

MEDINFO23

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ICD11 for Accident & Emergency Informatics and One Digital Health

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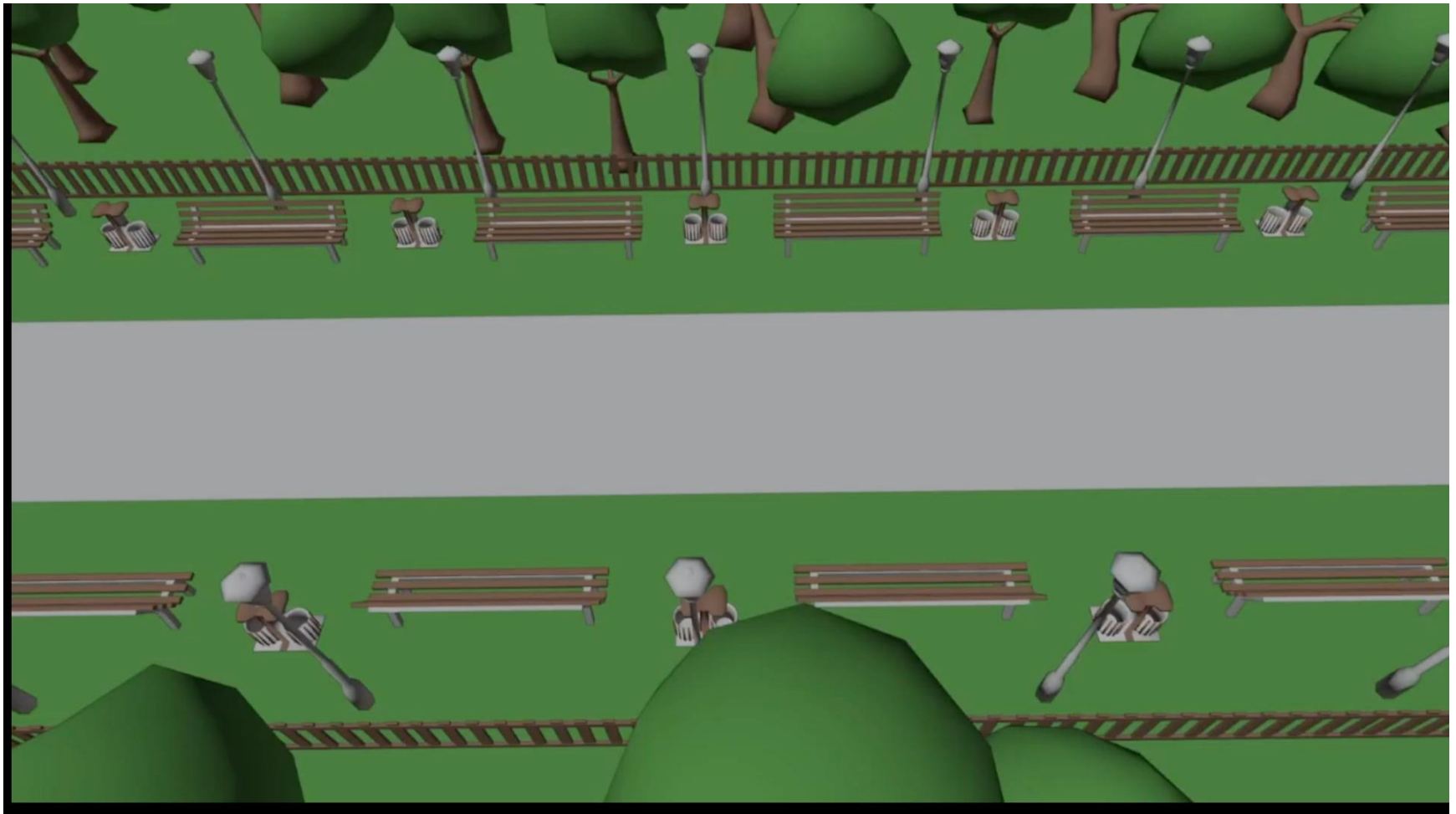
Timeline

