MISSISSIPPI STATE DEPARTMENT OF HEALTH

MISSISSIPPI IMMUNIZATION INFORMATION EXCHANGE HL7 Implementation Guide

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Introduction to Interfacing with Mississippi's Immunization Information System, MIIX

The Implementation Guide is intended to provide the necessary information for the exchange of immunization records between the Mississippi Immunization Information System, MIIX, and external health providers. It includes information on:

- Sending and receiving patient immunization histories.
- Sending and receiving patient demographic information.

This guide serves as an important tool for assuring accurate and timely communication between MIIX and health care providers. It contains acceptable code values to be used in the HL7 messages and defines the appropriate places to document MIIX business rules that are outside the standard HL7 message.

The registry's goal is to build an HL7 bidirectional real-time interface exchanging all possible vaccination data elements., An interface must initially meet basic requirements and plan to work toward a more complete interface in the future. The IIS does focus on Meaningful Use (MU) requirements and strongly encourages all data elements required for MU certification to be included in an interface.

The MIIX HL7 interface supports the CDC standard immunization messages as described in the current CDC HL7 Implementation Guide for Immunization Messages. ***This guide addresses the Mississippi specific requirements and restrictions.*** The interface currently supports HL7 version 2.5.1. All **new and existing** interfaces must conform to HL7 version 2.5.1.

HL7 Messaging Notes

The IIS (MIIX) software:
- Accepts the following patient update messages: **VXU**
- Responds to immunization record query messages: **VXQ, QBP/RSP**

The following list includes messages segments that are *required* for the IIS (MIIX) Interface.

Segment	Notes
MSH	Header message that include critical information about the medical organization. MSH-11 should always contain 'P'.
PID	Patient identifying information
NK1	Patient next of kin information. Must be present for all patients under 19 years of age. Relationship must be GRD = Guardian, MTH = Mother, FTH = Father or PAR = Parent. These four relationships are the only accepted values.
PD1	Field 3 (PD1-3) of this segment contains the name and Id for the clinic location. This populates the patient demographics screen in MIIX.
ORC	Common order segment.

Segment	Notes
RXA	This segment contains information about the vaccination given. It includes the code for the vaccine administered, the vaccine lot number, expiration date, and manufacturer. It identifies the vaccination as new or historical and provides an action code telling the IIS to add, update or delete the information from the IIS. It is not required if a vaccination was **NOT** given.
RXR	This segment contains the route and anatomical site of vaccine administration. It is required with every RXA segment.
OBX	Documents; Public or private vaccine funding source (LOINC 30963-3), VIS presentation date (LOINC 29769-7), VIS publication date (LOINC 29768-9), VFC status (LOINC 64994-7) is required for patients of **ALL** ages, Vaccine Type (LOINC 30956-7 preferred – LOINC 38890-0 accepted).

The IIS expects to receive HL7 messages formatted in accordance with the CDC specifications. All available segment components are expected in the message, even if the components are empty or null. Consider all components as required for inclusion in the message, even if you do not intend to send data in the component. Those components that must contain data are listed in the section titled **Required Fields (Segments and Components)** as "Required".   If a provider sends a 'strongly recommended" data item, that item must be sent correctly and becomes required data, subject to the data quality threshold.

Also keep in mind that EHRs and HL7 interfaces are a rapidly changing environment. There will be updates and changes to the IIS interface requirements as the Centers for Medicaid and Medicare (CMS) criteria for Meaningful Use are moved forward. The Centers for Disease Control and Prevention (CDC) make changes to their HL7 specifications as requirements specific to the federal entitlement Vaccines for Children (VFC) Program occur. The Mississippi Immunizations Interoperability team is available to support your work and answer any questions related to HL7 interfaces you may have.

Mississippi has a lengthy waiting list or queue for interfacing with MIIX. If the data connections team has completed one interface with a provider and the provider changes EHRs, the provider will go on the waiting list for a new HL7 interface project. The data connections team is not immediately available to work on an interface with a provider based on a change in EHR.

If a provider is unable or unwilling to continuously monitor an interface once it has moved to the production environment and the interface is not performing or the data quality falls below the threshold, the MS State Department of Health reserves the right to terminate the interface.

