

Provision of Options and Recommendations for an EU Citizens' Vaccination Card

Excerpt from Final report Data collection and mapping for an EU citizens' vaccination card

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1. Digital vaccination cards: interoperability considerations

Summary

To develop a EVC that is portable and inclusive of all countries, we considered the interoperability of Immunisation Information Systems (IIS) and The Patient Summary that is currently designed in the eHealth Digital Service Infrastructure (eHDSI) for cross-border cooperation.

dVCs need to be 'portable' and in the custody of the citizen to enable cross-border use. 'Portability' of dVC relates to sharing of vaccination data (e.g., into local or remote, public, or private repositories) at the initiative, and under the control of, the citizen. 'Global availability' of vaccine data relates to the real-time fetching of foreign data by the health professional (the aim of the eHDSI Patient Summary). Both require some level of interoperability, but not with the same constraints. eHDSI was designed to enable health professionals to retrieve information about patients in other countries and was not designed to involve nor empower the citizen, as is expected from the dVC. While vaccination is recorded in eHDSI, it is not a major consideration – the eHDSI patient summary places it focus on other areas. eHDSI is particularly strong for emergency care for example. While there are many differences in purpose, there are many technical similarities in execution. The two initiatives each bring value and should coexist, sharing technical building blocks so that the dVC and eHDSI systems are developed and strengthened without duplication of effort.

IIS in different European countries are not interoperable as they have evolved separately to support the provision of vaccinations in different epidemiological contexts, health systems, and languages. As they were developed individually at the Member State level as opposed to through a pan-European effort, they are not aligned at either the semantic or structural levels and therefore cannot exchange information. While no country is mandated to do so, interoperability would bring value at both the national and European levels and could be supported by developing and then adopting commonly agreed standards that align IIS, enabling them to exchange information. Structural interoperability could be supported by consistent use of HL7 CDA and HL7 FHIR standards. We found that HL7 CDA and HL7 FHIR standards emerged as the common ground between different systems. Semantic interoperability could be improved by developing vaccination codes that use both a local, context dependent descriptor (e.g., pharmaceutical code) in addition to a range of descriptors that are characteristic both across borders and over time. We found that most IIS coded vaccines using national pharmaceutical codes. While this coding works at the national level it does not work across borders which presents a challenge to both the portability and global availability of vaccine data. **To be inclusive of the continually evolving range of vaccination descriptors, dVCs will need to handle both historical and/or 'foreign' data**.

A dVC and pVC will need to coexist to ensure any VC is inclusive of all citizens. The dVC needs to be presented to citizens using a 'rendering system' that tailors the information displayed to purpose, audience, and in-line with local immunisation policy. Some existing Immunisation Information Systems (IIS) present a citizen portal that may be considered as an approximation of the rendering for the dVC. Yet, they do not propose any kind of portability.

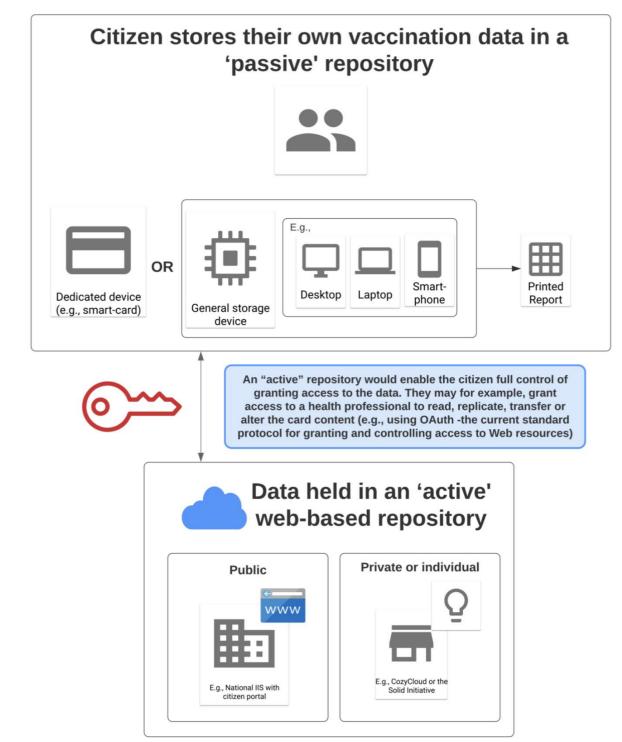
1.1. Definitions and issues

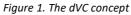
1.1.1. Definition of the dVC

dVC need to be 'portable' and in the custody of the citizen to enable cross-border use. 'Portability' of dVC relates to sharing of vaccination data (e.g., into local or remote, public, or private repositories) at the initiative, and under the control of, the citizen. To exercise the right to portability as is stated in Article 20 of the GDPR, the citizen must have the control of the access to their own data.

Here we view the dVC as a pivoting platform that takes information from data repositories (such as IIS) and renders it to citizens. We did not find any examples of dVC that enabled citizens to take ownership of the data by granting permission to health professionals to access and edit their vaccination information (our vision) but we did identify several features of IIS systems that rendered information to citizens in a way that could provide inspiration for the design of a citizen-focused dVC. Here, in order to gain insights for VC development, we therefore include any system where digitalised vaccination history was made <u>available to the citizen</u> through access either on mobile or computer, including printouts from Electronic Health Records (EHR) or Immunisation Information Systems (IIS). IIS that did not enable access by citizens were <u>not included.</u>

Our vision of the dVC concept is illustrated in Figure 1: Citizens can store their own vaccine data 'at home' in a 'passive repository' – a storage system which would enable viewing but not editing of the vaccine information. This could be a device (e.g., smart-card, computer, or smartphone) or simply a paper card. This data would also be stored in one or several 'active repositories' – data system(s) within which content can be modified. This repository could be a public system (e.g., a national IIS) or a private initiative, and the citizen would be able to decide how the information could be shared. They would for example have the authority to grant access to the data to health professionals who could choose to upload a CDA file from the national IIS of their origin country, and transfer it to the software of their General Practitioner, enabling them to view the information, store it on their system (e.g., an EHR), and edit it (e.g., add a new vaccine administered to the record).





More information about the examples CozyCloud and the Solid Initiative can be found on their websites (16) (17).

1.1.2. Rendering of the dVC

In essence, when we refer to the dVC, we are referring to a technical exchange format, or a 'pivot' format, between a variety of information systems. This can be considered in terms of the following elements:

- "dVC document" a portable format that enables the vaccine information to be carried by the citizen.
- "dVC protocols" which define the interactions between different systems.
- "dVC infrastructure" which includes:
 - "Repositories" in which data is stored
 - "Rendering servers" that provide a human readable representation of a dVC. These can be developed to allow different user functions to be built in to meet different needs in different contexts, i.e., they can be 'contextualised'.

A number of functions can be built into a renderer. For example, in most contexts the provision of immunisation history, information on vaccination, and vaccination reminders would be useful functions for a citizen. The functions built into rendering servers need to be in line with the needs in a specific context, for example with the rules defined by the local National Immunisation Technical Advisory Group (NITAG). While the NITAG would encode the rendering system with the rules, at the other side the information would be rendered to the citizen that was tailored to their specific needs. To ensure tailoring to the needs of a particular citizen, they would be asked to provide some information (e.g., profile data) to the server. The interface, or 'rendering' piece of the dVC would then aim to deliver the information to the citizen in a user friendly and inclusive way that aimed to ensure equitable access : While a digital card would have many benefits over a physical card in terms of tailoring information to diverse audiences (as is discussed in previous sections), having a pVC for access would also be necessary to ensure access for all. This physical card would be provided by a rendering or contextualisation server (e.g., the IIS of their place of residence) and could for example be printed locally or sent through the mail from a trusted authority. Citizens would hold this card and would then be able to use it to grant access to officials (e.g., health professionals or public health authorities) in other administrative areas (e.g., different countries) when their vaccinated record was needed. Health professionals would then be able to use the data via their local EHR system or an IIS (Figure 2).

A system rendered in this way should lead to citizen empowerment. By having access to their personal vaccination information and guidance on local vaccination policy (e.g., scheduling) citizens would likely be more informed and enabled to play a more active role in managing their vaccinations. By managing the sharing of their personal data, citizens will also feel more in control which may help to ameliorate some of the concerns expressed by those opposed to vaccination.

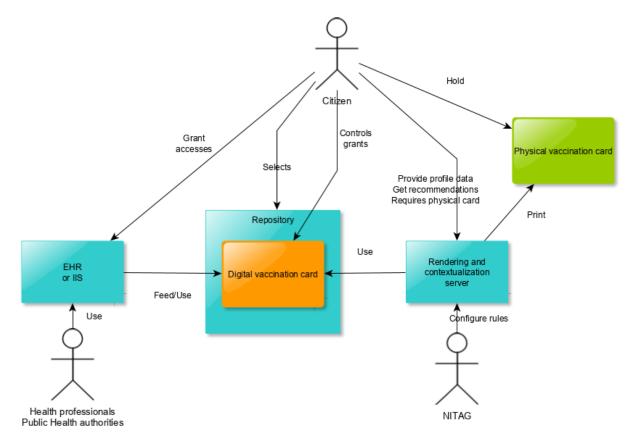


Figure 2. Interaction between EHR, active repository, and contextualization server

1.1.2.1. Semantic interoperability

In this section we discuss semantic interoperability in relation to any kind of pre-existing vaccination records, either within a physical vaccination card (pVC), an Immunisation Information System (IIS) or a general-purpose Electronic Health Record (EHR). The pVC handles only a subset of the data elements held in an IIS. This is both because of the different origins and purposes of pVCs and IIS, in addition due to feasibility considerations: space on a pVC is limited and it is not possible to continually change data elements as it necessitates the development of a new card version. pVC hold information on the vaccine recipient, in addition to vaccination events:

- Vaccine recipient related data (name, age, gender, etc.): An identity check should take place when the dVC holder provides the card in-person. Traditionally, these types of identity checks are based on name, surname, birthplace, and birthdate. This basic information should therefore be incorporated into physical cards, while more detailed information will be held on the IIS.
- Vaccination event related data: The date of administration and the name of the vaccine administered are essential, as is information about the vaccine provider for vaccination records that are used as 'proof' of vaccination (e.g., for travel). Other information such as batch number and expiry date, route and site of vaccine administration may also be collected. Existing designations used to code the vaccine administered are diverse, and particularly variable across different languages and countries (see Box 6). Labels and descriptive terminology need to facilitate accurate vaccine identification by both healthcare professionals and citizens. This includes alternative or related vaccine names and dates of availability of the product (e.g., from a string of characters or a batch number, presentation of vaccines marketed on a given date).

Some semantic interoperability challenges have already been addressed (e.g., alternative calendars) by all administrative information systems, but many remain. The most critical challenge in terms of a dVC is that existing international standards for vaccine coding are insufficient. Although they are insufficient, they are not redundant however, and we recommend basing any new dVC system as much as possible on standards that are already commonly used. This will enable past efforts to be capitalized upon, for example, the eHDSI plans to rely on a combination of SNOMED-CT and ATC as its Master Value Set for vaccines (for more information on SNOMED-CT and ATC see Box 6). We suggest that the eHDSI relies upon a more global, vaccine dedicated code system. Our vision is that both eHDSI and dVC document producers use the same dictionaries to transcribe from the locally used code systems to this global reference.

1.1.2.2. Structural interoperability

For different IIS and EHR to read, update or create a dVC, systems need to be structurally interoperable. Two kind of exchange formats exist:

- 1. **Transaction oriented exchange** (for interactions between the IIS and third parties). This category is quite diverse and lays upon the pre-existing infrastructures for exchanging medical information: KMEHR (Belgium), FMK (Denmark), ebXML (Norway) HL7v2 (US), etc. More recent systems, e.g., the Lithuanian ESPBI or Portuguese eBoletim de Vacinas, use HL7 FHIR resources and interactions.
- 2. **Document oriented exchange**, where the underlying transaction is a content neutral exchange protocol. HL7 CDA profiles are used except for the FHIR based systems that use FHIR bundles.

Box 6. Variation in coding for vaccines in paper and digital systems

We observe variations by:

- Brand name e.g., the same quadrivalent vaccine manufactured at a single production site by the same manufacturer (GSK) in Europe is BoostrixTetra in France, Polioboostrix in Italy and Boostrixpolio in Belgium.
- Antigen designation e.g., "DT-IPV" (Diphtheria-Tetanus-Poliomyelitis) or DTaP (Diphtheria-Tetanus-Acellular pertussis)
- Vaccine preventable disease designations, such as "Pertussis" or "Hepatitis B".
- Abbreviations for monovalent or combined vaccines
- Conjugation protein for vaccines against encapsulated bacteria

In digital systems, codes are defined within each country and to our knowledge, there is no international terminology capable of coding both brand names of active and inactive vaccines as well as generic names of antigens or vaccine preventable diseases in most languages and countries in all EU Member States and EEA countries, plus other countries identified to be of particular interest by vaccine experts. Examples of mechanisms used include:

- Drug delivery encoding scheme used by the health insurance system (e.g., CIS in France, CNK in Belgium, PZN in Austria, NPAKID in Lithuania, etc.).
- International codes (e.g., ATC, SNOMED-CT, CVX). ATC only addresses target diseases or antigens, with a rather imprecise information (e.g. J07BD01 encodes "measles, live attenuated"). SNOMED-CT provides a short description in a limited number of languages. This description lacks granularity and precision, so this terminology does not allow for a proper assessment of the vaccine protection of individuals, mixes up valences and dose ranks, and in its native form does not handle brands, which are often reported on paper records.
- Local extensions of international codes (e.g., SNOMED-CT variants). UK and Canada have implemented local extensions to make SNOMED CT more specific, but these extensions are only in English (UK) or English and French (Canada) and include only active vaccines branded in the country
- Totally specific coding systems. CVX (USA) is available only in English. This vaccine code set combines antigen and manufacturer information (through an additional MVX code), which requires specific encoding tweaks when product portfolios are acquired, and it is limited to vaccines commercialized in the US.

Special focus point on vaccine designations

BoostrixTetra vaccine includes four antigens: diphtheria toxoid "d" (the lowercase letter "d" indicates a reduced antigen content, the uppercase letter "D" indicates a normal antigen content), the tetanus toxoid "T", the pertussis antigens "ap" (for acellular pertussis, reduced antigen content; there is also an antigen called "aP" that indicates a normal antigen content). A vaccine with reduced content ("d" and/or "ca") is used in adults, adolescents or older children properly primed with "D" or "Ca". The ATC code of Boostrixtetra is "J07CA02", which is a "diphtheria-pertussis-poliomyelitis-tetanus vaccine": this code does not differentiate between pediatric and adult antigens ("d" and "D"; "ca" and "D"). Without this information, in many situations it will not be possible to assess the level of protection of a person who has received this vaccine; it will also be difficult to predict the type of vaccine to be used for the next dose (and its date of administration).

