AIRA
AMERICAN IMMUNIZATION REGISTRY ASSOCIATION

Vaccine Credentials: Context and Working Definitions for IIS

A Working Guide

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Background and Context

The need to demonstrate proof of vaccination is not new. International travel has long called for proof of vaccination for certain destinations, and most schools require proof of immunization for attendance.[1] However, consumer interest in accessing vaccine records has increased substantially as individuals have been immunized to protect against COVID-19. Immunization information systems (IIS) are faced with broad demand for access to consolidated records (i.e., records combined from multiple sources) stored in their systems.

In the absence of formal guidance, the American Immunization Registry Association (AIRA) is developing this "Working Guide" that aims to gather and document common terminology and references related to consumer access and vaccine credentials.

Historically, many IIS have focused on providing consumer access to vaccine records, which may be considered separate from the concept of vaccine credentials. For the purposes of this working guide, consumer access is defined as the process of offering individuals direct access to their own immunization records and, in some cases, their family members' immunization records. To date, guidance on consumer access to immunization records has been limited. Many IIS offer this level of role-based access. The IIS must have a process to authenticate (or verify the identity) of the individual, but this process is not yet standardized. Guidance on how to provide consumers with access, and the process of authentication, is needed.

As part of the COVID-19 response, newer terms have expanded the consumer-access conversation. Verifiable vaccination credentials (VVCs), digital vaccine credentials (DVCs), vaccine certificates, and vaccine passports have all been used to describe either paper or electronic immunization records, or a current immunization status (as in, "Immunized for COVID-19"). Guidance is needed to differentiate these terms, provide specifications for data and information exchanged, and clarify expectations of IIS to support these concepts. As recently as April 2021, the White House administration stated they would defer to private companies that may choose to implement a vaccine credentialing or "passport" system and emphasized that there would be no federal mandate for individuals to obtain a single vaccine credential.[2] According to recent polling, the term "passport" is particularly sensitive, as it has connotations of threats to freedom and choice.[3] The alternate term that 40% of Americans support is vaccine "verification."

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[1] CDC, accessed 5/4/2021: https://wwwnc.cdc.gov/travel/page/faq

[2] The Hill, accessed 5/4/2021: https://thehill.com/homenews/administration/546705-white-house-rules-out-involvement-in-vaccine-passports

[3] Becker's Hospital Review, accessed 5/5/2021: https://www.beckershospitalreview.com/digital-marketing/viewpoint-ditch-the-term-vaccine-passport-and-try-these-messaging-strategies-instead.html

In the absence of national guidance or standards, IIS and their jurisdiction's related leadership and administrators are individually left to determine how best to meet the growing consumer demand. This diversity in IIS response may impose interoperability challenges to consumers and partner organizations that need to interface with multiple IIS. In addition, the number of potential or actual actors and functions involved in accessing vaccine records is significant. In part due to this complexity, terms and concepts may get misinterpreted and/or joined together.

Working Definitions

This working guide is an effort to document a working set of common concepts and terminology related to vaccine credentials across the IIS community. These definitions will continue to be refined as guidance emerges and use cases specific to IIS become more clear.

As mentioned above, "**consumer access**" is the process of offering individuals direct access to their own immunization records and, in some cases, their family members' immunization records. Although there is no broadly agreed upon definition, "**vaccine credentials**" is the emerging term that may represent either paper or digital records of one's immunizations. This term may also be associated with "**verifiable credentials**," a broader and more general term not solely associated with vaccinations. According to the World Wide Web (W3C) Data Model, verifiable credentials can represent the same information that a physical credential represents, but the addition of technologies such as digital signatures makes verifiable credentials more trustworthy and tamper-resistant than their physical counterparts.[4]

The term vaccine credentials is also mostly synonymous with "**vaccine certificates**" and "**vaccine passports**." "**Vaccine verification cards**" is also used, although definitionally, this does not appear to be different from the terms above. In common usage, these terms may refer to a paper or electronic record of immunizations received, or immunization status (e.g., complete for COVID-19). There is some thought that verification could speak more to the *process* of verifying vaccine status rather than a physical card itself. "**Vaccination pass**" may also be used to indicate vaccine status.

