

COVID-19 Collecting semantic sources – Lessons learned

State of document: 20/10/2020

The eHN sg on Semantics has initiated from May to July 2020 a collection of relevant international and national sources of COVID-19 related activities in regard of semantic and syntactic (data modelling) aspects (see Annex).

The intention behind this work was to analyse the specific national initiatives and responses of the different Member States (MS) to the pandemic, as to foster capacity building for the EU by providing recommendations on how to improve and support a harmonized approach. The subgroup on Semantics supported this activity as the pandemic situation showed that “not re-inventing the wheel” helped to speed up and gain valuable time.

Thus, this paper aims to directly answer the following questions:

1. Which are the main data elements necessary when transferring COVID-19 patients between healthcare providers?
 - Can any type of improvement in the Patient Summary guidelines be recommended?
2. Which are the MS coding practices regarding COVID-19 health data?
 - Can a recommendation to the eHN be made by the sg on Semantics on this subject?
3. Which are the main data elements used in COVID-19 patient registries for the purpose of policy making or research (secondary use of data)?
 - Can a recommendation on this be made to the eHN?

To provide an answer to these questions, approaches of different MS and initiatives to provide data models to collect COVID-19 related information from Germany, Portugal, Ireland and Spain were analysed, to ascertain whether the information regarding COVID-19 could be transferred via the existing cross-border data exchange infrastructure (eHDSI). These data models were also analysed to get an overview of which type of information is considered necessary for this specific use and to compare overlaps and gaps between the different modelling initiatives.

After proceeding with this analysis, the Group has drafted a set of lessons learned that are presented in the following section.

Lessons learned from Corona-specific data exchange

- The existing technical, syntactic and semantic structures for cross-border data (eHDSI data set for Patient summary) cover essential data resources and are suitable for

transporting most information needs for clinicians to get an overview over a patient to be treated.

With relation to the syntactic structure, the most relevant sections for the transfer of COVID-19 meaningful information, are the sections qualified as mandatory, in the current eHDSI PS guidelines, specifically Problems, Procedures, Medication, Medical Devices and Allergies.

The existing valuesets recommended for these specific sections can be reviewed on whether they cover COVID-19 specific code values, however the Group did not manage to go through all of the available data sources and thus agreement on this still needs to be reached within the sg on Semantics.

- An important aspect worthy of mentioning related to the review of the current valueset for the Problem's section – IllnessesandDisorders, relates to the recommendation of the usage of two ICD10 codes U07.1 and U07.2. Some MS, like Belgium, Portugal and Spain, are currently using ICD10–CM codes to register information on IllnessesandDisorders, however the currently available version of this dataset does not include the U07.2 code. This can present itself as a challenge in the sharing of cross-border information from these MS while using the PS.
- Additionally, from the revision of the available data sources the Group concluded that the valuesets specifically set up for the eHDSI PS are not being widely used throughout the EU, and this holds true in regard to COVID-19 specific codes. As well, the eHDSI PS data sets are not widely known, which led to creation of new data sets at national level, especially in the research community of countries. A Revision of the Patient Summary guidelines can take this insight into consideration as a lesson learned from the comparison of 4 different data sources, and can take into consideration a more broad analysis including further data sources, to be conducted in a near future if necessary.
- From this analysis, the Group concluded that there is an opportunity to extend/enlarge the current eHDSI PS data set and sections.
To this regard, keeping in line with some ongoing projects, like the X-eHealth Project, the Group considers Medical Examination Reports, Laboratory Analysis Results and the Hospital Discharge Summary report to be key sections to expand the currently available sections on the PS. In addition, to get the "full picture" of a patient, the existing PS data set should be extended to account for these sections.
Domain specific and use-case specific extension modules should be considered on a case-by-case basis. A particular case that the Group considers worthy of being explored and evaluated is the inclusion in the PS of Travel History information, that convenes epidemiological factors related to specific regions of the world, which are relevant to specify an individual risk of exposition. This information also holds relevant for non-pandemic usage.
Specific medical risk factors may be of influence for treatment and prognosis. Thus, information on the participation of a patient in a clinical study should also be captured by

the PS. Likewise, the inclusion of sections relating to the Plan of Care and Advance Directives should also be considered.

