



PHIN Messaging Standard
Substance Administration Message
RAS_O17
HL7 Version 2.5

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Centers for Disease Control and Prevention



Revision History

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1. Introduction

This Implementation Guide documents the use of the Health Level 7 (HL7) Version 2.5 Pharmacy/Treatment Administration Message to support messaging of information regarding the administration of vaccines and other substances that may be given as a countermeasure response.

The specifications in this supplement are not intended as a tutorial for either HL7 or interfacing in general. The reader is expected to have a basic understanding of interface concepts, HL7, and the reporting of laboratory test results. This supplement is based on and conforms to the HL7 Standard, Version 2.5.

PHIN Messaging

The PHIN (Public Health Information Network) initiative is a comprehensive architecture of data and information systems standards intended to advance the development of efficient, integrated and interoperable public health information systems. PHIN development, along with the work of related initiatives such as eHI (e-Health Initiative) is based on the fundamental understanding that exchange of health-related information between healthcare providers, public health agencies, and the general public is an essential aspect of public health surveillance and response. As a consequence, messaging – the electronic exchange of data between computerized information systems – is a key element of the PHIN architecture.

The development and effective management of data interchange (messaging) requires the use of generally accepted standards. These standards become more widely used and more effective when they are developed by a widely based, consensus process, rather than by any single organization. Furthermore, use of industry standards is a basic tenet of the e-Government initiative which provides direction to CDC as to other government agents. Since it is generally accepted that Health Level Seven (HL7) standards are the prevailing industry standards for communicating clinical and laboratory data in the form of electronic messages, CDC has chosen to work with HL7 as the primary source for interface standards.

The breadth and general applicability of the HL7 standard are advantageous to a wide variety of users but also present challenges for specific implementations in public health and other contexts. Public health messaging partners need to define with particularity, the data to be passed, and the circumstances under which it is passed. In other words, it is necessary to develop message implementation guides based around specific scenarios or use cases. These guides are necessary because they introduce the level of specificity required in order to define verifiably compliant messages.

What is an Implementation Guide?

A public health messaging implementation guide is a document that describes:

- a) The circumstances under which messaging takes place.
- b) The data which is passed in a particular message.
- c) Additional specifications and guidance to assist in message implementation.

A wide range of use cases and partners are involved in public health messaging. Despite a multiplicity of specific message contexts, many of the same partners are involved as message receivers and message senders. As a result, consistency in both the form and content of message implementation guides can help

establish and maintain a common, standards-based approach to electronic messaging.

Audience

This guide is designed to be used by analysts who need a better understanding of the contents of PHIN messages, and by implementers working to develop PHIN compliant applications. In fact, understanding and using the relevant implementation guide or guides is a key requirement for establishing PHIN compliance. This flows from the fact that one key aspect of application level PHIN compliance is the ability to send and receive messages that conform to the requirements of the appropriate implementation guide.

Document Structure

This body of this document contains the following major sections.

- Application Requirements and Data Flows: describes the context and usage for the messaging.
- Abstract Message: indicates the segments that comprise the message, and describes their ordering and repetition.
- Segment & Field Descriptions: provides details about the segments that make up the message, and the fields that comprise the segments.
- Datatypes: defines the data types that establish the format and components of fields.
- Code Systems & Value Sets: includes the list of valid values for coded fields within the message, and describes how vocabulary items are managed.
- Use of Object Identifiers: defines the OIDs (object identifiers) that are used to identify a) specific parties involved in messaging, or in providing data relevant to messaging, and b) the coding systems and value sets that are used within the message.
- Miscellaneous: additional material, including sample messages, that will be useful to implementers.

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2. Application Requirements and Data Flows

This guide addresses the data requirements for specifying one of the data flows needed to fully implement Preparedness & Outbreak Response Messaging. The diagram below outlines the different functional areas – each of which would normally be supported by a discrete application - that need to cooperate to achieve the goals of the preparedness messaging process. The diagram also indicates the data flows that are required in order to support the functional area.

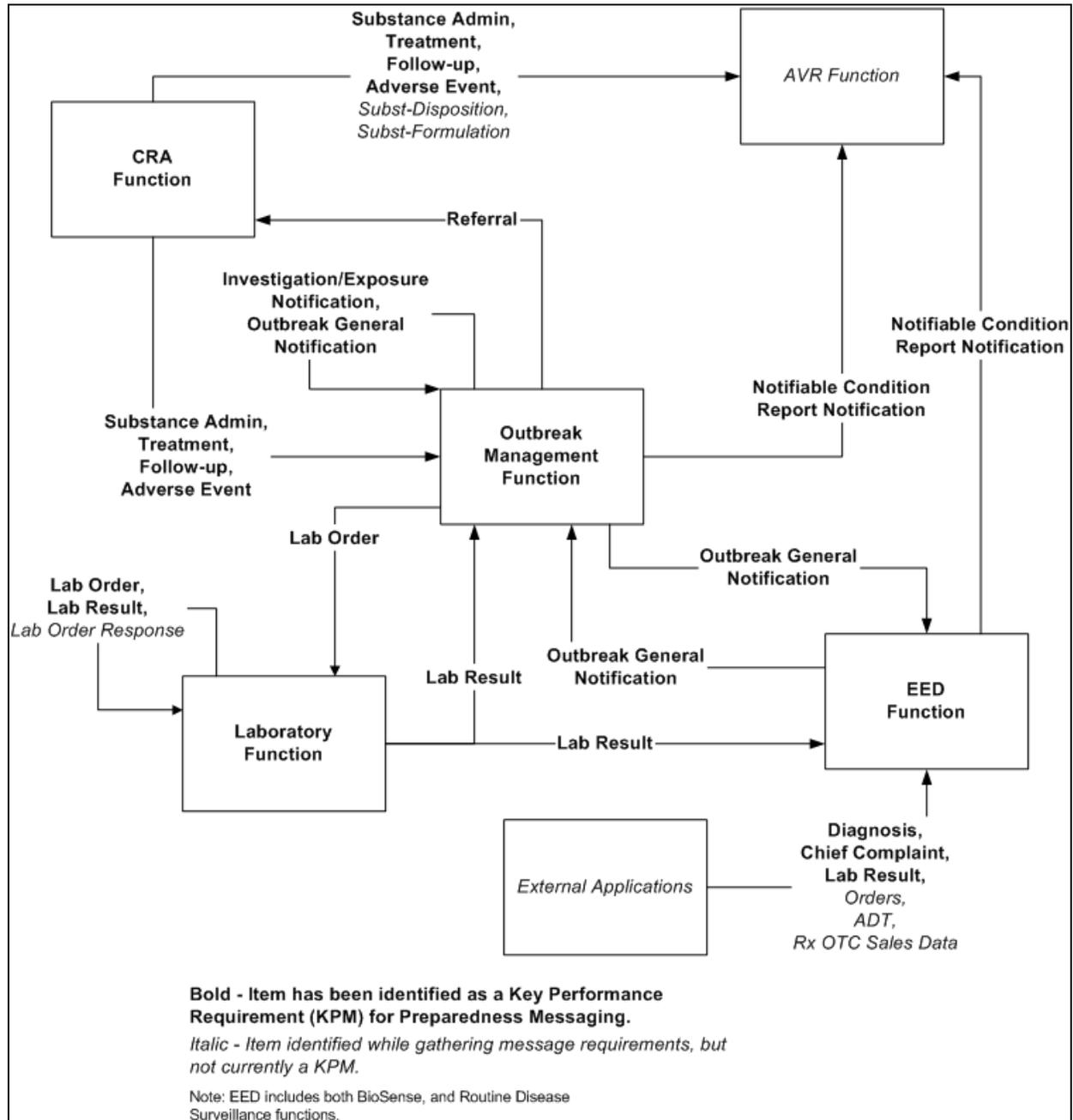


Figure 1: Preparedness & Outbreak Response Messaging Systems and Flows

The list below describes the functional areas, and briefly discusses the transactional information flows. All of these functional areas must collaborate to support the overall requirements:

Outbreak Management : OM includes the responsibility for investigating and managing outbreaks, whether of natural or man-made origin. Outbreak management functions includes identifying individuals who are affected – cases, referring persons in need of treatment, investigating case contacts, and reporting on cases that have been detected.

An outbreak management system tracks cases related to an outbreak, and is generally locally deployed for the management of that outbreak. The outbreak management system supports investigation, monitoring, management, analysis, and reporting of a public health event or act of bioterrorism. The outbreak management system aids in the collection and analysis of data to support identifying and containing the outbreak.

In order to fulfill its responsibilities, an outbreak management system needs to support the following information flows:

- The ability to refer patients to a CRA system for management and treatment.
- The ability to receive information on CRA patient related activities. As shown above, this includes information on substance administrations (administration of vaccines or other drugs), treatments (non-pharmaceutical interventions including such activities as isolation and monitoring), follow-up activities (reviewing the efficacy of drug and other interventions), and adverse event reports. Outbreak management systems also receive aggregate statistical reports that summarize the countermeasures that have been undertaken.
- The ability to pass investigation/exposure information and outbreak general notifications from one outbreak management system to another is needed. This function is needed since multiple outbreak management systems can be deployed to handle an extensive outbreak, or an outbreak that crosses jurisdictional boundaries.
- The ability to pass case notifications to an Analysis, Visualization and Reporting (AVR) system to support reporting and analysis. (In the diagram, the Analysis, Visualization, and Reporting role is taken by CDC's National Reporting system.)
- The ability to send outbreak general notifications to an EED system in order to support early event detection activities.
- The ability to receive outbreak general notifications from an EED system as a trigger for initiating outbreak response.
- The ability to order tests to be performed by a testing laboratory as part of outbreak investigation.
- The ability to receive test results from a laboratory to confirm or rule out the presence of an investigated condition.

Countermeasure Response Administration (CRA): CRA defines the system responsibilities for managing specific actions that are taken to prepare for or respond to public health emergencies. Countermeasures include vaccination and other types of drug prophylaxis, as well as non-drug actions such as patient follow up activities and isolation and restriction monitoring. The recipients of the countermeasures may include potential responders from the public and the private sector, identified exposed individuals, and the general public.

A countermeasure response system supports preparedness activities, or manages the response to an outbreak by providing medications and vaccines to affected or potentially affected persons. This includes, but is not limited to, persons referred by an OM system. It also deploys and manages other services such as isolation and quarantine.

In order to fulfill its responsibilities, a countermeasure response administration system needs to support the following information flows:

- The capability to receive referrals from an outbreak management system in order to initiate treatment for persons who have been exposed or are at risk of exposure.
- The ability to provide the OMS system with information on substance administrations and other treatments provided, follow activities related to persons who have received treatment, and adverse events experienced as a result of treatment. This information is used to update the information held by the outbreak management system.
- The ability to, in order to support reporting and analysis, pass information on substance administrations and other treatments provided, on follow-up activities related to persons who have received treatment, and on adverse events experienced as a result of treatment to the system or systems supporting Analysis, Visualization, and Reporting. It will also provide the AVR system(s) with information on the amount of drugs and other substances that have been formulated, and that have been dispensed to patients.

Early Event Detection (EED): EED includes the processes under which data collected by routine means is collated and analyzed to identify patterns that detect or indicate potential outbreaks that require further investigation. Typical data analyzed by the EED system includes patient diagnoses, hospital visit chief complaints, orders, laboratory results and pharmacy prescriptions dispensed.

