



# **PUBLIC HEALTH INFORMATION NETWORK VOCABULARY METADATA STANDARDS**

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## VERSION HISTORY

VERSION #	IMPLEMENTED BY	REVISION DATE	APPROVED BY	APPROVAL DATE	REASON
1.0	David Dobbs, Mamie Bell, Francis, Ganesan	04/29/2005	PHIN Vocabulary	04/29/2005	Published.
1.05	David Dobbs	07/30/2005	PHIN Vocabulary	07/30/2005	Updated metadata based on discussions with PHIN Vocabulary stakeholders.
1.1	Dobbs, Bell, Ganesan	08/03/2005	PHIN Vocabulary	08/02/2005	Reflected conditional and complex value set metadata.
1.2	Van Cleave	8/8/2005	PHIN Vocabulary	8/8/05	General editing and formatting.

## **TABLE OF CONTENTS**

<b>1</b>	<b>PHIN VOCABULARY METADATA STANDARDS OVERVIEW.....</b>	<b>4</b>
1.1	Overview and Objective .....	4
1.2	Key Terms .....	4
<b>2</b>	<b>PHIN VOCABULARY METADATA MODEL.....</b>	<b>5</b>
2.1	PHIN Vocabulary Metadata Definitions .....	6
2.2	Coding System and Value Set Naming Conventions .....	16

# 1 PHIN VOCABULARY METADATA STANDARDS OVERVIEW

## 1.1 OVERVIEW AND OBJECTIVE

The target audience and intended users of this document are the Centers for Disease and Prevention (CDC) Programs participating in the Public Health Information Network (PHIN).

Use of agreed-upon vocabulary metadata across PHIN enables data from different programs to be documented in a consistent fashion so that users can understand PHIN vocabulary more easily. This leads to a heightened ability to understand PHIN data semantically, and increases the interoperability of data across PHIN. For example, requiring that all PHIN data share a consistently described “Definition” metadata element allows a straightforward comparison of one PHIN data element’s definition to another PHIN data element’s definition.

PHIN Vocabulary metadata standards are based on ISO<sup>1</sup> 11179 standards for data elements. The vocabulary objects to which these metadata standards apply are drawn from HL7’s Common Terminology Server (CTS) vocabulary model.

PHIN Vocabulary has developed a metadata model of required and optional attributes for Code Systems, Code System Concepts, Value Sets, and Value Set Concepts. CDC internal authors of PHIN-compliant vocabularies will utilize this model in creating and expanding code systems and value sets.

## 1.2 KEY TERMS

In order to establish a common understanding in the remainder of this document, the following definitions are provided:

Code system – A terminology, thesaurus, vocabulary, nomenclature, or classification that uses codes for designating concepts. Examples of code systems are LOINC<sup>2</sup> and SNOMED<sup>3</sup>.

Concept – A unit of thought constituted through abstraction, based on properties common to a set of objects.

Metadata – Data that defines and describes other data. For example, the *code*, *name*, *date created*, and *definition* of a concept constitute metadata about the concept.

Pre-coordinated Concept – A concept that can be decomposed into atomic concepts and, when the atomic concepts are examined in aggregate, there is no loss of meaning. The atomic concepts are representations that are considered single concepts within a vocabulary. For instance, the pre-coordinated concept of ‘right, upper arm’ can be broken

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<sup>1</sup> International Organization of Standardization. ISO is a non-governmental network of the national standards institutes of 153 countries, on the basis of one member per country, with a Central Secretariat in Geneva, Switzerland, that coordinates the system.

<sup>2</sup> Logical Observation Identifiers, Names, and Codes—Universal identifiers for laboratory and other clinical observations that seek to standardize the internal and idiosyncratic code values of individual laboratories.

<sup>3</sup> Systematized Nomenclature of Medicine Clinical Terms—A comprehensive and precise clinical reference terminology that health care providers, health care information technology suppliers, providers, payers, purchasers, and institutional researchers can use to improve the comparability of data. Generally referred to as “SNOMED.”

into atomic concepts of ‘right,’ ‘upper,’ and ‘arm,’ all of which are atomic concepts within a vocabulary.

