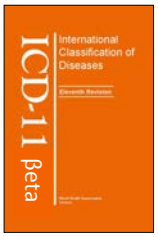
Riksektionen för Diagnos-Kodning
ICD-10-SE

Om problem med ICD-11 Revisionen ICD-11 +DRG = SANT?



RDK:s fortbildningsdagar

Stockholm 13 mars 2014

Olafr Steinum

olafr@diaqualos.se

WHO-FIC Network Meeting Tunis 2006

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Översikt

- Introduktion
- ICD-11: Foundation Layer och Content Model
- Linearisering: Mortalitet / morbiditet
- Kodstruktur och tekniska detaljer
- Användning för analyser och DRG
- Fortsättningen ……..

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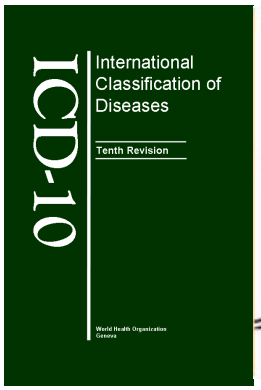

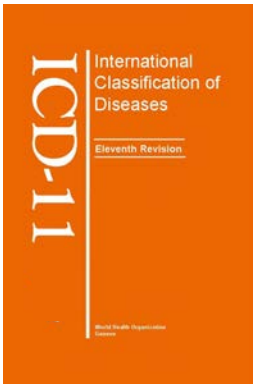

Tevfik Bedirhan Üstün

Classifications, Terminologies, Standards Team
World Health Organization

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ICD-11 Revision Goals

1. Evolve a **multi-purpose** and **coherent** classification
   - ***Mortality, morbidity, primary care, clinical care, research, public health…***
   - ***Consistency*** & ***interoperability*** *across* ***different uses***

2. Serve as an **international** and **multilingual reference standard** for **scientific comparability** and **communication p**urposes

3. Ensure that ICD-11 will function in an **electronic** environment.
   - *ICD-11 will be* ***a digital product***
   - *Support* ***electronic health records*** *and* ***information systems***
     - ***Link ICD logically*** *to underpinning* ***terminologies*** *and* ***ontologies*** *(e.g. SNOMED, GO, …)*
     - *ICD Categories* ***"defined"*** *by "****logical operational rules****" on their associations and details*

(4. Statistical continuity)

Inte längre med i målbeskrivn

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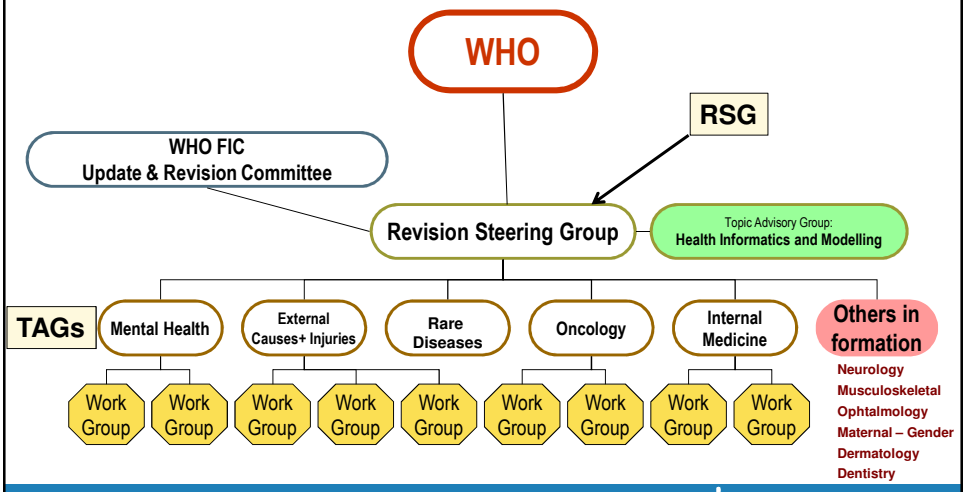
ICD-11 Revision Organization Structure



Topic Advisory Groups (TAGs)

- Vertical:
  - Mental health
  - Rare diseases
  - Internal Medicine
  - GURM (Genito- Urinary- Reproductive- Maternal) TAG
  - Dermatology
  - Oncology

    etc……..
- Horizontal ”Cross-cutting”:
  - Mortality TAG
  - Morbidity TAG
  - Quality&Safety TAG