An early event detection system captures relevant transactional information that is generated in the normal course of providing healthcare and analyses that information to detect potential cases, and to identify potential outbreaks for investigation and management.

In order to fulfill its responsibilities, an early event detection system needs to support the following information flows:

- The ability to receive transactional information from external applications. For the most part, these are applications that support healthcare functions in hospitals, doctor's offices and pharmacies. The EED system will receive information on patient diagnoses, chief complaints, lab results, orders, admits discharges and transfers (ADT), and pharmacy drug sales from these external applications. This data flow provides the EED system with data to analyze.
- The ability, since laboratory results are a key indicator for many types of outbreak, to receive information on lab results from clinical testing laboratories.
- The ability to receive outbreak notifications from an OMS system.
- The ability, as potential cases are discovered, to pass information to the relevant OMS system.
- The ability to pass information related to possible cases to the Analysis, Visualization, and Reporting system, in order to support reporting and analysis.

Analysis Visualization and Reporting (AVR): AVR includes those processes needed to receive reports from systems involved in any of the other Preparedness & Outbreak Response Messaging functions, to accumulate the data that has been received, and to make that data useful for analysis through visualization and other techniques. Today, CDC is developing such a system to support national requirements. It is likely that, in the future, other such systems will be implemented.

An Analysis, Visualization, and Reporting system will pull together information from all relevant systems involved in Preparedness & Outbreak Response Messaging. The data will be managed and stored to

support a wide range of analytic and reporting tasks.

In order to fulfill its responsibilities, an AVR system needs to support the following information flows:

- The ability to receive information on substance administrations and other treatments provided, information on follow-up activities related to persons who have received treatment, and information on adverse events experienced as a result of treatment to CDC's Analysis, Visualization, and Reporting system. It will also receive information on the amount of drugs and other substances that have been formulated, and that have been dispensed to patients.
- The ability to receive case notifications from outbreak management systems.
- The ability to receive case notifications from EED systems.

Laboratory: Laboratory processing includes the functions necessary to support testing and results reporting for samples collected in the process of outbreak management and countermeasure response. It also includes routine testing and reporting that takes place within the course of providing health care and provides important information for early event detection.

A laboratory system manages the processing required for laboratory testing and result reporting.

In order to fulfill its responsibilities, a laboratory system needs to support the following information flows:

- The ability to receive test orders from an outbreak management or other system, and transmit relevant lab results to that system.
- The ability to provide relevant test results to an EED system for analysis.
- The ability to, when further or specialized testing is needed, pass lab orders onto reference laboratories, and receive both order confirmations and test results from those laboratories.

External Applications: An external application is one that is not directly involved in Preparedness & Outbreak Response Messaging but, as a result of its day to day business, generates information that can be analyzed for EED purposes.

In order to fulfill its preparedness messaging responsibilities, an external system needs to support the following information flows:

- The ability to provide transactional information to the EED system. This includes information on patient diagnoses, chief complaints, lab results, orders, admits discharges and transfers (ADT), and pharmacy drug sales.

3. Abstract Message

The message description below shows how the HL7 Pharmacy/Treatment Administration message is constrained for use in preparedness & response messaging.

Abstract Message Structure

The pattern of message segments that are used is shown below.

Segment	Pharmacy/Treatment Administration Message RAS_O17	Usage	HL7 Chapter
MSH	Message Header	Required and does not repeat	2.15.9
[SFT]	Software	Optional; does not repeat	2.15.17
	<i>Patient... begin</i>		
PID	Patient Identification	Required and does not repeat (one patient per message)	3.4.2
[[AL1]]	Allergy Information	Optional and may repeat	3.4.6
	<i>Patient... end</i>		
{	<i>Order... begin</i>		
[ORC]	Common Order	Optional; will repeat with each section repeat	4.5.1
{	<i>Administration... begin</i>		
{RXA}	Pharmacy/Treatment Administration	Required and may repeat	4.14.7
RXR	Pharmacy/Treatment Route	Required; does not repeat as the route is assumed same for all administrations	4.14.2
[[<i>Observation...begin</i>		
OBX	Observation/Result	Optional and may repeat	7.4.2
]]	<i>Observation...end</i>		
}	<i>Administration... end</i>		
[CTI]	Clinical Trial Identification	Optional; does not repeat	7.8.4
}	<i>Order... end</i>		

- The patient visit segments, PV1 and PV2, are not supported.
- The timing and quantity segments, TQ1 and TQ2, are not supported.
- The RXO Pharmacy/Treatment Order segment is not supported along with the other segments in the order detail group.
- The RXE Pharmacy/Treatment Encoded Order segment is not supported along with the other segments in the encoded order group.

4. Segment and Field Descriptions

This section contains descriptions of the segments used. Within each segment, the supported fields are briefly described. For more information on segments and fields, refer to the HL7 Standard.

Segment Attribute Table Abbreviations

The abbreviated terms and their definitions used in the segment table headings are as follows:

ABBREVIATION	DEFINITION
HL7 SEQ	The sequence of the elements as they are numbered in the HL7 segment.
HL7 LEN	The HL7 maximum length of the element.
HL7 DT	The data type of the HL7 element.
HL7 OPT	HL7 standard determination of whether the field is required, optional, or conditional in a segment.
HL7 RPT/#	Indicates if element repeats. If the number of repetitions is limited, the number of allowed repetitions is given.
HL7 TBL#	HL7-Specific table reference.
PHIN Value Set	Pre-coordinated tables used in public health messages are accessed via the Public Health Information Network Vocabulary Access and Distribution Services at http://www.cdc.gov/PhinVSBrowser/StrutsController.do
HL7 Element Name	HL7 name of element in the segment.
Description/Comments	PHIN context and usage for the element.

Note: Gray = The PHIN Messaging Standard does not support the use of this field.

MSH - Message Header Segment

This segment is necessary to support the functionality described in the Control/Query chapter of the HL7 standard. MSH is used to define the intent, source, destination, and some specifics of the syntax of a message.

HL7 Seq.	HL7 Len.	HL7 DT	HL7 Opt	HL7 RPT/#	HL7 Tbl #	PHIN Value Set	HL7 Element Name	Description/Comments
1	1	ST	R				Field Separator	The character to be used as the field separator for the rest of the message. The supported value is , ASCII (124).
2	4	ST	R				Encoding Characters	The four characters that always appear in the same order in this field are: ^~\&
3	227	HD	O		0361	OID Registry	Sending Application	This field may be used to uniquely identify the sending application for messaging purposes. If populated, it will contain an OID that represents the sending application instance.
4	227	HD	R		0362	OID Registry	Sending Facility	This field uniquely identifies the facility that sends the message. The sending facility must be part of the PHIN OID registry.
5	227	HD	O		0361	OID Registry	Receiving Application	This field may be used to uniquely identify the receiving application for messaging purposes. If populated, it will contain an OID that represents the receiving application instance.
6	227	HD	R		0362	OID Registry	Receiving Facility	This field uniquely identifies the facility that is to receive the message. This unique identifier must be part of the PHIN OID registry.
7	26	TS	R				Date/Time Of Message	This field contains the date/time that the sending system created the message. The user values the field only as far as needed. When a system has only a partial date, e.g., month and year, but not day, the missing values may be interpreted as zeros. The time zone is assumed to be that of the sender.

HL7 Seq.	HL7 Len.	HL7 DT	HL7 Opt	HL7 RPT/#	HL7 Tbl #	PHIN Value Set	HL7 Element Name	Description/Comments
8	40	ST	O				Security	This field may be used by the sender to convey whether information contained in the message is sharable or non-sharable, identified, non-identified, etc.
9	15	MSG	R				Message Type	This field contains the message type, trigger event, and the message structure ID for the message. For the Adverse Event message, the value in this field will always be ORU^R01.
10	20	ST	R				Message Control ID	This field contains a string that uniquely identifies the message instance from the sending application. Typically, this field contains a timestamp and possibly a counter.
11	3	PT	R				Processing ID	This field may be used to indicate the intent for processing of the message, such as "Testing", "Development" or "Production". For this message, the field will always contain P . Processing mode is understood to be "Current" if not explicitly sent in the message.
12	60	VID	R				Version ID	This field contains the HL7 version number that is used to interpret format and content of the message. For this message, the version id will always be 2.5.
13	15	NM	O				Sequence Number	Not supported
14	180	ST	O				Continuation Pointer	Not supported
15	2	ID	O		0155		Accept Acknowledgment Type	Not supported
16	2	ID	O		0155		Application Acknowledgment Type	Not supported
17	3	ID	O		0399	PHVS_Count ry_FIPS_10-4	Country Code	This field may be used to indicate country of origin of the message.

HL7 Seq.	HL7 Len.	HL7 DT	HL7 Opt	HL7 RPT/#	HL7 Tbl #	PHIN Value Set	HL7 Element Name	Description/Comments
18	16	ID	O	Y	0211		Character Set	Not supported
19	250	CE	O				Principal Language Of Message	Not supported
20	20	ID	O		0356		Alternate Character Set Handling Scheme	Not supported
21	427	EI	O	Y			Message Profile Identifier	Not supported

SFT – Software Segment

The software segment provides information about the software product being used as the Sending Application in this message instance. The information will be provided for diagnostic purposes by the receiving application.

HL7 Seq.	HL7 Len.	HL7 DT	HL7 Opt	HL7 RPT/#	HL7 Tbl #	PHIN Value Set	HL7 Element Name	Description/Comments
1	567	XON	R				Software Vendor Organization	Organization identification information for the software vendor that created this transaction. The Software Vendor Organization field allows for identification of the vendor who is responsible for maintaining the application.
2	15	ST	R				Software Certified Version or Release Number	Software version number assigned to the instance of the application being used to send the message.
3	20	ST	R				Software Product Name	The name of the software product that submitted the transaction. This field is synonymous with the application name
4	20	ST	R				Software Binary ID	Contains the Software Binary ID issued by the vendor for each unique software version instance. Identical IDs in this field indicate that the software is identical at the binary level, although configuration settings may differ.
5	1024	TX	O				Software Product Information	Not supported.
6	26	TS	O				Software Install Date	The date the submitting software was installed at the sending site.

PID - Patient Identification Segment

The PID segment is used as the primary means of conveying patient identification information that is not likely to change frequently.

HL7 Seq.	HL7 Len.	HL7 DT	HL7 Opt	HL7 RPT/#	HL7 Tbl #	PHIN Value Set	HL7 Element Name	Description/Comments
1	4	SI	C				Set ID - PID	This segment sequencing field does not need to be populated or could contain a '1', but only one patient/one PID segment per message is supported
2	20	CX	B				Patient ID	Not supported
3	250	CX	R	Y			Patient Identifier List	This field contains one or more identifiers used by the sending application to uniquely identify a patient. Social security, account number, and driver's license number are sent in this field as of version 2.3.1 of the HL7 standard.
4	20	CX	B	Y			Alternate Patient ID - PID	Not supported
5	250	XPN	R	Y		PHVS_Name Type_HL7_2x PHVS_Degree LicenseCertificate_HL7_2x	Patient Name	This field may contain one or more names of the person who is the subject of the message. The name in the first position is considered the primary or legal name. Therefore, the name type code for the first instance is "L - Legal". In the absence of sending a patient name, some other patient identifier must be placed in this field.
6	250	XPN	O	Y			Mother's Maiden Name	Not supported
7	26	TS	O				Date/Time of Birth	This field contains the patient's date of birth.
8	1	IS	O		0001	PHVS_AdministrativeSex_HL7_2x	Administrative Sex	This field indicates the patient's sex.
9	250	XPN	B	Y			Patient Alias	Not supported
10	250	CE	O	Y	0005	PHVS_Race Category_CD C	Race	This field contains one or more codes that broadly refer to the patient's race(s).

