	Unexpected error while constructing the response *

12.22 UD01 User Defined Table - Insurance Company Name: IN1-3

In IN1-3.3 only value shown in the table should be used.

IN1-3.1	Insurer Description	Type of Insurance
Blank	Unknown	Unknown
0	No Health Insurance	Uninsured
1	MassHealth	Mass Health
31	Medicare	Medicare
99	Other Private Insurance	Private Insurance

12.23 UD02 User Defined Table - CVX Code: RXA-5

RXA-5 is a CE data type; a triplet of values should be used, if available. In RXA-5 both code (RXA-5.1) and vaccine name (RXA-5.2) shown in the table should be used. Refer to Coding System (HL7 Table 0396) for options for the 3rd sequence (RXA-5.3). Suggested value is "CVX". For vaccines currently being administered, only active codes (ACTIVE = Y) should be used; others may be used for historic shots.

The MIIS follows the latest CVX listing as posted on the CDC website here

12.24 HL7 Table NIP001 - Immunization Information Source: RXA-9

RXA-9 is a CE data type; a triplet of values should be used, if available. In RXA-9 both value (RXA-9.1) and description (RXA-9.2) shown in the table should be used. Refer to Coding System (HL7 Table 0396) for options for the 3rd sequence (RXA-9.3). Suggested value is "HL7".

VALUE (RXA-9.1)	DESCRIPTION
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
08	Historical information - from public agency

13 Appendix II: Sample Messages

13.1 VXU Sample Message with immunizations

```
MSH|^~\&|EHR|12345^SiteName|MIIS|99990|20140701041038||VXU^V04^VXU_V04|MSG.Valid_01|P|2.5.1|||
PID|1||82223^^^AssigningAuthority^MR||TEST^PATIENT||20020303022142|F||2028-9^Asian^HL70005|543
Main St^^Anytown^MA^01111^^P||781-999-9999^PRN^PH^^1^781^9999999~978-999-
9999^WPN^PH^^1^781^9999999~^NET^X.400^email.test@gmail.com|||||||||2135-2^HIspanic or
latino^CDCREC|||||||||
PD1|||Sample Family Practice^^10144|NPI001^LastName^ClinicianFirstName^^^^Title||||||||||||A|
NK1|1|mother^patient|MTH^Mother^HL70063|5 elm st^^boston^MA^01234^^P|781-999-
9999^PRN^PH^^1^781^9999999|||||||||||||||||01^No reminder/recall^HL70215
PV1|1|R|||||||||||||||||V01^20120901041038
IN1|1||8|Aetna Inc
ORC|RE||4242546^NameSpaceID||||||||||||||
RXA|0|1|20140701041038|20140701041038|48^HPV, quadrivalent^CVX|0.5|ml^MilliLiter [SI Volume
Units]^UCUM||00^New
Immunization^NIP001|NPI001^LastName^ClinicianFirstName^^^^Title^^AssigningAuthority|14509||||L987||MSD
^Merck^MVX|||CP||20120901041038
RXR|C28161^Intramuscular^NCIT|LA^Leftarm^HL70163
OBX|1|CE|30963-3^ VACCINE FUNDING SOURCE^LN|1|VXC2^STATE FUNDS^HL70396||||||F|||20120901041038
OBX|2|CE|64994-7^Vaccine funding program eligibility category^LN|1|V01^Not
VFC^HL70064||||||F|||20140701041038
OBX|3|TS|29768-9^DATE VACCINE INFORMATION STATEMENT
PUBLISHED^LN|1|20010711||||||F|||20120720101321
OBX|4|TS|29769-7^DATE VACCINE INFORMATION STATEMENT
PRESENTED^LN|1|19901207||||||F|||20140701041038
```

