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English Version

Health informatics - A syntax to represent the content of medical classification systems - ClaML

Informatique de la santé - Syntaxe permettant de représenter le contenu des systèmes de classification médicaux - ClaML

Medizinische Informatik - Syntax zur Darstellung des Inhalts medizinischer Klassifikationssysteme (ClaML)

This European Standard was approved by CEN on 7 October 2007.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 14463:2007) has been prepared by Technical Committee CEN/TC 251 “Health informatics”, the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2008, and conflicting national standards shall be withdrawn at the latest by May 2008.

This document supersedes CEN/TS 14463:2003.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

Many classification systems are still distributed in a form suitable for direct text processing like MS Word etc. This is a very dangerous forma because unwanted and unspotted mistakes are easily made. For example, the accidental deletion of a tab makes a sibling rubric into a parent.

Industry is faced with a variety of formats in which classification systems are delivered. Many different parsers have to be maintained and yet, due to the informal nature of texts, it is hard to give a 100 % guarantee for correct parsing into more formal structures.

For work on classification systems, revision work and especially when terminological tools are used for work on classification systems there is a need to store and transfer classification systems while maintaining the structure of codes, rubrics, comments, inclusion/exclusion criteria etc. A neutral format like plain ASCII files with comma separated value fields is widely used, but has insufficient structuring capabilities. XML is the chosen format for this Standard as a) XML provides the necessary structuring elements, and b) there are many readily available XML parsers in existence.

This standard builds on CEN/TS 14463:2002 in that CEN/TS 14463:2002 primary focus was to support Electronic Data Processing. Assessment of CEN/TS 14463:2002 as well as growing insights from other areas has revealed the need for a tighter version management. The scope of the standard therefore has been explicitly extended.

1 Scope

1.1 Main purposes

The main purpose of this European Standard is to support the safe transfer of the majority of hierarchical healthcare classification systems between organisations and dissimilar software products. It is intended to serve as the core representation, from which all publication forms can be derived. The Standard shall therefore be in depth enough to uniquely identify and describe the structure and the relevant elements in those systems. This Standard does not intend to prescribe the meaning of structuring elements in classification systems. This Standard is not meant to be a direct format for printing or viewing the contents of a classification system. Views and prints shall be derived from this representation by post processing.

1.2 Target groups of this European Standard

This European Standard is applicable to:

a) developers of first and second generation [2] classification systems and terminologies, to assist in the construction, maintenance and publication (both in paper and electronic formats) of a particular system;

b) developers of information systems to assist in the inclusion of mechanisms for unambiguous loading of classification systems in their applications;

c) organisations responsible for updating classification systems;

d) institutions receiving updated classification systems.

1.3 Topics considered outside the scope of this European Standard

This European Standard is not intended to:

a) provide a normative syntax on how a classification system shall be constructed;

b) define link types between elements in a classification system; this is left to the developers of classification systems;

c) provide a representation for direct viewing or printing.

2 Conformance

The normative part of this standard is written in the form of a DTD. Many commercially available XML tools provide facilities to test the conformance of an XML document with a DTD. Users of this standard are encouraged to perform such a test before distributing their classifications in the format of this standard.

3 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 3166-1, *Codes for the representation of names of countries and their subdivisions – Part 1: Country codes (ISO 3166-1:2006)*

ISO 639-2, *Codes for the representation of names of languages – Part 2: Alpha-3 code*

4 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

4.1
preferred term
term rated according to the scale of the **term acceptability rating** as the primary term for a given **code**

[ISO 1087-1:2000]

4.2
reference
pointer within a **rubric** to an other class

NOTE The reference may be either within or between classifications. A reference does not specify the nature of the pointer. It is not necessarily a mapping.

4.3
rubric
descriptive phrase for a given concept

NOTE Preferred term is an example of a rubric kind. Other examples are inclusions, exclusions and editorial notes.

4.4
variant
one instance of a collection of related documents

EXAMPLE The ICD10-CM is a variant of the WHO ICD10 classification.

4.5
version
exclusive identifier of a **variant**

NOTE It is suggested to use the major.minor.patch scheme for version numbering.

5 Symbols and abbreviations

ClaML Classification Markup Language

XML Extensible Markup Language 1.0

DTD Document Type Definition

6 Classification mark-up language

6.1 Basis of the syntax

The basis of the syntax is to represent the content of medical classification systems. The syntax defined in this Standard is called Classification Mark-up Language. It is defined here in the form of a Document Type Definition (DTD). The reference to this syntax will be headed to ClaML in the remainder of this document.