Acknowledgement (ACK) Message

MIIX sets your HL7 account to "Always Acknowledge" every message received. An ACK message will be sent to your account. If clinic staff contacts the IIS and states that HL7 messages were sent to the Registry but they didn't transfer, the IIS staff may refer the caller to

their Information Technology staff or EHR Support team to ask if an ACK was received. It is the responsibility of the provider to monitor these ACKs to verify if the record is rejected.

Query Response (Bi-directional Interfaces)

The provider must submit HL7 version 2.5.1 and MIIX expects a QBP/RSP query message.

A query sent to MIIX will result in one of three possible responses:
- Query Acknowledgment No Match (QCK).
- Query Acknowledgment Possible Match (VXX). This returns maximum number requested and/or allowed. No immunization history returned.
- Query Acknowledgment Exact Match (VXR). Immunization history returned.

QBP/RSP – Consult the CDC's HL7 2.5.1 Implementation Guide for Immunization Messaging details on the Query By Parameter found here: http://www.cdc.gov/vaccines/programs/iis/technical-guidance/downloads/hl7guide-1-5-2014-11.pdf. The response differs from the QCK, VXX, and VXR.

Testing of evaluated vaccination queries (forecast) will include the ability to send and receive the data; however troubleshooting the consumption of the forecast by the provider's EHR or the validity of the forecast is not the responsibility of MSDH. MIIX forecasting follows ACIP recommendations.

Outcome of Query	Response
No match found	Response indicates that message was successfully processed and that no clients matched the criteria that were sent in the query.
Exactly one high confidence match found	Response includes a complete immunization history as specified in CDC's Profile, *Return Immunization History.*
At least one lower confidence match is found, but <= maximum number allowed.	Response returns one PID with associated PD1 and NK1 segments for each potential match. No immunization history is returned. See CDC's Profile *Return Candidate List.*
More than the maximum number allowed is found.	Response indicates that the message was successfully processed, but that too many potential matches were found. The maximum number allowed is the lower of the maximum number requested and the maximum number that the receiving system will return.
Message is not well formed and has fatal errors.	Response indicates that the message was not successfully processed and may indicate errors.

Query Requesting Forecast Information

The forecast information will only be returned in cases of an exact match with the IIS.

Sending HL7 Messages

HL7 message files may be submitted automatically via HTTPS or SOAP in a near real-time manner. Please see Connectivity Guide for details.

HL7 messages may be sent one at a time (one for every HTTPS request) or together as a batch or group. Batch or grouped messages do not require special separators or wrappers. MIIX always returns responses in HL7 format (ACK). Responses are returned based on the account configuration in MIIX.

The HL7 response can indicate any one of the following:
- Authentication error – username and password are incorrect, or the account does not have permission to submit HL7 messages.
- Message parsing error – incoming messages do not conform to HL7 standards
- Message content error – incoming message is missing information or includes incorrect information
- Message processing exception – incoming message has an unexpected problem
- Message accepted – data has been accepted and has been set to deduplication
- Response to query – registry responds to query with query results.

Specific Requirements for Interfaces

To successfully implement an interface to MIIX it is important to include specific vaccine information in HL7 messages.
- VFC (Vaccines for Children) status is required and should be sent within an OBX segment with the LOINC of 64994-7.
- Current CVX/CPT/NDC coding is critical – no codes set inactive by CDC or codes for unspecified vaccines are acceptable. The MIIX team strongly recommends providers subscribe to email updates on CVX/CPT/NDC codes from the CDC. http://www2a.cdc.gov/vaccines/IIS/IISStandards/vaccines.asp?rpt=cvx
- Lot number, lot expiration date, and vaccine manufacturer, utilizing the MVX codes from the CDC, are critical to ensure accurate inventory values. The MVX code sent by the provider in an HL7 message must match exactly the code in MIIX for the provider's inventory (if recorded in MIIX). The MIIX team strongly recommends providers subscript to email updates on MVX codes from the CDC. http://www2a.cdc.gov/vaccines/IIS/IISStandards/vaccines.asp?rpt=mvx