13.1.1 VXU Sample Message demographic only update

MSH|^~\&|EHR|12345^SiteName|MIIS|99990|20140701041038||VXU^V04^VXU_V04|MSG.Valid|P|2.5.1|||
PID|1||82223^^^AssigningAuthority^MR||TEST^PATIENT||20020302|F||2028-9^Asian^HL70005|543 Main St^^Anytown^MA^01111^^P||781-999-9999^PRN^PH^^1^781^9999999~978-999-9999^WPN^PH^^1^781^9999999~^NET^X.400^email.test@gmail.com|||||||||2135-2^HIspanic or latino^CDCREC|||||||
PD1|||Sample Family Practice^^10144|NPI001^LastName^ClinicianFirstName^^^^Title||||||||||||A|
NK1|1|mother^patient|MTH^Mother^HL70063|5 elm st^^boston^MA^01234^^P|781-999-9999^PRN^PH^^1^781^9999999|||||||||||||||||01^No reminder/recall^HL70215
PV1|1|R|||||||||||||||||V01^20120901041038
IN1|1||8|Aetna Inc

13.2 Successful Acknowledgment: AA

MSH|^~\&|MIIS|99990|SiteName|12928|20150331150017||ACK^V04^ACK|ACK-20150331-150017-259|P|2.5.1 MSA|**AA**|9298520150331145000

13.3 Message accepted with errors: AE (Any error that is non structure)

MSH|^~\&|MIIS|99990|SiteName|13164|20150331140015||ACK^V04^ACK|ACK-20150331-140015-649|P|2.5.1 MSA|**AE**|123955720150331123400
ERR||RXA^10^^^^|101^Required field missing|W|7^required data missing|||Administering Provider is missing. ERR||RXA^17^1^^^|101^Required field missing|W|7^required data missing|||Substance Manufacturer Name is missing.
ERR||^^^^^|0^Message accepted

13.4 Error Acknowledgment: AR (Only structure issues)

MSH|^~\&|MIIS|99990|EHR|12345|20150327140433||ACK^V04^ACK|ACK-20150327-140433-851|P|2.5.1
MSA|**AR**|MSG.Valid_01
ERR||^^^^^|207^Application internal error|E|8^Data was ignored|||MSG_402. MIIS HL7 SERVICE ERROR please review the HL7 message that was sent to confirm it is formatted in accordance with the Massachusetts DPH HL7 Transfer Specifications. After this review, please try to resend the message. If this error continues, contact the MDPH MIIS Help Desk.
Note: AR responses are typically due to malformatted HL7 messages and/or missing or invalid required fields.

13.5 QBP Sample Profile Z34 (Request for Complete Immunization History)

MSH|^~\&|EHR|12345^SiteName|MIIS|99990|20140701041038||QBP^Q11^QBP_Q11|48077894|T|2.5.1|||NE|AL||||Z34^CDCPHINVS
QPD| Z34^Request Complete Immunization History^CDCPHINVS|QT216987|MasonMel56979^^^12345^MR|Mason^Melinda^Carol^^^^L|Walters^Rebecca^^^^^M|20081015|F|305 Main Street^Boston^MA^12345^^P|^PRN^^^^617^5551212|Y|1|
RCP|I|1|R

13.6 QBP Sample Profile Z44 (Request for Complete History with Forecast)

MSH|^~\&|EHR|12345^SiteName|MIIS|99990|20140701041038||QBP^Q11^QBP_Q11|48077894|T|2.5.1|||NE|AL||||Z44^CDCPHINVS
QPD| Z44^Request Complete Immunization History^CDCPHINVS|QT216987|MasonMel56979^^^12345^MR|Mason^Melinda^Carol^^^^L|Walters^Rebecca^^^^^M|20081015|F|305 MainStreet^Boston^MA^12345^^P|^PRN^^^^617^5551212|Y|1|
RCP|I|1|R