6.2 Document Type Definition

```
<!ENTITY % rubric.simple "#PCDATA | Reference | Term">

<!ENTITY % rubric.complex "%rubric.simple; | Para | Include |
   IncludeDescendants| Fragment | List | Table">

<!ELEMENT ClaML (

          Meta*,

          Identifier*,

          Title,

          Authors?,

          Variants?,

          ClassKinds,

          UsageKinds?,

          RubricKinds,

          Modifier*,

          ModifierClass*,

          Class*)

>

<!ATTLIST ClaML

          version CDATA #REQUIRED

>
```

```
<!ELEMENT Variants (Variant+)>
<!ELEMENT Variant (#PCDATA)>
<!ATTLIST Variant
          name ID #REQUIRED
>
<!ELEMENT Meta EMPTY>
<!ATTLIST Meta
          name CDATA #REQUIRED
          value CDATA #REQUIRED
          variants IDREFS #IMPLIED
>
<!ELEMENT Identifier EMPTY>
<!ATTLIST Identifier
          authority NMTOKEN #IMPLIED
          uid CDATA #REQUIRED
>
<!ELEMENT Title (#PCDATA)>
<!ATTLIST Title
          name NMTOKEN #REQUIRED
          version CDATA #IMPLIED
          date CDATA #IMPLIED
>
<!ELEMENT Authors (Author* )>
<!ELEMENT Author (#PCDATA)>
<!ATTLIST Author
          name ID #REQUIRED
>
<!ELEMENT ClassKinds (ClassKind+)>
<!ELEMENT RubricKinds (RubricKind+)>
```

```
<!ELEMENT UsageKinds (UsageKind+)>


<!ELEMENT ClassKind (Display*)>
<!ATTLIST ClassKind
          name ID #REQUIRED
>
<!ELEMENT RubricKind (Display*)>
<!ATTLIST RubricKind
          name ID #REQUIRED
          inherited (true|false) "false"
>
<!ELEMENT UsageKind EMPTY>
<!ATTLIST UsageKind
          name ID #REQUIRED
          mark CDATA #REQUIRED
>
<!ELEMENT Display (#PCDATA)>
<!ATTLIST Display
          xml:lang NMTOKEN #REQUIRED
          variants IDREF #IMPLIED
>
<!ELEMENT Modifier (
          Meta*,
          SubClass*,
          Rubric*,
          History*)
>
<!ATTLIST Modifier
          code NMTOKEN #REQUIRED
```

```
          variants IDREFS #IMPLIED
>
<!ELEMENT ModifierClass (
          Meta*,
          SuperClass,
          SubClass*,
          Rubric*,
          History*)
>
<!ATTLIST ModifierClass
          modifier NMTOKEN #REQUIRED
          code NMTOKEN #REQUIRED
          usage IDREF #IMPLIED
          variants IDREFS #IMPLIED
>
<!ELEMENT Class (
          Meta*,
          SuperClass*,
          SubClass*,
          ModifiedBy*,
          ExcludeModifier*,
          Rubric*,
          History*)
>
<!ATTLIST Class
          code NMTOKEN #REQUIRED
          kind IDREF #REQUIRED
          usage IDREF #IMPLIED
          variants IDREFS #IMPLIED
```

```
>
<!ELEMENT ModifiedBy (
          Meta*,
          ValidModifierClass*)
>
<!ATTLIST ModifiedBy
          code NMTOKEN #REQUIRED
          all (true|false) "true"
          position CDATA #IMPLIED
          variants IDREFS #IMPLIED
>
<!ELEMENT ExcludeModifier EMPTY>
<!ATTLIST ExcludeModifier
          code NMTOKEN #REQUIRED
          variants IDREFS #IMPLIED
>
<!ELEMENT ValidModifierClass EMPTY>
<!ATTLIST ValidModifierClass
          code NMTOKEN #REQUIRED
          variants IDREFS #IMPLIED
>
<!ELEMENT Rubric (
           Label+,
           History*)
>
<!ATTLIST Rubric
          id ID #IMPLIED
          kind IDREF #REQUIRED
          usage IDREF #IMPLIED
```

```
>
<!ELEMENT Label (%rubric.complex;)*>
<!ATTLIST Label
          xml:lang NMTOKEN #REQUIRED
          xml:space (default|preserve) "default"
          variants IDREFS #IMPLIED
>
<!ELEMENT History (#PCDATA)>
<!ATTLIST History
          author IDREF #REQUIRED
          date NMTOKEN #REQUIRED
>
<!ELEMENT SuperClass EMPTY>
<!ATTLIST SuperClass
          code NMTOKEN #REQUIRED
          variants IDREFS #IMPLIED
>
<!ELEMENT SubClass EMPTY>
<!ATTLIST SubClass
          code NMTOKEN #REQUIRED
          variants IDREFS #IMPLIED
>
<!ELEMENT Reference (#PCDATA)>
<!ATTLIST Reference
          class CDATA #IMPLIED
          authority NMTOKEN #IMPLIED
          uid NMTOKEN #IMPLIED
          code NMTOKEN #IMPLIED
          usage IDREF #IMPLIED
```

```
          variants IDREFS #IMPLIED
>
<!ELEMENT Para (%rubric.simple;)*>
<!ATTLIST Para
          class CDATA #IMPLIED
>
<!ELEMENT Fragment (%rubric.simple;)*>
<!ATTLIST Fragment
          class CDATA #IMPLIED
          usage IDREF #IMPLIED
          type (item | list) "item"
>
<!ELEMENT Include EMPTY>
<!ATTLIST Include
          class CDATA #IMPLIED
          rubric IDREF #REQUIRED
>
<!ELEMENT IncludeDescendants EMPTY>
<!ATTLIST IncludeDescendants
          code NMTOKEN #REQUIRED
          kind IDREF #REQUIRED
>
<!ELEMENT List (ListItem+)>
<!ATTLIST List
          class CDATA #IMPLIED
>
<!ELEMENT ListItem (
           %rubric.simple;
           | Para
```

```
            | Include
            | List
            | Table)*
>
<!ATTLIST ListItem
          class CDATA #IMPLIED
>
<!ELEMENT Table (
           Caption?,
           THead?,
           TBody?,
           TFoot?)
>
<!ATTLIST Table
          class CDATA #IMPLIED
>
<!ELEMENT Caption (%rubric.simple;)*>
<!ATTLIST Caption
          class CDATA #IMPLIED
>
<!ELEMENT THead (Row+)>
<!ATTLIST THead
          class CDATA #IMPLIED
>
<!ELEMENT TBody (Row+)>
<!ATTLIST TBody
          class CDATA #IMPLIED
>
<!ELEMENT TFoot (Row+)>
```

```
<!ATTLIST TFoot
          class CDATA #IMPLIED
>
<!ELEMENT Row (Cell*)>
<!ATTLIST Row
          class CDATA #IMPLIED
>
<!ELEMENT Cell (
           %rubric.simple;
           | Para
           | Include
           | List
           | Table)*
>
<!ATTLIST Cell
          class CDATA #IMPLIED
          rowspan CDATA #IMPLIED
          colspan CDATA #IMPLIED
>
<!ELEMENT Term (#PCDATA)>
<!ATTLIST Term
          class CDATA #IMPLIED
>
```

6.3 Semantic description of the Classification Markup Language (DTD)

6.3.1 ClaML

6.3.1.1 General

The element ClaML identifies a Classification Markup Language file.

6.3.1.2 Contents

The element **ClaML** shall contain:

- optional number of **Meta** elements;
- optional number of **Identifier** elements;
- one **Title** element;
- one optional **Authors** element;
- one optional **Variants** element;
- one **ClassKinds** element;
- one optional **UsageKinds** element;
- one **RubricKinds** element;
- optional number of **Modifier** elements;
- optional number of **ModifierClass** elements;
- optional number of **Class** elements.