Revision Process

- Innovation by using information technology to work collaboratively on a "**Wikipedia-like**" internet platform.
- To assure quality input:
  - Input is structured
  - Demands scientific references
  - Must pass through peer-review process
- Beta Phase will open platform to the public to:
  - Make comments
  - Submit proposals
  - Take part in field trials

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http://informatics.mayo.edu/WHO/ICD11/collaboratory/projects/icd11-infonotes/documents

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The Foundation

- Innehållet i ICD **samlas** nu i en databas, kallad The Foundation layer
- Innehållet **struktureras** för varje enhet (sjukdom, symtom, problem) enligt ett standard format, kallad

The Content Model

Se: Information Note #4

http://informatics.mayo.edu/WHO/ICD11/collaboratory/projects/icd11-infonotes/documents

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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

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THE CONTENT MODEL

Any Category in ICD is represented by:

TITLE of ENTITY: Name of disease, disorder, or syndrome…

1. Textual definition
2. Synonyms - Inclusion – Exclusion - Index terms

Completed with:
Descriptive characteristics

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TITLE of ENTITY: Name of disease, disorder, or syndrome…

1. Textual definition
2. Synonyms - Inclusion – Exclusion - Index terms

Descriptive characteristics

1. **Type**
   Disease, disorder, syndrome, injury, sign/symptom, external cause, reason for encounter;
2. **Body System(s)** ***(pathophysiology)***
3. **Body Part(s)** ***(anatomical site)***
4. **Manifestation Attributes**
   a. **Signs & Symptoms**
   b. **Diagnostic Findings**
5. **Etiology**
   a. **Causal Mechanisms /Agents**
   b. **Genomic characteristics**
6. **Temporal Properties**
7. **Severity and/or Extent**
8. **Functional Impact**
9. **Treatment**

Maintenance attributes

A. **Unique identifier**

B. **Subset, adaptation, and special view flag**
   1. Primary Care
   2. Clinical Care
   3. Research
   4. Special indices (e.g. Public Health Indices or Resource Groupings)

C. **Hierarchical relationships**
   parents and children in ICD structure

D. **Mapping relationships**
   Linkages to other systems like SNOMED etc.

E. **Other rules**

Classifications, Terminology, and Standards …building blocks of health information World Health Organization 16

Exempel:

Title

- ***{Acute}* Myocardial Infarction (I 21)**

Exempel:

Textual Definition

- Myocardial Infarction is an **ischemic disease** of the **heart**.
- Basic mechanism is the **lack of oxygen** in the heart muscle, which may lead to the **death of myocardial tissue**.
  - This generally happens due to interruption of the blood supply of the heart when a **coronary artery** is **block**ed.
    - Underlying this **blockage** is generally a **collection of lipids** and **atherosclerotic plaques**.

Exempel:

"Synonyms"

- Heart attack
- Acute coronary syndrome
- Silent MI
- Others?

  …

Exempel:

Inclusion/Exclusion Terms

- ***Excludes*:** certain current complications following acute myocardial infarction **(I23.–)**
  myocardial infarction:
  • old **(I25.2**)
  • specified as chronic or with a stated duration of more than 4 weeks (more than 28 days) from onset **(I25.8)**
  • subsequent **(I22.–)**
  • postmyocardial infarction syndrome **(I24.1)**

Exempel:

"Index Terms"

- Coronary {artery} / {vein} embolism
  - Occlusion of …
  - Thromboembolism at …
- Sudden cardiac death over 40
  - ***for verbal autopsy only***
- Silent MI
- Karochi ?

Exempel:

"Index Terms"

- Coronary {artery} / {vein} embolism
  - Occlusion of …
  - Thromboembolism at …
- Sudden cardiac death over 40
  - ***for verbal autopsy only***
- Silent MI
- Karochi ?

Exempel:

Type

- **Disease**
  - Constellation complete with a given pattern
  - known etiology
- Or:
  - **Disorder ?**
    - Constellation complete – unknown etiology ?
  - **Syndrome**?
    - Common pattern
  - **Injury** ?
    - Can this be induced by **external causes**?

