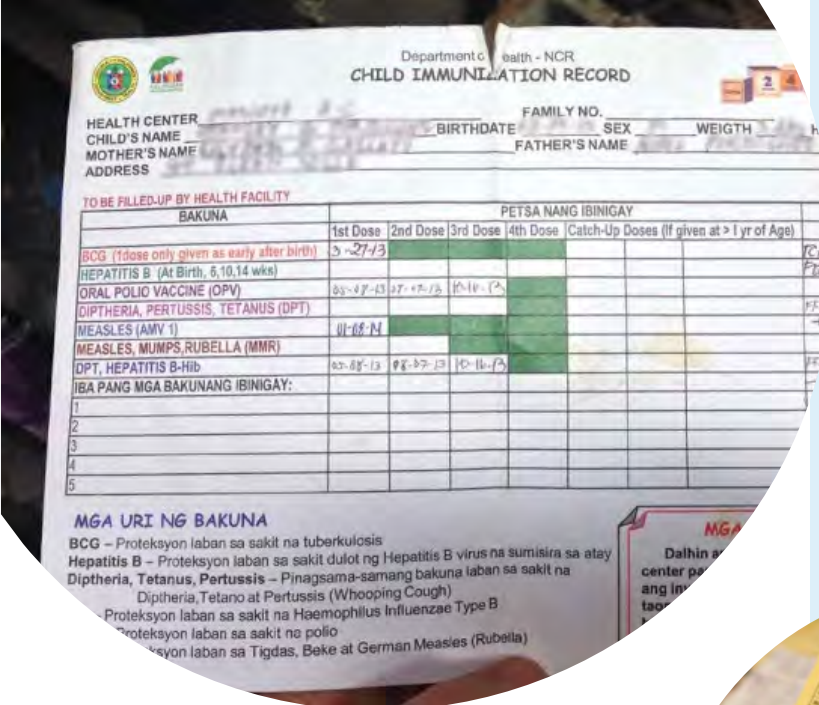# Longer term lessons from Digital Documentation of COVID-19 Certificates

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Before COVID-19, individual immunization records have been implemented in a variety of ways in every country

- The **international certificate of vaccination or prophylaxis for international travellers (i.e., yellow booklet)** - bought from WHO with WHO logo or nationally branded

- Home-based records for **routine childhood** immunizations

… or, more often, something in between:

- Use of the "yellow booklet" for recording routine childhood immunizations

- vaccinations received as **adults** under the "other vaccinations" section

- Campaign specific certificates e.g., Ebola, Cholera, COVID-19

- Overall inconsistency in how this is done globally
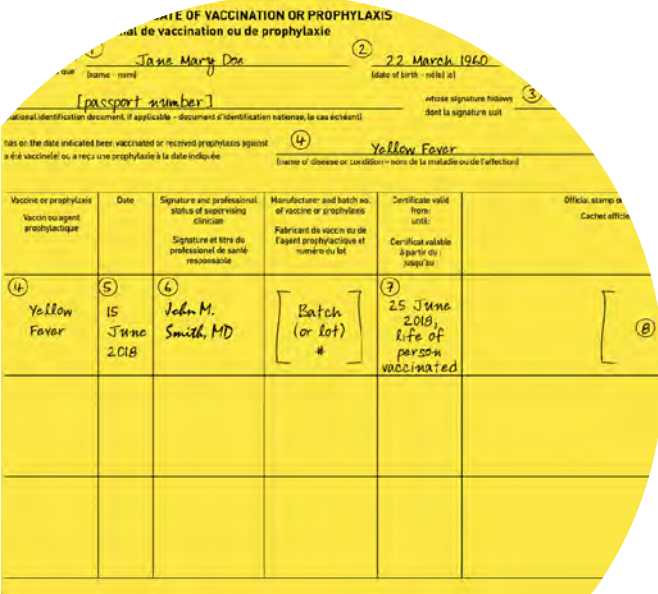
With the increased use of digital technologies globally, and the COVID-19 pandemic, there was a clear opportunity to adopt digital vaccination certificates

Direct benefits

✓ Can be **easily distributed** without the complications arising from supply chain issues of delivering paper forms

✓ More **durable** (physically – paper can easily be damaged)

✓ **Greater trust** in the information available in a digital format (digital age) because it is more difficult to fraud and counterfeit