13.7 RSP Sample Profile Z32 Response (Immunization History)

MSH|^~\&|EHR|12345^SiteName|MIIS|99990|20140701041038||RSP^K11^RSP_K11|20121017143959-0400CIR-WS|T|2.5.1|||NE|NE||||Z32^CDCPHINVS|
MSA|AA|48077894|
QAK|QT216987|OK|
QPD|Z34^Request Immunization History^CDCPHINVS|MasonMel56979^^^^MR|Mason^Melinda^Carol^^^^L|Walters^Rebecca^^^^^M|20011015|F|1234 Main Street^7C^Boston^MA^02115^^P|^PRN^^^^212^5551212|Y|1|
PID|||777851651^^^^MR~777851651^^^^SR||MASON^MELINDA^CAROL^^^^L||20011015|F|
ORC|RE||4242546^NameSpaceID|||||||||||||
RXA|0|1|20100105|20100105|48^Hib (PRP-T)^CVX|0.5|ml|||||||0111-034975|20090731|PMC^Aventis Pasteur Inc.^MVX|
RXR|C28161^Intramuscular^NCIT|LA^Leftarm^HL70163
OBX|1|CE|38890-0^Component Vaccine Type^LN|1|48^Hib (PRP-T)^CVX||||||F|
ORC|RE||4242546^NameSpaceID|||||||||||||| RXA|0|1|20140701041038|20140701041038|62^HPV, quadrivalent^CVX|0.5|ml^MilliLiter [SI Volume Units]^UCUM||01^Historical^NIP001|NPI001^LastName^ClinicianFirstName^^^^Title^^AssigningAuthority|12345||||L987||MSD^Merck^MVX|||CP||20120901041038
RXR|C28161^Intramuscular^NCIT|LA^Leftarm^HL70163 OBX|2|CE|30956-7^SINGLE VACCINE TYPE^LN|1|62^HPV^CVX||||||F|||
ORC|RE||4242546^NameSpaceID|||||||||||||
RXA|0|1|20140701041038|20140701041038|43^HepB,Adult^CVX|0.5|ml^MilliLiter [SI Volume Units]^UCUM||00^Historical^NIP001|NPI001^LastName^ClinicianFirstName^^^^Title^^AssigningAuthority|12345S||||L98753||MSD^Merck^MVX|||CP||20120901041038 RXR|C28161^Intramuscular^NCIT|LA^Leftarm^HL70163
OBX|3|CE|30956-7^SINGLE VACCINE TYPE^LN|1|62^HPV^CVX||||||F|||
ORC|RE||4242546^NameSpaceID|||||||||||||| RXA|0|1|20160412|20160412|998^No vaccine administered^CVX|999|||||||||||||NA
OBX|15|CE|59784-9^Disease with presumed immunity ^LN|1|38907003^ History of Varicella infection ^SCT||||||F|||20160412

13.8 RSP Sample Profile Z42 Response (Evaluated History and Forecast)

MSH|^~\&|EHR|12345^SiteName|MIIS|99990|20140701041038||RSP^K11^RSP_K11|20121017143959- 0400CIR-WS|T|2.5.1|||NE|NE|||||Z42^CDCPHINVS|
MSA|AA|48077894|
QAK|QT216987|OK|
QPD|Z44^Request Immunization History^CDCPHINVS|MasonMel56979^^^^MR|Mason^Melinda^Carol^^^^L|Walters^Rebecca^^^^^M|20011015|F|1234 Main Street^7C^Boston^MA^02115^^P|^PRN^^^^212^5551212|Y|1|

