The International Classification of Diseases 11th Revision is due by 2017

ICD is the international standard to measure health & health services

- Mortality Statistics
- Morbidity Statistics
- Health Care Costs
- Progress towards MDGs
ICD-11

- A multi-purpose and coherent classification
  - Consistency & interoperability across different uses

- Serve as an international and multilingual reference standard

- Ensure that ICD-11 will function in an electronic environment

ICD-11 is designed for...

- International:
  - Countries
  - Languages
  - Multiple health care systems

- Multiple Professionals
  - e.g. clinical specialties, nursing & midwifery

- Different health care aspects
  - Primary, secondary, tertiary care
  - Home care
  - Rehabilitation
  - Long term care

- Different sectors
ICD is part of the WHO Family of International Classifications (WHO-FIC)

**RELATED Classifications**
- International Classification of Primary Care (ICPC)
- International Classification of External Causes of Injury (ICECI)
- The Anatomical, Therapeutic, Chemical (ATC) classification system with Defined Daily Doses (DDD)
- ISO 9999 Technical aids for persons with disabilities – Classification and Terminology

**REFERENCE 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 Diseases to Dentistry and Stomatology, Third Edition (ICD-DA)
- Application of the International Classification of Diseases to Neurology (ICD-10-NA)

**DERIVED Classifications**
- Application of the International Classification of Diseases to Neurology (ICD-10-NA)

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**ICD MAINTENANCE**
ICD-11 maintenance

Internet-based permanent platform
- All year round
- Open to all people in a structured way
- Content experts focus

**Digital curation**
- Wiki enabled collaboration
- Ontology based

Enhanced **discussion & peer review**
- TAGs serve as the editorial group

**Electronic copy →** print version
- Work in **multiple languages**

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ICD Maintenance Structure

![Diagram of ICD Maintenance Structure]

WHO

**JRC <= WHO-FIC NETW.**

- Health Informatics and Modelling TAG (HIM TAG)
- iCAT Software Team
- Morbidity TAG
- Mortality TAG
- Functioning TAG
- Quality & Safety TAG

Cross-Sectional TAGs

- Internal Medicine TAG
- Paediatrics TAG
- Dentistry TAG
- Dermatology TAG
- Rare Diseases TAG
- External Causes and Injuries TAG
- GURM
- Mental Health TAG
- Musculoskeletal TAG
- Neoplasms TAG
- Neurology TAG
- Ophthalmology TAG
- Traditional Medicine TAG

Working Groups

- Gastroenterology WG
- Cardiovascular WG
- Hepatology & Pancreatobiliary WG
- Nephrology WG
- Endocrinology WG
- Rheumatology WG
- Haematology WG
- Respiratory WG

Genito-Urinary, Reproductive and Maternal TAG
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
THE CONTENT MODEL
Any Category in ICD is represented by:

1. ICD Concept Title
2. Hierarchy, Type and Use
   a) Parents
   b) Type
   c) Use
3. Textual Definition(s)
4. Terms
   a) Index Terms
      1. Synonyms
      2. Inclusion Terms
   b) Exclusion Terms
5. Clinical Description
   1. Body System(s)
   2. Body Part(s) [Anatomical Site(s)]

1. Manifestation Properties
   a) Signs & Symptoms
   b) Findings
2. Causal Properties
   a) Etiology Type
      i. Infection (agents)
      ii. Injury (mechanisms)
   b) Risk Factors
   c) Genomic Characteristics
3. Temporal Properties
4. Severity Properties
5. Functional Properties
6. Specific Condition Properties
7. Treatment Properties
8. Diagnostic Criteria

Search - use of content model

Show me all conditions affecting the skin of the eyelid — and substructures
Aggregation - use of content model
Kidney – Diabetes M. – A. Hypertension

Mortality of Diabetes, Hypertension and Renal diseases compared to each other, EURO+South Am 2002

- Diab w/o renal: 41%
- Hypertens w/o renal: 27%
- Diabetic renal: 6%
- Hypertens renal: 5%
- Other chron renal: 1%
- Chronic failure: 9%
- Akute renal: 11%
- Renal: 31.6%

FOUNDATION AND LINEARIZATION
The ICD **Foundation Component**

- **ALL ICD entities**
  - diseases, disorders...