Exempel:

Body System

- Cardiovascular System

Exempel:

Body Part(s)

- Heart
- Myocardium
  - Location
    - Anterior
    - Septal
    - …

Exempel:

Signs and Symptoms

1. sudden chest pain
   - typically radiating to the left arm or left side of the neck
2. shortness of breath
3. nausea or vomiting
4. palpitations
5. sweating
6. anxiety (***often described as about to die***)
7. 25% are without chest pain or other symptoms " (***Silent MI***)

Exempel:

Diagnostic Findings

1. an electrocardiogram (ECG, EKG)
   - Pathological Q waves
   - a distinction is made between:
     - ST elevation MI (STEMI)
     - non-ST elevation MI (NSTEMI)
2. chest X-ray
3. blood tests:
   - creatine kinase-MB (CK-MB) fraction
   - troponin I (TnI) or troponin T (TnT) levels.

Exempel:

Causal Mechanisms / Agents

- **Anoxia**
  - Ischemia
  - Thrombosis
  - Embolism
- Basic mechanism is the **lack of oxygen** in the heart muscle which may lead to the **death of myocardial tissue**. This generally happens due to interruption of the blood supply of the heart due to a **coronary artery blockage**.
- Underlying this blockage is generally a **collection of lipids** and **atherosclerotic plaques**.

Exempel:

Genomic Linkages

- **Association of the angiotensin type 1 receptor (AT1R)+1166A/C polymorphism with MI**
  - *C allele conferred an increase in MI risk
    - (odds ratio = 1.13 per allele, p = 0.005).
  - **http://www.cdc.gov/genomics/hugenet/reviews/myocardial.htm**
- **HUGO proline/serine rich coiled coil (PSRC1)**
  - J. Molecular Biol.
  - **PMID: 18649068**

Exempel:

Temporal Properties

- **Acute** by default ?
  - {Put / Delete acute from title ?}
  - time pattern
    - Minutes – days
- ? Definition for "Subacute" MI
- ? Definition for Chronic MI

Exempel:

Severity and/or Extent

1. ST elevation MI (**STEMI**)
2. non-ST elevation MI (**NSTEMI**)

- Other extent / severity types:
  - ? by **size / % myocard tissue death**
  - ? by **location**
  - **? by prognosis**

Exempel:

Functional Impacts
(from ICF)

- **Heart Functions (b410)**
  - Blood Supply to the Heart **(b4103)**
  - Decreased cardiac output **(b4108)**
  - Arrhythmias **(b4101)**
  - Chest Pain **(b28011)**
- Standing …walking…climbing… carrying …
- Any **Activity or Participation** Restriction **(d110-d999)**
  - **Watching** (d110)
  - **Carrying out daily routine** (d 240)
  - **Going to work**…

Exempel:

Diagnostic Rules

- **an acute, evolving or recent MI:**

(1) Typical rise and gradual fall (troponin) or more rapid rise and fall (CK-MB) of biochemical markers of myocardial necrosis with at least one of the following:

a) ischemic symptoms;

b) development of pathologic Q waves on the ECG;

c) ECG changes indicative of ischemia (ST segment elevation or depression); or

d) coronary artery intervention (e.g., coronary angioplasty).

(2) Pathologic findings of an acute MI.

- **Established MI**

(1) Development of new pathologic Q waves on serial ECGs. The patient may or may not remember previous symptoms. Biochemical markers of myocardial necrosis may have normalized, depending on the length of time that has passed since the infarct developed.

(2) Pathologic findings of a healed or healing MI.

Exempel:

Treatment

- Frequent treatment of **STEMI**:
  - **thrombolysis**
  - if possible with percutaneous coronary intervention (**PCI**, angioplasty and stent insertion), provided the hospital has facilities for coronary angiography.
- **NSTEMI** is managed with:
  - medication:
    - Sedatives
    - Dilatation
    - Lysis
  - although PCI is often performed during hospital admission

Remaining Content Model Parameters

- Laboratory Tests
- Genetic Linkages
- Treatment Properties

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Översikt

- Introduktion
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Linearisation

Information note #5

http://informatics.mayo.edu/WHO/ICD11/collaboratory/projects/icd11-infonotes/documents

- A LINEARIZATION is **a subset** of the foundation component, that is:
  - **Fit for a particular purpose:** reporting mortality, morbidity, or other uses
  - **Jointly Exhaustive** of ICD Universe (Foundation Component)
  - Composed of entities that are **Mutually Exclusive** of each other
  - Each entity is given **a single parent**
- Residual Categories:

  ***.8 Other specified ….**

  ***. 9 Unspecified …**
  - The categories not used in ICD-11 will be marked as obsolete in the foundation layer. Only the specified categories under *.8 may take place on their own in the foundation component. All *.8 and *.9 code categories will be automatically generated in linearizations.

