

Semantic Harmonization of Standards

NCVHS Standards Subcommittee
Listening Session - Panel 3
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About Health Level 7 International

ANSI-accredited, non-profit
Standards Development Organization
Founded in 1987

The HL7 Vision

A world in which everyone can securely access and use the right health data when and where they need it.

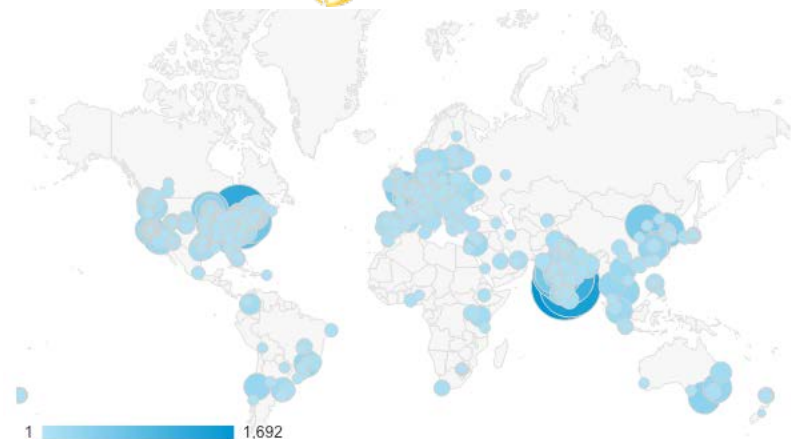
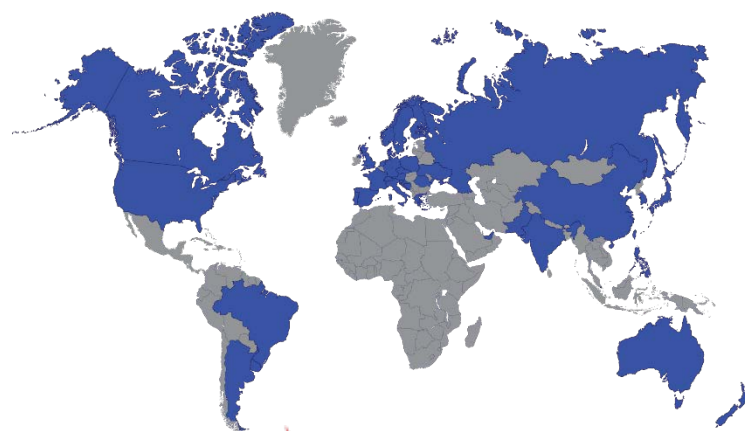
The HL7 Mission

To provide standards that empower global health data interoperability.

HL7 Products

>350 specifications, with 3 primary product families: v2, v3 CDA and HL7 FHIR.

HL7 Affiliates



The Fundamentals of FHIR

Fast Healthcare Interoperability Resources

- A next generation, *open-source standards framework & platform*, designed for implementation
- Built on REST, a pattern for using web technologies to manage information and APIs
- Content based on human-readable *Resources*: essential, portable modular information building blocks of common elements easily assembled into working systems
 - Like web pages directed toward computers; fast and scalable
- Flexible outputs: *web services, messages, documents, bulk data domain files*
- Components for Mobile Health (SMART-on-FHIR), Clinical Decision Support (CDS-Hooks), Image Integration (FHIRCast) and many other functions
- A *technology platform*, a *data model*, and an active, global *community* (>17000 active members worldwide; 100's of servers, apps, testing environments and shared reference materials)

“The Web, for Healthcare” – Grahame Grieve



This page is part of the FHIR Specification (v4.0.1: R4 - Mixed [Normative](#) and [STU](#)). This is the current published version. For a full list of available versions, see the [Directory of published versions](#)

Using Codes [Code Systems](#) [Value Sets](#) [Concept Maps](#) [Identifier Systems](#)





4.1 Using Codes in Resources

| | | |
|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|----------------------------------------------|
| FHIR Infrastructure  Work Group | Maturity Level : Normative | Standards Status : Normative |
|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|----------------------------------------------|



This page has been approved as part of an [ANSI](#)  standard. See the [Infrastructure](#) Package for further details.

Many elements in the FHIR resources have a **coded value**: some fixed string (a sequence of characters) assigned elsewhere that identifies some defined "concept". The sequence of characters and its meaning may be defined in one of several places:

- As one of a set of fixed values defined in this specification
- In an internet RFC (e.g. mime type, language)
- An HL7 specification ([HL7 v3](#)  code system, or [HL7 v2](#)  table)
- Some external terminology or ontology such as [LOINC](#) , or [SNOMED CT](#) 
- A locally maintained dictionary, look up table or enumeration in an application (for further discussion of locally defined value sets, see "[Profiling FHIR](#)")

These methods of defining codes are collectively called "code systems". This list is far from complete; there are many ways to define code systems, and they vary widely in sophistication and size.

