Arizona Syndromic Surveillance Implementation Guide (AZSSIG) for Critical Access Hospitals (CAHs) and Eligible Hospitals (EHs)

Version 1.0 | June 2014

HL7 2.5.1 Admission, Discharge and Transfer (ADT) Messaging Specifications for A01, A03, A04, and A08

Health and Wellness for all Arizonans

DOCUMENT HISTORY

Many thanks to the internal and external partners of the Arizona Department of Health Services (ADHS). Your feedback and suggestions have been invaluable throughout the development of this document.

AZ Syndromic Surveillance Implementation Guide – Document History				
Author(s)	**Date**	**Version**	**Source Document**	**Update Description**
Sara Imholte, MPH Artrina Sturges, Ed.D.c. Krystal Collier, BA Ji Won Moon, MPH Manoj Shaw Tim Sharma, MPH Stanley Kotey, MBChB MPH Electronic Disease Surveillance Program Office of Infectious Disease Services	June 2014	1.0	Public Health Information Network (PHIN) Messaging Guide for Syndromic Surveillance: Emergency Department and Urgent Care Data; ADT Messages A01, A03, A04, and A08, HL7 Version 2.5.1, Release 1.1, August 2012 PHIN Messaging Guide for Syndromic Surveillance: Emergency Department and Urgent Care Data, Addendum Release 1.1 (August 2012) PHIN Messaging Guide for Syndromic Surveillance: Emergency Department, Urgent Care and Inpatient Settings; ADT Messages A01, A03, A04, and A08, HL7 Version 2.5.1, Release 1.9, April 2013	First version of document released.

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INTRODUCTION

The Arizona Department of Health Services (ADHS) is pleased to release the Arizona Syndromic Surveillance Implementation Guide (AZSSIG). This guide offers standardized specifications to Eligible Hospitals (EHs) and Critical Access Hospitals (CAHs) for the electronic transfer of Syndromic Surveillance (SS) data from hospital Certified Electronic Health Records technology (CEHRT) to the BioSense 2.0 system for SS reporting. This guide will provide an overview of the type of data being collected, the suppliers of the data, the system collecting the information, and the format needed for successful submission of Syndromic Surveillance data to ADHS.

Syndromic Surveillance and Meaningful Use

The Centers for Medicare and Medicaid Services (CMS) created an incentive program to support the efforts of Eligible Professionals (EPs), EHs, and CAHs to adopt and implement certified EHR technology (CEHRT). The program is divided into progressive stages, encompassing specific objectives for each stage to demonstrate *meaningful use* of the CEHRT. Within those objectives are Public Health core and menu set measures. SS reporting is one of the measures. The BioSense 2.0 system helps EHs and CAHs to achieve their Meaningful Use (MU) objective by functioning as the receiver of SS data on behalf of ADHS. At this time, ADHS is not accepting the electronic transfer of SS data from EPs. Any updates to this status will be located on the ADHS website, under the Meaningful Use tab. http://azdhs.gov/meaningful-use. For more information on MU, please visit the Centers for Medicare and Medicaid Services (CMS) website: http://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/Meaningful_Use.html.

Syndromic Surveillance (SS) is the continued collection and analysis of diagnostic population health data. This health data is currently comprised of hospital patient visits. Consistent monitoring of this data supports Public Health's ability to perform timely assessments of population health. Regular reviews of SS data support event detection, increase situational awareness, and response management surveillance activities of Local Public Health Jurisdictions (LPHJs) and ADHS.

The SS data reporting standards to fulfill the Public Health (PH) Stage 2 reporting objective are outlined in two documents: "*The Public Health Information Network (PHIN) Messaging Guide for Syndromic Surveillance: Emergency Department and Urgent Care Data, Health Level Seven (HL7) version 2.5.1, Release 1.1";* and *"PHIN Messaging Guide for Syndromic Surveillance: Emergency Department and Urgent Care Data, Addendum Release 1.1, August 2012".* Those standards are further constrained in this Arizona Specific Syndromic Surveillance Implementation Guide (AZSSIG), to meet the needs of Arizona Public Health agencies performing disease management activities.

Please Note: Reporting inpatient data is not required per the Meaningful Use Final Rule to fulfill the Public Health Stage 2 reporting objective. However, Arizona hospitals who wish to submit the data elements are permitted to do so. Guidelines for submitting the data elements can be found in the following document: *"PHIN Messaging Guide for Syndromic Surveillance: Emergency Department, Urgent Care and Inpatient Setting, Release 1.9, April 2013"*. In this guide, inpatient elements have the following symbol for demarcation (IP) in the "Description/Comments".

BIOSENSE 2.0 OVERVIEW

What is BioSense 2.0?

BioSense 2.0 is a cloud-enabled, web application providing commercial hosting, provisioning, and support for SS Data. The mission of the BioSense Program is to support and improve the national public health surveillance infrastructure's ability to monitor the scope and severity of potential threats to public health. This system ultimately provides a regional and national depiction of multiple health outcomes and syndromes. The BioSense 2.0 System is the reporting method for the State of Arizona to continually receive and maintain SS data reported by hospitals. BioSense 2.0 is a national system sponsored by the Centers for Disease Control and Prevention (CDC) and governed by the Association of State and Territorial Health Officials (ASTHO).

ADHS has a Data Use Agreement (DUA) with ASTHO to access the BioSense 2.0 data. Hospitals sign a DUA with ADHS to submit SS data to the BioSense 2.0 system. LPHJs sign a DUA with ADHS before gaining access to the data reported by hospitals. The signing of DUAs completes the legal and administrative duties associated with SS data exchange. LPHJs and ADHS are granted access to the data in two formats: 1) a Visualization Site; 2) the data stored in the jurisdictional data locker. The jurisdictional data locker is a state-controlled area which contains all the SS data reported by Arizona hospitals to BioSense 2.0. ADHS and LPHJs staff will utilize this information to support fulfillment of the CDC's Ten Essential Public Health Services.

Data Sources and Data Sharing

The data source for the BioSense 2.0 tool are EHs and CAHs, also referred to as *Data Providers*, sending patient visit information as a single message. This message summarizes aspects of the patient visit that are useful for Public Health and is sent in the HL7 format to ensure the message is compliant with national standards. Any subsequent visit updates are captured as well and included as updates to the original data submitted. All patient visits are bundled into daily batches and sent by EHs and CAHs to the BioSense tool for processing. At the hospital, *Data Managers* are responsible for ensuring the data submissions are occurring daily and are in the proper format. The ability of EHs and CAHs to send these messages utilizing a CEHRT assists them to fulfill the Public Health-related syndromic surveillance Meaningful Use Objective.
Data are not delineated by facility in the visualization tool and *Data Providers do not have access to the Visualization Site*. The CDC is permitted by the State of Arizona to view data in the Visualization Site as a collaborator. They are not permitted to remove or publish data without express consent and notification from the Arizona Department of Health Services as the DUA holder with ASTHO.

How Data is Stored and Secured

The storage infrastructure is supported by Amazon Web Services (AWS) and meets Federal Information Security Management Act (FISMA) requirements. The Amazon S3 storage maintains multiple copies of data to ensure disaster recovery activities are implementable. In addition, the BioSense 2.0 system information is backed-up nightly and reviewed monthly for completeness and correctness of data. Data is stored in a distributed storage format as a countermeasure against data loss. Authentication mechanisms are deployed to ensure data resources are secured from unauthorized access and only retrievable by data owners. Please consult the BioSense 2.0 Re-design Website for more information and updates: https://sites.google.com/site/biosenseredesign/about

IMPLEMENTATION GUIDE OVERVIEW

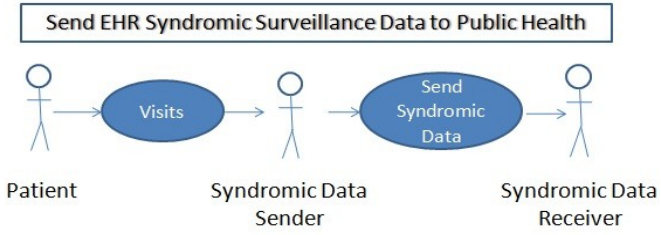
The AZ SS Implementation Guide is based on four sources:
1) *Public Health Information Network (PHIN) Messaging Guide for Syndromic Surveillance: Emergency Department and Urgent Care Data; ADT Messages A01, A03, A04, and A08, HL7 Version 2.5.1 Release 1.1, August 2012*;
2) *PHIN Messaging Guide for Syndromic Surveillance: Emergency Department and Urgent Care Data, Addendum Release 1.1, August 2012;*
3) *PHIN Messaging Guide for Syndromic Surveillance: Emergency Department, Urgent Care and Inpatient Settings; ADT Messages A01, A03, A04, and A08, HL7 Version 2.5.1, Release 1.9, April 2013;*
4) Recommendations from the Arizona BioSense 2.0 Work Group.

The Arizona BioSense 2.0 Work Group convened fall 2012 and is comprised of statewide representation from LPHJs, hospitals, Information Technology (IT) Vendors, and additional community partners. The guide has been further constrained in conformance with the aforementioned source documents to guide Eligible Hospitals (EHs) and Eligible Critical Access Hospitals (CAHs) in Arizona to fulfill Stage 1 and Stage 2 Meaningful Use criteria for SS. The AZ SS Implementation Guide is not intended to replace the PHIN Messaging Guide for Syndromic Surveillance; this guide is a *supplement* to the national sources. For additional information, please refer to the Resources tab on the ADHS website: www.azdhs.gov/meaningful-use.

USE CASE MODEL

The AZ SS Implementation Guide use case model focuses on the transmission of electronic health data from hospitals (Syndromic data senders) to the BioSense 2.0 System (Syndromic data receiver) on behalf of ADHS, the Public Health Authority (PHA) (see figure 1.1). An inpatient or emergency department patient visit is the trigger for the data being sent from the hospital to the PHA. The health data is captured in an EHR during the patient's visit to the hospital. The health data is then sent by the hospital to the PHA. The hospital must be capable of generating and transmitting HL7 messages containing the patient visit data semantically and syntactically consistent with the syndromic data receiver's requirements. The syndromic data sender may be the aggregator of the data – e.g. the CEHR vendor or the hospital. The receiving entity is identified as the BioSense 2.0 system which serves as the SS data receiver and data processor on ADHS's behalf. The goal of the use case is to provide secure, reliable delivery of daily batches of SS data to PHAs.

