WHO
Family of
International Classifications

... building blocks of health information ...

Classifications Assessment Terminology
WHO Family of Classifications

REFERENCE
Classifications

- International Classification of Diseases
- International Classification of Functioning, Disability & Health
- International Classification of Health Interventions (under development)
WHO Family of Classifications

REFERENCE Classifications

International Classification of Diseases

International Classification of Functioning, Disability & Health

International Classification of Health Interventions (under development)

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 Diseases to Dentistry and Stomatology, Third Edition (ICD-DA)

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

ICF, Children & Youth Version (ICF-CY)
WHO Family of Classifications

**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**
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- ICF, Children & Youth Version (ICF-CY)
Placing WHO Classifications in HIS & IT

- **ICF**
- **ICD**
- **ICHI**

**Terminologies**
- e-Health Record Systems
- Mappings

**Classifications**
- Population Health
  - Births
  - Deaths
  - Diseases
  - Disability
- Clinical
  - Decision Support
  - Integration of care
  - Outcome
- Administration
  - Scheduling
  - Resources
  - Billing
- Reporting
  - Cost
  - Needs
  - Outcome
State of the Union in the USA

“By computerizing health records:

• we can avoid dangerous medical mistakes

• reduce costs

• and improve care”

George W. Bush
Jan. 20, 2004
An Information Paradox:
Reporting of Mortality in the World
Information Paradox

Burden of Mortality

VR countries vs No VR

YLLs
ICD Revisions

![Chart showing ICD revisions with intervals in years]

- 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: 2011

Interval (years):
- ICD-1: 7
- ICD-2: 9
- ICD-3: 10
- ICD-4: 10
- ICD-5: 9
- ICD-6: 10
- ICD-7: 7
- ICD-8: 10
- ICD-9: 10
- ICD-10: 14
- ICD-11: 22
ICD Development and Maintenance Platform

Classification Maintenance System
- ClaML / XML DTDs, Schemas
- Language Versions

- Terminologies
- Other Products
- Coding Tool
- Translations

WEB Version

Electronic Version
- CD/DVD

Paper
- .rtf
- .pdf

XM
- National Modifications
- Chronicle
- Tool for snapshots

CLASSIFICATIONS
A Continuum between Classifications and Terminologies

Classifications

Terminologies

Shared human consensus

Text descriptions

Guidelines - Criteria used in practice

Semantics used at runtime

Implicit

Informal

Formal

Formal

(explicit)

(for humans)

(for machines)

Further to the right means:

• Less ambiguity
• More correct functionality
• Better interoperability

• More difficult
Linking Classifications to eHealth Records

e-Health Record Systems

Terminologies

Diagnosis / Assessment
- Diseases
- Disability

Mappings

Classifications

ICD
ICF
ICHI

Management / Interventions

... BUILDING BLOCKS OF HEALTH INFORMATION ...
Linking Terminology & Classifications

• **Build ICD-11** using XML & Schemas (e.g. ClaML)

• **Mapping** ICD and Terminologies (e.g. SNOMED CT)
  – Disease, disorder, sign, syndrome attributes - standardization
  – Equivalence of ICD items and SNOMED concepts
    • Primary maps (UK, US....)
  – Knowledge Representation through diagnostic rules
    • Decision-making rules (Map of Medicine)
Basic Research Questions for Semantic Interoperability

What does it mean?      For whom?      A Meaning for what?

• What is the main real-life health system operation & interoperability?
  – **System Analysis** of the **corresponding Health Information System**
    Understanding **multi-purpose uses** of the system
  • What **types of data** are handled by the system?
    – Consumer-Client-Patient
    – Provider
    – Administrator

• What **terminology system** has been used to code information?
  – Who codes the data?
  – Primary use & user of the data vs. Secondary use etc.
  – **International standards and** Multi-lingual representations

• What is the **eHR functional model** and standard?
  – Information retrieval and recognition

• Linkage with **Decision Support Systems**

• Linkage with **Semantic Web** and **Web Services (middleware)**

• **Continuum of terminology and classifications**
  – Links - Mappings – groupings
  • for treatment, management, reimbursement etc. issues
"I don't know what you mean by 'glory'," Alice said.

Humpty Dumpty smiled contemptuously. "Of course you don't- till I tell you. I meant 'there's a nice knock-down argument for you'!"

"But 'glory' doesn't mean 'a nice knock-down argument'," Alice objected.

"When I use a word," Humpty Dumpty said, in rather a scornful tone, "it means just what I choose it to mean- neither more nor less."

"The question is," said Alice, "whether you can make words mean so many different things."

"The question is," said Humpty Dumpty, "which is to be master- that's all."

Alice was too much puzzled to say anything; so after a minute Humpty Dumpty began again. "They've a temper some of them- particularly verbs: they're the proudest- adjectives you can do anything with, but not verbs- however, I can manage the whole lot of them! Impenetrability! That's what I say!"
What happens to Humpty Dumpty?

Humpty Dumpty sat on the wall,
Humpty Dumpty had a great fall,
All the king's horses and all the king's men,
Couldn't put Humpty Dumpty together again
Humpty Dumpty today?

Humpty Dumpty sat on the mall,

Humpty Dumpty had a great ball,

'cause all the experts on SIOp,

had put Humpty Dumpty together again