Throughout this specification, coded values are always treated as a pair composed of "system" and "code", where the system is a URL that identifies the code system that defines the codes. Note that [system](#) values are always case sensitive. Different code systems make their own rules as to whether the codes they define are case sensitive or not. Note that all the codes defined by FHIR itself are case sensitive and SHALL be used in the provided case (usually, but not always, lowercase).

The FHIR framework for using coded values is based on the fundamental framework defined in section 5 of the [HL7 v3 Core Principles](#)  document, including the separation between code systems and value sets.

This page is part of the HL7 Terminology (v2.1.0: Release) based on [FHIR R4](#). This is the current published version. For a full list of available versions, see the [Directory of published versions](#).

2 Code Systems

All Code Systems

CDA

FHIR

V2

V3

Unified

External

Retired

Code systems defined by HL7 and published in HL7 International Standards

The list of code systems here are all of the code systems maintained by HL7 through the Unified Terminology Governance (UTG) process, published by HL7 in the different HL7 product families. Updates and maintenance in UTG is a continuous process, and the content available here is updated frequently.

• [American College of Radiology finding codes](#)

• [ASTM E1238/ E1467 Universal](#)

• [AS4 Neurophysiology Codes](#)

• [ABCcodes](#)

• [accept-applicationAcknowledgm](#)

• [accessRestrictionValue](#)

• [AcknowledgementCondition](#)

• [AcknowledgementDetailCode](#)

• [AcknowledgementDetailType](#)

• [AcknowledgementType](#)

• [acknowledgmentCodes](#)

• [ActClass](#)

• [ActCode](#)

• [ActExposureLevelCode](#)

• [ActInvoiceElementModifier](#)

• [ActMood](#)

• [ActPriority](#)

• [ActReason](#)

• [ActRelationshipCheckpoint](#)

• [ActRelationshipJoin](#)

• [eventReason](#)

• [ObservationCategory](#)

<https://terminology.hl7.org/codesystems.html>

- ~1050 code system resources
- >2200 value sets
- ~15,000+ terms (~10,000 SNOMED/CT terms for IPS)
- ~190,000 HTML pages

• [Example Diagnosis Type Codes](#)

• [Example Message Reason Codes](#)

• [Example Payment Type Codes](#)

• [Example Procedure Type Codes](#)

• [Example Program Reason Codes](#)

• [Example Provider Qualification Codes](#)

• [Example Related Claim Relationship Codes](#)

• [onlineVerificationResultErrorCodes](#)

• [Operation Outcome Codes](#)

• [Online Product Identification Number Index of Nova Scotia](#)

• [Oral Site Codes](#)

• [orderControlCodeReason](#)

• [orderControlCodes](#)

• [orderStatus](#)

Implementation Guides and Profiles











- FHIR is a base standard that must be tailored for the many different contexts in healthcare.
- Semantic consistency is enforced by compliance with FHIR Implementation Guides
- Implementation Guides consist of profiles, which specify terminology bindings, extensions and constraints