Time	Duration	Topic	Speaker
9:00 AM	05:00	Welcome	Deserno
9:05 AM	10:00	The Need of Standardization in A&EI and ODH	Deserno
9:15 AM	10:00	The ICD Foundation and ICD 11	Jakob
9:25 AM	30:00	Software tools for ICD 11	Celik
9:55 AM	10:00	ICD11 in Use	NN
10:05 AM	20:00	Open Discussion	Deserno
10:25 AM	05:00	Summary and Closing	Jakob

One Digital Health

Accident & Emergency Informatics

Case study



The Need of Standardization

ICD 11

ICD REST API

and other Tools for Software Developers

C. Çelik

World Health Organization

Tools for Software Integration	Tools	
	Tools for End Users	Tools for Development and Maintenance
ICD-API (REST API)	ICD-11 Browser	iCat - Authoring Tool
Other software components Embedded Coding Tool	ICD-11 Coding Tool	Maintenance Platform <ul style="list-style-type: none"> - Proposal System - Translation Platform - ICD-FIT (Field Implementation Tool)
https://icd.who.int		

ICD-11 Browser

تصنيف 11 لإحصائيات الوفيات والمراضة (نسخة : 09/2020)

التصنيف 11 - إحصائيات الوفيات والمراضة

01 بعض الأمراض المعدية (العدوانية) أو الطفيلية

التهابات المعدية والأعضاء أو القولون من منشأ عدواني

عداوى معوية جرثومية [بكتيرية]

1A00 الكوليرا

1A01 عدوى الأمعاء الناجمة عن ضمات أخرى.

1A02 حالات عدوى الأمعاء ناجمة عن الشيفيلات

1A03 عدوى الأمعاء الناجمة عن الإثريكات القولونية

1A04 حالات التهاب الأمعاء ناجمة عن المظفبات العسيرة (الكلوستريديوم ديفيسيل)

1A05 عدوى الأمعاء الناجمة عن البرسينية الملهية للأمعاء والقولون (برسينية إنتيروكوليتكا)

1A06 التهاب المعدة والأمعاء الناجم عن العطائف

1A07 الحمى التيفية

1A08 الحمى نظيرة التيفويد

1A09 عداوى ناجمة عن السلمونيلات الأخرى

1C10.1 داء الشقيبات البطنية

1A0Y عداوى أخرى جرثومية (بكتيرية) تصيب الأمعاء، لم يتم تعيينها

التشمم الجرثومي المنقول بالعداء

عداوى الأمعاء الفيروسية المنشأ

عداوى الأمعاء الناجمة عن الأوالي (البروتوزوا)

1A40 التهابات المعدة والأمعاء أو التهاب القولون بدون

用于死因与疾病统计的ICD-11 (版本 : 09/2020)

ICD-11 - 死因与疾病统计

01 某些感染性疾病或寄生虫病

感染性胃肠炎或结肠炎

细菌性肠道感染

1A00 霍乱

1A01 其他弧菌的肠道感染

1A02 志贺菌肠道感染

1A03 大肠埃希菌肠道感染

1A04 难辨梭状芽孢杆菌引起的肠道感染

1A05 小肠结肠耶尔森菌肠道感染

1A06 弯曲菌性胃肠炎

1A07 伤寒

1A08 副伤寒

1A09 其他沙门菌感染

1C10.1 腹部放线菌病

1A0Y 其他特指的细菌性肠道感染

1A0Z 未特指的细菌性肠道感染

细菌性食物中毒

病毒性肠道感染

肠道原虫感染

1A40 未特指感染性病原体的胃肠炎或结肠炎

真菌性肠感染

以性传播为主要途径的感染性疾病

分枝杆菌病

1A00 霍乱

父节点

细菌性肠道感染

包括术语

霍乱综合征

后组配

增加细节 霍乱

感染性病原体 (需要时, 使用附加编码)

XN7N1 霍乱弧菌

XN8P1 O1群霍乱弧菌, 霍乱生物型

XN62R O1群霍乱弧菌, 埃尔托生物型

关联情况 (需要时, 使用附加编码)

查找

版本说明

1A00 Cholera

Parent

Bacterial intestinal infections

Inclusions

cholera syndrome

Postcoordination

Add detail to Cholera

Infectious agent (use additional code)