Shingles vaccine is SCTID 722215002 "Administration of herpes zoster vaccine" in SNOMED CT coding. This description does not inform the user of the difference between the live vaccine from MSD and the inactivated vaccine from GSK, while this knowledge is crucial both to assess the putative efficacy of the vaccine and its contraindications.

1.2. dVC and the patient summary of eHDSI

The eHDSI is a network of national contact points in eHealth (NCPeH) that can transfer information between one another at the national system level, and convert data from the national level so that it can be used at the local level (e.g., an EHR). Rather than creating a separate system and duplicating efforts, we propose that any dVC utilises the same machinery for conversion as eHDSI in order to leverage and strengthen existing efforts. Some considerations are listed below:

- The dVC and eHDSI both propose 'pivot' formats that can be produced or consumed by any IIS. The eHDSI patient summary format includes a Vaccination section within the History of past illness section in its extended (optional) data set. Here, vaccination events are recorded with their date, brand name, vaccine code (SNOMED-CT or ATC) and target disease.
- The patient summary is a transient format that flows in real-time between National Contact Points for eHealth, while the dVC is a persistent format stored and exchanged under the control of its owner the citizen. This difference in use necessitates differences in format. The dVC is a living document that evolves with its owner during his whole lifetime. It will need to include vaccination records from many sources (including information systems that do not exist yet) and be tamper proof to prevent fraud.
- Digital signatures are needed for the integrity of each individual record and of the assembly. Such a feature does not exist in the
 interoperability standards that are defined for the instantaneous transmission between two trusted systems, so some adaptation
 will be required.
- eHDSI does not use or produce dVCs but to it makes sense to align the systems and not duplicate efforts using the same conversion elements, such as vaccine designation terminology. By adopting the same terminology, the interoperability of information systems through eHDSI will determine their ability to generate dVCs (Figure 3).

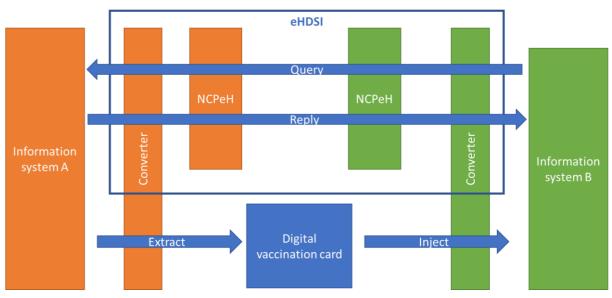


Figure 3. dVC and eHDSI

In current eHDSI specifications (value set eHDSIVaccine dated of June 17th,2020), the representation of vaccines is a value set gathering codes from the SNOMED International version and from the WHO ATC classification. The ATC codes have been added only since April 22nd, 2020. A structured ontology like the ones implemented in the Danish IIS Det Danske Vaccinationsregister (DDV) or the French IIS MesVaccins would be more relevant, either as a standalone European initiative or a SNOMED-CT extension (provided that the SNOMED-CT licensing issues have been solved).

1.3. dVC and IIS

As no portable dVC currently exists, IIS with citizen portals constitute the best existing approximation we have of a dVC. Health information systems, including IIS, may play either the role of the producer or the consumer in relation to the dVCs. For example, they may:

- Produce dVCs based upon its own records
- Receive dVCs from people entering a national health system
- Perform reconciliation of divergent versions of a dVC
- Act as an active repository for dVCs deposited by citizens
- Act as a renderer for dVCs
- Act as a contextualization system to provide personalized recommendations based upon the NITAG rules.

These interactions will be described, and possible technical protocols will be proposed in D9.3.

It is likely that in time, IIS will emerge to be a producer of pVC as opposed to a consumer. This can already be seen in countries where the IIS has reached a sufficient level of maturity (e.g., Norway), where the independent pVC has disappeared due to its lack of utility. In these settings if there is a specific need for a physical record (e.g., administrative proof of vaccination or travel abroad), health facilities may deliver stamped printouts of the IIS contents upon request.

The two aspects of the IIS that we have observed from existing systems to be the most relevant when it comes to the handling of VCs, are the encoding of vaccines and the technical format they already use when communicating with other information systems.

Table 37 summarizes the findings on the different IIS. More detailed information collected for each country is presented in Section 7.4.

		Exchange		Va	ccine product encod	ings	
	System	format	PharmaCode	ATC	SNOMED-CT	CVX/MVX	Custom
AT	ELGA	CDA	PZN	Х			
BE	Vaccinnet	KMEHR	CNK	Х			Х
HR	CEZIH		JLL				
CZ	ZOPIK						
DK	DDV	FMK		Х			Х
EE	DIGILUGU	CDA		Х			Х
FI	Rokotus Rekisteri	JSON	NAN	Х			Х
FR	DMP	CDA	CIS	Х			
FR	MesVaccins	FHIR					NUVA
EL	AIFY						
HU	EESZT						
IT	ANV	XML	AIC				Х
LT	ESPBI	FHIR	NPAKID				
МТ	MyHealth	CDA		Х			
NL	Praeventis						
РТ	E-Boletim de Vacunas	FHIR	Х		International		
RO	RENV						Х
SI	eRCO		CBZ		International		
ES(AN)	Diraya						Х
SE	NVR		NPL-ID				
UK	eRedBook				Extension		
US	MIROW guides	HL7v2	NDC			Х	
CAN	CANImmunize				Extension		CVC
AU	AIR		AMT				Х
IS	Heilsuvera			Х			
NO	SYSVAK	ebXML		X			X
СН	MesVaccins	CDA		Х			Х

Table 37. Exchange formats and vaccine product encodings for different systems

1.4. Country-level information

This section summarizes the information collected from February 2020 until May 2020 among 35 countries (all EU Member States and EEA countries, plus other countries identified to be of particular interest by vaccine experts).

The collection process was hindered by the unavailability of public health authorities during the first COVID-19 peak. Most of the information was found online, although a few elements were provided from an unpublished survey driven by the EU Joint Action on Vaccination (EU-JAV).

As a result, for 9 countries, no evidence of an existing IIS could be found at that time: Bulgaria, Cyprus, Germany, Ireland, Latvia, Luxembourg, Poland, Slovakia, and Lichtenstein. Some of these 9 countries have initiated the implementation of an IIS since May 2020, with the primary objective of tracking COVID-19 vaccination, and with a secondary benefit of improving the monitoring of other vaccine preventable diseases. These solutions did not deviate from the standards already implemented in some other countries.

The 26 countries analyzed provide a clear view of the diversity of, and commonalities between existing solutions. The precision and completeness of the data collection was sufficient to allow for the identification of best practices. These will be discussed further in D9.3.

Summary	ELGA (elektronische Gesundheisakte) is a general EHR system accessible both to professionals and citizens. It is still under deployment. Within ELGA a pilot project for the dVC (e_Impfass) has been initiated in June 2018.	
Syntax	SyntaxThe data exchange format is CDA profile Immunization Content.SyntaxTwo formats have been standardized: one for the full vaccination status of an individual, and one documenting a change in the vaccination status.	
Citizen identity	Citizens connect using a citizen e-card delivered by their health insurance or a companion smartphone application. A new version of e-id card will be deployed in 2020. The CDA record contains a set of identity trails, including the Social Security Number and a specific identifier for health named bPk-GH.	
Vaccine designation	Vaccines are described with their name, PZN code, lot number, serial number, manufacturer, ATC code, components, and dose. The value set for vaccines can be found at <u>https://termpub.gesundheit.gv.at/TermBrowser/gui/main/main.zul</u> , under category elmpf-Impfstoffe_VS. Codes are OIDs under root 1.2.40.0.34.4.16.1, corresponding to HL7 Austria. The vaccine identifier is the pharmaceutical code PZN. The target diseases are also documented with SNOMED-CT codes (Figure 4).	
Other terminologies used	SNOMED CT: identification of document and event type, of target disease, of antibodies, of past illnesses. LOINC: identification of sections in CDA document ATC: Vaccine antigens	
Additional information	-	
Rendering for citizens	No view was found, the access for citizens is not opened yet. This is planned and will constitute an additional example of a dVC.	
Sources	General presentation of ELGA: <u>http://www.elga.gv.at/en/about-elga/</u> dVC in ELGA: <u>https://www.elga.gv.at/e-impfpass/e-impfpass/</u> Technical documentation of dVC: <u>https://wiki.hl7.at/index.php?title=ILF:E-Impfpass</u> Citizen portal: <u>https://www.gesundheit.gv.at/</u> Citizen card: <u>https://www.buergerkarte.at/faq-karte.html</u>	

Table 38. Austria

Zur Kollaborationsumgebung	Publikationsumgebung Terminology-Browser	Received States and A Contractions and A Contractio
Code Systems Value Sets Search	Contents	
8 8 🤹	Value Set: elmpf_Impfstoffe_VS Version: 202003	
Name		
APPC_Anatomie_VS	_ Term	Code Source
APPC_Lateralitaet_VS	TETANOL PUR FSPR 0.5ML	0056489 elmpf_impfstoffe 202003.2 (1.2.40.0.34.4.16.1)
APPC_Modalitaet_VS	FSME-IMMUN FSPR 0.5ML NAD F	0514986 elmpf impfstoffe 202003.2 (1.2.40.0.34.4.16.1)
APPC_Prozeduren_VS	FSME-IMMUN FSPR 0.5ML NAD F	0515738 eimpf_impfstoffe 202003.2 (1.2.40.0.34.4.16.1)
DICOM_SOPClasses_VS	VAXIGRIP FSPR M.KANUELE	1076502 eimpf_impfstoffe 202003.2 (1.2.40.0.34.4.16.1)
elmpf_Antikoerperbestimmung_VS	SANDOVAC FSPR 0,5ML	1079021 eimpf_impfstoffe 202003.2 (1.2.40.0.34.4.16.1)
elmpf_Historischelmpfstoffe_VS	INFLUVAC FSPR 0,5ML	1258120 elmpf_Impfstoffe 202003.2 (1.2.40.0.34.4.16.1)
eImpf ImmunizationTarget VS	POLIO SALK MER SPRAMP	1260571 elmpf_Impfstoffe 202003.2 (1.2.40.0.34.4.16.1)
elmpf Impfdosis VS	INFLUVAC FSPR 0,5ML O.KANUEL	1265597 eimpf_impfstoffe 202003.2 (1.2.40.0.34.4.16.1)
✓ elmpf Impfgrund VS	ACT-HIB TRSTAMP +LSM	1276939 eImpf_Impfstoffe 202003.2 (1.2.40.0.34.4.16.1)
201908 (empfohlen)	DT-REDUCT MER FSPR 0,5ML	1290520 eimpf_impfstoffe 202003.2 (1.2.40.0.34.4.16.1)
elmpf ImpfrelevanteErkrankung VS	ENGERIX-B SPRAMP 10MCG	1292200 elmpf_Impfstoffe 202003.2 (1.2.40.0.34.4.16.1)
<pre>empl_implifieevanteErkrankung_v3 4 elmpf Impfrollen VS</pre>	HAVRIX FSPR 1440 ERW	1301057 elmpf_Impfstoffe 202003.2 (1.2.40.0.34.4.16.1)
	TWINRIX ERW 1ML FSPR	1304498 elmpf_Impfstoffe 202003.2 (1.2.40.0.34.4.16.1)
201908 (empfohlen)	TWINRIX KIND 0,5ML FSPR	1309515 eimpf_impfstoffe 202003.2 (1.2.40.0.34.4.16.1)
elmpf_lmpfschema_VS	HAVRIX FSPR 720 JUNIOR	1315496 elmpf_Impfstoffe 202003.2 (1.2.40.0.34.4.16.1)
201910 (empfohlen)	VARILRIX PLV+LSM	1316018 elmpf_Impfstoffe 202003.2 (1.2.40.0.34.4.16.1)
202001 (empfohlen)	PRIORIX IMPFDS	1325750 elmpf_Impfstoffe 202003.2 (1.2.40.0.34.4.16.1)
202003 (empfohlen)	VIVOTIF KPS	1329251 elmpf_Impfstoffe 202003.2 (1.2.40.0.34.4.16.1)
 elmpf_Impfstoffe_VS 	TYPHERIX IJLSG 25MCG/0,5ML FLUAD FSPR 0.5ML	1333991 elmpf_impfstoffe 202003.2 (1.2.40.0.34.4.16.1) 1349762 elmpf impfstoffe 202003.2 (1.2.40.0.34.4.16.1)
201911 (empfohlen)	HEVAXPRO SUS INJ 40MCG FLAES	1349762 elmpf_impfstoffe 202003.2 (1.2.40.0.34.4.16.1) 1350268 elmpf impfstoffe 202003.2 (1.2.40.0.34.4.16.1)
201912 (empfohlen)	ENGERIX-B SPRAMP 20MCG	1350268 eImpt_Imptstoffe 202003.2 (1.2.40.0.34.4.16.1) 1364721 eImpf Impfstoffe 202003.2 (1.2.40.0.34.4.16.1)

Figure 4. Vaccine designation, Austria

Summary	solution, while e-Vax The documentation	exist in Belgium: Vaccinnet for Flanders, E-Vax for V is said to have been derived from Vaccinnet in 2016 found regards Vaccinnet. Citizens have access to t is itself upon an API presented by the Vitalink system	, with the primary purpose to order vaccines. heir records through the My Health Viewer		
Syntax	The transfer format is XML, accessed through REST services under a message syntax named KMEHR (Kind Messages for E-Health Records), promoted by the Smals association.				
Citizen identity	The citizen is identified by its family name, first name, social security identity number (INSZ), and optionally an additional insurance identifier (RIZIV number). It accesses the My Health Viewer portal with his e-ID card.				
Vaccine designation		sed to represent vaccines. By decreasing order of pr cific code	iority, they are: A pharmaceutical code, CNK;		
Other terminologi es used	ATC; A Vaccinnet specific code No other terminology has been identified.				
	-	kthrough described at <u>https://www.roeckoe.be/?p</u> n attained the list of vaccines is presented with adn (taken from user manual, versio O Medicatie Eevolkingsonderzoek	ninistration date, brand name and dose, and n 6.0 of May 2016). (see		
	18-01-2016	BOOSTRIX SER PREREMPL 1 X 0,5 ML	- Kinkhoest (pertussis) - Difterie (kroep) - Tetanus (klem)		
	18-01-2016	ALPHARIX TETRA 0,5ML SPUITAMP 2015	- Griep (influenza)		
Rendering for citizens	Vaccin Al Code 32 Code type Cl Toedieningsdatum 18	NK			
	03-11-2015	PREVENAR 13 SER PRE REMPL 1X0,5ML	- Pneumokok 13		
	03-11-2015	BOOSTRIX SER PREREMPL 1 X 0,5 ML	- Kinkhoest (pertussis) - Difterie (kroep) - Tetanus (klem)		
	03-11-2015 Figure 5)	ENGERIX B 20 SER IM 1 ML	- Hepatitis B (geelzucht)		
	U ,	pro.be/spip.php?article1461)			
Sources	https://www.vitalink.be/vaccinatiegegevens-delen https://www.vitalink.be/sites/default/files/atoms/files/Safe_Cookbook_Vaccinaties_v4.pdf https://www.ehealth.fgov.be/standards/kmehr/en/transactions/vaccination-report				
	https://www.smals.b https://en.wikipedia. https://www.roecko	org/wiki/KMEHR			

Table 39. Belgium

By selecting a row, additional information is unfolded, with the vaccine code and the administration date again. The user can obtain a PDF printout.

