

# Idaho BioSense 2.0 Syndromic Surveillance Implementation Guide: Required Elements and HL7 Messaging

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## Introduction

The Idaho Department of Health and Welfare (IDHW) Division of Public Health (DPH) compiled this guide for eligible hospitals who wish to implement Syndromic Surveillance reporting. The information in this guide is based on the ***PHIN Messaging Guide for Syndromic Surveillance: Emergency Department and Urgent Care Data*** (August 2012) and provides additional guidance specific to reporting of syndromic surveillance data in Idaho. Please send questions about the guide to [PublicHealthMU@dhw.idaho.gov](mailto:PublicHealthMU@dhw.idaho.gov).

A summary of the data elements required by Idaho for syndromic surveillance submission is listed in **Table 1**. Additionally, **Appendix A** provides users with definitions of the minimum requested data elements as well as the appropriate value sets. **Appendix B** categorizes these same minimum data elements into message segments so users can identify exactly where each data element should be placed. Users of this guide must be familiar with the details of HL7 message construction and processing. This guide is not intended to be a tutorial on HL7. For more information about HL7 messaging, go to <http://www.hl7.org/>.

Please note that not all the information presented in the ***PHIN Messaging Guide for Syndromic Surveillance: Emergency Department and Urgent Care Data*** is replicated in this document. For example, all unsupported fields have been excluded from this document. This document was compiled to assist facilities with understanding what data elements an HL7 2.3.1 or 2.5.1 message should contain for syndromic surveillance submission in Idaho.

Please refer to the ***PHIN Messaging Guide for Syndromic Surveillance: Emergency Department and Urgent Care Data*** for additional information. This guide is specific to emergency department and urgent care data and can be found here: <http://www.cdc.gov/phin/resources/PHINguides.html>

### BioSense 2.0

The BioSense 2.0 application provides local, state, and federal partners a timely regional and national picture of trends of disease syndromes and situational awareness. The BioSense 2.0 application is one programmatic element of the Syndromic Surveillance activities within the Centers for Disease Control and Prevention (CDC). The goal is to provide nationwide and regional situational awareness for monitoring community health and all-hazard health threats and to support national, state, and local responses to those threats.

### Data Elements of Interest – Summary

The Idaho Department of Health and Welfare, Division of Public Health has adopted the requirement for submission of the minimum recommended data set shown in Table 1. To remain in compliance with public health reporting of syndromic surveillance for Meaningful Use, facilities submitting syndromic surveillance data must, at a minimum, submit those data elements marked as “required”.

<b>Table 1: Summary of Data Elements of Interest</b>			
<b>Data Element</b>	<b>*Submission Requirements</b>	<b>Data Element</b>	<b>*Submission Requirements</b>
<b>TREATMENT FACILITY IDENTIFIERS</b>		<b>PATIENT HEALTH INDICATORS</b>	
Facility Identifier (Treating)	R	Unique Visiting ID	R
Facility Name (Treating)	O	Visit Date/Time	R
Facility Location (Treating) - Street Address	O	Date of Onset	O
Facility Location (Treating) - City	O	Patient Class	O
Facility Location (Treating) - County	O	CC/Reason for visit	RE
Facility Location (Treating) - State	O	Triage Notes	O
Facility/Visit Type	R	Diagnosis/Injury Code	RE
Report Date/Time	R	Clinical Impression	O
<b>PATIENT DEMOGRAPHICS</b>		Diagnosis Type	R
Unique Patient Identifier	R	Discharge Disposition	RE
Medical Record #	O	Disposition Date/Time	O
Age	R	Initial Temperature	RE
Age Units	R	Initial Pulse Oximetry	O
Gender	RE		
City/Town (Patient)	O		
ZIP Code (Patient)	RE		
State (Patient)	O		
Country (Patient)	O		
Race (Patient)	RE		
Ethnicity (Patient)	RE		
County (Patient)	RE		

\*(R=Required, RE=Required but can be left empty, O=Optional)

## Useful Resources

PHIN Messaging Guide for Syndromic Surveillance: Emergency Department and Urgent Care (Release 1.1 August 2012):

<http://www.cdc.gov/phin/resources/PHINguides.html>

Idaho Department of Health and Welfare website:

<http://www.healthandwelfare.idaho.gov/>

## General Message Infrastructures

### Basic HL7 Terms

Table 2.1	Basic HL7 Terms
Term	Definition
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.
Segment	A segment is a logical grouping of data fields. Segments within a defined message may be required or optional and may occur only once or may be allowed to repeat. Each segment is named and identified by a segment ID, a unique 3-character code.
Field	A field is a string of characters. Each field has an element name and is identified by the segment it is in and its sequence within the segment. Usage and cardinality requirements are defined in the Segment Definitions.
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 necessarily required to be populated.
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 HL7 data type is listed in each field definition.
Delimiters	The delimiter values are given in MSH-1 and MSH-2 and are used throughout the message. Delimiters supported are:   Field Separator ^ Component Separator & Sub-Component Separator ~ Repetition Separator \ Escape Character

### Encoding Rules

The following list details the encoding rules.

- Encode each segment in the order specified in the Message Structure.
- Begin each segment with the 3-letter segment ID (e.g., PID).
- End each segment with the carriage return terminator (hex 0D). Note that in the examples in this guide, this character is illustrated as “<cr>”. This character is a single ASCII character; the segment terminator is NOT the four-character sequence.
- Encode the data fields in the sequence given in the corresponding segment definition tables.
- Encode each data field according to the data type format listed in this guide. Components, subcomponents, or repetitions that are not valued at the end of a field need not be represented by component separators. Likewise, field separators are not required for empty fields at the end of a segment. For example, the data fields and segments below are equivalent:

|^XXX&YYY&&^| is equal to |^XXX&YYY|

|ABC^DEF^^| is equal to |ABC^DEF|

And

MSH|^~\&||Facility\_NPI^0131191934^NPI|||201009221330||ADT^A04^ADT\_A01|1|P|2.3.1|||||||<cr>

MSH|^~\&||Facility\_NPI^0131191934^NPI|||201009221330||ADT^A04^ADT\_A01|1|P|2.5.1|||||||<cr>

Is equal to

MSH|^~\&||Facility\_NPI^0131191934^NPI|||201009221330||ADT^A04^ADT\_A01|1|P|2.3.1<cr>

MSH|^~\&||Facility\_NPI^0131191934^NPI|||201009221330||ADT^A04^ADT\_A01|1|P|2.5.1<cr>

## Transport Method

Approved organizations will have two transport options for ongoing submission of syndromic surveillance data to the Idaho BioSense 2.0 Secure Space: Secure File Transport Protocol (SFTP) and the Public Health Information Network Messaging System (PHINMS).