Example – US Core Patient Profile

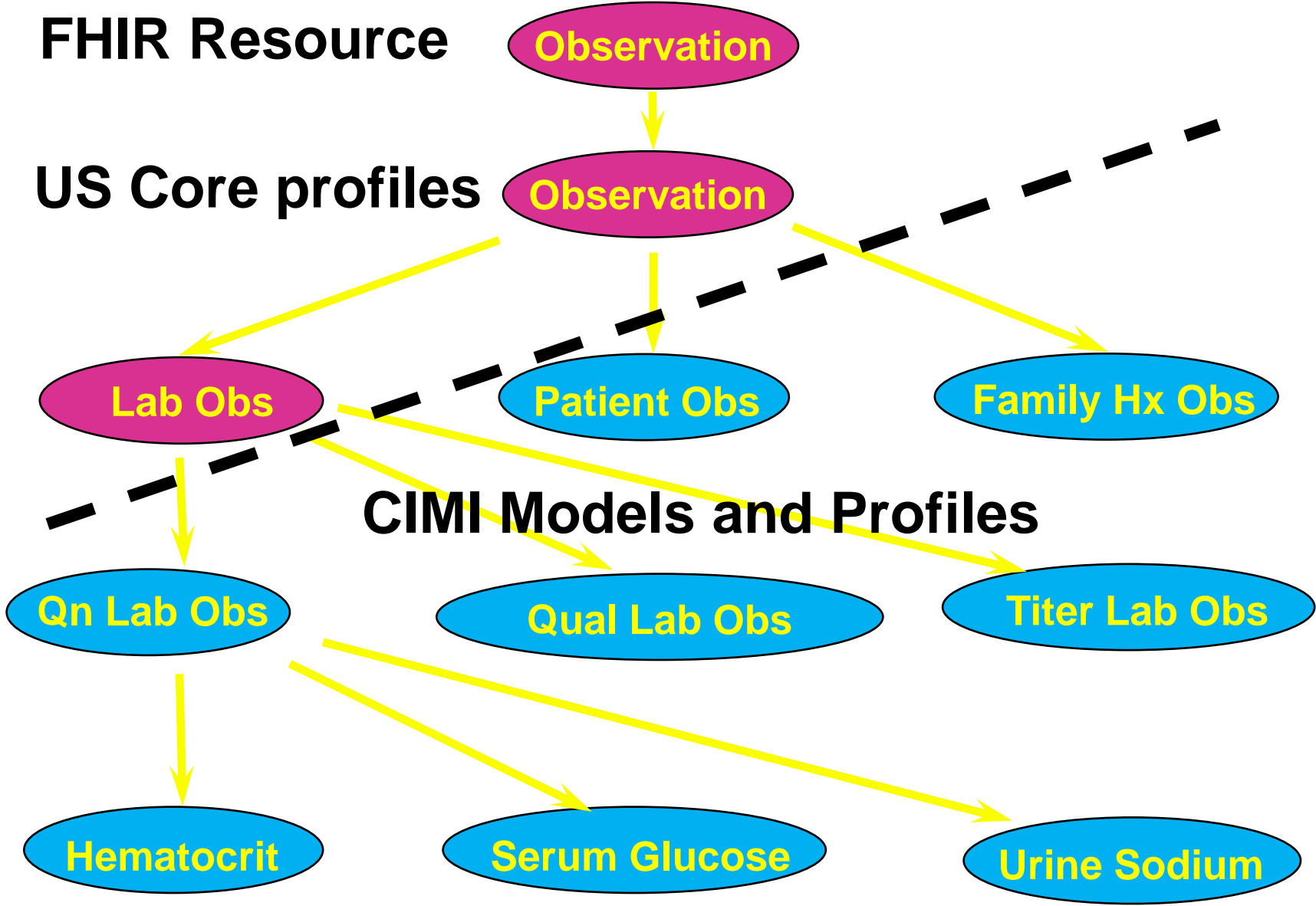
The official URL for this profile is: <http://hl7.org/fhir/us/core/StructureDefinition/us-core-patient> Copy

Published on Sat Jun 27 00:00:00 AEST 2020 as active by the HL7 US Realm Steering Committee.

This profile builds on [Patient](#)

| Text Summary Differential View Full View All Views | | | | |
|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name | Flags | Card. | Type | Description & Constraints |
|  Patient | | 0..* | Patient | Information about an individual or animal receiving health care services |
|  us-core-race |  | 0..1 | (Complex) | US Core Race Extension URL: http://hl7.org/fhir/us/core/StructureDefinition/us-core-race |
|  us-core-ethnicity |  | 0..1 | (Complex) | US Core ethnicity Extension URL: http://hl7.org/fhir/us/core/StructureDefinition/us-core-ethnicity |
|  us-core-birthsex |  | 0..1 | code | Extension URL: http://hl7.org/fhir/us/core/StructureDefinition/us-core-birthsex Binding: Birth Sex (required) |
|  Identifier |  | 1..* | Identifier | An identifier for this patient |
|  system |  | 1..1 | uri | The namespace for the identifier value |
|  value |  | 1..1 | string | The value that is unique within the system. |
|  name |  I | 1..* | HumanName | A name associated with the patient us-core-8: Either Patient.name.given and/or Patient.name.family SHALL be present or a Data Absent Reason Extension SHALL be present. |

HL7 Clinical Information Modeling Initiative (CIMI) Logical Models and US Core Profiles



Source: Stan Huff

Semantic Harmonization and HL7

- HL7's vision and mission focuses on achieving semantic interoperability
- HL7 believes the path toward this goal will be based on use of the HL7 FHIR platform and FHIR global community
- Semantic interoperability will be based on conformance with FHIR profiles in standard FHIR Implementation Guides
- Additional methods and tools for mapping/translating/converting individual code systems will also be necessary.

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