More detailed information on the possible PS extensions that the Group considered can be found in table 1 and table 2, in the annex section of this paper.

Part of this work is already being conducted by ongoing EU initiatives and projects, however, COVID-19 related assets could be asked to be prioritized.

- As a long-term scenario, the technical basis for a patient summary may be extended to an exchange of a full electronic health record. This would include possibility to collect and also transfer all information bits which a patient collects during his or her journey through the health care system.
In case of COVID-19 resources this would cover also Admission and discharge dates, a consecutive documentation of interventions done (for example ECMO, assisted ventilation, artificial coma), complications (like kidney failure and temporary dialysis, documentation of all symptoms (fever, loss of sense for taste and smell) or the outcome at discharge.
- Unstructured information is welcome and useful as complementary and supporting documentation if the nature of the document can be identified. As for a non-cross-border scenario it will be up to the physician to consider this information or perform / re-new these assessments on his own. Unstructured supporting information may contemplate X-rays, CTs, MRTs, ECGs, lab value panels etc. As additional information the transfer of unstructured documents is welcome, eventually also to transmit use case specific unstructured data (in English).

To resume these lessons learned, the Group concluded that the existing eHDSI structures are apt to transfer the key elements of information, which are needed for data transfer cross-border and also generally within a Member State. For future use they should be extended and made widely known and accepted. This way, they can be used for all kinds of applications and data collection in a timely manner for new emerging health crisis. A mechanism of extending the data set of the Patient Summary Guideline could be described to allow for homogeneity in new developments. They then should be used to tackle the ongoing pandemic and future health emergencies in a timelier manner.

The extension of the data set towards IPS is considered a necessary step for planned care. The “transfer non-structured data in the language of origin” in case no structured data can be provided may help the physician providing further treatment to improve or complete the information on the patient to be treated and avoid duplicate interventions and gain time.

As a final consideration, since the initial request in May, the Group has worked to address the 3 questions posed by the Commission. We have managed to learn from how many of the MS are addressing and responding to the challenges from the COVID-19 pandemic, and we have managed to conduct a detailed analysis of the information shared by 4 MS (Portugal, Ireland, Germany and Spain). Although this has proven useful to identify possible well worth changes to

the eHDSI PS, which are dully documented in the present paper, the Group feels that it needs more time to keep track of the evolution of the current crisis and consequently the actions being taken by the different MS, before promoting final recommendations.

As such, the recommendation the Group can provide at this point to the eHN is in the form of the insights presented in this Lessons Learned paper, whilst also recommending that for the next 6 months we continue to monitor these events, before publishing a set of final lessons learned and from this derived recommendations.

This should also provide the Group with the opportunity to better address the secondary use of data.

ANNEX 1

Table 1 - Overview of missing data entities:

Section	Portugal	Ireland	Germany	Spain
Advance directives			[do-not-resuscitate-status] (SNOMED-CT)	
Plan of care / Procedures during treatment			Therapy, also current procedures (ECMO, intensive care, type of ventilation, abdominal position, dialysis, apheresis) (SNOMED-CT, HL7)	Treatment of disease, type of ventilation and position (SNOMED CT)
Results (labs and imaging)	Laboratory test (test, specimen, substance, result) LOINC	2.3.11 Clinical Measurements (SNOMED-CT) 2.3.12 Clinical Observations (SNOMED-CT) 2.3.21 Taking of Swabs 2.4. Laboratory test details (Specimen, test, substance, result)	[type of imaging procedure + result/ finding] (SNOMED-CT), Specific lab measures+result (LOINC) Neurological assessment	Yes, Imaging reports (type of exam, result) Laboratory test (test, specimen, substance, result) (SNOMED CT)

Definitions of these additional sections can be taken from the IPS standard. Before implementing IPS related sections in the eHDSI PS, further work must be done to define the type of information and underlying valuesets to be transferred in the additional sections.