### Secure Message Transmission

**SFTP** is a network protocol that provides file access, file transfer, and file management functionalities over any reliable data stream. An account will be provided on our server to which organizations will upload their files.

**PHINMS** is the public health standard for reporting to the Centers for Disease Control and Prevention (CDC). The software is freely available from the CDC. A Digital Certificate is required when using PHINMS and must be installed and updated by the sending organization.

Facilities will need to set up a transport mechanism with the BioSense 2.0 team after successfully completing the initial testing phase with the Idaho Division of Public Health (DPH). Contact information for the BioSense 2.0 team for assistance on how to set up data transport mechanisms will be provided by the Idaho DPH. Facilities will transmit test messages, containing fictional patient data, via email to Idaho DPH. All test messages must be attached to an email as a separate TXT file and directed to [PublicHealthMU@dhw.Idaho.gov](mailto:PublicHealthMU@dhw.Idaho.gov). Once the test message has been validated, ongoing submission can be implemented.

**Batched Messages:** HL7 batch files allow one or more messages to be sent in a single file, using specialized segments in a structure that mirrors HL7 defined message types. HL7 batching is useful for systems that are not connected via real-time transmission protocols

**Real Time Messages:** “Real time” message processing refers to the ability to transmit HL7 messages in real time.

### Data Submission Parameters

The Idaho Division of Public Health (DPH) requires that encounter data be submitted a minimum of once every 24 hours as a batch message file containing the previous day’s ER encounters and updates. Facilities should submit data on all visits to the emergency department with no filtering done prior to submission to Idaho.

\*Idaho DPH will not provide installation, configuration or technical support for the PHINMS ebXML client message sender. Full documentation and contact information for the PHINMS product may be found at the following link:

<http://www.cdc.gov/phinf/>  
<http://www.cdc.gov/phinf/tools/PHINms/>

## Supported ADT Message Types

Syndromic surveillance will use information from HL7 Admit-Discharge-Transfer (ADT) messages. Only the following message transaction types will be accepted for emergency department syndromic surveillance submission:

- **ADT^A04** (Registration) – A patient has arrived or checked in as a one-time, or recurring outpatient, and is not assigned to a bed.
- **ADT^A08** (Patient Information Update) – Patient information has changed but no other trigger event has occurred.

## Supported ADT Message Format

While both HL7 versions 2.3.1 and 2.5.1 are supported under Stage 1 of Meaningful Use, Idaho DPH is requiring that all syndromic surveillance messages conform to HL7 version 2.5.1 standards. HL7 version 2.5.1 is the required format for Stage 2 of Meaningful Use.

## Required Message Segments

**R** = Required to be sent

**RE**= Required to be sent but can be empty if information is not available

Segment	A01, A03, A04, A08	Description
Message Header (MSH)	R	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, senders, receiver, message type, etc.
Event Type (EVN)	R	The EVN segment is used to communicate trigger event information to receiving applications.
Patient Identification (PID)	R	The PID segment is used as the primary means of communicating patient identification information. This segment contains pertinent patient identifying and demographic information.
Patient Visit (PV1)	R	The PV1 segment is used by Registration/Patient Administration applications to communicate information on a visit-specific basis.
Patient Visit – Additional Information (PV2)	RE	The PV2 segment is a continuation of visit-specific information and is the segment where the Admit Reason is passed.
Observation/Result (OBX)	R	The OBX Segment in the ADT Message is used to transmit observations related to the patient and visit. If the data element is carried in an OBX segment and usage is “Required”, the segment and its fields must be populated.
Diagnosis (DG1)	RE	The DG1 segment contains patient diagnosis information of various types. Syndromic Surveillance supports Admitting, Working and Final Diagnosis types.

## Segment Profile Attributes

Abbreviation	Definition
Field Name	Descriptive name of the data element
Sequence (Seq)	Sequence of the elements as they are numbered in the HL7 segment
Data type (DT)	Data type used for HL7 element
Length (Len)	<p>Length of an element is calculated using the following rules:</p> <p><i>Field length</i> = (Sum of all supported component lengths) + (component number of the last-supported component) – 1.</p> <p><i>Component length</i> = (Sum of all supported sub-component lengths) + (sub-component number of the last-supported component) – 1.</p>
Cardinality	<p>Minimum and maximum number of times the field may appear.</p> <p>[0..0] Field never present</p> <p>[0..1] Field may be omitted and can have, at most, one occurrence.</p> <p>[1..1] Field must have exactly one occurrence</p> <p>[0..n] Field may be omitted or may repeat up to <i>n</i> times</p> <p>[1..n] Field must appear at least once, and may repeat up to <i>n</i> time.</p> <p>[0..*] Field may be omitted or repeat an unlimited number of times.</p> <p>[1..*] Field must appear at least once, and may repeat unlimited number of times.</p> <p>[m..n] Field must appear at least <i>m</i> and at most <i>n</i> times.</p>
Values / Value Set	<p>Link to value set or literal value of data expected to be populated in the field. Numbers in this field denote the related vocabulary in that HL7 Table. Contains the name and/or the PHIN Value Set (accessible through PHIN VADS) when relevant as well as notes, condition rules and recommendations</p> <p><a href="#">-HL7 Tables</a></p>

## Appendix A: Data Element Descriptions

The tables below more thoroughly describe the minimum data elements being requested for submission of public health syndromic surveillance data. Appendix B summarizes where each of the requested data elements should be placed in the HL7 message section.