- With their
  - Relationships
    - Multiple parenting
  - Content model
  - Instructions to build linearizations

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The Foundation
Grouping entities

Formulating Linearizations
Infections due to Salmonella Grouping
http://id.who.int/icd/entity/1561949126

Salmonella Fever Grouping
http://id.who.int/icd/entity/1958990204

Paratyphoid Fever coded category
http://id.who.int/icd/entity/78638636

Colitis due to paratyphoid fever A index or postcoordination
http://id.who.int/icd/entity/25782079

Enteritis due to paratyphoid fever A index or postcoordination
http://id.who.int/icd/entity/1045590756

Paratyphoid fever A index or postcoordination
http://id.who.int/icd/entity/1704920593

Colitis due to paratyphoid fever B index or postcoordination
http://id.who.int/icd/entity/1258234397

Enteritis due to paratyphoid fever B index or postcoordination
http://id.who.int/icd/entity/345609254

Paratyphoid fever B index or postcoordination
http://id.who.int/icd/entity/800386953

Colitis due to paratyphoid fever C index or postcoordination
http://id.who.int/icd/entity/416227453

Enteritis due to paratyphoid fever C index or postcoordination
http://id.who.int/icd/entity/1781535490

Bacterial colitis due to paratyphoid fever C index or postcoordination
http://id.who.int/icd/entity/468854632

Colitis due to paratyphoid fever C index or postcoordination
http://id.who.int/icd/entity/1781535490

Enteritis due to paratyphoid fever C index or postcoordination
http://id.who.int/icd/entity/135609254

Colitis due to paratyphoid fever A index or postcoordination
http://id.who.int/icd/entity/725907799

Enteritis due to paratyphoid fever A index or postcoordination
http://id.who.int/icd/entity/345609254

Paratyphoid fever B index or postcoordination
http://id.who.int/icd/entity/725907799

Colitis due to paratyphoid fever A index or postcoordination
http://id.who.int/icd/entity/25782079

Enteritis due to paratyphoid fever A index or postcoordination
http://id.who.int/icd/entity/1528414070

Typhoid fever coded category
http://id.who.int/icd/entity/55117941

Typhoid arthritis index or postcoordination
http://id.who.int/icd/entity/1890032609

Typhoid fever with heart involvement index or postcoordination
http://id.who.int/icd/entity/1711457761

Typhoid pneumonia index or postcoordination
http://id.who.int/icd/entity/1758228980

Typhoid osteomyelitis index or postcoordination
http://id.who.int/icd/entity/1631651468

Typhoid meningitis index or postcoordination
http://id.who.int/icd/entity/1890032609

Typhoid enteritis index or postcoordination
http://id.who.int/icd/entity/587904348

Typhoid colitis index or postcoordination
http://id.who.int/icd/entity/1520312138

Salmonella enteritis coded category
http://id.who.int/icd/entity/1528414070

Formulating Linearizations

Infections and infestations affecting the skin
Viral infections affecting skin
Bacterial infections affecting skin
Infec tions and infestations affecting the skin

Inflammatory dermatoses
Dermatitis and eczema
Acute dermatitis
Atopic dermatitis
Seborrheic dermatitis

World Health Organization

ICD-11 GMDS 2014 | 8 Sept 2014

20
Formulating Linearizations

- Infections and infestations affecting the skin
  - Viral infections affecting skin
  - Bacterial infections affecting skin

- Inflammatory dermatoses
  - Herpes viruses
  - Dermatitis and eczema

- Seborrheic dermatitis

Formulating Linearizations
Infections due to Salmonella
Paratyphoid Fever
Typhoid fever
Typhoid enteritis
Salmonella enteritis
Salmonella Fever
Colitis
Enteritis
Dermatitis
Paratyphoid Enteritis
Typhoid Typhoid Typhoid Typhoid Typhoid Colitis
Typhoid Typhoid Typhoid Typhoid Typhoid Colitis
Paratyphoid Enteritis
Paratyphoid
Salmonella

Classification - Foundation or linearization?