Indirect benefits

✓ **Easily scalable to other use cases** – e.g., personal health records, diagnostic test certificates

✓ Strong **foundation** to building sustainable health information systems

✓ **Greater access to information** by public health authorities for decision making

However, there were key challenges in implementing international travel-related measures during the COVID-19 pandemic

- **Lack of scientific evidence** on virus characteristics or effectiveness/impact of PHSMs

- High **uncertainty** due to the emergence of new VOCs/new pathogens

- **Varying levels of risk tolerance** across countries

- Difficulties operationalizing the "**precautionary approach**"

- No **international definition** of "essential travel"

- **No global trust** architecture for digital COVID-19 certificates

- **Highly multisectoral** area both nationally and internationally – requiring an immense amount of coordination

PHSM = Public health and social measures
VOC = Variants of concern

The complex policy environment is further perpetuated by the complexities surrounding digitization

Vaccine certificates cannot simply be put into a digital format – then trusted, scaled, and sustainably maintained

PAPER System

DIGITAL System

Assumption

One format that is used for travel

- Yellow booklet printed and sold by WHO
- Yellow booklet printed and used by national authorities based on Annex 6 for travel-related vaccinations, primarily yellow fever

An application used on a smart phone

- One application that can be used by everyone, everywhere

Reality

Multiple formats for multiple use cases

- For travel
- Used for recording routine immunizations & specific campaigns
- For personal health record

Multiple formats used for multiple use cases

- Digital doesn't only mean on a smart phone and online
- This can be done with paper

Digital vaccination certificates do not exist in a vacuum, but work with and contribute to the larger ecosystem of immunization information systems

SERVICE DELIVERY PLANNING

VACCINATION STATUS

COUNTERFEIT DETECTION

COMMUNITY MOBILISATION

LOGISTICS MANAGEMENT

COVERAGE MONITORING

REMOTE HEALTH WORKER LEARNING

HEALTH SERVICE DELIVERY

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DDCC guidance documents have been published as a starting point with those considerations in mind

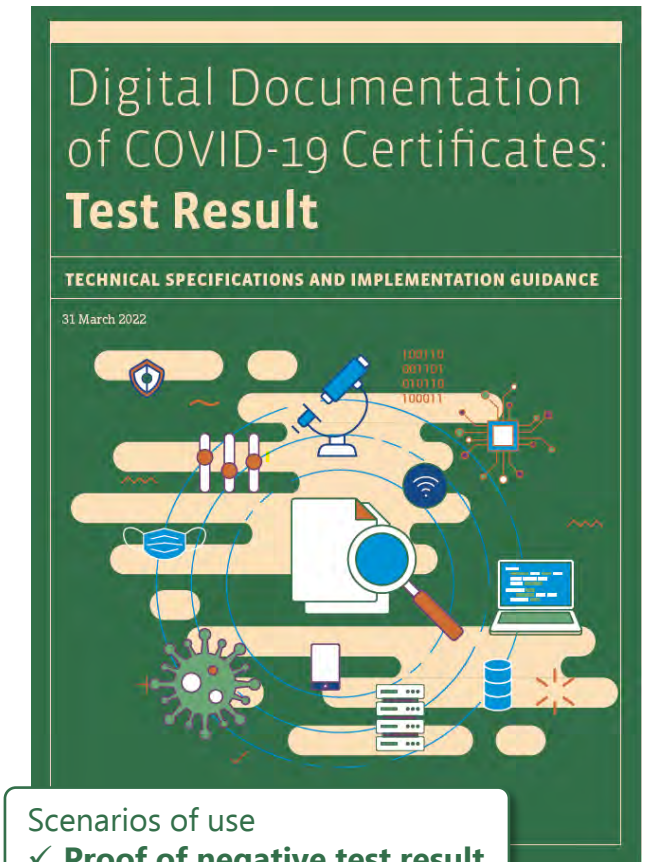## Requirements and specifications for technology implementers