XN7N1 Vibrio cholerae

XN8P1 Vibrio cholerae

XN62R Vibrio cholerae

Associated with (use additional code)

Search

CIE-11 para estadísticas de mortalidad y morbilidad (Versión : 09/2020)

CIE-11 - Estadísticas de morbilidad y mortalidad

01 Algunas enfermedades infecciosas o parasitarias

02 Neoplasias

03 Enfermedades de la sangre o de los órganos hematopoyéticos

04 Enfermedades del sistema inmunitario

05 Enfermedades endocrinas, nutricionales o metabólicas

06 Trastornos mentales, del comportamiento y del neurodesarrollo

07 Trastornos del ciclo de sueño y vigilia

08 Enfermedades del sistema nervioso

09 Enfermedades del aparato visual

10 Enfermedades del oído o de la apófisis mastoideas

CIE-11 para las estadísticas de mortalidad y morbilidad

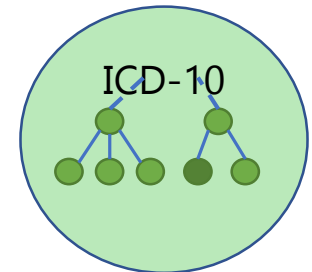
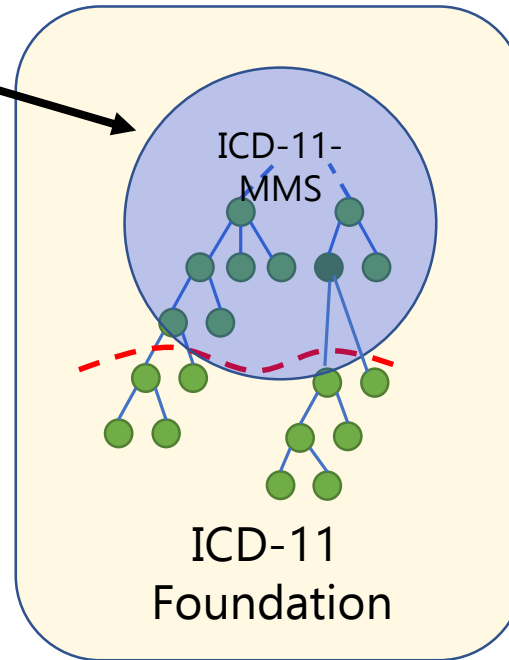
Versión para preparar la puesta en funcionamiento

Notas de la versión

- La estructura de códigos de la CIE-11
- El mecanismo de actualización está en [mantenimiento](#).

ICD-11 – more relevant detail

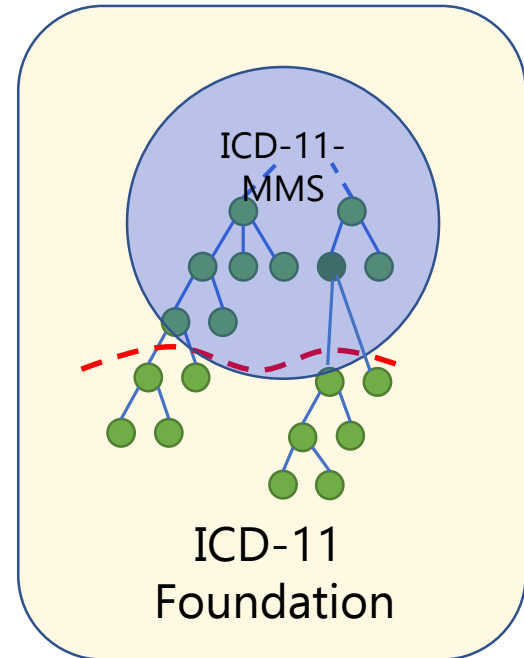
- 17.000 statistical categories
 - ICD-11 for Mortality and Morbidity Statistics (MMS)
- 80.000 entities
- 120.000 terms
- >1.600.000 terms recognized



- 14000 categories
- Separate text index
- Separate rule base
- Need terminology link
- Outdated content

Coding Tool Features

- Searches all terms in the Foundation
 - The Coding Tool searches all of these terms
 - But guides the user to the correct code in the statistical classification



Word completion/suggestion

- Supports word completion and word suggestion during search

ICD-11 Coding Tool Mortality and Morbidity Statistics (MMS)
December 2018

dial ✕

Guessing the word being typed...

