

Slide 1

**Networking and Health  
Information Exchange**

Unit 4e  
Basic Health Data Standards

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Slide 2

**Unit 4e Objectives**

- Understand data elements; attributes of data elements

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Slide 3

**Why data elements?**

- The level at which data is created and collected
  - Level that is necessary to define clinical models and input for clinical decision making
- Level at which data elements can be precisely, uniquely and unambiguously defined that is independent of use, location and circumstance.
- Simplifies achieving semantic interoperability
- Essential for computer understandability

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**Data elements and terminology**

- What is a data element and what is a terminology?
- Is diagnosis a data element or a terminology?
  
- Any and every concept is a data element

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**Data elements**

- Each data element assigned a unique code for identification purposes.
- Each data element will be derived to a level of precision to prevent any ambiguity in its meaning and use.
- If uniform agreement cannot be reached for an element, an element will be defined for each agreement with precise definitions to distinguish. Experience in use might ultimately resolve these disagreements.

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**Data element set**

- Defines at the lowest level the structured components that are contained and used in health care.
- If all data is derived from this master data element set, data can be shared and understood independent of the interchange mechanism
- Can be harmonized across clinical domains
- Permits sites to define the data they collect

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**Master data element set**

- Enables sites to define what data elements are collected and stored as part of the EHR
- From this master, minimum data sets may be derived for various purposes, for example, a minimum data set defining decision support inputs, reporting quality measures or to a clinical data registry.
- Becomes the basis for interoperability in the interchange of data

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**Master data element set**

- The MDE set will include categorical terms from high to lower levels. The level of defining these levels will be a development issue. It is most likely that these will be hierarchical.
- Class examples include:
  - Demographic
  - Studies
  - Therapies
  - Problems
  - Physical Examination

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**Other uses**

- It is likely that most data exchanges between various sites of care will be in a query response mode. A site's database of the data elements collected will make it much easier to define what is available and what is desired.
- Query profiles can be defined from the site's data element set.
- Permits local, dynamic classification sets for various purposes, including medical specialties

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**Attributes**

- Unique code
- Short name or acronym
- Long name
- Synonyms
- Definition
- Use and purpose, including context
- Category
- Units
- Data type
- Value set
- Mood (state)
- RIM Class
- Linkages to representation sets
- ...

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**List of attributes (1)**

- Code
  - numeric without meaning
  - OID hierarchically assigned
- Name
  - As used in clinical setting
  - Preferred
  - Short name or display name
- Definition
  - Textual
  - Structured

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**List of attributes (2)**

- Data type
  - Chosen from ISO/HL7/CEN standard
  - Simple or complex
- Units
  - Scientific; ISO
- Value set
  - A set of permissible values
  - Single or multiple
- Synonyms

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**List of attributes (3)**

- Relationship to other data elements
  - Hierarchical relationships
  - Bidirectional (parent, children)
  - Other linkages (equivalent, opposite)
  - Flags: top level; leaf level
- Classifications (Antihistamine, beta blocker)
- Language

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**Administrative attributes**

- Owner/caretaker/steward/responsible organization
- Submitting organization
- Registration authority
- Status (active/inactive or deprecated)
- Version
- Date

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**Potential issues**

- Data elements should not be controversial, since they represent a master set, not a required set.
- Categories and groupings of data elements subject to discussion and debate
- Attribute sets subject to discussion and debate
- Tool sets might evolve in functionality provided
- Early user would be essential to define issues, gaps, unforeseen consequences
- Permanent support, including maintenance and distribution must be defined, including funding

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**What is ISO/IEC 11179?**

- ISO/IEC 11179 Parts 1-6: Information technology – Specification and Standardization of data elements
  - A metamodel for 'data element' metadata
  - Standard by which to convey semantic, syntactic and lexical meaning
    - Human and machine understandable
    - Unambiguous