Value Set – a collection of concepts grouped together for a specific purpose. In many instances, value sets are constructed to group together the valid answers to surveillance questions. For instance, a value set containing gender concepts can be used to supply the answers to the question, “What is the gender of the individual?”

## 2 PHIN VOCABULARY METADATA MODEL

The diagram below depicts the PHIN Vocabulary Metadata Model.

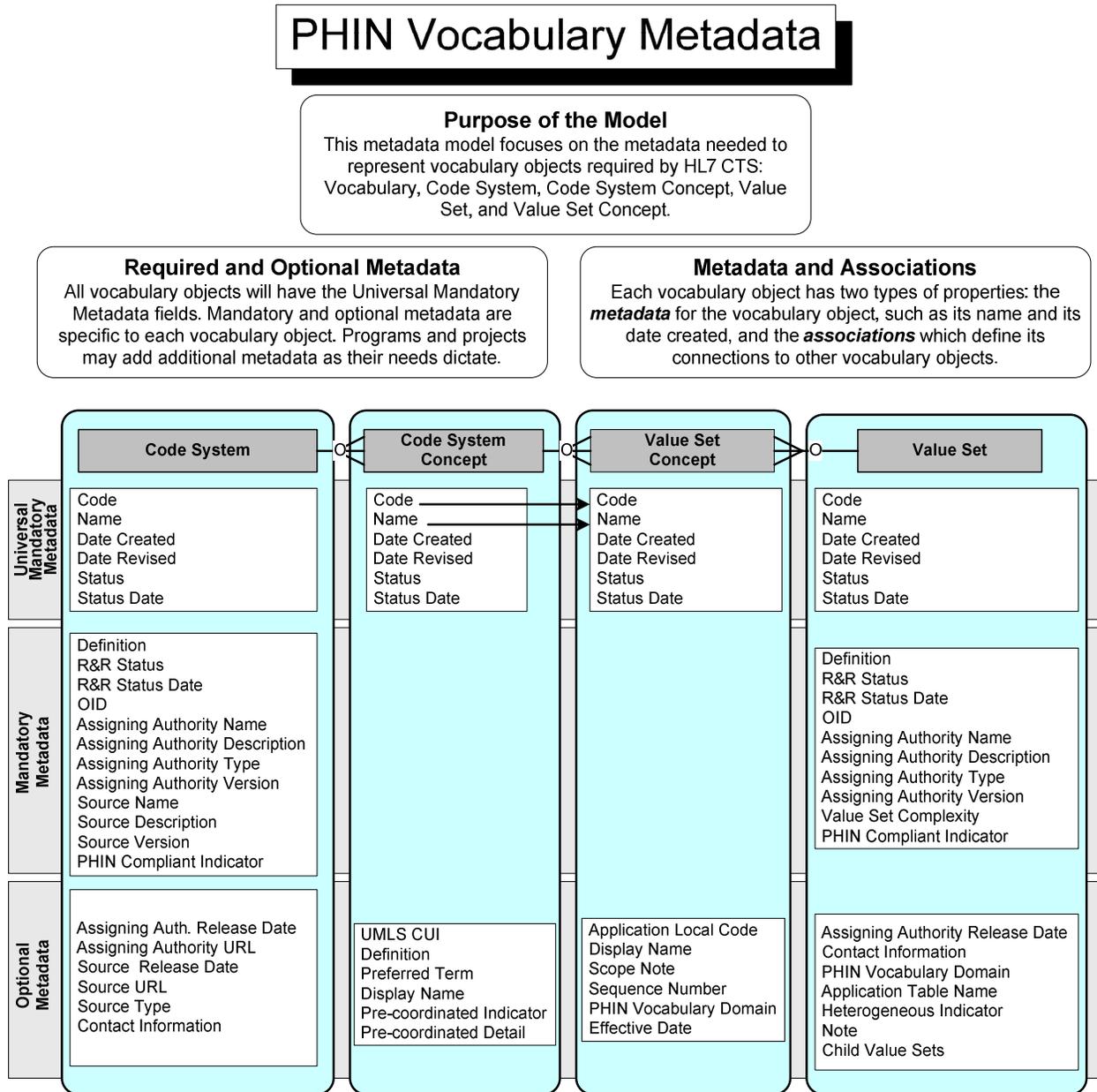


Figure 2-1. PHIN Vocabulary Metadata Model

## 2.1 PHIN VOCABULARY METADATA DEFINITIONS

**Note:** Unless otherwise specified, all metadata properties may have only one value.

METADATA PROPERTY	GENERAL DEFINITION	VOCABULARY OBJECT	OPTIONALITY	VOCABULARY OBJECT-SPECIFIC DEFINITIONS
Application Local Code	The application's local code used for a concept.	Code System	N/A	
		Code System Concept	N/A	
		Value Set	N/A	
		Value Set Concept	Optional	
Application Table Name	Defines the application table(s) associated with the value set.	Code System	N/A	
		Code System Concept	N/A	
		Value Set	Optional	
		Value Set Concept	N/A	
Assigning Authority Description	The description of the authority that develops and maintains the vocabulary object.	Code System	Mandatory	The description of the authority that develops and maintains the coding system.
		Code System Concept	N/A	
		Value Set	Mandatory	The description of the authority that develops and maintains the value set.
		Value Set Concept	N/A	
Assigning Authority Name	The name of the authority that develops and maintains the vocabulary object.	Code System	Mandatory	The name of the authority that develops and maintains the coding system.
		Code System Concept	N/A	
		Value Set	Mandatory	The name of the authority that develops and maintains the value set. For PHIN standard value sets, this is PHIN Vocabulary Services. For CDC program specific value sets, this is the program.
		Value Set Concept	N/A	

METADATA PROPERTY	GENERAL DEFINITION	VOCABULARY OBJECT	OPTIONALITY	VOCABULARY OBJECT-SPECIFIC DEFINITIONS
Assigning Authority Release Date	Date vocabulary object was released for use by the assigning authority.	Code System	Optional	The date the coding system was released for use by the assigning authority.
		Code System Concept	N/A	
		Value Set	Optional	The date the value set was released for use by the assigning authority.
		Value Set Concept	N/A	
Assigning Authority Type	Defines the type of organization that authors and maintains the vocabulary object. Valid values are [CDC, PHINVS, External].	Code System	Mandatory	Descriptor identifying whether the coding system is maintained by a CDC Program, PHIN Vocabulary Services or an external organization. Valid values are [CDC, External].