Table 2 - Overview of missing data entities:

Section	Portugal	Ireland	Germany	Spain
Travel History		2.3.4. Recent travel abroad (SNOMED CT)	History of travel	Yes (SNOMED CT)

Risk factors	Risk associated with diagnosis (ICD9CM, ICD10CM)	2.3.17 Known risk factors (SNOMED-CT)		Yes, Known risk factors (SNOMED-CT)
Demography			Ethnicity, Frailty Score, body weight, body height (SNOMED-CT)	
Epidemiological factors	Contact or exposure with infected person (ICD10CM) Suspected or risk of infection (ICPC-2)	2.3.3 / 2.3.16 Exposure confirmed (SNOMED CT) 2.3.6 start of isolation	Contact with infected person	Exposure, contact with case, environment of recent contact (SNOMED CT)
Complications		2.3.15 Complication 2.3.17 Known risk factors 2.3.18 Comorbidities (all SNOMED-CT)	Co-morbidities, problems during hospital stay (ICD-10, SNOMED-CT)	Comorbidities, disease caused by (SNOMED CT)
Onset of illness / admission	Yes (ICPC-2; ICD9CM; ICD10CM)	2.3.8 Admission to hospital (SNOMED CT; ICD10AM)	Stage at admission (SNOMED-CT)	Yes (SNOMED CT)
Outcome on discharge		2.3.22 Positive Assessment Outcome (SNOMED-CT)	Respiratory outcome, final lab test, Type of discharge (home, death, other care institution) (LOINC, SNOMED-CT)	Yes, test outcome (SNOMED CT)
Study participation (Imunization – clinical trial)			Yes	Yes, immunization (SNOMED CT)
Symptoms + severity (problems section)	Symptoms (ICPC-2; ICD9CM; ICD10CM)	2.3.9 Symptoms 2.3.10 Severity (all SNOMED-CT)	Additional symptoms and severity (SNOMED-CT)	Symptoms and signs observed (SNOMED CT)

Travel History

This section covers generic information regarding traveling in the near past. It is not presumed to cover contact tracing or specific information to trace back the mobility of a patient (f. ex. to record town/city/country/airport, flight number, seat number and date information for all international and local travel).

Risk factors

This section will be used to record the known patient conditions which may increase the risk of the patient being especially vulnerable to the COVID-19 disease, which are NOT specific diseases to be summarized in the "history of (active or past) problems" (Diabetes, Respiratory Diseases, Oncological Diseases, Chronic Lung Diseases) or consequences of a procedure performed noted in "history of procedures" (organ transplanted) Examples of this section can be: "Smoking habits", "DNA characteristics" or more generic remarks as "risk of infection" or "immunodeficiency".

Demography

The "demography" section covers patient information, which is currently not hold in the eHDSI or IPS patient summary information. This additional information helps also to identify particularly vulnerable patients and is needed to initiate the proper therapy. Examples are ethnicity or a frailty score, body weight or body height.

Epidemiological factors

This section contains information about exposure or contact to persons considered at risk, the necessary information to assess whether there was a risk of contagion or transmission chains.

Complications

The "complications" section contains the information to record a secondary disease, problem or condition occurring during treatment or observation period in addition or aggravating the main thread, in this context the COVID-19 disease. These problems are consecutive to the "history of problems".

A complication, or medical complication, is an unfavorable result of a disease, health condition, or treatment. Complications generally involve a decline in severity of disease or the development of new signs, symptoms or pathological changes, which may become widespread throughout the body and affect

other organ systems. Information on abnormal condition resulting from a COVID-19 disease and comorbidities should also be considered.

Onset of illness / admission

The "Onset of illness / admission" section identifies whether the patient matches the health case definition and clinical description for COVID-19 on admission as a starting point of the "inpatient / outpatient therapeutical journey of the patient".