An attribute of many of these credentials is digitization; the term "**digital vaccine credential**" is used often. A digital vaccine credential is a way to demonstrate a person's vaccination status, generally through a smartphone app or a QR code that has been printed. There are many reasons why shifting to a digital credential may be advantageous. Digital credentials are typically:

- More secure/private
- Easier to share/more interoperable (e.g., QR codes)

[4] W3C Verifiable Credentials Data Model, accessed 5/20/2021: https://www.w3.org/TR/vc-data-model/

- Easier to save (and find when needed)
- Easier to ensure they are being issued and presented by the entity meant to issue and present them
- Less vulnerable to counterfeiting
- Less susceptible to modification, fraud[5]

Two components of the process worthy of more discussion are "**authentication**" and "**authorization**." In the simplest terms, authentication is the process of verifying whether someone is, in fact, who they declare to be. The National Institute of Standards and Technology (NIST) defines authentication as "verifying the identity of a user, process, or device, often as a prerequisite to allowing access to resources in an information system." Authorization, on the other hand, gives users permission to access a resource, such as an IIS record. Historically, IIS have policy agreements with provider sites and, less commonly, with individual users working within these provider sites who are authorized users of their systems. These individuals are already authenticated by the provider sites employing them. They are also authorized to access the IIS. This same process does not exist for individual consumers.

Individual consumers must be authenticated and authorized to access their records and/or the records of family members. In some cases, IIS conduct this authentication themselves through verifying matches across demographic data elements. In other cases, this authentication may be conducted by a third party. Local law or policy may also dictate whether consumers are authorized users within a jurisdiction.

Select Vaccine Credentialing Efforts

There are a number of initiatives emerging to support vaccine credentials and access to them. A full list of initiatives active as of March 2021 can be found within a presentation provided to the Federal Health IT Coordinating Council.[6] This guide will explore a small subset of initiatives that may have particular relevance to the IIS community. This is in no way meant to be a comprehensive list of initiatives under way. These initiatives are also not mutually exclusive and may leverage each other and/or utilize overlapping methods or concepts.

WHO Smart Vaccination Certificate

Efforts by the World Health Organization (WHO) will likely have a global impact, given its reach and influence. WHO has established a Smart Vaccination Certificate Working Group, which is focused on establishing standards for a common architecture for a digital smart

[5] Paraphrased from Dakota Gruener, ID2020, Medpage Today, accessed 5/6/2021: https://www.medpagetoday.com/podcasts/trackthevax/92303

[6] Washington Post, accessed 5/4/2021: https://www.washingtonpost.com/context/federal-officials-review-vaccine-passport-plans/d40fb0be-fb34-48c9-be39-43d10bb15feb/?itid=lk_inline_manual_18

vaccination certificate.[7] The effort seeks to develop key specifications, standards, and a trust framework for a digital vaccination certificate for COVID-19 vaccinations (and potentially other vaccines in the future). To this end, WHO has released an Interim Guidance Document available today for developing a Smart Vaccination Certificate.[8] As defined by WHO, a trust framework is made up of "technical specifications, interoperability criteria and related governance mechanisms that are agreed upon by multiple entities to establish trust between those entities." This effort has been created to support both continuity of care as well as cross-border uses and is designed to be useful if and when COVID-19 vaccine is included in the updated version of International Health Regulations.[9]