- 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

Digital Documentation of COVID-19 Certificates:
Vaccination Status

TECHNICAL SPECIFICATIONS AND IMPLEMENTATION GUIDANCE
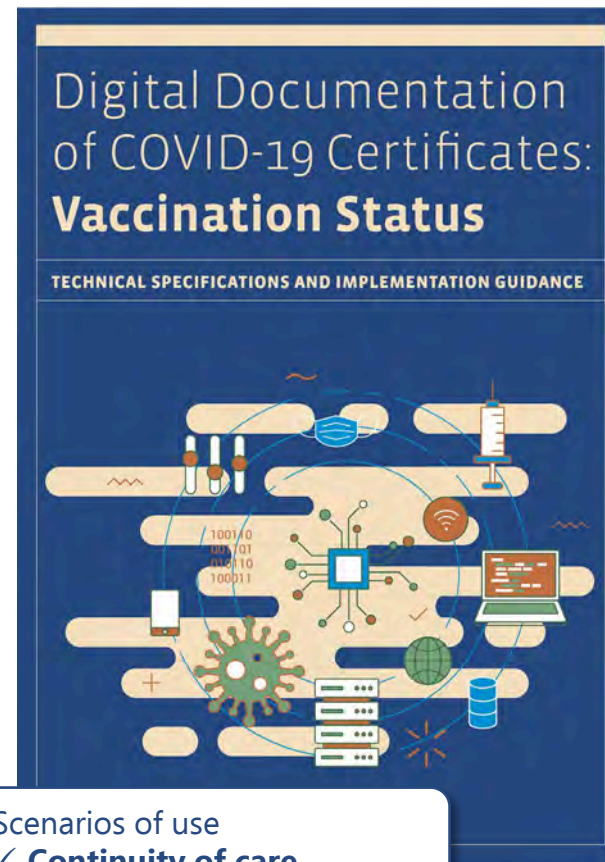
Scenarios of use
✓ **Continuity of care**
✓ **Proof of vaccination**

Digital Documentation of COVID-19 Certificates:
Test Result

TECHNICAL SPECIFICATIONS AND IMPLEMENTATION GUIDANCE

31 March 2022

Scenarios of use
✓ **Proof of negative test result**
✓ **Proof of previous SARS-CoV-2 infection**

Digital documentation of COVID-19 certificates: vaccination status: technical specifications and implementation guidance, 27 August 2021 (who.int)
Digital documentation of COVID-19 certificates: test result: technical specifications and implementation guidance, 31 March 2022 (who.int)

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DDCC specifications supports countries to adopt whichever modality best fits their context

Illustrative formats of digital vaccine certificates

Illustrative formats of digital test result certificates

DDCC is an "umbrella" specification

- Varying public health policies across countries based on their risk tolerance
  - Mutual recognition vs. Reissuance model

- Many existing digital standards that don't interoperate

- Establishing a new standard or central solution would not be viable at this point in the pandemic

- Investment in digital technologies is expensive – will need to architect for use cases beyond COVID-19

- Updating the IHR and digitizing the International Certificate of Vaccination or Prophylaxis ("yellow card") will take time

- There is a need for directory to federate across trust networks

WHO DDCC Document
Signed HL7 FHIR document

can be used to generate multiple respresentations of a test result certificate

EU Digital COVID Certificate (DCC)

ICAO Visible Digital Seal for Non-Constrained Environments (VDS-NC)

Digital Infrastructure for Vaccination Open Credentialing (DIVOC)

SMART Health Cards (SHC)

another certificate standard(s) linked to other trust network(s)

Need for a **trust network federator** that facilitates trust across multiple **certificate types** AND **implementations.** Each network has their own rules.

Future directions of the DDCC - federated model of Interoperable Digital Health Trust Networks

WHO is coordinating and consulting with member states, G20, OECD, GDHP to discuss a federated model of Interoperable Digital Health Trust Networks consisting of:

1. Directory of trusted services:

   - PKI for any digitally signed health document

   - Metadata services e.g. terminology, product list

   - Business rules library e.g. is a given course of vaccinations considered valid?