In addition to the "problem", this section includes more specific information on the stage, status or the severity of the given diagnosis.

Outcome on discharge

The "Outcome on discharge" section defines the ending point of the "therapeutical journey of the patient". It contains a set of information to describe the status of the patient when leaving the hospital or daycare setting.

Examples for structured information are "Type of discharge", "Respiratory outcome", "Result of subsequent smear", "Recommended treatment" and "Disease surveillance and control".

Study participation

This section covers information whether a patient is during his therapy enrolled in a study, which may be an interventional clinical trial or an observational study. This section can be seen as a link to other sources as study registries or electronic case report form repositories.

Symptoms + severity

The "Symptoms and severity section" represent physical or mental features which are regarded as an indication of a condition or disease, particularly those features that are apparent to the patient.

In addition to the observation also the "severity" is documented, representing the quality of the observation or condition.

The "severity" may be recorded for each symptom, or as a general statement of their disease state. Further information as onset or offset dates are to be recorded here.

ANNEX 2

List of Semantic Resources and EU-Member States implementation activities

EU-level

[Research Data Alliance](#)

[EU COMMISSION](#)

https://ec.europa.eu/info/live-work-travel-eu/health/coronavirus-response_en

<https://ec.europa.eu/digital-single-market/en/content/digital-technologies-actions-response-coronavirus-pandemic>

https://ec.europa.eu/health/ern/covid-19_en

International

[Virus Outbreak Data Network \(VODAN\)](#)

Standard Development Organizations

Covid-19 Interoperability Alliance

<https://covid19ia.org/>

<https://covid19ia.org/useful-links/>

<https://covid19ia.org/downloads/>

The COVID-19 Interoperability Alliance is a collaborative effort between healthcare industry stakeholders to provide a collection of value sets for clinical, demographic, and administrative concepts relating to the COVID-19 pandemic.

[HL7](#)

<https://confluence.hl7.org/display/CR/COVID-19+Response+Home>

<https://covid-19-ig.logicahhealth.org/>

Regenstrief

[LOINC and SARS Coronavirus 2](#)

[LOINC Prerelease Terms for special use](#)

[Allocation of LOINC and SNOMED Codes to specific IVD-Tests](#)

SNOMED International

[SNOMED CT and COVID-19](#)

<https://confluence.ihtsdotools.org/display/snomed/SNOMED%2BCT%2BCOVID-19%2BRelated%2BContent>

[COVID-19 Data Coding using SNOMED CT](#)

<https://confluence.ihtsdotools.org/display/DOCCV19>

WHO

[COVID-19 coding in ICD-10](#)

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance>

Member states

Not all Member States provided feedback or where able to present semantic sources at the time of data collection. Updating of the list for missing member states can be addressed after eHN-Meeting.

Belgium

COVID-19 in authentic source for laboratory codes

The ReTaM lab code table management tool is a visual (and searchable) representation of the authentic source for laboratory codes.

It has been developed and is hosted by eHealth. The unique source for lab codes could not be realized but for the longstanding and unabated support for standardization by the FOD Volksgezondheid - SPF Santé Publique.

This authentic source is –wherever possible – based on LOINC. However, as for a number of common concepts multiple applicable LOINC codes exist, and for some others LOINC codes do

not yet exist, choices have been made. Also a sequential numerical code (so-called Albert code) is attributed to each concept, so concepts without a preferred LOINC code can still be uniquely referenced.

https://www.vas.ehealth.fgov.be/webretam/retam/home.htm?eventName=SEARCH&htmlfield_searchon=sars&htmlfield_searchin=all

COVID-19 with ICD-10-BE in National Minimal Dataset

Coding of COVID-19 within National Minimal Dataset using ICD-10-CM interim guidelines
<https://www.cdc.gov/nchs/data/icd/interim-coding-advice-coronavirus-March-2020-final.pdf>

Additional coding: The ICD-10-CM code U07.1 will be automatically coded by the Federal Public Service of Health, Food Chain Safety and Environment based on coupling datasets (National Minimal Dataset with NIHDI), in order to limit administrative burden for health providers.