		Code System Concept	N/A	
		Value Set	Mandatory	Descriptor identifying whether the coding system is maintained by a CDC Program, PHIN Vocabulary Services, or an external organization. Valid values are [CDC, External].
		Value Set Concept	N/A	
Assigning Authority URL	Provides the Universal Resource Locator (URL) for the assigning authority on the World Wide Web.	Code System	Optional	The URL of the assigning authority.
		Code System Concept	N/A	
		Value Set	N/A	
		Value Set Concept	N/A	
Assigning Authority Version	The version identifier for the vocabulary object according to the assigning authority.	Code System	Mandatory	The version of the coding system according to the assigning authority.
		Code System Concept	N/A	
		Value Set	Mandatory	The version of the value set according to the assigning authority.
		Value Set Concept	N/A	

METADATA PROPERTY	GENERAL DEFINITION	VOCABULARY OBJECT	OPTIONALITY	VOCABULARY OBJECT-SPECIFIC DEFINITIONS
Child Value Sets	This field is used for complex value sets. Complex value sets are value sets that are composed of other, simple value sets. See metadata property, Value Set Complexity. If a value set is complex it must have the child value sets listed in this field with a plus sign, +, between value sets.	Code System	N/A	
		Code System Concept	N/A	
		Value Set	Conditional	A complex value set consisting of two simple value sets. For example, PHVS_ABC and PHVS_XYZ would have this field set as: PHVS_ABC+PHVS_XYZ'
		Value Set Concept	N/A	
Code	An alpha-numeric identifier that is unique for the vocabulary object.	Code System	Mandatory (Universal)	A code that is unique across all coding system codes. Please see section 2.3 for naming conventions for code system codes.
		Code System Concept	Mandatory (Universal)	A code that is unique within a code system.
		Value Set	Mandatory (Universal)	A code that is unique across all value sets. Please see section 2.3 for value set code naming conventions.
		Value Set Concept	Mandatory (Universal)	A value set concept code that is the same as the associated code system concept code.
Contact Information	Person or organization that can be contacted to provide more information on the vocabulary object.	Code System	Optional	Contact information for the person or organization that can be contacted to provide more information on the coding system.
		Code System Concept	N/A	
		Value Set	Optional	Contact information for the person or organization that can be contacted to provide more information on the value set.
		Value Set Concept	N/A	

