European Commission

WAY FORWARD FOR CROSS-BORDER VERIFIABLE

COVID-19 VACCINATION CERTIFICATES

2021-02-17

Background

- On 10-11 December, the European Council called for a coordinated approach to vaccination certificates. On 21 January, the European Council agreed to work on a standardised and interoperable form of proof of vaccination for medical purposes.
- There is an overall consensus on the use of such certificates for medical purposes (continuity of care, e.g. to ensure proper follow up between 1st and 2nd dose). On 21 January, the European Council indicated that leaders would determine at a later stage in what circumstances vaccination certificates could be used.
- On 27 January 2021, the eHealth Network adopted first interoperability elements: a minimum data set and a unique identifier.
  - Guidelines available at https://ec.europa.eu/health/ehealth/covid-19_en
- Further work is being conducted on a trust framework. Collaboration with WHO is instrumental.

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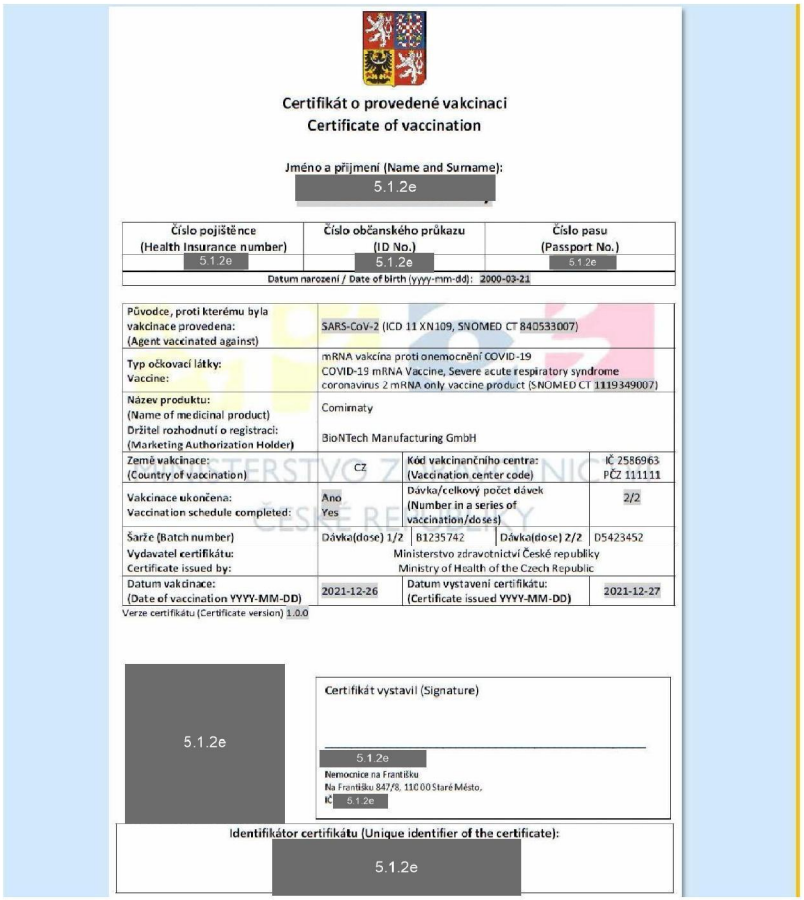


Certifikát o provedené vakcinaci
Certificate of vaccination

Jméno a příjmení (Name and Surname):
5.1.2e

Číslo pojištěnce (Health Insurance number)	Číslo občanského průkazu (ID No.)	Číslo pasu (Passport No.)
5.1.2e	5.1.2e	5.1.2e