   - Credential & health document issuance

2. Federator to manage access between trust networks

Leveraging the **HL7 FHIR** (Fast Healthcare Interoperability Resources) **IPS** (International Patient Summary). Specific to COVID-19 first but working towards a **portable digital health wallet.**

ILLUSTRATIVE

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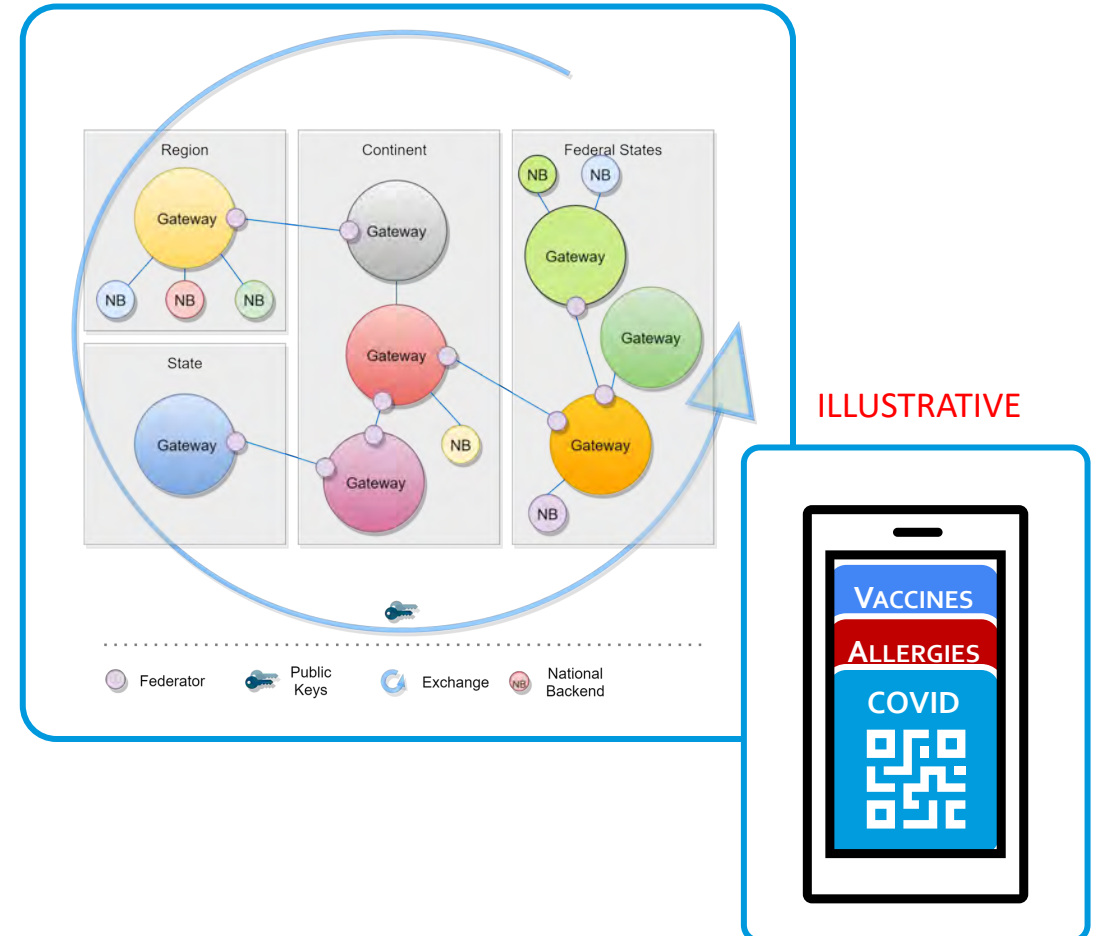
Paths forward for international travel-related health measures

✓ Regular **systematic reviews of evidence on both effectiveness and impact of PHSMs** should continue to be conducted and used to inform future health emergency responses

✓ While technical guidance must be risk-based and context-specific, **key principles should be respected throughout the decision-making process** (i.e., evidence-informed decision-making, transparency, coordination, respect for human rights)

✓ **"Essential travel" needs to be clearly defined** to ensure that key operations are not disrupted during any health emergency (i.e., transport of essential personnel and goods, repatriations).

✓ **Coordination should be enhanced** at national and international levels to leverage from the experience and perspectives of different sectors; yet avoiding overlapping mandates.

✓ Consider the use of **trust networks beyond COVID-19**

Trust networks beyond COVID-19

It is fundamentally about the right for **an individual patient** to have **access and control** over **their own health information** in the form of **a personal health record,**

which can **then be used for a variety of use cases where credentials are needed** such as:

- The yellow card (IHR)/ international travel

- Reimbursements (UHC)

- Prescriptions

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Thank you

For more information, please contact:
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