FIGURE 1.1 – AZ SS Implementation Guide Use Case Model

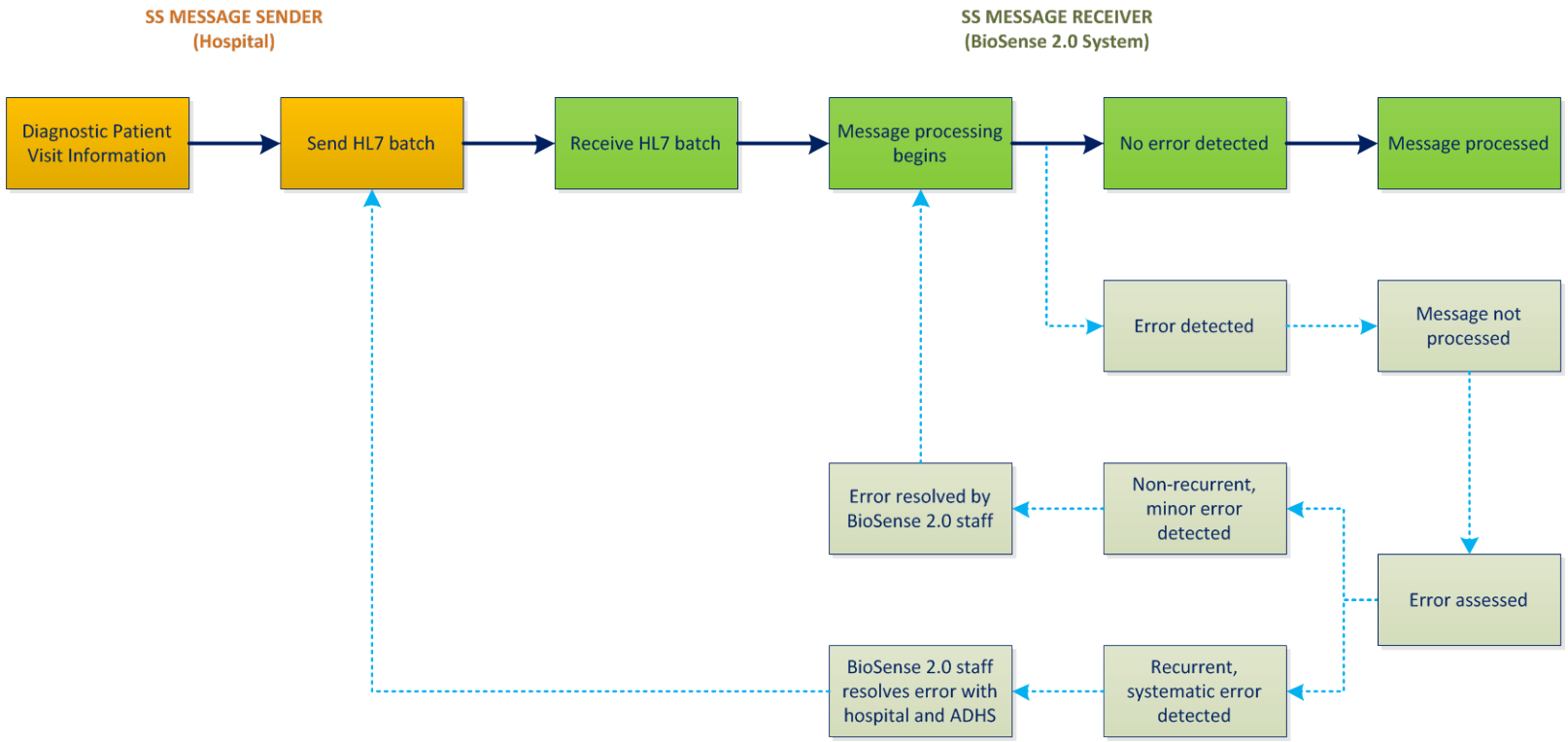


OVERVIEW – INTERACTION DYNAMICS

The AZ SS Implementation Guide supports a regularly monitored, unidirectional batch messaging protocol in which the hospital sender transmits a daily batch of patient visit information. The batch messaging protocol does not allow acknowledgement messages to be exchanged between the sending and receiving applications. Acknowledgement messages are outside the scope of this document. If the receiving application encounters an error with an incoming HL7 message, the BioSense 2.0 team will examine the source of the error and resolve the issue in one of the following methods:

- If the error is found to be minor and non-recurrent, BioSense 2.0 will internally resolve the error and manually resubmit the message for processing;
- Recurrent sender errors identified by BioSense 2.0 will be reported to the hospital and ADHS for root cause analysis. The hospital will make the necessary changes and resubmit the message(s).

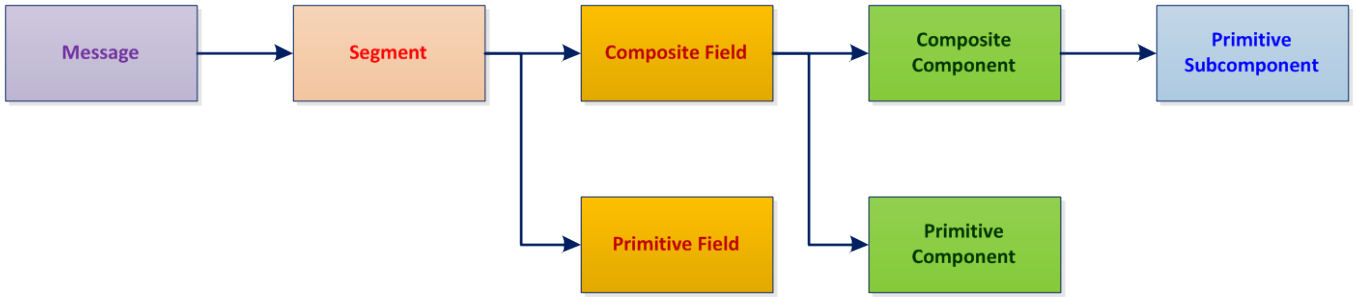
FIGURE 1.2 – Batch Messaging Protocol Interaction Model



HL7 MESSAGE FRAMEWORK

Implementers will benefit from understanding the basics of the HL7 message framework including the way in which information is organized in a **message** (see Figure 1.3). A standard HL7 **message** is comprised of a group of **segments**, which are arranged in a defined sequence. Each **segment** is comprised of a group of **fields** that are also organized in a defined sequence. **Fields** may be divided into **components**, which may be further divided into **subcomponents**, depending on their *data types*. *Data types* are largely divided into two categories: (1) *Primitive* data types are populated as string or numeric values. (2) *Composite* data types are an arranged group of values. For example, fields with composite data types are divided into a group of **components**. **Components** may again be either primitive or composite. **Components** with composite data types consist of **subcomponents**, which are always assigned primitive data types.

FIGURE 1.3 – Data Element Hierarchy in a Standard HL7 Message



When constructing a message, special characters should be designated as delimiter values to separate segments, fields, components and subcomponents. Special characters may also differentiate multiple occurrences of data elements and special formats within a field, where allowed (see Table 1.1). These characters are designated in the first two fields of the message header segment (MSH)—segment beginning a new message—and establish delimitation rules throughout the message. Due to the use of the batch messaging protocol, delimiter values also appear in the first two fields of the file header (FHS) and batch header (BHS) segments. Specific examples on how delimiter values are used, along with detailed explanations, are provided in the subsequent pages of this guide. Standard HL7 delimiters shown in Table 1.1 are required for Arizona SS implementations. Further information on delimiters can be obtained in the full HL7 version 2.5.1 standard.

TABLE 1.1 – HL7 Standard Message Delimiters

Delimiter	Required Value	Description
Segment Terminator	<cr>	ASCII-013 carriage return character used to terminate a segment record. This value cannot be changed by implementers.
Field Separator	|	Separates two adjacent data fields within a segment. It also separates the segment ID from the first data field in each segment.
Component Separator	^	Separates adjacent components within a field.
Repetition Separator	~	Separates multiple occurrences of a field where allowed.
Escape Character	\	Used in instances where special character formatting is needed.
Subcomponent Separator	&	Separates adjacent subcomponents within a component.

HL7 MESSAGING CONVENTIONS

The HL7 messaging conventions used in this implementation guide strictly adhere to the PHIN Messaging Guide for SS. Table 1.2 provides definitions of the attributes that appear throughout this guide. The descriptions provided below are summarized based on the source document. Please consult the HL7 2.5.1 standard for additional clarifications.

TABLE 1.2 – Message Element Attributes

Attribute	Definition
SEQ	Sequence of the elements as numbered in the HL7 message element.
Message Structure	Contains three-character code for the segments—e.g. MSH, EVN, PID—and the following abstract syntax: **XXX** Required **[XXX]** Optional **{ XXX }** Repeating **[{ XXX }]** Optional and repeating – synonymous with **{[XXX]}** Segment groups can also be expressed within the braces and brackets.
LEN	Maximum length of the element. Lengths are provided only for primitive data types, and should be considered recommendations, not absolutes.
DT	Data type. Determines the format in which the field, component or subcomponent is to be populated.
Usage	Usage of the segment, segment group or field. **R** Required **RE** Required, but can be empty if the information is unavailable. If the sender has the data, it should be sent. **C** Requirement is conditional on other field(s) – Description/Comments section describes the algorithm defining the conditionality. **X** Not used in this guide
Cardinality	Minimum and maximum number of times the message element may appear. **[0..0]** Field never present **[0..1]** May be omitted or have no more than one occurrence **[0..*]** May be omitted or repeat an unlimited number of times **[1..1]** Exactly one occurrence **[1..*]** At least one occurrence and may repeat an unlimited number of times
TBL#	HL7 defined or external table used for the field.
Element Name	HL7 descriptor of the message element.
Required/Recommended/ Literal Value	Value and usage designations for components and subcomponents. **Required** Element is required for the message to be considered complete. **Recommended** Element must be populated if the information is available. **Literal** Absolute value for the element that must appear in the message exactly as shown.
Description/Comments	Context and usage for the element.

ADMIT DISCHARGE TRANSFER (ADT) MESSAGE STRUCTURE

This guide is specific to the Admit Discharge Transfer (ADT) use case specifications for the data exchange of core Syndromic Surveillance elements from healthcare providers to Public Health. It has been constructed to highlight data element usage requirements and utilize the color gray to indicate an unused segment or attribute. As shown below, a **file** is comprised of a single **batch** containing an unlimited number of **messages**. Enclosed within each **message** is a series of segments which possess their own attributes. For example, a single message may contain an unlimited number of observations, diagnoses and procedures. Because of this, it is important the message headers are arranged in their respective segment groups.

Also note there are two different ADT message structures, defined by the trigger events. If the hospital is sending an A01 (Admit/Visit Notification), A04 (Register a Patient), or A08 (Update Patient Information) message, the message structure indicated below is required. Please note these trigger events require a different order for the OBX, DG1, and PR1 segments within the message structure when compared to Table 1.4.

TABLE 1.3 – Message Structure for ADT^A01, ADT^A04 and ADT^A08

Message Structure	Segment Description	Usage	Cardinality
FHS	**File Header**	**R**	**[1..1]**
BHS	**Batch Header**	**R**	**[1..1]**
{	***—Message begins***	**R**	**[1..*]**
MSH	Message Header	R	[1..1]
EVN	Event Type	R	[1..1]
PID	Patient Identification	R	[1..1]
PV1	Patient Visit	R	[1..1]
[PV2]	Patient Visit Additional Information	RE	[0..1]
{ OBX }	Observation/Result	RE	[1..*]
[{ DG1 }]	Diagnosis	RE	[0..*]
[{ PR1 }]	Procedures	O	[0..*]
[{ IN1 }]	Insurance	O	[0..*]
}	***—Message ends***		
BTS	**Batch Trailer**	**R**	**[1..1]**
FTS	**File Trailer**	**R**	**[1..1]**

For trigger events A01 (Admit/Visit Notification), A04 (Register a Patient) and A08 (Update Patient Information), the above ADT message structure is used.

HL7 ADT MESSAGE STRUCTURE (Continued)

If the facility is sending an A03 (Discharge/End Visit) message, the message structure indicated below in Table 1.4 is required. Please note this trigger event requires a different order for the ***OBX, DG1, and PR1*** segments within the message structure in comparison to Table 1.3.

TABLE 1.4 – Message Structure for ADT^A03

Message Structure	Segment Description	Usage	Cardinality
FHS	**File Header**	**R**	**[1..1]**
BHS	**Batch Header**	**R**	**[1..1]**
{	***—Message begins***	**R**	**[1..*]**
MSH	Message Header	R	[1..1]
EVN	Event Type	R	[1..1]
PID	Patient Identification	R	[1..1]
PV1	Patient Visit	R	[1..1]
[PV2]	Patient Visit Additional Information	RE	[0..1]
[{ DG1 }]	Diagnosis	RE	[0..*]
[{ PR1 }]	Procedures	O	[0..*]
{ OBX }	Observation/Result	RE	[1..*]
[{ IN1 }]	Insurance	O	[0..*]
}	***—Message ends***		
BTS	**Batch Trailer**	**R**	**[1..1]**
FTS	**File Trailer**	**R**	**[1..1]**

For trigger event A03 (Discharge/End Visit), the above message structure is used.

HOW TO READ HL7 SEGMENTS

This section provides a quick tutorial for first-time implementers of HL7 on the basics regarding how to read, understand and analyze the contents within HL7 segments.

Figure 1.4 illustrates a sample MSH segment, in which the fields and components are read in sequence. The segment begins with a three-letter segment ID that determines the arrangement of contents throughout the rest of the segment. MSH-1 indicates the field separator and MSH-2 indicates the set of delimiter values. Designating special characters in the first two fields of MSH establishes delimitation rules throughout the message, allowing MSH-3 and all subsequent segments to be separated using the appropriate delimiter values. In the case of batch messaging protocol, delimiter values also appear in the first two fields of the file header (FHS) and batch header (BHS) segments. Special characters must always be positioned in the fixed order shown below.