DATA ELEMENTS OF INTEREST - DESCRIPTION			
#	Data Element Name	Description of Field	Value Set/Value Domain
<b>TREATMENT FACILITY IDENTIFIERS</b>			
1	Facility Identifier (Treating)	Unique facility identifier of facility where the patient originally presented (original provider of the data)	Recommend the use of the National Provider Identifier Standard provided by Centers for Medicare and Medicaid Services. For more information about NPI, search for, or to apply for a NPI, <a href="#">click here</a> . Final Rule establishing NPI as standard unique health identifier for health care providers <a href="#">NPI Final Rule</a>
2	Facility Name (Treating)	Name of facility where the patient originally presented (original provider of the data)	Recommend the use of the Organization Name Legal Business Name (LBN) associated with the National Provider Identifier Standard provided by Centers for Medicare and Medicaid Services. For more information about NPI, search for, or to apply for a NPI, <a href="#">click here</a> . Final Rule establishing NPI as standard unique health identifier for health care providers <a href="#">NPI Final Rule</a>
3	Facility Location (Treating) - Street Address	Street address of treating facility location	
4	Facility Location (Treating) - City	City of treating facility location	It is recommended that free text be used to populate City/Town designations.
5	Facility Location (Treating) - County	County of treating facility location	It is recommended that free text be used to populate County designations.
6	Facility Location (Treating) - State	State of treating facility location	<a href="#">PHVS State FIPS 5-2</a>
7	Facility/Visit Type	Type of facility that the patient visited for treatment	<a href="#">PHVS FacilityVisitType SyndromicSurveillance</a>
8	Report Date/Time	Date and time of report transmission from original source (from treating facility)	If data flows through an intermediary or third party, the intermediary must keep the original date/time of transmission. HL7 Date/Time Format: YYYYMMDDHHMM[SS[.S[S [S[S]]]]] [+/- ZZZZ]
INTENTIONALLY LEFT BLANK			
<b>PATIENT DEMOGRAPHICS</b>			
9	Unique Patient Identifier	Unique identifier for the patient	<a href="#">PHVS IdentifierType SyndromicSurveillance</a>
10	Medical Record #	Patient medical record number	<a href="#">PHVS IdentifierType SyndromicSurveillance</a>
11	Age	Numeric value of patient age	<a href="#">PHVS ObservationIdentifier SyndromicSurveillance</a>

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12	Age Units	Unit corresponding to numeric value of patient age (e.g. Days, Month or Years)	<a href="#">PHVS AgeUnit SyndromicSurveillance</a>
13	Gender	Gender of patient	<a href="#">PHVS Gender SyndromicSurveillance</a>
14	City/Town (Patient)	City/Town of patient residence	It is recommended that free text be used to populate City/Town designations.
15	ZIP Code (Patient)	ZIP Code of patient residence	
16	State (Patient)	State of patient residence	<a href="#">PHVS State FIPS 5-2</a>
17	Country (Patient)	Country of patient residence	<a href="#">PHVS Country ISO 3166-1</a>
18	Race (Patient)	Race of patient	<a href="#">PHVS RaceCategory CDC</a>
19	Ethnicity (Patient)	Ethnicity of patient	<a href="#">PHVS EthnicityGroup CDC</a>
20	County (Patient)	County/Parish Code	<a href="#">PHVS County FIPS 6-4</a>
<b>PATIENT HEALTH INDICATORS</b>			
21	Unique Visiting ID	Unique identifier for a patient visit	<a href="#">PHVS IdentifierType SyndromicSurveillance</a>
22	Visit Date/Time	Date/Time of patient presentation	
23	Date of Onset	Date that patient began having symptoms of condition being reported	<a href="#">PHVS ObservationIdentifier Syndromic Surveillance</a>
24	Patient Class	Patient classification within facility	<a href="#">PHVS PatientClass Syndromic Surveillance</a>
25	CC/Reason for visit	Short description of the chief complaint or reason of patient's visit, recorded when seeking care	For OBX-3 Please use: <a href="#">PHVS ObservationIdentifier SyndromicSurveillance</a> For OBX-5 Please use: Free text OR <a href="#">PHVS AdministrativeDiagnosis CDC ICD-9CM</a> OR <a href="#">PHVS CauseOfDeath ICD- 10 CDC</a> OR <a href="#">PHVS Disease CDC</a> (SNOMED Based Valueset) For further guidance refer to <b>APPENDIX B.</b>
26	Triage Notes	Triage notes for the patient visit	For OBX-3 Please use: <a href="#">PHVS ObservationIdentifier SyndromicSurveillance</a> For OBX-5 Please use: Free text For further guidance refer to <b>APPENDIX B.</b>

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27	Diagnosis/Injury Code	Diagnosis or injury code of patient condition	<a href="#">PHVS AdministrativeDiagnosis CDC ICD-9CM</a> OR <a href="#">PHVS CauseOfDeath ICD- 10 CDC</a> OR <a href="#">PHVS Disease CDC</a> (SNOMED Based Valueset)
28	Clinical Impression	Clinical impression (free text) of diagnosis	For OBX-3 Please use: <a href="#">PHVS ObservationIdentifier SyndromicSurveillance</a> For OBX-5 Please use: Free text For further guidance refer to <b>APPENDIX B.</b>
29	Diagnosis Type	Qualifier for Diagnosis / Injury Code specifying type of diagnosis	<a href="#">PHVS DiagnosisType HL7 2x</a>
30	Discharge Disposition	Patient's anticipated location or status following ED visit	<a href="#">PHVS Discharge Disposition HL7 2x</a> The disposition of the patient at time of discharge (i.e., discharged to home, expired, etc.).
31	Disposition Date/Time	Date and time of disposition	
32	Initial Temperature	1st recorded temperature, including units	For OBX-3 Please use: <a href="#">PHVS ObservationIdentifier SyndromicSurveillance</a> OBX-6 Please use: <a href="#">PHVS TemperatureUnit UCU M</a>
33	Initial Pulse Oximetry	1st recorded pulse oximetry value	For OBX-3 Please use: <a href="#">PHVS ObservationIdentifier SyndromicSurveillance</a> For OBX-6 Please use: <a href="#">PHVS PulseOximetryUnit UC UM</a>

## Appendix B: Data Element Specifications by Message Segment

The tables below outline the data elements by **message segment** that are requested for syndromic surveillance submission.

### MSH: Message Header Segment Definition

The MSH segment defines the intent, source, destination, and selected message syntax specifications. This segment includes identification of message delimiters, sender, receiver, message type, timestamp, etc. The MSH segment is required.