Word list sort: [Relatedness/repetition](#) ▾

- dialysis
- dialysis-associated
- dialysis-related

Destination Entities

- QB94.Z** Care involving **dialysis**, unspecified ☰ 🔗
- dialysis** NOS ☰
- 5D00.3 Dialysis-associated** amyloidosis ☰ 🔗
- 6D85.X** Dementia due to other specified disease classified

ICD-11 Coding Tool Mortality and Morbidity Statistics (MMS)
December 2018

malignant

Related words...

Word list sort: [Relatedness/repetition](#) ▾

- neoplasm
- site
- carcinoma
- cell
- lymphoma
- melanoma

Dynamic results

- Search results dynamically available as user types
- Organized by matching score and classification hierarchy

The screenshot displays the ICD-11 Coding Tool interface. At the top, the title bar reads "ICD-11 Coding Tool" and "Mortality and Morbidity Statistics (MMS) December 2018". A search input field contains the text "asthma". Below the search bar, there is a section for "Related words..." which is currently empty. The main content area is divided into two panels. The left panel, titled "Word list", shows a list of related terms such as "bronchial", "catarrh", "allergic", "hay", "fever", "allergy", "bronchitis", "pollen", "rhinitis", "pulmonary", "chronic", "acute", "obstructive", "extrinsic", "severe", "cardiac", "rostan", "millar", and "disease". The right panel, titled "Destination Entities", shows a list of ICD-11 codes and their descriptions, sorted by "Matching score". The codes include CA23.00 through CA23.32, with descriptions like "Allergic asthma with exacerbation", "Allergic asthma with status asthmaticus", "Allergic asthma, uncomplicated", "Non-allergic asthma", "Non-allergic asthma with exacerbation", "Non-allergic asthma with status asthmaticus", "Non-allergic asthma, uncomplicated", "Other specified forms of asthma or bronchospasm", "Aspirin-induced asthma", "Cough variant asthma", "Unspecified asthma", "Unspecified asthma with exacerbation", "Unspecified asthma with status asthmaticus", and "Unspecified asthma, uncomplicated".

Better Search

ICD-11 search engine is customized for better search results

- Similar words (tuberculosis – tuberculous)
- Aware of Spelling variants (edema, oedema)
- Substitutions (renal - kidney) (cancer – malignant neoplasm)
 - In addition to thousands of synonyms, we have global substitutions so that our system finds terms that are not even in ICD-11 index
- Diacritic normalization (behcet, behçet)
- Possessive normalization (behcet's, behcet)
- Handling compound words
 - Searching **myelitis** will get you “**Neuromyelitis**” “**polymyelitis**” as well.
 - Searching **art** will not match **part** (i.e. not simplistic search that would cause unwanted matches)

Handling Postcoordination

- In cases when the Coding Tool finds a result in the foundation that is more detailed than an ICD-11 category.
 - It could return a post-coordination combination when the required meta data is available in the foundation

The screenshot displays the ICD-11 Coding Tool interface. At the top, a dark blue header contains the text "ICD-11 Coding Tool" and "Mortality and Morbidity Statistics (MMS) December 2018". Below the header is a search input field containing the text "cholera eltor" with a red 'X' icon to its right. Underneath the input field, the text "Guessing the word being typed..." is visible. The main content area is divided into two sections: "Word list" and "Destination Entities". The "Word list" section has a "sort:" dropdown menu set to "Relatedness/repetition" and contains the word "eltor". The "Destination Entities" section has a "sort:" dropdown menu set to "Matching score" and contains two entries: "1A00&XN62R Cholera due to Vibrio cholerae 01, biovar eltor" and "cholera due to Cholera eltor". Below these sections is a "Postcoordination" section with a question mark icon. It displays the code "1A00 Cholera" and "Code: 1A00&XN62R". Underneath, it shows "Infectious agent" and "XN62R Vibrio cholera 01, biovar eltor" with a red 'X' icon to its right.

Coding maternal cases

ICD-11 Coding Tool

Mortality and Morbidity Statistics (MMS)
2020-09

Infectious cystitis ✕

Related words...