FIGURE 1.4 – Sample Message Header Segment

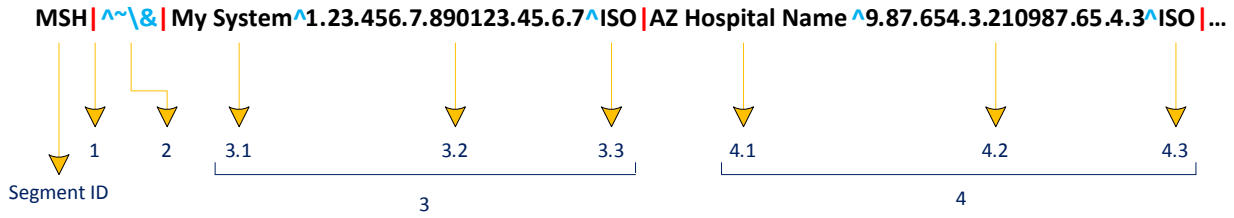
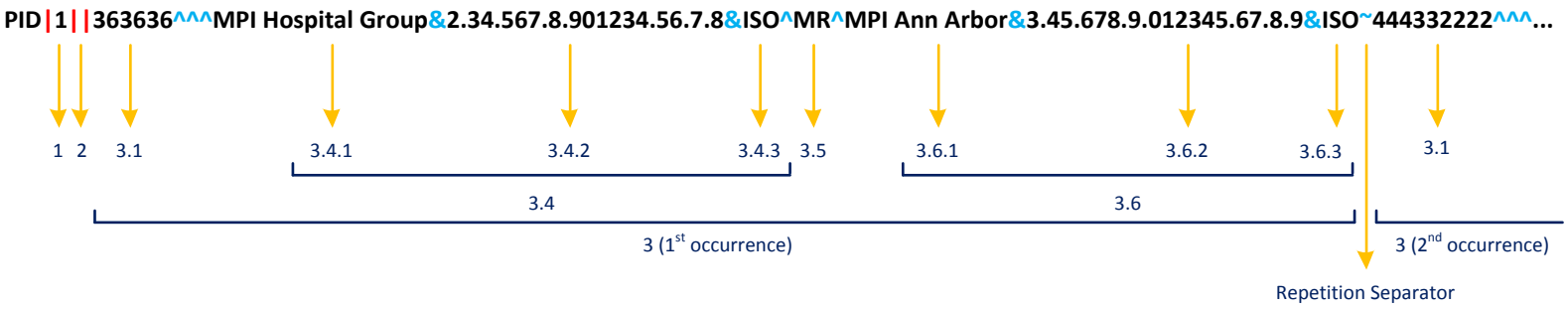


Figure 1.5 demonstrates the process of reading the fields, components and subcomponents within a sample PID segment. It is important to note that PID-1 is the value populated after the first field separator. This is because the delimiter values are already established in the MSH segment, which precedes the PID segment. PID-2 is not present since there is no populated value between the enclosing field separators. PID-3 is a large field comprised of components and subcomponents, all of which are separated by the designated delimiters. PID-3.2 and 3.3 are not present for the same reason that applies to PID-2. PID-3.4 and 3.6 are each divided into three subcomponents. A repetition separator marks the end of the first occurrence of PID-3 as well as the beginning of the second occurrence, which begins with its own first component.

FIGURE 1.5 – Sample Patient Identification Segment



The segment terminator, <cr>, is the ASCII-013 carriage return character used to terminate segments. It is important to note that the segment terminator is not a literal value that visibly appears at the end of segments and therefore *must not be manually entered into a message*. Special formatting is not essential to the use case described in this implementation guide. Therefore examples regarding the use of escape characters are not covered in this section. Implementers who wish to learn more about the escape characters are encouraged to refer to the full HL7 version 2.5.1 standard for detailed explanations and examples.

SEGMENT DESCRIPTIONS

Detailed specifications of the segments used in SS messaging implementations are provided in the subsequent pages. Unsupported data elements in this guide have been shaded gray for distinction. There are notes in the "Description/Comments" field to assist implementers to identify Inpatient Data Elements outlined in the PHIN guide, version 1.9. Example data is provided at each segment for quick reference and guidance. With the exception of values that are specified as literal values, example data should not be used when testing with BioSense 2.0. Implementers are encouraged to refer to the full HL7 version 2.5.1 Standard for comprehensive overview of data types and any additional clarifications.

FHS – FILE HEADER SEGMENT

This segment is used as the lead-in to a file (group of batches).

FHS – File Header Segment								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
1	1	ST	R	[1..1]		File Field Separator	**|**	Default Value "|".
2	4	ST	R	[1..1]		Encoding Characters	**^~\&**	**^** = Component Separator **~** = Repetition Separator **** = Escape Character **&** = Subcomponent Separator
3	227	HD	R	[1..1]		File Sending Application	Application Name **^** Application ID **^** ID Type	Sender can use an Object Identifier (OID) or a National Provider Identifier (NPI)
4	227	HD	R	[1..1]		File Sending Facility	Facility Name **^** Facility ID **^** ID Type	
5	227	HD	R	[1..1]		File Receiving Application	**BioSense^2.16.840.1.113883.3.1673^ISO**	
6	227	HD	R	[1..1]		File Receiving Facility	**BioSense^2.16.840.1.113883.3.1673^ISO**	
7	26	TS	R	[1..1]		File Creation Date/Time	YYYYMMDDHHMM[SS[.S[S[S[S]]]]] [+/- ZZZZ]	The minimum granularity is to the nearest minute. If Coordinated Universal Time (UTC) offset is not sent, it is assumed to be offset of the receiver.
8	40	ST	X	[0..1]		File Security		Not used.
9	20	ST	RE	[0..1]		File Name/ID		
10	80	ST	RE	[0..1]		File Header Comment		
11	199	ST	RE	[0..1]		File Control ID		
12	20	ST	RE	[0..1]		Reference File Control ID		

Example Data:

FHS|^~\&|My App^1.23.456.7.890123.45.6.7^ISO|My Facility^9.87.654.3.210987.65.4.3^ISO|BioSense^2.16.840.1.113883.3.1673^ISO|BioSense^2.16.840.1.113883.3.1673^ISO|20130507174500.0005-0700

BHS – BATCH HEADER SEGMENT

This segment is used as the lead-in to a batch (group of messages).

BHS – Batch Header Segment								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
1	1	ST	R	[1..1]		Batch Field Separator	**|**	Default Value "|".
2	4	ST	R	[1..1]		Batch Encoding Characters	**^~\&**	**^** = Component Separator **~** = Repetition Separator **** = Escape Character **&** = Subcomponent Separator
3	227	HD	R	[1..1]		Batch Sending Application	Application Name **^** Application ID **^** ID Type	
4	227	HD	R	[1..1]		Batch Sending Facility	Facility Name **^** Facility ID **^** ID Type	
5	227	HD	R	[1..1]		Batch Receiving Application	**BioSense^2.16.840.1.113883.3.1673^ISO**	
6	227	HD	R	[1..1]		Batch Receiving Facility	**BioSense^2.16.840.1.113883.3.1673^ISO**	
7	26	TS	R	[1..1]		Batch Creation Date/Time	YYYYMMDDHHMM[SS[.S[S[S[S]]]]] [+/- ZZZZ]	The minimum granularity is to the nearest minute.
8	40	ST	X	[0..1]		Batch Security		Not used.
9	20	ST	RE	[0..1]		Batch Name/ID		
10	80	ST	RE	[0..1]		Batch Header Comment		
11	20	ST	RE	[0..1]		Batch Control ID		
12	20	ST	RE	[0..1]		Reference Batch Control ID		

Example Data:

BHS|^~\&|My App^1.23.456.7.890123.45.6.7^ISO|My Facility^9.87.654.3.210987.65.4.3^ISO|BioSense^2.16.840.1.113883.3.1673^ISO|BioSense^2.16.840.1.113883.3.1673^ISO|20130507174500.0005-0700

MSH – MESSAGE HEADER SEGMENT

The MSH segment is used to define the intent, source, destination, and some specifics of the syntax of the message. This segment includes identification of message delimiters, sender, receiver, message type, timestamp, etc.

MSH – Message Header Segment								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
1	1	ST	R	[1..1]		Field Separator	**|**	
2	4	ST	R	[1..1]		Encoding Characters	**^~\&**	**^** = Component Separator **~** = Repetition Separator **** = Escape Character **&** = Subcomponent Separator
3	227	HD	R	[1..1]		Sending Application	Application Name **^** Application ID **^** ID Type	
4	227	HD	R	[1..1]		Sending Facility	Facility Name **^** Facility ID **^** ID Type	This field uniquely identifies the hospital associated with the application sending the message. National Provider Identifier (NPI) or an Object Identifier (OID) assigned to the facility can be used.
5	227	HD	R	[1..1]		Receiving Application	**BioSense^2.16.840.1.113883.3.1673^ISO**	
6	227	HD	R	[1..1]		Receiving Facility	**BioSense^2.16.840.1.113883.3.1673^ISO**	
7	7	TS	R	[1..1]		Date/Time of Message	YYYYMMDDHHMM[SS[.S[S[S[S]]]]] [+/- ZZZZ]	The minimum granularity is to the nearest minute.
8	40	ST	X	[0..0]		Security		Not used.
9	15	MSG	R	[1..1]	0076 0003 0354	Message Type	Message Code^Trigger Event^Message Structure	PHVS_MessageType_SyndromicSurveillance PHVS_EventType_SyndromicSurveillance PHVS_MessageStructure_Syndromic Surveillance
10	199	ST	R	[1..1]		Message Control ID	Message Control ID	This field is a number or other identifier that uniquely identifies the message.

MSH – Message Header Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
11	1	PT	R	[1..1]	0103	Processing ID	Processing ID	PHVS_ProcessingID_HL7_2x
12	5	VID	R	[1..1]		Version ID	**2.5.1**	HL7 Version number used to interpret format and content of the message.
13	15	NM	X	[0..0]		Sequence Number		Not used.
14	180	ST	X	[0..0]		Continuation Pointer		Not used.
15	2	ID	X	[0..0]	0155	Accept Ack. Type		Not used.
16	2	ID	X	[0..0]	0155	Application Ack. Type		Not used.
17	3	ID	X	[0..0]	0399	Country Code		Not used.
18	16	ID	X	[0..0]	0211	Character Set		Not used.
19	478	CE	X	[0..0]		Principal Language of Message		Not used.
20	20	ID	X	[0..0]	0356	Alternate Character Set		Not used.
21	427	EI	R	[1..1]		Msg. Profile Identifier	**PH_SS-Batch^SSReceiver^ 2.16.840.1.114222.4.10.3^ISO**	

Example Data:

MSH|^~\&|My App^1.23.456.7.890123.45.6.7^ISO| My Facility^9.87.654.3.210987.65.4.3^ISO|BioSense^2.16.840.1.113883.3.1673^ISO|BioSense^2.16.840.1.113883.3.1673^ISO|20130507174500.0005-0700||ADT^A01^ADT_A01|20130507174500.0005-0700-V22147|P|2.5.1|||||||||PH_SS-NoAck^SS Sender^2.16.840.1.114222.4.10.3^ISO

EVN – EVENT TYPE SEGMENT

The EVN segment is used to communicate trigger event information to receiving applications.

EVN – Event Type Segment								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
1	3	ID	X	[0..0]	003	Event Type Code		Not used.
2	26	TS	R	[1..1]		Recorded Date/Time	YYYYMMDDHHMM[SS[.S[S[S[S]]]]] [+/- ZZZZ]	The minimum granularity is to the nearest minute.
3	26	TS	X	[0..0]		Date/Time Planned Event		Not used.
4	3	IS	X	[0..0]	0062	Event Reason Code		Not used.
5	309	XCN	X	[0..0]	0188	Operator ID		Not used.
6	26	TS	X	[0..0]		Event Occurred		Not used.
7	80	HD	R	[1..1]		Event Facility	Facility Name **^** National Provider Identifier **^NPI**	Location where the patient was actually treated. PHIN recommends using the Organization Name Legal Business Name (LBN) associated with the National Provider Identifier (NPI) provided by Centers for Medicare and Medicaid Services (CMS). PHIN recommends using the NPI Standard provided by CMS. If an NPI is not available, PHIN recommends obtaining a different unique identifier, such as an OID.