Datum narození / Date of birth (yyyy-mm-dd): 2000-03-21

Původce, proti kterému byla vakcinace provedena: (Agent vaccinated against)	SARS-CoV-2 (ICD 11 XN109, SNOMED CT 840533007)		
Typ očkovací látky: Vaccine:	mRNA vakcína proti onemocnění COVID-19 COVID-19 mRNA Vaccine, Severe acute respiratory syndrome coronavirus 2 mRNA only vaccine product (SNOMED CT 1119349007)		
Název produktu: (Name of medicinal product) Držitel rozhodnutí o registraci: (Marketing Authorization Holder)	Comirnaty BioNTech Manufacturing GmbH		
Země vakcinace: (Country of vaccination)	CZ	Kód vakcinančního centra: (Vaccination center code)	IČ 2586963 PČZ 111111
Vakcinace ukončena: Vaccination schedule completed:	Ano Yes	Dávka/celkový počet dávek (Number in a series of vaccination/doses)	2/2
Šarže (Batch number) Vydavatel certifikátu: Certificate issued by:	Dávka(dose) 1/2 B1235742	Dávka(dose) 2/2	D5423452
	Ministerstvo zdravotnictví České republiky Ministry of Health of the Czech Republic		
Datum vakcinace: (Date of vaccination YYYY-MM-DD)	2021-12-26	Datum vystavení certifikátu: (Certificate issued YYYY-MM-DD)	2021-12-27

Verze certifikátu (Certificate version) 1.0.0

5.1.2e

Certifikát vystavil (Signature)

5.1.2e

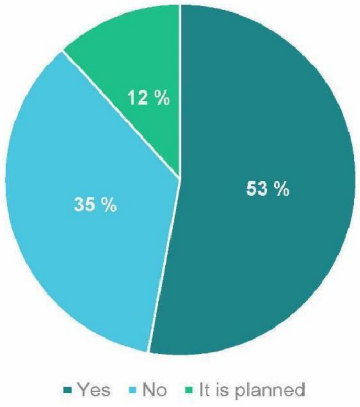
Nemocnice na Františku
Na Františku 847/8, 110 00 Staré Město,
IČ 5.1.2e

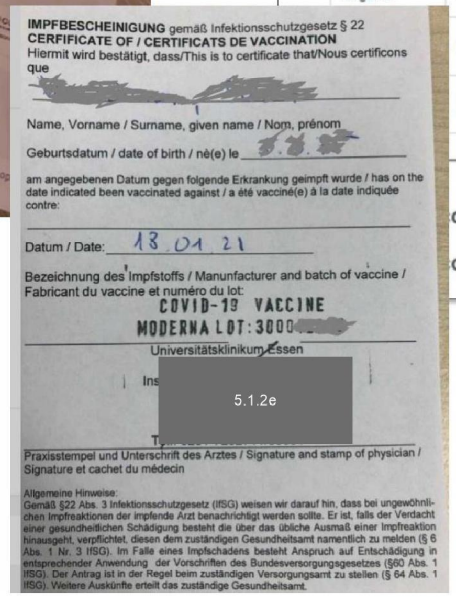
Identifikátor certifikátu (Unique identifier of the certificate):
5.1.2e

MS are working on and some are issuing vaccination certificates already.

- Both paper and digital solutions are supported

Member States with legislation to cover the issuance of the vaccination certificates





PASSPORT OF IMMUNIZATION

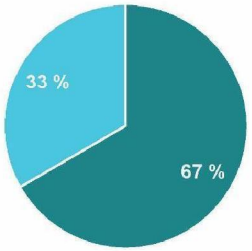
Name: [redacted]
Date of birth or Personal Code: [redacted]

Disease targeted	Date of vaccination	Brand name of vaccine	Batch number of vaccine	Dose quantity	Dose number	Next booster	Vaccinator
	02.03.2020		D04 [redacted]	0.5 ml			[redacted]
	12.11.2018 10:22:00		R3C[redacted]	0.5 ml			[redacted]