Foundation

Linearization 1
The Telescope
General criteria for determining pre-coordination - shorelining

- **Legacy** (esp. if used previously in Mortality linearization)

  1. **Scientific evidence**
  2. **Consistency** according to Taxonomical and ontological rules
  3. **Utility**
    a) Clinical – treatment grouping etc
    b) Public Health - reportable disease etc
  4. “Use Case specific”:
    A. Frequency in practice setting for a given linearization
      (e.g. Primary Care, Verbal Autopsy…)

PRIMARY CARE Low Resource (Verbal Autopsy ?) PRIMARY CARE middle Resource Joint linearization

INTERNATIONAL
ExtensioNS
National Linearizations
Specialty - Research

MD -11 GMDS 2014 8 Sept 2014
Shoreline
Boundary between Pre- and Post-Coordination

- Mortality Linearization uses only Pre-coordinated categories
- Morbidity Linearization uses both Pre- and Post-Coordinated entities
- Specialty Linearizations may use:
  - Post-Coordination and other extensions

Classification

JOINT LINEARIZATION FOR MORTALITY AND MORBIDITY STATISTICS
Infections due to Salmonella

Salmonella Fever

Paratyphoid Fever

Typhoid fever

Other specified salmonella Fever

Salmonella enteritis
Indexed entries

- 1A0H - - - - - Paratyphoid Fever Bacterial colitis due to paratyphoid fever
- 1A0H - - - - - Paratyphoid Fever Colitis due to paratyphoid fever A
- 1A0H - - - - - Paratyphoid Fever Colitis due to paratyphoid fever B
- 1A0H - - - - - Paratyphoid Fever Colitis due to paratyphoid fever C
- 1A0H - - - - - Paratyphoid Fever Enteritis due to paratyphoid fever A
- 1A0H - - - - - Paratyphoid Fever Enteritis due to paratyphoid fever B
- 1A0H - - - - - Paratyphoid Fever Enteritis due to paratyphoid fever C
- 1A0H - - - - - Paratyphoid Fever infection; salmonella, paratyphi, a
- 1A0H - - - - - Paratyphoid Fever infection; salmonella, paratyphi, b
- 1A0H - - - - - Paratyphoid Fever infection; salmonella, paratyphi, c
- 1A0H - - - - - Paratyphoid Fever infection; salmonella, schottmuelleri
- 1A0H - - - - - Paratyphoid Fever paratyphoid a
Infections due to Salmonella

Salmonella infection with fever, abdominal pain, diarrhoea, nausea and sometimes vomiting is caused by Salmonella which is a major cause of foodborne illness throughout the world and is generally transmitted to humans through consumption of contaminated food. The symptoms of Salmonella infection usually appear 12–72 hours after infection and usually last 4–7 days. Most people recover without treatment, however, in the very young and the elderly, and in cases when the bacteria enter the bloodstream, antibiotherapy may be needed.

Salmonella Fever

Paratyphoid Fever

Typhoid fever

Acute systemic febrile infection caused by Salmonella typhi, with insidious onset of sustained fever, marked headache, malaise, anorexia, relative bradycardia, splenomegaly, non productive cough in the early stage of the illness, rose spots on the trunk in 25% of white skinned patients and constipation more often than diarrhoea in adults.

Inclusions: Infection due to Salmonella typhi

Other specified salmonella Fever

Salmonella Fever, unspecified

Salmonella enteritis

Poisoning caused by ingestion of food harboring species of Salmonella; conditions of raising, shipping, slaughtering, and marketing of domestic animals contribute to the spread of this bacterium in the food supply.