Example Data:

EVN||20130507090030.0005-0700||||My Facility^1234567890^NPI

PID – PATIENT IDENTIFICATION SEGMENT

This segment provides basic demographics regarding the subject of the laboratory observation.

PID – Patient Identification Segment								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
1	4	SI	R	[1..1]		Set ID – PID	**1**	Only one patient per message is supported.
2	20	CX	X	[0..0]		Patient ID		**Do not populate this field.**
3	80	CX	R	[1..1]	0203	Medical Record Number	Identifier **^^^** Assigning Authority Name **&** ID **&** ID Type **^MR^** Assigning Facility Name **&** ID **&** ID Type	PHVS_IdentifierType_SyndromicSurveillance The Medical Record number is placed in the 1st component of the CX data type and the Identifier Type Code (MR) in in the fifth component.
4	20	CX	X	[0..0]		Alternative Patient ID – PID		Not used.
5	294	XPN	R	[1..*]		Patient Name		Syndromic Surveillance uses the Patient ID number to uniquely identify the patient, whereas HL7 does require this field even when reporting de-identified data. When the name of the patient is known, but not desired to be sent, use the following: **~^^^^^^S** When the name of the patient is not known, use the following: **~^^^^^^U**
6	294	XPN	X	[0..0]		Mother's Maiden Name		Not used.
7	20	TS	RE	[0..1]		Date/Time of Birth	YYYYMMDDHHMM	Hour and minute should only be sent if they are known.
8	1	IS	R	[1..1]	0001	Administrative Sex	Sex	PHVS_Gender_SyndromicSurveillance
9	294	XPN	X	[0..0]		Patient Alias		Not used.
10	80	CE	RE	[0..*]	0005	Race	Race (TBL# 0005) **^** Description **^CDCREC**	PHVS_RaceCategory_CDC

PID – Patient Identification Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
11	295	XAD	RE	[0..1]	0190	Patient Address	Street Address ^ Other Designation ^ City ^ State/Province ^ ZIP/Postal Code ^ Country ^ Address Type (TBL# 0190) ^^ County/Parish Code (PHVS_County_FIPS_6-4)	PHVS_State_FIPS_5-2 PHVS_Country_ISO_3166-1 PHVS_AddressType_CDC PHVS_County_FIPS_6-4
12	4	IS	X	[0..0]	0289	County Code		Not used.
13	250	XTN	X	[0..0]		Phone Number – Home		Not used.
14	250	XTN	X	[0..0]		Phone Number – Business		Not used.
15	478	CE	X	[0..0]		Primary Language		Not used.
16	478	CE	X	[0..0]	0002	Marital Status		Not used.
17	478	CE	X	[0..0]	0006	Religion		Not used.
18	250	CX	RE	[0..1]	0203	Patient Account Number	Identifier^^^ Assigning Authority Name & ID & ID Type ^ Identifier Type (TBL# 0203) ^ Assigning Facility Name & ID & ID Type	PHVS_IdentifierType_IIS
19	16	ST	X	[0..0]		Social Security No. – Patient		Not used.
20	64	DLN	X	[0..0]		Driver's License No. – Patient		Not used.
21	250	CX	X	[0..0]		Mother's Identifier		Not used.
22	80	CE	RE	[0..1]	0189	Ethnic Group	Ethnicity ^ Description ^CDCREC	PHVS_EthnicityGroup_CDC_Unk
23	250	ST	X	[0..0]		Birth Place		Not used.
24	1	ID	X	[0..0]	0136	Multiple Birth Indicator		Not used.

PID – Patient Identification Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
25	2	NM	X	[0..0]		Birth Order		Not used.
26	478	CE	X	[0..0]	0171	Citizenship		Not used.
27	478	CE	X	[0..0]	0172	Veterans Military Status		Not used.
28	478	CE	X	[0..0]	0212	Nationality		Not used.
29	26	TS	RE	[0..1]		Patient Death Date and Time	YYYYMMDDHHMM[SS[.S[S[S[S]]]]] [+/- ZZZZ]	The minimum granularity is to the nearest minute.
30	20	ID	C	[0..1]	0136	Patient Death Indicator	Yes/No Indicator	PHVS_YesNo_HL7_2x If PID-29 is valued, this field must be a **Y** since the patient is known to be deceased.
31	1	ID	X	[0..0]	0136	ID Unknown Indicator		Not used.
32	20	IS	X	[0..0]	0445	Identity Reliability Code		Not used.
33	26	TS	X	[0..0]		Last Update Date/Time		Not used.
34	241	HD	X	[0..0]		Last Update Facility		Not used.
35	478	CE	X	[0..0]	0446	Species Code		Not used.
36	478	CE	X	[0..0]	0447	Breed Code		Not used.
37	80	ST	X	[0..0]		Strain		Not used.
38	478	CE	X	[0..0]	0429	Production Class Code		Not used.
39	697	CWE	X	[0..0]		Tribal Citizenship		Not used.

Example Data:

PID|1||20130012168^^^MPI Hospital Group&2.34.567.8.901234.56.7.8&ISO^MR^MPI Ann Arbor&3.45.678.9.012345.67.8.9&ISO||~^^^^^^S||19850301|F||2106-3^White^CDCREC|2222 Home Street ^^Phoenix^AZ^85007^USA^H^^04013||||||20130507AM0073^^^MPI Hospital Group&2.34.567.8.901234.56.7.8&ISO ^AN^MPI Ann Arbor&3.45.678.9.012345.67.8.9&ISO||||2186-5^Not Hispanic^CDCREC||||||201305071155|Y

PV1 – PATIENT VISIT SEGMENT

The PV1 segment is used by Registration/Patient Administration applications to communicate information on a visit-specific basis.

PV1 – Patient Visit Segment								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
1	4	SI	RE	[0..1]		Set ID – PV1	**1**	Only one patient per message is supported.
2	1	IS	R	[1..1]	0004	Patient Class	Patient Class	PHVS_PatientClass_SyndromicSurveillance
3	1220	PL	RE	[0..1]	0305	Assigned Patient Location	Point of Care **^** Room **^** Bed **^** Facility Name **&** Facility ID **&** ID Type **^** Location Status **^** Person Location Type **&** Description **&HL70305 ^** Building **^** Floor **^** Location Description	PH_HealthcareServiceLoc_HL7_V3
4	2	IS	R	[1..1]	0007	Admission Type	Admission Type	PHVS_AdmissionType_HL7_2x
5	250	CX	X	[0..0]		Pre-Admit Number		Not used.
6	1220	PL	X	[0..0]		Prior Patient Location		Not used.
7	309	XCN	RE	[0..*]		Attending Doc.		PHIN Guide recommends using the NPI Standard assigned by CMS.
8	309	XCN	X	[0..*]	0010	Referring Doctor		Not used.
9	309	XCN	X	[0..0]	0010	Consulting Doctor		Not used.
10	3	IS	RE	[0..1]	0069	Hospital Service	Hospital Service	User defined HL7 table #0069
11	1220	PL	X	[0..0]		Temporary Location		Not used.
12	2	PL	X	[0..0]	0087	Preadmit Test Indicator		Not used.

PV1 – Patient Visit Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
13	2	IS	X	[0..0]	0092	Re-admission Indicator		Not used.
14	6	IS	RE	[0..1]	0023	Admit Source	Admit Source	PHVS_AdmitSource_HL7_2x
15	2	IS	RE	[0..1]	0009	Ambulatory Status		Field indicates any permanent or transient handicapped conditions. HL7 user-defined table # 0009
16	2	IS	X	[0..0]	0099	VIP Indicator		Not used.
17	309	XCN	X	[0..0]	0010	Admitting Doctor		Not used.
18	2	IS	X	[0..0]	0018	Patient Type		Not used.
19	478	CX	R	[1..1]	0203	Visit Number	Identifier**^^^** Assigning Authority Name **&** ID **&** ID Type **^VN^** Assigning Facility Name **&** ID **&** ID Type	PHVS_IdentifierType_SyndromicSurveillance
20	50	FC	X	[0..0]	0064	Financial Class		Not used.
21	2	IS	X	[0..0]	0032	Charge Price Indicator		Not used.
22	2	IS	X	[0..0]	0045	Courtesy Code		Not used.
23	2	IS	X	[0..0]	0046	Credit Rating		Not used.
24	2	IS	X	[0..*]	0044	Contract Code		Not used.
25	8	DT	X	[0..*]	0136	Contract Effective Date		Not used.
26	12	NM	X	[0..*]		Contract Amount		Not used.
27	3	NM	X	[0..*]		Contract Period		Not used.
28	2	IS	X	[0..0]	0073	Interest Code		Not used.

PV1 – Patient Visit Segment (Continued)								
SEQ	LEN	DT	Usage	Cardinality	TBL#	Element Name	Required/Recommended/Literal Value	Description/Comments
29	4	IS	X	[0..0]	0110	Transfer to Bad Debt Code		Not used.
30	8	DT	X	[0..0]		Transfer to Bad Debt Date		Not used.
31	10	IS	X	[0..0]	0021	Bad Debt Agency Code		Not used.
32	12	NM	X	[0..0]		Bad Debt Transfer Amt.		Not used.
33	12	NM	X	[0..0]		Bad Debt Recovery Amt.		Not used.
34	1	IS	X	[0..0]	0111	Delete Account Indicator		Not used.
35	8	DT	X	[0..0]		Delete Account Date		Not used.
36	3	IS	RE	[0..1]	0112	Discharge Disposition	Discharge Disposition	PHVS_DischargeDisposition_HL7_2x **Required** for ADT_A03 message type; required ***empty*** in ADT_A08 message type; Element ***not supported*** in ADT_A01 and ADT_A04 messages.
37	47	DLD	X	[0..0]	0113	Discharged to Location		Not used.
38	478	CE	X	[0..0]	0114	Diet Type		Not used.
39	2	IS	X	[0..0]	0115	Servicing Facility		Not used.
40	1	IS	X	[0..0]	0116	Bed Status		Not used.
41	2	IS	X	[0..0]	0117	Account Status		Not used.
42	1220	PL	X	[0..0]		Pending Location		Not used.
43	1220	PL	X	[0..0]		Prior Temp. Location		Not used.
44	26	TS	R	[1..1]		Admit Date/Time	YYYYMMDDHHMM[SS[.S[S[S[S]]]]] [+/- ZZZZ]	The minimum granularity is to the nearest minute.

PV1 – Patient Visit Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
45	26	TS	RE	[0..1]		Discharge Date/Time	YYYYMMDDHHMM[SS[.S[S[S[S]]]]] [+/- ZZZZ]	The minimum granularity is to the nearest minute. ***Required field for a Discharge message (A03).***
46	12	NM	X	[0..0]		Current Patient Balance		Not used.
47	12	NM	X	[0..0]		Total Charges		Not used.
48	12	NM	X	[0..0]		Total Adjustments		Not used.
49	12	NM	X	[0..0]		Total Payments		Not used.
50	250	CX	X	[0..0]	0203	Alternate Visit ID		Not used.
51	1	IS	X	[0..0]	0326	Visit Indicator		Not used.
52	309	XCN	X	[0..0]	0010	Other Healthcare Provider		Not used.

Example Data:

PV1|1|I|$E^305^B^My Facility&1234567890&NPI^Available^1162-7&24-Hour observation area&HL70305^150 Building^first floor^140
NE|E|||||NUR||||7|||||V22147^^^MPI Hospital Group&2.34.567.8.901234.56.7.8&ISO ^MR^MPI Ann Arbor&3.45.678.9.012345.67.8.9&ISO
||||||||||||||||09|||||||20130507085500.0015-0700

PV2 – PATIENT VISIT – ADDITIONAL INFORMATION SEGMENT

The PV2 segment is a continuation of visit-specific information and is the segment where the Admit Reason is passed.