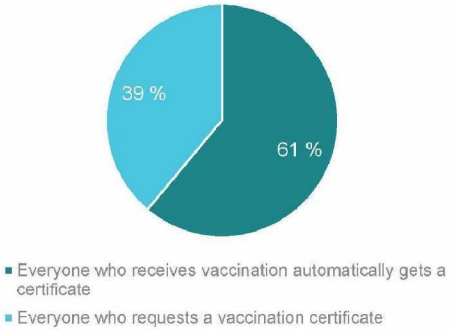
omposed on:19.01.2021 14:15:21

omposed by: Tervise ja Heaolu Infosüsteemide Keskus

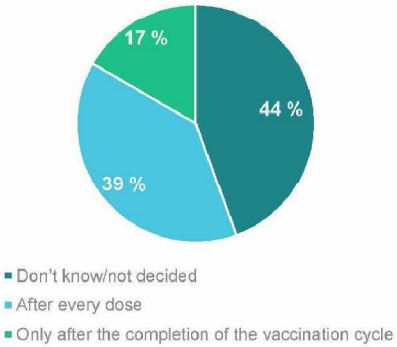
Do Member States issue vaccination certificates/proofs for COVID-19 vaccinated persons?



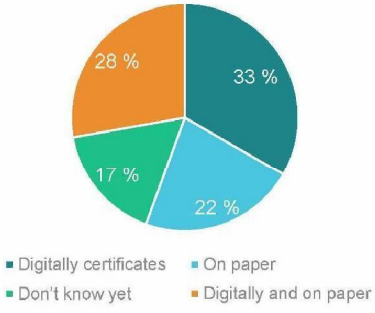
Who receives a vaccination certificate/Proof?



When will the Vaccination Certificate be issued?



How will the Vaccination Certificates be issued?



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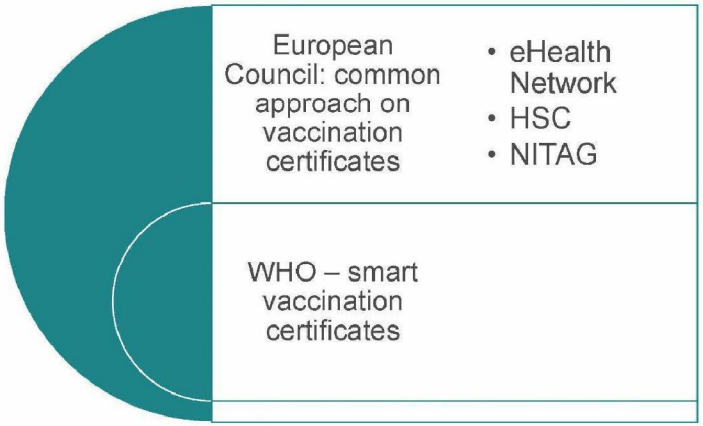
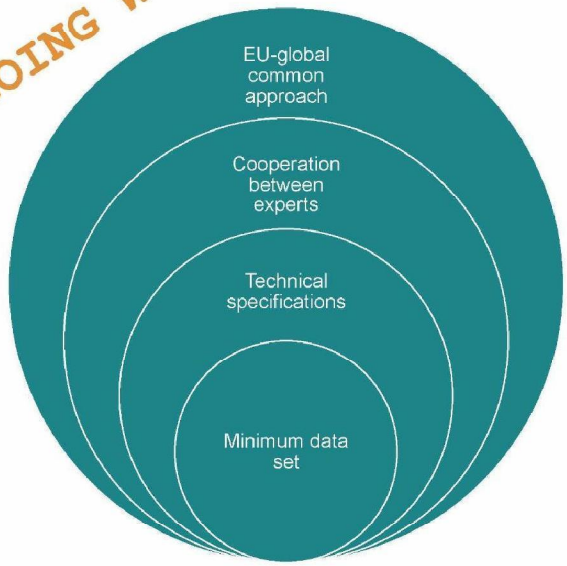
Purposes of use

- **Medical** purposes (**continuity of care**) – *undisputable*
  - A vaccinated person who has received the first dose in Country A would like to receive the next dose in Country B. The only information available is that on the certificate.
  - A vaccinated person needs to receive information about the date of the next dose.
- **Proof** of vaccination – *debatable*
  - A vaccinated person presents the vaccination certificate in order to avoid or shorten a quarantine period during or after travel.
  - The organizer of a leisure event provides specific rules to vaccinated persons.
  - Support for proof for people who cannot get vaccinated (due to medical reasons) or cannot receive the next dose should be enabled.
- Possible extensions – *to be aware of*
  - Proofs of negative **test results** – *currently used for preserving free movement*
  - Proofs of a previously contracted **Covid-19 disease** – *used by some MS*