Vaccinaties	Medicatie Sevolkingsonderzoek(en)	🛓 John Doe 🕁
18-01-2016	BOOSTRIX SER PREREMPL 1 X 0,5 ML	- Kinkhoest (pertussis)
		- Difterie (kroep)
		- Tetanus (klem)
18-01-2016	ALPHARIX TETRA 0,5ML SPUITAMP 2015	- Griep (influenza)
03-11-2015	PREVENAR 13 SER PRE REMPL 1X0,5ML	- Pneumokok 13
03-11-2015	BOOSTRIX SER PREREMPL 1 X 0,5 ML	- Kinkhoest (pertussis)
		- Difterie (kroep)
		- Tetanus (klem)
03-11-2015	ENGERIX B 20 SER IM 1 ML	- Hepatitis B (geelzucht)
03-11-2015	CERVARIX AMP SER 1X0,5ML	- Papillomavirus (HPV 16, 18)
03-11-2015	IMOVAX POLIO SER. 0,5 ML	- Polio (kinderverlamming)
06-08-2013	PRIORIX-TETRA FL INJ DOS 1 X 0,5 ML	- Mazelen
🔖 Vaccinaties	Medicatie Sevolkingsonderzoek	(en) 💄 John Doe 🦷
18-01-2016	BOOSTRIX SER PREREMPL 1 X 0,5 ML	- Kinkhoest (pertussis) - Difterie (kroep)
		- Kinkhoest (pertussis)
		- Kinkhoest (pertussis) - Difterie (kroep)
18-01-2016	BOOSTRIX SER PREREMPL 1 X 0,5 ML	- Kinkhoest (pertussis) - Difterie (kroep) - Tetanus (klem)
18-01-2016 18-01-2016 Vaccin	BOOSTRIX SER PREREMPL 1 X 0,5 ML ALPHARIX TETRA 0,5ML SPUITAMP 2015	- Kinkhoest (pertussis) - Difterie (kroep) - Tetanus (klem)
18-01-2016 18-01-2016 Vaccin Code Code type	BOOSTRIX SER PREREMPL 1 X 0,5 ML ALPHARIX TETRA 0,5ML SPUITAMP 2015 ALPHARIX TETRA 0,5ML SPUITAMP 2015 3258282 CNK	- Kinkhoest (pertussis) - Difterie (kroep) - Tetanus (klem)
18-01-2016 18-01-2016 Vaccin Code	BOOSTRIX SER PREREMPL 1 X 0,5 ML ALPHARIX TETRA 0,5ML SPUITAMP 2015 ALPHARIX TETRA 0,5ML SPUITAMP 2015 3258282 CNK 18/01/16	- Kinkhoest (pertussis) - Difterie (kroep) - Tetanus (klem) - Griep (influenza)
18-01-2016 18-01-2016 Vaccin Code Code type	BOOSTRIX SER PREREMPL 1 X 0,5 ML ALPHARIX TETRA 0,5ML SPUITAMP 2015 ALPHARIX TETRA 0,5ML SPUITAMP 2015 3258282 CNK	- Kinkhoest (pertussis) - Difterie (kroep) - Tetanus (klem) - Griep (influenza)
18-01-2016 18-01-2016 Vaccin Code Code type	BOOSTRIX SER PREREMPL 1 X 0,5 ML ALPHARIX TETRA 0,5ML SPUITAMP 2015 ALPHARIX TETRA 0,5ML SPUITAMP 2015 3258282 CNK 18/01/16 Voor de interpretatie van uw vaccinaties: re	- Kinkhoest (pertussis) - Difterie (kroep) - Tetanus (klem) - Griep (influenza)
18-01-2016 18-01-2016 Vaccin Code Code type Toedieningsdatum	BOOSTRIX SER PREREMPL 1 X 0,5 ML ALPHARIX TETRA 0,5ML SPUITAMP 2015 ALPHARIX TETRA 0,5ML SPUITAMP 2015 3258282 CNK 18/01/16 Voor de interpretatie van uw vaccinaties: re Deze gegevens zijn aangeleverd van uw	- Kinkhoest (pertussis) - Difterie (kroep) - Tetanus (klem) - Griep (influenza)
18-01-2016 18-01-2016 Vaccin Code Code type Toedieningsdatum 03-11-2015	BOOSTRIX SER PREREMPL 1 X 0,5 ML ALPHARIX TETRA 0,5ML SPUITAMP 2015 ALPHARIX TETRA 0,5ML SPUITAMP 2015 3258282 CNK 18/01/16 Voor de interpretatie van uw vaccinaties: ra Deze gegevens zijn aangeleverd vanuit PREVENAR 13 SER PRE REMPL 1X0,5ML	- Kinkhoest (pertussis) - Difterie (kroep) - Tetanus (klem) - Griep (influenza) addpleeg uw arts. t Vaccinnet. - Pneumokok 13
18-01-2016 18-01-2016 Vaccin Code Code type Toedieningsdatum 03-11-2015	BOOSTRIX SER PREREMPL 1 X 0,5 ML ALPHARIX TETRA 0,5ML SPUITAMP 2015 ALPHARIX TETRA 0,5ML SPUITAMP 2015 3258282 CNK 18/01/16 Voor de interpretatie van uw vaccinaties: ra Deze gegevens zijn aangeleverd vanuit PREVENAR 13 SER PRE REMPL 1X0,5ML	- Kinkhoest (pertussis) - Difterie (kroep) - Tetanus (klem) - Griep (influenza) aadpleeg uw arts. t Vaccinnet. - Pneumokok 13 - Kinkhoest (pertussis)

Figure 5. Rendering of the Belgian system

1.4.3. Bulgaria

A paper published in 2015¹ that provides an overview of Bulgarian e-Health states that the creation of an EHR for each Bulgarian citizen will be undertaken within the next five years, and that it will be accessible through a national e-Health portal that should be be opened in 2019. The site ehealth-bg.org of the e-Health Bulgarian foundation quoted in this paper is no longer accessible.

In June 2019, within a survey driven by EU JAV WP5, Bulgaria confirmed that they had not implemented an IIS.

1.4.4. Croatia

Summary	In September 2019, within a survey driven by EU JAV WP5 (personal communication), Croatia indicated that they had not implemented an IIS. Yet some information was found online: The Croatian Health Insurance Fund (HZZO) has set up a national EHR system named CEZIH. A patient portal eHZZO allows access to the stored data. At this stage it seems that vaccination information is not accessible, but discharge letters and prescriptions are.
Syntax	-
Citizen identity	The citizen is identified through their health insurance number (MBOO)
Vaccine designation	A specification document including the transaction for declaring adverse events mentions the substance code as coming from a Unique list of drugs (Jedinstvena lista lijekova). Most likely it uses the national

¹ Stanchev P. and Foteva E. Bulgarian E-Health Overview. DOI: 10.5220/0005889900870092. In Proceedings of the Fourth International Conference on Telecommunications and Remote Sensing (ICTRS 2015), pages 87-92

	pharmaceutical code.
Other terminologies used	-
Rendering for citizens	Not relevant yet.
Sources	<u>https://www.hzzo.hr/ehzzo/</u> <u>https://www.hzzo.hr/e-gradani/hzzo-za-e-gradane/</u>

Table 40. Croatia

1.4.5. Cyprus

No IIS was found for Cyprus.

1.4.6. Czechia

Summary	A national eHealth strategy report was issued in 2016. It excludes the creation of a centralized information system by the state. Instead, eHealth is conducted through private initiatives with the government only having the role of orientation and urbanization. One of the objectives stated in the report is easy access to personal medical records by citizens, using a National Health Information Portal. A specific portal for child records exists at zopik.info. It allows individuals to record their vaccines and those of their children, and get recommendations for the next vaccinations. The application is self-contained and does not seem to exchange with third party systems. Thus, no technical specification was found on encodings.
Syntax	-
Citizen identity	-
Vaccine designation	-
Other terminologies used	-
Rendering for citizens	Recorded vaccination events are presented as a timeline of past and future vaccination events (Figure 6)
Sources	https://zopik.info/

Table 41. Czechia

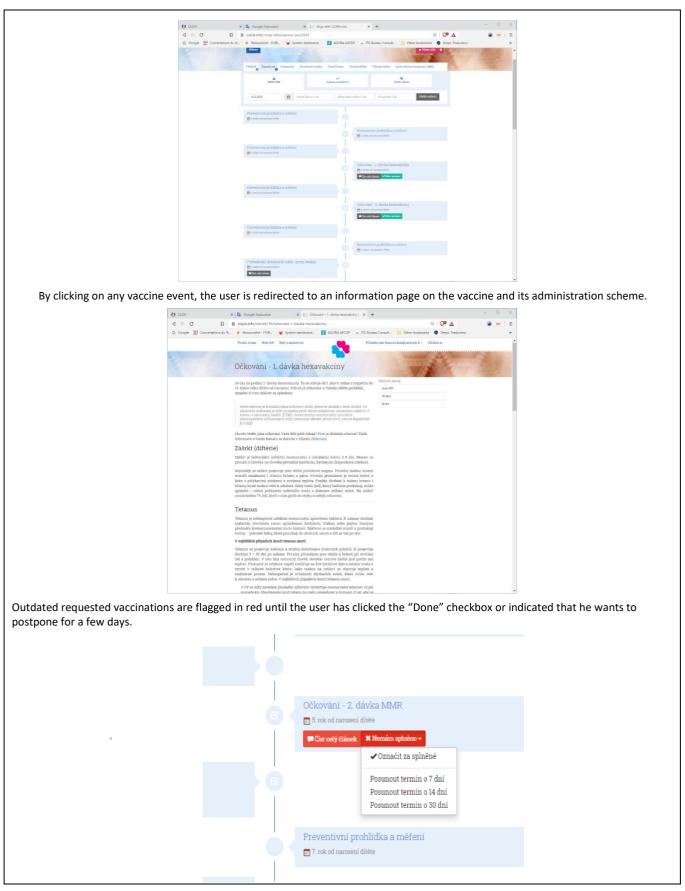


Figure 6. Rendering of the IIS for citizens in Czechia

Summary	"Det Danske Vaccinationsregister" (DDV), theStatens Seruminstitut , is responsible for operating the DDV which contains all vaccinations since November 15th, 2015. To support it, access rights for health professionals were extended twice in 2017. Residents have access through portals (FMK-online.dk and Sundhed.dk) or a mobile application (Min Laege, that is "My Doctor"). They can register their own vaccinations, for example when performed abroad.
Syntax	The standard for interaction is defined for the Faelles MedicinKort (FMK – Shared Medicine Card) as a set of Web services to handle XML documents.
Citizen identity	Individuals are identified with his civil registration identifier, a 10 digit number consisting of his birthdate and a sequence number.
Vaccine designation	The data structure for representing vaccines, diseases and vaccination plans is provided in Figure 7. A vaccine here is the link between a single drug and one or several diseases. Details of each table can be found at: <u>https://www.nspop.dk/pages/releaseview.action?pageld=66414473</u> . Each vaccine is uniquely identified with a Vaccine ID specific to the dataset, and characterized with an ATC Code, validity intervals, its name and potential synonyms, a description as a string of valences (e.g. Di-Te-Ki-Pol-HepB). Several vaccines can use a same ATC Code.
Other terminologies used	-
Additional information	For each vaccination: Report administrative details; Credibility of report (depending upon the origin and validation process); Batch number; Coverage duration; Dosage option; ConfirmedByPrescriptionServer; ActiveStatus; IsPrevious; NegativeConsentIndicator; Insurance and reimbursement details.
Rendering for citizens	Figure 8 illustrates the mobile application "Min Laege", a general-purpose application for interaction with health professionals (Q&A, videoconference, appointments, vaccinations, care plans)
Sources	https://web.archive.org/web/20190803005619/https://sundhedsdatastyrelsen.dk/vaccinationsregister https://wiki.fmk.netic.dk/doku.php https://wiki.fmk.netic.dk/doku.php?id=fmk:ddv:1.4.0:getvaccinationcard https://wiki.fmk.netic.dk/doku.php?id=fmk:ddv:1.4.0:vaccine https://www.nspop.dk/pages/releaseview.action?pageId=66414473 https://sundhedsdatastyrelsen.dk/da/borger/selvbetjening_og_services/min_laege_appen

Table 42. Denmark

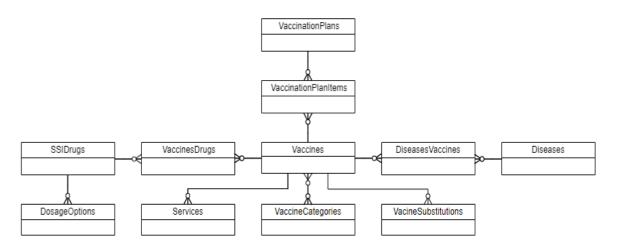


Figure 7. Vaccine designation in Denmark.