HL7 Seq.	HL7 Len.	HL7 DT	HL7 Opt	HL7 RPT/#	HL7 Tbl #	PHIN Value Set	HL7 Element Name	Description/Comments
11	250	XAD	O	Y		PHVS_AddressType_HL7_2x PHVS_Count ry_FIPS_10-4 PHVS_State_FIPS_5-2 PHVS_Count y_FIPS_6-4 PHVS_Zipcode_USPS	Patient Address	This field contains the residence address of the patient. Multiple addresses for the same person may be sent.
12	4	IS	B		0289		County Code	Not supported – residence county is part of PID-11
13	250	XTN	O	Y		PHVS_Telecommunication EquipmentType_HL7_2x PHVS_Telecommunication UseCode_HL7_2x	Phone Number - Home	This field may contain a telephone number of a residence where the patient may be contacted.
14	250	XTN	O	Y		PHVS_Telecommunication EquipmentType_HL7_2x PHVS_Telecommunication UseCode_HL7_2x	Phone Number - Business	This field may contain the patient's business telephone number.
15	250	CE	O		0296	PHVS_Language_ISO_639-2	Primary Language	Language spoken by the subject of the message.
16	250	CE	O		0002	PHVS_MaritalStatus_HL7_2x	Marital Status	Marital status of the subject of the message.
17	250	CE	O		0006	PHVS_Religion_HL7_2x	Religion	Religion of the subject of the message.
18	250	CX	O				Patient Account Number	Not supported
19	16	ST	B				SSN Number - Patient	Not supported. (see PID-3 Patient Identifier list)
20	25	DLN	B				Driver's License Number - Patient	Not supported. (see PID-3 Patient Identifier list)
21	250	CX	O	Y			Mother's Identifier	Not supported
22	250	CE	O	Y	0189	PHVS_EthnicityGroup_CD C	Ethnic Group	This field defines the patient as either Hispanic or Non-hispanic.
23	250	ST	O			PHVS_Count ry_FIPS_10-4	Birth Place	Country of Birth of subject of the message.
24	1	ID	O		0136		Multiple Birth Indicator	Not supported.
25	2	NM	O				Birth Order	Not supported.
26	250	CE	O	Y	0171	PHVS_Count ry_FIPS_10-4	Citizenship	Country of Citizenship of subject of the message.

HL7 Seq.	HL7 Len.	HL7 DT	HL7 Opt	HL7 RPT/#	HL7 Tbl #	PHIN Value Set	HL7 Element Name	Description/Comments
27	250	CE	O		0172		Veterans Military Status	Not supported.
28	250	CE	B		0212		Nationality	Not supported.
29	26	TS	O				Patient Death Date and Time	If the patient is known to be deceased at the time of the message, the patient death date/time should be sent in this field.
30	1	ID	O		0136	PHVS_YesNo_HL7_2x	Patient Death Indicator	If the patient is known to be deceased at the time of the message, the patient death indicator (Y) would be sent in this field along with the deceased date in PID-29
31	1	ID	O		0136	PHVS_YesNo_HL7_2x	Identity Unknown Indicator	There are times when this field could be populated to indicate that the treatment subject's identity is unknown. It is a relatively new HL7 field that simply contains Y or N.
32	20	IS	O	Y	0445		Identity Reliability Code	Not supported.
33	26	TS	O				Last Update Date/Time	This is the date/time of the last the demographics record update. This date/time is helpful for patient reconciliation purposes when populated by the sending application.
34	241	HD	O			OID Registry	Last Update Facility	The application that last updated the demographics record. This information is helpful for patient reconciliation when populated by the sending application. An OID may be passed to identify the facility.
35	250	CE	C		0446	PHVS_Species_CDC_CRA	Species Code	This information may be necessary for non-human subjects.
36	250	CE	C		0447	PHVS_Breed_CDC_CRA	Breed Code	This information is only relevant if PID-35 Species is populated.
37	80	ST	O				Strain	This information may be necessary to further define non-human living subjects
38	250	CE	O	2	0429	PHVS_ProductionClass_HL7_2x	Production Class Code	This information may be necessary for tracking and identification of non-human subjects.
39	250	CWE	O	Y	0171		Tribal Citizenship	

AL1 - Patient Allergy Information Segment

The AL1 segment may contain patient allergy information of various types, if the sending system chooses to populate it. Each AL1 segment instance describes a single patient allergy.

HL7 Seq.	HL7 Len.	HL7 DT	HL7 Opt	HL7 RPT/#	HL7 Tbl #	PHIN Value Set	HL7 Element Name	Description/Comments
1	4	SI	R				Set ID - AL1	This field contains the segment repeat number. For the first occurrence of the segment, the sequence number is 1 , for the second allergy occurrence is 2 , etc.
2	250	CE	O		0127	PHVS_Allergen Type_HL7_2x	Allergen Type Code	This field indicates a general allergy category (drug, food, pollen, etc.).
3	250	CE	R			PHVS_Allergen_CDC	Allergen Code/Mnemonic/Description	This field uniquely identifies a particular allergen. The value set conforms to the CHI recommendations for Allergen Codes.
4	250	CE	O		0128	PHVS_AllergySeverity_HL7_2x	Allergy Severity Code	May indicate the general severity of the allergy.
5	15	ST	O	Y			Allergy Reaction Code	May contain a string of text that describes the specific allergic reaction. (The "code" in the name is misleading, since the data type is String.)
6	8	DT	B				Identification Date	Not supported

ORC - Common Order Segment

The Common Order segment (ORC) is used in the RAS message to transmit referral information and Campaign ID, if available. The ORC is a required segment for this message. The Order Control Code must be "RE".

HL7 Seq	HL7 Len.	HL7 DT	HL7 Opt	HL7 RPT /#	HL7 Tbl #	PHIN Value Set	HL7 Element Name	Description/Comments
1	2	ID	R		0119		Order Control	The Order Control Code determines the function of the order segment. For purposes of this message, the default value will be 'RE' (Observations/Performed Service to Follow) since it is a required field.
2	22	EI	C				Placer Order Number	Not supported.
3	22	EI	C				Filler Order Number	Not supported.
4	22	EI	O				Placer Group Number	This field may be used to carry the name and id for the campaign under which the patient is being treated. The second component would contain the OID for the assigning authority.
5	2	ID	O		0038		Order Status	Not supported.
6	1	ID	O		0121		Response Flag	Not supported.
7	200	TQ	B	Y			Quantity/Timing	Not supported.
8	200	EIP	O				Parent	Not supported.
9	26	TS	O				Date/Time of Transaction	Not supported.
10	250	XCN	O	Y			Entered By	Not supported.
11	250	XCN	O	Y			Verified By	Not supported.
12	250	XCN	O	Y		PHVS_NameType_HL7_2x PHVS_DegreeLicenseCertificate_HL7_2x	Ordering Provider	May contain name and identification information on the provider who ordered the substance administration.
13	80	PL	O				Enterer's Location	Not supported.
14	250	XTN	O	Y/2		PHVS_TelecommunicationEquipmentType_HL7_2x PHVS_TelecommunicationUseCode_HL7_2x	Call Back Phone Number	May contain a contact phone number for the provider who ordered the substance administration.
15	26	TS	O				Order Effective Date/Time	Not supported.
16	250	CE	O				Order Control Code Reason	Not supported.
17	250	CE	O				Entering Organization	Not supported.

HL7 Seq	HL7 Len.	HL7 DT	HL7 Opt	HL7 RPT /#	HL7 Tbl #	PHIN Value Set	HL7 Element Name	Description/Comments
18	250	CE	O				Entering Device	Not supported.
19	250	XCN	O	Y			Action By	Not supported.
20	250	CE	O		0339		Advanced Beneficiary Notice Code	Not supported.
21	250	XON	O	Y		PHVS_NameType_HL7_2x	Ordering Facility Name	This field is used to capture the name of the organization that ordered the substance administration.. The OID for the assigning authority would be in component 10.
22	250	XAD	O	Y		PHVS_AddressType_HL7_2x PHVS_Country_FIPS_10-4 PHVS_State_FIPS_5-2 PHVS_County_FIPS_6-4 PHVS_Zipcode_USPS	Ordering Facility Address	This field may contain the phone number of the organization that ordered the substance administration..
23	250	XTN	O	Y		PHVS_TelecommunicationEquipmentType_HL7_2x PHVS_TelecommunicationUseCode_HL7_2x	Ordering Facility Phone Number	This field may contain the phone number of the organization that ordered the substance administration..
24	250	XAD	O	Y		PHVS_AddressType_HL7_2x PHVS_Country_FIPS_10-4 PHVS_State_FIPS_5-2 PHVS_County_FIPS_6-4 PHVS_Zipcode_USPS	Ordering Provider Address	This field may contain the address of the physician or other provider who ordered the substance administration.. The name and phone number of this person are passed in ORC12 and ORC-14 respectively.
25	250	CWE	O				Order Status Modifier	Not supported.
26	60	CWE	C		0552		Advanced Beneficiary Notice Override Reason	Not supported.
27	26	TS	O				Filler's Expected Availability Date/Time	Not supported.
28	250	CWE	O		0177		Confidentiality Code	Not supported.
29	250	CWE	O		0482		Order Type	Not supported.
30	250	CNE	O		0483		Enterer Authorization Mode	Not supported.

RXA - Pharmacy/Treatment Administration Segment

The RXA segment carries information regarding the vaccine or substance that was administered.

HL7 Seq.	HL7 Len.	HL7 DT	HL7 Opt	HL7 RPT /#	HL7 Tbl #	PHIN Value Set	HL7 Element Name	Description/Comments
1	4	NM	R				Give Sub-ID Counter	This field's value is zero (0), as it is a required field for this segment but the Sub_ID counter is not applicable for this implementation.
2	4	NM	R				Administration Sub-ID Counter	This field starts with 1 the first time that medication/treatment is administered for this order. It indicates the dose number of the substance the patient has received in this administration. This field may be used to indicate progress for series administrations (i.e., anthrax vaccine).
3	26	TS	R				Date/Time Start of Administration	This is the beginning time of substance administration.
4	26	TS	R				Date/Time End of Administration	If the substance is administered over a period of time, as in intravenous administration of an antibiotic, this field is the end time of substance administration. The field will default to the start date/time as in RXA-3, otherwise.
5	250	CE	R		0292	PHVS_SubstanceAdministered_CDC_CRA	Administered Code	Identifier of the medical substance/treatment administered. It is equivalent to <i>OBR-4-universal service ID</i> in function. The value set may differ based on the campaign or protocol; currently the value set reflects the join of the CVX Vaccine codes and the UMLS values for antibiotics.
6	20	NM	R				Administered Amount	This field contains the amount administered. The amount will default to '1' unless the amount is otherwise specified.