Cooperation with the WHO



ONGOING WORK



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Minimum dataset

Section	Data element	Description	Preferred Code System
Person identification	Person name	The legal name of the vaccinated person	
	*Person identifier (optional, repeatable)	An identifier of the vaccinated person, according to the policies applicable in each country. It should be captured what type of identifier is used. Examples: citizen ID card or identifier within the health system/IIS/e-registry.	
	Sex (optional)	Administrative gender	
	Person date of birth (conditional)	Vaccinated person's date of birth. Mandatory if no Person identifier is provided.	Complete date, without time, following the ISO 8601.
***Vaccination / prophylaxis information** *** means that the whole section may be repeated**	Disease or agent targeted (optional)	Disease or agent that the vaccination provides protection against	ICD-10 or SNOMED CT (GPS). In the future ICD-11.
	Vaccine / prophylaxis	Generic description of the vaccine/prophylaxis or its component(s) Example: J07BX03 covid-19 vaccines (temporary code, to be implemented in ATC 2022) 1119349007 | COVID-19 mRNA vaccine | 1119305005 | COVID-19 antigen vaccine |	SNOMED CT and ATC Classification (J07 therapeutic subgroup); In the future substances from the ISO IDMP Implementation-EU-SRS system
	Vaccine medicinal product	Medicinal product name Example: COMIRNATY concentrate for dispersion for injection	For the time being, this should be the name of the medicinal product as registered in the country. In the future the information on the medicinal product can incorporate the identifiers from the implementation of the ISO IDMP Standards and the medicinal package's unique identifier.
	Marketing Authorization Holder	Marketing Authorisation Holder Example: Pfizer BioNTech	EMA's Organisations System data (SPOR)
	Number in a series of vaccinations / doses	Order in the vaccination course Example: 1/2	
	Batch/lot number (optional)	A distinctive combination of numbers and/or letters which specifically identifies a batch	
	Date of vaccination		Complete date, without time, following ISO 8601
	Administering centre	Name/code of administering centre or a health authority responsible for the vaccination event	
	Health Professional identification (optional)	Name or health professional code responsible for administering the vaccine or prophylaxis	
	Country of vaccination	The country in which the individual has been vaccinated	ISO 3166 Country Codes
	Next vaccination date (optional)	Date on which the next vaccination should be administered	Complete date, without time, following ISO 8601
Certificate metadata (minimum dataset)	Certificate issuer	Entity that has issued the certificate (allowing to check the certificate)	
	Certificate Identifier	Unique identifier of the certificate (UVCI), to be printed (human readable) into the certificate; the unique identifier can be included in the IIS	**See next slide**
	Certificate valid from (optional)	Certificate valid from (required if known)	Complete date, without time, following ISO 8601
	Certificate valid until (optional)	Certificate valid until (validity can differ from the expected immunisation period)	Complete date, without time, following ISO 8601
	Certificate schema version	Version of this minimum dataset definition - currently set at 1.0.0	Semantic versioning (ISO, https://semver.org/ version 2.0.0 or newer).

Unique Vaccination Certificate/assertion identifier (UVCI)

ADOPTED AND PUBLISHED

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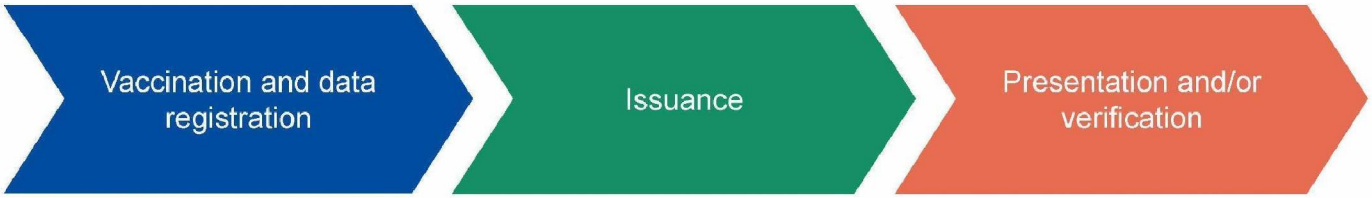
User story, steps