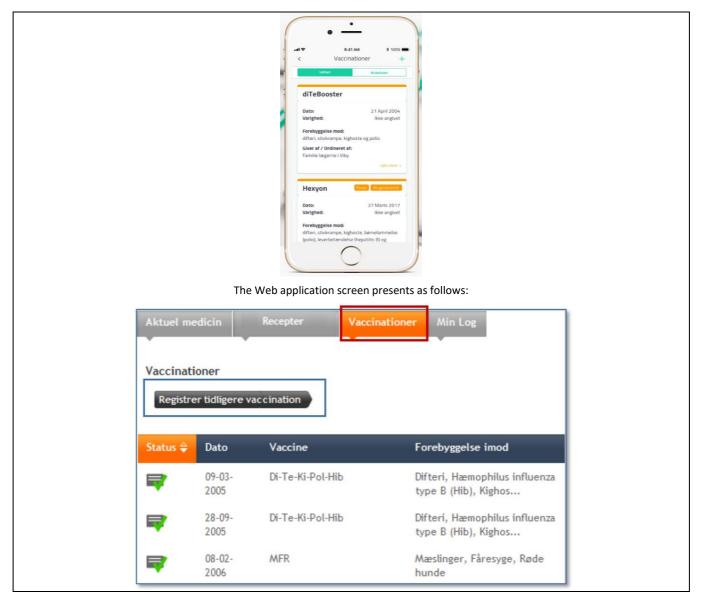


Figure 8. Rendering for citizens in Denmark

Summary	The Estonian administration is highly digitized. Citizens can access their health records through the ePatient portal at <u>https://www.digilugu.ee/</u> yes access to vaccination records appears to be incomplete (see <u>https://news.err.ee/1054714/end-date-for-digitalization-of-vaccination-information-still-unclear</u>)
Syntax	CDA formats have been defined for the notification of a newimmunisation event and for a completeimmunisation passport. Samples and style sheets are available in the study database, including a sample translated from Estonian to English. Most OIDs identifying the data items are taken under the IANA Private Enterprise Number (PEN) of the Estonian e-Health Foundation (1.3.6.1.28284).
Citizen identity	Composed of an OID for the national authority (typically Estonia) and a personal identification number, complemented with given name and family name.
Vaccine designation	The vaccine product may be identified by its ATC code and by its brand name
Other terminologies used	SNOMED-CT is used to identify the data element for next immunisation.
Additional information	For each immunisation event the following are recorded: Target diseases (one or several, national encoding); Batch number; Dose; Dose rank; Performing entity and person (including an external reference to a descriptive document); Planned date for next immunisation if any.
Rendering for citizens	No screen capture was found.
Sources	https://www.digilugu.ee/ http://web.archive.org/web/20190905203922/https://pub.etervis.ee/ https://news.err.ee/1054714/end-date-for-digitalization-of-vaccination-information-still-unclear

Table 43. Estonia

Summary	The National Institute for Health and Welfare (THL) operates an IIS that is fed by local EHR systems from the public sector (predominant in Finland) through the AVOHILMO infrastructure. Citizen access should be opened in the future through the My Kanta Pages (Omakanta) portal.
Syntax	My Kanta Pages content will be made available through FHIR webservices.
Citizen identity	The citizen is identified through their nationwide personal identity number.
Vaccine designation	The vaccine is identified by an application specific code, complemented by brand name, generic name, ATC code, and pharmaceutical code (Nordic Article Number). The list of codes is available at https://koodistopalvelu.kanta.fi/codeserver/pages/classification-view-page.xhtml?classificationKey=1925&versionKey=2185
Other terminologies used	None were identified. For each administered vaccine: Batch number; Vaccination route; Vaccination site; Target diseases
Rendering for citizens	Vaccination information in Kanta Pages is currently accessible by selecting 'Vaccination events' from a list of all recorded medical encounters. No screen capture was found.
Sources	Introduction: https://thl.fi/en/web/vaccination/vaccination-coverage/national-vaccination-register Overview: https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2017.22.17.30520 HILMO documentation: http://www.julkari.fi/handle/10024/137178 Codesystem: https://koodistopalvelu.kanta.fi/codeserver/pages/classification-view-page.xhtml?classificationKey=1925&versionKey=2185 Instructionsforrecording: https://thl.fi/fi/web/infektiotaudit-ja-rokotukset/tietoa-rokotuksista/rokottamisen-vaiheet/rokotusten-kirjaaminen Citizen access: https://www.kanta.fi/en/web/guest/my-kanta-pages

Table 44. Finland

Summary	Until now, the MesVaccins.net platform created and operated by SYADEM is the reference solution and has been subscribed by the health professional associations for several regions. Since May 2020, the possibility to register and view vaccination events has been added to the national EHR, Dossier Médical Partagé (DMP). Agence Numérique en Santé (ANS), formerly known as ASIP Santé, the governmental agency in charge of interoperability and standardization, has created a CDA template in collaboration with the MesVaccins team, as well as a FHIR specification to obtain vaccine recommendations from the MesVaccins recommendation engine. Note that the encodings chapter is based upon this standardization effort, while the Rendering is the one of MesVaccins. A mobile application named MesVaccins is also available.
Syntax	The dVC is a CDA document (profile Patient Care Coordination/Immunization Content). The link for its full specification is available in Sources below.
Citizen identity	The citizen is identified through a national health identifier, that is incidentally identical to social security number. It is complemented with name, surname, gender, birthdate, birthplace, address, and telephone number.
Vaccine designation	In the current version, the vaccine is identified with: The dispensation code (UCD) if it was administered within a hospital; The pharmaceutical code (CIS/CIP) if it was administered by a general practitioner, nurse, pharmacist, etc; The ATC code if it was administered abroad, and for future vaccinations. There is an ongoing effort to include the much more extensive NUVA terminology of MesVaccins within national terminologies. For now, data entry from a legacy VC is practically impossible due to a lack of appropriate codes.
Other terminologies used	LOINC and SNOMED-CT are used to characterize nodes in the CDA structure. LOINC is used for vital signs. ICD-10 is used for target diseases, past diseases, and adverse events.
Additional information	Other than the standard CDA headers (custodian, author, authenticator, encounter, etc.), there are many sections describing relevant factors for determining the vaccination decision: Past illnesses; Chronic diseases; Ongoing medications; Vital signs; Allergies; Pregnancy history; Social history; Refusal of vaccination. For each performed vaccination (Figure 9), the record contains: Performer, author; Route and site of administration; Dose quantity, dose rank; Batch number; Observed adverse effects. Recommended vaccinations (Figure 10 and Figure 11) are included with the target date, ATC code, route and site of administration, dose quantity and dose rank. Citizens can choose to share their information with health professionals (Figure 12).
Rendering for citizens	In MesVaccins Within a familial account, there are several cards. Each card his presented with four tabs (Figure 23).
Sources	https://esante.gouv.fr/sites/default/files/media_entity/documents/CI-SIS_CONTENUS_VOLET- VACCINATION_V3.1.pdf

Table 45. France

Mes carnets	Mon compte Ai	Nous contacter				
Modifier Supprimer	Né en 1963 (56 ans ½) Transférer vers un autre compte					
Vous recevrez des rapp	els par e-mail lors de vos échéances v	vaccinal	les.			
Vaccins reçus	Questionnaire santé Vaccins à	a faire	Partage du carnet			
Ajouter une vaccinatio	Imprimer					
Vaccins réalisés						
Date de l'acte 🔺	Vaccin utilisé	¢	Protège contre	¢	Lot	
11/02/1964 8 mois 23 jours	DTCoqPolio notice	٠	Diphtérie, Tétanos, Polio, Coq.			I I I I I I I I I I I I I I I I I I I
05/04/1965 1 an 8 mois	DTCoqPolio notice	Ŧ	Diphtérie, Tétanos, Polio, Coq.			I I I I I I I I I I I I I I I I I I I
26/04/1965 1 an 9 mois	DTCoqPolio notice	۲	Diphtérie, Tétanos, Polio, Coq.			I I I I I I I I I I I I I I I I I I I
01/06/1965 1 an 10 mois	VACCIN BCG notice	٠	Tuberculose			I I I I I I I I I I I I I I I I I I I
04/02/1967 3 ans 6 mois	TETRACOQ notice	٠	Diphtérie, Tétanos, Polio, Coq.			I I I I I I I I I I I I I I I I I I I
09/09/1970 7 ans 1 mois	TETRACOQ notice	۲	Diphtérie, Tétanos, Polio, Coq.			 ✓ ≜
14/06/1971 7 ans 10 mois	VACCIN BCG notice	٠	Tuberculose			Ø 🌶
12/10/1972 9 ans 2 mois	TETRACOQ notice	\oplus	Diphtérie, Tétanos, Polio, Coq.			I I I I I I I I I I I I I I I I I I I
25/06/1975 11 ans 11 mois	DTP (nom générique) notice	٠	Diphtérie, Tétanos, Polio			I I I I I I I I I I I I I I I I I I I
12/10/1979 16 ans	VACCIN BCG notice	٠	Tuberculose			I I I I I I I I I I I I I I I I I I I
09/10/1981 18 ans	DTP (nom générique) notice	۲	Diphtérie, Tétanos, Polio			I I I I I I I I I I I I I I I I I I I

Figure 9. Performed vaccines

	Né en 1963 (56 ans ½)			Sen savoir plus
lodifier Supprimer	Transférer vers un autre comp	ote		
us recevrez des ra	ppels par e-mail lors de vos e	échéances vaccinale	5.	
rofil santé enregi	stré le 30/10/2012 🥒 😫			
Antécédent de				
 Antécédent de Antécédent de 				
Aucune des pr	ofessions énumérées dans le	questionnaire		
Vaccins reçus	Questionnaire santé	Vaccins à faire	Partage du carnet	
Les			s inclus dans le carnet mais disp t/web/recommendations	onibles sur :
Ne cochez un item	que si vous êtes concerné, sinon	continuez à faire défil	er le questionnaire Et pensez à prome	ner la souris sur les 🕐 !
Antécéden				
😑 Malao	lies infectieuses			
			ur la rubéole, la varicelle et la rougeole e	en phase aiguë.
	Coqueluche depuis moins de :			
	Infection grave à pneumocoq	ue 🥨		
	Rougeole 🕜			
	Oreillons 🕜			
	Rubéole 🕜			
× .	Varicelle 🕜			
Autre	s antécédents			
	s antecedents			

Figure 10. Conditions for recommendations

difier		vers un autre com		P En savoir plus
srece	vrez des rappels par e	-mail lors de vos	s echeances vaccinaies.	
ofil sar	nté enregistré le 30/10)/2012 🧨 😫		
	écédent de varicelle écédent de rougeole			
Auci	une des professions ér	numérées dans le	e questionnaire	
accin	is reçus Question	naire santé	Vaccins à faire Partage du carnet	
				1. I
	Les conseils co		OVID-19 ne sont pas inclus dans le carnet mais dispon vww.mesvaccins.net/web/recommendations	ibles sur :
Vac	Les conseils co ccins à faire		www.mesvaccins.net/web/recommendations	iffichage par maladie
Vac			www.mesvaccins.net/web/recommendations	
Vad	ccins à faire	https://w	vww.mesvaccins.net/web/recommendations	.ffichage par maladie
Vad	ccins à faire Vaccin contre	https://w	www.mesvaccins.net/web/recommendations	.ffichage par maladie
Vac	ccins à faire Vaccin contre <u>Tuberculose</u>	https://w Doses reçues 3 doses	www.mesvaccins.net/web/recommendations	ffichage par maladie Prochaine dose
Vac O O	ccins à faire Vaccin contre Tuberculose Diphtérie	https://w Doses reçues 3 doses 10 doses	www.mesvaccins.net/web/recommendations ♪ Diagnostic À jour Prochain rappel : à 65 ans	ffichage par maladie Prochaine dose - 19/07/2028
Vac	ccins à faire Vaccin contre <u>Tuberculose</u> Diphtérie <u>Tétanos</u>	https://w Doses reçues 3 doses 10 doses 12 doses	Www.mesvaccins.net/web/recommendations Diagnostic À jour Prochain rappel : à 65 ans Prochain rappel : à 65 ans	ffichage par maladie Prochaine dose - 19/07/2028 19/07/2028

En cas de doute, consultez votre médecin.

Figure 11. Actual recommendations

Carnet de : J. Modifier Supprimer	Née en 1996 (23 ans Transférer vers un autre co				S En savoir plus
Vous recevrez des ra	appels par e-mail lors de v	os échéances vaccina	ales.		
Vaccins reçus	Questionnaire santé	Vaccins à faire	Partage du carnet		
Ce partage perme aussi d'officialiser	et au professionnel de gér r le carnet par la validatior	er votre carnet en aj n des dates des vacci oprimer l'accès à un	ous et un ou des professio outant les vaccins au fur et ins que vous avez déjà rens professionnel de santé. Vou	t à mesure de leur i seignées.	réalisation, mais
			Envoyer sur	🔉 🔋 🍓	
		Régénérer un	nouveau code 💡		
Donnez ce code a	aux professionnels de sant	é de votre choix. Mu	ni de ce code, ils pourront	importer ce carnet	et le gérer.

Figure 12. Control of shares with health professionals

		Vie	ew per date		
DM		ER MÉDICAL PART	AGÉ		19/07/1963 Me déconnecter
				ON DU DMP HISTORIQUE DES	ACCÈS
	Consultation du carnet de vaccination du carnet de vaccir	nation			
				Affichage des documents	Par date Par pathologie
Ajouter une vaccination					 Plus d'infos
Vaccinations	réalisées				
Date de l'acte 오	Nom du vaccin	Pathologie	Nom du vaccinateur	Vaccin ajouté ou modifié par	Actions
07/02/2012	REPEVAX	Diphtérie, Tétanos, Coqueluche, Poliomyélite	Inconnu		6
Télécharger mon carnet	de vaccination				
		View pe	er target disease	2	
				Affichage des documents	Par date Par pathologie
Ajouter une vaccination					Plus d'infos
	2 P 2				
Vaccinations r	éalisées				
Date de l'acte 🥥	Nom du vaccin	Nom du vaccinateur	Vaccin ajouté	ou modifié par	Actions
07/02/2012	REPEVAX	Inconnu			
Diphtérie Date de l'acte 😠	Nom du vaccin	Nom du vaccinateur	Vaccin ajouté	ou modifié par	Actions
07/02/2012	REPEVAX	Inconnu			
Poliomyélite					
Date de l'acte 🕞	Nom du vaccin REPEVAX	Nom du vaccinateur	Vaccin ajoute	e ou modifié par	Actions
Tétanos					
Date de l'acte 🥃	Nom du vaccin REPEVAX	Nom du vaccinateur	Vaccin ajouté	ou modifié par	Actions
DM		nput of a vaccina IER MÉDICAL PAR		he citizen)	19/07/1963 Me déconnecte
RÉCAPITULAT		ARNET DE VACCINATION	ES INFORMATIONS GEST	TION DU DMP HISTORIQUE DE	IS ACCÈS
<u>Carnet de vaccination</u> » Ajout d'une v					
Date de la vaccination*					* Champs ob
14/07/2020					
Nom du vaccin *					
		ection à Hæmophilus influenzæ B, Po à Hæmophilus influenzæ B, Poliomyé			
NEISVAC - Infection à					
		atite B, Infection à Hæmophilus influe	inzæ B,		
PREVENAR 13 - Infec	tion à Pneumocoque		-		
Nom du vaccinateur *					
Ajouter Annuler					

Figure 13. Rendering for citizens – DMP

1.4.11. Germany

There is no evidence of an IIS in Germany. The closest equivalent is the population monitoring tool KV-Impfsurveillance developed by the Robert Koch Institute, but it handles only pseudonymised data.