HL7 Seq.	HL7 Len.	HL7 DT	HL7 Opt	HL7 RPT /#	HL7 Tbl #	PHIN Value Set	HL7 Element Name	Description/Comments
7	250	CE	C			PHVS_AdministeredUnits_CDC_CRA	Administered Units	This field is conditional because it is required if the administered amount code does not imply units. This field must be in simple units that reflect the actual quantity of the substance administered. It does not include compound units.
8	250	CE	O				Administered Dosage Form	Not supported
9	250	CE	O	Y			Administration Notes	This field contains notes from the provider administering the medication/treatment. If coded, requires a user-defined table. If free text (describing a custom IV, mixture, or salve, for example) place a null in the first component and the text in the second, e.g., ^this is a free text administration note .
10	250	XCN	O	Y		PHVS_HL7_Name_Type PHVS_DegreeLicenseCertificate_HL7_2x	Administering Provider	This field contains the provider ID and name of the person administering the pharmaceutical/treatment.
11	200	LA2	C			OID Registry	Administered-at Location	The 4 th component of this field may contain an OID that represents the organization/physical location where the substance was administered.
12	20	ST	C				Administered Per (Time Unit)	Contains the rate at which this medication/treatment was administered as calculated by using <i>RXA-6-administered amount</i> and <i>RXA-7-administered units</i> . This field is conditional because it is required when a treatment is administered continuously at a prescribed rate, e.g., certain IV solutions.

HL7 Seq.	HL7 Len.	HL7 DT	HL7 Opt	HL7 RPT /#	HL7 Tbl #	PHIN Value Set	HL7 Element Name	Description/Comments
13	20	NM	O				Administered Strength	Use when <i>RXA-5-Administered Code</i> does not specify the strength. This is the numeric part of the strength, used in combination with <i>RXA-14-Administered Strength Units</i> .
14	250	CE	O			PHVS_UnitsOf Measure_CDC	Administered Strength Units	Use when <i>RXA-5-Administered Code</i> does not specify the strength. This is the units of measure for the strength specified in RXA13.
15	20	ST	O	Y			Substance Lot Number	The lot number of the medical substance administered. In the case of single administration doses, the lot number pre-printed on the label of the vaccination material is sufficient to track the substance. In cases where a batch of the substance is prepared, a batch number unique to that preparation is assigned and would be the value passed in this field upon administration of the substance. Both the vaccine lot and the diluent lot are tracked as part of the documentation of substance preparation, but for the administration event, these values are not captured.
16	26	TS	O	Y			Substance Expiration Date	The expiration date of the medical substance administered. If the expiration date does not include a specific day, the expiration date may be transmitted as YYYYMM.
17	250	CE	O	Y	0227	PHVS_Vaccine Manufacturers_HL7_2x	Substance Manufacturer Name	The manufacturer of the medical substance that was administered. For this message, the manufacturer is expressed as an entity with an OID for the coding system.

HL7 Seq.	HL7 Len.	HL7 DT	HL7 Opt	HL7 RPT /#	HL7 Tbl #	PHIN Value Set	HL7 Element Name	Description/Comments
18	250	CE	O	Y		PHVS_SubstanceTreatmentRefusalReason_CD C_CRA	Substance/Treatment Refusal Reason	This field may contain the reason the patient refused the medical substance/treatment. Any entry in the field indicates that the patient did not take the substance.
19	250	CE	O	Y			Indication	Not supported.
20	2	ID	O		0332	PHVS_TreatmentCompletionStatus_HL7_2x	Completion Status	Status of treatment administration event.
21	2	ID	O		0323		Action Code – RXA	Not supported
22	26	TS	O				System Entry Date/Time	Date/time the administration information was entered into the source system. This field is used to detect instances where treatment administration information is inadvertently entered multiple times by providing a unique identification field. Under usual circumstances, this field would be provided automatically by the computer system rather than being entered by a person.
23	5	NM	O				Administered Drug Strength Volume	This numeric field defines the volume of the substance administered.
24	250	CWE	O			PHVS_UnitsOfMeasure_CDC	Administered Drug Strength Volume Units	Contains the unit of measure for the substance administered volume described RXA-23.
25	60	CWE	O				Administered Barcode Identifier	Contains a unique instance identifier for the administration. The instance identifier may be a barcode number for the given occurrence. This barcode may be available as part of a vaccination kit with a campaign. The kits contain preprinted labels with a vaccination event number that is unique across organizations.
26	1	ID	R		0480		Pharmacy Order Type	Not supported

RXR - Pharmacy/Treatment Route Segment

The Pharmacy/Treatment Route segment is used to pass the administration site for the substance.

HL7 Seq.	HL7 Len.	HL7 DT	HL7 Opt	HL7 RPT /#	HL7 Tbl #	PHIN Value Set	HL7 Element Name	Description/Comments
1	250	CE	R		0162	PHVS_RouteOfAdministration_HL7_2x	Route	This field is the route of administration. Some current "route codes," such as some of the NDC-derived codes include the site already. In such cases, the entire code can be included in this field as a "locally-defined code" for the CE data type.
2	250	CWE	O		0163	PHVS_BodySite_HL7_2x	Administration Site	The body site of administration.
3	250	CE	O		0164	PHVS_Administration_Device_HL7_2x	Administration Device	The mechanical device used to administer the substance.
4	250	CWE	O		0645	PHVS_Administration_Method_HL7_2x	Administration Method	This field identifies the specific method requested for the administration of the drug or treatment to the patient.
5	250	CE	O				Routing Instruction	Not supported
6	250	CWE	O		0495		Administration Site Modifier	Not supported

OBX - Observation/Result Segment

The OBX is used to convey the observation results. There may be multiple OBX segments reported under a single Observation Request segment. In adverse event reporting, multiple OBXs are clustered under an OBR to indicate information about a particular vaccine that was administered, details of a specific adverse event, etc.

HL7 Seq.	HL7 Len.	HL7 DT	HL7 Opt	HL7 RPT/#	HL7 Tbl #	PHIN Value Set	HL7 Element Name	Description/Comments
1	4	SI	O				Set ID – OBX	This field contains the sequence number of the OBX, which increments up by one for each observation segment in the group.
2	2	ID	C		0125		Value Type	This field contains the format of the observation value expressed in OBX-5. Value Type is required for this message. The expected value types SN, CE, TX or ST, to reflect Structured Numeric, Coded, ext or String observations.
3	250	CE	R			PHVS_EncounterObservations_CDC_CRA	Observation Identifier	This field contains a code that identifies the specific observation being passed in this segment. The format is that of the Coded Element (CE). Example: 21612-7^Reported Patient Age^LN.
4	20	ST	C				Observation Sub-ID	A sequence number in this field may be used to tie together observations with the same value in OBX-3.

HL7 Seq.	HL7 Len.	HL7 DT	HL7 Opt	HL7 RPT/#	HL7 Tbl #	PHIN Value Set	HL7 Element Name	Description/Comments
5	99999	variables	C			PHVS_EncounterType_CD C_CRA PHVS_AdverseEventCons equence_CD C_CRA PHVS_VaccinatedAtLocatio n_CDC_CRA PHVS_VaccinePurchased WithFunds_C DC_CRA PHVS_HistorySource_CD C_CRA PHVS_PreviousVaccination History_CDC _CRA PHVS_Occupation_SOC_2 000 PHVS_RiskCategory_CDC _CRA PHVS_Contraindications_ CDC_CRA	Observation Value	This field contains the actual result value or observation. The data type in OBX-2 Value Type indicates the format of the observation. It is not a required field because some systems will report the result using only the Abnormal Flag values in (OBX-Ø), especially in product experience reporting. The length of the observation field is variable, depending upon the value type. The Standard allows the observation value to repeat using a tilde (~) for multipart, single answer results with appropriate data types, e.g., CE, TX, ST and FT data types, but repeats are not recommended as it complicates parsing. The data is typically split across more than one OBX, tying the segments together with the Observation Sub-ID and the same value in OBX-3, Observation Identifier. As in the observation identifier, if the value type is CE, the first 3 components would reflect the universal result identifier, description, and its encoding system OID, whereas fields 4-6 would be used to convey the local result code, description as alternate result values, and local coding system OID.
6	250	CE	O			PHVS_UnitsOfMeasure_CDC	Units	Units of measure put the observation value expressed in OBX-5 into context. Units includes weight, height, age, and temperature units.
7	60	ST	O				References Range	Not supported
8	5	IS	O	Y	0078	PHVS_AbnormalFlag_HL7_2x	Abnormal Flags	This field may contain a qualifier assigned by the person making the observation. The Abnormal Flag details the observer's assessment as to whether the results are normal or abnormal; or it could be a value that says a therapeutic substance level is high or low.
9	5	NM	O				Probability	Not supported.

HL7 Seq.	HL7 Len.	HL7 DT	HL7 Opt	HL7 RPT/#	HL7 Tbl #	PHIN Value Set	HL7 Element Name	Description/Comments
10	2	ID	O	Y	0080		Nature of Abnormal Test	Not supported.
11	1	ID	R		0085	PHVS_ObservationResultStatus_HL7_2x	Observation Result Status	Observation Result Status is a required field. "F" (Final) can be used as a default code. Receipt of a subsequent message with the same filler number and a different status in this field implies processing on the receiving side may need to occur to update previous results.
12	26	TS	O				Effective Date of Reference Range Values	Not supported.
13	20	ST	O				User Defined Access Checks	Not supported.
14	26	TS	O				Date/Time of the Observation	This field used to capture the date/time that observation identified in OBX-3 was performed.
15	250	CE	O				Producer's ID	Not supported.
16	250	XCN	O	Y			Responsible Observer	Not supported.
17	250	CE	O	Y			Observation Method	Not supported.
18	22	EI	O	Y			Equipment Instance Identifier	Not supported.
19	26	TS	O				Date/Time of the Analysis	Not supported.

CTI - Clinical Trial Identification Segment

This optional segment may be used when substances are administered under a clinical trial protocol used for countermeasure administration purposes.

HL7 Seq.	HL7 Len.	HL7 DT	HL7 Opt	HL7 RPT/#	HL7 Tbl #	PHIN Value Set	HL7 Element Name	Description/Comments
1	60	EI	R				Sponsor Study ID	If the CTI segment is used, this field contains a universal identifier for the clinical trial. The coding system in this entity identifier would be an OID.
2	250	CE	C				Study Phase Identifier	This field may be used to further identify the phase of the clinical trial. There would be a code set dependent upon the protocol that represents the valid values for this field.
3	250	CE	O				Study Scheduled Time Point	May identify a time point in the clinical trial phase. If this field is populated, the phase must be identified in CTI-2.

5. Data Types

Only those data types which are used within this guide have been included.

Data Type	Data Type Description
CE	Coded Element
CNN	Composite ID number and name simplified
CX	Extended Composite ID with Check Digit
DTM	Date Time
EI	Entity Identifier
FN	Family Name
HD	Hierarchic Designator
ID	Coded Value for HL7 defined tables
IS	Coded Value for User defined tables
MSG	Message Type
NM	Numeric Data
PT	Processing Type
SAD	Street Address
SI	Sequence ID
SN	Structured Numeric Data
ST	String Data
TS	Time Stamp
TX	Text Data
VID	Version Identifier
XAD	Extended Address
XCN	Extended Coded Name
XON	Extended Organization Name and ID
XPN	Extended Person Name
XTN	Extended Telephone Number

CE - Coded Element

HL7 Component Table - CE – Coded Element

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS
1	20	ST	0		Identifier	
2	199	ST	0		Text	
3	20	ID	0	0396	Name of Coding System	
4	20	ST	0		Alternate Identifier	
5	199	ST	0		Alternate Text	
6	20	ID	0	0396	Name of Alternate Coding System	

Definition: This data type transmits coded values and the text associated with the code. Codes that represent the PHIN standard coding systems should be placed in the first set of components. Locally defined codes – if it desired to provide them – should go in the second set – alternate ID, text and coding system. HL7 recommended maximum length is 483 characters, but with the use of OIDs to represent the relevant coding system, the CE maximum length has been increased to 836 for PHIN messaging.

