WHO Family of International Classifications

Bedirhan Üstün, WHO
WHO Family of International Classifications

... BUILDING BLOCKS OF HEALTH INFORMATION ...

Dr. T. Bedirhan Üstün
Classifications and Terminology

To facilitate communication

• ustunb@who.int

• phone: +41 22 791 3609

A suite of classifications for international use as meaningful information tools to capture the core health dimensions such as deaths, disease, disability and health as well as related health system parameters such as health interventions.
Aims of the WHO FIC

- to provide *a scientific basis* for definition and management of health conditions
- to establish *a common language* to improve communications
- to permit *comparison of data* across countries, health care disciplines, services and time
- to provide a systematic coding scheme for *health information systems*
- to stimulate *better care, services and research* on health conditions

WHO Family of Classifications

REFERENCE Classifications

- International Classification of Diseases
- International Classification of Functioning, Disability & Health
- International Classification of Health Interventions

DERIVED Classifications

- International Classification of Diseases for Oncology, Third Edition (ICD-O-3)
- The ICD-10 Classification of Mental and Behavioural Disorders
- Application of the International Classification of Disease in Dentistry and Stomatology, Third Edition (ICD-DA)
- Application of the International Classification of Disease in Neurology (ICD-10-NA)
- ICF, Children & Youth Version (ICF-CY)
How do we optimize our health services?

Health Systems & Information Systems:

- Analog to Digital

ICD Revisions

- ICD-1: 1900
- ICD-2: 1909
- ICD-3: 1919
- ICD-4: 1929
- ICD-5: 1938
- ICD-6: 1948
- ICD-7: 1955
- ICD-8: 1965
- ICD-9: 1975
- ICD-10: 1989
- ICD-11: 2014

Key Drivers

- Mandated by WHA and EB
- Respond to consumer needs
  - Clinicians, Administration, Patients, families; Data-users
- Keep up with new scientific knowledge
  - New Diseases, Treatments, Terminology...
  - Corrections: pruning and grafting, deletions
  - Change in rules, guidelines, conventions...
- Compatibility within the WHO-FIC members
  - ICF, ICH, ICECI, ICD-O...
- Creation of an improved network and dissemination
- Better implementation within Health Information Systems
  - Electronic Health Record, Clinical Terminologies, Mortality Database
**ICD Revision Work Streams**

1. **Scientific Stream**
   - Evidence Based Reviews
   - Meta analyses
   - Surveys
   - Validation Studies
   - Add-on protocols for existing studies

2. **Clinical Stream**
   - Clinical utility – linkage to patient reports
     - Treatment Response
   - Phenotypes: gene to behaviour specs

3. **Public Health Stream**
   - Impact on Health Systems –society –service delivery
   - Resource management -reimbursement - accounting
   - IT applications – terminology – Health Information Systems

**ICD Revision Process**

- Drafting Rules & Guidelines
  - Taxonomy
    - Drafting Overall Structure
    - Drafting Individual Chapters
  - Definitions
  - Diagnostic Guidelines and criteria
  - Indexing / mapping guidelines

- Sorting Primary Care, Clinical and Research versions

- Overseeing the TOTAL ICD
  - ALPHA Draft & field testing through structured comments
  - BETA Draft & field testing

- Final Draft
  - WHA Approval

**Involvement Strategy**

- International:
  - Multiple countries
  - Multiple languages
  - Multiple health care systems

- Multiple Parties & Professionals
  - Different clinical specialties, nursing & midwifery; other professionals
  - Different health care aspects:
    - primary care
    - home care
    - rehabilitation
    - long term care
  - Consumers from different sectors
ICD Revision Platform

As a part of **ICD Knowledge Portal** three main applications envisaged:

1. **ICD-10 + Application**
2. **ICD-11 Draft Creation**

*Possibly for display – not directly for WEB entry

---

ICD-10 Plus

**ICD-10 + WEB Application**

**Key Tasks**

- ANY USER can POST proposals or comments.
- ANY USER can REVIEW other proposals and discuss.
- Clinical Modification Owners enter their CM version Codes
- TAG and Workgroups enter proposals

**ICD-10 Plus**

- Proposals
- Comments
- Discussions
- Evidence

---

ICD-11

**ICD-11 draft**

**Key Tasks**

- TAG Experts for ICD-11
- WHO editors
- Taxonomic rules
- Definitions
- Diagnostic criteria

**Joint-authoring Tool**

*WIKI like application*

- ALL USERS can see drafts and comment.