6.3.1.3 Required attribute

The attribute **version** shall specify the version of ClaML used in the remaining document. The value to indicate the current version must be “2.0.0”.

6.3.2 Variants

Optionally, this standard supports multiple variants of a classification in the same ClaML file. The element Variants defines the **variants** that are contained within the ClaML file.

6.3.3 Variant

6.3.3.1 General

The element **Variant** uniquely identifies a variant within the ClaML file.

6.3.3.2 Required attribute

The attribute **name** uniquely identifies the variant in the remainder of the ClaML file.

EXAMPLE

```
<Variants>
    <Variant name="cm">Clinical Modification</Variant>
    <Variant name="am">Australian Modification</Variant>
</Variants>
```

6.3.4 Meta

6.3.4.1 General

The element **Meta** shall be used to define meta information about a class or the classification.

6.3.4.2 Contents

The element **Meta** has no contents.

6.3.4.3 Required attributes

The attribute **name** defines the name for the meta information.

The attribute **value** defines the contents of the meta information.

The attribute **variants** defines the variants in which this **Meta** element is valid. When the attribute is absent the **Meta** element is valid in all **variants**.

EXAMPLE

<Meta name="CSS" value="icd10.css"/>

6.3.5 Identifier

6.3.5.1 General

The optional element **Identifier** may occur multiple times. It defines an issuing authority and the unique identifier for the coding scheme defined by that authority.

6.3.5.2 Contents

The element **Identifier** has no contents.

6.3.5.3 Required attribute

The attribute **uid** is required and defines the unique identifier for the coding scheme.

6.3.5.4 Optional attribute

The optional attribute **authority** identifies the authority that issued the uid.

EXAMPLE

<Identifier authority="HL7" uid="2.16.840.1.113883.6.3"/>

6.3.6 Title

6.3.6.1 General

The element **Title** defines the title for the coding scheme.

6.3.6.2 Contents

The contents of the element **Title** is limited to plain text.

6.3.6.3 Required attribute

The attribute **name** defines a short name for the classification.

6.3.6.4 Optional attributes

The attribute **version** defines the version of the classification. It is recommended to use the well-known major.minor.patch version numbering scheme.

The attribute date defines the date of publication. It is recommended to use the date format as defined by ISO 8601.

EXAMPLE

<Title name="ICD10" version="10.2006.13" date="2005-11-15">International Classification of Diseases, version 10</Title>

6.3.7 Authors

6.3.7.1 General

The element **Authors** defines the authors of the ClaML file.

6.3.7.2 Contents

The element **Authors** contains an optional number of the element Author.

6.3.8 Author

6.3.8.1 General

The element **Author** represents the name of an author of the classification.

6.3.8.2 Contents

The contents of the element **Author** is limited to plain text.

6.3.8.3 Required attribute

The attribute **name** uniquely identifies the author. The first character of the attribute id must be a letter, underscore or colon. This attribute is referenced in the element History.

EXAMPLE

<Authors>

<Author name="who">World Health Organisation</Author>

<Author name="fic_nl">Dutch WHO-FIC</Author>

</Author>

6.3.9 ClassKinds

6.3.9.1 General

The element **ClassKinds** lists the kinds of classes, which are present in the coding scheme.

6.3.9.2 Contents

The element **ClassKinds** contains one or more elements **ClassKind**.

6.3.10 UsageKinds

6.3.10.1 General

The optional element **UsageKinds** lists the kinds of usage of classes, which are present in the coding scheme.

6.3.10.2 Contents

The element **UsageKinds** contains one or more elements **UsageKind**.

6.3.11 RubricKinds

6.3.11.1 General

The element **RubricKinds** lists the kinds of rubrics, which are present in the coding scheme.

6.3.11.2 Contents

The element **RubricKinds** contains one or more elements **RubricKind**.

6.3.12 UsageKind

6.3.12.1 General

The element **UsageKind** defines the name of a **UsageKind**.

6.3.12.2 Contents

The element **UsageKind** is empty.

6.3.12.3 Required attribute

The attribute **name** defines the name for a **UsageKind**. The first character of the attribute name must be a letter, underscore or colon.

The attribute **mark** specifies how the code of a **Class** with a specific **UsageKind** shall be marked.

EXAMPLE

```
<UsageKinds>
    <UsageKind name="etiology" mark="†"/>
    <UsageKind name="manifestation" mark="*"/>
```

</UsageKinds>

6.3.13 ClassKind

6.3.13.1 General

The element **Kind** defines the name of a **Class**.

6.3.13.2 Contents

The element **ClassKind** contains an optional number of the element **Display**.

6.3.13.3 Required attribute

The attribute **name** defines the name for the class kind. The first character of the attribute name must be a letter, underscore or colon.

6.3.14 RubricKind

6.3.14.1 General

The element **Kind** defines the name of a **RubricKind**.

6.3.14.2 Contents

The element **RubricKind** contains an optional number of the element **Display**.

6.3.14.3 Required attribute

The attribute **name** defines the name for the rubric kind. The first character of the attribute name must be a letter, underscore or colon.

The attribute **inherited** specifies if rubrics with this rubric kind are inherited by subclasses. The default value for this attribute is **false**.

6.3.15 Display

6.3.15.1 General

The element **Display** defines how a **ClassKind** or **RubricKind** is to be displayed in a specific language.

6.3.15.2 Display

The contents of the element **Display** is limited to plain text.

6.3.15.3 Required attribute

The attribute **xml:lang** defines the language of the content of the element. The attribute values of xml:lang shall follow ISO 639-2 if they are three-letter codes, and EN ISO 3166-1 if they contain two-letter sub codes. Language identifiers registered with the IANA shall contain the prefix "I-" or "i-". Any privately used codes shall contain the prefix "X-" or "x-".

6.3.15.4 Optional attributes

The attribute **variants** define the variants in which this **Display** element is used. When the attribute is absent the **Display** element is used in all **variants**.

