

The background of the top half of the page is a light blue image of a globe made of puzzle pieces. A horizontal blue band with a thin yellow line above and below it is overlaid on the globe. The text "Integrated Public Health Solutions" is centered within this band.

Integrated Public Health Solutions

West Virginia Statewide Immunization Information System (WVSIIS) HL7 Implementation Guide

Version 1.2.1

July 2013

Table of Contents

1.0 Benefits of WVSIS to the Provider	4
2.0 Overview of IWeb Software	4
2.1 Immunization Data Interface	4
2.1.1 HL7	5
2.1.1.1 WVSIS HL7 Capabilities.....	5
2.1.1.2 Sample HL7 Messages	5
2.1.1.2.1 Acknowledgement (ACK) Message.....	6
2.1.1.2.2 Vaccination Query (VXQ) Message.....	6
2.1.1.2.3 Query Acknowledgement (QCK) Message.....	6
2.1.1.2.4 Vaccination Query Possible Match (VXX) Message	6
2.1.1.2.5 Vaccination Query Record (VXR) Message	6
2.2 File Size & Data Migration	6
2.3 Deduplication (Patient Matching).....	7
2.4 Required and Expected Fields.....	7
2.4.1 IWeb Fields for Data Import.....	7
2.4.1.1 WVSIS Required Data Fields.....	7
* = % correctly populated during testing	7
2.5 Submitting HL7 Data.....	11
3.0 Resources	12

List of Tables and Figures

Table 1-1: Data Fields.....	7
-----------------------------	---



West Virginia Department of Health & Human Resources
Division of Immunization Services
Phone: (304) 558-2188
Website: <http://www.wvimmunization.org>



West Virginia Statewide Immunization
Information System (WVSIIS)

<https://wvsiis.wvdhhr.org/wvsiis>

1.0 Benefits of WVSIS to the Provider

- Real-time electronic system eliminates lag time of viewing immunization data after reporting.
- Reduces paperwork.
- Provides easy access to consolidated patient immunization records.
- Decreases the need to pull and refile paper patient records.
- Consolidates immunizations from multiple providers into one record.
- Source for obtaining immunization histories for patients.
- Generates parental reminder notices on due, overdue or invalid immunizations.
- Supports efforts to improve immunization coverage rates.
- Supports the ability to recall vaccines based on manufacturer error.
- Prints a completed official Immunization Certificate of Compliance (Form 121).
- Reduces calls from schools and day care centers during registration.
- Provides vaccine inventory management.
- Generates doses administered and immunization assessment reports upon demand.
- Forecasting recommendations based on the ACIP/AAP schedule.
- Satisfies “Meaningful Use” Criteria for interfacing with existing EMR/EHRS.

2.0 Overview of IWeb Software

IWeb is a population-based immunization registry that helps public health agencies and vaccine providers make informed decisions that improve the health of children and the entire community. IWeb is a web-based product which is used by public health officials, public health employees, and private providers by enabling:

- Vaccinators to view a child’s complete vaccination record, thus preventing over and under vaccination.
- Health officials to measure and improve vaccination rates by providing a big picture through various reports.
- Health officials to send mailings to remind parents of needed vaccinations.
- School nurses to review student vaccination records.

2.1 Immunization Data Interface

The HL7 interface supports CDC standard immunization messages and is the recommended format for submitting immunization data to WVSIS.

Providers should have at least 250 patients with immunizations in their EMR so that adequate technical and data quality testing can be completed prior to taking

an electronic interface LIVE. Providers are responsible for keeping their vaccination codes in their application current and ensure that staff are using the appropriate vaccinations in their EMR documentation to preserve WVSIS data integrity during testing and on an ongoing basis.

2.1.1 HL7

WVSIS sends and receives HL7 immunization queries and updates. These messages conform to HL7 specification version 2.3 and the CDC's Implementation Guide for Immunization Transactions version 2.1 which can be found here:

<http://www.cdc.gov/vaccines/programs/iis/stds/downloads/hl7guide.pdf>

We are moving to HL7 v2.5.1 specifications in early 2011.