Inclusions: Salmonellosis
‘VOLUMES OF ICD-11’

ICD-11 - Joint Linearization for Mortality and Morbidity Statistics

- Volume 1 – The Tabular List
  - 26 chapters, some 15000 categories
  - 5 special tabulation lists: not designed for coding
  - X-chapter: describe in more detail a condition

- Volume 3 – The Alphabetical Index

- Volume 2 – The Reference Guide
  - introduction to context, components and intended use ICD
Structure of volume 1

- ICD-11: Alphanumeric codes: from 1A00 to QF3Z
  - alphanumeric listing of diseases and disease groups
  - Number of codes possible in theory
  - Grouping with specific purpose

- Hierarchy
  - Chapters
    - Groups of categories (blocks)
      - N-character categories
      - N+2 character subcategories

- Add detail: X-chapter

Content of Volume 2 - Reference Guide

- Purpose of ICD: Multiple Uses
- Structure and Content of the ICD
- How to use the ICD
- Main Uses of the ICD: Mortality, Morbidity
- Statistical presentation
- History
Volume 3 - Index

Lead terms and keywords point to ICD categories

- Instructions
- Index to diseases and nature of injury
- External causes of injury
- Table of drugs and chemicals

MULTIPLE PARENTING
Two possible parents

- Tumor
- Condition of the Oesophagus
- Oesophageal Cancer

Multiple parenting

02 Neoplasms
- Neoplasms of brain and central nervous system
- Neoplasms of haematopoietic and lymphoid tissues
- Malignant neoplasms
  - Malignant neoplasms, stated or presumed to be primary, of specified sites, except of lymphoid, haematopoietic and related tissues
    - Malignant mesenchymal neoplasms
    - Malignant neoplasms of lip, oral cavity and pharynx
    - Malignant neoplasms of digestive organs
      - 2C80 Malignant neoplasms of oesophagus

Malignant neoplasms of the oesophagus have their primary location, in Chapter 2, Neoplasms, and they are coded there (all codes of that chapter start with 2).
Multiple parenting

- 13 Diseases of the digestive system
  - Diseases and disorders of orofacial complex
  - Diseases of oesophagus
    - Anatomical alterations of the oesophagus
    - Vascular disorders of the oesophagus
    - DB30 Oesophagitis
    - Neoplasms of the oesophagus
      - 2H82.1 Benign neoplasm of oesophagus
      - 2C80 Malignant neoplasms of oesophagus

Thanks to multiple parenting, *malignant neoplasms of the oesophagus* can also be accessed browsing through Chapter 13, Digestive system (all codes of this chapter start with D). The multiple parented neoplasm categories show up in grey and keep their code of their primary location, Chapter 2, Neoplasms (all codes of that chapter start with 2).

NON EXHAUSTIVE illustration of multiple parenting across chapters. Things are shown in their primary location in the classification, but also in other places where they have been parented to.
Multiple Parenting

In linearization
- Category has only one code
- Primary parent determines code
- Shown in different places with always the same code
Multiple coding - postcoordination

Chapter X

- Type I extension codes
- Type II extension codes
- Type III extension codes
### X – Chapter: Extension Codes