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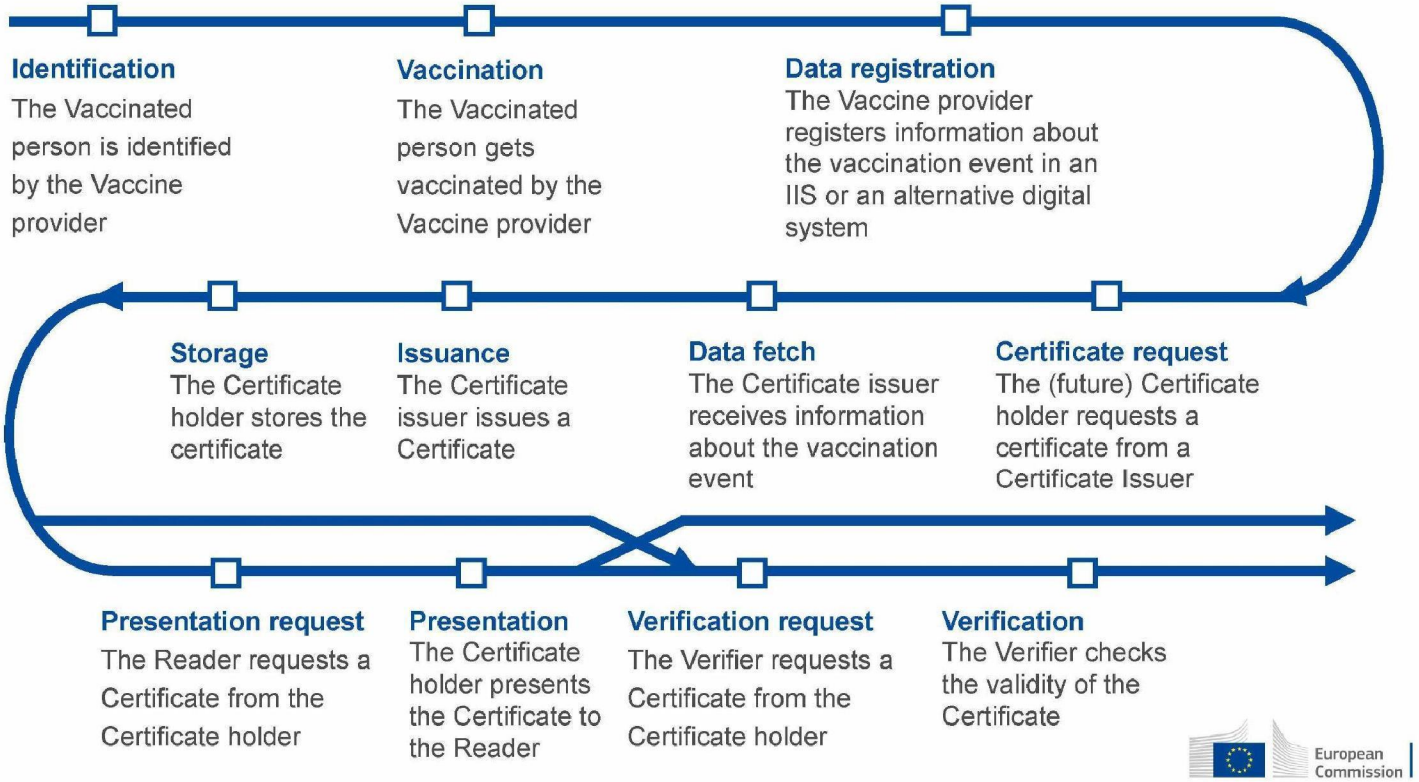
Identification
The Vaccinated person is identified by the Vaccine provider
Vaccination
The Vaccinated person gets vaccinated by the Vaccine provider
Data registration
The Vaccine provider registers information about the vaccination event in an IIS or an alternative digital system
Storage
The Certificate holder stores the certificate
Issuance
The Certificate issuer issues a Certificate
Data fetch
The Certificate issuer receives information about the vaccination event
Certificate request
The (future) Certificate holder requests a certificate from a Certificate Issuer
Presentation request
The Reader requests a Certificate from the Certificate holder
Presentation
The Certificate holder presents the Certificate to the Reader
Verification request
The Verifier requests a Certificate from the Certificate holder
Verification
The Verifier checks the validity of the Certificate
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Trust Framework

