



**MEETING OF WHO COLLABORATING CENTRES
FOR THE FAMILY OF INTERNATIONAL CLASSIFICATIONS**

Cologne, Germany

19-25 October 2003

Title: Dutch ICD-10 and ICF in a CEN Technical Standard Format for version control and maintenance

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Purpose: for information and discussion

Recommendations:

Abstract:

Until 2001 the Dutch translations of international classifications, such as ICD-10 and the Beta drafts of ICIDH-2, were only published as books. Although being laborious, for this purpose the processing and maintaining the updates of the classifications, word processing environments seemed to be sufficient. In fact two different word processing programs were used.

In the late nineties of the 20th century several quests for an electronic version of the ICD and, at that time, the ICIDH in a database format reached the Dutch Centre. Also quests for more accessible, electronic versions of the Classifications were put to us. For the Dutch Centre the question was, how these quests could be answered and how different required formats could be maintained in a standardised way.

In 2001 the Dutch Centre decided to adopt the CEN/TS 14463 (ClAML) a Technical Standard for structuring Classifications, and to produce the ICF and the ICD-10 in this format to meet the quests for an accessible electronic version and a ClAML (XML for Classifications) for database production.

We will demonstrate the Dutch electronic versions of ICF and ICD-10 and show how the qualifiers in ICF and additional coding in ICD-10 are handled. Also some topics for the production of a book version of ICD and ICF, using the same source, will be addressed.

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Introduction

In the Netherlands many health care disciplines have incorporated classifications in their educational programs and professional profiles, as they feel the need for a univocal terminology. The problem is that paper based classifications are perceived as troublesome to get familiar with.

There is a perceived need for electronic versions of the ICD-10 and the ICF. This need for 'electronic versions' ranges from exact 'readable' copies in word-processor format to versions of the classifications in database format for implementation in Electronic Patient Record Systems. The most urgent needs are user friendly, easy accessible versions of the classifications and database files.

During the translation of the ICF, the Dutch WHO CC therefore decided to publish the ICF, not only as a book, but also to disseminate the ICF in a number of formats. One of these formats would be the electronic version of the ICF in a software tool.

To enable the production of the required formats, the Centre looked for an application that would meet a number of the Centres requirements. These requirements are ranging from not having to use different software programs for production of a paper versions of classifications and electronic versions, possibilities for import of already produced text files, easy maintenance and version control, to, most of all a standard representation of classifications. An almost impossible set of requirements to be fulfilled within one environment.

ClaML

For the construction of the electronic version of ICF, the Centre cooperated with KERMANOG, a Dutch company with expertise on knowledge management. They also assisted the Centre during the ICIDH revision process in tracking errors in successive ICIDH draft versions. The company developed the Classification Manager (Clam), the software tool that is now in use by the Centre. They also took the initiative for a standard format for structuring classifications, which resulted in the CEN/TS 14463 (ClamL). In 2001 the Centre decided to adopt this standard as it offered the chance for meeting the set of requirements for centralising and facilitating work within the Clam software and for making classifications more accessible.

In 2002 the Centre produced the first ever version of a classification in ClamL format, the Dutch ICF version. In 2003 we developed the ICD-10 in ClamL. Both files are the product of our own electronic versions of the classifications in the Clam software for version control and maintenance.

ICF in electronic format

The ICF is in fact a classification with a simple structure. The complete classification is now available to us in electronic format. The complete text of the detailed classification is included, on every level, component, domain, block or class.

Qualifiers

The qualifiers are represented in a different way than within the paper-based classification. Clam has a feature for structuring and manipulating modifiers. Modifiers is technically the same as qualifiers. In Clam modifiers are assigned to specific classes within the

classification. The advantage of this way of representation is that the qualifiers are not only shown on the component level, but also appear under each separate class.