EXAMPLE

```
<ClassKinds>
    <Kind name="chapter">
        <Display xml:lang="en" prefix="§">Chapter</Display>
    </Kind>
    <Kind name="block">
        <Display xml:lang="en">Section</Display>
    </Kind>
     <Kind name="category">
        <Display xml:lang="en"/>
     </Kind>
</ClassKinds>
<RubricKinds>
     <Kind name="inclusion">
        <Display xml:lang="de">Inklusiva</Display>
      </Kind>
</RubricKinds>
```

6.3.16 Modifier

6.3.16.1 General

The element **Modifier** defines a modifier within the coding scheme.

6.3.16.2 Contents

The element **Modifier** contains:

- optional number of the element **Meta**;
- optional number of the element **SubClass**;
- optional number of the element **Rubric**;
- optional number of the element **History**.

6.3.16.3 Required attribute

The attribute **code** defines the code for the Modifier.

6.3.16.4 Optional attribute

The attribute **variants** defines the list of variants in which this **Modifier** is valid. When the attribute is absent the **Modifier** is valid in all variants.

EXAMPLE

```
<Modifier code="Md1">
    <SubClass code="0"/>
    <SubClass code="1"/>
    <SubClass code="2"/>
</Modifier>
```

6.3.17 ModifierClass

6.3.17.1 General

The element **ModifierClass** defines a modifier class in the coding scheme.

6.3.17.2 Contents

The element **ModifierClass** contains:

- optional number of the element **Meta**;
- exactly one element SuperClass;
- optional number of the element SubClass;
- optional number of the element Rubric;
- optional number of the element **History**.

6.3.17.3 Required attributes

The attribute **modifier** references the code of the modifier the **ModifierClass** belongs to.

The attribute **code** defines the code for the **ModifierClass**.

6.3.17.4 Optional attribute

The attribute usage refers to a **UsageKind** and specifies the usage of the **ModifierClass**.

The attribute **variants** defines the list of variants in which this **ModifierClass** is valid. When the attribute is absent the **ModifierClass** is valid in all variants.

EXAMPLE

```
<ModifierClass modifier="Md1" code="0">
    <SuperClass code="Md1"/>
    <SubClass code="00"/>
    <SubClass code="01"/>
    <SubClass code="02"/>
</ModifierClass>
```

6.3.18 Class

6.3.18.1 General

The element **Class** defines a class in the coding scheme.

6.3.18.2 Contents

The element **Class** contains:

- optional number of the element **Meta**;
- optional number of the element **SuperClass**;
- optional number of the element **SubClass**;
- optional number of the element **ModifiedBy**;
- optional number of the element **ExcludeModifier**;
- optional number of the element **Rubric**;
- optional number of the element **History**.

6.3.18.3 Required attribute

The attribute **code** defines the code for the class.

The attribute **kind** references the **ClassKind** of the class, e.g. chapter, block, category, etc.

6.3.18.4 Optional attribute

The attribute **usage** refers to a **UsageKind** and specifies the usage of the class.

The attribute **variants** defines the list of variants in which this **Class** is valid. When the attribute is absent the **Class** is valid in all variants.

EXAMPLE

```
<Class code="A00" kind="3digit">
    <SuperClass code="A00-A09"/>
    <SubClass code="A00.0"/>
```

```
    <SubClass code="A00.1"/>

    <SubClass code="A00.9"/>

    <Rubric kind="preferred">

        <Label xml:lang="en">Cholera</Label>

    </Rubric>

</Class>
```

6.3.19 ModifiedBy

6.3.19.1 General

The element **ModifiedBy** refers to the code of a Modifier, which modifies the class and its descendants. In case the **Modifier** shall not modify a descendant of the **Class** the element **ExcludeModifier** must be defined at that specific descendant (see ExcludeModifier).

6.3.19.2 Contents

The element **ModifiedBy** contains:

- an optional number of the element **Meta**;
- an optional number of the element **ValidModifierClass**.

6.3.19.3 Required attributes

The attribute **code** references the code of the **Modifier**.

6.3.19.4 Optional attributes

The attribute **all** may be used to indicate that all **ModifierClasses** are valid. In such a case, the element **ModifiedBy** does not contain an element **ValidModifierClass**. The default value of the attribute **all** is **true**.

The attribute **position** specifies the position for the code of the **ModifierClass** when the **Modifier** is used to generate the subclasses of the modified **Class**. The first position shall be specified by the number ‘1’.

The attribute **variants** defines the list of variants in which this **ModifiedBy** element is valid. When the attribute is absent this **ModifiedBy** element is valid in all variants.

EXAMPLE

```
<Class code="C88" kind="category">

    ...

    <SubClass code="C88.0"/>

    <SubClass code="C88.1"/>

    <ModifiedBy code="Md1" position="5"/>

</Class>
```

```
<Class code="C88.0" kind="category">
    <SuperClass code="C88"/>
</Class>
<Class code="C88.1" kind="category">
    <SuperClass code="C88"/>
    <ExcludeModifier code="Md1"/>
</Class>
```

In the example both **Class** C88 and its descendant C88.0 are modified by **Modifier** Md1. At the descendant **Class** C88.1 the modifier is excluded, i.e. **Class** C88.1 is not modified by **Modifier** Md1.

6.3.20 ExcludeModifier

6.3.20.1 General

The element **ExcludeModifier** refers to the code of a **Modifier**, which is not to be used for this class.

6.3.20.2 Contents

The element **ExcludeModifier** has no contents.

6.3.20.3 Required attribute

The attribute **code** references the code of the excluded **Modifier**.

6.3.20.4 Optional attribute

The attribute **variants** defines the list of variants in which this **ExcludeModifier** element is valid. When the attribute is absent this **ExcludeModifier** element is valid in all variants.

6.3.21 ValidModifierClass

6.3.21.1 General

The element **ValidModifierClass** refers to the code of a **ModifierClass** that is valid for this class. Only valid **ModifierClasses** may be used to modify the **Class**. When the element **ModifiedBy** contains one or more **ValidModifierClass** elements the attribute **all** at **ModifiedBy** must be set to false.

6.3.21.2 Contents

The element **ValidModifierClass** has no contents.

6.3.21.3 Required attribute

The attribute **code** defines the code of the **ModifierClass**.

6.3.21.4 Optional attribute

The attribute **variants** defines the list of variants in which this **ValidModifierClass** element is valid. When the attribute is absent this **ValidModifierClass** element is valid in all variants.