Word list

sort : [Relatedness/repetition](#) ▾

noninfectious
acute
cholecystitis

Destination Entities

sort: [Matching score](#) ▾

GC00.1 Infectious cystitis *

Description

Inflammation of the urinary bladder caused by microbes

Exclusions

tuberculous cystitis (NHEA) (1B12.5)
bladder disorder in schistosomiasis [bilharziasis] (NHEB) (1F86.0)

Matching Terms

infective cystitis

Related categories in maternal chapter ↓

Infections of bladder in pregnancy / Infectious cystitis (JA62.1/GC00.1)

Postcoordination +

Postcoordination is available: [click here to open the browser](#)

GC00.Y Other specified **cystitis** [Details]
Noninfectious **cystitis**

DC12.0Z Acute cholecystitis, unspecified [Details]
acute cholecystitis **infection**



ICD API allows programmatic access to the International Classification of Diseases (ICD).

It is an HTTP based REST API

ICD API

- ICD API (web services) allow other software to access the ICD content
- HTTP based REST API
 - Uses solid, proven underlying technology designed for the web
 - Benefit from the infrastructure and tools of the web.
- Easy to consume, technology independent
 - Can be consumed from any programming language or platform

ICD API – Multilingual

- **Multiple languages**

- Supports language headers to provide different language versions.
- 2023 release supports 7 languages.
 - 20 more languages in different levels of completion

ICD API

- **Multiple Versions**

- ICD-11 Foundation / Linearizations such as MMS
- Different Releases can be accessed. (2023,2022,2021,...[2018](#))

Searching

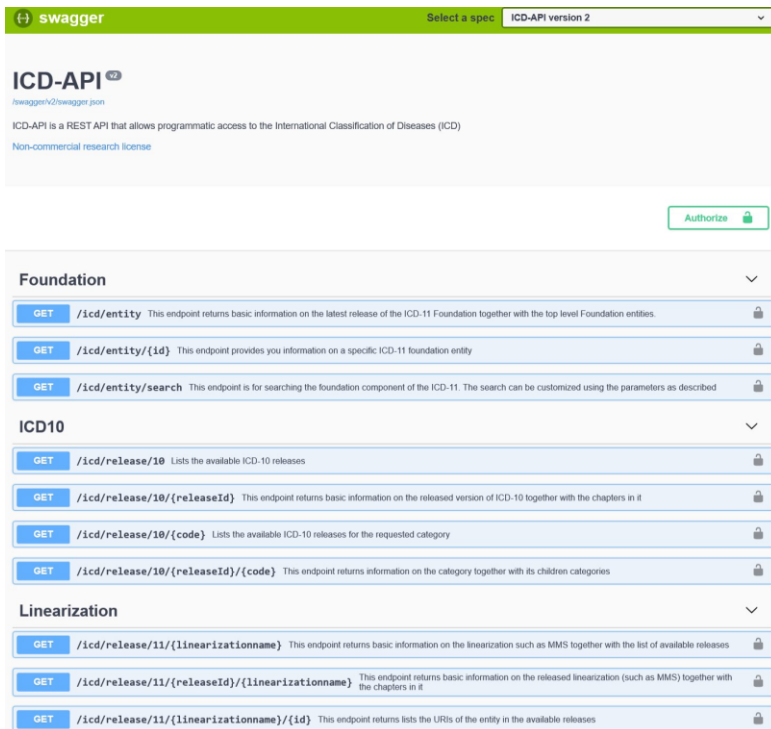
Searching with the ICD-API

- Advanced search functionality (*similar to the searching used in the WHO tools (ICD-11 Coding Tool, ICD-11 Browser)*)
 - Weighted results
 - Subset searching
 - Post-coordination combination results
 - Multilingual

Postcoordination Support

- Full access to post-coordination information
 - Which entity can be post-coordinated with which axes
 - Allowed value sets
 - Searching allowed value sets when postcoordinating

Open API (Swagger) Support



swagger Select a spec ICD-API version 2

ICD-API
/swagger2/swagger.json
ICD-API is a REST API that allows programmatic access to the International Classification of Diseases (ICD)
Non-commercial research license