Identification code for COVID-19 patients in nomenclature of NIHDI (National institute for health and disability insurance)

793800: COVID-19-Patiënt (N 0)

https://www.riziv.fgov.be/nl/covid19/Paginas/spoedgevallen-intensieve-zorg-covid19-afdelingen-ziekenhuizen.aspx#Verstrekkingen_voorbehouden_voor_COVID-pati%C3%ABnten:_duidelijke_identificatie_via_de_code_793800

https://www.riziv.fgov.be/fr/covid19/Pages/urgences-soins-intensifs-unites-covid19-hopitaux.aspx#Des_prestations_r%C3%A9serv%C3%A9es_aux_%C2%AB_patients_covid_%C2%BB_clairement_identifi%C3%A9s_via_le_code_793800

Epidemiologic follow-up of COVID-19

Sciensano, the Belgian institute for health, is responsible for the epidemiological follow-up of the COVID-19 epidemic in collaboration with its partners and other healthcare actors. The data collected can provide insight into the dynamics of the epidemic, help to anticipate different scenarios and to elaborate possible measures to curb the spread of the virus. To achieve its mission, Sciensano has reinforced or set up different surveillance systems.

A description of the variables is available in the codebook: <https://epistat.wiv-isp.be/Covid/#Data>

SNOMED CT COVID-19 concepts in Belgian National Release of SNOMED CT (BE-NRC)

Concepts <https://confluence.ihtsdotools.org/display/snomed/SNOMED+CT+COVID-19+Related+Content> added and translated in Belgian release
<https://browser.ihtsdotools.org/?perspective=full&conceptId1=404684003&edition=MAIN/SNOMEDCT-BE/2020-03-15&release=&languages=en,nl,fr>

SNOMED CT COVID 19 interface terms for General Practitioners

Interface terms for General Practitioners were added to thesaurus and mapped to SNOMED CT and from SNOMED CT to ICD-10 and ICPC-2.

Czech Republic

Covid information pages of the MoH: <https://koronavirus.mzcr.cz/> (english version is available)

Covid outbreak data for the Czech Republic: <https://onemocneni-aktualne.mzcr.cz/covid-19>
(Czech only)

More Covid reports can be found here: <https://www.uzis.cz/index.php?pg=covid-19>

ICD-10 (MKN-10) classification of Covid cases is being used to collect information about Covid cases. Data are reported by laboratories and regional Public health authorities and stored in the National Healthcare Information System (NZIS). All publications are using data from this source.

Following ICD-10 codes has been added:

U07.1	COVID–19, virus laboratorně prokázán
U07.2	COVID–19, virus nebyl laboratorně prokázán
U69.75	Podezření na COVID-19

National standard for lab. test codes (derived from NPU) includes following new Covid-related codes (however Covid cases are being reported for epidemiological purposes using a simplified coding system):

19922	Anti-SARS CoV-2 IgG (P; arb. konc. [arb.j.] *)
19923	Anti-SARS CoV-2 IgG (S; arb. konc. [arb.j.] *)
19924	Anti-SARS CoV-2 IgM (P; arb. konc. [arb.j.] *)
19925	Anti-SARS CoV-2 IgM (S; arb. konc. [arb.j.] *)
19930	Antigen viru SARS CoV-2 (P; přítomnost [-]*)
19931	Antigen viru SARS CoV-2 (P; přítomnost [-]ICHR)
19932	Antigen viru SARS CoV-2 (S; přítomnost [-]*)
19933	Antigen viru SARS CoV-2 (S; přítomnost [-]ICHR)
19934	RNA viru SARS CoV-2 (SPCORL; přítomnost [-] *)
19935	RNA viru SARS CoV-2 (SPCORL; přítomnost [-] PCR)
19936	RNA viru SARS CoV-2 (SPCRESP; přítomnost [-] *)
19937	RNA viru SARS CoV-2 (SPCRESP; přítomnost [-] PCR)
19938	Anti-SARS CoV-2 IgG (P; arb. konc. [arb.j.] IA)
19939	Anti-SARS CoV-2 IgG (S; arb. konc. [arb.j.] IA)
19940	Anti-SARS CoV-2 IgM (P; arb. konc. [arb.j.] IA)