EXAMPLE

```
<Class code="C88" kind="3digit">
    <ModifiedBy code="Md1" all="false">
        <ValidModifierClass code="0"/>
    </ModifiedBy>
</Class>
```

6.3.22 Rubric

6.3.22.1 General

The element **Rubric** defines the labels that belong to a **Class**, **Modifier**, or **ModifierClass**.

6.3.22.2 Contents

The element **Rubric** contains:

- one or more elements **Label**;
- optional number of the element **History**.

6.3.22.3 Required attributes

The attribute **kind** refers to the **RubricKind** of rubric, for example *preferred*, *inclusion*, *exclusion*, etc.

6.3.22.4 Optional attributes

The attribute **id** defines a unique identifier for the rubric. If this is absent, the rubric can not be uniquely identified. The first character of the attribute **id** must be a letter, underscore or colon.

The attribute **usage** refers to a **UsageKind** and specifies the usage of the **Rubric**.

6.3.23 Label

6.3.23.1 General

The element **Label** defines a piece of text.

6.3.23.2 Contents

The element **Label** contains plain text, and possibly one or more of the following elements:

- **Reference**;
- **Term**;

- **Para**;
- **Include**;
- **IncludeDescendants**;
- **Fragment**;
- **List**;
- **Table**.

6.3.23.3 Required attributes

The attribute **xml:lang** defines the language of the content of the element. The attribute values of xml:lang shall follow ISO 639-2 if they are three-letter codes, and EN ISO 3166-1 if they contain two-letter sub codes. Language identifiers registered with the IANA shall contain the prefix "I-" or "i-". Any privately used codes shall contain the prefix "X-" or "x-".

The attribute **xml:space** can be used to indicate that white space (spaces, carriage returns, line feeds, tabs, etc) shall be preserved within the rubric. The default value for this attribute is **default**, which indicates that white space may be ignored. The value **preserve** indicates that white space shall be preserved.

6.3.23.4 Optional attributes

The attribute **variants** defines the list of variants in which this **Label** is valid. When the attribute is absent the **Label** is valid in all variants.

EXAMPLE

```
<Rubric id="r1234" kind="preferred">
    <Label xml:lang="en">Cholera</Label>
</Rubric>
```

6.3.24 History

6.3.24.1 General

The element **History** shall be used to describe what happened to a **Modifier**, **ModifierClass**, **Class** or **Rubric**.

6.3.24.2 Contents

The contents of the element **History** is limited to plain text.

6.3.24.3 Required attributes

The attribute **author** references the unique identifier of the **Author**.

The attribute **date** gives the date of the change. It is recommended to use the date format as defined by ISO 8601.

EXAMPLE

```
<Rubric id="r123" kind="preferred">
    <Label xml:lang="en">Cholera, unspecified</Label>
    <History author="a234" date="2005-11-15">add unspecified</History>
</Rubric>
```

6.3.25 SuperClass

6.3.25.1 General

The element **SuperClass** defines a parent class of a **ModifierClass** or **Class**.

6.3.25.2 Contents

The element **SuperClass** has no contents.

6.3.25.3 Required attribute

The attribute **code** refers to the code of the **SuperClass**.

6.3.25.4 Optional attribute

The attribute **variants** defines the list of variants in which this **SuperClass** is valid. When the attribute is absent the **SuperClass** is valid in all variants.

6.3.26 SubClass

6.3.26.1 General

The element **SubClass** defines a child of a **Modifier**, **ModifierClass** or **Class**.

6.3.26.2 Contents

The element **SubClass** has no contents.

6.3.26.3 Required attribute

The attribute **code** refers to the code of the **SubClass**.

6.3.26.4 Optional attribute

The attribute **variants** defines the list of variants in which this **SubClass** is valid. When the attribute is absent the **SubClass** is valid in all variants.

6.3.27 Reference

6.3.27.1 General

The element **Reference** defines a reference within a **Rubric** to another **Class** either in the ClaML file or in some external classification.

6.3.27.2 Contents

The contents of the element **Reference** is limited to plain text.

6.3.27.3 Optional attributes

The attribute **class** may be used to assign a class name to a **Reference**.

In case of an external reference the attribute authority defines the issuing **authority** of the unique identifier for the external classification, which is given in the attribute **uid**.

The attribute **code** defines the code of the referenced **Class**. In case this attribute is absent the contents of the element **Reference** define the code of the referenced **Class**.

The attribute **usage** defines a **UsageKind** that overrides the usage of the referenced class.

The attribute **variants** defines the list of variants in which this **Reference** is valid. When the attribute is absent the **Reference** is valid in all variants.

EXAMPLE

```
<Reference>A00.0</Reference>

<Reference code="I">A00-B99</Reference>

<Reference usage="etiology">A00</Reference>

<Reference authority="HL7" uid="2.16.840.1.113883.6.3">A00.0</Reference>

<Reference authority="HL7" uid="2.16.840.1.113883.6.3" code="I">A00-B99</Reference>
```

6.3.28 Para

6.3.28.1 General

The element **Para** defines a paragraph within a Rubric.

6.3.28.2 Contents

The element **Para** contains plain text, possibly mixed with the elements:

- **Reference**;
- **Term**.

EXAMPLE

```
<Para>some text in a paragraph</Para>

<Para>and another paragraph</Para>
```

6.3.29 Fragment

6.3.29.1 General

The element **Fragment** defines a fragment of text within a **Rubric**.

6.3.29.2 Contents

The element **Fragment** contains plain text, possibly mixed with the elements:

- **Reference**;
- **Term**.

6.3.29.3 Optional attributes

The attribute **usage** refers to a **UsageKind** and specifies the usage of the **Fragment**.

The attribute **type** defines the type of **Fragment**. Possible values are **item** and **list**. The default value is **item**.