PID|1||777851651^^^^MR~777851651^^^^SR ||TEST^PATIENT||20020303022142|F||2028-9^Asian^HL70005|543 Main St^^Anytown^^01111^^P||781-999-9999^PRN^PH^^1^781^9999999~978-999-9999^WPN^PH^^1^781^9999999~^NET^X.400^email.test@gmail.com|||||||||2135-2^HIspanic or latino^CDCREC|||||||
ORC|RE||4242546^NameSpaceID|||||||||||||||
RXA|0|1|20090105|20090105|48^Hib (PRP-T)^CVX|999|||||||||0111-034975|20090731|PMC^Aventis Pasteur Inc.^MVX|
OBX|1|CE|38890-0^Component Vaccine Type^LN|1|48^Hib (PRP-T)^CVX||||||F|
OBX|2|CE|59781-5^Dose Validity^LN|1|Y|||||||
ORC|RE||4242546^NameSpaceID|||||||||||||||
RXA|0|1|20090210|20090210|48^Hib (PRP-T)^CVX|999|||||||||0111-034975|20090731|PMC^Aventis Pasteur Inc.^MVX|
RXR|C28161^Intramuscular^NCIT|LA^Leftarm^HL70163
OBX|3|CE|38890-0^Component Vaccine Type^LN|1|48^Hib (PRP-T)^CVX||||||F|
OBX|4|CE|59781-5^Dose Validity^LN|1|N|||||||
ORC|RE||4242546^NameSpaceID|||||||||||||||
RXA|0|1|20121017153152|20121017153152|998^No vaccine administered^CVX|999|
OBX|5|CE|30979-9^Vaccine due next^LN|1|88^influenza^CVX||||||F||||
OBX|6|CE|59780-7^Immnization Series Name^LN|1|88^influenza,Unspecified^CVX||||||F||||
OBX|7|TS|30980-7^Date vaccine due^LN|1|20150801||||||F||||
OBX|8|TS|30981-5^Earliest date dose should be given^LN|1|20120801||||||F|||| **OBX**|9|TS|59777-3^Latest date next dose should be given^LN|1|20120801||||||F|||| **OBX**|10|TS|59778-1^Date Dose is Overdue^LN|1|20160801||||||F||||
OBX|11|CE|59779-9^Immunization Schedule used^LN|1|VXC16^ACIP Schedule^CDCPHINVS||||||F||||
ORC|RE||4242546^NameSpaceID|||||||||||||||| **RXA**|0|1|20121017153152|20121017153152|998^No vaccine administered^CVX|999| **OBX**|12|CE|30979-9^Vaccine due next^LN|1|137^HPV, Unspecified^CVX||||||F|||| **OBX**|13|DT|30980-7^Date vaccine due^LN|1|20121015||||||F||||
OBX|14|CE|59779-9^Immunization Schedule used^LN|1|VXC16^ACIP Schedule^CDCPHINVS||||||F||||
ORC|RE||4242546^NameSpaceID|||||||||||||||
RXA|0|1|20160412|20160412|998^No vaccine administered^CVX|999||||||||||||||NA OBX|15|CE|59784-9^Disease with presumed immunity ^LN|1|38907003^ History of Varicella infection ^SCT||||||F|||20160412

13.9 No Match Found in the MIIS

MSH|^~\&|EHR|12345^SiteName|MIIS|99990|20140701041038||RSP^K11^RSP_K11|7731029|P|2.5.
1|||NE|NE|||||Z33^ CDCPHINVS|
MSA|AA|793543
ERR|||0^Message Accepted^HL70357|I|9^No Match Found^HL70533|||No Match found in the MIIS
QAK|37374859|NF|Z34^request Immunization history^CDCPHINVS
QPD| Z44^Request Immunization History^CDCPHINVS
|37374859|123456^^^MYEHR^MR|Child^Bobbie^Q^^^^L|Que^Suzy^^^^^M|20050512|M|10 East Main St^^Boston^MA^^^L

13.10 More than one match Found in the MIIS

MSH|^~\&|EHR|12345^SiteName|MIIS|99990|20140701041038||RSP^K11^RSP_K11|7731029|P|2.5.
1|||NE|NE|||||Z33^ CDCPHINVS|
MSA|AA|793543
ERR|||0^Message Accepted^HL70357|I|10^More Than One Match^HL70533|||More than one match found in MIIS. Please re-query with more information
QAK|37374859|TM|Z34^request Immunization history^CDCPHINVS
QPD| Z44^Request Immunization History^CDCPHINVS
|37374859|123456^^^MYEHR^MR|Child^Bobbie^Q^^^^L|Que^Suzy^^^^^M|20050512|M|10 East Main St^^Boston^MA^^^L