19941	Anti-SARS CoV-2 IgM (S; arb. konc. [arb.j.] IA)
50355	Anti-SARS CoV-2 IgA (B; arb. konc. [arb.j.] *)
50356	Anti-SARS CoV-2 IgA (B; arb. konc. [arb.j.] Imunochromatografie)
50357	Anti-SARS CoV-2 IgA (P; arb. konc. [arb.j.] *)
50358	Anti-SARS CoV-2 IgA (P; arb. konc. [arb.j.] IA)
50359	Anti-SARS CoV-2 IgA (P; arb. konc. [arb.j.] Imunochromatografie)
50360	Anti-SARS CoV-2 IgA (S; arb. konc. [arb.j.] *)
50361	Anti-SARS CoV-2 IgA (S; arb. konc. [arb.j.] IA)
50362	Anti-SARS CoV-2 IgA (S; arb. konc. [arb.j.] Imunochromatografie)
50363	Anti-SARS CoV-2 IgG (B; arb. konc. [arb.j.] *)
50364	Anti-SARS CoV-2 IgG (B; arb. konc. [arb.j.] Imunochromatografie)
50365	Anti-SARS CoV-2 IgG (P; arb. konc. [arb.j.] Imunochromatografie)
50366	Anti-SARS CoV-2 IgG (S; arb. konc. [arb.j.] Imunochromatografie)
50367	Anti-SARS CoV-2 IgM (B; arb. konc. [arb.j.] *)
50368	Anti-SARS CoV-2 IgM (B; arb. konc. [arb.j.] Imunochromatografie)
50369	Anti-SARS CoV-2 IgM (P; arb. konc. [arb.j.] Imunochromatografie)
50370	Anti-SARS CoV-2 IgM (S; arb. konc. [arb.j.] Imunochromatografie)
50371	Antigen viru SARS CoV-2 (P; přítomnost [-] IA)
50372	Antigen viru SARS CoV-2 (S; přítomnost [-] IA)
50373	Antigen viru SARS CoV-2 (Vzorek z oblasti "ORL"; přítomnost [-] *)
50374	Antigen viru SARS CoV-2 (Vzorek z oblasti "ORL"; přítomnost [-] Imunochromatografie)
50375	RNA viru SARS CoV-2 (Likvor; přítomnost [-] *)
50376	RNA viru SARS CoV-2 (Likvor; přítomnost [-] PCR)
50377	Anti-SARS CoV-2 IgA+IgM (P; arb. konc. [arb.j.] *)
50378	Anti-SARS CoV-2 IgA+IgM (P; arb. konc. [arb.j.] IA)
50379	Anti-SARS CoV-2 IgA+IgM (S; arb. konc. [arb.j.] *)
50380	Anti-SARS CoV-2 IgA+IgM (S; arb. konc. [arb.j.] IA)
50381	Anti-SARS CoV-2 IgM+IgG (B; arb. konc. [arb.j.] Imunochromatografie)
50382	Anti-SARS CoV-2 IgM+IgG (P; arb. konc. [arb.j.] Imunochromatografie)
50383	Anti-SARS CoV-2 IgM+IgG (S; arb. konc. [arb.j.] Imunochromatografie)

Finland

<https://thl.fi/en/web/infectious-diseases/what-s-new/coronavirus-covid-19-latest-updates>

Map application on corona cases: (also in English): The application displays the confirmed corona cases in Finland, the incidence of cases; in other words, the number of cases per 100,000 residents by area, cases by municipality, cases by age group, cases by gender, number of performed tests by hospital district.