ONGOING WORK

The Trust Framework should provide answers to at least the following questions:

- What entities can issue vaccination certificates?
- How can a certificate reader or verifier establish whether a certificate has been issued by a trustworthy entity?
- How can a verifier ascertain whether the data in the certificate is authentic, valid, and sufficient for a given use case, respecting the data minimization principle?
- What kind of infrastructure is needed for supporting the interoperability of vaccination certificates?
- What would be the legal basis for data processing?

Trust framework: high-level requirements

- Interoperability (cross-border, preferably global, not only EU-wide)
- Data protection (data minimization, purpose limitation etc.)
- Security and privacy by design/default, robustness
- Simplicity & user-friendliness
- Inclusiveness (medium-agnostic)
- Flexibility on implementations
- Modularity and expandability (to accommodate for instance additional use cases)
- Use of open standards (e.g. FHIR, W3C VC etc.)

Trust framework: General principles

- The trust framework supports different use case scenarios and settings in which certificates may be requested or verification may take place.
  - Decisions related to ethical or political questions should be tackled separately (for example, requesting vaccination certificates in private settings might be prohibited by law).
- Data minimization principle
  - Only data relevant for the specific use case should be made available or displayed to the verifier.
  - In order to achieve that, the trust framework might support separation of datasets for privileged users vs other users.