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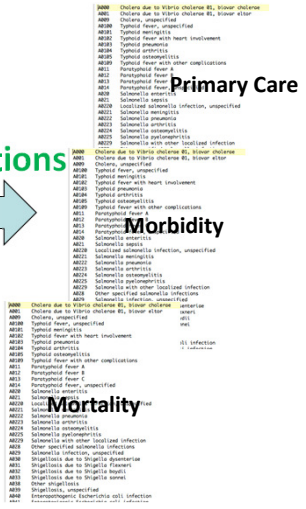
ICD-11 Components: Linearizations

Foundation: ICD categories with
- Definitions, synonyms
- Clinical descriptions
- Diagnostic criteria
- Causal mechanism
- Functional Properties

Find Term

SNOMED-CT,
International Classification of Functioning, Disability and Health (ICF)…

Linearizations



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Building Linearizations

- **Multiple Parenting** Allowed
  - Pneumonia
    - Lung Disease
    - Sometimes Infectious Disease
- **Permanence** of meaning across different linearizations
  - Telescopic principle
    - Zoom in – zoom out

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Översikt

- Introduktion
- Foundation Layer och Content Model
- Linearisering: Morbiditet / mortalitet
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Information Notes

http://informatics.mayo.edu/WHO/ICD11/collaboratory/projects/icd11-infonotes/documents

1. ICD Revision Communication
2. ICD Revision Timelines
3. TAG Allocation
4. Content Model
5. Foundation Component and Linearizations
6. Legacy Linearizations
7. Code Structure
8. Multidimensional Coding
9. Index
10. **Diagnosis Type**
11. **Main Condition**
12. Review Process
13. Mirror Coding
14. Modifiers and Qualifiers
15. Field Trials
16. Stability Analysis
17. Multilingual ICD Platform
18. Dagger and Asterisk resolution
19. Multisystem Chapter

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Information Notes

under development

20. **Cross-cutting TAG Roles**
    a. Mortality
    b. Morbidity
    c. Functioning
    d. Quality & Safety
21. **Post-Coordination Principles and Rules**
22. **Residual Categories**
23. **Common Ontology** with SCT
24. **Coding Rules**
25. **National Linearizations in ICD-11**
26. **ICD-11 Definitions**

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Kodstruktur

- Koder byggs upp som ”stem codes” med 4 tecken. Därefter en punkt och ytterligare 1 till 3 (eller möjligen flera) undergrupper.
- Sista tecknet (för närvarande det 7de) används för kodkopplingar.
- Varje tecken kan vara siffer eller bokstav och koderna skapas automatiskt med fortlöpande serier, men första tecknet anger kapitel. Således för närvarande (mars 2014):

Kapitel 1 Infektionssjukdomar
1A00 Cholera syndrome due to Vibrio cholerae
1P3G Infectious disease unspecified
Kapitel 2 Tumörer
2A00 Glioblastoma in brain
2J9Z Neoplam, unspecified
Kapitel 10 Cirkulationsorganens sjukdomar
AA00 Transient ischaemic attacs (TIA)
Kapitel 20 Symtom, tecken och patologiska fynd
LA00 Feeling ill
LH8Z Symtom etc, unspecified
Kapitel 24 Traditionell Medicine
QA00

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X – Chapter: Extension Codes (ca 10 000)

Type 1	Type 2	Type 3
Severity	**Main Condition** (types)	**History of**
Temporality (course of the condition)	Reason for encounter/admission	**Family History of**
Temporality (Time in Life)	**Main Resource Condition**	**Screening/Evaluation**
Etiology	**Present on Admission**	**Rule out**
Anatomic detail Topology Specific Anatomic Location	**Provisional** diagnosis	**Differential**
Histopathology	**Diagnosis confirmed by**	
Biological Indicators		
Consciousness		
External Causes ***(detail)***		
Injury Specific (detail)		