The provider must monitor changes to the vaccine supply, including the introduction of new vaccines and vaccine coding changes. CVX coding submitted through HL7 messages must match the vaccine products administered at the provider's location. **Current coding must be in place in HL7 messaging before the interface moves to the MIIX production system.**

VFC (Vaccines for Children) Status

To submit VFC (Vaccines for Children) status via HL7 messaging, a code indicating eligible or ineligible must be submitted for all patients using the table below:

VFC Code	VFC Status
V01	Not VFC eligible. Must be sent via OBX segment for all patients in this category receiving a vaccination
V02	VFC eligible – Medicaid/Medicaid Managed Care
V03	VFC eligible - Uninsured
V04	VFC eligible – American Indian/Alaska Native
V05	VFC eligible – Federally Qualified Health Center Patient/Underinsured
V22	CHIP patient
V24	Medicare Patient

Race and Ethnic Group

CDC strongly recommends immunization information systems (IIS) collect Race and Ethnicity data on all patient records. MIIX requires a race code be submitted in HL7 data. If possible, Ethnicity data should also be submitted in HL7 data. Only the current CDC values for HL7 version 2.5.1 are acceptable. Deprecated (outdated) values will not be accepted. If you are unable to submit current values, leave the appropriate segments empty but **note: Race code (current values) must be submitted to MIIX.**

US Race Codes	Description
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 (should be avoided or very limited use; make a specific race selection when possible)
<empty field>	Unknown/undetermined (Avoid unless EHR defaults to Other in the interface)

US Ethnicity Codes	Description
2135-2	Hispanic or Latino
2186-5	Not Hispanic or Latino
<empty field>	Unknown (Avoid)

Required Fields (Segments and Components)

DATA FIELD	REQUIRED, RECOMMENDED, ACCEPTED, IGNORED	HL7 SEGMENT	COMMENTS
Patient Fields			
Patient Id (Medical Record Number)	Required	PID-3	This field should not contain Social Security Number
Birth File Number	Accepted	PID-3	
First Name	Required	PID-5	
Last Name	Required	PID-5	
Middle Name	Recommended	PID-5	
Suffix	Required in a suffix field	PID-5	
Mothers Maiden Name	Required	PID-6	
Date of Birth	Required	PID-7	
Gender	Required	PID-8	
Alias First Name	Recommended	PID-9	
Alias Last Name	Recommended	PID-9	
Race	Required	PID-10	Use current standard code set per current CDC Implementation Guide 2.5.1
Address Street & City	Required	PID-11	Entire street address should be concatenated into one line. The address must include: street, city, state, zip code
Address State	Required	PID-11	

DATA FIELD	REQUIRED, RECOMMENDED, ACCEPTED, IGNORED	HL7 SEGMENT	COMMENTS
Address Zip	Required	PID-11	
Phone	Required	PID-13	Special formatting requirements to populate patient record at this time |(999)999-9999^PRN^PH^^^|
Email	Recommended	PID-13	
Ethnicity	Required	PID-22	Use current standard code set per current CDC Implementation Guide 2.5.1 Regard as Required but may be Empty (RE)
Birth Multiple	Recommended	PID-24	**Required if multiple births**
Birth Order	Recommended	PID-25	**Required if multiple births**
Facility Name	Required	PD1-3.1	
Facility Id	Required	PD1-3.3	
VACCINATION FIELDS			
Vaccination Administration Date	Required	RXA-3	
Vaccine Name	Required	RXA-5	
Vaccine Code CVX	Required	RXA-5	CVX vaccine codes are required for Meaningful Use. CVX, NDC, and CPT codes can be submitted if all codes are valid and formatted correctly
Vaccine Code NDC	Required	RXA-5	NDC vaccine codes are required for Meaningful Use Stage 3. It is recommended these be send with the corresponding CVX code and formatted correctly
Administered Amount (dose size, numeric volume)	Required	RXA-6	