<https://experience.arcgis.com/experience/92e9bb33fac744c9a084381fc35aa3c7>

A mobile contact tracing app used on a voluntary basis and compliant with data protection legislation can help stop chains of infection caused by the coronavirus. The app will allow people

to participate in and influence the prevention of coronavirus infections and to protect their own and their loved ones' health. It is ready for use 31.8.2020.

<https://thl.fi/en/web/infectious-diseases-and-vaccinations/what-s-new/coronavirus-covid-19-latest-updates/transmission-and-protection-coronavirus/contact-tracing-app-will-help-stop-chains-of-infection>

Finland has ICD-10 COVID-19 diagnose codes and also one ICPC-2 code in use, national codes for laboratory tests and -results and also national classification for radiology

Germany

German Initiative for Data Sharing on COVID-19 Information: [CoCoS \(Covid Components Standard\)](#)

Datamodel for CoCos in ARTDECOR (Datamodel and Semantics): <https://art-decor.org/art-decor/decor-datasets--covid19f-?id=&effectiveDate=&conceptId=&conceptEffectiveDate=>

REST interface to download data model <https://art-decor.org/decor/services/RetrieveDataSet?id=2.16.840.1.113883.3.1937.99.61.65.1.1&language=en-US&format=xml> (+ '&download=true' für download xml, further formats to be downloaded please see <https://art-decor.org/mediawiki/index.php?title=URIs>)

FHIR implementation please see <https://simplifier.net/forschungsnetz-covid-19>
Implementation guide <https://simplifier.net/guide/german-corona-consensus-dataset-implementation-guide/home>

Central Registry for Corona Patients for research purposes: <https://leoss.net/>

Repository on COVID activities in Germany:
<https://gitlab.gwdg.de/medinfpub/medicalinformatics-covid19/-/blob/master/README.md>

Corona warning app:

<https://play.google.com/store/apps/details?id=de.rki.coronawarnapp>

<https://apps.apple.com/de/app/corona-warn-app/id1512595757>

Hungary

Central webpage about the national Covid19 situation:

<https://koronavirus.gov.hu>

Covid-19 coding and data information:

In Hungary using ICD10 code system the following codes are used in the national dataset regarding Covid-19:

U07.1 Covid-19 identified

U07.2 Covid-19 virus not identified

Using the above ICD10 codes all national health care institutes are sending EHR reports, while microbiology laboratories are sending results of PCR test to the National eHealth Services Systems marking the result as negative or positive.

All results are available and accessible in a .pdf document.

Hospital-level data collecting reporting system has been established regarding Covid-19 data.

Further, the National eHealth System provides for the Hungarian health institutes a central ordering system for pandemic protection materials and devices (gloves, masks, detergents, etc.).

Application:

Personal Quarantine Supervisor application used by the law enforcement bodies also provides report about the quarantine state of the patient – it reports periodically self-provisioned health status (symptoms, vital parameters) to National eHealth System.

A new structured Covid e-status document is also under development. This document has to be sent by all health professionals if they provide health service to a Covid infected or Covid-suspicious patient.

Ireland

A dataset specification for the patient assessment data set for Assessment, Testing, Contact Tracing & Management through the HSE CovidCare Tracker (CCT) and Patient Hub Management during the COVID-19 pandemic has been developed by the Irish National Release Centre (NRC): <https://www.hse.ie/eng/services/news/newsfeatures/covid19-updates/covid-19-dataset-specification-for-patient-assessment-and-tracking.pdf>

Netherlands

Formal website for the Netherlands with all known data sources on COVID-19:

[COVID-19 Data sources](#)

Website with SNOMED, LOINC and ICD-10 codes for the Netherlands:

[COVID-19 work in Terminology Center at Nictiz](#)