1.4.12. Greece

Summary	In September 2019, within a survey driven by EU JAV WP5 (personal communication), Greece confirmed that they had not implemented an IIS. Home information was found online however, and is presented here.
Syntax	Citizens have access to their e-health records through website e-syntagografisi.gr. It is a comprehensive set of information with their caregiver list, management of access rights, diseases, allergies, social habits (profession, smoking, alcohol), growth graphs and vaccination. No technical information was found on the encodings that could be used to exchange with other systems.
Citizen identity	•
Vaccine designation	-
Other terminologies used	-
Rendering for citizens	Two tables list the vaccination dates, one for adult vaccines, the second one for children vaccines. A third one allows to enter free text for other vaccinations (Figure 14)
Sources	Citizen portal (e-prescription): <u>https://www.e-syntagografisi.gr/p-rv/p</u>

Table 46. Greece

Εμβολιαστική κάλυψη ενηλίκων			
<u>Χρονοδιάγραμμα εμβολιασμών για ενήλικα</u> Εμβόλια για ενήλικες σε ειδικές ομάδες ατ		κίνδυνο	
EMBOΛIA	1η δόση	2η δόση	3η δόση
Γρίπης			
Τεττάνου, Διφθερίτιδας, ακυτταρικό Κοκκύτη (Td, Tdap)			
Ιλαράς, Παρωτίτιδας, Ερυθράς (MMR)			
Ανεμευλογιάς (VAR)		#	
Έρπητα Ζωστήρα			
Ιού ανθρώπινων θηλωμάτων (HPV)		m	
Πνευμονιόκοκκου συζευγμένο (PCV13)		11	
Πνευμονιόκοκκου πολυσακχ/κό (PPSV23)			
Μηνιγγιτιδόκοκκου συζευγμένο (MCV4)	**	m	
Ηπατίτιδας Α (HepA)	m	11	

Adult vaccines table

Χρονοδιάγραμμα εμβολιασμών για παιδιά- ΕΜΒΟΛΙΑ	<u>εφήβους</u> 1η δόση	2η δόση	3η δόση	4η δόση	5η δόση	1η επάν.
Ηπατίτιδας Β (HepB)						
Διφθερίτιδας, Τεττάνου, ακυτταρικό Κοκκύτη (DTap <7 ετών, Tdap >= 7 ετών)						
Αιμόφιλου ινφλουέντζας τύπου b (Hib)	m					
Πολιομυελίτιδας αδρανοποιημένο (IPV)						
Πνευμονιόκοκκου συζευγμένο (PCV13)	(#					
Πνευμονιόκοκκου πολυσακχ/κό (PPSV23)						
Μηνιγμπιδόκοκκου συζευγμένο (MCC, MCV4)						
Ιλαράς, Παρωτίτιδας, Ερυθράς (MMR)						
Ανεμευλογιάς (VAR)	#					
Ηπατίτιδας Α (HepA)						
			Children vacci	nes table		
ιοπτοί Εμβολιασμοί						
Ονομασία				1	Ημερομηνία Εμβολιασμού	Σχόλια εμβολιασμού
OPTAFLU (ANTICPINITIKO EMBONIO) INJU	IPC (15+15+15)MC	G/0 SML PESVR/186a	N PTV1 PECYDAD SMI		12/01/2018	

Figure 14. Greece, rendering for citizens

1.4.13. Hungary

Summary	The national eHealth database was launched in November 2017. It is accessible to citizens through a Patient Portal. Its module eProfile embeds the long-term medical records, including the vaccination history. No technical information was found on the encodings used to exchange with other systems. A request was sent to the infrastructure technical support on May 13 th and was not answered yet.
Syntax	-
Citizen identity	-
Vaccine	_
designation	
Other	
terminologies	-
used	
Rendering for	No screen layout was found for vaccinations. One for encounters is provided in Figure 15.
citizens	
_	Presentation: https://e-egeszsegugy.gov.hu/hu/web/eeszt-information-portal/
Sources	Portal: <u>https://www.eeszt.gov.hu/hu/nyito-oldal</u>

Table 47. Hungary

🇬 Önrendelkezés - l	Lakossági Pc 🕽	< \ +		-					x
← 🛈 🔒 https://w	ww.eeszt. gov. l	hu/hu/onrendelkezes?	p_p_id=eesztdorportlet_WAR_6	eesztdorportlet&p_	2 9096 C Q Keresés	☆ 自	↓ 🏫		=
			(EESZI Elektroniku Szolgáltatás	ıs Egészségügyi	DR. ALEXIN ZOLTÁN FERENC		0	
	FŐOLDAL	ÖNRENDELKEZÉS	NYILVÁNOS KÔDTÖRZSEK			v			
	Digitális önr	rendelkezés	Név: DR. ALEXIN ZOLTÂN F	FERENC TAJ					
- 1	Rendelke	zéseim kezelése	Személyes információk	Adatkezelési na	pló Értesítések beállítása				
	Napló Az alábbi felül	eten megtekintheti az a	adataival kapcsolatos korábbi l	ekérdezéseket. <u>Mi</u>	<u>ez?</u> ▼				Ξ.
	LEKÉRDEZ 2017.09.20		SZŰRŐMEZŐK ÜRÍTÉSE						
	2017.09.20	2	2017.09.22	Bezár 🔺					
	Dátum	Azonosító	Felhasználó	Intézmény	Funkció	Részletek			
	2017.09.22. 1		Állampolgár saját tevékenység		Önrendelkezés lekérdezése - Funkció befejez				
	2017.09.22. 1	.0:57:10	Állampolgár saját tevékenység	ge	Önrendelkezés lekérdezése	∑ <u>részletek</u>			
	2017.09.22. 1	0:56:53	Állampolgár saját tevékenység	ge.	OEP viszontazonosítás	≻ <u>részletek</u>			
	2017.09.21.2	1:22:17	Állampolgár saját tevékenység	ge	Önrendelkezés lekérdezése - Funkció befejez	ése > <u>részletek</u>			
	2017.09.21. 2	1:22:17	Állampolgár saját tevékenység	ge	Önrendelkezés lekérdezése	≻ <u>részletek</u>			
	2017.09.21.2	11:21:24	Állampolgár saját tevékenység	ge	Önrendelkezés lekérdezése - Funkció befejez	ése ≻ <u>részletek</u>			*

Figure 15. Encounters for vaccinations in Hungary

Summary	A School Immunisation System exists, but no access is open to the citizens. A Child Immunisation Tracker service has been supported by the private company IrishHealth.com but has now been discontinued.
Syntax	-
Citizen identity	-
Vaccine designation	-
Other terminologies used	-
Rendering for citizens	-
Sources	http://www.irishhealth.com/hold/index.html

Table 48. Ireland

1.4.15. Italy

Summary	Italy is currently implementing a national system, "Anagrafe nazionale vaccini" (ANV) (National vaccines registry) to gather and consolidate information from the regional information systems. Although it is updated only once per quarter, the encodings used are relevant for a VC.
Syntax	The transfer syntax is a custom XML, with three files representing: The demographic situation of the source region; the administered vaccines; and the non-administered vaccines. The corresponding XML schemas can be found at the site referenced in Sources.
Citizen identity	Registered Italian citizens are identified with their fiscal identifier (Codice fiscale). Alternative methods are described for European citizens, either with the European Health Insurance Card number or specific codes for temporary residents or refugees. In the flow sent to the national system, the identifier is encrypted. Additional information includes gender, birth date, city of registration and of residence, and nationality.
Vaccine designation	Vaccines are identified with their Italian market authorization code (AIC), or from a list of foreign vaccines available at: <u>http://www.dati.salute.gov.it/dati/dettaglioDataset.jsp?menu=dati&idPag=23</u> . Their description also includes the brand name, number of antigens, individual antigens (actually, one record is created for each antigen, meaning for example that 4 records are transmitted for a tetravalent vaccine), batch number and vaccine expiry date.
Other terminologies used	None
Rendering for citizens	Not relevant
Additional information	Vaccination health facility; Health conditions at risk; Administration way and site; Dose rank; Payment conditions; Reason for non-vaccination
Sources	http://www.salute.gov.it/portale/vaccinazioni/dettaglioContenutiVaccinazioni.jsp?lingua=italiano&id=5067& area=vaccinazioni&menu=vuoto

Table 49. Italy

1.4.16. Latvia

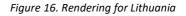
In June 2019, within a survey driven by EU JAV WP5, Latvia confirmed that they had no IIS implemented.

1.4.17. Lithuania

Summary	In July 2019, within a survey driven by EU JAV WP5, Lithuania replied that they had not implemented an IIS, yet detailed technical information was found online and is presented here. Lithuania has deployed ESPBI, a national health information system. A patient portal is accessible at <u>https://www.esveikata.lt/</u>
Syntax	ESPBI is exposed as a collection of FHIR resources. Documents are constituted as FHIR bundles (Atom feeds). Specifically, the E063 bundle forms a vaccination statement. The FHIR resources Immunization and ImmunizationRecommendation, such as described at http://hl7.org/fhir , are used.
Citizen identity	It is a detailed FHIR object, including the national identity number.
Vaccine designation	Vaccines are encoded using the pharmaceutical code NPAKID-7 and NPAKID.
Other terminologies used	As described in the FHIR resources.
Additional information	As defined in the FHIR Immunization resource: batch number, administration route and site, performer, adverse events, protocol applied, dose number, vaccine expiration date.
Rendering for citizens	The "Skiepy kalendorius" portlet redirects to the next vaccinations (Figure 16).
Sources	Technical documentation: <u>https://www.esveikata.lt/naujienos/0/21</u> Professional view: <u>https://specialistas.esveikata.lt/help/index.html?page=perzireti-skiepu-irasus-kalendoriaus-forma.html</u>

Table 50. Lithuania

Vardenis Pavardenis, 55 m., 150402-00004 *	Sveikatos duomenys 👻	Pranešima () Paciento srit
👤 Pacientas 🔍 👻	🛗 Sklepų kalendorlus 🛛 🗸 🗸	🗞 Paskutinė diagnozė 🛛 🗸 🗸
	Cholera 2015-04-10 Pagal poreiki Dretacen	J80 Úminis nazofaringitas [peršalimas] 2015-06-04
	Visi skiepai	Visos diagnozės
Vardenis Pavardenis, 1959-02-02 ESI Nr. 150330-00004 PSP gyódtolas: Vardas Pavardé	🖿 Pažymos 🔍 🗸 🗸	🛢 Alergijos 🗸 🗸 🗸
Všį Kauno Kalniočių polikinika	E047 Duomenys privalomai sveikatos patikrinimo medicinimei pažymai (Darbdavio atstove pildoma dalis)	Z28.2 Imunizacija, neatlikta pacientul atsisakius del kitų ir nepatikslintų priežasčių 2015-04-21 informacija
Visa informacija	Pateiktas pasirašymui Išduotas 2015-04-07	Z51.60 Alergenas, nepatikslintas
🛙 Paskutinis apsilankymas 🛛 🗸 🗸	E048 Asmens medicininė knygelė Pasirašytas Išduotas 2015-04-16 Galutinis	2015-03-31 Alergiją sukelianti medžiaga
Viešoji įstaiga Alytaus poliklinika Soimos gydylojas VARDAS PAVARDE 2016 08 04 08:11 - J. Http:	E048 Asmens medicininé knygelé Juodrašts Sukůré dír. pavaduotoja Vardes Pavardé	Z51.6 Desensibilizacija alergenams 2015-03-30 Alergiją sukolianti medžiaga Visos alergijos
Suvertina > Dokumenta () >	E647 Privalomo sveikatos patikrinimo 😋 🔹	
🕮 Aktyvūs siuntimai 💿 🛛 🗸 🗸	medicininé pažyma Juodrašts Sukūrė dir, pavaduotoja Vardas Pavardė	Všį Dainavos poliklinika
E027 Konsultacijos, tyrimų, gydymo siuntimas A39.8 Kitos meningokolų sukeitos infekcijos	Visos pažymos	Dél svekatos papitiomo patiturimo 2015- 02-22 2015-01-26 17:46
Konsultuoja: Gyd. kardiologas 2014-09-04 Gyd. kardiologas Vardas Parardé	🖹 Sveikatos istorijos suvestinė 🛛 🗸 🗸	Sistema
E027 Skuntimus skiepytis BCG vaccinę SSI 2014-08-30 Šeimosgytytojas Vantas Pavantė	Vardes Pavardé 2015-04-23 12:02 Viešo: jasica Hauso Dainavos politinika	Reikalingas paciento Vardas Pavardo sveikatos suvestinės sugeneravimas 2015-01-28 17:46
E014 Patologijos tyrimo užsakymas C00.3 Viršutinės lūpos vidinis paviršus	Suvestine	Medicinos gydytojas Vardas Pavardo 😨 Dėl sveikatos 2016-01-20 17/40 VS Deinavos polikinika
E014-ats Patologijos tyrimo atsakymas 2014-08-28 Šeimos grdytojas Verdes Pevarde		Visi gauti pranešimai
Visi sluntimai		
Lietuvos Respublikos		tainės medis Privatumo politika. Pagalba Kontaktai v1.0



1.4.18. Luxemburg

In a feedback e-mail sent on 28 April 2020, the Luxemburg eHealth agency confirmed that they were working on a dVC and had elaborated a proof of concept. Further demands for details were unsuccessful.