DATA FIELD	REQUIRED, RECOMMENDED, ACCEPTED, IGNORED	HL7 SEGMENT	COMMENTS
Administration Notes: Historical vs Administered (new)	Required	RXA-9	New = 00 Historical =01
Vaccinator (administering provider)	Recommended	RXA-10	
Administering Facility Name	Required	RXA 11.1	
Administering Facility ID	Required	RXA-11.4	
Administering Facility Address	Accepted	RXA-11	
Vaccine Lot Number	Required – Administered vaccines	RXA-15	
Vaccine Lot Expiration Date	Required – Administered vaccines	RXA-16	Required for Vaccine Lot identification and decrementing
Vaccine Manufacturer Code (only current MVX accepted)	Required – Administered vaccines	RXA-17	
Action Code	Recommended	RXA-21	A = Add U = Update D = Delete Will default to Add if left empty.
Route of Administration	Required	RXR-1	
Anatomical Site of Administration	Required	RXR-2	
Vaccine Eligible VFC Code	Required	OBX-3 and OBX-5	LOINC = 64994-7 See VFC (Vaccines For Children) Status earlier in this guide.
VIS Presentation Date	Required	OBX-3 and OBX-5	LOINC = 29769-7
VIS Publication Date	Required	OBX-3 and OBX-5	LOINC = 29768-9

DATA FIELD	REQUIRED, RECOMMENDED, ACCEPTED, IGNORED	HL7 SEGMENT	COMMENTS
Vaccine Type	Required	OBX-3 and OBX-5	LOINC = 30956-7 (Preferred) LOINC = 38890-0 (Acceptable)
Vaccine Funding Source	Highly Recommended	OBX-3 and OBX-5	LOINC = 30963-3 See Vaccine Funding Source code values later in this guide
GUARDIAN FIELDS			
First Name	Required	NK1-2	Only required for < 19 years old
Last Name	Required	NK1-2	Only required for <19 years old
Relationship	Required	NK1-3	Required to be coded as GRD, MTH, FTH, PAR. If populated with any other value, the guardian name info will be ignored.
Phone	Recommended	NK1-5	

Tips for a Successful Implementation of an Interface

Message Segment	Recommendation
MSH-4.1	The MIIX Organization Id will be provided by the Interoperability administrator.
MSH-4.2	The MIIX Organization Name will be provided by the Interoperability administrator.
MSH-11	The processing id is always 'P' even when submitting messages to the testing server.
PID-3	The identifier code should always be 'MR'.

Message Segment	Recommendation
NK1-2	Next of kin name. Correct submission format: LASTNAME^FIRSTNAME^MIDDLENAME (or initial)^SUFFIX
NK1-3	Next of kin relationship code. Accepted values: FTH – Father GRD – Guardian MTH – Mother PAR – Parent
PD1-11	Publicity code identifies Reminder Recall method. If submitted, the correct value is 02^Reminder/Recall any method.
OBX-3	64994-7 – code used for VFC eligibility status 30963-3 – code used for Vaccine funding source 29768-9 – code used for VIS publication date 29769-7 – code used for VIS presentation date 30956-7 – code preferred for Vaccine Type, 38890-0 is acceptable
OBX-5	For OBX-3 value of 64994-7 see VFC (Vaccines For Children) Status earlier in this guide. For OBX-3 value of 30963-3 see Vaccine Funding Source code values later in this guide.
QBP/RSP	Query required for HL7 version 2.5.1
RXA-5	Administered code. CVX codes are expected. NDC and/or CPT codes may be included with the CVX values, if formatted correctly.
RXA-6	Dosage of vaccine given. Numeric value.
RXA-10	Vaccinator. Correct submission would include: RXA10.1 – ID RXA10.2 – Last name RXA10.3 – First name RXA10.4 – Middle name/initial (optional) RXA10.5 - Credential
RXA-11	Administered location. Correct submission format for HL7 2.5.1: Facility Name^^^Facility ID

Vaccine Funding Source code values

PHC68	Military Funds
PHC70	Private Funds
VXC1	Federal Funds
VXC2	State Funds
VXC3	Tribal Funds
VXC50	Public Funds
VXC51	Public VFC
VXC52	Public Non-VFC
OTH	Other
UNK	Unknown