<table>
<thead>
<tr>
<th>Type 1</th>
<th>Type 2</th>
<th>Type 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severity</td>
<td><strong>Main Condition</strong> (types)</td>
<td><strong>History of</strong></td>
</tr>
<tr>
<td>Temporality</td>
<td><strong>Reason for</strong></td>
<td><strong>Family History of</strong></td>
</tr>
<tr>
<td>(course of the condition)</td>
<td>encounter/admission</td>
<td></td>
</tr>
<tr>
<td>Temporality</td>
<td><strong>Main Resource Condition</strong></td>
<td><strong>Screening/Evaluation</strong></td>
</tr>
<tr>
<td>(Time in Life)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Etiology</td>
<td><strong>Present on Admission</strong></td>
<td></td>
</tr>
<tr>
<td>Anatomic detail</td>
<td><strong>Provisional diagnosis</strong></td>
<td></td>
</tr>
<tr>
<td>Topology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specific Anatomic Location</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Histopathology</td>
<td><strong>Diagnosis confirmed by</strong></td>
<td></td>
</tr>
<tr>
<td>Biological Indicators</td>
<td><strong>Rule out / Differential</strong></td>
<td></td>
</tr>
<tr>
<td>Consciousness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>External Causes</td>
<td>(detail)</td>
<td></td>
</tr>
<tr>
<td>Injury Specific</td>
<td>(detail)</td>
<td></td>
</tr>
<tr>
<td>Topology</td>
<td><strong>skin of the eye lid</strong></td>
<td></td>
</tr>
<tr>
<td>Medial</td>
<td><strong>lipoma 8850/0</strong></td>
<td></td>
</tr>
<tr>
<td>Histopathology</td>
<td><strong>e.g. conjunctivitis</strong></td>
<td></td>
</tr>
<tr>
<td>Clinical forms</td>
<td>(e.g. thalidomide)</td>
<td></td>
</tr>
</tbody>
</table>

**Multiple coding - postcoordination**

**Benign neoplasms of the face**

- **Anatomy**: skin of the eye lid
- **Topology**: medial
- **Histopathology**: lipoma 8850/0
- **Clinical forms** (e.g. conjunctivitis)
- **Substances** (e.g. thalidomide)
Multiple Coding
Equivalent Expressions

Cluster Style

- Code1*
- Code2*
- Code3*
- ..
- * CLUSTERING IND.

Chain / String Style

- Code1/Code2/Code3

Multiple Coding
Equivalent Expressions

STEMI - posterior wall – confirmed by EKG

Cluster Style

- JH61.001 Myocardial Infarction with ST Elevation
- XT00.??1 Posterior wall of heart
- XD00.11 Diagnosis Confirmed by EKG

Chain / String Style

JH61.10/ XT00.??/ XD00.1

1 CLUSTERING indicator.
Postcoordination

- X-chapter – codes to be used only in conjunction with stem code
  - Histology
  - Anatomy
  - Substances
  - ...

- Signs and symptoms chapter (formerly XVIII)
  - Codes can be used alone, but adding additional detail from other chapters is recommended.

- All chapters
  - In principle, codes of all chapters can be combined – following rules.

Postcoordination must never be used to replicate the meaning of an existing stem code.
### Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism

<table>
<thead>
<tr>
<th>English</th>
<th>French</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title and Synonyms</strong></td>
<td><strong>Is Title</strong></td>
</tr>
<tr>
<td>Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism</td>
<td>Maladies du sang et des organes hématopoïétiques et certaines troubles du système immunitaire</td>
</tr>
<tr>
<td>Add any other synonyms that have no English equivalent, if there are more than one and only one and the system will provide two new empty spaces after you submit</td>
<td></td>
</tr>
<tr>
<td>Reclassifications</td>
<td></td>
</tr>
<tr>
<td>complications of pregnancy, childbirth and the puerperium</td>
<td>complications de la grossesse, de l'accouchement et de la puerperalité</td>
</tr>
<tr>
<td>congenital malformations, deformations and chromosomal anomalies</td>
<td>malformations congénérates et anomalies chromosomiques</td>
</tr>
<tr>
<td>autoimmune disease (systemic) NOS</td>
<td>maladies auto-immunes (systémiques) NOS</td>
</tr>
<tr>
<td>certain conditions originating in the perinatal period</td>
<td>certaines affections dont origine se situe dans la periode perinatale</td>
</tr>
</tbody>
</table>
Crosswalk

ICD-10 to ICD-11 Crosswalk Diagram

World Health Organization
STABILITY ANALYSIS
Stability Analysis

Objectives

- Enable a **seamless transition** between ICD-10 and ICD-11
  - national
  - international levels

- CrossCutting TAGs **review** and confirm **continuity** between ICD-10 and ICD-11

- Represent knowledge gained from **national clinical modifications** in the revised ICD.