PV2 – Patient Visit – Additional Information Segment								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
1	1220	PL	X	[0..0]		Prior Pending Location		Not used.
2	478	CE	X	[0..0]	0129	Accommodation Code		Not used.
3	478	CE	RE	[0..1]		Admit Reason	Identifier ^ Text ^ Coding System	PHVS_AdminstrativeDiagnosis_CDC_ICD_9CM **OR** PHVS AdministrativeDiagnosis_ICD-10CM **OR** PHVS_Disease_CDC Any free text documented in PV2-3.2.
4	478	CE	X	[0..1]		Transfer Reason		Not used.
5	25	ST	X	[0..*]		Patient Valuables		Not used.
6	25	ST	X	[0..1]		Pat. Valuables Location		Not used.
7	2	IS	X	[0..*]	0130	Visit User Code		Not used
8	26	TS	X	[0..1]		Expected Admit Date/Time		Not used.
9	26	TS	X	[0..1]		Expected Discharge D/T		Not used.
10	3	NM	X	[0..1]		Est. Length of Inpatient Stay		Not used.
11	3	NM	X	[0..1]		Act. Length of Inpatient Stay		Not used.
12	50	ST	X	[0..1]		Visit Description		Not used.
13	309	XCN	X	[0..*]		Referral Source Code		Not used.
14	8	DT	X	[0..1]		Previous Service Date		Not used.
15	1	ID	X	[0..1]	0136	Employment Illness Indicator		Not used.

PV2 – Patient Visit – Additional Information Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
16	1	IS	X	[0..1]	0213	Purge Status Code		Not used.
17	8	DT	X	[0..1]		Purge Status Date		Not used.
18	2	IS	X	[0..1]	0214	Special Program Code		Not used.
19	1	ID	X	[0..1]	0136	Retention Indicator		Not used.
20	1	NM	X	[0..1]		Exp. Number of Insurance Plans		Not used.
21	1	IS	X	[0..1]	0215	Visit Publicity Code		Not used.
22	1	ID	X	[0..1]	0136	Visit Protection Indicator		Not used.
23	250	XON	X	[0..*]		Clinic Org. Name		Not used.
24	2	IS	X	[0..1]	0216	Patient Status Code		Not used.
25	1	IS	X	[0..1]	0217	Visit Priority Code		Not used.
26	8	DT	X	[0..1]		Previous Rx Date		Not used.
27	2	IS	X	[0..1]	0112	Exp. Discharge Disposition		Not used.
28	8	DT	X	[0..1]		Signature on File Date		Not used.
29	8	DT	X	[0..1]		First Similar Illness Date		Not used.
30	478	CE	X	[0..1]	0218	Patient Charge Adjustment Cd.		Not used.
31	2	IS	X	[0..1]	0219	Recurring Service Code		Not used.
32	1	ID	X	[0..1]	0136	Billing Media Code		Not used.

PV2 – Patient Visit – Additional Information Segment (Continued)								
SEQ	LEN	DT	Usage	Cardinality	TBL#	Element Name	Required/Recommended/Literal Value	Description/Comments
33	26	TS	X	[0..1]		Exp. Surgery Date and Time		Not used.
34	1	ID	X	[0..1]	0136	Military Partnership Cd.		Not used.
35	1	ID	X	[0..1]	0136	Military Non-Availability Cd.		Not used.
36	1	ID	X	[0..1]	0136	Newborn Baby Indicator		Not used.
37	1	ID	X	[0..1]	0136	Baby Detained Indicator		Not used.
38	478	CE	X	[0..1]	0430	Mode of Arrival Code		Not used.
39	478	CE	X	[0..*]	0431	Recreational Drug Use Code		Not used.
40	478	CE	X	[0..1]	0432	Adm. Level of Care Code		Not used.
41	478	CE	X	[0..*]	0433	Precaution Code		Not used.
42	478	CE	X	[0..1]	0434	Patient Condition Code		Not used.
43	2	IS	X	[0..1]	0315	Living Will Code		Not used.
44	2	IS	X	[0..1]	0316	Organ Donor Code		Not used.
45	478	CE	X	[0..*]	0435	Advance Directive Code		Not used.
46	8	DT	X	[0..1]		Patient Status Effective Date		Not used.
47	26	TS	X	[0..1]		Exp. LOA Return D/T		Not used.
48	26	TS	X	[0..1]		Exp. Pre-Adm. Testing D/T		Not used.
49	20	IS	X	[0..*]	0534	Notify Clergy Code		Not used.

Example Data:

PV2|||78907^Abdominal Pain, Generalized^I9CDX

OBX – OBSERVATION/RESULT SEGMENT

This segment is used to transmit observations related to the patient and visit.

OBX – Observation/Result Segment								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
1	4	SI	RE	[0..1]		Set ID – OBX	Set ID	OBX|1|… OBX|2|…
2	3	ID	R	[1..1]	0125	Value Type	Value Type	Identifies the structure of data in OBX-5. PHVS_ValueType_HL7_2x Supported values: **TS, TX, NM, CWE, XAD**
3	478	CE	R	[1..1]		Observation Identifier	Identifier (Syndromic Surveillance) **^** Description **^** Coding System **^** Alternate Identifier **^** Alternate Description **^** Alternate Coding Sys.	Identifies the data to be received in the observation value (OBX-5). **See OBX-5 for specific values.**
4	20	ST	X	[0..1]		Obs. Sub-ID		Not used.
The OBX – 5 field is used to transmit a variety of observations related to the patient and the visit. Reportable observations are outlined below based on Data Type.								
5	24	**TS**	RE	[0..1]		Date of Onset	YYYYMMDDHHMMSS.SSSS +/- ZZZZ	**Date of Onset** OBX-3 = 11368-8^IllnessorInjuryOnsetDate andTime^LN OBX-5: Date of Onset For **TS**, the minimum acceptable precision is to the nearest day.
5	65536	**TX**	RE	[0..1]		Triage Note	Text Value	**Triage Note (Emergency Department Element = ED)** OBX-3 = 54094-8^ EmergencyDepartmentTriageNote^LN OBX-5: Triage Note Free Text

OBX – Observation/Result Segment (Continued)								
OBX – 5 (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
5	65536	**TX**	RE	[0..1]		Clinical Impression	Text Value	**Clinical Impression** OBX- 3 = 44833-2^PreliminaryDiagnosis^LN OBX- 5: Clinical Impression Free Text PHVS_ObservationIdentifier_SyndromicSurveillance
5	16	**NM**	RE	[0..1]		Height	Numeric Value	**Height (Inpatient Element = IP)** OBX- 3 = 8302-2^BodyHeight^LN OBX- 5: Height OBX -6: Height Unit PHVS_HeightUnit_UCUM
5	16	**NM**	RE	[0..1]		Weight	Numeric Value	**Weight (IP)** OBX- 3 = 3141-9^BodyWeight^LN OBX- 5: Weight OBX – 6: Weight Unit PHVS_WeightUnit_UCUM
5	16	**NM**	RE	[0..1]		Initial Temperature	Numeric Value	**Initial Temperature** OBX- 3 = 8310-5^BodyTemperature^LN OBX- 5: Initial Temperature OBX – 6: Temperature Unit PHVS_TemperatureUnit_UCUM
5	16	**NM**	RE	[0..1]		Systolic Blood Pressure	Numeric Value	**Systolic Blood Pressure** OBX- 3 = 8480-6^SystolicBloodPressure^LN OBX- 5: Systolic Blood Pressure OBX – 6: Unit of Measure PHVS_BloodPressureUnit_UCUM
5	16	**NM**	RE	[0..1]		Diastolic Blood Pressure	Numeric Value	**Diastolic Blood Pressure** OBX- 3 = 8462-4^DiastolicBloodPressure^LN OBX- 5: Diastolic Blood Pressure OBX – 6: Unit of Measure PHVS_BloodPressureUnit_UCUM

OBX – Observation/Result Segment (Continued)								
OBX – 5 (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
5	16	**NM**	RE	[0..1]		Initial Pulse Oximetry	Numeric Value	**Initial Pulse Oximetry** OBX- 3 = 59408-5^ OxygenSaturationinArterialBloodbyPulseOximetry^LN OBX- 5: Initial Pulse Oximetry OBX – 6: Pulse Oximetry Unit PHVS_PulseOximetryUnit_UCUM
5	16	**NM**	RE	[0..1]		Age	Numeric Value	**Age** OBX- 3 = 21612-7^AgeReported^LN OBX- 5: Age OBX – 6: Age Unit PHVS_AgeUnit_SyndromicSurveillance
5	697	**CWE**	RE	[0..1]		Smoking Status	Identifier **^** Description **^** Coding System **^** Alternate Identifier **^** Alternate Description **^** Alternate Coding Sys. **^** Coding Sys. Ver. ID **^** Alt. Coding Sys. Ver. ID **^** Original Text	**Smoking Status (IP)** OBX- 3 = 72166-2^TobaccoSmokingStatus^LN OBX- 5: Smoking Status PHVS_SmokingStatus_MU
5	697	**CWE**	RE	[0..1]		Hospital Unit	Identifier **^** Description **^** Coding System **^** Alternate Identifier **^** Alternate Description **^** Alternate Coding Sys. **^** Coding Sys. Ver. ID **^** Alt. Coding Sys. Ver. ID **^** Original Text	**Hospital Unit (IP)** OBX- 3 = 56816-2^HospitalUnit^LN OBX- 5: Hospital Unit NHSNHealthcareServiceLocationCode
5	697	**CWE**	RE	[0..1]		Hospital/Visit Type	Identifier **^** Description **^** Coding System **^** Alternate Identifier **^** Alternate Description **^** Alternate Coding Sys. **^** Coding Sys. Ver. ID **^** Alt. Coding Sys. Ver. ID **^** Original Text	**Hospital/Visit Type (ED only)** OBX- 3 = SS003^HOSPITAL/VISITTYPE^PHINQUESTION OBX- 5 = 261QE0002X^EmergencyCare^HCPCS PHVS_FacilityVisitType SyndromicSurveillance

OBX – Observation/Result Segment (Continued)								
OBX – 5 (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
5	697	**CWE**	RE	[0..*]		Chief Complaint (coded)	Identifier ^ Description ^ Coding System ^ Alternate Identifier ^ Alternate Description ^ Alternate Coding Sys. ^ Coding Sys. Ver. ID ^ Alt. Coding Sys. Ver. ID ^ Original Text	**If Chief Complaint is coded then** OBX- 3 = 8661-1 ^ChiefComplaintReported^LN OBX- 5.1: Chief Complaint Code PHVS_AdminstrativeDiagnosis_CDC_ICD_9CM **OR** PHVS_CauseOfDeath_ICD-10_CDC **OR** PHVS_Disease_CDC
5	697	**CWE**	RE	[0..*]		Chief Complaint (free text)	Identifier ^ Description ^ Coding System ^ Alternate Identifier ^ Alternate Description ^ Alternate Coding Sys. ^ Coding Sys. Ver. ID ^ Alt. Coding Sys. Ver. ID ^ Original Text	**If Chief Complaint is Free Text then** OBX- 3 = 8661-1 ^ChiefComplaintReported^LN OBX- 5.9: Chief Complaint Free Text
5	697	**CWE**	RE	[0..*]		Problem List	Identifier ^ Description ^ Coding System ^ Alternate Identifier ^ Alternate Description ^ Alternate Coding Sys. ^ Coding Sys. Ver. ID ^ Alt. Coding Sys. Ver. ID ^ Original Text	**Problem List** Problem List can be sent as SNOMED or ICD9 or ICD10 code. OBX- 3 = DataOverflow^ProblemList^L OBX- 5: Problem List PHVS_ProblemList_HITSP **OR** PHVS_AdminstrativeDiagnosis_CDC_ICD_9CM **OR** PHVS_CauseOfDeath_ICD-10_CDC **OR** PHVS_Disease_CDC
5	674	**XAD**	RE	[0..1]	0190	Facility Address	Street Address ^ Other Designation ^ City ^ State/Province ^ ZIP/Postal Code ^ Country ^ Address Type (TBL# 0190) ^^ County Code	**Facility Address** OBX – 3 = SS002^TREATING FACILITY LOCATION^PHINQUESTION OBX - 5: Treating facility physical address PHVS_State_FIPS_5-2 PHVS_Country_ISO_3166-1 PHVS_AddressType_CDC PHVS_County_FIPS_6-4
OBX – 5 ENDS								

OBX – Observation/Result Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
6	62	CE	C	[0..1]		Units	Identifier ^ Description ^ Coding System ^ Alternate Identifier ^ Alternate Description ^ Alternate Coding Sys.	Required if OBX-2 is **NM**. Defines units for pulse oximetry, temperature, age, etc. See OBX-5 details for coding systems.
7	60	ST	X	[0..0]		Reference Range		Not used.
8	5	IS	X	[0..*]	0078	Abnormal Flags		Not used.
9	5	NM	X	[0..1]		Probability		Not used.
10	2	ID	X	[0..*]	0080	Nature of Abnormal Test		Not used.
11	1	ID	R	[1..1]	0085	Observation Result Status	Result Status	Result Status (HL7)
12	26	TS	X	[0..1]		Effective Date of Ref. Range		Not used.
13	20	ST	X	[0..1]		User-Defined Access Checks		Not used.
14	26	TS	RE	[0..1]		Date/Time of Observation	YYYYMMDDHHMM[SS[.S[S[S[S]]]]] [+/- ZZZZ]	The minimum granularity is to the nearest minute.
15		CE	X	[0..1]		Producer's ID		Not used.
16		XCN	X	[0..*]		Responsible Observer		Not used.
17		CE	X	[0..*]		Observation Method		Not used.
18		EI	X	[0..*]		Equipment Instance ID		Not used.
19		TS	X	[0..1]		Date/Time of Analysis		Not used.

