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ICD-11 revision: where are we now? Ontology-driven tools and the web platform

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Introduction

ICD is the international de facto standard classification for most epidemiological and many health-care and clinical uses. Originally designed to record causes of death, the usage of ICD has been extended to include morbidity classification, reimbursement, and several other specialty areas such as oncology and primary care. The current 10th edition of ICD was endorsed by the World Health Assembly in 1990 and has been periodically updated over the years. Recently, the World Health Assembly decided to develop a completely new version named the 11th revision.

Methods

In previous revisions of ICD, specialty experts and national representatives of WHO collaborative-classification centers proposed additions and changes to the codes (using lists of codes for creating new drafts). In contrast, the development of ICD-11 aims to create an information infrastructure and workflow processes that utilize knowledge engineering and management techniques that are supported by software. Instead of just codes, titles, and associated rules and indices, the information infrastructure will enable a more detailed definition of disease and health conditions, as well as the use of reference terminologies and ontologies, review of best scientific evidence, and field trials of draft standards.

In terms of workflow, the information infrastructure should support the collaborative development of new content and proposed changes, rigorous review and approval processes, and the creation of draft classifications for field testing. The ICD revision process was initially the work of Topic Advisory Groups (TAG) that had been set up for various specialty areas. The ICD-11 revision process will eventually be opened up for comments and suggestions from interested parties on the Internet.

Lastly, the final output will be multiple for different use cases such as mortality, morbidity and primary care, which can be mapped with ontology-driven tools

Results

The content model is made up of three different parts:

A) Descriptive Characteristics
ICD Concept Title
Hierarchy, Type and Use
Textual Definition
Terms
Index Terms
Synonyms
Inclusion Terms
Exclusion Terms
B) Clinical Description
Manifestation Properties
Signs & Symptoms
Findings
Temporal Properties
Severity Properties
Functional Properties
Treatment Properties
Diagnostic Rules
Reason For Encounter
C) Formal Characteristics
Body Structure
Morphologic Abnormality
Causal Properties
Mechanisms/ Agents
Risk Factors
Genomic Characteristics
Dysfunction

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The web platform named ICAT has been developed by a team of Stanford University to allow a collaborative population of the content model by their different tags.

The ICD-11 content model is still evolving, but the main components have been specified. A detailed guide describes the expected content and usage of each component. It is the document that records the shared understanding of the content model.

The OWL content model realizes the informal description in the guide and formalizes the three-layer conceptualization of the original UML model.

Conclusions

The ICD-11 content model is very much a work in progress. Consensus formulation of several components such as temporal properties, severity properties, and diagnostic criteria is not yet available. From the view point of case mix, the new tools will provide an ICD of better quality for morbidity, thus allowing better mapping between diagnosis systems and, as a result of this, better mapping across case-mix systems based on diagnosis coding.

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