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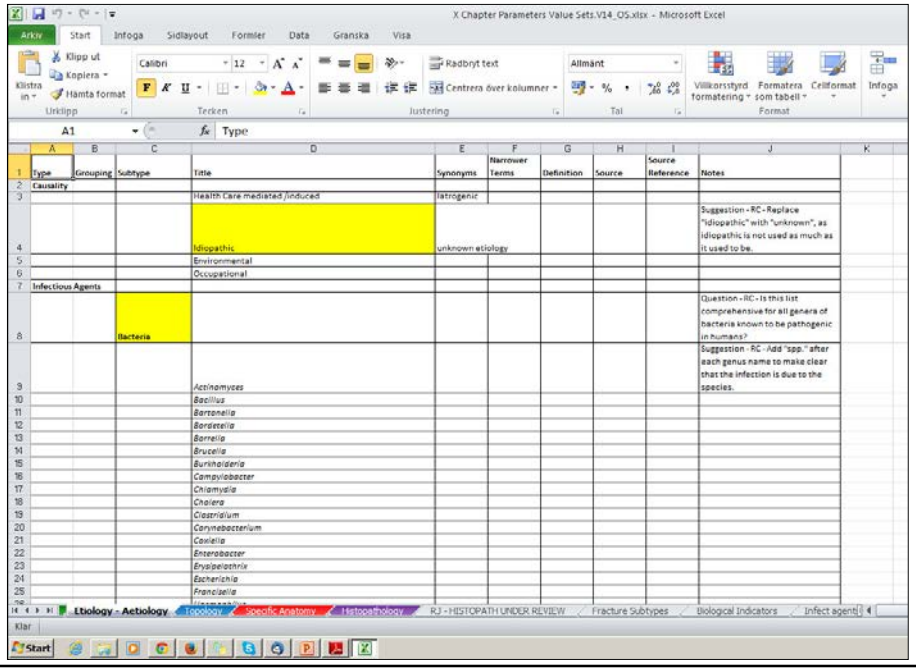
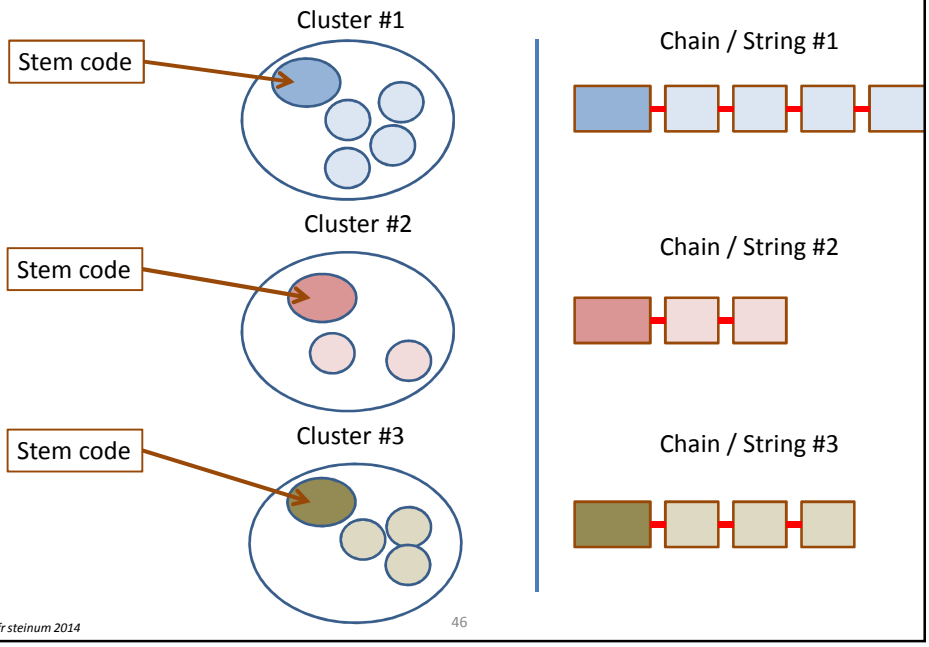
X-kapitel – Extention Codes – ca 10 000



Style options



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Multiple Coding
Equivalent Expressions

STEMI - posterior wall – confirmed by EKG

Cluster Style	*Chain / String Style*
• **JH6.1001** Myocardial Infarction with ST Elevation • **XT0.???1** Posterior wall of heart • **XD0.1001** Diagnosis Confirmed by EKG **1** CLUSTERING indicator.	**JH6.100/ XT0.???/ XD0.100**

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Information Note #8

a) ***Using Cluster digits and 7 digit numbers***:
Using the last digit to represent a shared value between the primary codes and all of its modifiers or qualifiers. This will define a cluster.