EXAMPLE

```
<Rubric kind="inclusion">
    <Label xml:lang="de">
        <Fragment type="list">tuberculosis<Fragment>
        <Fragment type="list">disseminated</Fragment>
    </Label>
</Rubric>
<Rubric kind="inclusion">
    <Label xml:lang="de">
        <Fragment type="list">tuberculosis<Fragment>
        <Fragment type="list">generalized</Fragment>
    </Label>
</Rubric>
```

displayed as:

Tuberculosis:

- disseminated
- generalized

```
<Rubric kind="inclusion">
    <Label xml:lang="de">
        <Fragment type="item">Leukorrhoea (vaginalis)</Fragment>
        <Fragment type="item">due to Trichomonas (vaginalis)</Fragment>
    </Label>
</Rubric>
```

```
<Rubric kind="inclusion"
    <Label xml:lang="de">
        <Fragment type="item" usage="etiology">Prostatitis</Fragment>
        <Fragment type="item">due to Trichomonas (vaginalis)</Fragment>
    </Label>
</Rubric>
```

displayed as:

Leukorrhoea (vaginalis) } due to Trichomonas (vaginalis)

Prostatitis† }

6.3.30 Include

6.3.30.1 General

The element **Include** references a **Rubric**, which shall be included in the current **Rubric**.

6.3.30.2 Contents

The element **Include** has no contents.

6.3.30.3 Required attribute

The attribute **rubric** contains the unique identifier of the **Rubric** that shall be included.

EXAMPLE

```
<Class code="A00">
    <Rubric id="r123" kind="preferred">
        <Label xml:lang="en">Incision of ear</Label>
    </Rubric>
</Class>
<Class code="A00.0">
    <Rubric kind="preferred">
        <Label xml:lang="en">
            <Include rubric="r123"/>external ear
        </Label>
    </Rubric>
</Class>
```

displayed as:

A00 Incision of ear

A00.0 Incision of ear: external ear

6.3.31 IncludeDescendants

6.3.31.1 General

The element **IncludeDescendants** references a **Class** from which the code and preferred Rubrics of its descendants shall be included in the **Rubric**.

6.3.31.2 Contents

The element **IncludeDescendants** has no contents.

6.3.31.3 Required attribute

The attribute **code** references the code of the **Class**.

The attribute **kind** defines the class kind of the descendants that shall be included.

EXAMPLE

```
<Class code="I" kind="chapter">
    <Rubric kind="contents">
        <Label xml:lang="en">This chapter contains the following blocks:<IncludeDescendants code="I" kind="block"/>
        </Label>
    </Rubric>
</Class>
```

6.3.32 List

6.3.32.1 General

The element **List** defines a list of **ListItems**.

6.3.32.2 Contents

The element **List** contains at least one and optionally more of the element **ListItem**.

6.3.32.3 Optional attribute

The attribute **class** may be used to assign a class name to a **List**.

6.3.33 ListItem

6.3.33.1 General

The element **ListItem** contains a piece of text that shall be formatted as an item in a list.

6.3.33.2 Content

The element **ListItem** contains plain text, possible mixed with the elements:

- **Reference**;
- **Term**;
- **Para**;
- **Include**;
- **List**;
- **Table**.

6.3.33.3 Optional attribute

The attribute **class** may be used to assign a class name to a **ListItem**.

EXAMPLE

```
<Class code="II" kind="chapter">
    <Rubric kind="instruction">
        <Label xml:lang="de">
            <List class="decimal">
                <ListItem>
                    <Para>Primary, ill-defined, secondary and unspecified sites of malignant neoplasms
                    </Para>
                    <Para>Categories C76-C80 include malignant neoplasms for which there is no clear indication of the
                      original site of the cancer or the cancer is stated to be "disseminated", "scattered" or "spread"
                      without mention of the primary site. In both cases the primary site is considered to be unknown.
                    </Para>
                </ListItem>
                <ListItem>
                  <Para>Functional activity</Para>
                </ListItem>
            </List>
```

```
        </Label>
    </Rubric>

</Class>
```

6.3.34 Table

6.3.34.1 General

The element **Table** defines a table.

6.3.34.2 Content

The element **Table** contains the following:

- one optional element **Caption**;
- one optional element **THead**;
- one optional element **TBody**;
- one optional element **TFoot**.

6.3.34.3 Optional attribute

The attribute **class** may be used to assign a class name to a **Table**.

6.3.35 Caption

6.3.35.1 General

The element **Caption** defines the caption of a **Table**.

6.3.35.2 Content

The element **Content** contains plain text, possibly mixed with the elements:

- **Reference**;
- **Term**.

6.3.35.3 Optional attribute

The attribute **class** may be used to assign a class name to a **Caption**.

6.3.36 THead

6.3.36.1 General

The element **THead** defines the headings of a **Table**.

6.3.36.2 Content

The element **THead** contains one or more occurrences of the element **Row**.

6.3.36.3 Optional attribute

The attribute **class** may be used to assign a class name to a **THead**.

6.3.37 TBody

6.3.37.1 General

The element **TBody** defines the body of a **Table**.

6.3.37.2 Content

The element **TBody** contains one or more occurrences of the element **Row**.

6.3.37.3 Optional attribute

The attribute **class** may be used to assign a class name to a **TBody**.

6.3.38 TFoot

6.3.38.1 General

The element **TFoot** defines the footer of a **Table**.

6.3.38.2 Content

The element **TFoot** contains one or more occurrences of the element **Row**.

6.3.38.3 Optional attribute

The attribute **class** may be used to assign a class name to a **TFoot**.

6.3.39 Row

6.3.39.1 General

The element **Row** defines a row within a **Table**.

6.3.39.2 Content

The element **Row** contains an optional number of the element **Cell**.

6.3.39.3 Optional attribute

The attribute **class** may be used to assign a class name to a **Row**.

6.3.40 Cell

6.3.40.1 General

The element **Cell** defines a cell within a **Row** of a **Table**.

6.3.40.2 Content

The element **Cell** contains plain text, possibly mixed with the elements:

- **Reference**;
- **Term**;
- **Para**;
- **Include**;
- **List**;
- **Table**.

6.3.40.3 Optional attributes

The attribute **class** may be used to assign a class name to a **Cell**.

The attribute **rowspan** defines the number of Rows that are spanned by a **Cell**.

The attribute **colspan** defines the number of columns that are spanned by a **Cell**.