13.11 One Identical/ One Exact Match Found but Data Sharing = No

MSH|^~\&|EHR|12345^SiteName|MIIS|99990|20140701041038||RSP^K11^RSP_K11|7731029|P|2.5.
1|||NE|NE|||||Z33^ CDCPHINVS|
MSA|AA|793543
ERR|||0^Message Accepted^HL70357|I|11^No Match - Data Sharing No^HL70533|||A match was found in the MIIS but no value is returned since Data Sharing for the record is set to No QAK|37374859|NF|Z34^request Immunization history^CDCPHINVS
QPD| Z34^Request Immunization History^CDCPHINVS
|37374859|123456^^^MYEHR^MR|Child^Bobbie^Q^^^^L|Que^Suzy^^^^^M|20050512|M|10 East Main St^^Boston^MA^^^L

13.12 One Identical/ One Exact Match Found but Data Sharing = Unknown

MSH|^~\&|EHR|12345^SiteName|MIIS|99990|20140701041038||RSP^K11^RSP_K11|7731029|P|2.5.
1|||NE|NE||||Z33^ CDCPHINVS|
MSA|AA|793543
ERR|||0^Message Accepted^HL70357|I |12^No Match- Data Sharing Unknown|||A match was found in the MIIS but no value is returned since Data Sharing for the record is set to Unknown| QAK|37374859|NF|Z34^request Immunization history^CDCPHINVS
QPD| Z34^Request Immunization History^CDCPHINVS
|37374859|123456^^^MYEHR^MR|Child^Bobbie^Q^^^^L|Que^Suzy^^^^^M|20050512|M|10 East Main St^^Boston^MA^^^L

13.13 Format Issue with query message format (Required field missing)

MSH|^~\&|MIIS|99990|EHR|12345|20170202091847||ACK^V04^ACK|ACK-20170202-091847-337|P|2.5.1|||NE|NE||||Z23^CDCPHINVS
MSA|AR|201612220045-050015617688
ERR|| PID^5^2^^^|101^Required Missing Field^HL70357|E|7^Required Data Missing^HL70533|||Patient Given Name is required.

13.14 RSP Sample Profile Z31 Response (List of Candidates Profile)

MSH|^~\&|EHR|12345^SiteName|MIIS|99990|20140701041038||RSP^K11^RSP_K11|20121017143959-0400CIR-WS|T|2.5.1|||NE|NE||||Z32^CDCPHINVS|
MSA|AA|48077894|
QAK|QT216987|OK|
QPD|Z34^Request Immunization History^CDCPHINVS|MasonMel56979^^^^MR|Mason^Melinda^Carol^^^^L|Walters^Rebecca^^^^^M|20011015|F|1234 Main Street^7C^Boston^MA^02115^^P|^PRN^^^^212^5551212|Y|1|
PID|1||777851651^^^^MR~777851651^^^^SR||MASON^MELINDA^^^^^L|MOM|20011015||10 East Main Street^^City^^^L|
PID|2||777851650^^^^SR||MASON BOB^MELINDA^^^^^L|MOM|20011014||10 East Main Street^^City^^^L|

14 Appendix III: Transport Instructions for SOAP Webservices 2.0

14.1 HTTP Header Content-Type

1) The content-type would be required to look like this with the action submitSingleMessage in the http header: Content-Type: application/soap+xml; charset=UTF-8; action="urn:cdc:iisb:2011:submitSingleMessage"