1.4.19. Malta

Summary	MyHealth is a national EHR for patients and doctors. It gives access to discharge letters, biology reports, medical imaging, appointments, patient summary. The vaccination report in the MyHealth portal shows vaccinations given by the National Immunisation Service since 1990, including those given from Health Centres and reported by private doctors, but excluding seasonal influenza vaccinations at Health Centres and tetanus vaccines given at Mater Dei or Health Centre emergency rooms. Patients who have old vaccination records may send them to the Government Immunisation Unit (immunisation@gov.mt) for inclusion.
Syntax	Malta was leading the patient summaries activity in the EU funded project epSOS, and thus uses CDA for international exchanges, but there was no evidence found about their local usage.
Citizen identity	The citizen is identified with his e-ID card.
Vaccine designation	From the presentation done at the ANTILOPE meeting of June 2014 and the screen capture that shows a very limited level of precision, the codification is most likely pure ATC.
Other terminologies used	No details found
Rendering for citizens	See Figure 17
Sources	https://myhealth-ng.gov.mt/

Table 51. Malta

Show only admini	stere	d	Show only scheduled	1				
Save as PDF		ave as CSV	OReport a Vaccination X Cle		ar All Filters			
Date administered	44	Vaccinations	s	11	Dose No.	Location of vaccination	Scheduled/Administered	
18/04/2001		DIPTHERIA, TETANUS, PERTUSSIS			1	GZIRA HEALTH CENTRE	Administered	
18/04/2001		HIB (HAEMOPHILUS TYPE B INFLUENZA)		1	GZIRA HEALTH CENTRE	Administered		
18/04/2001		POLIO			1	GZIRA HEALTH CENTRE	Administered	
26/07/2001		DIPTHERIA,	TETANUS, PERTUSSIS		2	GZIRA HEALTH CENTRE	Administered	
26/07/2001		HIB (HAEMO	PHILUS TYPE B INFLUENZ	A)	2	GZIRA HEALTH CENTRE	Administered	
26/07/2001		POLIO			2	GZIRA HEALTH CENTRE	Administered	
14/11/2001		DIPTHERIA,	TETANUS, PERTUSSIS		3	GZIRA HEALTH CENTRE	Administered	
14/11/2001		HIB (HAEMO	PHILUS TYPE B INFLUENZ	A)	3	GZIRA HEALTH CENTRE	Administered	
14/11/2001		POLIO			3	GZIRA HEALTH CENTRE	Administered	
25/02/2003		MEASLES, N	IUMPS, RUBELLA (MMR)		1	MOSTA HEALTH CENTRE	Administered	
22/02/2005		DIPHTHERIA	DIPHTHERIA, TETANUS		4	MOSTA HEALTH CENTRE	Administered	
22/02/2005		POLIO			4	MOSTA HEALTH CENTRE	Administered	
08/10/2007		HEPATITIS B	3		1	SCHOOL MEDICAL SERVICE MALTA	Administered	
12/11/2007		HEPATITIS B	3		2	SCHOOL MEDICAL SERVICE MALTA	Administered	
14/04/2008 HEPATITI		HEPATITIS B	ris B		3	SCHOOL MEDICAL SERVICE MALTA	Administered	
29/01/2009 MEASLES,		MEASLES, N	/UMPS, RUBELLA (MMR)		2	SCHOOL MEDICAL SERVICE MALTA	Administered	

Figure 17. Rendering for Malta

1.4.20. Netherlands

Summary	A central immunisation registry has existed since 2005, called Praeventis. Citizens do not have access to Præventis but they are able to request information on their vaccination history at the local organisation responsible for the execution of the National Immunisation Programme (NIP) in their own region. Præventis provides vaccination status in real-time for every infant born or registered in the Netherlands: through a link with the population register (gemeentelijke basisadministratie, GBA), Præventis receives continuous updates on all newborn and deceased children and on changes in the address of children (due to movement within the country or immigration/emigration). At this stage, the Dutch IIS does not capture complete vaccination data for refugees, asylum seekers, and diplomats. Praeventis has a link to the population register; it receives continuous updates on all newborn and deceased children, and on changes in the addresses of children (due to change of address within the country or immigration/emigration). We did not obtain any encoding information on Praeventis.
Syntax	-
Citizen identity	-
Vaccine	_
designation	
Other	
terminologies	-
used	
Rendering for	
citizens	•
Sources	https://www.ncbi.nlm.nih.gov/pubmed/22551495

Table 52. Netherlands

1.4.21. Poland

No evidence was found of any IIS in Poland.

1.4.22. Portugal

Summary	In May 2020, Portugal announced the release of its vaccine register, eBoletim de vacinas (<u>https://ec.europa.eu/regional_policy/pt/projects/portugal/vaccination-ecard-covers-all-portuguese-citizens</u>). It is an additional service within a citizen health portal and mobile application MySNS Carteira.
Syntax	The system uses a FHIR STUv3 encoding with specific services to request for a vaccination schedule or a vaccination status. The answer consists of FHIR Immunization and Immunization Recommendation resources.
Citizen identity	The patient is identified with his national health number (SNS number). Optional additional information consists of name, gender, birth date, contact information and address.
Vaccine designation	Vaccines are represented with their Infarmed pharmaceutical code or a SNOMED-CT code, plus their description in English.
Other terminologies used	According to the specification of the FHIR resources.
Additional information	Health facility; Dose sequence; Target disease; Dose status (indicates if dose counts towards immunity); Vaccinator identity (practitioner).
Rendering for citizens	-
Sources	https://ec.europa.eu/regional_policy/pt/projects/portugal/vaccination-ecard-covers-all-portuguese- citizens https://www.sns24.gov.pt/servico/aceder-ao-boletim-de-vacinas-eletronico/

Table 53. Portugal

1.4.23. Romania

Summary	The Registrul Electronic National de Vaccinari (RENV) records since 2011 the vaccination for citizen under the age of 18. The database is updated monthly by maternity departments and family doctors. The reports generated by the system are submitted by the physicians to the District Public Health Authorities in order to obtain reimbursement for the services provided. The District Public Health Authorities have access to the National Electronic Vaccination Registry in order to verify the physicians' reports, as well as to generate analyses of vaccination coverage in their districts. No technical detail was found on encodings.
Syntax	-
Citizen identity	For each child registered in the system, the application generates a UNIQUE child identification code (CUI). It will later be replaced with the national identifier (CNP) Upon leaving the maternity ward, the parents will receive the file of the child on which they will be found and the unique registration code of the child in the system. At the first visit made to the doctor who will take care of the child's vaccination after leaving the maternity ward, the parents will present the child's file to the doctor. Based on the unique registration code generated by the system, the doctor will identify the child in the system and will fill in the child's CNP on his file. After completing the form with the CNP, the doctor will add the vaccines given to the child.
Vaccine designation	As described in the user manual, vaccines are identified by antigens and brand name. The list of presented vaccines is filtered according to the national vaccination plan and the administrations already performed.
Additional information	For each vaccination: batch number, vaccine expiration date, adverse events following immunisation, observations.
Other terminologies used Rendering for	-
Rendering for citizens	-
Sources	https://insp.gov.ro/index.php/manuale-renv-maternitati-si-medici

Table 54. Romania

1.4.24. Slovakia

In September 2019, within a survey driven by EU JAV WP5, Slovakia confirmed that they had no IIS implemented.

1.4.25. Slovenia

Summary	The Slovenia IIS, eRCO, has been deployed since 2017.
Syntax	-
Citizen identity	The citizen is identified with his health insurance number (ZZZS). Optionally, the national identification number (EMSO) can be used for children that do not have yet a health insurance number. His name, surname, sex, birth date, and address are also recorded.
Vaccine designation	Vaccines are represented with their national pharmaceutical code (CBZ), brand name, SNOMED-CT code and target diseases. CBZ is the most precise designation, several different entries use the same SNOMED-CT code.
Other terminologies used	SNOMED-CT is used for target diseases.
Additional information	For each administration: Batch number, dose rank per target disease, vaccination provider and facility, reason for vaccination, administration route and site, observations, adverse events following immunisation. For non-administered vaccines: reason for cancellation.
Rendering for citizens	-
Sources	https://nijz.si/sl/elektronski-register-cepljenih-oseb-in-nezelenih-ucinkov-po-cepljenju-erco

Table 55. Slovenia

Summary	Each of the 17 regions in Spain has its own IIS or EHR. Some information was found only on Diraya, the IIS for Andalusia.
Syntax	No exchange format was found.
Citizen identity	The citizen is identified with his 'Número Único de Historia de Salud de Andalucía' (NUHSA).
Vaccine designation	The application differentiates between individual antigens (Vacunas básicas) and actual vaccines, that can be target diseases (Gripe), groups of antigens (DTPa), or brand names (Figure 18).
Other terminologies used	No exchange format was found.
Additional information	From the printout, it appears that the batch number and health facility are recorded for every performed vaccination. From the configuration menus, there are tables for target diseases, laboratories, adverse effects, some criteria to select a vaccination scheme.
Rendering for citizens	A companion mobile application Vacunas can be used to view the contents (Figure 19).
Sources	https://play.google.com/store/apps/details?id=es.juntadeandalucia.msspa.appvacunas.android&hl=es https://www.sspa.juntadeandalucia.es/servicioandaluzdesalud/profesionales/sistemas-de- informacion/diraya

Table 56. Spain

Diraya Vacunas 5.0	🕰 🚨 🖾	Centra	les, Servicios Ac	lm. central	/ Servicios C	entrales	<u></u>
Gestión	Vacunas Activas Pasivas						± +
Vacunas básicas	Vacuna	Aplicable	G.Riesgo	Enf.	Comen.	Lab.	
Vacunas	Anticolérica (Cólera)	Todos				A	×
Enfermedades	Anti-D (Groamma)	Todos				~	×
Laboratorios Nombres comerciales Calendarios Contraindicaciones Reacciones Adversas Criterios pautas	Antirrábica (Rabia)	Todos				~	×
	BCG (BCG)	Todos				A	×
	Bexsero (Men B)	Todos				~	×
	Boostrix (Boostrix)	Todos				~	×
	Difteria (Difteria)	Todos				A	
	DTPa (DTPa)	Todos				A	×
	Encefalitis Japonesa (Encef_Jap)	Todos				A	×
	Fiebre Amarilla (F.Amarilla)	Todos	•••			A	×
	Fiebre Tifoidea (TIF)	Todos				A	×
	Gripe (Gripe)	Todos	<u>105</u>	۲	P	~	×
he events are regis	stered by target disease or group of target disea	ses, with several reco	ras when	a muit	ivalent	vacci	ine i
	4 meses			- 10			
	4 meses Haemophilus-influenzae b / Vacunado / P 15/12/2016 / A.G.S. Sur de Sevilla - Ntra.		72-1				
	Haemophilus-influenzae b / Vacunado / P	Sra. de la Oliva , Lote: M4072-1	72-1				
	 Haemophilus-influenzae b / Vacunado / P 15/12/2016 / A.G.S. Sur de Sevilla - Ntra. Polio Inyectable / Vacunado / PENTAVAC 	Sra. de la Oliva ;, Lote: M4072-1 Sra. de la Oliva nado / PENTAVAC, Lo		1			

Figure 18. Vaccine designation

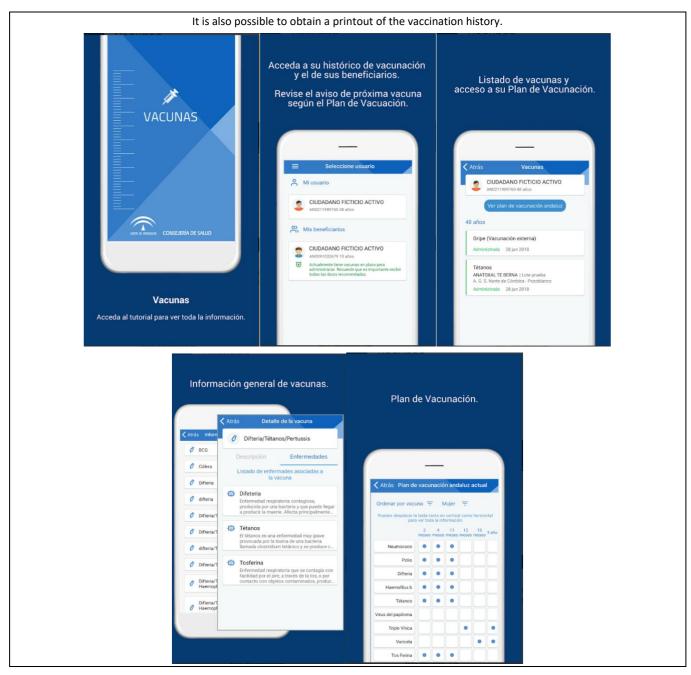


Figure 19. Rendering for citizens

Summary	Since 2013, a national system (Nationella vaccinationsregistret) is fed for children vaccination for 11 target diseases. It is accessible to citizens A mobile application named MittVaccin is also available.
Syntax	No technical information was found on exchange formats.
Citizen identity	The person is identified with a national identification number. It is complemented with the residence at the time of vaccination, the current residence (updated daily from the tax register), the birth date, the gender.
Vaccine designation	Vaccines are encoded with a local identifier (NPL-ID), or if missing the brand name. The codes table is available online. The target disease is also specified, in full text
Other terminologies used	None were identified
Rendering for citizens	Account creation (Figure 20)
Sources	http://web.archive.org/web/20210115024828/https://vaccinationskortet.se/ https://www.folkhalsomyndigheten.se/smittskydd-beredskap/vaccinationer/vaccinationsregister/ https://www.folkhalsomyndigheten.se/contentassets/7e0f5d83310044868a7ef582078cbe76/nvr- variabellista.pdf

Table 57. Sweden

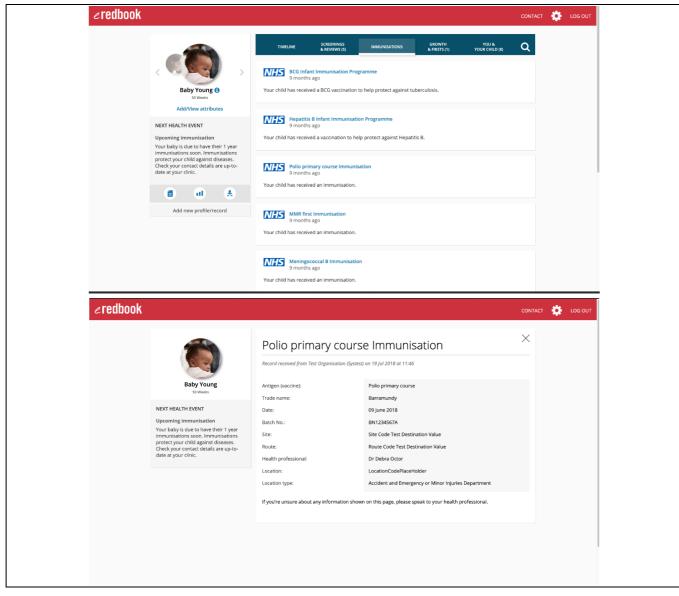
	⊠ Info@vaccinationskortet.se
	VACCINATIONSKORTET.SE HEM MITT VACCINATIONSKORT VACCINATIONSCENTRALER INFÖRRESAN OM
	Aktivera konto - Steg 2
	Ange användarinformation Email: mariane.cimin@icimbiose.com Forami*: dirino Gatuadres: unohilitvigen 11, C/C: Postnummer: 112 64 Or: tooholm Teléonsummer: Födelsedatur: 198 0 18 10 10
	Skapa ditt kostnadsfria vaccinationskort idag!
	Recording a vaccine administration:
	Lägg till ny vaccination —
	Steg 1: Välj vaccin och datum
	Vaccin
	Cervarix (HPV) \$
	Dos
	3 2020-04-14
	Steg 2: Välj vaccinationsprogram
	Cervarix (Ålder >10 år) Grundimmunisering, tre doser vid 0, 1 och 6 månader.
	Steg 3: Välj påminnelser
	Dos 2. 2020-05-14 ©Pàminnelse?
	Vaccines choice:
	Lägg till ny vaccination
	V - Välj vaccin - Avaxim (Hepatit A)
	Boostrix (Difteri, Stelkramp, Kikhosta (Pertussis)) Carvarix (HPV)
	DTE Booster (Differi, Steikramp) Dukoral (Kolera) Encepur (TEE)
	Engerix-B (Hepatit B) Epaxal (Hepatit A)
	Fluarix (Influensa) FSME-IMMUN (TBE)
	Gardaali (HPV) Havrix (Hepatit A) HBVXXPRO (Hepatit B)
	Imovax (Pola) Infanrix (Differi, Stelkramp, Kikhosta (Pertussis))
	Infanrix Polio+HiB (Difteri, Stelkramp, Kikhosta (Pertussis), Polio, HiB) Influvac (Influensa)
	biaro () Meningxx A+C (Hjärnhinnelinflammation) M-M-RVXXPRD (Mässling, Påssjuka, Röda Hund)
	NeisVac (Hormitania) Vasilaa joola hand) NeisVac (Hormitaniania) Preumova (Pneumokocker)
	Rabies-Imovax (Rabies) Stamaril (Gula Febern)
	Tetravac (Difteri, Stelkramp, Kikhosta (Pertussis), Polio) Twinrix (Hepatit A, Hepatit B)
	Typherix (Tyfold) Typhim VI (Tyfold) Vaccim mci Intensa (influensa)
	Vaccin mot smittkoppor (Smittkoppor) Vaccin mot tuberkulos (Tuberkulos)
	Vaccination mot Difteri, Stelkramp och Kikhosta (Difteri, Stelkramp, Kikhosta (Pertussis)) Vaccination mot Difteri, Stelkramp och Polio (Difteri, Stelkramp, Polio)
- 1 M	Vaccination mot Polio (Polio) Varihix (Varicella zoster) Vaxigrip (Influensa)
gorge	