The link for the 2.5.1 guide is here:

<http://www.cdc.gov/vaccines/programs/iis/stds/downloads/hl7guide-02-2011.pdf>

Please see the [link](#) at the end of the document for the latest IIS standards and guides.

2.1.1.1 WVSIS HL7 Capabilities

- Accepts the following patient update messages: VXU, ADT, DFT, and ORU.
- Responds to immunization record query messages: VXQ.
- Queries external registries by sending immunization record query messages: VXQ.
- Sends batch updates to external registries: VXU.

2.1.1.2 Sample HL7 Messages

2.1.2.2.1 Vaccination Update (VXU) Message

```
MSH|^~\&|^STC-IWeb&2.10.0.1^|KEVIN^STC-Nathan^|nathan^STC-IWeb^|^savetofile^|
20050608111146|VXU^V04|1118254306762.100000010|P|2.3.1|
PID|1||43773^^^^MR||DOE^JOHN^C^^^^L||19420915|M|||||||||||||||||N|
PD1||^MR|^MR|||||02^Reminder/recall -any method^HL70215|||||A^Active^HL70441|
ZSP|^PH^FX^INTERNET^NET|
PV1|R|
RXA|0|999|20041214|20041214|33^pneumococcal^CVX^90732^Pneumococcal (PPV23)^CPT~
31^Pneumococcal (PPV23)^STC0292|999|||00^New immunization record^NIP001|||||
A|20050608111146|
RXR|OTH^Other/Miscellaneous^HL70162|
ZSV|^^^^MR~^^^^SR|^PH^FX^INTERNET^NET|
RXA|0|999|20021122|20021122|15^influenza, split (incl. purified surface antigen)^CVX^
90658^Influenza Split^CPT~61^Influenza Split^STC0292|999|||00^New immunization record^
NIP001|||||A|20050608111146|
RXR|OTH^Other/Miscellaneous^HL70162|
ZSV|^^^^MR~^^^^SR|^PH^FX^INTERNET^NET|
RXA|0|999|20041214|20041214|15^influenza, split (incl. purified surface antigen)^CVX^
90658^Influenza Split^CPT~61^Influenza Split^STC0292|999|||00^New immunization record^
NIP001|||||A|20050608111146|
RXR|OTH^Other/Miscellaneous^HL70162|
ZSV|^^^^MR~^^^^SR|^PH^FX^INTERNET^NET|
```

2.1.1.2.2 Acknowledgement (ACK) Message

```
MSH|^~\&|^|DOE^^|DCC^^|DOE^^|20050829141336||ACK^|1125342816253.100000055|P|2.3.1|
MSA|AE|00000001|Patient id was not found, must be of type 'MR'|||^HL70357|
ERR|PID^1^3^^HL70357|
```

2.1.1.2.3 Vaccination Query (VXQ) Message

```
MSH|^~\&|DBO^QSInsight^L|QS4444|5.0^QSInsight^L||20030828104856+0000||VXQ^V01|QS44443786100000004
2|P|2.3.1|||NE|AL|
QRD|20030828104856+0000|R|I|QueryID01|||5|00000001^Bucket^Pail^^^^^^^^^MR|VXI|SIIS|
QRF|QS4444|20030828104856+0000|20030828104856+0000||100000001~19460401~1 Somewhere Lane
Boulevard^Indianapolis^IN~10000|
```

2.1.1.2.4 Query Acknowledgement (QCK) Message

```
MSH|^~\&|5.0^QSInsight^L|^|DBO^QSInsight^L|QS4444^^|20051019154952||QCK^|1129754992182.100000002
|P|2.3.1|
MSA|AA|QS444437861000000042|No patients found for this query|
QAK||NF|
```