CNN - Composite ID Number and Name Simplified

HL7 Component Table - CNN - Composite ID Number and Name Simplified

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS
1	15	ST	O		ID Number	
2	50	ST	O		Family Name	
3	30	ST	O		Given Name	
4	30	ST	O		Second and Further Given Names or Initials Thereof	
5	20	ST	O		Suffix (e.g., JR or III)	
6	20	ST	O		Prefix (e.g., DR)	
7	5	IS	O	0360	Degree (e.g., MD)	
8	4	IS	C	0297	Source Table	
9	20	IS	C	0363	Assigning Authority - Namespace ID	OID
10	199	ST	C		Assigning Authority - Universal ID	
11	6	ID	C	0301	Assigning Authority - Universal ID Type	

Definition: Specifies a person using both an identifier and the person's name. For PHIN messaging, component #9, the Assigning Authority namespace ID, will contain the OID that indicates the namespace for the identifier. The OIDs used to identify entities will be available for look-up in the PHIN-VADS OID Registry.

CX - Extended Composite ID with Check Digit

HL7 Component Table - CX - Extended Composite ID with Check Digit

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS
1	15	ST	R		ID Number	
2	1	ST	O		Check Digit	null if ID is alphanumeric
3	3	ID	O	0061	Check Digit Scheme	null if ID is alphanumeric
4	227	HD	O	0363	Assigning Authority	OID
5	5	ID	O	0203	Identifier Type Code	PHVS_EI_TYPE
6	227	HD	O		Assigning Facility	
7	8	DT	O		Effective Date	
8	8	DT	O		Expiration Date	
9	705	CWE	O		Assigning Jurisdiction	
10	705	CWE	O		Assigning Agency or Department	

Definition: This data type specifies an identifier with its associated administrative detail. Maximum length is 1913 characters.

It is important to note that, for PHIN messaging, component #4, assigning authority, will be filled with the OID that indicates the namespace for the identifier. This namespace, in effect, identifies both the assigning authority and the type of identifier. As a result, the identifier type code value, component #5, can be inferred from the chosen OID. The OIDs used to identify entities will be available for look-up in the PHIN-VADS OID Registry.

DTM - Date/Time

HL7 Component Table - DTM – Date/Time

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS	SEC.REF.
	24				Date/Time		

Definition: This data type specifies a point in time using a 24-hour clock notation. It is a component of the Timestamp datatype and does not appear on its own in these messages. Maximum length is 24. The number of digits specifies the precision, in that:

- a) only the first four are used to specify a precision of "year"
- b) the first six are used to specify a precision of "month"
- c) the first eight are used to specify a precision of "day"
- d) the first ten are used to specify a precision of "hour"
- e) the first twelve are used to specify a precision of "minute"
- f) the first fourteen are used to specify a precision of "second"
- g) the first sixteen are used to specify a precision of "one tenth of a second"
- h) the first nineteen are used to specify a precision of "one ten thousandths of a second"

EI - Entity Identifier

HL7 Component Table - EI – Entity Identifier

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS
1	199	ST	O		Entity Identifier	
2	20	IS	O	0363	Namespace ID	
3	199	ST	C		Universal ID	
4	6	ID	C	0301	Universal ID Type	

Definition: This datatype indicates an identifier that defines a given entity within a specified series of identifiers. Maximum length is 427 characters.

It is important to note that, for PHIN messaging, component #3, Universal ID, will contain the OID that indicates the namespace for the identifier. The presence of the Universal ID requires the Universal ID Type to be valued in component #4. Since OIDs are dictated for component 3, the value "ISO" should appear in component 4. The OIDs used to identify entities are available for look-up in the PHIN-VADS OID Registry.

FN - Family Name

HL7 Component Table - FN – Family Name

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS
1	50	ST	R		Surname	surname will be the only component supported in the Family Name field of the Extended Person Name field
2	20	ST	O		Own Surname Prefix	
3	50	ST	O		Own Surname	
4	20	ST	O		Surname Prefix From Partner/Spouse	
5	50	ST	O		Surname From Partner/Spouse	

Definition: This data type allows full specification of the surname of a person. The FN data type is included here only because it is a component of the Extended Person Name (XPN) data type. In reality, the surname that is passed as the first component of this field is the only portion of the FN data type that will be supported. Maximum length is 194 characters.

HD - Hierarchic Designator

HL7 Component Table - HD – Hierarchic Designator

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS
1	20	IS	O	0300	Namespace ID	Note item is grayed out.
2	199	ST	C		Universal ID	
3	6	ID	C	0301	Universal ID Type	

Definition: The Hierarchic Designator data type identifies a system or application or other entity that has responsibility for managing or assigning a defined set of instance identifiers (such as placer or filler number, patient identifiers, provider identifiers, etc.).

For PHIN messaging, component #2, Universal ID, will contain the OID that indicates the namespace for the identifier. The presence of the Universal ID requires the Universal ID Type to be valued in component #3. Since OIDs are dictated for component 3, the value "ISO" should appear in component 4. The OIDs used to identify entities are available for look-up in the PHIN-VADS OID Registry.

ID - Coded Value for HL7 Defined Tables

HL7 Component Table - ID – String Data

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS
					Coded Value for HL7-Defined Tables	

Definition: The ID data type indicates that the value is drawn from a HL7 table of legal values. data type is used only for HL7 tables. Maximum length of data with this data type varies.

IS - Coded Value for User-Defined Tables

HL7 Component Table - IS – String Data

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS
	20				Coded Value for User-Defined Tables	

Definition: The IS data type indicates that the value is drawn from a site-defined (or user-defined) table of legal values. There is an HL7 table number associated with IS data types. Maximum length is 20 characters.

LA2 - location with address variation 2

HL7 Component Table – LA2 – Location with Address Variation 2

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS
1	20	IS	O	302	Point of Care	
2	20	IS	O	303	Room	
3	20	IS	O	304	Bed	
4	227	HD	O		Facility	
5	20	IS	O	306	Location Status	
6	20	IS	O	305	Patient Location Type	
7	20	IS	O	307	Building	
8	20	IS	O	308	Floor	
9	120	ST	O		Street Address	
10	120	ST	O		Other Designation	
11	50	ST	O		City	
12	50	ST	O		State or Province	
13	12	ST	O		Zip or Postal Code	
14	3	ID	O	399	Country	
15	3	ID	O	190	Address Type	
16	50	ST	O		Other Geographic Designation	

Definition: Specifies a location and its address. With PHIN messaging, the OID that represents the facility where the vaccination is given is passed in the 4th component. Maximum length is 790 characters.

MSG – Message Type

HL7 Component Table - MSG – Message Type

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS
1	3	ID	R	0076	Message Code	
2	3	ID	R	0003	Trigger Event	
3	7	ID	R	0354	Message Structure	

Definition: This data type is used only in MSH-9 to indicate the type of format, content, and intent of the message. Maximum length is 15 characters.

NDL – Name with Date and Location

HL7 Component Table - NDL – Name with Date and Location

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS
1	406	CNN	O		Name	
2	26	TS	O		Start Date/time	
3	26	TS	O		End Date/time	
4	20	IS	O	0302	Point of Care	
5	20	IS	O	0303	Room	
6	20	IS	O	0304	Bed	
7	227	HD	O		Facility	
8	20	IS	O	0306	Location Status	
9	20	IS	O	0305	Patient Location Type	
10	20	IS	O	0307	Building	
11	20	IS	O	0308	Floor	

Definition: Specifies the name of the person performing a service, when the person performed the service and where the person performed the service. PHIN is using only the first component to capture a code and name. (See CNN datatype) Maximum length is 835 characters.

NM - Numeric

HL7 Component Table - NM – Numeric

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS
	16				Numeric	

Definition: This field contains a number with optional leading sign (+ or -), digits and an optional decimal point. In the absence of a sign, the number is assumed to be positive. If there is no decimal point the number is assumed to be an integer. Leading zeros, or trailing zeros after a decimal point, are not significant. Maximum length is 16 characters.

Except for the optional leading sign (+ or -) and the optional decimal point (.), no non-numeric ASCII characters are allowed, thus, the value <6 should be encoded as the structured numeric (SN) data type.

PT - Processing Type

HL7 Component Table - PT – Processing Type

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS
1	1	ID	O	0103	Processing ID	
2	1	ID	O	0207	Processing Mode	

Definition: This data type is used only in MSH-11 to indicate the type of processing that may be performed on the message (Debugging, Production, Training). Maximum length is 3 characters.

SAD – Street Address

HL7 Component Table - SAD – Street Address

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS
1	120	ST	O		Street or Mailing Address	
2	50	ST	O		Street Name	
3	12	ST	O		Dwelling Number	

Definition: This data type is a component of the XAD Extended Address data type. For this message, only data in the first component will be parsed into the street address field. Maximum length is 184 characters.

SI - Sequence ID

HL7 Component Table - SI – Sequence ID

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS
	4				Sequence ID	

Definition: The SI provides a numeric sequencing for segments that may repeat. Maximum length is 4 digits.

SN – Structured Numeric

HL7 Component Table - SN – Structured Numeric

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS
1	2	ST	O		Comparator	Defined as greater than, less than, greater than or equal, less than or equal, equal, and not equal, respectively (= ">" or "<" or ">=" or "<=" or "=" or "<>") If this component is not valued, it defaults to equal ("=").
2	15	NM	O		Num1	
3	1	ST	O		Separator/Suffix	"-" or "+" or "/" or "." or ":"
4	15	NM	O		Num2	

Definition: The structured numeric data type unambiguously expresses numeric results that are not simply integers or real numbers. This enables receiving systems to parse and store the components separately. The corresponding sets of values indicated with the <comparator> and <separator/suffix> components are intended by HL7 to be the authoritative and complete set of values. If additional values are needed for the <comparator> and <separator/suffix> components, they should be submitted to HL7 for inclusion in the Standard.

If <num1> and <num2> are both non-null, then component 3 must contain a valid separator/suffix. If the separator is "-", the data range is inclusive; e.g., <num1> - <num2> defines a range of numbers x, such that: <num1> <=x<= <num2>.

ST - string data

HL7 Component Table - ST – String Data

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS
	199				String Data	

Definition: String data is comprised of any ASCII characters except the escape and delimiter characters. The ST datatype is intended for short strings of less than 200 characters. For longer strings, the TX data type should be used. Maximum length is 199 characters.

TS - Time Stamp

HL7 Component Table - TS – Time Stamp

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS
1	24	DTM	R		Time	
2	1	ID	B	0529	Degree of Precision	

Definition: The Timestamp data type indicates a point in time. Only the first component, which is of the previously described Date/Time data type, is supported. Maximum length is 4 digits.

TX - Text Data

Component Table - TX – Text Data

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS
					Text Data	

Definition: The TX data type is used for string data meant for user display (on a terminal or printer). TX supports leading spaces in the field (that is, not necessarily left justified) as this may enhance the presentation to the user.