METADATA PROPERTY	GENERAL DEFINITION	VOCABULARY OBJECT	OPTIONALITY	VOCABULARY OBJECT-SPECIFIC DEFINITIONS
Date Created	Date the vocabulary object is initially loaded into PHIN VADS. For the Controlled Health Thesaurus this date will be set to the date it was created within Apelon.	Code System	Mandatory (Universal)	Date the code system is initially loaded into PHIN VADS.
		Code System Concept	Mandatory (Universal)	Date the code system concept is initially loaded into PHIN VADS.
		Value Set	Mandatory (Universal)	Date the value set is initially loaded into PHIN VADS.
		Value Set Concept	Mandatory (Universal)	Date the value set concept is initially loaded into PHIN VADS.
Date Revised	Date the vocabulary object is last revised in PHIN VADS. For the Controlled Health Thesaurus this date will be set to the date it was revised within Apelon.	Code System	Mandatory (Universal)	Date the code system is last revised in PHIN VADS.
		Code System Concept	Mandatory (Universal)	Date the code system concept is last revised in PHIN VADS.
		Value Set	Mandatory (Universal)	Date the value set is last revised in PHIN VADS.
		Value Set Concept	Mandatory (Universal)	Date the value set concept is last revised in PHIN VADS.
Definition	Concise and comprehensive explanation of the meaning of the vocabulary object.	Code System	Mandatory	Definition of the code system.
		Code System Concept	Optional	Definition of the code system concept.
		Value Set	Mandatory	Definition of the value set.
		Value Set Concept	N/A	See <i>Scope Note</i> .

METADATA PROPERTY	GENERAL DEFINITION	VOCABULARY OBJECT	OPTIONALITY	VOCABULARY OBJECT-SPECIFIC DEFINITIONS
Display Name	The recommended display name for the concept. Related metadata see Name.	Code System	N/A	
		Code System Concept	Optional	<b>Note:</b> The code system <i>Name</i> metadata item is the preferred display name for a concept. However, a code system concept can specify a <i>Display Name</i> that can be used for display purposes.
		Value Set	N/A	
		Value Set Concept	Optional	<b>Note:</b> It is preferred that the value set concept use the code system concept <i>Name</i> or <i>Display Name</i> for displaying a value set concept name. However, a value set concept can specify a <i>Display Name</i> that overrides the code system concept <i>Name</i> and <i>Display Name</i> .
Effective Date	The date the value set concept becomes effective. Normally this is used to pre-populate concepts in a value set for use at a later time.	Code System	N/A	
		Code System Concept	N/A	
		Value Set	N/A	
		Value Set Concept	Optional	
Heterogeneous Indicator	Identifies if the value set contains concepts from multiple PHIN Vocabulary Domains. The intent of this indicator is to identify value sets that may not use proper vocabulary practices.	Code System	N/A	
		Code System Concept	N/A	
		Value Set	Conditional	<b>Note:</b> It is mandatory for this field to be present and set to [yes] if the value set contains concepts from multiple PHIN Vocabulary Domains. Related metadata is <i>PHIN Vocabulary Domain</i> .
		Value Set Concept	N/A	