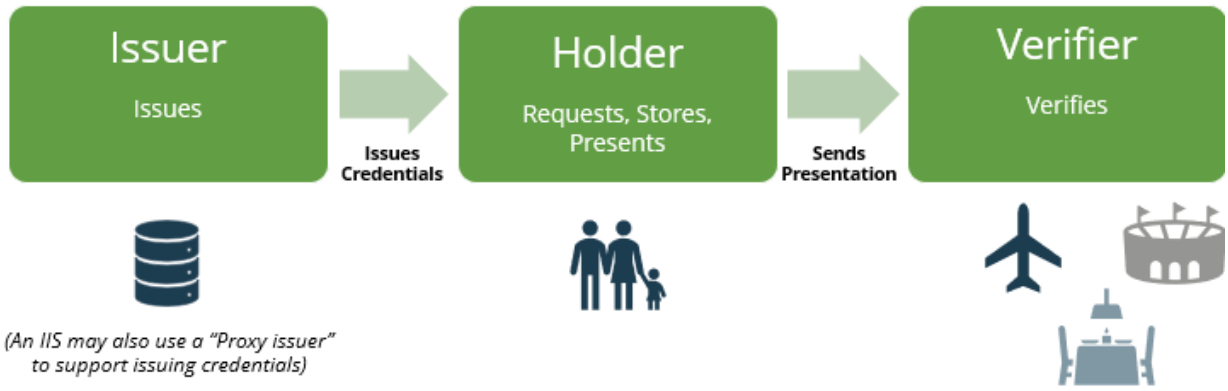
VCI

VCI brings together a coalition of private and public organizations to support consumers' having access to their vaccination records.[10] VCI has strong buy-in from the health and technology communities, involvement from government-adjacent organizations, and a well-developed structure for governance and participation. It leverages open, interoperable standards and uses the SMART Health Card Framework and specifications in its development.[11] To ensure broad access and to avoid reinforcing health inequities, VCI is designed to provide records in either digital or paper form. Because the framework is built using open standards, there is no charge for using VCI-created standards or guidance. As these standards have matured, HL7 has assumed an ongoing governance role for both SMART Health Cards and the FHIR data models.

Conceptual model of VCI

This diagram illustrates the simplified roles and information flows forming the basis of the VCI specification; this conceptual model can be found on the SMART Health Cards Framework website and is adapted from the World Wide Web Consortium (W3C) Verifiable Credentials Specification.[12]

[7] WHO, accessed 5/4/2021: https://www.who.int/groups/smart-vaccination-certificate-working-group
[8] WHO, accessed 5/20/2021: https://www.who.int/publications/m/item/interim-guidance-for-developing-a-smart-vaccination-certificate
[9] WHO International Health Regulations, accessed 5/6/2021: https://www.who.int/health-topics/international-health-regulations#tab=tab_1
[10] VCI, accessed 5/4/2021: https://vci.org/
[11] Smart Health Card Framework, accessed 5/4/2021: https://smarthealth.cards/
[12] Verifiable Credentials Data Model, accessed 5/5/2021: https://www.w3.org/TR/vc-data-model/



Graphic and concepts adapted from the SMART Health Cards Framework: https://smarthealth.cards/

Issuer: An entity that generates verifiable credentials. An IIS can be considered the issuer in most cases. Other entities might be a lab, pharmacy, health care provider, EHR, or public health department. The issuer may authenticate the holder, or the holder may be authenticated by a separate party or proxy issuer.

Holder: A person who "holds" a (paper or digital) record. This record can be their own or that of an authorized person, like a child's.

Verifier: An entity that applies its own rules to the event facts contained in the holder's record. Some example entities are airlines, countries, music venues, employers, and schools.

It is important to note that the holder's credential contains only the facts of the vaccination event(s). For instance, it will contain the dates and relevant details of two separate COVID-19 vaccinations; it will not contain outcomes such as "valid" or "series complete." Each verifier applies its own rules or logic to the facts on the credential. For example, an airline might apply one set of rules to a traveler heading to Europe and another set of rules to a traveler heading to Canada.

The SMART card model may also reference a common registry of users with appropriate conformance testing and associated "**trust framework**." This mediates the creation and verification of identifiers, keys, and other relevant data which might be required to use verifiable credentials. Examples include trusted databases, decentralized databases, government ID databases, and distributed ledgers.

The COVID-19 Credentials Initiative (CCI)

This initiative describes itself as an "open global community looking to deploy and/or help deploy privacy-preserving verifiable credential projects to mitigate the spread of COVID-

19."[13] It builds on the same verifiable credentials projects mentioned above. As of December 2020, it is also affiliated with Linux Foundation Public Health, which supports an open-standard-based open source development approach to public health. What makes CCI distinctive is that it has a specific US-focused workgroup that is examining vaccine credential issues from that perspective.[14] CCI does not appear to be defining any standards nor building any software but is a forum for developers and stakeholders to interact and exchange plans and ideas.