14.2 WSDL Setup

1) Download, unzip and open the MIISCDCService.wsdl
2) Username and password are highlighted below. You may use these generic credentials duringtest.
3) The facility id is only for information purpose and logging. An alpha value must be placed in thisfield, such as ABC Pediatrics.
4) The HL7 messages have to account for ASCII characters, such as & would have to be & OR wrap the message in a CDATA Tag as the below example.
5) This is a working SOAP Envelope that should be used

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"xmlns:urn="urn:cdc:iisb:2011">
  <soap:Header/>
  <soap:Body>
    <urn:submitSingleMessage>
          <urn:username>ccghlsevenqa</urn:username>
          <urn:password>Cgmiis801</urn:password>
          <urn:facilityID>Facility Name </urn:facilityID>
                    <urn:hl7Message><![CDATA[INSERT HL7 MESSAGE]]></urn:hl7Message>
      </urn:submitSingleMessage>
   </soap:Body>
 </soap:Envelope>
```

6) We also offer a SOAP connectivity test as well which has the echo back functionality. SOAP Request and response can be found below, what goes in the yellow highlighted area is what willbe echoed back:

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:urn="urn:cdc:iisb:2011">
  <soap:Header/>
  <soap:Body>
    <urn:connectivityTest>
      <urn:echoBack>Hello</urn:echoBack>
    </urn:connectivityTest>
   </soap:Body>
 </soap:Envelope>
```

```
<soapenv:Envelope xmlns:soapenv="http://www.w3.org/2003/05/soap-envelope">
  <soapenv:Body>
    <urn:connectivityTestResponse xmlns:urn="urn:cdc:iisb:2011">
          <urn:return>Hello</urn:return>
        </urn:connectivityTestResponse>
   </soapenv:Body>
 </soapenv:Envelope>
```

14.3 Acknowledgement and Response

```
<soapenv:Envelope xmlns:soapenv="http://www.w3.org/2003/05/soap-envelope">
  <soapenv:Body>
    <urn:submitSingleMessageResponse xmlns:urn="urn:cdc:iisb:2011">
      <urn:return>MSH|^~\&amp;amp;|MIIS|99990|EHR|12345|20200717101551||ACK^V04^ACK|ACK-
20200717-101551-228|T|2.5.1|||NE|NE|||||Z23^CDCPHINVS
MSA|AA|23ss113432s</urn:return>
    </urn:submitSingleMessageResponse>
   </soapenv:Body>
 </soapenv:Envelope>
```

14.4 Sample Acknowledgments

Successful Acknowledgment: AA

```
MSH|^~\&|MIIS|99990|SiteName|12928|20150331150017||ACK^V04^ACK|ACK-20150331-150017- 259|P|2.5.1
MSA|AA|9298520150331145000
ERR||^^^^^|0^Message accepted
```

Message accepted with errors: AE

MSH|^~\&|MIIS|99990|SiteName|13164|20150331140015||ACK^V04^ACK|ACK-20150331-140015- 649|P|2.5.1
MSA|**AE**|12395572015033112340 0
ERR||RXA^10^^^^|101^Required field missing|W|7^required data missing|||Administering Provider ismissing.
ERR||RXA^17^1^^^|101^Required field missing|W|7^required data missing|||Substance Manufacturer Name is missing.
ERR||^^^^^|0^Message accepted

Error Acknowledgment: AR*

MSH|^~\&|MIIS|99990|EHR|12345|20150327140433||ACK^V04^ACK|ACK-20150327-140433- 851|P|2.5.1
MSA|**AR**|MSG.Valid_01
ERR||^^^^^|207^Application internal error|E|8^Data was ignored|||MSG_402. MIIS HL7 SERVICE ERROR Please review the HL7 message that was sent to confirm it is formatted in accordance with the Massachusetts DPH HL7 Transfer Specifications. After this review, please try to resend the message. Ifthis error continues, contact the MDPH MIIS Help Desk.

***AR responses are typically due to malformatted HL7 messages.**