Authorize

Foundation

- GET /icd/entity This endpoint returns basic information on the latest release of the ICD-11 Foundation together with the top level Foundation entities.
- GET /icd/entity/{id} This endpoint provides you information on a specific ICD-11 foundation entity
- GET /icd/entity/search This endpoint is for searching the foundation component of the ICD-11. The search can be customized using the parameters as described

ICD10

- GET /icd/release/10 Lists the available ICD-10 releases
- GET /icd/release/10/{releaseId} This endpoint returns basic information on the released version of ICD-10 together with the chapters in it
- GET /icd/release/10/{code} Lists the available ICD-10 releases for the requested category
- GET /icd/release/10/{releaseId}/{code} This endpoint returns information on the category together with its children categories

Linearization

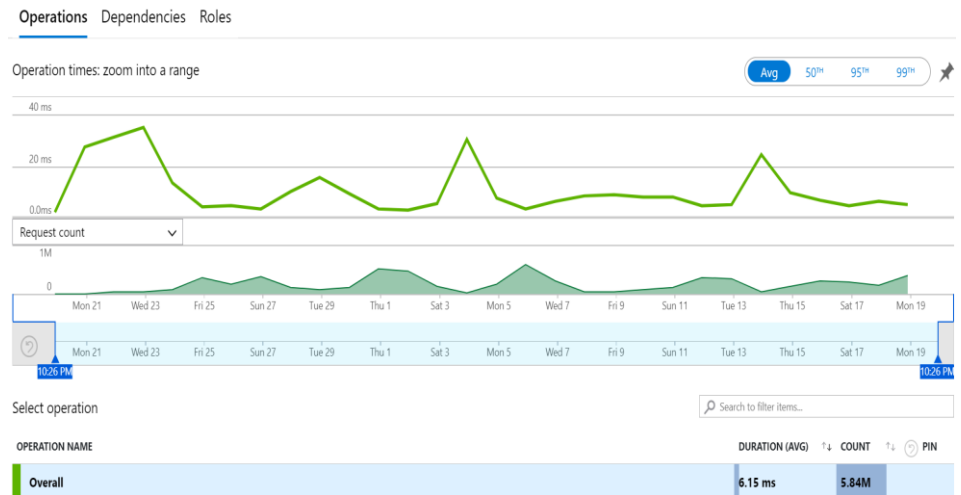
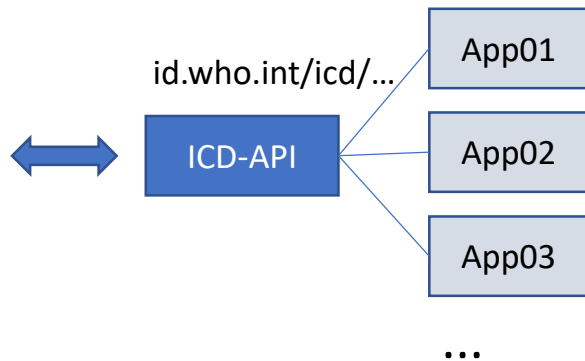
- GET /icd/release/11/{linearizationname} This endpoint returns basic information on the linearization such as MMS together with the list of available releases
- GET /icd/release/11/{releaseId}/{linearizationname} This endpoint returns basic information on the released linearization (such as MMS) together with the chapters in it
- GET /icd/release/11/{linearizationname}/{id} This endpoint returns lists the URIs of the entity in the available releases

- Detailed API documentation in Open API (Swagger) format
- Many examples included
- Allows trying out the API
- Supports Client code generation

<https://id.who.int/swagger>

Cloud Infrastructure

- Deployed in the Microsoft Cloud (Azure)
 - Scalable vertically and horizontally
 - Increased availability with redundant deployments



Local Deployments



Docker based deployment

- Very light weight docker images
- Supports multilingual versions
- Linux / Windows / Cloud



Other local deployment options coming

- Windows service
- Linux systemd service

<https://icd.who.int/icdapi>

[Home](#) [About](#)

[Register](#) [Log in](#)



ICD API allows programmatic access to the International Classification of Diseases (ICD). It is an HTTP based REST API. You may use this site to access up to date documentation on using the API as well as managing the keys needed for using the API.