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**ISO 11179**

- Part 1: *Framework for the Specification and Standardization of Data Elements*
- Part 2: *Classification for Data Elements*
- Part 3: **Basic Attributes of Data Elements**
- Part 4: *Rules and Guidelines for the Formulation of Data Definitions*
- Part 5: *Naming and Identification Principles for Data Elements*
- Part 6: *Registration of Data Elements*

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**Data Element Details**

**Sex**  
Sex

[\(Relationship and Representational Attributes\)](#)
[\(Administrative Attributes\)](#)
[\(Data Collection Issues\)](#)
[\(Data Element Table\)](#)

**Identifying and Definitional Attributes**

Data Element ID: NEDMG 000149 Version No: 2  
 Type: Data Element  
 Status: Current  
 01-JUL-98

**Definition:** The sex of the person.  
**Context:** Required for analyses of service utilization, needs for services and epidemiological studies.

**Synonymous Name and context:** Gender  
 Dictionary ID: 34

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**Relational and Representational Attributes**  
Datatype : String  
Representational Form : Code  
Representation Layout : XX  
Minimum Size : 1  
Maximum Size : 1  
Data Domain :   
1 Male  
2 Female  
3 Indeterminate  
9 Not stated / adequately described

**Guide for Use** : An indeterminate sex category may be necessary for situations such as the identification of prenatal status when it is not possible for the sex to be determined.

**Verification Rules** : For the provision of State and Territory hospital data to Commonwealth agencies the field must be consistent with diagnosis and procedure codes, for records grouped in Major Diagnostic Categories 12, 13 and 14, for valid grouping, otherwise resulting in a link error for sex code. For other Major Diagnostic Categories, sex codes result in a warning error.

**Related Data References** : \* is used in the derivation of [Diagnostic codes](#) NMDMG 000142 ver 1  
\* supersedes previous data element [See NMDMG 000140 ver 1](#)

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ANSI X12 837D (3000) to HL7 v3 (2009) Mappings

**Appendix C  
CONVERSIONS**

Mapping the X12 837D to HL7 v3 (2009) base attributes to the HL7 v3 (2009) (3000) conversions and base attributes.

C.4. Attributes Data

Figure C.4 - Base Attributes of data elements

The table of the defined attributes, see also the table in the HL7 v3 (2009) conversion table associated with this table of the defined attributes, see also the table in the HL7 v3 (2009) conversion table associated with this table of the defined attributes.

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**National Cancer Institute**

- Cancer Data Standard Repository (caDSR) – registry of common data elements
- Enterprise Vocabulary Service (EVS) – registry of terminology used by CDSR
  - Includes SNOMED CT, MedDRA, VA\_NDF-RT, LOINC, HL7, NCI Thesaurus
- Based on ISO 11179
- Tools available
  - CDE Browser, UML Browser, free style search, CDE curation tool, form maker, others

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**caBIG**

- Vocabularies & Common Data Elements
- Evaluate and integrate systems for vocabulary and ontology content development used throughout caBIG system
- Review process classifies vocabulary into bronze, silver, gold categories with rigid rules for definition
- Stores in caDSR, EVS

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**CDISC**

- Study Data Tabulation Model – data elements used for clinical trials
- Uses NCI's caDSR
- Operational Data Model (ODM)

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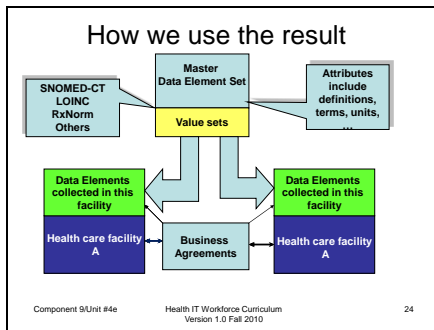
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**Summary**

- Necessary part of semantic interoperability
- Importance of fully defined set of characteristics
- Use 11179 standard as base
- Need global commitment

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