PROPOSAL MECHANISM
Proposal Types

- Add Entity
- Delete Entity
- Edit Content Proposal
  - Propose changes in Title or Definition
- Delete Content Proposal
  - Propose deleting any property value such as synonym, body site, etc.
- Add Content Proposal
  - Propose Adding any property value such as synonym, body site, etc.
- Complex Hierarchical Changes

Browsing - Creating Proposals

Proposals

Filter: Foundation

Search [Advanced Search] Browse Admin Info

Proposal List (attached to 'Infections due to Vibrio cholerae')

- Content Enhancement Proposal
  - Changes Title
    - 2013-Mar-26 - 16:29
    - 2013-Mar-26 - 16:29
- Add New Entity Proposal
  - Text
    - 2013-Apr-17 - 18:48
Content Enhancement Proposal

Infection following immunization

Title
Infection following immunization

Definition
I'm suggestion a new definition

Synonym
- immunization; infection
- infection following immunization
- infection; immunization or vaccination
- infections-postvaccinal
- vaccination infection
- new synonym

REVIEW PROCESS
Review Process

- The ‘content’
  - Definitions
  - Content model parameters

- The structure - of the linearization (s)
  - Mortality
  - Morbidity
  - Primary Care

- The reviewers:
  - Scientific peers
  - Routed to vertical TAG, Horizontal Tag –
  - Arbitration by RSG if necessary

FIELD TRIALS
Field Trial Studies

1. Core Studies
   1. Basic Questions – consistency, errors
   2. Reliability & Feasibility
   3. Bridge Coding

2. Additional Studies

ICD11 Field Trials

- Fitness of ICD-11 for multiple use cases
  - Ease of use
  - Renders useful information

- Comparability between ICD-10 and ICD-11

- Reliability - Consistency
  - Identify improvement paths, and reduce errors
Field Trial Platform

ICD11 beta

ICD-11 beta draft is INCOMPLETE
• updated on a daily basis
• NOT TO BE USED for CODING except for agreed FIELD TRIALS

Welcome to the ICD11 Beta Browser
You can browse the ICD11 proposed content without registration here
If you wish to participate in the Beta Phase please register or sign-in here.
More information on ICD-11 Beta Phase

Caveats

ICD-11 Beta draft is:
• NOT FINAL
• updated on a daily basis
• It is not approved by WHO
• NOT TO BE USED for CODING except for agreed FIELD TRIALS

Expectations, Concerns and Known Issues

For more information about how to use the ICD-11 Browser, please see the User Guide
For more questions, please contact iodd1@who.int
01 Infectious diseases
02 Neoplasms
03 Diseases of the blood and blood-forming organs
04 Disorders of the immune system
05 Endocrine, nutritional and metabolic diseases
06 Conditions related to sexual health
07 Mental and behavioural disorders
08 Sleep-wake disorders
09 Diseases of the nervous system
10 Diseases of the eye and adnexa
11 Diseases of the ear and mastoid process
12 Diseases of the circulatory system
13 Diseases of the respiratory system
14 Diseases of the digestive system
15 Diseases of the skin
16 Diseases of the musculoskeletal system and connective tissue
17 Diseases of the genitourinary system
18 Pregnancy, childbirth and the puerperium
19 Certain conditions originating in the perinatal and neonatal period
20 Developmental anomalies
21 Symptoms, signs, clinical forms, and abnormal clinical and laboratory findings, not elsewhere classified
22 Injury, poisoning and certain other consequences of external causes
23 External causes of morbidity and mortality
24 Factors influencing health status and contact with health services
25 Codes for special purposes
26 Traditional Medicine conditions - Module I (Note: This is a provisional title for ICD-11 Beta Phase)

ICD-11: 2017 WHA

www.who.int/classifications/icd11

Google:

ICD-11 beta browser