Indexer tool

The ICF can be indexed as desired for search on terms or codes. Every rubric kind within a chapter, block or class can be in- or excluded for indexing. Normally the search would be for a specific term, possibly hard to find in a paper-based classification. The search would in fact not be focussed on terms in exclusions, as this would not be part of the paper-based-index. In ClaM we can easily index on exclusion terms as well, as this is no burden to the system. In ICF this may even be obvious as exclusions often carry referrer codes

Referrer tool

The ICF contains a high number of referrals to rubrics. ClaM offers the possibility of making these referrer codes active. This can be regarded as an additional search function within the classification. One can easily jump from one class to another and reverse. Within ClaM there is also another functionality. In version control it can be used for checking invalid references. In paper based classification development this reference checking is a time consuming and uncertain activity.

ICD-10 in electronic format

The ICD-10 has a more complicated structure(s) to represent electronically. However, the complete classification is now available to us in electronic format. Here also the complete text of the detailed classification is represented on every level, chapter, block, and class. Also the Morphology lists are included.

Qualifiers

As with the ICF, all modifiers, like extra positions, are represented in a different way than on paper. They have been structured within the modifier mode and assigned to specific classes. Certainly in ICD this approach to extra positions offers the advantage of having relevant information represented on the correct place in the complexity of the classification, automatically excluding irrelevant classes.

Referrer tool

Especially in ICD the number of referrals is immense. The functionality is the same as in ICF. A complicating factor is the use of dagger and asterix in the code. This use of daggers and asterix needs to be studied further in detail. Some of the problematic uses are discussed in the discussion.

Discussion

We think that there will be less demand for future revisions and versions of classifications on paper. However little the demand, we want to be able to produce paper versions, or at least be able to let users print their own copy of a classification.

ClaML may be sufficient for 'representation' of the structure of most classifications in software, for presentation of the classifications on paper some work still needs to be done. In this context 'presentation' is referred to as the lay-out of the classification on paper. Parts of this presentation will also need to be made explicit for a correct representation in an

electronic environment like e.g. a Web-browsing tool. For these purposes ClaML needs to be expanded.

Working on the electronic version of the ICD-10 we addressed a number of layout items and inconsistencies in ICD 10 representation that need to be resolved. Some of these items are

Lay-out items per page (examples)

Page 107

How to tag the text? This chapter contains the following blocks.

The tag should be made explicit and hidden in the browser

Tagname: note?

How to tag A00-A09, tag should be made explicit and hidden

Tagname: block? In fact it is not a block in this place, it is a summary of blocks, maybe tag it as 'blocksum'?

How to treat the white space in the last line B99 Overige infectieziekten?

The white space is now a tab, which is lost in ClaM

Page 108 and all other places where terms are 'includes' in Dutch 'neventerm' or 'neventermen'

These terms are tagged as such, but should be hidden

How to handle italics in a text, all italics are named beasts

How to handle curly brackets? They are now replaced by adding the full text to each separate line, which would make more sense in an electronic system. For publishing replacement of repeated text by curly brackets again?

Page 116, and other relevant pages where double curly brackets are used.

Double curly brackets are handled by adding the full text on the right hand side to each separate line

Page 150

Footnote to codename, how to be handled?

It is tagged as 'footnote'

Page 181

Indenting of a sub-block in an overview of blocks; white space disappears after reimporting. Making it explicit by means of a specified tag? Like `_sub_blocksum` and a deeper level by `_sub_sub_blocksum`?

Bold text and space before and after.

In this case it concerns 'opmerkingen', headings. Tag: `_opmerkingBt`

There is a difference between the heading and content. Tag `_opmerkingPt`

Page 183

Indenting on the level of plain text. Tag: `_sub_opmerkingPt`

Page 1180

Representation of a line in the text, as part of a scheme

Also the representation of a scheme with tabs to separate the different columns

The scheme also contains brackets that need to be represented in a printable version. The question here is, what do these brackets mean?

From page 1202

Categories of classes are given in italics, it is not clear as if this has meaning in the sense of 'bacteria' and other beasts. It probably just is a layout error.