### MSH Example:

```
MSH|^~\&|EHR SYSTEM NAME|HLTHCTRNAME^9876543210^NPI|SYNDSURV|IDH|201112091114|| ADT^A04^ADT_A01
|201112091114-0078|P|2.5.1 |||||||PH_SS-NoAck^SS Sender^2.16.840.1.114222.4.10.3^ISO <cr>
```

MSH: Message Header Segment Definition							
Field Name	Seq	DT	Length	Sender Usage	Receiver Usage	Cardinality	Values/Value Set
Field Separator	1	ST	1	R	R	[1..1]	<b>Definition:</b> This field contains the separator between the segment ID and the first real field, MSH-2-encoding characters. As such, the field serves as the separator and defines the character to be used as a separator for the rest of the message. Default value is  , (ASCII 124).
Encoding Characters	2	ST	4	R	R	[1..1]	<b>Default Values:</b> “^~\&” (ASCII 94, 126, 92, and 38). <b>Definition:</b> This field contains the four characters in the following order: the component separator, repetition separator, escape character, and subcomponent separator. Default values are ^~\& (ASCII 94, 126, 92, and 38, respectively).
Sending Application	3	HD	227	O	O	[0..1]	<b>Definition:</b> This field uniquely identifies the sending application among all other applications within the network enterprise. The network enterprise consists of all those applications that participate in the exchange of HL7 messages within the enterprise.
Sending Facility	4	HD	227	R	R	[1..1]	National Provider Identifier. (10-digit identifier) <b>Definition:</b> This field further describes the sending application, MSH-3-sending application. This field uniquely identifies the facility associated with the application that sends the message. If Acknowledgements are in use, this facility will receive any related Acknowledgement message.

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Namespace ID	4.1	IS	20	RE	RE	[0..1]	Name of the sending facility. Use full name of sending facility, no codes or abbreviations will be accepted. If message is sent by a vendor on behalf of a health care facility, the name of vendor should be used.
Universal ID	4.2	ST	199	R	R	[1..1]	National Provider Identification <a href="#">NPI Registry Search Home</a> Or <a href="#">National Provider System</a>
Universal ID Type	4.3	ID	6	R	R	[1..1]	<a href="#">PHVS UniversalIDType_SyndromicSurveillance</a>
Date/Time of Message	7	TS	26	R	R	[1..1]	<b>Conformance Statement:</b> MSH-7 (Date/Time of Message) <b>SHALL</b> be expressed with a minimum precision of the nearest minute, and be represented in the following format: 'YYYYMMDDHHMM[SS[.S[S[S[S]]]]] [+/-ZZZZ]'  <b>Definition:</b> This field contains the date/time that the sending system created the message. If the time zone is specified, it will be used throughout the message as the default time zone. <b>Note:</b> MSH-7 (Date/Time of Message) does not have to equal EVN-2 (Message Date/Time)
Message Type	9	MSG	15	R	R	[1..1]	<b>Conformance Statement:</b> MSH-9 (Message Type) <b>SHALL</b> be constrained to be a value in the set: 'ADT^A04^ADT_A01', 'ADT^A08^ADT_A01',  <b>Definition:</b> This field contains the message type, trigger event, and the message structure ID for the message.
Message Code	9.1	ID	3	R	R	[1..1]	<a href="#">PHVS_MessageType_SyndromicSurveillance</a>
Trigger Event	9.2	ID	3	R	R	[1..1]	<a href="#">PHVS_EventType_SyndromicSurveillance</a>
Message Structure	9.3	ID	7	R	R	[1..1]	<a href="#">PHVS_MessageStructure_SyndromicSurveillance</a>
Message Control ID	10	ST	199	R	R	[1..1]	<b>Definition:</b> This field contains a number or other identifier that uniquely identifies the message. The receiving system echoes this ID back to the sending system in the Message acknowledgment segment (MSA). <b>Note:</b> This field is a number or other identifier that uniquely identifies the message.

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Processing ID	11	PT	3	R	R	[1..1]	<p><b>Conformance Statement:</b> MSH-11 (Processing ID) <b>SHALL</b> have a value in the set of literal values: “P” for Production, “D” for Debug or “T” for Training.</p> <p><b>Definition:</b> This field is used to decide whether to process the message as defined in HL7 Application (level 7) Processing rules.</p> <p><b>Note:</b> Indicates how to process the message as defined in HL7 processing rules</p>
Version ID	12	VID	5	R	R	[1..1]	<p><b>Definition:</b> This field is matched by the receiving system to its own version to be sure the message will be interpreted correctly. For this Admission message the value shall be 2.5.1</p> <p><b>Note:</b> HL7 version number used to interpret format and content of the message.</p>
Message Profile Identifier	21	EI	427	R	R	[0..1]	<p><b>Conformance Statement:</b> An instance of MSH.21 (Message Profile Identifier) <b>SHALL</b> contain the constant value:</p> <p>PH_SS-Ack^SS Sender^2.16.840.1.114222.4.10.3^ISO or PH_SS-Ack^SS Receiver^2.16.840.1.114222.4.10.3^ISO</p> <p>PH_SS-NoAck^SS Sender^2.16.840.1.114222.4.10.3^ISO or PH_SS-NoAck^SS Receiver^2.16.840.1.114222.4.10.3^ISO</p> <p>PH_SS-Batch^SS Sender^2.16.840.1.114222.4.10.3^ISO or PH_SS-Batch^SS Receiver^2.16.840.1.114222.4.10.3^ISO</p> <p><b>Definition:</b> Sites may use this field to assert adherence to, or reference, a message profile. Message profiles contain detailed explanations of grammar, syntax, and usage for a particular message or set of messages.</p>

### EVN: Event Type Segment Definition

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

#### EVN Example:

```
EVN||201203270000|||||HOSPITAL NAME^1111111111^NPI<cr>
```

EVN: Event Type Segment Description							
Field Name	Seq	DT	Length	Sender Usage	Receiver Usage	Cardinality	Values/Value Set
Recorded Date/Time	2	TS	26	R	R	[1..1]	<p><b>Conformance Statement:</b> EVN-2 (Recorded Date/Time of Message) <b>SHALL</b> be expressed with a minimum precision of the nearest minute, and be represented in the following format: 'YYYYMMDDHHMM[SS[.S[S[S[S]]]]] [+/-ZZZZ]'</p> <p><b>Note:</b> EVN-2 (Recorded Date/Time) does not have to equal MSH-7 (Date/Time of Message)</p> <p><b>Note:</b> Most systems default to the system Date/Time when the transaction was entered.</p> <p><b>Data Element of Interest:</b> Message Date/Time</p>
Event Facility	7	HD	241	R	R	[1..1]	<p><b>Definition:</b> This field identifies the location where the patient was actually treated.</p> <p><b>Note:</b> The use of 'NPI' should be discussed during the implementation process as local jurisdictions may differ on their use of identifiers for this field.</p> <p><b>Data Element of Interest:</b> Facility Identifier (Treating) (EVN-7.1)</p> <p><b>Data Element of Interest:</b> Facility Name (Treating) (EVN-7.2)</p>
Namespace ID	7.1	IS	20	RE	RE	[0..1]	Full name of facility where patient presented for treatment. No codes or abbreviations will be accepted.
Universal ID	7.2	ST	199	R	R	[1..1]	National Provider Identifier. (10-digit identifier).
Universal ID Type	7.3	ID	6	R	R	[1..1]	<a href="#">PHVS UniversalIDType SyndromicSurveillance</a>

**PID: Patient Identification Segment Definition**

The PID segment is used as the primary means of communicating patient identification information. This segment contains patient identifying and demographic information that change infrequently. The PID segment is required.