[The list of available classification versions](#)

How to Use the API

Version 2 new

[What's new in version 2](#)

[API Documentation](#)

[API-Reference \(swagger\)](#)

[ICD API Samples GitHub repository](#)

API Access

View API access key(s) (*please login first*)

If you haven't registered already please [Register](#) to get access to the API

Embedded Coding Tool new

You can easily integrate ICD-11 Coding Tool into your applications.

[Learn more](#)

Embedded Coding Tool is powered by the ICD-API

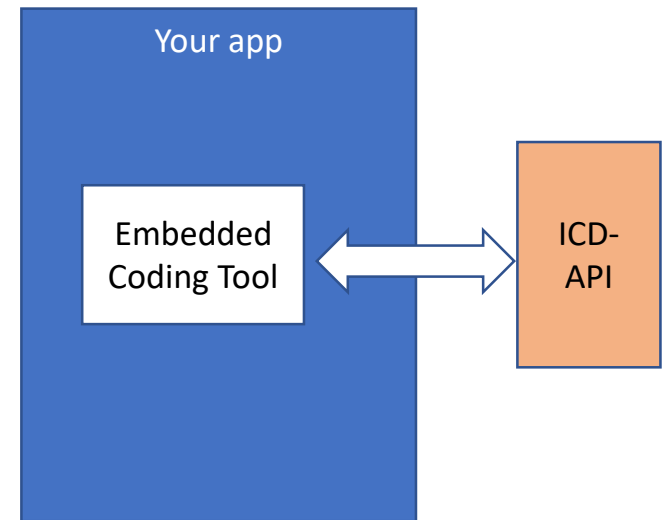
ICD-API in container new beta

You may deploy the ICD-API locally using Docker

[Learn more](#)

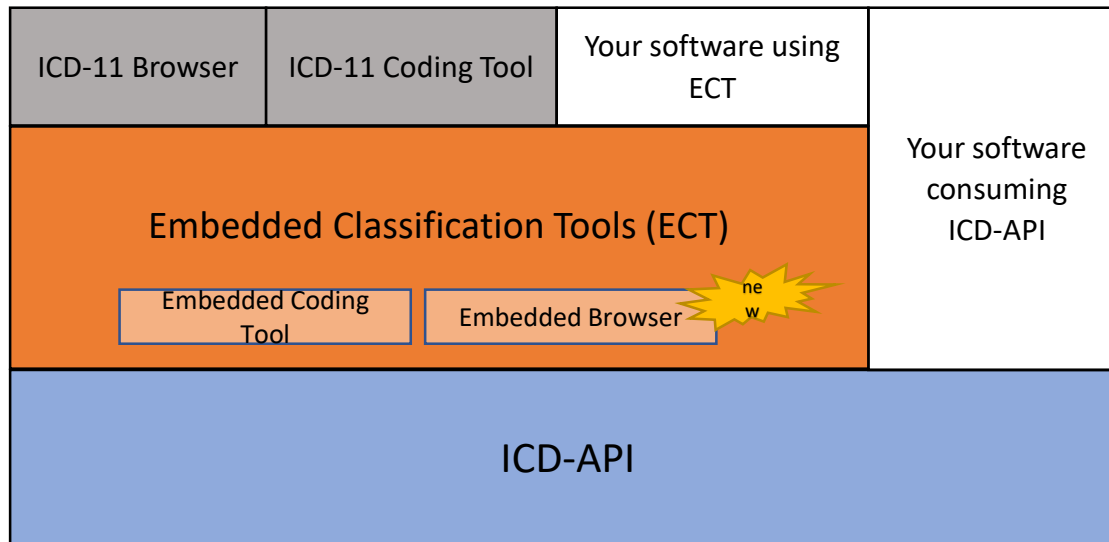
Embedded Coding Tool

- javascript / HTML component that could be integrated into any web-based application
- Powered by ICD-API
- Any input field within your application could become a complete Coding Tool by simply decorating it with additional attributes
- Could use cloud deployed or container deployed ICD-API
- Multilingual



Embedded Classification Tools (ECT)

- A set of web-based components that could be integrated into any web-based software.
 - Could use cloud deployed or locally deployed ICD-API



DEMO

Summary