Figure 20. Rendering for citizens in Sweden

1.4.28. United Kingdom

Summary	NHS has subcontracted to Sitekit Ltd an application, eRedBook, fed since August 2019 from the immunisation events flowing through the NHS National Event Management Service (NEMS). Other sources that do not feed the NEMS may also connect directly to the eRedBook infrastructure.
Syntax	
Citizen identity	Citizens create their eRedBook account with their e-mail address or Facebook account. The association between a child NHS identity and an eRedBook account is made by a health professional upon request of the eRedBook account owner. The national NHS identifier is used, complemented with the gender and date of birth.
Vaccine designation	NHS has created a local extension "UK drug extension module" to SNOMED-CT in order to represent the vaccines.
Other terminologies used	-
Rendering for citizens	See Figure 21.
Sources	http://web.archive.org/web/20200806091701/https://support.eredbook.org.uk/knowledgebase/category/?id=CAT- 01021 https://termbrowser.nhs.uk/?perspective=full&conceptId1=71181003&edition=uk-edition&release=v20200610

Table 58. United Kingdom



1.4.29. United States of America

Summary	There are 63 identified IIS in the USA. The American Immunization Registry Association gathers all of them and publishes useful analysis and guidelines. The data is this sheet comes from the AIRA website. (Figure 22). The MIROW (Modeling of Immunization Registry Operations Workgroup) establishes best practice guides for all operational aspects of IIS. Various citizens portals, such as <u>https://myvaccinerecord.cityofnewyork.us/</u> , allow access to personal records.
Syntax	The HL7v2 Immunization messaging is enforced for exchange of data between EHRs and IIS. A full specification is available from the AIRA website.
Citizen identity	The patient identification is specific to each IIS. The exchange specification refers to the existence of identity brokers for reconciling the systems.
Vaccine designation	AIRA released an excellent synthesis of Vaccine Code Set Considerations (18) on May 21 st , 2020. The US CDC manages and publishes his own code sets, the CVX codification of vaccines and the MVX codification of manufacturers. It is complemented as usual by the pharmaceutical code (NDC) and the brand name. The responses to the survey done in this study are provided in Table 60. The study stresses on the need for an automated distribution and integration of code sets. The CDC VCSMS (Vaccine Code Sets Management Service) is designed to serve this purpose.
Other terminologies used	LOINC codes are used to characterize the HL7 message segments and provide further information of patient and context, a guidance document on their use is available from the AIRA website.
Rendering for citizens	See Figure 23.
Sources	https://repository.immregistries.org/resources/search/HL7/filtered/by/technical https://myvaccinerecord.cityofnewyork.us/myrecord/home.htm#

Table 59. United States of America



Table	% of Respondents Referencing Its Use
CVX	89%
NDC Crosswalk	79%
Product Name Mapped to CVX/MVX	74%
MVX	68%
CPT Mapped to CVX	63%
CVX Mapped to Vaccine Group	53%

Table 60. Responses to the survey conducted by AIRA on vaccine code sets in the US

		Results		exit set	sion	
Text Ema This report con report with your h	Ive Immunization messages from the H Messages: • Yes No Cell Numi Il Messages: • Yes No Email Add tains Immunization data that have beer ealth care provider for completeness ar lafe form (PDF) g.	er 347396240 ress test@healt reported to the H	00 h.nγc.gov save lealth Department's Citywide Immuniz	ation Registry (CIR). Re	Enter cell or email f	d or Print. phone number and or future messages eau of Immunization.
resth Bureau Cit ID: Name:	of Immunization 5700787 MINNE MOUSE		Citywide Immunization Registry 42-09 28th Street, 9th Floor, CN 21 Long Island Gty, NY 11101-4132	Print		
DOB: Age: Sex As at Birth Immun	10/10/2005 11 y 5 m signed Female		email: cir-records@health.nvc.gov www.nyc.gov/health/cir			
Vacci	ne Vaccine Name	Date of Vaccination	Next Due/Recommendation			
Influen	Influenza Influenza, IIV3, Adjuvanted,IM (>=85yrs)	09/23/2014 08/25/2016	Due on 08/01/2017 Influenza			
HepB	* Influenza, IIV3, IM DTaP-Hep B-IPV (Pediarix) DTaP-Hep B-IPV (Pediarix) DTaP-Hep B-IPV (Pediarix)	12/05/2016 12/10/2005 02/13/2006 05/10/2008	Completed Vaccine Series			NYC Health
Bryson Crawford 4yo, 1/10/2014 MRN: 55103	Care PCP:	Feam Seeger, Marty, MD	ı.			G
Immunizatio	ons - All Types 🗄 All Admin Tj	pes 👻 🗏 Incomp	olete Admins 🕲 <u>H</u> istorical Admins 👻	∦ New Admin 🖗 Immuniz	ation Report 📓 E-S	ign 🐉 Imm Registry 🛛 More 👻
	Administered On				Next Due	Show Deleted Show Deferred
Immunizat					a second for the	
⊗ DTAP-IPV-I	HEP B 7/10/2014, 5/10/2	014, 3/10/2014				+ New
⇒ Hib (PRP-T		014, 3/10/2014				+ New
✓ Influenza W						
⇒ MMR	1/10/2015		31.			+ New
	1/10/2015, 5/10/2	014, 3/10/2014				+ New
⊗ Pcv13						+ New
⊗ Varicella	1/10/2015 ons from Immunization Regi					

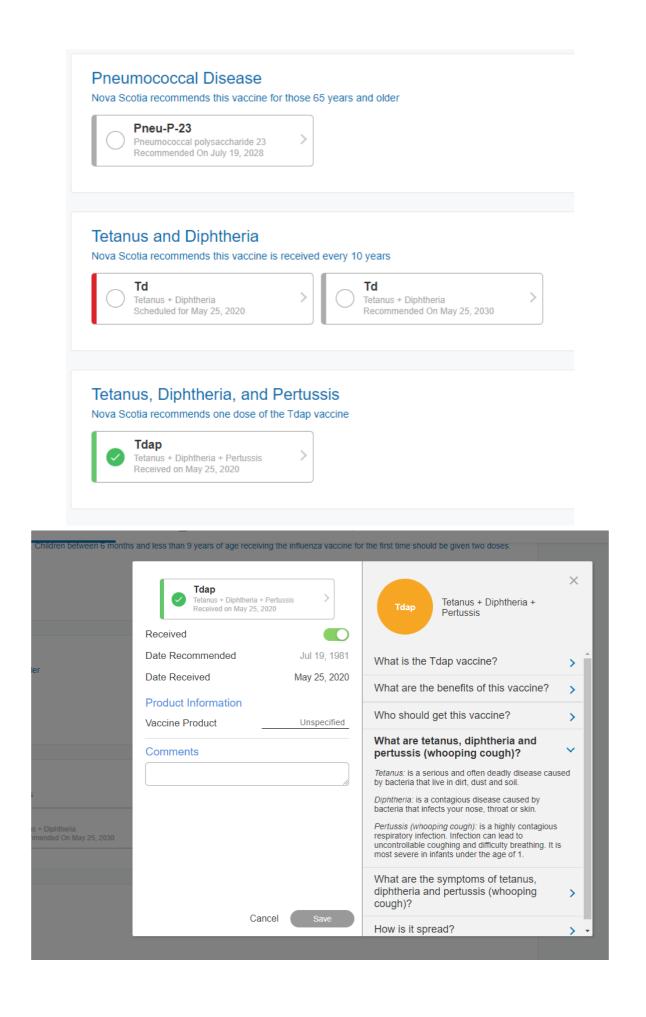
Figure 23. Rendering examples from the USA

1.4.30. Canada

Summary	Each province or territory in Canada is responsible for its organization of vaccinations and may have an IIS of its own. A common user portal and applications, CANImmunize (<u>https://www.canimmunize.ca/</u>), allows citizens to record by themselves their vaccines and check them against the schemes for their residence province. The data can be synchronized on a server with a CANImmunize account. In some provinces, the CANImmunize records can be transferred to the provincial IIS. No technical information was fond on transfer formats.
Syntax	•
Citizen identity	•
Vaccine designation	Vaccines are described according to the Canadian Vaccine Catalog (see documentation at <u>https://cvc.canimmunize.ca/en/home</u>). They are presented as a collection of valences. The brand name can be added as an extra characteristic for the vaccines that were commercialized in Canada.
Other terminologies used	SNOMED-CT is used for diseases and events categorization.
	Vaccines are organized with tabs: Childhood, Adult, Travel, Other and All.
Rendering for	For the Childhood and Adult tabs, the scheduled routineimmunisation are presented by age, then recommended vaccine valences for each age. The user is free to remove or reschedule an event, and validate the sending of a notification on the due date.
citizens	Vaccines are presented with a green, grey, or red border depending upon whether they are up to date, late or not recommended. Further details can be obtained by clicking on a given vaccine. Travel vaccinations and out-of-routine vaccinations are presented as a simple list. See Figure 24.
Sources	https://www.canimmunize.ca/ Vaccine catalogue: https://cvc.canimmunize.ca/en/home

Table 61. Canada

Home François KAAG	OVERDUE Last edited: 02/03/2020					
Create New Record	👶 Childhood	† Adult	<u>∄</u> Travel	🐑 Other	⊞ All	
	This view shows the vaccinations François n paediatric immunization schedule.	eeds to receive grouped into the recomme	ended visits, according to the Nova Scotia	Sort ✓ Collapse all		François's immunization status By Vaccination By Disease
	Two Month Visit Recommended Date: September 19, 1963 DTAP-JPV-Hib Opta-JPV-Hib Sd years overhalt	Pneu-C-13 Pneumococcal conjugate 13 56 years overdual	>	Add Valcsination	•	Flu Shot Status • François nost flu shot should be in fall 2020. Tetanos Shot Status • François kus Tatanos vacchation was on Fabrus /, Source Status • Coverdue Vaccinations • Tetanos and Optimular la B years overdue. • Tetanos Debthoria, and Partuda is 8 years overdue.
	Four Month Visit Recommended Date: November 19, 1963 DTAP-IPV-Hib Drap-IPV-Hib S5 years overdael	Preu-C-13 Presentococci conjugate 13 56 years overduet	>	Add Vaccenation	• •	
Have a question about immunization?	Six Month Visit Recommended Date: January 19, 1964			Add Vaccination	`	



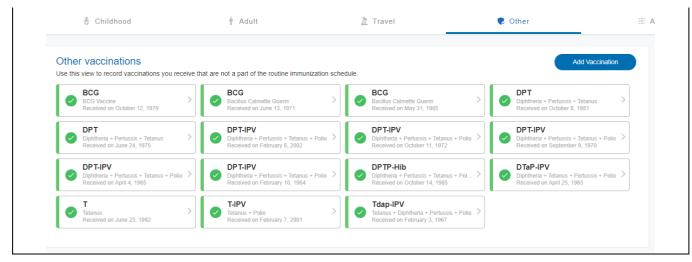


Figure 24. Rendering in Canada

1.4.31. Australia

Summary	The Australian Immunization Register (AIR) is a national register that records all vaccines given to all people in Australia. The AIR includes vaccines given under the nationalimmunisation program, through school programs, and privately, such as for flu or travel. Every citizen enrolled in Medicare has an AIR vaccination record. It is updated directly by the vaccination providers. Two mobile applications named "ExpressPlus Medicare" and "Save the Date to Vaccinate" are also available.
Syntax	The immunisation record is transferred to other applications as a CDA document. The full CDA documentation is in the referenced CDA implementation guide.
Citizen identity	Citizens are identified through their Individual Healthcare Identifier (IHI) <u>https://www.servicesaustralia.gov.au/organisations/health-</u> <u>professionals/services/medicare/healthcare-identifiers-service-health-professionals/about/types-</u> <u>healthcare-identifiers#a1</u>
Vaccine designation	The primary codification for Vaccine designation is the Australian Medicines Terminology (AMT). As a fallback, the application has its own vaccine code set, with codes per brand name, plus a few generic codes per target disease. The full code set is available at: <u>https://www.servicesaustralia.gov.au/organisations/health-</u> <u>professionals/services/medicare/australian-immunisation-register-health-professionals/resources/air-</u> <u>vaccine-code-formats</u> The vaccine entry may also include the list of antigens, represented through a custom CDA extension, and encoded with a Medicare antigen code.
Other terminologies used	SNOMED-CT is used for the CDA structure.
Additional information	The usual CDA headers: custodian, author, target Gender, birth date, contact information In specific contexts, birth order, date of death, age accuracy, birth country, mother name, indigenous status, etc. Entitlement (Medicare) Vaccine ingredients, dose number, Vaccine cancellations and their reason. The batch number and administration route and site are not recorded
Rendering for	Childrens version (MC73) (Figure 25).
citizens	
Sources	https://www.healthterminologies.gov.au/docs/DH_2407_2016_AMT_FactSheet_v2.1.pdf https://www.servicesaustralia.gov.au/organisations/health- professionals/services/medicare/australian-immunisation-register-health-professionals/resources/air- vaccine-code-formats https://www.servicesaustralia.gov.au/individuals/services/medicare/australian-immunisation-register

Table 62. Australia



immunisation

Immunisation history statement - online version As at: For: Date of birth: 14 September 2010 Immunisation status: up to date Schedule Immunisation Date given Brand name given Provider type Diphtheria Tetanus Pertussis Hepatitis B 2 months 02 Nov 2010 Infanrix Hexa General Practice Polio Hib Prevenar 7 Pneumococcal Rotavirus Rotarix Diphtheria Tetanus Pertussis Hepatitis B 18 Jan 2011 Infanrix Hexa General Practice 4 months Polio Hib Prevenar 7 Pneumococcal Rotavirus Rotarix Diphtheria Tetanus Pertussis Hepatitis B 6 months 29 Mar 2011 Infanrix Hexa General Practice Polio Hib Prevenar 7 Pneumococcal 12 months Hib 26 Sep 2011 Hiberix GP Measles Mumps Rubella Priorix Meningococcal C Meningitec 20 Mar 2012 Prevenar 13 18 months Pneumococcal GP Varicella Varilrix 4 years Diphtheria Tetanus Pertussis Polio 11 Nov 2014 Infanrix-IPV GP Measles Mumps Rubella Priorix Next immunisation(s) due Date due This child has received all vaccines required by 5 years of age. Every effort is made to ensure that the information contained on the Australian Childhood Immunisation Register is correct. The data is based on information provided to Medicare Australia by immunisation providers and the accuracy of data is dependent on the quality and timeliness of information provided. Immunisation

records are only available from 1 January 1996.