EXAMPLE The following table from ICD-10 at codes H54

Table 1 — Classification of severity of visual impairment

<table>
<tr><td rowspan="2">Category of visual impairment</td><td colspan="2">Visual acuity with best possible correction</td></tr>
<tr><td>Maximum less than:</td><td>Minimum equal to or better than:</td></tr>
<tr><td rowspan="3">1</td><td>6/18</td><td>6/60</td></tr>
<tr><td>3/10 (0,3)</td><td>1/10 (0,1)</td></tr>
<tr><td>20/70</td><td>20/200</td></tr>
<tr><td rowspan="3">2</td><td>6/60</td><td>3/60</td></tr>
<tr><td>1/10 (0,1)</td><td>1/20 (0,05)</td></tr>
<tr><td>20/200</td><td>20/400</td></tr>
<tr><td rowspan="3">3</td><td>3/60</td><td>1/60 (finger counting at 1metre)</td></tr>
<tr><td>1/20 (0,05)</td><td>1/50 (0,02)</td></tr>
<tr><td>20/400</td><td>5/300 (20/1200)</td></tr>
<tr><td rowspan="3">4</td><td>1/60 (finger counting at 1metre)</td><td rowspan="3">Light perception</td></tr>
<tr><td>1/50 (0,02)</td></tr>
<tr><td>5/300</td></tr>
<tr><td>5</td><td colspan="2">No light perception</td></tr>
<tr><td>9</td><td colspan="2">Undetermined or unspecified</td></tr>
<tr><td colspan="3">WHO Technical Report Series No. 518, 1973</td></tr>
</table>

would be represented in this standard as:

```
<Table>
    <Caption> Classification of severity of visual impairment</Caption>
    <THead>
        <Row>
            <Cell rowspan="2"> Category of visual impairment </Cell>
            <Cell colspan="2"> Visual acuity with best possible correction </Cell>
        </Row>
        <Row>
            <Cell> Maximum less than:</Cell>
            <Cell> Minimum equal to or better than:</Cell>
        </Row>
      </THead>
       <TBody>
         <Row>
            <Cell rowspan="3">1</Cell>
            <Cell>6/18</Cell>
            <Cell>6/60</Cell>
        </Row>
        <Row>
            <Cell>3/10 (0,3)</Cell>
            <Cell>1/10 (0,1)</Cell>
         </Row>
         <Row>
            <Cell>20/70</Cell>
            <Cell>20/200</Cell>
        </Row>
        <Row>
            <Cell rowspan="3">2</Cell>
            <Cell>6/60</Cell>
            <Cell>3/60</Cell>
```

```
 </Row>
 <Row>
        <Cell>1/10 (0,1)</Cell>
        <Cell>1/20 (0,05)</Cell>
</Row>
<Row>
         <Cell>20/200</Cell>
         <Cell>20/400</Cell>
 </Row>
 <Row>
         <Cell rowspan="3">3</Cell>
         <Cell>3/60</Cell>
         <Cell>1/60 (finger counting at 1metre)</Cell>
</Row>
<Row>
         <Cell>1/20 (0,05)</Cell>
         <Cell>1/50 (0,02)</Cell>
</Row>
<Row>
          <Cell>20/400</Cell>
          <Cell>5/300 (20/1200)</Cell>
</Row>
<Row>
           <Cell rowspan="3">4</Cell>
           <Cell>1/60 (finger counting at 1metre)</Cell>
           <Cell rowspan="3"> Light perception </Cell>
</Row>
<Row>
            <Cell>1/50 (0,02)</Cell>
</Row>
```

```
        <Row>
                <Cell>5/300</Cell>
        </Row>
        <Row>
                <Cell>5</Cell>
                 <Cell colspan="2"> No light perception </Cell>
        </Row>
        <Row>
                 <Cell>9</Cell>
                 <Cell colspan="2"> Undetermined or unspecified </Cell>
         </Row>
      </TBody>
      <TFoot>
         <Row>
                 <Cell colspan="3">WHO Technical Report Series No. 518, 1973</Cell>
         </Row>
      <TFoot>
</Table>
```

6.3.41 Term

6.3.41.1 General

The element **Term** contains a piece of text that has a special meaning.

6.3.41.2 Contents

The element **Term** may only contain plain text.

6.3.41.3 Optional attributes

The attribute **class** may be used to assign a class name to a **Term**.

EXAMPLE

```
<Class code="B81">
        ...
        <Rubric kind="exclusion">
```

```
            <Label xml:lang="en">angiostrongyliasis due to
                <Term class="organism">Parastrongylylus cantonensis</Term>
                <Reference class="bracket">B83.2</Reference>
            </Label>
        </Rubric>
</Class>
```

Annex A
(informative)

Examples of usage of this standard

A.1 Representing the Dagger and Asterisk System of ICD

A feature of the ICD-9 and ICD-10 is the dagger (etiology) and asterisk (manifestation) system, which is used as an alternative method to classify diagnostic statements including a general disease and a manifestation in a particular organ or site. This can be represented in ClaML by defining a **UsageKind** for asterisk codes and one for dagger codes.

```
<UsageKinds>
      <UsageKind name="etiology" mark="†"/>
      <UsageKind name="manifestation" mark="*"/>
</UsageKinds>
...
<Class code="A17.0" kind="digit4" usage="etiology">
    <SuperClass code="A17"/>
    <Rubric kind="preferred">
          <Label xml:lang="en">
               Tuberculous meningitis <Reference>G01</Reference>
          </Label>
    </Rubric>
</Class>
...
<Class code="G01" kind="digit3" usage="manifestation">
    <SuperClass code="G00-G09"/>
     <Rubric kind="preferred">
          <Label xml:lang="en">
            Meningitis in bacterial diseases classified elsewhere
          </Label>
    </Rubric>
```

```
</Class>
```

Theoretically any code in ICD-10 (except for asterisk codes) can be referenced as a dagger code. For example at G01 the code A22.8 is referenced as a dagger code, although A22.8 itself is not marked as a dagger code. In such a case the **UsageKind** of the referenced code can be overruled with the attribute **usage** at the element **Reference**.

```
<Class code="A22.8" kind="digit4">
    <SuperClass code="A22"/>
    <Rubric kind="preferred">
        <Label xml:lang="en">Other forms of anthrax</Label>
    </Rubric>
</Class>
...
<Class code="G01" kind="digit3">
    <SuperClass code="G00-G09"/>
    ...
    <Rubric kind="inclusion">
        <Label xml:lang="en">
            Meningitis in Anthrax <Reference usage="etiology">A22.8</Reference>
        </Label>
    </Rubric>
</Class>
```