2.1.1.2.5 Vaccination Query Possible Match (VXX) Message

```
MSH|^~\&|5.0^QSInsight^L|^|DBO^QSInsight^L|QS4444^^|20051019163235||VXX^V02|1129757555111.100000
025|P|2.3.1|
MSA|AA|QS444437861000000042||
QRD|20030828104856|R|I|QueryID01|||5|10^SNOW^MARY^^^^^^^^^SR|VXI^Vaccine
Information^HL70048|SIIS|
QRF|QS4444|20030828104856|20030828104856||100000001~20021223|
PID|1||41565^^^SR~2410629811:72318911||SNOW^MARY^^^^L|20021223|F|||2 NORTH WAY
RD^^MOORESVILLE^INDIANA^46158^M|(317)123-4567^PH|EN^English^HL70296|||N|
PID|2||28694^^^SR~2663391364:111111111||FROG^KERMIT^^^^L|20021223|
NK1|1|PIGGY^MISS|GRD^Guardian^HL70063|
```

2.1.1.2.6 Vaccination Query Record (VXR) Message

```
MSH|^~\&|5.0^QSInsight^L|^|DBO^QSInsight^L|QS4444^^|20051019163315||VXR^V03|1129757595953.100000
029|P|2.3.1|
MSA|AA|QS444437861000000042||
QRD|20030828104856|R|I|QueryID01|||5|41565^SNOW^MARY^^^^^^^^^SR|VXI^Vaccine
Information^HL70048|SIIS|
QRF|QS4444|20030828104856|20030828104856||100000001~20021223|
PID|1||41565^^^SR~2410629811:72318911||FROG^KERMIT^^^^L|20021223|F|||3 SOUTH WAY
RD^^MOORESVILLE^INDIANA^46158^M|(317)222-1234^PH|EN^English^HL70296|||N|
PDI|||^SR|^SR|||02^Reminder/recall -any method^HL70215|||A^Active^HL70441|
PVI||R|
```

2.2 File Size & Data Migration

The maximum size for import files will vary depending on the provider's Internet connection speed and quality. A data set of 1000 records is recommended.

If the provider's data is not part of the data migration to WVSIIS, then a one time data dump of historical immunizations is required. In general 5 years of back data is requested but WVSIIS can take as much historical data as the provider has available. For the one time dump, WVSIIS will set the provider to "non-owning" so that existing data in WVSIIS does not change ownership. This may

require several separate uploads of 1,000 records until the entire historical data set has been sent to WVSIIIS.

2.3 Deduplication (Patient Matching)

WVSIIIS has a very sophisticated deduplication algorithm when runs every night. Automatic deduplication requests that are sent during off hours are queued to run after the nightly process. Records accepted during the day will be processed during the night and will be viewable in the registry the following day.

2.4 Required and Expected Fields

Data Quality is a high priority for the immunization registry as information received is used to build a permanent vaccination record for patients. It is important that the information is accurate and as complete as possible. For this reason certain fields are required in every message (for example, patient date of birth) and other fields are expected to be sent (for example, patient phone number). Fields that are expected to be sent may be empty if there is no information to send but normally should have a value. During an initial data quality analysis and periodic checks the registry will review to ensure that expected fields are being sent as expected.

2.4.1 IWeb Fields for Data Import

IWEB has several fields that are required. This means that files that do not include this information 100% of the time will fail to import into WVSIIIS. Those fields required by WVSIIIS will technically import but will not be accepted by WVSIIIS unless the acceptance threshold is met during the testing phase.

2.4.1.1 WVSIIIS Required Data Fields

Table 1.1 Data Fields

* = % correctly populated during testing

DATA FIELD	Required, recommended, Accepted, Ignored	HL7 Segment	ACCEPTED VALUES
PATIENT FIELDS			
Patient ID (Medical Record Number)	Required	PID-3	May be alphanumeric.
First Name	Required	PID-5	Alphabetic values only.
Last Name	Required	PID-5	Alphabetic values only.
Middle Name	Recommended	PID-5	Alphabetic values only.
Suffix	Recommended	PID-5	Alphabetic values only.
Alias First Name	Recommended	PID-9.2	Alphabetic values only.
Alias Middle Name	Recommended	PID-9.3	Alphabetic values only.
Alias Last Name	Recommended	PID-9.1	Alphabetic values only.