**PID Example:**

PID|1||9999000000^^^MR^^|~^^^S||19880630|M||2106-3^WHITE^CDCREC|^83720|||||||2186-5^NOT HISPANIC OR LATINO^CDCREC<CR>

**PID Example with Patient Death Date and Patient Death Indicator included:**

PID|1||9999000000^^^MR^^|~^^^S||19880630|M||2106-3^WHITE^CDCREC|^83720|||||||2186-5^NOT HISPANIC OR LATINO^CDCREC|||||201112080400|Y<cr>

PID: Patient Identification Segment Description							
Field Name	Seq	DT	Length	Sender Usage	Receiver Usage	Cardinality	Values/Value Set
Set ID	1	SI	4	R	R	[0..1]	<p><b>Conformance Statement:</b> PID-1 (Set ID) <b>SHALL</b> have the Literal Value of ‘1’</p> <p><b>Definition:</b> This field contains the number that identifies this transaction. The sequence number shall be one.</p>
Patient Identifier List	3	CX	478	R	R	[1..*]	<p><b>Definition:</b> PID.3 is a repeating field that can accommodate multiple patient identifiers.</p> <p><b>Note:</b> Patient’s unique identifier(s) from the facility that is submitting this report to public health officials. Different jurisdictions use different identifiers and may often use a combination of identifiers to produce a unique patient identifier. Patient identifiers should be strong enough to remain a unique identifier across different data provider models, such as a networked data provider or State HIE.</p> <p><b>Data Element of Interest:</b> Unique Patient Identifier</p>
ID Number	3.1	ST	15	R	R	[1..1]	
Identifier Type Code	3.5	ID	5	R	R	[1..1]	<a href="#">PHVS_IdentifierType_SyndromicSurveillance</a>

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Patient Name	5	XPN	294	R	R	[1..*]	<p><b>Note:</b> Syndromic Surveillance does not require the patient name. The Patient ID number will be used to identify uniquely the patient. HL7 does require the patient name field for a PID segment. The patient name field must still be populated even when reporting de-identified data.</p> <p><b>Conformance Statement:</b> If <b>PID-5</b> (Patient Name) is known, but not desired to be sent, then the second occurrence of PID-5 <b>SHALL</b> be valued and only PID-5.7 (Name Type Code) shall be valued with the constant value "S" (i.e., PID-5 shall be valued as ~^^^S).second name field indicates that it is unspecified.</p>
Name Type Code	5.7	ID	1	R	R	[1..1]	<a href="#">PHVS NameType SyndromicSurveillance</a>
Administrative Sex	8	IS	1	RE	RE	[0..1]	<p><a href="#">PHVS Gender SyndromicSurveillance</a></p> <p><b>Definition:</b> This field contains the patient's sex. <b>Data Element of Interest:</b> Gender</p>
Race	10	CE	478	RE	RE	[0..*]	<p><b>Definition:</b> This field refers to the patient's race</p> <p><b>Note:</b> Patient could have more than one race defined.</p> <p><b>Data Element of Interest:</b> Race</p>
Identifier	10.1	ST	20	RE	RE	[0..1]	<a href="#">PHVS RaceCategory CDC</a>
Text	10.2	ST	199	O	RE	[0..1]	
Name of Coding System	10.3	ID	20	CE	C	[0..1]	<p><b>Condition Predicate:</b> If PID-10.1(the identifier) is provided then PID 10.3is valued.</p>
Patient Address	11	XAD	513	RE	RE	[0..1]	<p><b>Definition:</b> This field contains the mailing address of the patient.</p> <p><b>Note:</b> Expecting only the patient primary (current) address information in the supported components</p> <p><b>Data Element of Interest:</b> Patient City/Town (PID-11.3) <b>Data Element of Interest:</b> Patient State (PID-11.4) <b>Data Element of Interest:</b> Patient ZIP Code (PID-11.5) <b>Data Element of Interest:</b> Patient Country (PID-11.6) <b>Data Element of Interest:</b> Patient County (PID-11.9)</p>
City	11.3	ST	50	O	O	[0..1]	
State or Province	11.4	ST	50	O	O	[0..1]	<a href="#">PHVS State FIPS 5-2</a>

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Zip or Postal Code	11.5	ST	12	RE	RE	[0..1]	<a href="#">USPS</a>
Country	11.6	ID	20	O	O	[0..1]	<a href="#">PHVS Country ISO 3166-1</a>
County/Parish Code	11.9	IS	20	RE	RE	[0..1]	<a href="#">PHVS County FIPS 6-4</a>
Ethnic Group	22	CE	478	RE	RE	[0..1]	<b>Definition:</b> This field further defines the patient's ancestry.  <b>Data Element of Interest:</b> Ethnicity
Identifier	22.1	ST	20	RE	RE	[0..1]	<a href="#">PHVS EthnicityGroup CDC</a>
Text	22.2	ST	199	O	O	[0..1]	

### PV1: Patient Visit Segment Definition

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

#### PV1 Example:

```
PV1|1|E|Bed 12 ER|E|||||MED||||7||||20110209_0064^^^VN^MIDLAND HLTH CTR&9876543210&NP I||||||| |||||
20111217144208<cr>
```

#### PV1 Example with Discharge Date/Time:

```
PV1|1|E|Bed 12 ER|E|||||MED||||7||||20110209_0064^^^VN^HLTH CTR NAME&9876543210&NPI||||||| |||||
20111217144208|20111217164208<cr>
```

**Note:** If a patient has not been discharged, the field is sent empty (null). Do not wait to send data until patient has been discharged. Discharge dates should be sent in subsequent update messages regarding the patient.