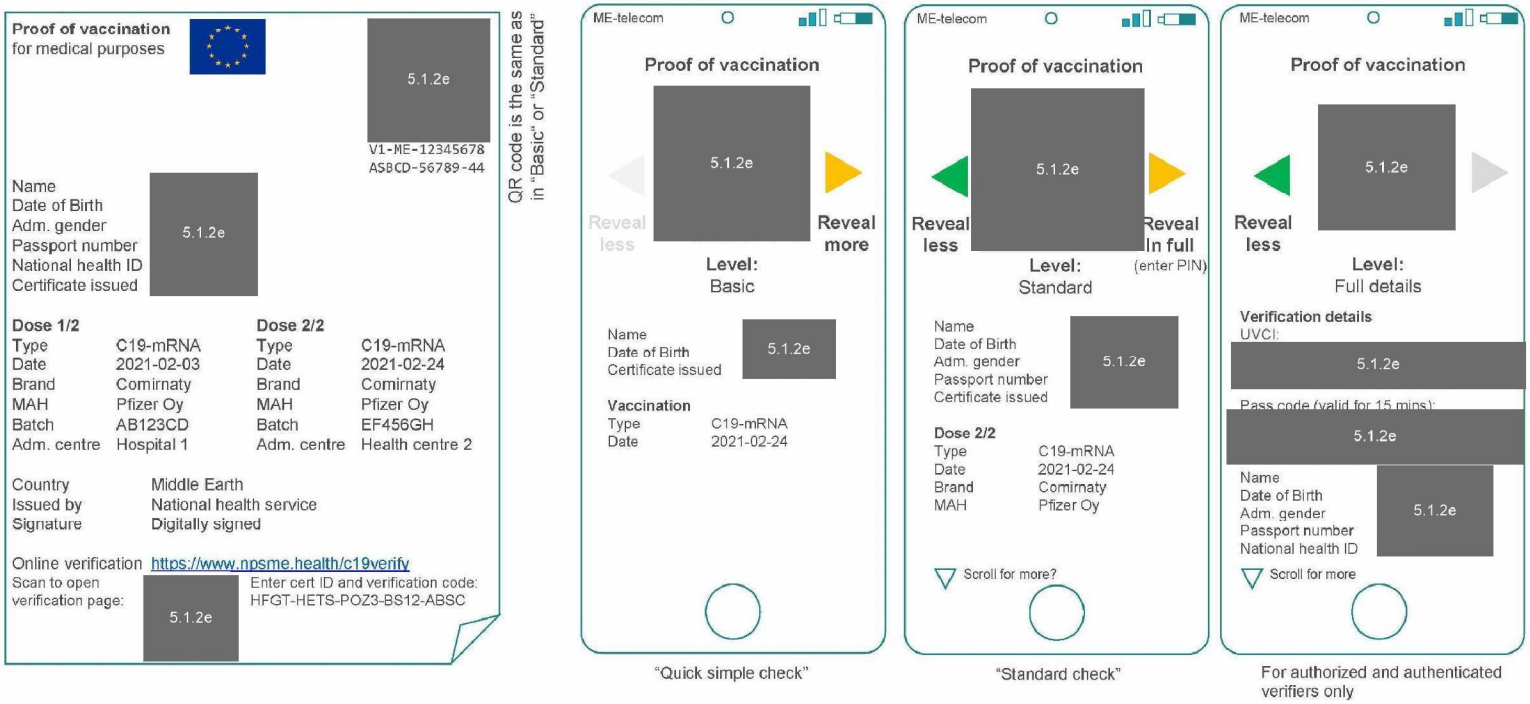
Trust framework: General principles

- Abuse of data by actors (especially verifiers) and forgery should be prevented
  - Security engineering should be used as a tool for restricting access to data and preventing malicious use of data.
  - Establishing authenticity of data and its link to the certificate subject/holder should be ensured.
  - The design should prevent the collection of identifiers or other similar data which might be cross-referenced with other data and re-used for tracking.
- Sufficient logging should be enabled for non-repudiation purposes
  - Logging procedures should however respect the data minimization principle.
  - Verifiers should not store too much information following a verification event