HL7 describes the use of the repeat delimiter as a paragraph terminator or hard carriage return, causing a receiving system to start any line beginning with a repeat delimiter on a new line. PHIN discourages repeats in OBX-5. To facilitate parsing, it is recommended that each line be sent as a repeat of the entire OBX segment, using the same OBX-3 value and incrementing the OBX-4 Sub-ID field to maintain line sequencing. Maximum length is 65536 characters.

VID – Version Identifier

HL7 Component Table - VID – Version Identifier

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS
1	5	ID	O	0104	Version ID	
2	483	CE	O	0399	Internationalization Code	
3	483	CE	O		International Version ID	

Definition: The VID data type is used to identify the version of HL7. The data type appears in MSH-12 Version ID in this message. Maximum length is 973 characters, although in practical terms a maximum of 5 characters are expected.

XAD - Extended Address

HL7 Component Table - XAD – Extended Address

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS
1	184	SAD	O		Street Address	
2	120	ST	O		Other Designation	
3	50	ST	O		City	
4	50	ST	O		State or Province	
5	12	ST	O		Zip or Postal Code	
6	3	ID	O	0399	Country	
7	3	ID	O	0190	Address Type	
8	50	ST	O		Other Geographic Designation	
9	20	IS	O	289	County/Parish Code	
10	20	IS	O	288	Census Tract	
11	1	ID	O	465	Address Representation Code	
12	53	DR	B		Address Validity Range	
13	26	TS	O		Effective Date	
14	26	TS	O		Expiration Date	

Definition: The XAD data type is used to convey complete address information for a person or organization. Maximum length is 631 characters.

XON - Extended Composite Name and Identification Number for Organizations

HL7 Component Table - XON – Extended Composite Name and Identification Number for Organizations

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS
1	50	ST	O		Organization Name	
2	20	IS	O	0204	Organization Name Type Code	
3	4	NM	B		ID Number	
4	1	NM	O		Check Digit	
5	3	ID	O	0061	Check Digit Scheme	
6	227	HD	O	0363	Assigning Authority	
7	5	ID	O	0203	Identifier Type Code	
8	227	HD	O		Assigning Facility	
9	1	ID	O	0465	Name Representation Code	
10	20	ST	O		Organization Identifier	

Definition: The XON data type is used to specify name and identification information for an organization. The maximum length is 567 characters.

For PHIN messaging, component #10, Organization Identifier, will contain the OID that indicates the namespace for the identifier. This namespace, in effect, indicates both the assigning authority and the type of identifier. As a result, the identifier type code value, component #7, and all the other components of the XON data type can be inferred from the chosen OID and are not supported. The OIDs used to identify entities will be available for look-up in the PHIN-VADS OID Registry.

XPN - Extended Person Name

HL7 Component Table - XPN- Extended Person Name

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS
1	194	FN	O		Family Name	
2	30	ST	O		Given Name	
3	30	ST	O		Second and Further Given Names or Initials Thereof	
4	20	ST	O		Suffix (e.g., JR or III)	
5	20	ST	O		Prefix (e.g., DR)	
6	6	IS	B	0360	Degree (e.g., MD)	
7	1	ID	O	0200	Name Type Code	
8	1	ID	O	0465	Name Representation Code	
9	483	CE	O	0448	Name Context	
10	53	DR	B		Name Validity Range	
11	1	ID	O	0444	Name Assembly Order	
12	26	TS	O		Effective Date	
13	26	TS	O		Expiration Date	
14	199	ST	O		Professional Suffix	

Definition: The XPN data type is used to convey complete name information for a person. Family Name or surname in the first component was previously described. Maximum length is 1103 characters.

XTN - Extended Telecommunication Number

HL7 Component Table - XTN – Extended Telecommunication Number

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS
1	199	ST	B		Telephone Number	
2	3	ID	O	0201	Telecommunication Use Code	
3	8	ID	O	0202	Telecommunication Equipment Type	
4	199	ST	O		Email Address	
5	3	NM	O		Country Code	
6	5	NM	O		Area/City Code	
7	9	NM	O		Local Number	
8	5	NM	O		Extension	
9	199	ST	O		Any Text	
10	4	ST	O		Extension Prefix	
11	6	ST	O		Speed Dial Code	
12	199	ST	C		Unformatted Telephone number	

Definition: The XTN data type is used to convey telephone or other telecommunications information for a person or organization. The formatted telephone number in the first field is not supported. Maximum length is 1103 characters.

6. Use of Object Identifiers (OIDs)

In order for computers to manipulate information about objects, those objects (and sometimes the records about the objects) need to be uniquely identified in some way. Health Level Seven has identified OIDs¹ as the preferred mechanisms for the unambiguous global identity of coding systems. This section describes how OIDs are used within PHIN messaging.

An OID is a character string made up of clauses that are concatenated together. The complete string is hierarchical in structure, and architected as a well-formed tree. Each node of the tree represents a namespace, where all branches under that node are unique. There are several representations of OIDs, but the one accepted by everyone is completely numeric with no embedded spaces or special characters. The different representations are fully isomorphic, but the non-numeric ones tend to be harder for machines to process efficiently. In the numeric representation, each node in the tree is given a unique numeric id, which is a non-zero positive integer (except for the zero at one root of the tree). The OID is constructed by putting a dot (decimal point, period, etc.) after the current node, then assigning a unique integer next. This process is repeated to construct a tree of arbitrary depth. At the top of the tree, there are three roots currently:

- 0 - ITU-T (International Telecommunication Union Standardization Sector) assigned
- 1 - ISO assigned
- 2 - Joint ISO/ITU-T assignment

Each of these three organizations maintains a namespace of the OIDs that they assign. Due to the hierarchical structure of OIDs, responsibility for maintenance and further assignment of any branch may be delegated to any organization that agrees to manage that branch. Therefore, the 2 root and the branches immediately below that are maintained by a joint ISO/ITU-T committee, and branch 2.16.840.1 is for US companies. A couple of important OIDs are immediately below that are managed by their respective organizations:

- 2 2.16.840.1.113883 – Health Level Seven, Inc.
- 3 2.16.840.1.114222 – Centers for Disease Control and Prevention (CDC)

Since an ISO OID is merely the globally unique identifier of an object, and any OID that is not a leaf on the OID tree is a namespace of objects, OIDs are very well suited to namespace management. HL7 has recommended that all coding systems used in message fields carrying coded data for Version 3 use HL7-registered OIDs to uniquely identify the coding system. HL7 also suggests that OIDs may be used for the namespace identifiers (the identifier 'root') in the fields that are of Instance Identifier data types in V3 messages.

Structure and Use at CDC

¹ The International Standards Organization (ISO) has developed the OID mechanism for the assignment of globally unique identifiers to any type of object in a decentralized way that retains some traceability of the object so identified. The Internet Engineering Task Force (IETF) realized the utility of this mechanism, and formalized it in RFC 1778. This was further refined after comments and a desire for increased usability on the World Wide Web and released again in RFC 2252. The W3C supports the use of OIDs, and they are also consistent with the implementation of DNS out on the Web.

PHIN Messaging uses OIDs for three primary purposes:

- **Identification of Well Known Objects:** These are organizations and places that are significant for messaging. Currently, the only parties who are assigned OIDs of this type are the parties who act as senders and receivers of messages.
- **Identification of Namespaces used in Public Health:** These are the namespaces within which identifiers are unique. The namespace OID indicates the organization assigning the identifier as well as the type of identifier being assigned. This usage is shown within the EI and CX data types.
- **Identification of Vocabulary items:** These are the structures – coding system and value set - used to organize vocabulary concepts and the codes used to represent them. This usage is shown within the CE, CWE, and CQ data types.

All of the OIDs that are assigned by CDC to support PHIN Messaging are based on the CDC OID with a suffix to indicate that the OID is assigned for use by the PHIN. This initial part of the OID is known as the PHIN root, and it is constructed by adding “.4” to CDC’s OID. The PHIN root, therefore, is “2.16.840.1.114222.4”. Except for HL7 defined coding systems, all the OIDs used in PHIN Messaging will start with the PHIN root.

OIDs for Well Known Objects

These OIDs identify message senders and receivers. The OIDs that are assigned are created as follows.

Start with the PHIN root.

Add a suffix that indicates this OID represents a partner ID. (Note, this suffix indicates which type of “information artifact” the OID is assigned to.)

Add a suffix that identifies the messaging partner in question

The OID that emerges has the following structure: [PHIN_root] + [Info_artifact = Partner id] + [partner specific indicator].

OIDs for Public Health Namespaces

The OID for public health namespaces are used to guarantee identifier uniqueness. It is important to note that namespace identifiers will only be used for identifiers that are locally assigned – that is to say – by the message sending organization. This could include such items as referral ids, and ids for drug or vaccine administrations. The namespace OIDs are built under the assumption that identifier uniqueness is guaranteed by the application creating the message; they include a component which identifies the software instance involved. The OIDs that are assigned for identifier namespaces are created as follows:

- 1) Start with the PHIN root.
- 2) Add a suffix (4.3.2.1) that indicates this is an instance of the Results Reporting application. Actually the suffix breaks down into (4-info artifacts) + (3.2 application software) + (1 LRN application)
- 3) Add a suffix that identifies the organization or site that is creating the message.
- 4) Add a suffix that identifies the software instance that is creating or recording the identifier. These suffixes will be sequential integers. I.e., 1, 2, 3, ...
- 5) Add a suffix that indicates the type of identifier being issued.

The following list indicates the suffixes that are currently supported.

Identifier/Namespace Type	Suffix
Messaging Partners	4.1
Information Artifacts	4.3
Coding Systems	4.5
External Coding Systems	4.6
External Namespaces	4.7
Surveillance Areas	4.8
Partner Namespaces	4.9
Value Sets	4.11

The OID that emerges has the following structure: [PHIN_root] + [Info_artifact = identifier namespace] + [partner specific indicator] + [software instance] + [namespace type indicator].

The reader may wonder why suffixes are not provided for provider IDs, or for the variety of identifiers assigned to patients, e.g., SSN, driver's license number. The reason is that these identifiers are currently handled as "external" identifiers. That is, they are treated as identifiers for which the name space specification is not rigorously possible.

OIDs for Vocabulary Items

Vocabulary items used in these Guides are drawn from two sources: Health Level 7, and the CDC PHIN. Their OID assignment reflects this by using either the PHIN root, or the HL7 root as the starting point for OID construction. The OIDs that are assigned for identifier namespaces are created as follows:

- 1) Start with the appropriate root. This will either be the PHIN root or the HL7 one.
- 2) Add a suffix that indicates whether the vocabulary item is a coding system or a value set.
- 3) Add a suffix that identifies the particular vocabulary item.

The reader should note that it is the coding system OID, not the one for the value set that will appear in messages.

Refer to the section on vocabulary items to find the OIDs assigned to coding systems and values sets.

7. Code Systems & Value Sets

This section contains the vocabulary items to be used with the described message. Every field in a message that contains one or more coded values has its value constrained by the specific list of values that are permitted in that field. Over time, the “list of values” that is associated with a field will change. Successful message implementation requires that transmitted messages (message instances) contain valid values for coded fields. However, since the list of valid codes changes from time to time, it is also important to make sure that updates to the valid vocabularies are properly managed. The segment tables in the previous sections associate a Table to each of these coded fields, and these tables are listed in this section below. The entry for each table enumerates all of the code values that may be used for the specified field, as those code values are known at the time of publishing this guide.