METADATA PROPERTY	GENERAL DEFINITION	VOCABULARY OBJECT	OPTIONALITY	VOCABULARY OBJECT-SPECIFIC DEFINITIONS
Name	Unambiguous label for a vocabulary object.	Code System	Mandatory (Universal)	Name of the coding system.
		Code System Concept	Mandatory (Universal)	Name of the code system concept.
		Value Set	Mandatory (Universal)	Descriptive name of the value set.
		Value Set Concept	Mandatory (Universal)	Same as the associated code system concept name.
Note	Used to document information of interest.	Code System	N/A	
		Code System Concept	N/A	
		Value Set	Optional	This metadata property can be used to document information on how the value set is created such as if the value set is an enumeration of a coding system, and the root concept for the enumeration. Other value set information can also be described in this metadata item.
		Value Set Concept	N/A	
OID	The Object Identifier of the vocabulary object	Code System	Mandatory	OID of the coding system. This OID must be in the PHIN OID Registry.
		Code System Concept	N/A	
		Value Set	Mandatory	OID of the value set. This OID must be in the PHIN OID Registry.
		Value Set Concept	N/A	
PHIN-Compliant Indicator	Specifies if the value set is PHIN compliant. A value set is PHIN compliant if it has gone through the PHIN Vocabulary	Code System	Mandatory	Valid values are [yes, no].
		Code System Concept	N/A	
		Value Set	Mandatory	Valid values are [yes, no].

METADATA PROPERTY	GENERAL DEFINITION	VOCABULARY OBJECT	OPTIONALITY	VOCABULARY OBJECT-SPECIFIC DEFINITIONS
	Registration and Reconciliation process and all its concepts are drawn from appropriate PHIN standards.	Value Set Concept	N/A	
PHIN Vocabulary Domain	Defines the PHIN Vocabulary Domain associated with the Value Set or the Value Set Concept. PHIN Vocabulary Domains are high level general semantic categories that are used to specify appropriate vocabulary standards within PHIN.	Code System	N/A	
		Code System Concept	N/A	
		Value Set	Conditional	<b>Note:</b> If a value set is composed of concepts drawn from one PHIN Vocabulary Domain, it is mandatory for the PHIN Vocabulary Domain to be specified on the value set.
		Value Set Concept	Conditional	<b>Note:</b> If a value set is composed of concepts drawn from more than one PHIN Vocabulary Domain, it is mandatory for the PHIN Vocabulary Domain to be specified on the value set concept.
Pre-coordinated Indicator	Identifies if the code system concept is pre-coordinated.	Code System	N/A	
		Code System Concept	Conditional	<b>Note:</b> Code system concepts that are pre-coordinated should have the pre-coordinated indicator set to [yes].
		Value Set	N/A	
		Value Set Concept	N/A	
Pre-coordinated Details	Identifies each atomic concept in a pre-coordinated concept.	Code System	N/A	
		Code System Concept	Conditional	<b>Example:</b> the field for the pre-coordinated concept of 'right arm' should be set to right+arm. If the concept is pre-coordinated, the atomic concepts should be listed in this metadata property.
		Value Set	N/A	
		Value Set Concept	N/A	
Preferred Term	The term in a controlled	Code System	N/A	

METADATA PROPERTY	GENERAL DEFINITION	VOCABULARY OBJECT	OPTIONALITY	VOCABULARY OBJECT-SPECIFIC DEFINITIONS
	vocabulary that is used as a controlled indexing term.	Code System Concept	Optional	
		Value Set	N/A	
		Value Set Concept	N/A	
R&R Status	Current state of a vocabulary object in the Vocabulary registration & reconciliation process. Valid values are [not R&R'ed, in process, R&R'ed]	Code System	Mandatory	State of the code system in the vocabulary Registration & Reconciliation process. Values are [not R&R'ed, in process, R&R'ed]
		Code System Concept	N/A	
		Value Set	Mandatory	State of the value set in the vocabulary Registration & Reconciliation process. Values are [not R&R'ed, in process, R&R'ed]
		Value Set Concept	N/A	
R&R Status Date	Date the status was set.	Code System	Mandatory	
		Code System Concept	N/A	
		Value Set	Mandatory	
		Value Set Concept	N/A	
Scope Note	A note which defines or clarifies the meaning of a concept as it is used in the structured vocabulary.	Code System	N/A	
		Code System Concept	N/A	
		Value Set	N/A	
		Value Set Concept	Optional	A term that can be used to restrict to one meaning a concept label that may have several meanings in normal usage. Other types of clarifications can also be described through a scope note.
Sequence Number	Used to sequence concepts in a value set.	Code System	N/A	
		Code System Concept	N/A	
		Value Set	N/A	
		Value Set Concept	Optional	