The first entry within a cluster will be considered the primary code.
This will disambiguate primary codes that are amended by other disease codes, e.g. Hypertension caused by renal failure, in contrast to renal failure caused by hypertension.

Subsequent ordering within a cluster, beyond the first entry, conveys no meaning.

Within a cluster, there is no pre-defined limit to the number of modifiers or qualifiers that a primary code (first entry in the cluster) may have.

Most extension codes will be drawn from the extension codes (X-chapter) of ICD
Extension codes can be drawn from disease to represent etiologies or primary tumors in the case of a secondary malignancy. Context will discriminate etiology from other types of disease associations such as many "complicated by" conditions.

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Information Note #8

a) *Using Cluster digits and 7 digit numbers:*

Usi
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cod

Cluster style

Examples:

1)

- note all codes in this cluster end in 1

1A2.XD21 Streptococcal Pneumococcal Pneumonia
ZC4.GX21 Streptococcal Pneumonia, Serotype 2
ZB3.5Y41 Upper Lobe of lung
ZA1.1001 Right
ZQ0.3001 Severe

2)

Prefix (Modifier first coding)

- codes in this cluster end in 2

ZA0.ER22 History Of
1A2.XD22 Streptococcal Pneumococcal Pneumonia

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Information Note #8

b) ***Using prefix and postfix notation on the core number (agglomeration)***

Prefix codes (Modifiers) will exist before the number, and be separated by a colon. Prefix values might be:

- M: Main condition
- R: Reason for admission
- F: Family hx
- H: History of
- E: Evaluation
- P: Present on Admission

Postfix code (Qualifiers)

These codes will be separated from the main code by a slash

Each domain will have a unique prefix as the first digit, for example

- /A - Anatomic detail
- /S – Severity or Stage
- /C - Causal agent/etiology
- /T - Temporality
- /H - Histopathology detail

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Information Note #8

b)

Using prefix and postfix notation on the core number (agglomeration)

Chain / String style

Examples:

H:1A2.XD20
History of
Streptococcal Pneumococcal Pneumonia

P: 1A2.XD20/DXZT42/APQ46/LR/SS
Streptococcal Pneumococcal Pneumonia /
serotype 2 /
upper lobe lung /
right side /
severe

/A - Anatomic detail
/S – Severity or Stage
/C - Causal agent/etiology
/T - Temporality
/H - Histopathology detail

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Om att använda klassif för statistik

- Stability analysis
- ICD-11 - en statistisk klassifikation?
- Och om att använda ICD-11 till DRG

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Pneumoni exempel per mars 2014

Chapter 01 Infectious diseases:

Pneumonia due to Bordetella (kikhosta)
1B7J Pneumonia due to Str pneumoniae
1C30 Pneumonia due to pseudomonas
1D02 Pneumonia due to Klebsiella pneumoniae
1C60.1 Pneumonia due to mycoplasma pneumoniae
A type of bacterial pneumonia caused by the bacteria species Mycoplasma pneumoniae

1C13 Pneumonia due to Staphylococcus
1A23 Pneumonia due to Escherichia coli
1M40.2 Bacterial pneumonia unspecified
1M40.3 Pneumonia, organism unspecified

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Cancer i magsäcken

- Neoplasms of the stomach
  - Primary malignant neoplasm of stomach
    - DC20 Gastric carcinoma
      - 2C82.1 Adenocarcinoma of stomach
    - Lymphoma of stomach
      - 2B86.3 Extranodal marginal zone B-cell lymphoma of mucosa-associated lymphoid tissue of stomach
    - DC21 Malignant mesenchymal tumour of stomach
      - DC21.1 Leiomyosarcoma of stomach
      - DC21.Y Other specified malignant mesenchymal tumour of stomach
      - DC21.Z Malignant mesenchymal tumour of stomach, unspecified
      - 2C2B.1 Gastrointestinal stromal tumour of stomach

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DRG ?

Problem:

- Klassifikationen underlätter inte aggregering av koder inom samma organsjukdom
  - Pneumoni
  - Urinvägsinfektioner: Pyelonefrit??
  - Magsårssjukdomar: Helicobacter och andra orsaker
- Kodsystemet med ”cluster” och tilläggskoder i pre- och postfix positioner kräver stora strukturella ändringar i inmatningssystemer (PAS).
- DRG-systemet måste sannolikt radikalt omarbetas pga nya kodsystemet.