Hospitals preparing for 2nd wave: <https://www.registratieaandebbron.nl/events-en-nieuws/klaar-voor-de-tweede-golf>

Portugal

Coding advice: https://www.ctc.min-saude.pt/wp-content/uploads/2020/06/NormalizacaoRegistoCOVID_v3.0_15062020.pdf

Slovakia

Following ICD-10 codes has been added:

U07.1 COVID-19 confirmed by laboratory testing irrespective of severity of clinical signs or symptoms

U07.2 COVID-19 diagnosed clinically or epidemiologically but laboratory testing is inclusive or not available

Following LOINC codes has been added:

94500-6

94508-9

94506-3

94507-1

94505-5

94547-7

94558-4

Slovenia

WHO ICD-10 coding used in national COVID-19 register (Public health authority NIJZ, Center for Communicable Diseases).

Laboratory test results are currently only reported in non-structured manner (pdf). All microbiology labs are submitting pdf reports to the national EHR system (Central Registry of Patient's Data).

Code U07.1 COVID-19, virus identified' is planned to be used in national Patient Summary. Microbiology labs have developed the APIs to report Patient Summary records but the reporting is temporarily banned by Ministry of Health and Public Health authority due to privacy concerns (fear of leakage of information and stigmatizing infected patients).

COVID-19 dataset (registry) by public health authority NIJZ available at https://webgate.ec.europa.eu/fpfis/wikis/display/eHN/COVID-19+Semantic+Sources?preview=/522879100/546276980/COVID-19_Dataset_Slovenia_EN.xlsx

Spain

SNOMED CT as Reference Terminology for COVID-19 and SARS-CoV-2 (Spanish)

- https://www.mscbs.gob.es/profesionales/hcdsns/areaRecursosSem/snomed-ct/SNOMED_CT_COVID-19.htm - Updated 13.07.2020

Conceptos relacionados con COVID-19 - PDF (Spanish)

- https://www.mscbs.gob.es/profesionales/hcdsns/areaRecursosSem/snomed-ct/SNOMED_doc/Conceptos_relacionados_SARS-CoV-2-Version7.0.pdf 13.07.2020

Concepts related to COVID-19 - PDF (English)

- https://www.mscbs.gob.es/profesionales/hcdsns/areaRecursosSem/snomed-ct/SNOMED_doc/Conceptos_relacionados_SARS-CoV-2_en.pdf 13.07.2020

Browsers for COVID-19 concepts - HTML + JS (Downloadable) (Bilingual es+en) - Update 13.07.2020

- https://webs.somsns.es/cnr/Visor_SARS-CoV-2K.htm
- https://webs.somsns.es/cnr/Visor_SARS-CoV-2.htm

eHN COVID-19 Tracing Apps Protocol – Spain – Work in progress

- <https://trello.com/b/a3fwK5Uj/ehn-covid-19-tracing-apps-protocol-spain-work-in-progress> (English)
- Defining “Positive for COVID-19” card: <https://trello.com/c/4zITKLF7> (Spanish)

Sweden

- Sweden has published coding guidelines and FAQs for coding of COVID-19 cases using ICD and national classifications (in Swedish): <https://www.socialstyrelsen.se/globalassets/sharepoint-dokument/dokument-webb/klassifikationer-och-koder/kodning-av-covid-19.pdf>
- Snomed CT concepts related to COVID-19 have been translated to Swedish
- NPU Terminology lab codes for COVID-19 tests have been developed and translated to Swedish (in Swedish): <https://mailchi.mp/equalis/equalis-nyhetsbrev-anvndarmte-patientnra-analyser-5154225>
- National quality registers have been amended to allow COVID-19 related variables to be collected in structured form.
- Infrastructure for citizen COVID-19 health data registration was set up using semantic standards, but has so far not been deployed.
- Infrastructure for direct reporting of microbiology findings from laboratories to stakeholders such as the patient, other care providers, and the Public Health Agency of Sweden is partly in place for many health regions, semantic standards were being piloted when the pandemic started.