Example Data:

OBX|1|TS|11368-8^Illness or Injury Onset Date and Time^LN||20130505220000.0000-0700|||||F|||20130507085500.0015-0700

OBX|2|TX|54094-8^Emergency Department Triage Note^LN||Intravenous fluids administered: Emergency Department|||||F|||201310152024

OBX|3|NM|21612-7^Age Reported^LN||28|a^Year^UCUM|||||F|||20130507085500.0015-0700

OBX|4|NM|11289-6^Body Temperature^LN||99.1|[degF]^Farenheit^UCUM|||||F|||20130507085500.0015-0700

OBX|5|CWE|8661-1^Chief Complaint Reported^LN||^^^^^^^^Stomach Ache|||||F|||20130507085500.0015-0700

OBX|6|CWE|Data_Overflow^Problem_List^L||46635009^Diabetes mellitus type 1^SCT|||||F|||201102091114

OBX|7|CWE|Data_Overflow^Problem_List^L||59621000^Essential hypertension^SCT|||||F|||201102091114

OBX|8|CWE|SS003^HOSPITAL/VISITTYPE^PHINQUESTION||261QE0002X^EMERGENCY CARE^HCPCS|||||F|||201102091114

OBX|9|XAD|SS002^TREATINGFACILITYLOCATION^PHINQUESTION||1234 Anywhere Street^^Doraville^13^30341^USA^C^DEKALB|||||F|||201102091114

DG1– DIAGNOSIS SEGMENT

The DG1 segment contains patient diagnosis information of various types. Syndromic Surveillance supports Admitting, Working and Final Diagnosis types.

DG1 – Diagnosis Segment								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
1	4	SI	R	[1..1]		Set ID – DG1	Set ID	DG1|1|… DG1|2|…
2	2	ID	X	[0..1]	0053	Diagnosis Coding Method		Not used.
3	478	CE	R	[1..*]		Diagnosis Code – DG1	Identifier ^ Description ^ Coding System	PHVS_AdminstrativeDiagnosis_CDC_ICD_9CM **OR** PHVS_Disease_CDC **OR** PHVS_CauseofDeath_ICD-10_CDC Will assist to identify external cause of injury. The first diagnosis code should be the primary.
4	40	ST	X	[0..0]		Diagnosis Description		Not used.
5	26	TS	RE	[0..1]		Diagnosis Date/Time	YYYYMMDDHHMM[SS[.S[S[S[S]]]]] [+/- ZZZZ]	The minimum granularity is to the nearest minute.
6	2	IS	R	(1..*)	0052	Diagnosis Type	Diagnosis Type	PHVS_DiagnosisType_HL7_2x
7	478	CE	X	[0..0]	0118	Mjr. Diagnostic Category		Not used.
8	478	CE	X	[0..0]	0055	Diagnostic Related Group		Not used.
9	1	ID	X	[0..0]	0136	DRG Approval Indicator		Not used.
10	2	IS	X	[0..0]	0056	DRG Grouper Review Code		Not used.
11	478	CE	X	[0..0]	0083	Outlier Type		Not used.
12	3	NM	X	[0..0]		Outlier Days		Not used.
13	538	CP	X	[0..0]		Outlier Cost		Not used.

DG1 – Diagnosis Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
14	4	ST	X	[0..0]		Grouper Version/Type		Not used.
15	2	ID	X	[0..1]	0359	Diagnosis Priority		Not used.
16	309	XCN	X	[0..*]		Diagnosing Clinician		Not used.
17	3	IS	X	[0..1]	0228	Diagnosis Classification		Not used.
18	1	ID	X	[0..1]	0136	Confidential Indicator		Not used.
19	26	TS	X	[0..1]		Attestation Date/Time		Not used.
20	427	EI	X	[0..1]		Diagnosis Identifier		Not used.
21	1	ID	X	[0..1]	0206	Diagnosis Action Code		Not used.

Example Data:

DG1|1||78900^Abdmnal Pain Unspcf Site^I9CDX||20130507085500.0015-0700|A

DG1|2||5409^Acute Appendicitis Nos^I9CDX||20130510122530.0030-0700|W

PR1– PROCEDURES SEGMENT

This segment is used to carry information relative to various types of procedures performed.

PR1 – Procedures Segment								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
1	4	SI	R	[1..1]		Set ID – PR1	Set ID	PR1|1|… PR2|2|…
2	3	IS	X	[0..1]	0089	Procedure Coding Method		Not used.
3	478	CE	R	[1..1]	0088	Procedure Code	Identifier ^ Description ^ Coding System	CPT-4
4	40	ST	X	[0..0]		Procedure Description		Not used.
5	26	TS	R	[1..1]		Procedure Date and Time	YYYYMMDDHHMMSS.SSSS +/- ZZZZ	The minimum granularity is to the nearest minute.
6	2	IS	X	[0..1]	0230	Procedure Functional Type		Not used.
7	4	NM	X	[0..1]		Procedure Minutes		Not used.
8	309	XCN	X	[0..0]	0010	Anesthesiologist		Not used.
9	2	IS	X	[0..1]	0019	Anesthesia Code		Not used.
10	4	NM	X	[0..1]		Anesthesia Minutes		Not used.
11	309	XCN	X	[0..0]	0010	Surgeon		Not used.
12	309	XCN	X	[0..0]	0010	Procedure Practitioner		Not used.
13	478	CE	X	[0..1]	0059	Consent Code		Not used.
14	2	ID	X	[0..1]	0418	Procedure Priority		Not used.

PR1 – Procedures Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
15	478	CE	X	[0..1]	0051	Associated Diagnosis Code		Not used.
16	478	CE	X	[0..*]	0340	Procedure Code Modifier		Not used.
17	20	IS	X	[0..1]	0416	Procedure DRG Type		Not used.
18	478	CE	X	[0..*]	0417	Tissue Type Code		Not used.
19	427	EI	X	[0..1]		Procedure Identifier		Not used.
20	1	ID	X	[0..1]	0206	Procedure Action Code		Not used.

Example Data:

PR1|1||648.5A^Appendectomy^L||20130515140000.0000-0700

IN1– INSURANCE SEGMENT

The IN1 segment contains insurance policy coverage information necessary to produce properly pro-rated patient and insurance bills.

IN1 – Insurance Segment								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
1	4	SI	R	[1..1]		Set ID – IN1	Set ID	IN1|1|… IN2|2|…
2	478	CE	RE	[0..1]	0072	Insurance Plan ID	Identifier **^** Description **^** Coding System	User defined table #0072
3	250	CX	RE	[0..*]	0203	Insurance Company ID	Identifier **^^^** Assigning Authority Name **&** ID **&** ID Type **^** Identifier Type (TBL# 0203) **^** Assigning Facility Name **&** ID **&** ID Type	PHVS_IdentifierType_IIS
4	250	XON	X	[0..*]		Ins. Company Name		Not used.
5	513	XAD	X	[0..*]		Ins. Company Address		Not used.
6	294	XPN	X	[0..*]		Ins. Company Contact Person		Not used.
7	250	XTN	X	[0..*]		Ins. Company Phone Number		Not used.
8	12	ST	X	[0..1]		Group Number		Not used.
9	250	XON	X	[0..*]		Group Name		Not used.
10	250	CX	X	[0..*]		Insured's Group Emp. ID		Not used.
11	250	XON	X	[0..*]		Insured's Group Emp. Name		Not used.
12	8	DT	X	[0..1]		Plan Effective Date		Not used.
13	8	DT	X	[0..1]		Plan Expiration Date		Not used.
14	239	AUI	X	[0..1]		Authorization Information		Not used.

IN1 – Insurance Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
15	3	IS	RE	[0..1]	0086	Plan Type		Coding structure of plan types, Medicare, Medicaid, Blue Cross, etc. User defined table #0086
16	294	XPN	X	[0..*]		Name of Insured		Not used.
17	478	CE	X	[0..1]	0063	Insured's Rel. to Patient		Not used.
18	26	TS	X	[0..1]		Insured's Date of Birth		Not used.
19	513	XAD	X	[0..*]		Insured's Address		Not used.
20	2	IS	X	[0..1]	0135	Assignment of Benefits		Not used.
21	2	IS	X	[0..1]	0173	Coordination of Benefits		Not used.
22	2	ST	X	[0..1]		Coordination of Benefit Priority		Not used.
23	1	ID	X	[0..1]	0136	Notice of Admission Flag		Not used.
24	8	DT	X	[0..1]		Notice of Admission Date		Not used.
25	1	ID	X	[0..1]	0136	Report of Eligibility Flag		Not used.
26	8	DT	X	[0..1]		Report of Eligibility Date		Not used.
27	2	IS	X	[0..1]	0093	Release Info. Code		Not used.
28	15	ST	X	[0..1]		Pre-admit Cert (PAC)		Not used.
29	26	TS	X	[0..1]		Verification Date/Time		Not used.
30	309	XCN	X	[0..*]		Verification By		Not used.
31	2	IS	X	[0..1]	0098	Type of Agreement Cd.		Not used.

IN1 – Insurance Segment (Continued)								
SEQ	LEN	DT	Usage	Cardinality	TBL#	Element Name	Required/Recommended/Literal Value	Description/Comments
32	2	IS	X	[0..1]	0022	Billing Status		Not used.
33	4	NM	X	[0..1]		Lifetime Reserve Days		Not used.
34	4	NM	X	[0..1]		Delay Before L. R. Day		Not used.
35	8	IS	X	[0..1]	0042	Company Plan Code		Not used.
36	15	ST	X	[0..1]		Policy Number		Not used.
37	538	CP	X	[0..1]		Policy Deductible		Not used.
38	538	CP	X	[0..0]		Policy Limit – Amount		Not used.
39	4	NM	X	[0..1]		Policy Limit – Days		Not used.
40	538	CP	X	[0..0]		Room Rate – Semi-Private		Not used.
41	538	CP	X	[0..0]		Room Rate – Private		Not used.
42	478	CE	X	[0..1]	0066	Insured – Emp. Status		Not used.
43	1	IS	X	[0..1]	0001	Insured – Admin. Sex		Not used.
44	513	XAD	X	[0..*]		Insured Employer Add.		Not used.
45	2	ST	X	[0..1]		Verification Status		Not used.
46	8	IS	X	[0..1]	0072	Prior Insurance Plan ID		Not used.
47	3	IS	X	[0..1]	0309	Coverage Type		Not used.
48	2	IS	X	[0..1]	0295	Handicap		Not used.

IN1 – Insurance Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
49	250	CX	X	[0..*]		Insured's ID Number		Not used.
50	1	IS	X	[0..1]	0535	Signature Code		Not used.
51	8	DT	X	[0..1]		Signature Code Date		Not used.
52	250	ST	X	[0..1]		Insured's Birth Place		Not used.
53	2	IS	X	[0..1]	0099	VIP Indicator		Not used.

Example Data:

IN1|1|T71^4353875^L|12345^^^Insurance com&2.34.567.8.901234.56.7.8&ISO^MCD^Facility&3.45.678.9.012345.67.8.9&ISO ||||||||||||HMO

BTS – BATCH TRAILER SEGMENT

This segment defines the end of a batch (group of messages).