PV1: Patient Visit Segment Description							
Field Name	Seq	DT	Length	Sender Usage	Receiver Usage	Cardinality	Values/Value Set
Set ID – PV1	1	SI	4	RE	RE	[0..1]	<p><b>Conformance Statement:</b> PV1-1 (Set ID) <b>SHALL</b> have the Literal Value of ‘1’</p> <p><b>Definition:</b> This field contains the number that identifies this transaction. The sequence number shall be one</p>
Patient Class	2	IS	1	R	R	[1..1]	<p><a href="#">PHVS PatientClass SyndromicSurveillance</a></p> <p><b>Definition:</b> This field is used by systems to categorize patients by site.</p> <p><b>Data Element of Interest:</b> Patient Class</p>
Visit Number	19	CX	478	R	R	[1..1]	<p><b>Definition:</b> This field contains the unique number assigned to each patient visit.</p> <p><b>Note:</b> Unique identifier for a patient visit</p> <p><b>Data Element of Interest:</b> Unique Visit Identifier</p>

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ID Number	19.1	ST	15	R	R	[1..1]	
Identifier Type Code	19.5	ID	5	R	R	[1..1]	<a href="#">PHVS_IdentifierType_SyndromicSurveillance</a> <b>Conformance Statement:</b> PV1-19.5 (Identifier Type Code) <b>SHALL</b> be valued to the Literal Value 'VN'.
Assigning Facility	19.6	HD	227	O	RE	[0..1]	
Admit Date/Time	44	TS	26	R	R	[1..1]	<b>Conformance Statement:</b> PV1-44 (Admit Date/Time) <b>SHALL</b> be expressed with a minimum precision of the nearest minute and be represented in the following format: 'YYYYMMDDHHMM[SS[.S[S[S[S]]]]] [+/-ZZZZ]'
							<b>Definition:</b> This field is reflects the date/time of an outpatient/emergency patient registration. <b>Note:</b> Date and time of the patient presentation. <b>Data Element of Interest:</b> Admit Date/Time

**OBX: Observation/Result Segment Definition**

The OBX Segment in the ADT Message is used to transmit observations related to the patient and visit. If the data element is carried in an OBX and usage is „Required“, the segment and its fields must be populated. The method for reporting age and chief complaint data is through an OBX segment. The OBX is a required segment.

**OBX Examples**

**OBX example of CWE value type with Chief Complaint:**

```
OBX|1|CWE|8661-1^CHIEF COMPLAINT:FIND:PT:PATIENT:NOM:REPORTED^LN||^STOMACH  
ACHE|||||F|||201112171531<cr>
```

**OBX examples of NM value type with Patient Age, Patient Temperature, and Patient Pulse Oximetry:**

```
OBX|2|NM|21612-7^AGE TIME PATIENT REPORTED^LN||43|a^YEAR^UCUM|||||F|||201112171531<cr>
```

```
OBX|3|NM|11289-6^BODY  
TEMPERATURE:TEMP:ENCTRFIRST:PATIENT:QN^LN||99.1|[degF]^FARENHEIT^UCUM|||||F|||201112171658<cr>
```

```
OBX|4|NM|59408-5^OXYGEN SATURATION:MFR:PT:BLDA:QN:PULSE  
OXIMETRY^LN||95|^PERCENT^UCUM|||||F|||201112171658<cr>
```

**OBX examples of TS value type with Patient illness/injury onset date:**

```
OBX|5|TS|11368-8^ILLNESS OR INJURY ONSET DATE AND TIME:TMSTP:PT:PATIENT:QN^LN||20111215|||||F|||201112171658<cr>
```

**OBX examples of TX value type with Patient triage notes:**

```
OBX|6|TX|54094-8^TRIAGENOTE:FIND:PT:EMERGENCYDEPARTMENT:DOC^LN||Pain a recurrent cramping  
sensation.|||||F|||201102121114<CR>
```

### OBX: Observation Result Segment Description

Field Name	Seq	DT	Length	Sender Usage	Receiver Usage	Cardinality	Values/Value Set
Set ID – OBX	1	SI	4	R	R	[0..1]	<p><b>Note:</b> Set ID numbers the repetitions of the segments. For the first repeat of the OBX segment, the sequence number shall be one (1), for the second repeat, the sequence number shall be two (2), etc.</p> <p><i>Example:</i>                      OBX 1 ...                      OBX 2 ...                      OBX 3 ...</p> <p><b>Definition:</b> This field contains the sequence number.</p>
Value Type	2	ID	3	R	R	[1..1]	<p><b>Conformance Statement:</b>                      SS-16 OBX-2 SHALL be valued to the Literal Value in the set ('TS', 'TX', 'NM', 'CWE', 'XAD')</p> <p><a href="#">PHVS_ValueType_SyndromicSurveillance</a></p> <p><b>Definition:</b> This field contains the format of the observation value in OBX.</p> <p><b>Note:</b> Identifies the structure of data in observation value (OBX.5)</p>
Observation Identifier	3	CE	478	R	R	[1..1]	<p><a href="#">PHVS_ObservationIdentifier_SyndromicSurveillance</a></p> <p><b>Definition:</b> This field contains a unique identifier for the observation.</p> <p><b>Note:</b> Identifies data to be received in observation value (OBX.5)</p> <p><b>Data Elements of Interest communicated in OBX Segment may include:</b>                      Facility Street address (Treating), Data Type: XAD:1, SAD:1                      Facility City (Treating), Data Type: XAD:3                      Facility State (Treating), Data Type: XAD:4                      Facility ZIP Code (Treating), Data Type: XAD:5                      Facility County (Treating), Data Type: XAD:9                      Age, Data Type: NM                      Facility / Visit Type, Data Type: CWE (only for ED/UC)</p>

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							Chief Complaint/Reason for Visit, Data Type: CWE, (Free Text is preferred) Clinical Impression, Data Type: TX Initial Temperature, Data Type: NM Triage Notes, Data Type: TX Initial Pulse Oximetry, Data Type: TX
Identifier	3.1	ST	20	R	R	[1..1]	
Text	3.2	ST	199	O	O	[0..1]	
Name of Coding System	3.3	ID	20	R	R	[0..1]	<b>Condition Predicate:</b> If OBX-3.1 (the identifier) is provided then OBX-3.3 is valued.
Observation Value	5	Varies	99999	RE	RE	[0..*]	<p>Listed below are the supported fields for each of the supported value types.</p> <p><b>Note:</b> Values received in observation value are defined by value type (OBX.2) and observation identifier (OBX.3).</p> <p><b>Notes on Data Types:</b></p> <p><i>TS Data Type:</i> Unconstrained. Some values might be to the day, others to the year/ decade, etc.</p> <p><i>TX Data Type:</i> The TX data type is used to carry string data intended for display purposes. It can contain leading blanks (space characters).</p> <p><i>NM Data Type:</i> A numeric data type is a number represented as a series of ASCII numeric characters consisting of an optional leading sign (+ or -), the 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.</p> <p><i>CWE Data Type:</i> Data Element: Facility / Visit Type (only for ED/UC) -CWE:2 Text: It is strongly recommended that text be sent to accompany any identifier.</p> <p>-CWE Data Type: Data Element: Chief Complaint/Reason for visit It is the short description of the patient's self-reported chief complaint or reason for visit. It is preferred that Free text is used. Free Text should appear in CWE:9</p>