Mother's Maiden Name	Recommended	PID-6	Alphabetic values only
Date of Birth	Required	PID-7	YYYYMMDD
Gender	Required	PID-8	M (for Male) or F (for Female)
Birth File Number	Recommended	PID-3	May be alphanumeric.
Birth Multiple	Recommended	PID-24	digit
Birth Order	Recommended	PID-25	digit
Race	Recommended	PID-10	2076-8 Native Hawaiian or Other Pacific Islander, 2131-1 Multi-Racial; 2028-9 Asian; 2106-3 White; 1002-5 American Indian or Alaska Native; 2054-5 Black or African American.
Ethnicity	Recommended	PID-22	2186-5 Not Hispanic or Latino, 2135-2 Hispanic or Latino, 2131-1 Multi-Racial
Facility Name	Recommended	PD1-3.1	If possible to send
Facility ID	Recommended	PD1-3.3	If possible to send; May be alphanumeric
Eligible VFC (at demographic level only)	Required	PV1-20	Applies to children age 18 yrs or younger only. Values accepted: V01 Ineligible V02 Medicaid V03 Uninsured V04 Nat. Amer. or Alaskan V05 Underinsured V06 State CHIP
Address Street & City	Required	PID-11	Entire address should be concatenated into one line: street, city, state, zip code.
Address State	Required	PID-11	
Address Zip	Required	PID-11	
Address Country	Recommended	PID-11.6	
Address County	Recommended	PID-11.9	FIPS County Code for West Virginia
Phone	Required	PID-13	### ### #### (ext#####)
Phone Type	Recommended	PID-13	Home/Cell/Business
Email	Recommended	PID-13	alphanumeric @_____.
Language	Recommended	PID-15	EN (English) or ES (Spanish)

Deceased Date	Recommended	PID-29	YYYYMMDD or BLANK
Patient Status (Facility)	Recommended		
Patient Status (IIS)	Recommended		
VACCINATION FIELDS			
Vaccine Name	Required	RXA-5	WVSIS reads the vaccine code to import the data successfully. Vaccine names help identify unintended errors.
Vaccine Code CVX	Required (for MU)	RXA-5	CVX vaccine codes are preferred and required for Meaningful Use Stage 2. Both CVX and CPT codes can be submitted – the CVX code trumps the CPT code when both are sent.
Vaccine Code CPT	Required if no CVX code	RXA-5	CPT vaccine codes can be accepted if CVX codes cannot be provided
Vaccination Administration Date	Required	RXA-3	YYYYMMDD
Vaccinator (administering provider)	Recommended	RXA-10	
Vaccine Lot Number	Required for administered doses	RXA-15	Required for Administered or New (00) vaccinations only; Not needed for historical doses (01)
Vaccine Manufacturer Name	Required for administered doses	RXA-17	Required for Administered or New (00) vaccinations only; Not needed for historical doses (01)
Vaccine Manufacturer Code	Required for administered doses	RXA-17	Required for Administered or New (00) vaccinations only; Only active MVX codes accepted. Values (02) - (09) will be imported as Historical
Vaccine expiration date	Recommended	RXA-16	Can accept but not required YYYYMMDD
Vaccine Eligible VFC Code	Recommended	OBX	Use a VFC code to indicate eligibility Applies to children age 18 yrs or younger only. Values accepted: V01 Ineligible V02 Medicaid V03 Uninsured V04 Nat. Amer. or Alaskan V05 Underinsured V06 State CHIP
Vaccine Publicly Supplied	Recommended	OBX	Use Y for publicly supplied or N for not publicly supplied
Administration Notes: Historical vs Administered	Required	RXA-9	Historical coded 01, New coded 00