BTS – Batch Trailer Segment								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
1	10	NM	R	[1..1]		Batch Message Count	Numeric Value	Total number of messages contained in the batch. This guide supports an unlimited number of messages in a single batch.
2	80	ST	RE	[0..1]		Batch Comment		
3	100	NM	X	[0..*]		Batch Totals		Not used.

Example Data:

BTS|354

FTS – FILE TRAILER SEGMENT

This segment defines the end of a file (group of batches).

FTS – File Trailer Segment								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
1	10	NM	R	[1..1]		File Batch Count	**1**	Total number of batches contained in the file. One batch is allowed in a single file in this implementation guide.
2	80	ST	RE	[0..1]		File Trailer Comment		

Example Data:

FTS|1

SYNDROMIC SURVEILLANCE MESSAGING EXAMPLES

Two(2) case scenarios have been presented to illustrate how this Guide should be used for messaging syndromic surveillance information about a patient visit.

Case 1 - Emergency Department Visit:

A 35 year old female walks into the emergency department of Maricopa hospital (Facility Identifier: 2231231234) on March 17, 2014 at 11:30 AM. The patient is registered by a clerical assistant who records the patient's name, age, race, smoking status, ethnicity and records that the patient's reason for visit is "abdominal pain, fever, painful urination". At 12:00 PM a nurse practitioner examines the patient and takes the vitals for the patient and updates in the EHR system. The nurse practitioner then diagnoses the patient with a urinary tract infection. The nurse assigns an ICD-9-CM diagnosis code within the EHR, and orders a course of antibiotics for the patient. The patient is discharged from hospital at 12:30 PM. After 2 days All the final diagnosis codes and procedure codes are entered by coders for services received by the patient during the visit.

The facility's electronic health record module for syndromic surveillance data assembles and transmits all the message to Arizona Department of Health Services about this visit.

Patient visit at ED department for treatment

A 35 year old female is taken to the emergency department of a Maricopa hospital on March 17, 2014 at 11:30 AM. The patient is registered by a clerical assistant who records the patient's name, age, race, smoking status, ethnicity and records that the patient's reason for visit is "abdominal pain, fever, painful urination."

A04

ADT A04 message is generated for admission.
MSH: Trigger Event (A04), Facility name
PID: Date of birth, Race, Ethnicity, Gender, patient Address, MRN
OBX: Onset date, Chief complaint, smoking status, problem list, Age
PV1: Admit Date
See below for example 1.1

Diagnosis

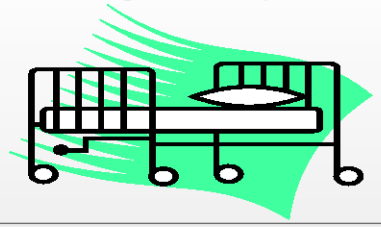
At 12:00 PM a nurse practitioner examines the patient and takes the vitals for the patient and updates in the EHR system. The nurse practitioner then diagnoses the patient with a urinary tract infection.

A08

ADT A08 message is generated for updates.
MSH: Trigger Event (A08)
OBX: Triage Note, Height, Weight, Temperature, Clinical Impression, Blood Pressure, Pulse Oximetry
DG1: admitting or working Diagnosis
See below for example 1.2

Discharge

The patient is discharged from hospital to home at 12:30 PM



A03

ADT A03 message is generated for discharge.
MSH: Trigger Event (A03)
PV1: Discharge Date, Discharge disposition
See below for example 1.3

Coding of final Diagnosis:

All the final diagnosis codes and procedure codes are entered by coders for services received by the patient during the visit.

A08

ADT A08 message is generated for updates.
MSH: Trigger Event (A08)
DG1: final Diagnosis code
PR1: procedure code
See below for example 1.4

1.1 A04 Event Type (Registration)

MSH|^~\&|App^1.23.456.7.890123.45.6.7^ISO|Maricopa Hospital^2231231234^NPI|BioSense^2.16.840.1.113883.3.1673^ISO|BioSense^2.16.840.1.113883.3.1673^ISO|201403171130||ADT^A04^ADT_A01|20140317113000.0005-0700-V22147|P|2.5.1|||||||||PH_SS-NoAck^SS Sender^2.16.840.1.114222.4.10.3^ISO
EVN||201403171130|||||Maricopa Hospital^2231231234^NPI
PID|1||2222^^^^MR||^^^^^^~^^^^^^S|||F||2106-3^White^CDCREC|||||||20130507AM0073^^^^AN||||2186-5^Not Hispanic^CDCREC
PV1|1|E||E|||||||||||||||222256^^^^VN|||||||||||||||||||||||||201403171130
OBX|1|CWE|SS003^HOSPITAL/VISITTYPE^PHINQUESTION||261QE0002X^EmergencyCare^HCPCS|||||F|||201403171130
OBX|2|CWE|8661-1^ChiefComplaintReported^LN||^^^^^^^^abdominal pain, fever, painful urination|||||F|||201403171130
OBX|3|NM|21612-7^AgeReported^LN||35|a^YEAR^UCUM|||||F|||201403171130
OBX|4|TS|11368-8^IllnessorInjuryOnsetDate^LN||201403161130|||||F|||201403171130
OBX|5|TX|54094-8^EmergencyDepartmentTriageNote^LN||Low abdominal pain,fever in triage|||||F|||201403171130
OBX|6|CWE|Data_Overflow^Problem_List^L||46635009^Diabetes mellitus type 1^SCT|||||F|||201403171130
OBX|7|CWE|72166-2^TobaccoSmokingStatus^LN||266927001^Tobacco smoking consumption unknown^SCT|||||F|||201403171130
IN1|1|T71^4353875^L|12345^^^^MCD||||||||||||HMO

1.2 A08 Event Type (Update)

MSH|^~\&|App^1.23.456.7.890123.45.6.7^ISO|Maricopa Hospital^2231231234^NPI|BioSense^2.16.840.1.113883.3.1673^ISO|BioSense^2.16.840.1.113883.3.1673^ISO|201403171200||ADT^A08^ADT_A01|20140317120000.0005-0700-V22147|P|2.5.1|||||||||PH_SS-NoAck^SS Sender^2.16.840.1.114222.4.10.3^ISO
EVN||201403171200|||||Maricopa Hospital^2231231234^NPI
PID|1||2222^^^^MR||^^^^^^~^^^^^^S|||F||2106-3^White^CDCREC|^^Phoenix^AZ^85007^^^^04013|||||||20130507AM0073^^^^AN||||2186-5^Not Hispanic^CDCREC
PV1|1|E||E|||122339^Dixonderson^Tim|||EMR|||||||||222256^^^^VN|||||||||||||||||||||||||201403171130
OBX|1|NM|8302-2^BodyHeight^LN||1.76|m^meter^UCUM |||||F|||201403171200
OBX|2|NM|3141-9^BodyWeight^LN||190|[lb_av]^pound^UCUM|||||F|||201403171200
OBX|3|NM|8310-5^BodyTemperature^LN||100.1|[degF]^Farenheit^UCUM|||||F|||201403171200
OBX|4|NM|8480-6^SystolicBloodPressure^LN||130|mm[Hg]^MilliMeters of Mercury^UCUM|||||F|||201403171200
OBX|5|NM|8462-4^DiastolicBloodPressure^LN||110|mm[Hg]^MilliMeters of Mercury^UCUM|||||F|||201403171200
OBX|6|NM|59408-5^OxygenSaturationinArterialBloodbyPulseOximetry^LN||98|%^percent^UCUM|||||F|||201403171200
OBX|7|CWE|44833-2^PreliminaryDiagnosis^LN||^^^^^^^^UTI|||||F|||201403171200

1.3 A03 Event Type (Discharge)

MSH|^~\&|App^1.23.456.7.890123.45.6.7^ISO|Maricopa Hospital^2231231234^NPI|BioSense^2.16.840.1.113883.3.1673^ISO|
BioSense^2.16.840.1.113883.3.1673^ISO|201403171230||ADT^A03^ADT_A03|20140317123000.0005-0700-V22147|P|2.5.1|||||||||PH_SS-NoAck^SS
Sender^2.16.840.1.114222.4.10.3^ISO
EVN||201403171230|||||Maricopa Hospital^2231231234^NPI
PID|1||2222^^^^MR||^^^^^^~^^^^^^S|||F||2106-3^White^CDCREC|^^Phoenix^AZ^85007^^^^04013|||||||20130507AM0073^^^^AN||||2186-5^Not Hispanic^CDCREC
PV1|1|E||E|||122339^Dixonderson^Tim|||EMR|||||||||222256^^^^VN|||||||||||||||||09|||||||201403171130|201403171230

1.4 A08 Event Type (Coding of final Diagnosis)

MSH|^~\&|App^1.23.456.7.890123.45.6.7^ISO|Maricopa Hospital^2231231234^NPI|BioSense^2.16.840.1.113883.3.1673^ISO|
BioSense^2.16.840.1.113883.3.1673^ISO|201403191230||ADT^A08^ADT_A01|20140319123000.0005-0700-V22147|P|2.5.1|||||||||PH_SS-NoAck^SS
Sender^2.16.840.1.114222.4.10.3^ISO
EVN||201403171230|||||Maricopa Hospital^2231231234^NPI
PID|1||2222^^^^MR||^^^^^^~^^^^^^S|||F||2106-3^White^CDCREC|^^Phoenix^AZ^85007^^^^04013|||||||20130507AM0073^^^^AN||||2186-5^Not Hispanic^CDCREC
PV1|1|E||E|||122339^Dixonderson^Tim|||EMR|||||||||222256^^^^VN|||||||||||||||||09|||||||201403171130|201403171230
DG1|1||599.0^URINARY TRACT INFECTION, SITE NOT SPECIFIED^I9CDX||20140317000000|F
DG1|2||600.01^Hypertrophy (Benign) of Prostate with Urinary Obstruction and Other Lower Urinary Tract Symptoms (Luts)^I9CDX||20140317121500|F
DG1|3||788.20^RETENTION OF URINE, UNSPECIFIED^I9CDX||20140317121500|F
DG1|4||596.0^BLADDER NECK OBSTRUCTION^I9CDX||20140317121500|F
DG1|5||276.51^Dehydration^I9CDX||20140317121500|F
DG1|6||496^CHRONIC AIRWAY OBSTRUCTION, NOT ELSEWHERE CLASSIFIED^I9CDX||20140317121500|F
PR1|2||92507^IV Cannular insertion^C4||20140317121000

Case 2 - Inpatient Visit:

On March 7, 2014 a White, non-Hispanic 86 year old male shows up to Medical Center (Facility Identifier: 2231237890) with a request from his physician to admit him for complications from influenza. During registration the patient's address is recorded as Phoenix, Maricopa County, Zip Code 85035. He tells the physician that he is suffering from a fever, chills and body aches as well as worsening shortness of breath. These symptoms are recorded as the patient's chief complaint. At 12:30 pm on March 7, 2014 the patient is admitted to an inpatient respiratory unit with an Admit Reason of ICD-9-CM 487.1(Influenza with other respiratory manifestations). The diagnosis type is recorded as an admitting diagnosis. After admission the patient's vitals were recorded and entered in EHR system. The Patient was treated for influenza and, over the course of the next 3 days, begins to recover from the respiratory complications of his influenza. After laboratory testing the physicians confirm that the patient was suffering from the H1N1 strain of influenza, possibly accounting for its severe manifestations. On March 10, 2014 at 1:00 pm the patient is discharged from the hospital to his home. After 4 days All the final diagnosis codes and procedure codes are entered by coders for services received by the patient during the visit.

The facility's electronic health record module for syndromic surveillance data assembles and transmits all the message to Arizona Department of Health Services about this visit.

Patient visit at hospital for treatment

On March 7, 2014 a White, non-Hispanic 86 year old male goes to Maricopa Medical Center with a request from his physician to admit him for complications from influenza. During the registration the patient's address is recorded as Phoenix, Maricopa County, 85035. He tells the physician that he is suffering from a fever, chills and body aches as well as worsening shortness of breath. Patient's smoking status and insurance information were also recorded at the time of registration.

