



Standard Specification for the Representation of Human Characteristics Data in Healthcare Information Systems¹

This standard is issued under the fixed designation E2436; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

INTRODUCTION

This document presents a standardized representation for the content and structure of human characteristics data for use in electronic health records and healthcare information systems generally. Many of the data available to clinicians, health researchers and educators, and healthcare planners cannot be easily compared due to the variety in representing human characteristics. This document standardizes the representation of these characteristics at the data tier of health information systems.

1. Scope

1.1 This document presents a standardized representation for the content and structure of human characteristics data for use in healthcare information systems.

1.2 This specification may be extended to apply to characteristics of non-human living things, such as in data systems supporting veterinary medicine.

1.3 The following provisions are within the scope of this specification:

1.3.1 Logical representation of human characteristics data for individuals and populations.

1.3.2 Physical representation of human characteristics at the data tier of healthcare information systems.

1.4 The following provisions are outside the scope of this specification:

1.4.1 The standardization of policy or regulation concerning the employment of human characteristics data described in this specification.

1.4.2 The establishment or standardization of legal constraints over the use of human characteristics in conjunction with healthcare clinical or business processes.

1.4.3 Addressing or standardizing personal privacy, medicolegal, and system security provisions associated with documenting human characteristics or storing human characteristics data.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the*

responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. Referenced Documents

2.1 ASTM Standards:²

E1384 [Practice for Content and Structure of the Electronic Health Record \(EHR\)](#)

E1633 [Specification for Coded Values Used in the Electronic Health Record](#)

E2145 [Practice for Information Modeling](#)

2.2 ANSI Standards

ANSI 260.3-1993 [Mathematical Signs and Symbols for Use in Physical Sciences and Technology](#) (revision and redesignation of ANSI/ASME Y10.20-1990).

ANSI 1320.2-1998 [IEEE Standard for Conceptual Modeling Language - Syntax and Semantics for IDEF1X97 \(IDEFobject\)](#)

ANSI/ADA 1000 [Standard Data Architecture for the Structure and Content of the Electronic Health Record, February 2001.](#)

2.3 ISO Standards

ISO 639 [Codes for the representation of names of languages](#)

ISO 2955 [Representation of SI Units](#)

ISO 5218 [Representation of the Human Sexes](#)

ISO 8601 [Representation of Dates](#)

2.4 Other Standards and Documents

[American Heritage Dictionary](#)

[ANSI/ADA Specification 1000 Implementation Guide](#)

[HL7 2.x reference values.](#)

¹ This specification is under the jurisdiction of ASTM Committee E31 on Healthcare Informatics and is the direct responsibility of Subcommittee E31.25 on Healthcare Data Management, Security, Confidentiality, and Privacy.

Current edition approved June 1, 2010. Published September 2010. Originally approved in 2005. Last previous edition approved in 2005 as E2436-05. DOI: 10.1520/E2436-05R10.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

National Institute of Standards and Technology, Federal Information Processing Standards Publications 184 Integrated Definition for Information Modeling (IDEFIX), 23 December 1993.

3. Terminology

3.1 Acronyms:

ADA	= American Dental Association
ANSI	= American National Standards Institute
CCR	= ASTM standard Continuity of Care Record
HL7	= Health Level Seven
IDEF	= Integrated Definition language
ISO	= International Standards Organization
LDM	= Logical data model
LOINC	= Logical Observation Identifiers Names and Codes
PDM	= Physical data model
XML	= Extensible Markup Language

3.2 Definitions:

3.2.1 *Ethnicity, n*—characteristics of a group of people sharing a common and distinctive racial, national, religious, linguistic, or cultural heritage.

American Heritage Dictionary

3.2.2 *Language, n*—A system of arbitrary signals, such as voice sounds, gestures, or written symbols, including its rules for combining its components, such as words, as used by a nation, people, or other distinct community for communication of thoughts and feelings.

American Heritage Dictionary

3.2.3 *Living Arrangement, n*—The setting or environment in which an individual lives, such as family setting, as may have impact on the individual's health and course of care.

3.2.4 *Physical characteristic, n*—a group of characteristics previously used by convention as a means to describe an individual, e.g. by hair color, eye color, build, etc.

3.2.5 *Race, n*—A local geographic or global human population distinguished as a more or less distinct group by genetically transmitted physical characteristics.

American Heritage Dictionary

3.2.6 *Religion, n*—A personal or institutionalized system grounded in such belief and worship. A set of beliefs, values, and practices based on the teachings of a spiritual leader.

American Heritage Dictionary

3.2.7 *Sex Characteristic, n*—Preferred term to more completely classify the multiple human sex characteristics. The term “Sex” is preferred as the biologically correct term rather than the grammatical term “gender.”

3.3 *Definitions:*The following information modeling and technology terms are used in this document:

3.3.1 *Attribute, n*—In a logical data model, an identifiable characteristic or data element of an entity.

3.3.2 *Column, n*—In a database, a vertical space or dimension in a database table that represents a particular domain of data and hold values for a particular attribute; in the physical data model analogous to the attribute of the logical data model.

3.3.3 *Entity, n*—In a logical data model, a distinguishable object about which data is kept.

3.3.4 *Logical Data Model, n*—A graphical and textual representation of the data properties that describes a business function, process, or organization, consisting and all the relationships that exist among them.

3.3.5 *Metadata, n*—Data about data, or information about information, generally comprising a structured set of descriptive elements about any definable entity.

3.3.6 *Physical Data Model, n*—A graphical and textual representation of the structural properties that are implemented or able to be implemented in a database, consisting of tables, columns and rows, and all the relationships that exist among these.

3.3.7 *Table, n*—The basic unit of storage in a relational database management system; in the physical data model analogous to the entity of the logical data model.

4. Reference Data Model

4.1 This specification is based upon the ANSI/ADA Specification 1000 reference data model and expands upon data structures found in the “Individual Characteristics” and “Population Characteristics” subject areas.

4.1.1 The Individual Characteristics subject area of this specification has been extended to include two additional entities/tables.³

4.1.1.1 Living Arrangement to allow the characterization and textual description of the residential life patterns and interpersonal life-dependencies of a patient or related individual.

4.1.1.2 Individual Physical Characteristics to allow documentation of administrative characteristics (e.g. height, eye color, hair color, etc.) not otherwise documented in this model.

4.1.2 In this specification, several attributes are deleted from the Individual entity that are not relevant to personal characteristics, and this entity is extended by adding reported and derived dates of birth and death.

4.1.3 The following entities in the ANSI/ADA Specification 1000 Individual Characteristics subject area are not referenced in this specification:

4.1.3.1 Individual Object is employed in ANSI/ADA Specification 1000 to carry object data descriptive of an individual such as an identification image or biometric data. This data is not considered as characteristics within the context of this specification.

4.1.3.2 Individual Taxonomy associative entity is not used in human health information systems. Where this specification is extended to represent the characteristics of non-human living things, the taxonomy or genus reference and associative entities may be employed.

4.1.4 Associated Individual and Pair Bond Status are employed in ANSI/ADA Specification 1000 to allow the construction of complex networks of interpersonal relationships, such as in an extended family or patterns of epidemiological contacts. This specification does not address such relationships as these concepts are subsequently covered in a separate standard.

³ These modifications and extensions are under consideration for inclusion in the next scheduled revision of ANSI/ADA Specification 1000.