In ICD-10 a dagger can also be added to a piece of text, as for example at A59.0 where a dagger is added to the text fragment Prostatitis. In such a case the attribute **usage** of the element **Fragment** may be used.

```
<Class code="A59.0" kind="digit4">
    <Rubric kind="inclusion">
        <Label xml:lang="de">
            <Fragment type="item">Leukorrhoea (vaginalis)</Fragment>
            <Fragment type="item">due to Trichomonas (vaginalis)</Fragment>
        </Label>
    </Rubric>
    <Rubric kind="inclusion">
        <Label xml:lang="de">
```

```
            <Fragment type="item" usage="etiology">Prostatitis</Fragment>
            <Fragment type="item">due to Trichomonas (vaginalis)</Fragment>
        </Label>
    </Rubric>
</Class>
```

A.2 References to different languages

The next piece of ClaML demonstrates how the same rubric in different languages would be represented.

```
<ClaML version="2.0.0">
        <Title name="ICD" version="10.0.0" date="2000-12-01">
            International Codes for Diseases, version 10
        </Title>
        <ClassKinds>
            <Kind name="chapter">
                <Display xml:lang="en">Chapter</Display>
            </Kind>
        </ClassKinds>
        <Class code="A00-B99" kind="chapter">
        <Rubric id="r1234567890" kind="preferred">
            <Label xml:lang="en">
                Certain infectious and parasitic diseases
            </Label>
            <Label xml:lang="nl">
                Bepaalde infectieziekten en parasitaire aandoeningen
            </Label>
            <Label xml:lang="de">
                Bestimmte infektiöse und parasitäre Krankheiten
            </Label>
        </Rubric>
        </Class>
```

```
</ClaML>
```

A.3 Text containing repetition and layout

In books a particular kind of layout (see below) is often used to prevent repetition of the same texts in consecutive lines. This type of layout can be represented in ClaML using the element Fragment. At the same time, each Rubric contains the complete meaningful text.

A16.0	**Tuberculosis of lung, bacteriologically and histologically negative** Tuberculous: · bronchiectasis } · fibrosis of lung } · pneumonia } · pneumothorax }	bacteriologically and histologically negative

```
<Class code="A16.0" kind="category">
        <SuperClass code="A15-A19"/>
        <Rubric kind="preferred">
            <Label xml:lang="en">
                Tuberculosis of lung, bacteriologically and histologically negative
            </Label>
        </Rubric>
        <Rubric kind="text">
            <Label xml:lang="en">
                <Fragment type="list">
                    Tuberculous
                </Fragment>
                <Fragment type="list">
                    bronchiectasis
                </Fragment>
                <Fragment type="item">
                    bacteriologically and histologically negative
                </Fragment>
            </Label>
```

```
</Rubric>
<Rubric kind="text">
    <Label xml:lang="en">
        <Fragment type="list">
            Tuberculous
        </Fragment>
        <Fragment type="list">
            fibrosis of lung
        </Fragment>
        <Fragment type="item">
            bacteriologically and histologically negative
        </Fragment>
    </Label>
</Rubric>
<Rubric kind="text">
    <Label xml:lang="en">
        <Fragment type="list">
            Tuberculous
        </Fragment>
        <Fragment type="list">
            pneumonia
        </Fragment>
        <Fragment type="item">
            bacteriologically and histologically negative
        </Fragment>
    </Label>
</Rubric>
<Rubric kind="text">
    <Label xml:lang="en">
        <Fragment type="list">
```

```
                    Tuberculous
                </Fragment>
                <Fragment type="list">
                    pneumothorax
                </Fragment>
                <Fragment type="item">
                    bacteriologically and histologically negative
                </Fragment>
            </Label>
        </Rubric>
</Class>
```

Annex B
(informative)

Suggested Usage of ClaML-attributes

In principle there is no need to standardise on attribute values in this standard. Because all entities are unequivocally identified, bulk changes are a trivial though sometimes time-consuming task. This list is provided for trial purposes. It may help in more easy interchange within certain communities.

B.1 Class kind attributes

Table B.1

Value	Usage
chapter	A chapter is a self-contained block of sections dealing with a specific content (e.g. in ICD-10 chapter 1 represents infectious diseases, in OPS chapter 8 represents non-surgical-therapeutic procedures).
block	A block is a self-contained block of codes dealing with a specific sub-content of a chapter (e.g. in ICD-10 section A00-A09 represents intestinal infectious diseases – a specific group of infectious diseases).
category	A category is a entity that describes a specific concept (e.g. in ICD-10 A00 represents Cholera – a specific infectious disease).

B.2 Usage Kind Attributes

The basic cause or underlying disease process is assigned a code marked with a dagger (†), and its clinical manifestation another, marked with an asterisk (*), with the two used jointly. An example of this is the coding of tuberculosis of the spinal column, which is coded as A18.0† (Chapter I – Certain infectious and parasitic diseases) as the basic cause and as M49.0* (Chapter XIII – Diseases of the musculoskeletal system and connective tissue) as its clinical manifestation.

Table B.2

Value	Usage
etiology	The basic cause or underlying disease process is assigned a code marked with a dagger (†).
manifestation	The clinical manifestation is marked with an asterisk (*).

B.3 Rubric kind attributes

Table B.3

Value	Usage
preferred	The attribute kind="preferred" defines a specific unique term that identifies the meaning of a class.
inclusion	The attribute kind="inclusion" shall be used for additional terms that can be used within a class.
exclusion	The attribute kind="exclusion" shall be used for terms that are excluded from a class.
coding-hint	Coding instructions
definition	Otherwise unspecified texts added to rubrics.
note	General remark
text	e.g. a text for a Modifier
title	A title for a text rubric
introduction	A long text at the beginning of a chapter.
footnote	As in the printed versions of ICD.

Bibliography

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[3] Rossi Mori A, Consorti F, Galeazzi E. Standards to support development of terminological systems for healthcare telematics. Methods Inf Med 1998 Nov;37(4-5):551-63.

[4] ISO 8601, *Data elements and interchange formats – Information interchange – Representation of dates and times*