A01

ADT A01 message is generated for admission.
MSH: Trigger Event (A01), Facility name
PID: Date of birth, Race, Ethnicity, Gender, patient Address, MRN
OBX: Onset date, Chief complaint, smoking status, problem list, Age
PV1: Admit Date
See below for example 2.1

Diagnosis

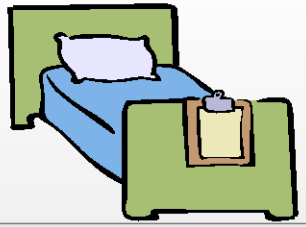
After admission the patient's vitals were recorded and entered in the EHR system. The Patient was treated for influenza and, over the course of the next 3 days, begins to recover from the respiratory complications of his influenza. After laboratory testing the physicians confirm that the patient was suffering from the H1N1 strain of influenza, possibly accounting for its severe manifestations.

A08

ADT A08 message is generated for updates.
MSH: Trigger Event (A08)
OBX: Triage Note, Height, Weight, Temperature, Clinical Impression, Blood Pressure, Pulse Oximetry
DG1: admitting or working Diagnosis
See below for example 2.2

Discharge

On March 10, 2014 at 1:00 pm the patient is discharged from the hospital to his home



A03

ADT A03 message is generated for discharge.
MSH: Trigger Event (A03)
PV1: Discharge Date, Discharge disposition
See below for example 2.3

Coding of final diagnosis:

All the final diagnosis codes and procedure codes are entered by coders for services received by the patient during the visit.

A08

ADT A08 message is generated for updates.
MSH: Trigger Event (A08)
DG1: final Diagnosis code
PR1: procedure code
See below for example 2.4

2.1 A01 event Type (Registration)

MSH|^~\&|App^1.23.456.7.890123.45.6.7^ISO|Maricopa Medical Center^2231237890^NPI|BioSense^2.16.840.1.113883.3.1673^ISO|BioSense^2.16.840.1.113883.3.1673^ISO|201403071230||ADT^A01^ADT_A01|201403071230.0005-0700-V22147|P|2.5.1|||||||||PH_SS-NoAck^SS Sender^2.16.840.1.114222.4.10.3^ISO
EVN||201403071230|||||Maricopa Medical Center^2231237890^NPI
PID|1||2223^^^^MR||^^^^^^~^^^^^^S|||M||2106-3^White^CDCREC|5227 W Wilshire Dr^^PHOENIX^AZ^85035^^^^04019||||||20130507UM0073^^^^AN||||2186-5^Not Hispanic^CDCREC
PV1|1|I|||||122338^Dixonderson^Sussane|||RPU|||||||||222359^^^^VN|||||||||||||||||||||||||201403071230
PV2|||487.1^Influenza with other respiratory manifestations^I9CDX
OBX|1|CWE|8661-1^^LN||^^^^^^^^fever, chills and body aches as well as worsening shortness of breath|||||F|||201403071230
OBX|2|NM|21612-7^AgeReported^LN||86|a^YEAR^UCUM|||||F|||201403071230
OBX|3|TS|11368-8^IllnessorInjuryOnsetDate^LN||201403041230|||||F|||201403071230
OBX|4|CWE|Data_Overflow^Problem_List^L||46635009^Diabetes mellitus type 1^SCT|||||F|||201403071230
OBX|5|CWE|Data_Overflow^Problem_List^L||59621000^Essential hypertension^SCT|||||F|||201403071230
OBX|6|CWE|72166-2^TobaccoSmokingStatus^LN||266927001^Tobacco smoking consumption unknown^SCT|||||F|||201403071230
IN1|1|T71^4353875^L|123456^^^^MCD||||||||||||PPO

2.2 A08 Event Type (Update)

MSH|^~\&|App^1.23.456.7.890123.45.6.7^ISO|Maricopa Medical Center^2231237890^NPI|BioSense^2.16.840.1.113883.3.1673^ISO|BioSense^2.16.840.1.113883.3.1673^ISO|201403071300||ADT^A08^ADT_A01|20140307130000.0005-0700-V22147|P|2.5.1|||||||||PH_SS-NoAck^SS Sender^2.16.840.1.114222.4.10.3^ISO
EVN||201403071300|||||Maricopa Medical Center^2231237890^NPI
PID|1||2223^^^^MR||^^^^^^~^^^^^^S|||M||2106-3^White^CDCREC|5227 W Wilshire Dr^^PHOENIX^AZ^85035^^^^04019||||||20130507UM0073^^^^AN||||2186-5^Not Hispanic^CDCREC
PV1|1|I|||||122338^Dixonderson^Sussane|||RPU|||||||||222359^^^^VN|||||||||||||||||||||||||201403071230
OBX|1|NM|8302-2^BodyHeight^LN||1.76|m^meter^UCUM |||||F|||201403071300
OBX|2|NM|3141-9^BodyWeight^LN||200|[lb_av]^pound^UCUM|||||F|||201403071300
OBX|3|NM|8310-5^BodyTemperature^LN||101.1|[degF]^Farenheit^UCUM|||||F|||201403071300
OBX|4|NM|8480-6^SystolicBloodPressure^LN||125|mm[Hg]^MilliMeters of Mercury^UCUM|||||F|||201403071300
OBX|5|NM|8462-4^DiastolicBloodPressure^LN||100|mm[Hg]^MilliMeters of Mercury^UCUM|||||F|||201403071300
OBX|6|NM|59408-5^OxygenSaturationinArterialBloodbyPulseOximetry^LN||95|%^percent^UCUM|||||F|||201403071300
OBX|7|CWE|44833-2^PreliminaryDiagnosis^LN||Tamiflu|||||F|||201403071300

2.3 A03 Event Type (Coding of Final Daiagnosis)

MSH|^~\&|App^1.23.456.7.890123.45.6.7^ISO|Maricopa Medical
Center^2231237890^NPI|BioSense^2.16.840.1.113883.3.1673^ISO|BioSense^2.16.840.1.113883.3.1673^ISO|201403101300||ADT^A03^ADT_A03|20140310130000.0005-0700-V22147|P|2.5.1|||||||||PH_SS-NoAck^SS Sender^2.16.840.1.114222.4.10.3^ISO
EVN||201403101300|||||Maricopa Medical Center^2231237890^NPI
PID|1||2223^^^^MR||^^^^^^~^^^^^^S|||M||2106-3^White^CDCREC|5227 W Wilshire Dr^^PHOENIX^AZ^85035^^^^04019||||||20130507UM0073^^^^AN||||2186-5^Not Hispanic^CDCREC
PV1|1|I|||||122338^Dixonderson^Sussane|||RPU|||||||||222359^^^^VN|||||||||||||||||||||||||20140307123000|20140310130000

2.4 A08 Event Type

MSH|^~\&|App^1.23.456.7.890123.45.6.7^ISO|Maricopa Medical
Center^2231237890^NPI|BioSense^2.16.840.1.113883.3.1673^ISO|BioSense^2.16.840.1.113883.3.1673^ISO|201403141300||ADT^A08^ADT_A08|20140314130000.0005-0700-V22147|P|2.5.1|||||||||PH_SS-NoAck^SS Sender^2.16.840.1.114222.4.10.3^ISO
EVN||201403141300|||||Maricopa Medical Center^2231237890^NPI
PID|1||2223^^^^MR||^^^^^^~^^^^^^S|||M||2106-3^White^CDCREC|5227 W Wilshire Dr^^PHOENIX^AZ^85035^^^^04019||||||20130507UM0073^^^^AN||||2186-5^Not Hispanic^CDCREC
PV1|1|I|||||122338^Dixonderson^Sussane|||RPU|||||||||222359^^^^VN|||||||||||||||||||||||||20140307123000|20140310130000
DG1|1||487.1^INFLUENZA WITH OTHER RESPIRATORY MANIFESTATIONS^I9CDX||20140309130000.0015-0700|A
DG1|2||V58.69^Long-Term (Current) Use of Other Medications^I9CDX||20140309070000.0015-0700|W
DG1|3||488.19^ Influenza due to identified 2009 H1N1 influenza virus with other manifestations^I9CDX||20140309130000.0015-0700|F

TOOLS AND RESOURCES

ADHS Meaningful Use Website http://www.azdhs.gov/meaningful-use

Contains general information on:

- *Meaningful Use objective and measure for Syndromic Surveillance reporting to public health (SS2PH)*
- *Message and vocabulary standards (HL7 Implementation Guide, LOINC, SNOMED CT)*
- *Syndromic Surveillance implementation and Meaningful Use attestation steps for hospitals*
- *Tools for vocabulary mapping and message validation*

Health Level Seven International Website http://www.hl7.org

Official HL7 website containing news and resources related to HL7

Logical Observation Identifiers Names and Codes (LOINC) Search Engine http://search.loinc.org

Browser engine for Logical Observation Identifiers Names and Codes (LOINC)

CDC PHIN Vocabulary Access and Distribution System (VADS) https://phinvads.cdc.gov/vads/SearchVocab.action

Vocabulary tool containing coded values for:

- *HL7 and user-defined tables*
- *LOINC*
- *SNOMED CT*
- *ICD 9 and ICD 10*

CDC PHIN Message Quality Framework (MQF)

https://phinmqf.cdc.gov/ValidateMessages.aspx?Act=1&ProjectName=Meaningful Use-Syndromic Surveillance HL7 2.5.1&ProjCode=119

HL7 Version 2.5.1 Syndromic Surveillance Message Receiver Profile Validation Tool released by CDC

National Institute for Standards and Technology (NIST) HL7 V2.5.1 Syndromic Surveillance Validation Tool – Meaningful Use 2014 Edition

http://hl7v2-ss-testing.nist.gov/mu-syndromic

HL7 Version 2.5.1 Syndromic Surveillance Message Receiver Profile Validation Tool released by NIST

GLOSSARY

ADT	An HL7 message type specific to an Admit, Discharge, and Transfer activity within a medical hospital or facility.
Assigning Authority	Identifies the system, application, or organization that assigns the identifier.
Assigning Facility	Identifies the place where the identifier is assigned.
Batch	A group of messages.
Cardinality	Minimum and maximum number of times the data element may appear.
CDC	Centers for Disease Control and Prevention
CLIA	Clinical Laboratory Improvement Amendments
Component	Data element within a field.
Component Separator	Separates adjacent components or data elements within a field.
Composite	A data type made up of a series of components that are themselves assigned a data type.
Data Locker	The cloud-enabled, web-based platform where ADHS and LPHJs view and analyze patient-level data.
Data Type (DT)	The basic building block used to construct or restrict the contents of a data field.
EHR	Electronic Health Record. The systematic collection of elements which comprise a health-related record about an individual or populations.
Escape Character	Used to signal certain special characteristics of portions of the text field.
Facility	A general reference to a hospital or hospital setting.
Field	A string of characters.
Field Separator	Separates two adjacent data fields within a segment. It also separates the segment ID from the first data field in each segment.
File	Contains one or more batches.
HL7	An international messaging standard used to exchange electronic health information.
ISO	International Organization for Standardization
Length (LEN)	The number of characters that one occurrence of the data field or component may occupy.
Local PH Jurisdiction (LPHJ)	The entity providing Public Health Services (as defined by the National Public Health Performance Standards Program (NPHPSP) ten essential services) within a geographic area in the State of Arizona.
Meaningful Use	Meaningful Use is the act of using a certified Electronic Health Record (CEHRT) technology to create better integration between public health and health care.
Message	An atomic unit of data comprised of a group of segments in a defined sequence.
NIST Validation Tool	A message validation tool released by the National Institute for Standards and Technology (NIST) to help Meaningful Use candidates prepare for certification.
OID	Object Identifier. A globally unique ISO identifier.
PHIN	Public Health Information Network
Primitive	A data type that consists of a series of characters.
Repetition Separator	Separates multiple occurrences of a field where allowed.
Segment	A logical grouping of data fields.
Segment Group	A logical unit of two or more segments.
Segment Terminator	Ends a segment record. This value cannot be changed by implementers.
Sequence (SEQ)	Ordinal position of the field within the segment.
Subcomponent	Data element within a component.
Subcomponent Separator	Separates adjacent subcomponents within a component.
Syndromic Surveillance	The continued collection and analysis of diagnostic population health data.
Usage	Indicates whether the message element is required, required but can be empty, conditional, or not used.
UCUM	Unified Code for Units of Measure
User Manager	The person from a LPHJ, also referred to as the BioSense Local Liaison, who functions as a Security Steward for their jurisdiction authorizing and deactivating user access to BioSense.

For additional information, please contact the Electronic Disease Surveillance Program at syndromicsurveillance@azdhs.gov.