PHIN messaging uses the HL7 defined code sets where these have been identified and published by HL7. For “user defined” tables, it uses those developed by PHIN messaging for use in public health. However, all tables are implemented using PHIN vocabulary principles. These principles mandate the assignment of object identifiers (OIDs) as the identifiers for code systems. These OIDs are identified, along with code values, within the PHIN Vocabulary Authoring and Distribution System (VADS). It is also important to be aware of the fact that code sets are relatively dynamic, and are subject to change between publications of these implementation guides. As a result, the VADS will be used to make updated code values available. This key PHIN application is discussed below.

Every code value that is passed in a message instance is drawn from a code system, which has an OID associated with it as a globally unique identifier of the code system. In the general case, a) the coded values allowed in a field may be drawn from more than one code system, and b) the coded values are a subset of the codes from a given coding system. Combining (a) and (b) makes it possible for the allowed code value to be a combination of multiple subsets drawn from multiple coding systems. In most cases, only some of the codes defined in a code system are legal for use in a particular message.

The subsets of the codes that are legal for a particular field are identified by an HL7 construct known as a Value Set. A value set is a collection of coded values drawn from code systems. Value sets serve to identify the specific set of coded values for the message from the universe of coded values across all coding systems.

The segment tables in previous sections identify the PHIN Value Set that is used for each supported field containing a coded value. For fields that use the datatype CE or CWE, these datatypes require that messages include the OID that uniquely defines the coding system as well as the coded value itself. It should be understood that some of these pre-coordinated value sets will need to be quickly updated or new ones created as new campaigns, new needs, and new sets of observations are identified.

The Value Sets are identified by an OID, but this OID does not get transmitted in the message. The OID for the coding system from which the value is derived is sent in the message. However, the value set OID is useful and important when vocabulary items are modified or replaced.

PHIN Vocabulary Management

Standards-based vocabularies are required for PHIN compliant applications and messages. PHIN Vocabulary Services (PHIN VS) provides a coordinated system for registering, identifying, mapping,

authoring, and editing standards-based vocabularies for PHIN stakeholders and applications. The PHIN Vocabulary Access and Distribution System (PHIN VADS) is a set of tools within the PHIN VS that provides a coordinated system for stakeholders to access, distribute, store, and manage vocabularies within and between applications. PHIN VADS components include an html browser for manual searching, viewing, and download of PHIN approved vocabularies, web services connections for automated functionalities, and a Java application programming interface (API) and data store which can facilitate the development and management of vocabularies within PHIN applications. For more information on PHIN VADS, the reader should refer to the PHIN VADS User Guide, Version 0.5. This document is available for download at the PHIN VADS website - <http://www.cdc.gov/PhinVSBrowser/StrutsController.do>.

The table below is a compilation of the Value Sets, Code Systems and their OIDs that have been pre-coordinated to be used in the Countermeasure Response Administration Messaging Guides. A brief description of usage throughout the Guides is also provided. Vocabulary discovery and PHIN-VADS updates will be an ongoing process. The table will be updated as vocabulary requirements change.

R & P Messaging Code System OID	R & P Messaging Code System Name	R & P Messaging Value Set Name	R & P Messaging Value Set OID	Usage
2.16.840.1.113883.12.78	PH_AbnormalFlag_HL7_2x	PHVS_AbnormalFlag_HL7_2x	2.16.840.1.114222.4.11.800	May be used in OBX segment on the individual observation
2.16.840.1.113883.12.190	PH_AddressType_HL7_2x	PHVS_AddressType_HL7_2x	2.16.840.1.114222.4.11.801	Address fields
2.16.840.1.113883.12.164	PH_AdministrationDevice_HL7_2x	PHVS_AdministrationDevice_HL7_2x	2.16.840.1.114222.4.11.802	Substance Administration
2.16.840.1.113883.12.165	PH_AdministrationMethod_HL7_2x	PHVS_AdministrationMethod_HL7_2x	2.16.840.1.114222.4.11.803	Substance Administration
2.16.840.1.113883.12.163	PH_BodySite_HL7_2x	PHVS_BodySite_HL7_2x	2.16.840.1.114222.4.11.804	Substance Administration
2.16.840.1.113883.12.1	PH_AdministrativeSex_HL7_2x	PHVS_AdministrativeSex_HL7_2x	2.16.840.1.114222.4.11.805	Patient Identification segment
2.16.840.1.113883.12.127	PH_AllergenType_HL7_2x	PHVS_AllergenType_HL7_2x	2.16.840.1.114222.4.11.806	Allergy information could be passed in Substance Administration or Referral message
2.16.840.1.113883.12.128	PH_AllergySeverity_HL7_2x	PHVS_AllergySeverity_HL7_2x	2.16.840.1.114222.4.11.807	Allergy information could be passed in Substance Administration or Referral message
2.16.840.1.113883.12.360	PH_DegreeLicenseCertificate_HL7_2x	PHVS_DegreeLicenseCertificate_HL7_2x	2.16.840.1.114222.4.11.808	Person name
2.16.840.1.113883.12.2	PH_MaritalStatus_HL7_2x	PHVS_MaritalStatus_HL7_2x	2.16.840.1.114222.4.11.809	Patient Identification segment
2.16.840.1.113883.12.200	PH_NameType_HL7_2x	PHVS_NameType_HL7_2x	2.16.840.1.114222.4.11.810	Person name (implied by location in field)
2.16.840.1.113883.12.85	PH_ObservationResultStatus_HL7_2x	PHVS_ObservationResultStatus_HL7_2x	2.16.840.1.114222.4.11.811	OBX-11 required field for observation result

R & P Messaging Code System OID	R & P Messaging Code System Name	R & P Messaging Value Set Name	R & P Messaging Value Set OID	Usage
2.16.840.1.113883.12.429	PH_ProductionClass_HL7_2x	PHVS_ProductionClass_HL7_2x	2.16.840.1.114222.4.11.812	PID segment when non-human subject
2.16.840.1.113883.12.63	PH_Relationship_HL7_2x	PHVS_Relationship_HL7_2x	2.16.840.1.114222.4.11.813	Next-of-Kin/Associated Parties segment, if used
2.16.840.1.113883.12.6	PH_Religion_HL7_2x	PHVS_Religion_HL7_2x	2.16.840.1.114222.4.11.814	Patient Identification segment
2.16.840.1.113883.12.123	PH_ResultStatus_HL7_2x	PHVS_ResultStatus_HL7_2x	2.16.840.1.114222.4.11.815	OBR-25 Required field when OBR segment used
2.16.840.1.113883.12.162	PH_RouteOfAdministration_HL7_2x	PHVS_RouteOfAdministration_HL7_2x	2.16.840.1.114222.4.11.816	Substance Administration
2.16.840.1.113883.12.202	PH_TelecommunicationEquipmentType_HL7_2x	PHVS_TelecommunicationEquipmentType_HL7_2x	2.16.840.1.114222.4.11.817	Telephone/fax/e-mail addresses
2.16.840.1.113883.12.201	PH_TelecommunicationUseCode_HL7_2x	PHVS_TelecommunicationUseCode_HL7_2x	2.16.840.1.114222.4.11.818	Telephone/fax/e-mail addresses
2.16.840.1.113883.12.136	PH_YesNo_HL7_2x	PHVS_YesNo_HL7_2x	2.16.840.1.114222.4.11.819	Yes/no indicator used for Deceased
2.16.840.1.113883.12.532	PH_ExpandedYesNo_HL7_2x	PHVS_ExpandedYesNo_HL7_2x	2.16.840.1.114222.4.11.820	May be used in OBX-5 as an observation response
2.16.840.1.113883.12.322	PH_CompletionStatus_HL7_2x	PHVS_TreatmentCompletionStatus_HL7_2x	2.16.840.1.114222.4.11.821	Referral message
2.16.840.1.113883.12.280	PH_ReferralPriority_HL7_2x	PHVS_ReferralPriority_HL7_2x	2.16.840.1.114222.4.11.822	Referral message
2.16.840.1.113883.12.336	PH_ReferralReason_HL7_2x	PHVS_ReferralReason_HL7_2x	2.16.840.1.114222.4.11.823	Referral message
2.16.840.1.113883.12.284	PH_ReferralCategory_HL7_2x	PHVS_ReferralCategory_HL7_2x	2.16.840.1.114222.4.11.824	Referral message
2.16.840.1.113883.12.282	PH_ReferralDisposition_HL7_2x	PHVS_ReferralDisposition_HL7_2x	2.16.840.1.114222.4.11.825	Referral message
2.16.840.1.113883.12.52	PH_DiagnosisType_HL7_2x	PHVS_DiagnosisType_HL7_2x	2.16.840.1.114222.4.11.827	Referral message where DG1 segment may be used; or in generic ORU, OBR-31 Reason for Study
2.16.840.1.113883.6.234	PH_Country_FIPS_10-4	PHVS_Country_FIPS_10-4	2.16.840.1.114222.4.11.828	Used in address fields, as birthplace, citizenship, and origin of message
2.16.840.1.113883.6.93	PH_County_FIPS_6-4	PHVS_County_FIPS_6-4	2.16.840.1.114222.4.11.829	May be used in address fields
2.16.840.1.113883.6.92	PH_State_FIPS_5-2	PHVS_State_FIPS_5-2	2.16.840.1.114222.4.11.830	Address fields
2.16.840.1.113883.6.100	PH_Language_ISO_639-2	PHVS_Language_ISO_639-2	2.16.840.1.114222.4.11.831	Patient Identification segment