Figure 25. Rendering in Australia

1.4.32. Iceland

Summary	A centralimmunisation registry exists since 2007 within the national EHR infrastructure. It is accessible for citizens at <u>https://www.heilsuvera.is</u> . No technical detail was found online.
Syntax	-
Citizen identity	-
Vaccine designation	The referenced presentation mentions ATC or HL7 (sic) for codes of vaccines. The screen capture shows brand names.
Additional information	Date and place of vaccination; Refusal of vaccination
Other terminologies used	-
Rendering for citizens	Figure 26.
Sources	https://www.heilsuvera.is/ https://www.landlaeknir.is/servlet/file/store1/item25603/version1/Bolusetningar.png https://www.landlaeknir.is/um-embaettid/greinar/grein/item20338/Spurningar-og-svor-um-rafraena- sjukraskra

Table 63. Iceland

	ilsuvera.is/bolusetningar				\$
VERA					🙎 Ísak Friðriksson 🤇
🗋 Heimasvæði	Bólusetningar 🕫				
🛇 Lyfseðlar 🗸 🗸	🗐 Sýna viðmið 📑 Prenta	PDF 💌 Opna allt			
🕽 Bólusetningar 🗸	Bóluefni	▼ Síðasta	Fjöldi	Almenn	ar bólusetningar barna á
sólusett gegn	Boostrix 💌	22.09.2009	1	Íslandi f	rá janúar 2014
🗊 Samskipti	Neisvac c 💌	05.09.2005	2	Aldur	Lyf / Sjúkdómar
🕒 Tímabókun 🗸	Pandemrix 💌	03.12.2009	1	3 mánaða	Pentavac gefið við: Barnaveiki, Stífkrampi, Kikhósti,
2 Líffæragjöf	Pentavac 🔻	17.01.2006	3		Heilahimnubóluefni, Lömunarveik - dautt bóluefni
Útskrá	Priorix v	11.07.2006	1		Synflorix gefið við: Pneumókokka Pneumókokkar-fjölsykra, Pneumókokkar-prótein tengt
				5 mánaða	Pentavac gefið við: Barnaveiki, Stifkrampi, Kikhósti, Heilahimnubóluefni, Lömunarveik - dautt bóluefni
					Synflorix gefið við: Pneumókokkar Pneumókokkar-fjölsykra, Pneumókokkar-prótein tengt
				6 mánaða	NeisVac-C gefið við: Meningókokkar C

Figure 26. Rendering in Iceland

1.4.33. Liechtenstein

No evidence was found regarding the existence of an IIS.

1.4.34. Norway

	SYSVAK is the centralized IIS used by all professionals in Norway.
	It is synchronized with Electronic Patient Records of public health centres, General Practitioners, and travel vaccination centres.
Summary	The citizen can access it through the national, multipurpose portal helsenorge.no and can print paper copies on their own or get certified (stamped and signed) copies from public health centres.
	Access is implicitly granted to every health professional.
	SYSVAK was initiated in 1995. It now contains 3.5M cards, for a total of 40M recorded vaccinations.
Syntax	The transactions between the EPRs and SYSVAK use the ebXML format.
Citizen identity	Every resident in Norway has a 13-digit personal identification number. It is complemented with gender, name, surname, address.
Vaccine designation	SYSVAK uses a combination of a proprietary SYSVAK vaccine (antigens) code and drug code, plus the brand name. The ATC code is also referenced. The list of vaccine codes is available at the referenced site. Drug codes are prefixed by the vaccine code, followed by a sequential number.
Additional	Non-executed vaccinations and their justification are also recorded as events.
information	Batch number, origin of information (paper card, oral, done locally) are recorded for each vaccination.
Other terminologies used	-
Rendering for citizens	See Figure 27.
Sources	 Interview with Hilde BAKKE and Marianne BERGSAKER on May 8th Citizen portal at <u>http://helsenorge.no/Sider/default.aspx</u> Vaccine codes at <u>https://www.fhi.no/hn/helseregistre-og-registre/sysvak/sysvak-koder/</u> Technical documentation and XML schemas at https://sarepta.ehelse.no/standard/SYSVAK

	Helse	enorge portal a	after authentica	tion:		
	Helsetjenester 🧿	0 1				
	MELDINGER Meldinger du har sendt og mottatt via helsenorge.no	TIMEAVTALER Dine timer og avtaler med helsetjenesten	HENVISNINGER Status på henvisningene dine til sykehus/spesialist	LEGEMIDLER Resepter på legemidler og andre værer med informasjon om utleveringer og riktig bruk		
	HELSEKONTAKTER Oversikt over dite kontaktpersoner og behandlere i helsetjenesten	VAKSINER Overslikt over alle vaksiner som er registrert på deg.	PASIENTREISER Pasientreiser er reiser som dekken av det offendige. sok og se innsendte soknadet til pasientveiser her	FRIKORT OG COENANDELER Se dine registrerte ogenandeler, og om du har fått frikort for helsertjenester		
	DYTTE PASTLEGE Finn og bytt fastlege, sett deg på venteste, og se hvem som er fastlegen din nå	SYKDOM OG KRITISK INFO Her vises helseopplysninger om deg som helsepersonell skal kjenne til ved undersøkeler og behandling	DOKUMENTER Oversikt over dokumenter som er lagtet på helsenarge.no	DONORKORT Opprett et digitalt donorkort		
	VERKTØY Kurs og andre verktøy for læring og mestring					
		Vaccin	es page:		-	
Opplys	ksiner ⑦ sninger om hvilke sy portering fra vaksin		aksinert mot og når	vaksinen er satt,	er basert på	
Vaks	inasjon	Vaksinasjonsdat	D			
Difte	ri	09.01.2015 11.	03.2015 29.09.201	5		
HIB-i	nfeksjon	09.01.2015 11.	03.2015 29.09.201	5		
Kikho	oste	09.01.2015 11.	03.2015 29.09.201			
				5		
Kusn	na	05.01.2016		5		
Kusn Mesl		05.01.2016 05.01.2016		5		
Mesi		05.01.2016	03.2015 29.09.201			
Mesi Pneu	inger	05.01.2016 09.01.2015 11.	03.2015 29.09.201 03.2015 29.09.201	5		
Mesi Pneu Polio	inger imokokksykdom	05.01.2016 09.01.2015 11.	03.2015 29.09.201	5		
Mesi Pneu Polio Rota	inger mokokksykdom myelitt	05.01.2016 09.01.2015 11. 09.01.2015 11.	03.2015 29.09.201	5		
Mesl Pneu Polio Rota Røde	inger imokokksykdom imyelitt virusinfeksjon	05.01.2016 09.01.2015 11. 09.01.2015 11. 11.11.2014 09. 05.01.2016	03.2015 29.09.201	5		
Mesi Pneu Polio Rota Rode Stivk	inger mokokksykdom myelitt virusinfeksjon	05.01.2016 09.01.2015 11. 09.01.2015 11. 11.11.2014 09. 05.01.2016 09.01.2015 11.	03.2015 29.09.201 01.2015 03.2015 29.09.201	5		

Figure 27. Rendering in Norway

1.4.35. Switzerland

Nota · the collection was or	nerated during spring 2	2020 The service was	discontinued in August 2021.
Nota . the concetion was of	perated during spring 2		uiscontinucu in August 2021.

Summary	With MesVaccins.ch, Switzerland has one of the most comprehensive dVCs so far, providing personalized recommendations according to the citizen profile. It is accessible at <u>www.mesvaccins.ch</u> or through the myViaVac mobile application.
Syntax	The exchange format is a CDA document under the Immunization Content profile.
Citizen identity	The patient is documented into the recordTarget section of the CDA document with its identity traits.
Vaccine designation	The vaccine substance is represented by an ATC Code, complemented with the product trade name, package barcode (GTIN), batch number and manufacturer name.
Additional information	The CDA document presents all the usual sections of the Immunisation Content profile, such as Past Illnesses, Allergies and Intolerances, Pregnancy observation, Laboratory results, etc. Immunisation recommendations and Adverse events may be present.
Other terminologies used	
Rendering for citizens	Figure 28.
Sources	<u>https://www.mesvaccins.ch/</u> <u>https://www.e-health-suisse.ch/fileadmin/user_upload/Dokumente/2018/D/180507_CDA-CH-</u> <u>VACD_de.pdf</u> <u>https://gitlab.com/ehealth-connector/api/-/wikis/CDA-CH-VACD</u>

Table 65. Switzerland

Home page	:																											
2	3	19.07.1963 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				/																						
		Vaccins														-	F	ranç	ois					01	Nodif	ier		
																ĸ	AAC	Fra	anco	ois							L	
		Carne Bilan		vaccination	I											S	exe						N	IAS	CUL	N		
										uuno							angu ode i		orisat	ion					NÇA 95-de			
		Enreg	istre	ment / valio	dation	/ bilan vaccina	il par	DAT	AVA	C																	L	
																			ages de n	non	carn	et					L	
	\mathcal{A}	Santé															_ (ema	inde	de s	aisie	/valio	datio	n/bi	lan			
)	🖸 Malad	ies f	aites															nal pa		ATAV	AC						
		Facter	urs d	le risque m	édicau	х											D F	actu	res									
		Risque	es ď	exposition												-	-	-	-		-	-	-	-	-	-		
\sim																		tion									L	
		Voyages	5																is n'o essior					valı	dees			
	ノ	Destin	atio	ns														Pro	ofess	sion	nels	aut	toris	és				
Entering a v	acci	ne by bra	nc	d or by	/ ar	ntigens:									 													
Mettre à jo Les vaccins peux qu'ils permettant Si vous conaiss choisissez "autre permet d'éviter. Si vous voulez e cliquer sur: Ajouter u Que Date 11.2.1964	1 E V V V V V V V V V V V V V V V V V V	e enregistrés par r. om du vaccin, ch " et 2) choisir ma	ierch anue dire	hez-le dan ellement la ctement è	is la li: i/les n	ste! Sinon, 1) naladies qu'il							Rougenle	Rubéole		_	Rage	Fièvre tophoïde		Fièvre jaune	Pneumocoques (PCV)	Meningocoques ACWY		ETEC				
11.2.1964	- •								2																			
5.4.1965	- • (2 -	2																			
26.4.1965	••							2 -																				
1.6.1965	BCG		~																									00
4.2.1967	Tetrac	oq	~					2 2																				0
		Disissez	~ [
			<u> </u>			·								1														
						Sauver		Ter	mi	ner		Ret	tour															

Display of vaccination history by target disease.

Carnet de vac	cination		Mettre à jour Vaccins	
Vaccination	Date	Vaccins	Validation Carnet de vaccination	
COQUELUCHE	26.04.1965	DTCoqPolio	× Bilan vaccinal	
	11.02.1964	DTCoqPolio	×	
	05.04.1965	DTCoqPolio	X Vaccins non souhaités	
	04.02.1967	Tetracoq	X Vaccins dans l'enfance	
DIPHTÉRIE	26.04.1965	DTCoqPolio	X Copie de mon carnet	
	11.02.1964	DTCoqPolio	×	
	05.04.1965	DTCoqPolio	🗙 🔇 😵 Santé	D
	04.02.1967	Tetracoq	×	
POLIOMYÉLITE	26.04.1965	DTCoqPolio	× Voyages	
	11.02.1964	DTCoqPolio	×	-
	05.04.1965	DTCoqPolio	× Malidation	
	04.02.1967	Tetracoq	X Vos données n'ont pas encore	
TUBERCULOSE	01.06.1965	BCG	validées par un professionnel e santé.	de
TÉTANOS	26.04.1965	DTCoqPolio	× Professionnels autoris	<i>4</i> a
	11.02.1964	DTCoqPolio	×	es
	05.04.1965	DTCoqPolio	×	
	04.02.1967	Tetracoq	×	
🖸 🚔 Imprimer la li	ste des vaccins enre	gistrés		

Impression du carnet de vaccination

Immunisation status (colour code)

Bilan vaccinal			Vaccins	
Bilan Vaccination	Date	Validation Qui?	Info Carnet de vaccinat	ion
😑 Hépatite B			Silan vaccinal	
🤶 Fièvre typhoïde			* 🔦	
	15.10.1985	×	Vaccins non souha	ités
Diphtérie			Vaccins dans l'enfa	ince
	11.02.1964	×	Copie de mon carn	et
	05.04.1965	×		
	26.04.1965	×	😵 Santé	D
	04.02.1967	×		
	09.09.1970	×	Voyages	
	12.10.1972	×		
	25.06.1975	×	Bilan vaccin	al
	09.10.1981	×		z pas encore saisi
	15.10.1985	×		s, soit vous devriez professionnel de
	07.02.2012	×	vérifier / comple	
🔵 Tétanos			vaccinations.	onnels autorisés
	11.02.1964	×		Annelo datoriseo
	05.04.1965	×		

Figure 28. Rendering in Switzerland