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							<p><i>XAD Data Type: Data Elements:</i>                  Facility Street address (Treating), Data Type: XAD:1, SAD:1:  <b>-Note:</b> This is the first subcomponent of the SAD data type.                  This has the same effect as being the first component of the field, while limiting the</p>
<b>Beginning of OBX-5 Observation Value Usage Based on Data Type in OBX-2</b>							
<b>TS Data Type</b>							
Time	5.1	DTM	24	RE	RE	[0..1]	<p><b>Date of Onset:</b> Sender usage is "O". Date that patient began having symptoms of condition being reported.</p>
<b>TX Data Type</b>							
Text Data	5.1	TX	65536	RE	RE	[0..1]	<p><b>Triage Notes:</b>                  Sender usage is "O". Please use free text.</p> <p><b>Clinical Impression:</b>                  Sender usage is "O". Designated as Preliminary Diagnosis LOINC (44833-2) in OBX-3.                  Please use free text.</p>
<b>NM Data type</b>							
Numeric Value	5.1	ST	16	RE	RE	[0..1]	<p><b>Age:</b> Sender usage is R. Numeric value of patient age in years at time of visit (not at time of report). If age is less than 1 year, use literal value "0".</p> <p><b>Initial Temperature:</b> Sender usage is O.</p> <p><b>Initial Pulse Oximetry:</b> Sender usage is O.</p>
<b>CWE Data Type: Facility / Visit Type (for ED/UC)</b>							
Identifier	5.1	ST	20	R	R	[0..1]	<p><b>Facility/Visit Type:</b> Sender usage is "R". Only send 1 per facility. Use value set: 2.16.840.1.114222.4.11.3401.  <a href="#">PHVS FacilityVisitType Value Set DetailsSyndromicSurveillance</a></p>
Text	5.2	ST	199	RE	RE	[0..1]	Strongly recommended that text is sent to accompany any identifier.
Name of Coding System	5.3	ID	20	R	R	[0..1]	<p><b>Condition Predicate:</b> If OBX-5.1 (the identifier) is provided then OBX-5.3 is valued.</p>
Alternate Identifier	5.4	ST	20	RE	RE	[0..1]	

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Alternate Text	5.5	ST	199	RE	RE	[0..1]	Strongly recommended that text is sent to accompany any identifier.
Name of Alternate Coding System	5.6	ID	20	C	C	[0..1]	<b>Condition Predicate:</b> If OBX-5.4 (the identifier) is provided then OBX-5.6 is valued.
Original Text	5.9	ST	199	RE	RE	[0..1]	Please use free text.
<b>CWE Data Type: Chief Complaint / Reason for visit- Free Text is preferred</b>							
Identifier	5.1	ST	20	RE	RE	[0..1]	<b>Chief complaint/reason for visit:</b> Sender usage is "RE". Short description of the chief complaint or reason for patient's visit recorded when seeking care.  <a href="#">PHVS AdministrativeDiagnosis CDC ICD-9CM</a> <b>Or</b> <a href="#">PHVS CauseOfDeath ICD-10 CDC</a> <b>Or</b> <a href="#">PHVS Disease CDC</a>
Text	5.2	ST	199	RE	RE	[0..1]	
Name of Coding System	5.3	ID	20	C	C	[0..1]	<b>Condition Predicate:</b> If OBX-5.1 (the identifier) is provided then OBX-5.3 is valued.
Alternate Identifier	5.4	ST	20	RE	RE	[0..1]	
Alternate Text	5.5	ST	199	RE	RE	[0..1]	
Name of Alternate Coding System	5.6	ID	20	C	C	[0..1]	<b>Condition Predicate:</b> If OBX-5.4 (the identifier) is provided then OBX-5.6 is valued.
Original Text	5.9	ST	199	RE	RE	[0..1]	Please use free text.
<b>End of OBX-5 Observation Value Usage Based on Data Type in OBX-2</b>							
Units	6	CE	62	C	C	[0..1]	<b>Condition Predicate:</b> If OBX.2 (Value Type) is valued "NM"  <b>Background:</b> When an observation's value is measured on a continuous scale, one must report the measurement units within the unit's field of the OBX segment.
Identifier	6.1	ST	20	R	R	[1..1]	<b>Conformance Statement:</b> If OBX 3.1 is valued with 21612-7, then OBX-6.1 (Identifier) <b>SHALL</b> be valued to a member of the set: <a href="#">Age Value Set Details</a>

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							<p><b>Conformance Statement:</b> If OBX 3.1 = is valued with 11289-6 then OBX-6.1 (Identifier) <b>SHALL</b> be valued to a member of the set: <a href="#">Temperature Value Set Details</a></p> <p><b>Conformance Statement:</b> If OBX 3.1 is valued with 59408-5 then OBX6.1 (Identifier) <b>SHALL</b> be valued to a member of the set: <a href="#">Pulse Value Set Details</a></p>
Text	6.2	ST	20	O	O	[0..1]	
Name of Coding System	6.3	ID	20	R	R	[0..1]	<b>Condition Predicate:</b> If OBX-6.1 (the identifier) is provided then OBX-6.3 is valued.
Observation Result Status	11	ID	1	R	R	[1..1]	<p>HL7 table 0085: HL7 defined: Observation Result Status. Expected values: "F"</p> <p><b>Definition:</b> This field contains the observation result status. This field reflects the current completion status of the results for one Observation Identifier.</p>

