WHO Technical Specifications and Implementation Guidance on
Digital Documentation of COVID-19 Certificates, Vaccination Status

Member States Briefing | 27 August 2021

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Vaccination certificate context and challenges

Global level challenges

- **Inconsistent data collected or interoperability standards - incompatibility**
  
  → One vaccine certificate issued by one country cannot be easily read or verified in another

Challenges faced by governments

- **Numerous competing products** for digitally documenting vaccination status; high opportunity for private sector to monopolize solution

- **Lack of criteria** for assessment of solutions or **specs for product** development

- **Non-existent guidance** on digital certificate functions, privacy of data, governance, procedures to mitigate misuse – undermining confidence

Individual-level challenges

- Some jurisdictions **limiting individuals** from travel, private and public venues - guidance on ethical use needed

- Possibility for **fraudulent paper and digital certificates** – undermining trust

- **High confusion** around where/how to get vaccine certificates for travel or otherwise. No understanding of what they should expect to get from their health care provider or public health authority
Goal for the Digital Documentation of COVID-19 Certificates (DDCC) work

Achieve implementable specifications and standards for any application of a digital vaccination certificate for national or cross-border purposes and ensure consistent data-representation, -exchange, -privacy, -security; while facilitating continuity of care, enabling verifiable proof of status, and individual empowerment.
Objective of the technical specifications and implementation guidance on DDCC

✓ To **publish specifications and standards** for data representation, functionality, privacy, and national trust architecture for use cases;

✓ To **develop guidance** detailing governance, ethics, and implementation best practices, and links to trust architecture.
Policy guidance regarding the use of COVID-19 vaccination certificates is available in the following WHO guidance documents:

- Technical considerations for implementing a risk-based approach to international travel in the context of COVID-19: Interim guidance, 2 July 2021
- Policy considerations for implementing a risk-based approach to international travel in the context of COVID-19
- Interim guidance on considerations for implementing and adjusting public health and social measures in the context of COVID-19
Assumptions for country responsibilities

1. Countries choose the modalit(ies) to implement COVID-19 certificates (e.g. paper, smart phone application, etc.)

2. Multiple point of service solutions operating, based on what countries want to implement

3. Countries responsible for implementing necessary policies to support the issuance and verification workflows

4. Countries determine which mechanism for unique identification (e.g. health ID, national ID number, passport number, etc.) and whether they wish to bind the certificate to identity

5. Countries determine which trust frameworks to use for validation of COVID-19 certificates & establish agreements with other countries that outline the governance process for establishing trust (e.g., equivalence)
What is in the document?

Requirements and specifications for technology implementers

- Business processes, workflows & use cases
- Core data elements mapped to standard terminology code sets (including an annexed spreadsheet)
- Functional and non-functional requirements
- Overview of signing a digital certificate with PKI
- HL7 FHIR Implementation Guide (linked website) detailing relevant standards for consistent representation and interoperability

Implementation considerations

- Data protection principles
- Ethical considerations
- National governance considerations
DDCC Specifications support paper-first, augmented by digital

DIFFERENT ILLUSTRATIVE FORMATS OF
DIGITAL DOCUMENTATION OF COVID-19 CERTIFICATES: VACCINATION STATUS

1. International Certificate of Vaccination or Prophylaxis (i.e. yellow card)
2. National Immunization Home-based Record

3. A handwritten paper certificate with only a HCID, which links to a DDCC:VS
   OR
   A handwritten paper certificate with a 2D barcode containing the full DDCC:VS core data set

4. A PDF print-out certificate with only a HCID which links to a DDCC:VS
   OR
   A PDF print-out with a 2D barcode containing the full DDCC:VS core data set

5. A DDCC:VS held on a smartphone
DDCC:VS Specifications support two key scenarios

**Continuity of Care + Personal Health Records**

The vaccination certificate is presented to a medical authority so that the bearer’s vaccination status can be considered as part of continuing to provide care to the individual. It forms part of the personal health record.

**Proof of Vaccination for National and Cross-border Uses**

The vaccination certificate is presented as proof that the bearer has received vaccine for COVID-19, and this claim can be checked and validated by an interested party.
Example guidance content from the DDCC:VS document