Problematic USAGE OF Dagger/asterix

B02.1† Zoster meningitis (G02.0*)

B02.2† Herpes zoster met andere aandoening van zenuwstelsel

Postherpetische:

- . ganglionitis geniculata (G53.0*)
- . polyneuropathie (G63.0*)
- . trigeminusneuralgie (G53.0*)

(below the preferred construct, for the revision in 2003)

B26.3† Bofpancreatitis (K87.1*)

B26.8 Bof met overige gespecificeerde complicaties

Bof:

- . arthritis† (M01.5*)
- . myocarditis† (I41.1*)
- . nefritis† (N08.0*)
- . polyneuropathie† (G63.0*)

INCONSISTENT REFERENCING with Dagger/asterix

G63.0* Polyneuropathie bij elders geclassificeerde infectieziekten en parasitaire aandoeningen

Polyneuropathie (bij):

- . bof (B26.8†) (code does not contain dagger)
- . difterie (A36.8†)

- . herpes zoster (B02.2†) (code contains dagger)
- . late syfilis (A52.1†)
 - . congenitaal (A50.4†)
- . lepra (A30.-†)
- . Lyme disease (A69.2†)
- . mononucleosis infectiosa (B27.-†)
- . postherpetisch (B02.2†)
- . tuberculose (A17.8†)

A52.1 Symptomatische neurosyfilis

Artropathie van Charcot† (M14.6*) (dagger misses in printed English version)

Late luetische:

- . encefalitis† (G05.0*)
- . meningitis† (G01*)
- . neuritis acustica† (H94.0*)
- . polyneuropathie† (G63.0*)
- . opticusatrofie† (H48.0*)
- . retrobulbaire neuritis† (H48.1*)

Luetisch parkinsonisme† (G22*)

Tabes dorsalis

M14.6* Neuropathische artropathie

Diabetische neuropathische artropathie (E10-E14† met gemeenschappelijk vierde teken .6)

Tabetische artropathie of artropathie van Charcot (A52.1†) (is tabetische a. simmilar to Charcot? English term was: Charcot's or tabetic arthropathy (A52.1†))

B26.3† Bofpancreatitis (K87.1*)

K87.1* Aandoeningen van pancreas bij elders geclassificeerde ziekten

Pancreatitis (bij)(door):

- . bof (B26.3†)
- . cytomegalovirus (B25.2†)

In this blok of 'neventermen' not all 'neventermen' are marked with a †. Should the individual terms be tagged with a dagger?

A18.3 Tuberculose van darmen, peritoneum en mesenteriale klieren

Tuberculeuze:

- . ascites
- . enteritis† (K93.0*)

- . peritonitis† (K67.3*)
- Tuberculose (van):
- . anus en rectum† (K93.0*)
- . darm (dikke)(dunne)† (K93.0*)
- . retroperitonea(a)l(e) (lymfeklieren)

Modifiers

A separate issue is how we are going to deal with dagger/asterix in Modifier fields. The examples below stem from Block E10-E14

.3† Met oogcomplicaties

Diabetisch:

- . cataract (H28.0*)
- . retinopathie (H36.0*)

.4† Met neurologische complicaties

Diabetische:

- . amyotrofie (G73.0*)
- . autonome neuropathie (G99.0*)
- . mononeuropathie (G59.0*)
- . polyneuropathie (G63.2*)
- . autonoom (G99.0*)

Problems with inclusions/exclusions

The inclusion below contains an exclusion (anders dan)

A02 Overige Salmonella-infecties

Inclusies: infectie of voedselvergiftiging door *Salmonella*, elke species anders dan *S. typhi* en *S. paratyphi*

Several different kinds of dagger and asterix problems.

Daggers are placed on different levels, sometimes on the level of the numeric code (A17.9+), sometimes on the level of the 'neventerm' behind the term itself. This is not done consequently in the list.

The asterix code behind the dagger code is always referring to a class with an asterix as a suffix.

In this code the referral to the daggercode, is in most cases to a non existing dagger code. In these cases the 'neventerm' or 'includes' has a dagger as an attribute. Taxonomically this is incorrect. The 'includes' inherits its properties from its parent, which in these cases does not own the dagger as a property. This would not be a problem if this was the differentium, but when almost all children within a class have the dagger as the differentium it looks more like the generium.

The question is if the dagger and the asterix are an attribute of the class numeric code or of the class name. Or are they type of relations?