### DG1: Diagnosis Segment Definition

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

#### DG1 Examples:

DG1|1||4739^CHRONIC SINUSITIS NOS^I9CDX||201112171658|A<cr>

DG1|2||04100^STREPTOCOCCUS UNSPEC^I9CDX||201112171858|F<cr>

### DG1: Diagnosis Segment Description

Field Name	Seq	DT	Length	Sender Usage	Receiver Usage	Cardinality	Values/Value Set
Set ID – DG1	1	SI	4	R	R	[1..1]	<p><b>Conformance Statement:</b> DG1-1 (Set ID) for the first occurrence of a DG1 Segment <b>SHALL</b> have the Literal Value of '1'. Each following occurrence <b>SHALL</b> be numbered consecutively.</p> <p><b>Definition:</b> This field contains the number that identifies this transaction. For the first occurrence of the segment the sequence number shall be 1, for the second occurrence it shall be 2, etc.</p>
Diagnosis code – DG1	3	CE	478	R	R	[1..1]	<p><b>Definition:</b> This contains the diagnosis code assigned to this diagnosis.</p> <p><b>Data Element of Interest:</b> Diagnosis</p>
Identifier	3.1	ST	20	R	RE	[0..1]	<p><a href="#">PHVS_AdministrativeDiagnosis_CDC_ICD-9CM</a> Or <a href="#">PHVS_AdministrativeDiagnosis_ICD-10CM</a> or <a href="#">PHVS_Disease_CDC</a></p>
Text	3.2	ST	199	RE	RE	[0..1]	.
Name of Coding System	3.3	ID	20	R	R	[0..1]	<p><b>Condition Predicate:</b> If DG1-3.1 (the identifier) is provided then DG1-3.3 is valued.</p> <p><b>Condition Predicate:</b> DG1-3.3 <b>SHALL</b> be valued to one of the Literal Values in the set ('I10', 'I9CDX', and 'SCT').</p>
Diagnosis Date/Time	5	TS	26	O	O	[0..1]	<p><b>Definition:</b> This field contains the date/time that the diagnosis was determined.</p>
Diagnosis Type	6	IS	2	R	R	[1..1]	<p><a href="#">PHVS_DiagnosisType_HL7_2x</a> <b>Definition:</b> This field contains a code that identifies the type of diagnosis being sent <b>Note:</b> Identifies the type of diagnosis being sent. <b>Data Element of Interest:</b> Diagnosis type</p>

**A04 Message Example - Patient X is registered at the emergency department**

```
MSH|^~\&||HEALTH SYSTEM NAME^999999999^NPI|SYNDSURV|IDH|201203300000|| ADT^A04^ADT_A01|
1234567890|P|2.5.1||||| PH_SS-NoAck^SS Sender^2.16.840.1.114222.4.10.3^ISO <CR>
EVN||201203270000|||||HOSPITAL NAME^111111111111^NPI<CR>
PID|1||9999000000^^^MR^^|~^^^S||19880630|M||2106-3^WHITE^CDCREC|^83720|||||2186-5^NOT HISPANIC OR
LATINO^CDCREC<CR>
PV1|1|E|BED 12 ER|E|||||MED||||7||||20110209_0064^^^VN^HLTH CTR NAME&9876543210&NPI|||||
20111217144208<CR>
OBX|1|CWE|8661-1^CHIEF COMPLAINT: FIND: PT: PATIENT: NOM: REPORTED^LN||^HEAD ACHE FELL DOWN HIT
HEAD|||||F||201112171531<CR>
```

## PHIN Syndromic Surveillance Messaging Case Study Examples

### Case - Patient Admitted from Emergency Department

The Case Study below provides an example of a hospital emergency department visit that is captured as an unstructured, free-text chief complaint, and the patient is discharged from the ED and admitted for inpatient care. ADT A04, A08, A03, and A01 messages are generated and sent to the public health agency about this visit.

### Step 1: Registration Trigger - ADT A04

A 10 year-old boy is brought to the emergency department (ED) at Southwest Corner Hospital by his parents at 3:30 PM on December 27, 2010. The patient is complaining of fever, cough, and difficulty breathing. A clerical assistant registers the patient with the parent's help. She records the patient's name, date of birth, race, ethnicity, residence, and insurance information. The clerical assistant also enters the patient's chief complaint as, "fever, cough, difficulty breathing."

At 4:00 PM on December 27, 2010, the hospital's electronic health record module for syndromic surveillance data assembles and transmits a Registration message about this encounter to the public health agency.

### Example Message- Step 1:

```
MSH|^~\&||DownTownProcessing^2231237890^NPI|||201012271600||ADT^A04^ADT_A01|NIST-SS-001.12|P|2.5.1|||||PH_SS-  
NoAck^SS Sender^2.16.840.1.114222.4.10.3^ISO  
EVN||201212271530||||SWCornerHospitalED^2231231234^NPI  
PID|1||4444^^^MR||^S||M||^30303^^13121|||||2186-5^CDCREC  
PV1|1|E|||||4444_001^^^VN|||||201212271530  
OBX|1|CWE|SS003^PHINQUESTION|| 261QE0002X^Emergency Care^NUCC|||||F  
OBX|2|NM|21612-7^LN||10|a^UCUM|||||F  
OBX|3|CWE|8661-1^LN||^ fever, cough and difficulty breathing |||||F
```

### Step 2: Record Update Trigger - ADT A08

The attending physician orders treatment and diagnostic tests for influenza and pneumonia. At 5:00 PM, she updates the patient's clinical record with *working ICD-9 CM diagnosis codes of 786.05 (shortness of breath) and 786.2 (cough)*. *Shortness of breath is the primary diagnosis*.

At 5:15 PM on December 27, 2010, the hospital's electronic health record module for syndromic surveillance data assembles and transmits an Update message about to this encounter to the public health agency.

**Example Message - Step 2:**

MSH|^~\&||DownTownProcessing^2231237890^NPI|||201212271715||ADT^A08^ADT\_A01|NIST-SS-001.12|P|2.5.1|||||PH\_SS-  
NoAck^SS Sender^2.16.840.1.114222.4.10.3^ISO  
EVN||201212271700||||SWCornerHospitalED^2231231234^NPI  
PID|1||4444^MR||^S||M||^30303^13121|||||2186-5^CDCREC  
PV1|1|E|||||4444\_001^VN|||||201212271700  
OBX|1|CWE|SS003^PHINQUESTION|| 261QE0002X ^Emergency Care^NUCC|||||F  
OBX|2|NM|21612-7^LN||10|a^UCUM|||||F  
OBX|3|CWE|8661-1^LN||^ fever, cough and difficulty breathing |||||F  
DG1|1||786.05^shortness of breath^I9CDX||201012271700|W^Working^2.16.840.1.114222.4.11.827  
DG1|2||786.2^(cough)^I9CDX||201012271700|W^Working^2.16.840.1.114222.4.11.827