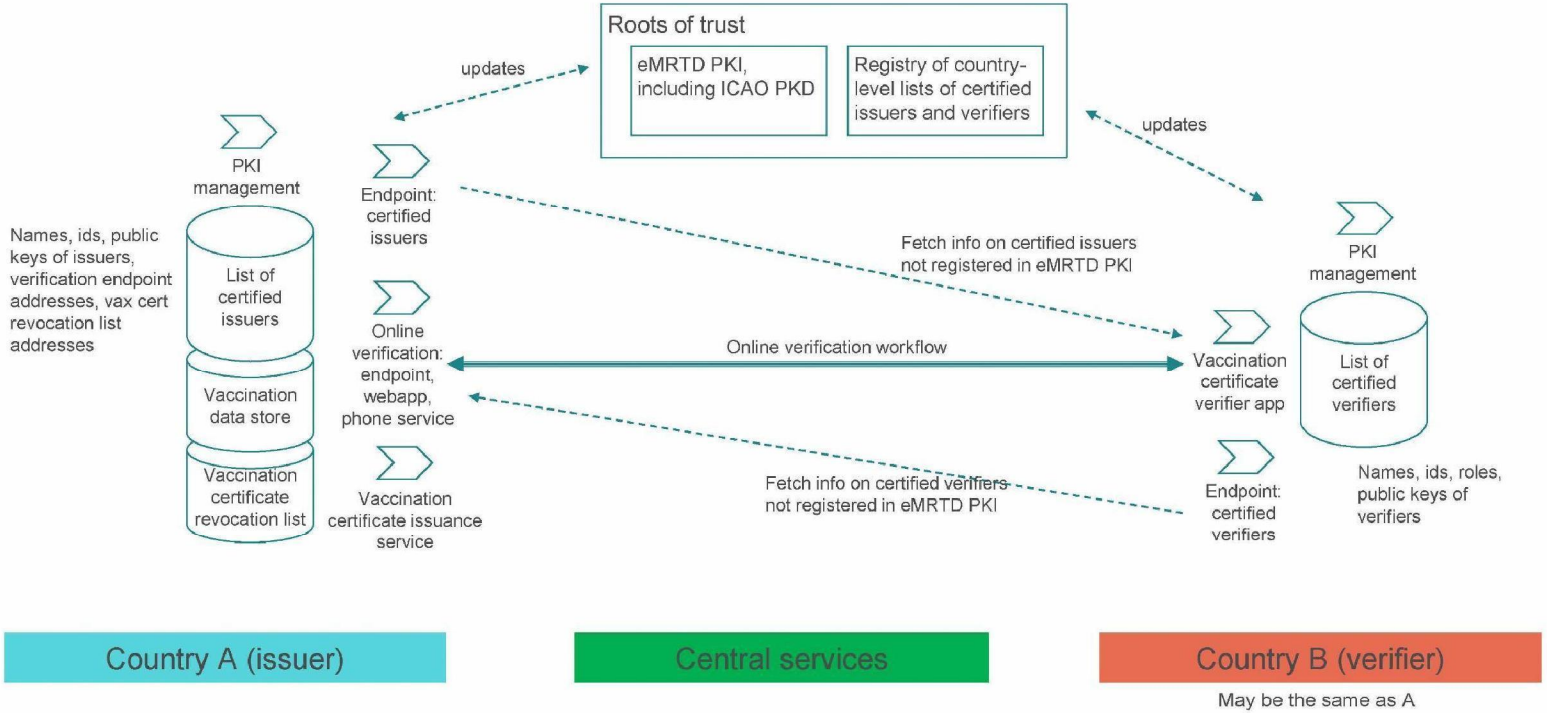
Trust framework: further requirements

- Offline verification on the spot should be supported.
  - However, verifiers can be expected to get online periodically in order to synchronize information necessary for verification purposes.
  - Different realization scenarios for provider-verifier (both being either online or offline) should be supported.
  - Offline verification may be followed by more rigorous verification online.
- Revocation of certificates should be supported.
  - Could be implemented through a control of the validity time in short-lived certificates.

A “keep it simple” model



Overall architecture (current draft, hybrid PKI)



Degrees of flexibility

Sensitivity level	Data shown (indicative)
0 (anyone)	Vax type, certificate date
1 ("private settings")	Level 0 + person **initials**, **part** of DOB, cert date
2 ("border guard")	Level 0 + person name, DOB, identifier (if any), brand name and MAH, vax date, last dose number (2/2)
3 ("health worker")	All data (full personal and vax details, UVCI, etc)

Medium/presentation type	Description and functions
Paper only	All data printed, signed, no digital artefacts
Paper + QR X	All data printed, QR for sensitivity level X
Mobile + QR X on screen	Display of data for a selected sensitivity level, with QR verification at the same or lower level
Online submission of proof / NFC / …	Submit data necessary and sufficient for a specific use case to an endpoint/webpage/NFC reader

Verification mode	How does it work?
View only	Visual check
View and call	Contact the national verification service, which contacts the service of the country of issuer. Or contact the cert issuer directly.
Scan, fully offline	Scan and verify digital signature offline.
Scan + check revocation	Scan and verify digital signature, perform a revocation check against a cert revocation list (CRL) online or against its local copy.
Scan + online check	Scan and send selected details to an online verification service, receive a check result.

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Data minimization

Might be performed in this order, depending on the law

Verification + sensitivity level	Contents and requirements
None	Visual check only, no verification.
Basic	Only very limited data. Should however enable a basic identity check. Fast. Should work offline.
Standard	Limited data sufficient for most cases. Should enable identity check. Should be reasonably fast. May require online connection.
Full	All data. Used rarely. May be slow. May require additional actions such as contacting the issuer.

Little details
Little effort
Offline

Full details
Much effort
Online/phone/etc

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Next steps

- Discussions in the eHealth Network about the draft Test Framework
  - Adoption of the document in the form of the eHN guidelines?
- Understanding the legal basis for establishing and operating the system
  - Multiple options under consideration
- Decisions on establishing and operating the infrastructure
- Providing support to national projects

Thank you