(new)			
Action Code (add & delete supported/update not supported)	Recommended	RXA-21	A = Add;U = Update; D = Delete
Administered Amount (i.e, dose size, numeric volume)	Recommended	RXA-6	0.00
Route of administration	Recommended	RXR-1	
Anatomical site of administration	Recommended	RXR-2	
VIS Presentation Date	Recommended	OBX	YYYYMMDD
VIS Publication Date	Recommended	OBX	YYYYMMDD
Facility ID	Required	RXA-11.1	Provider system ID may be sent and then mapped in WVSIS or you can use the ID that WVSIS supplies
Facility Name	Required	RXA-11.4	
Facility Address	Accepted if sent	RXA-11	
History of chickenpox disease	Recommended	RXA-5	Custom code of 921 in RXA-5 message or send in OBX message
History of chickenpox disease date	Recommended	OBX	YYYYMMDD
Contraindications/Precautions	Recommended	OBX	
Contraindications/Precautions Date	Recommended	OBX	YYYYMMDD
Exemption/Parental Refusal	Recommended		
Exemption/Parental Refusal Date	Recommended		YYYYMMDD
Vaccine reactions	Recommended	OBX	Free Text
GUARDIAN FIELDS			
First Name	Required	NK1-2.2	For patients 18 yrs or older, the patient's first name may be sent or it may be blank. The patient's Legal guardian is the name that is expected in this and the next field.
Last Name	Required	NK1-2.1	For patients 18 yrs or older, the patient's first name may be sent or it may be blank. The patient's Legal guardian is the name that is expected in this field.
Middle Name	Recommended	NK1-2.3	Alphabetic .

Phone	Recommended	NK1-5	### ### #### (ext#####)
Relationship	Recommended	NK1-3	Required if patient address is not available. Values accepted are GRD, MTH, FTH, PAR, or null. If null, defaults to GRD. If populated with any other value, the guardian name info will be ignored.

2.5 Submitting HL7 Data

HL7 message files may be uploaded manually to WVSIIIS or automatically via HTTPS. Applications that can generate a file or use TCP/IP but can't connect via HTTPS may install the HL7 Bridge on their local server to submit directly to WVSIIIS.

If the file is automated, we request that they are sent nightly when WVSIIIS is not generally in use. If it requires manual upload, once a week a staff member will need to generate a file from their application and upload it directly to the WVSIIIS server. At least two people in an office should be trained to do this task so that there is no interruption of data flow to WVSIIIS. This process takes about 5 minutes.

Request: When the sending application sends WVSIIIS an HL7 message via an HTTPS POST command, it must have the following fields:

- USERID - Assigned by the WVSIIIS administrator.
- PASSWORD - Assigned by the WVSIIIS administrator.
- MESSAGEDATA - The HL7 message(s).

HL7 messages may be one at a time (one for every HTTPS request) or together as a batch. Batched messages do not require special separators or wrappers.

Response: WVSIIIS always returns responses in HL7 format. Responses are returned based on how the account is configured in WVSIIIS. The response configurations available are Always, Never, On Error (only for those messages are not accepted) or Determined by Message (Incoming request message indicates in the MSH segment whether to always, never or only on error).

The HL7 response can indicate any one of the following things:

- Authentication error - username and password are incorrect or account does not have permission to accept HL7
- Message parsing error – incoming messages do not conform to HL7 standards
- Message content error – incoming message is missing or incorrect information
- Message processing exception – incoming message has an unexpected problem

- Message accepted - data has been accepted and has been sent to deduplication
- Response to query – WVSIIIS responds to query with query results

3.0 Resources

This immunization registry conforms to standards published by the CDC. For the latest code sets and standards please see:

<http://www.cdc.gov/vaccines/programs/iis/stds/standards.htm>

For more detailed information about how IWeb processes HL7 data please see the *IWeb HL7 Interface Specification Guide*.