<table>
<thead>
<tr>
<th>Requirement ID</th>
<th>Functional requirement</th>
<th>DDCC Paper Print</th>
<th>DDCC Online Digital</th>
</tr>
</thead>
<tbody>
<tr>
<td>DDCC.FREQ1:008</td>
<td>It SHALL be possible to enter or attach the ICID as a QR barcode to any paper vaccination card issued to the Subject of Care (or the ICID card holder).</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>DDCC.FREQ1:008</td>
<td>It SHOULD be possible to prepare pre-printed cards with a previously generated ICID that is encased in (at minimum) a QR barcode.</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>DDCC.FREQ1:010</td>
<td>It SHALL be possible to record the core data set content on a paper vaccination card issued to the Subject of Care (or the DDCC:VS card holder).</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>DDCC.FREQ1:011</td>
<td>It SHALL be possible to manually sign the paper card and also the official stamp of the administering center as a non-digital means of certifying that the content has been recorded by an approved authority.</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>DDCC.FREQ1:012</td>
<td>The data concerning the vaccination (at minimum, the ICID and the core data set content) SHOULD be entered into an electronic format as soon as reasonably possible after the vaccine is administered. This will most likely be into a Digital Health Solution, if one exists, at point of care.</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>DDCC.FREQ1:013</td>
<td>It SHALL be possible to retrieve information about the vaccination administered to the Subject of Care from the content in the DDCC:VS.</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>DDCC.FREQ1:014</td>
<td>All data concerning the vaccination SHALL be handled in a secure manner to protect confidentiality between the Health worker and Subject of Care.</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>DDCC.FREQ1:015</td>
<td>Digital technology SHALL NOT be needed for any aspect of paper card issuance update - the process SHALL function in an entirely offline and non-electronically manner.</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>DDCC.FREQ1:018</td>
<td>Digital technology SHALL NOT be needed for any aspect of paper card issuance update - the process SHALL function in an entirely offline and non-electronically manner.</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>DDCC.FREQ1:017</td>
<td>Where an offline (disconnected) Digital Health Solution exists, the Data Entry Personnel SHALL securely log in to record all pertinent information about the vaccination.</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>DDCC.FREQ1:018</td>
<td>Any offline Digital Health Solution for vaccination registration SHALL include required content defined in the DDCC:VS core data set.</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>DDCC.FREQ1:039</td>
<td>Any offline Digital Health Solution for vaccination registration SHOULD be designed for quality data capture including enforcement of data validation rules at the point of data entry.</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>DDCC.FREQ1:040</td>
<td>If the digital record is held on an offline Digital Health solution available at the time of vaccination, then it SHOULD be possible for an authorized user to view the digital record.</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

Table 11
Data for each vaccination event, with preferred code system

<table>
<thead>
<tr>
<th>Data element label</th>
<th>Description</th>
<th>Data type</th>
<th>Preferred code system</th>
<th>Requirement status for Continuity of Care</th>
<th>Requirement status for Proof of Vaccination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaccine or prophylaxis</td>
<td>Generic description of the vaccine or vaccine sub-type (e.g. COVID-19 mRNA vaccine, HPV vaccine).</td>
<td>Coding</td>
<td>ICD-11</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Vaccine brand</td>
<td>The brand or trade name used to refer to the vaccine received.</td>
<td>Coding</td>
<td>As defined by Member State</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Vaccine manufacturer</td>
<td>None of the manufacturer of the vaccine received (e.g. Serum Institute of India, Astrazeneca). If vaccine manufacturer is unknown, vaccine manufacturer is REQUIRED.</td>
<td>Coding</td>
<td>As defined by Member State</td>
<td>Required – conditional</td>
<td>Required – conditional</td>
</tr>
<tr>
<td>Vaccine market authorization holder</td>
<td>None of the market authorization holder of the vaccine received. If market authorization holder is unknown, vaccine manufacturer is REQUIRED.</td>
<td>Coding</td>
<td>As defined by Member State</td>
<td>Required – conditional</td>
<td>Required – conditional</td>
</tr>
<tr>
<td>Vaccine batch number</td>
<td>Batch number or lot number of the vaccine.</td>
<td>String</td>
<td>Not applicable</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Date of vaccination</td>
<td>Date on which the vaccine was provided.</td>
<td>Date</td>
<td>Complete date, following ISO 8601</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Dose number</td>
<td>Vaccine dose number.</td>
<td>Quantity</td>
<td>Not applicable</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Total doses</td>
<td>Total expected doses as defined by Member State care plan and immunization programme policies.</td>
<td>Quantity</td>
<td>Not applicable</td>
<td>Optional – recommended</td>
<td>Optional – recommended</td>
</tr>
<tr>
<td>Country of vaccination</td>
<td>The country in which the individual has been vaccinated.</td>
<td>Coding</td>
<td>ISO 3166.a (a 3 letter)</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Administering centre</td>
<td>The name or ID of the vaccination facility responsible for providing the vaccination.</td>
<td>String</td>
<td>As defined by Member State</td>
<td>Required</td>
<td>Optional – recommended</td>
</tr>
</tbody>
</table>
How does the DDCC:VS relate to other initiatives?

- DDCC:VS core data set guidance laid out in this document may be leveraged to generate DDCC:VS compatible with other initiatives:
  - International Civil Aviation Organization (ICAO) *Guidelines on visible digital seals for travel-related health proofs*
  - EU Digital COVID Certificate (DCC)
    - Additional technical details can be found on the DDCC vaccination certificate implementation guide available at: [https://worldhealthorganization.github.io/ddcc/](https://worldhealthorganization.github.io/ddcc/)

- The technical specifications laid out in this document can help inform other private sector initiatives on best practice & establish alignment on data collection and interoperability.

- Member States can use this guidance to guide their technology partners on minimum requirements for a DDCC:VS
Digital Documentation of COVID-19 Certificates: Lab Results Technical specifications and implementation guidance:
- Certificates for SARS-CoV-2 Negative Test Results
- Certificates for History of SARS-CoV-2 infection

Open-source reference software for:
- Recording COVID-19 vaccinations in a digital format
- Generating DDCC:VS in multiple compatible formats (e.g., ICAO VDS-NC, EU DCC, DIVOC)

Mechanism to facilitate testing compatibility with WHO specifications through connectathons organized by standards organizations (e.g., HL7 FHIR) for possible inclusion in a Clearinghouse
Documents will be available at 5PM CEST, 27th August (today)


✓ **Web annex A. DDCC:VS core data dictionary**

✓ **Web annex B. Technical briefing**
Thank you!

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