---

ICD Ontology

**ICD Ontology**

- Entities
- Attributes
- Linkages

---

ICDICD

**Terminology**

- Protégé/OWL
- LEXGRID

**Ontology Model**

- Linkages between ICD and:
  - SNOMED
  - Other ontology & terminologies

**Clinical interface algorithms**

- ALL USERS can see drafts and comment

---

Access

**Technical Layer**

ICDICD--10 Plus

**ICD-10 + WEB Application**

• ANY USER can POST proposals or comments.
• ANY USER can REVIEW other proposals and discuss.
• Clinical Modification Owners enter their CM version Codes
• TAG and Workgroups enter proposals

**ICD-10 +**

- Proposals
- Comments
- Discussions
- Evidence

---

ICDICD--11 draft

**ICD-11 draft**

- Comments
- Discussions
- Evidence

---

ICDICD

**Terminology**

- Protégé/OWL
- LEXGRID

**Ontology Model**

- Linkages between ICD and:
  - SNOMED
  - Other ontology & terminologies

**Clinical interface algorithms**

- ALL USERS can see drafts and comment

---
**Definition of Disease**

A set of dysfunction(s) in any of the body systems including:

- with a known pattern of signs, symptoms & findings  
  » symptomatology - manifestations
- probably with an underlying explanatory mechanism  
  » etiology
- a distinct pattern of development over time  
  » course and outcome
- a known pattern of response to interventions  
  » treatment response
- with linkage to underlying genetic factors  
  » genotypes, phenotypes and endophenotypes
- with linkage to interacting environmental factors

---

**Rewriting ICD Using SNOMED**

Example of Depressive Disorder F32.0

<table>
<thead>
<tr>
<th>A. Low mood</th>
<th>(4100004)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of interest</td>
<td>(41752304)</td>
</tr>
<tr>
<td>Low energy</td>
<td>(52474002)</td>
</tr>
<tr>
<td>B.</td>
<td></td>
</tr>
<tr>
<td>1. Appetite</td>
<td>(Decrease, increase) [64379006, 7245004]</td>
</tr>
<tr>
<td>2. Body weight</td>
<td>(Decrease, increase) [8582005, 8943002]</td>
</tr>
<tr>
<td>3. Sleep</td>
<td>(Decrease, increase) [50605008, 77802006]</td>
</tr>
<tr>
<td>4. Psychomotor</td>
<td>(Decrease, increase) [39899006, 47295007]</td>
</tr>
<tr>
<td>5. Libido loss</td>
<td>(3097000)</td>
</tr>
<tr>
<td>6. Loss of self esteem</td>
<td>(2364002, 16220005)</td>
</tr>
<tr>
<td>7. Guilt, self blame</td>
<td>(7512003)</td>
</tr>
<tr>
<td>8. Thoughts of death</td>
<td></td>
</tr>
<tr>
<td>9. Suicide ideation</td>
<td>(102031000, 6471006)</td>
</tr>
</tbody>
</table>
Field Trials

e-Questionnaires within a Global Practice Network

- Relevance
  - Appropriate coding – fit for purpose
  - Scientific accuracy
  - Guidance for case-management

- Coverage
  - Comprehensiveness, missing elements

- Utility
  - Possibility, benefits
  - Exploratory power, need, costs, utilization
  - User acceptance, barriers

- Trends
  - Statistical time series
  - Bridge-coding studies
  - Projections

- Translations
  - Computer Applications
    - Links with other IT tools
    - Mapping with Terminologies

ICD for multilevel use: Primary Care, Clinical Care, Research

- Zoom in and out across levels
  - Congruent – compatible coding scheme
  - Possible computer application
  - Tailoring: use of a master version to generate Paper Copies to print segments

- Primary Care
  - Focus on most frequent conditions in PC – that are treated in PC
  - Generally broad categories: e.g. Depressive Disorder

- Clinical Care
  - All clinical conditions with diagnostic guidelines
    - e.g. unipolar, bipolar depressive disorder: mild, moderate, severe...

- Research
  - Detailed standardized criteria for all disorders for identifying research groups
  - Tentative disease labels that are not yet in official classification
**Tentative Timeline**

- 2006: International Consultations for Start of multiple streams of workplan
- 2008: Alpha version (ICD 10+ → ICD 11 draft)
- 2009: Commentaries and consultations
- 2010: Beta version & Field Trials Version
- 2011: Field trials
- 2012: Final version for public viewing
- 2014: WHA Approval
- 2015+: implementation

**Structure of Revision Process**

- WHO
- FIC Update & Revision Committee
- Revision Steering Group
- Topic Advisory Group: Mental Health, Field Trials, Oncology, Internal Medicine, Rare Diseases, External Causes
- Working Group

**ICD Revision – Key Messages**

- Concepts in Health Sciences have become complex and intertwined
  - Genomic information → Clinical manifestations → Public Health
  - Comparable and consistent data across HIS
- Single person – workgroup function is not sufficient to capture and synthesize information
- Large scale involvement of multiple stakeholders
ICD Revision – Key Messages

- Web based tools are available for:
  - Enhanced communication among individuals involved in the revision process
  - Knowledge management tools
  - Commons-based production tools

- Firmer grounding in science and research
- Rigorous field testing
- Increased feedback from global users
- Use digital tools (Ontologies) to build classifications