R & P Messaging Code System OID	R & P Messaging Code System Name	R & P Messaging Value Set Name	R & P Messaging Value Set OID	Usage
2.16.840.1.113883.6.235	PH_Occupation_SOC_2000	PHVS_Occupation_SOC_2000	2.16.840.1.114222.4.11.832	Observation response
2.16.840.1.113883.6.236	PH_VaccineManufacturer_CDC	PHVS_VaccineManufacturer_CDC	2.16.840.1.114222.4.11.826	May be used as an observation response or sent with Substance Administration
2.16.840.1.113883.6.231	PH_Zipcode_USPS	PHVS_Zipcode_USPS	2.16.840.1.114222.4.11.833	Address fields
2.16.840.1.114222.4.5.200	PH_Allergen_CDC	PHVS_Allergen_CDC	2.16.840.1.114222.4.11.834	Allergy information could be passed in Substance Administration or Referral message
2.16.840.1.114222.4.5.201	PH_Breed_CDC	PHVS_Breed_CDC_CRA	2.16.840.1.114222.4.11.835	Used for non-human subject of message
2.16.840.1.113883.6.238	PH_RaceAndEthnicity_CDC	PHVS_RaceCategory_CDC	2.16.840.1.114222.4.11.836	Patient Identification segment
2.16.840.1.113883.6.238	PH_RaceAndEthnicity_CDC	PHVS_EthnicityGroup_CDC	2.16.840.1.114222.4.11.837	Patient Identification segment
2.16.840.1.114222.4.5.202	PH_UnitsOfMeasure_CDC	PHVS_UnitsOfMeasure_CDC	2.16.840.1.114222.4.11.838	Used to qualify numeric results, age, weight, height, and temperature
2.16.840.1.114222.4.5.203	PH_CaseContactType_CDC_CRA	PHVS_CaseContactType_CDC_CRA	2.16.840.1.114222.4.11.839	Observation response
2.16.840.1.114222.4.5.204	PH_PreviousVaccinationHistory_CDC_CRA	PHVS_PreviousVaccinationHistory_CDC_CRA	2.16.840.1.114222.4.11.840	Observation response
2.16.840.1.114222.4.5.205	PH_TakeResponse_CDC_CRA	PHVS_TakeResponse_CDC_CRA	2.16.840.1.114222.4.11.841	Observation response
2.16.840.1.114222.4.5.206	PH_SubstanceAdministered_CDC_CRA	PHVS_SubstanceAdministered_CDC_CRA	2.16.840.1.114222.4.11.842	Substance Administration or ORU Observation response
2.16.840.1.114222.4.5.207	PH_AdministeredUnits_CDC_CRA	PHVS_AdministeredUnits_CDC_CRA	2.16.840.1.114222.4.11.843	Substance Administration
2.16.840.1.114222.4.5.208	PH_ContactRole_CDC_CRA	PHVS_ContactRole_CDC_CRA	2.16.840.1.114222.4.11.844	Adverse Event
2.16.840.1.114222.4.5.209	PH_SubstanceBatchDeactivationReason_CDC_CRA	PHVS_SubstanceBatchDeactivationReason_CDC_CRA	2.16.840.1.114222.4.11.845	Batch disposition
2.16.840.1.114222.4.5.210	PH_EncounterPurpose_CDC_CRA	PHVS_EncounterPurpose_CDC_CRA	2.16.840.1.114222.4.11.846	Used to identify both Referral requested service and Encounter Type (OBR-4 Universal service ID value for Follow-up, Other Treatment, and Adverse Event)

R & P Messaging Code System OID	R & P Messaging Code System Name	R & P Messaging Value Set Name	R & P Messaging Value Set OID	Usage
2.16.840.1.114222.4.5.211	PH_EncounterType_CD_CRA	PHVS_EncounterType_CD_CRA	2.16.840.1.114222.4.11.847	Observation response
2.16.840.1.114222.4.5.212	PH_ExposureType_CD_CRA	PHVS_ExposureType_CD_CRA	2.16.840.1.114222.4.11.848	Observation response
2.16.840.1.114222.4.5.213	PH_HistoricalObservation_CD_CRA	PHVS_HistoricalObservation_CD_CRA	2.16.840.1.114222.4.11.849	Observation response
2.16.840.1.114222.4.5.214	PH_HistorySource_CD_CRA	PHVS_HistorySource_CD_CRA	2.16.840.1.114222.4.11.850	Observation response
2.16.840.1.114222.4.5.215	PH_ReferralStatus_CD_CRA	PHVS_ReferralStatus_CD_CRA	2.16.840.1.114222.4.11.851	Observation response
2.16.840.1.114222.4.5.216	PH_Species_CD_CRA	PHVS_Species_CD_CRA	2.16.840.1.114222.4.11.852	Observation response
2.16.840.1.114222.4.5.217	PH_EncounterNotPerformedReason_CD_CRA	PHVS_EncounterNotPerformedReason_CD_CRA	2.16.840.1.114222.4.11.853	Observation response
2.16.840.1.114222.4.5.218	PH_TreatmentStatus_CD_CRA	PHVS_TreatmentStatus_CD_CRA	2.16.840.1.114222.4.11.854	Observation response
2.16.840.1.114222.4.5.219	PH_SubstanceTreatmentRefusalReason_CD_CRA	PHVS_SubstanceTreatmentRefusalReason_CD_CRA	2.16.840.1.114222.4.11.855	Substance Administration
2.16.840.1.113883.6.2	PH_DiseaseClassification_ICD-9CM	PHVS_AdministrativeDiagnosis_CD_CRA	2.16.840.1.114222.4.11.856	Used when coded diagnosis information needs to be passed
2.16.840.1.114222.4.5.220	PH_ConsentCode_CD_CRA	PHVS_ConsentCode_CD_CRA	2.16.840.1.114222.4.11.857	Observation response
2.16.840.1.114222.4.5.221	PH_EncounterObservation_CD_CRA	PHVS_EncounterObservation_CD_CRA	2.16.840.1.114222.4.11.858	This is the starter set of questions that would appear in OBX-3 Observation
2.16.840.1.114222.4.5.222	PH_AdverseEventConsequence_CD_CRA	PHVS_AdverseEventConsequence_CD_CRA	2.16.840.1.114222.4.11.859	Observation response (Adverse Event)
2.16.840.1.114222.4.5.223	PH_VaccinatedAtLocation_CD_CRA	PHVS_VaccinatedAtLocation_CD_CRA	2.16.840.1.114222.4.11.860	Observation response (Adverse Event)
2.16.840.1.114222.4.5.224	PH_VaccinePurchasedWithFund_CD_CRA	PHVS_VaccinePurchasedWithFund_CD_CRA	2.16.840.1.114222.4.11.861	Observation response (Adverse Event)
2.16.840.1.114222.4.5.225	PH_AdverseEventPreviouslyReported_CD_CRA	PHVS_AdverseEventPreviouslyReported_CD_CRA	2.16.840.1.114222.4.11.862	Observation response (Adverse Event)
2.16.840.1.114222.4.5.226	PH_AdverseEventReportType_CD_CRA	PHVS_AdverseEventReportType_CD_CRA	2.16.840.1.114222.4.11.863	Observation response (Adverse Event)
2.16.840.1.114222.4.5.227	PH_VaccineContraindication_CD_CRA	PHVS_VaccineContraindication_CD_CRA	2.16.840.1.114222.4.11.864	Substance Administration
2.16.840.1.114222.4.5.228	PH_RiskCategory_CD_CRA	PHVS_RiskCategory_CD_CRA	2.16.840.1.114222.4.11.865	Substance Administration

8. Miscellaneous

This section contains additional material for use by implementers.

HL7 Definitions

Message: A message is the entire unit of data transferred between systems in a single transmission. It is a series of segments in a defined sequence, with a message type and a trigger event. Between text messages in a batch, two carriage returns/line feeds (hex characters 0D0A0D0A) represent the end of each message.

Segment: A segment is a logical grouping of data. Segments within a defined message may be required or optional, may occur only once, or may be allowed to repeat. Each segment is named and is identified by a segment ID, a unique 3-character code. The hex characters '0D0A' that act as a Segment Terminator (equivalent to a Carriage Return and Line Feed) denote the end of each segment.

Field: A field is a string of characters. Every field has a data type that dictates the structure of the data in that field. The segment the field is in and the position within the segment identify each field; e.g., PID-5 is the fifth field of the PID segment. Optional data fields need not be valued. Whether a field is required, optional, or conditional in a segment is specified in the segment attribute tables. The designations are:

R=Required; the field must be valued

O=Optional; the information might be collected and the information might be sent

C=Conditional; the information is required or mandatory based on the presence or absence of another value

D=Deprecated; the value is not longer valid. Do not use

B=Backward Compatibility; left in for compatibility with previous versions of HL7; the value is scheduled to be Deprecated within two HL7 versions; use is discouraged

A maximum length of the field is stated as normative information. Exceeding the listed length should not be considered an error.

Component: A component is one of a logical grouping of items that comprise the contents of a coded or composite field. Within a field having several components, not all components are required to be valued. Examples in this document demonstrate both fully valued and partially valued coded and composite fields.

Item number: Each field is assigned a unique item number. Fields that are used in more than one segment will retain their unique item number across segments.

Null and empty fields: The null value is transmitted as two double quote marks (""). A null-valued field differs from an empty field. An empty field should not overwrite previously entered data in the field. The null value means that any previous value in this field should be overwritten.

Data type: A data type restricts the contents and format of the data field. Data types are given a 2- or 3-letter code. Some data types are coded or composite types with several components. The applicable data type is listed and defined in each field definition. Chapter 2A of the HL7 v2.5 standard provides a complete listing of data types used in this document and their definitions.

Delimiters: The delimiter values are given in MSH-1 and MSH-2 and used throughout the message. Applications must use agreed upon delimiters to parse the message. The recommended delimiters for laboratory messages are:

- <CR> (hex 0D0A) = The Carriage Return is the symbol for the Segment Terminator; *Note:* Designation cannot be changed
- | = The vertical bar is the symbol for the Field Separator
- ^ = The circumflex accent mark or hat is the symbol for the Component Separator
- & = The ampersand is the symbol for the Sub-Component Separator
- ~ = The tilde or squiggled line is the symbol for the Repetition Separator
- \ = The back slash is the symbol for the Escape Character

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

Trigger events: The trigger event is a real-world event that causes a need for data to flow among systems. For example, the availability of an result from the laboratory may trigger an unsolicited observation message to be sent to a number of other systems.

Z segments: All message types, trigger event codes, and segment ID codes beginning with Z are reserved for locally defined messages. No Z segments or trigger events are being used with this standard message type.

Basic Message Construction Rules

Encoding Rules for Sending

Encode each segment in the order specified in the abstract message format.

Place the Segment ID first in the segment.

Precede each data field with the field separator.

Encode the data fields in the order and data type specified in the segment definition table.

End each segment with the segment terminator.

Component separators need not be represented for components, subcomponents, or repetitions that come at the end of a field. The data fields below, for example, are equivalent:

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

Encoding Rules for Receiving

If a data segment is included that is not expected, ignore it; this is not an error.

If data fields are found at the end of a data segment that are not expected, ignore them; this is not an error.

If a segment contains fields that are not expected, ignore them; this is not an error.

Example Message

The following example message is provided as a concrete message instance that follows this guide. Not all of the optional fields and segments are included.

Example 1: Smallpox Vaccination Record

```
MSH|^~\&|^2.16.840.1.114222.4.3.2^ISO|^2.16.840.1.114222.4.3.2^ISO||^2.16.840.1.114222.4.3.2^ISO|
O|200505171830||ORU^R01^ORU_R01|200504171830|P|2.5<CR>
SFT|^^^^^^2.16.840.1.114222.4.3.2|V 2.1|IVA|||20050101<CR>
PID|||9510110000^^&2.16.840.1.114222.4.3.2&ISO~423523049^^&2.16.840.1.11.383.4.1&ISO||LA
STNAME^FIRSTNAME^MI||19641004|F^Female^ 2.16.840.1.113883.12.1||2054-
3^Black^2.16.840.1.113883.6.238|100 MAIN ST.^APT
B^ATLANTA^GA^30303^US^^FULTON||^404^9998888||
M^Married^2.16.840.1.113883.12.2|||2135-2^Hispanic^2.16.840.1.113883.6.238<CR>
ORC|RE|||SMP^2.16.840.1.114222.4.3.2<CR>
RXA|0|1|200502171830|200502171830|75^SMALLPOX VACCINATION^
2.16.840.1.114222.4.5.206|1|||1234^VACGIVER^^^^^^2.16.840.1.114222.4.3.2|^^^2.16.840.1.1142
22.4.3.2|||LOT123|20060101| PMC^AVENTID
PASTEUR^2.16.840.1.113883.5.144|||CP^COMPLETE^2.16.840.1.113883.12.322
RXR||RA^Right Arm^2.16. 1.113883.12.163<CR>
```

References

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http://www.cdc.gov/phinkpm/KPM_RSv1.0.pdf

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