

Quality and Safety Use Case for ICD-11

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With slides borrowed from colleagues on the WHO-FIC Quality and Safety Working Group (reporting to the Morbidity Reference Group)

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ICD-11 use cases

Uses of the ICD are diverse and widespread and much of what is known about the extent, causes and consequences of human disease worldwide relies on use of data classified according to ICD. See below just a few examples:

Certification and reporting of Causes of Death

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Morbidity coding and reporting including Primary care

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Casemix and Diagnosis-Related Grouping (DRG)

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Assessing and monitoring the safety, efficacy, and quality of care

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Quality of care uses ICD-coded information to describe the situation of the patient, outcome of treatment and incidents or near-incidents including mechanisms and involved objects such as the failure of an infusion pump or the accidental wrong dosage of a medicament by the patient in line with the WHO recommendations for patient safety incident reporting and learning systems (page 12).

Cancer registries

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Antimicrobial resistance (AMR)

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Interoperability standards in WHO Digital Guidelines and for Digital Documentation of COVID-19 Certificates (DDCC)

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Coding traditional medicine conditions

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Assessing functioning

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Researching and performing clinical trials and epidemiological studies

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Key features of ICD-11 for Q&S use case

- Underlying Foundation or semantic knowledge base
- Clustering to express relationships among diagnoses, using extension codes with stem codes
- Postcoordination using 3-part model to explain harm, cause, and mode or mechanism
- Robust coding tools with potential for automated code-building from free text in the EHR

Extension codes

Add-ons to be attached to a diagnosis to capture the granularity of clinical documentation – if/when needed



Courtesy of:
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Three-part model

The 3-part model for capturing healthcare-related adverse events in ICD-11 consists of:

- 1. A healthcare-related activity that is the cause of injury or other harm (selected from Chapter 23 of ICD-11);
- 2. A mode or mechanism of injury or harm, related to the underlying cause (also from Chapter 23 of ICD-11); and
- 3. The harmful consequences of the event to the patient, selected from any of Chapters 1 through 22 of ICD11 (most importantly, the injury or harm experienced by the patient)

Healthcare-related activity that is the "source" of harm

- Substances
- Procedures
- Devices
- Other Aspects of Care

"Mode or Mechanism" of harm

- e.g. overdose/underdose for substances
- e.g. accidental perforation for procedures
- e.g. dislodgement/malfunction for devices
- e.g. mismatched blood used in transfusion for other aspects of care

the
"Consequences (i.e. Injury or Harm)"
that resulted from the event

Southern DA, Pincus HA, Romano PS, Burnand B, Harrison J, Forster AJ, Moskal L, Quan H, Driesler SE, Sundararajan V, Colin C, Gurevich Y, Brien SE, Kostanjsek N, Üstün B, Ghali WA; WHO ICD-11 Revision Topic Advisory Group on Quality & Safety. Enhanced capture of healthcare-related harms and injuries in the 11th revision of the International Classification of Diseases (ICD-11). *Int J Qual Health Care*. 2016 Feb;28(1):136-42. doi: 10.1093/intqhc/mzv099.

Example of application of 3-part model

A patient had a left knee-replacement less than a year ago, because of arthritis. The implanted device has come loose, resulting in pain and reduced function

Harm: Pain in joint ME82; Specific Anatomy (use additional code, if desired) Knee joint XA8RL1; Laterality (use additional code, if desired)—Left XK8G

Cause: Orthopaedic devices associated with adverse incidents, prosthetic or other implants, materials or accessory devices PK99.2

Mode: Dislodgement, misconnection or de-attachment, as mode of injury or harm PL12.4

Code Structure: ME82&XA8RL1&XK8G/PK99.2/PL12.4

Article

A World Health Organization field trial assessing a proposed ICD-11 framework for classifying patient safety events

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Purpose:

Proof of concept → Can we apply the three-part model to representative patient safety cases?

Approach:

All reviewers reviewed 45 cases

Identified from three sources:

15 cases identified from field work at 4

Canadian hospitals;

15 cases identified from CIHI's training set;

15 cases identified from AHRQ PSNet cases;

Analysis:

Assessed consistency and coverage,

opportunities to improve coding tools

20/45 could have harm, cause, mode classified

5/45 had no harm ("near miss"), but could

have cause, mode classified

20/45 missing information about cause and/or

mode of harm

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Spotlight on ICD-11: New Features and New Opportunities

Research

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Edited by Danielle A Southern, Harold A Pincus, Olafur Steinum and William A Ghali.

ICD-11: an international classification of diseases for the twenty-first century

The International Classification of Diseases (ICD) has long been the main basis for comparability of statistics on causes of mortality and morbidity between places and over time. This paper provides an overvie...

James E. Harrison, Stefanie Weber, Robert Jakob and Christopher G. Chute

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Free-text clinical note (authored by physician):

58-year-old male with class III CHF presents with acute pulmonary edema due to inappropriate low furosemide dose in the setting of chronic LV dysfunction (EF30%)



Controlled terminology (underlined terms):

Patient harm:

- Outcome: Pulmonary oedema caused by: underdosing as a mode of injury

Patient's underlying condition:

- Diagnosis: Left ventricular failure with reduced ejection fraction;
Duration: Chronic; Severity: NYHA Class III



ICD-11 Codes:

Patient harm: CB01/PL13.7

Patient's underlying condition: BD 11.2/XT8W/XS9T

Fig. 1 Example of ICD-11 terms and codes derived from a clinical note

Personal observations

- ICD-11 will create new opportunities for tracking and understanding harms that patients experience in health care.
- ICD-11 allows linkage of outcomes of care with specific process failures, incorporating results of quality improvement activities.
- ICD-11 is designed for compatibility with AHRQ's Common Formats and other tools for describing patient safety events and will catalyze global advances in patient safety surveillance.

Incident Reporting Software



Application Programming Interface (API)

WHO ICD-11 Code Finder Solution



Software "sends" free text string to code finder via the API

API "returns" the ICD-11 code and controlled terms to the software

"pulmonary edema secondary to underdosing of diuretic medication"

Pulmonary oedema caused by underdosing as a mode of injury

CB01/PL13.7

"Patient developed pulmonary edema secondary to underdosing of diuretic medication"

Fig. 2 Application programming interface facilitates patient safety workflow by linking software solutions (for example incident reporting software) and the WHO ICD-11 code finder solution

Forster, A.J., Chute, C.G., Pincus, H.A. et al. ICD-11: A catalyst for advancing patient safety surveillance globally. *BMC Med Inform Decis Mak* 21 (Suppl 6), 383 (2021). <https://doi.org/10.1186/s12911-023-02134-2>