METADATA PROPERTY	GENERAL DEFINITION	VOCABULARY OBJECT	OPTIONALITY	VOCABULARY OBJECT-SPECIFIC DEFINITIONS
Source Description	The description of the source of the vocabulary object.	Code System	Mandatory	Description of the source of the coding system.
		Code System Concept	N/A	
		Value Set	N/A	
		Value Set Concept	N/A	
Source Name	The name of the source of the vocabulary object.	Code System	Mandatory	Name of the source of the coding system.
		Code System Concept	N/A	
		Value Set	N/A	
		Value Set Concept	N/A	
Source Release Date	Date vocabulary object was released for use by the source.	Code System	Optional	Date the coding system was released for use by the source.
		Code System Concept	N/A	
		Value Set	N/A	
		Value Set Concept	N/A	
Source URL	Provides the Universal Resource Locator (URL) for the source on the World Wide Web.	Code System	Optional	URL of the coding system source.
		Code System Concept	N/A	
		Value Set	N/A	
		Value Set Concept	N/A	
Source Version	The version identifier for the source of the vocabulary object.	Code System	Mandatory	Version of the coding system according to the source.
		Code System Concept	N/A	
		Value Set	Mandatory	
		Value Set Concept	N/A	

METADATA PROPERTY	GENERAL DEFINITION	VOCABULARY OBJECT	OPTIONALITY	VOCABULARY OBJECT-SPECIFIC DEFINITIONS
Status	Current state of a vocabulary object. Valid values are [under development, active, retired].	Code System	Mandatory (Universal)	Status of the code system. Values are [under development, active, retired].
		Code System Concept	Mandatory (Universal)	Status of the code system concept. Values are [under development, active, retired].
		Value Set	Mandatory (Universal)	Status of the value set. Values are [under development, active, retired].
		Value Set Concept	Mandatory (Universal)	Status of the value set concept. Values are [under development, active, retired].
Status Date	Date the status was set.	Code System	Mandatory (Universal)	
		Code System Concept	Mandatory (universal)	
		Value Set	Mandatory (Universal)	
		Value Set Concept	Mandatory (Universal)	
UMLS CUI	The Unified Medical Language System (UMLS) Concept Unique Identifier (CUI) of the concept.	Code System	N/A	
		Code System Concept	Optional	
		Value Set	N/A	
		Value Set Concept	N/A	
Value Set Complexity	Defines if a value set is composed of multiple value sets [i.e., complex] or is not composed of multiple value sets [i.e., simple].	Code System	N/A	
		Code System Concept	N/A	
		Value Set	Mandatory	Values are [complex, simple].
		Value Set Concept	N/A	

## 2.2 CODING SYSTEM AND VALUE SET NAMING CONVENTIONS

The following naming conventions apply to the ‘code’ metadata item of coding systems and value sets.

### ➤ Coding System Naming Convention

Syntax: PH\_{PHIN Domain Name}\_{Coding System}\_{Program/Version/other}

Examples:

- PH\_Country\_FIPS\_10\_4
- PH\_Country\_ISO\_3166\_1\_Alpha3
- PH\_AdministrativeGender\_HL7\_2x
- PH\_SpecimenSource\_CDC\_CRS
- PH\_AnatomicSite\_CDC\_NIP
- PH\_SNOMED-CT
- PH\_Organisms\_CDC\_SNOMED\_Ext

### ➤ Value Set Naming Convention

PHVS\_{Value set Theme}\_{CodingSystem}\_{Program/Version/Code}

**Note:** Value Set Theme may be a “Data Element Name” or “PHIN Domain Name.”

Examples:

- PHVS\_AntibioticName\_UMLS\_2005AA
- PHVS\_AntibioticName\_CDC\_BMIRD
- PHVS\_AntibioticName\_CDC
- PHVS\_Unit\_HL7\_ISO
- PHVS\_Unit\_CDC
- PHVS\_NullFlavor\_HL7
- PHVS\_NullFlavor\_CDC
- PHVS\_NullFlavor\_HL7\_Unk
- PHVS\_NullFlavor\_HL7\_O