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ICD11 Field Trials

- **Applicability (Feasibility)** –
  - Is the classification easy to implement in the hands of the real life users (coders, doctors etc.) ?
- **Reliability** –
  - Is the classification used in the same manner by different users?
  - Do two different users code the same case with the same code?
  - What are the sources of discrepancy?
  - What are the factors to improve comparability and consistency?
- **Utility** –
  - What is the value of the classification to enhancing data capture and its uses?
  - Does it improve recognition?
  - Does it serve for better documentation?
  - Does it enable re-use?
  - Does it guide better diagnosis?
  - Does it allow better resource allocation?

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Statstical analyses and comparisons ?

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Pieter Bruegel (1563)

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Tefvik Bedirhan Üstün, WHO-FIC

Översikt

- Introduktion
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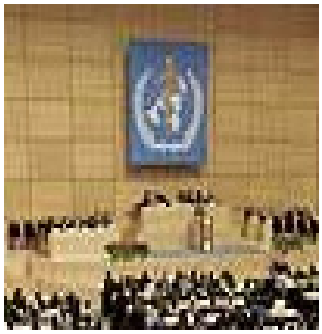
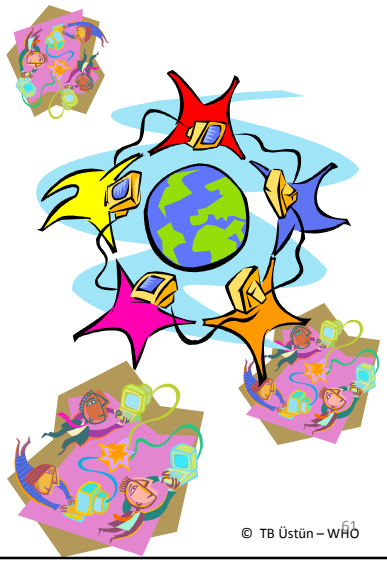
How do we go from

Here to **21st Century?**





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ICD-11 Timeline

- 201
  - – +2
- 201
  - – 20
  - – C
    - ICD 2016
    - ICD 2017

Ny tidsplan!
Pga kritik från många länder och centra är nu tidsplanen framflyttad till 2017

ersion

roval

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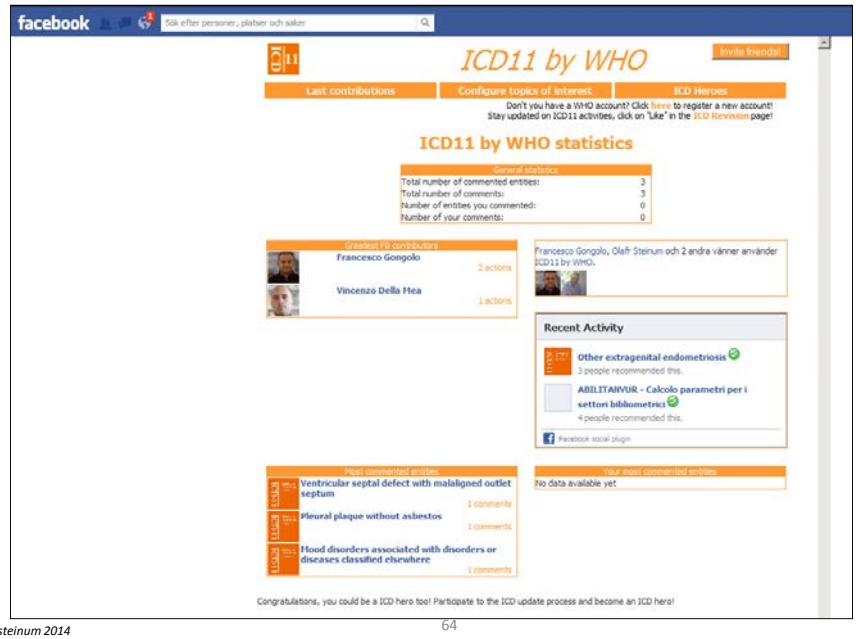
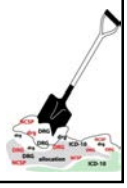
ICD Revision på facebook (1)

ICD-11 på facebook (2)



Har ni några frågor ?

olafr@diaqualos.se



Tack för uppmärksamheten !

olafr@diaqualos.se