The Good Health Pass Collaborative (GHPC)

Similar to CCI, the Good Health Pass Collaborative describes itself as "an open, inclusive, cross-sector initiative, bringing together leading companies and organizations from the technology, health, and travel sectors."[15] The Collaborative cites as guiding values the goals of restoring confidence, promoting equity, and fostering collaboration across their work. Most notably, GHPC collaborators are actively working on an extensive blueprint document that describes in detail the Collaborative's understanding of the use case, architecture, and operation of vaccine credentials.

Other global efforts

There are additional initiatives and projects being explored across the globe, and these efforts will continue to evolve. One such effort is the EU Digital COVID Certificate,[16] designed to facilitate safe, free movement of citizens in the European Union during the COVID-19 pandemic. Per the European Commission's website, the certificate is planned to be introduced in EU member states, and some countries are believed to already be using it. The certificate will become available in all EU member states on July 1, 2021. The EU Digital COVID Certificate provides proof that a person has (1) been vaccinated against COVID-19, (2) received a negative test result, or (3) recovered from COVID-19.

The Anticipated Role of IIS

Public health is fundamentally a state and local responsibility; states are the principal government entity responsible for protecting the public's health in the US.[17] IIS are governed by laws and policies at the state and/or jurisdictional level. As a result of the

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[13] CCI, accessed 5/20/2021: https://www.covidcreds.org/

[14] CCI Meeting Page, accessed 5/20/2021: https://docs.google.com/document/d/1_5o2-btJ2dQx172GHzGdATvar-S01XaWRBM0muNnNJI/edit

[15] Good Health Pass, accessed 5/20/2021: https://www.goodhealthpass.org/

[16] EU Digital COVID Certificate, accessed 6/9/2021 : https://ec.europa.eu/info/live-work-travel-eu/coronavirus-response/safe-covid-19-vaccines-europeans/eu-digital-covid-certificate_en?mc_cid=7b73084a87&mc_eid=302aff3c9b

[17] Institute of Medicine Committee for the Study of the Future of Public Health, accessed 5/4/2021: https://www.ncbi.nlm.nih.gov/books/NBK218212/

alignment of IIS with their local laws and policies, they may have inherent differences when compared to each other. However, IIS strive to function as a nationwide network of systems, and consistency of functions and standards is key to interoperability and data exchange. Although roles may vary, in the majority of cases, it is assumed that IIS will play a fairly narrow role as an "issuer" of vaccine credentials. This could mean enhancements to the IIS to authenticate the holder and/or the record requested and to issue a standards-compliant vaccine credential. However, with the development of new notions such as "proxy issuer," an IIS may never have to issue a standards-based vaccine credential but may have someone else access the IIS through existing query functionality and issue the credential on behalf of the IIS. For example, a proxy issuer may query IIS data and provide the credential "sanctioned" by the state in which the IIS operates.

In terms of how IIS will issue credentials, this will likely vary across jurisdictions, depending on how they provide access to their consumers and if they opt to conduct the authentication step. As mentioned above, IIS have typically worked with provider sites as their primary interface endpoint. It is a separate process to allow individual consumers direct access to the IIS. Individual consumers must be authenticated and authorized to access their records and/or the records of family members.

In some cases, IIS will conduct this authentication themselves through verifying matches across demographic data elements. In other cases, this authentication may be conducted by a third party. Local law or policy may also dictate whether consumers are authorized users within a jurisdiction. For IIS, this may mean expanding the pool of those eligible to query their IIS from hundreds or thousands of provider sites to potentially millions of consumers within their jurisdiction. This could have implications across policy, operational, and technical aspects for IIS.

Several discussions have focused on what key data elements make up an official immunization record. Although there is no documented standard, some jurisdictions have articulated what constitutes proof of vaccination. The Oregon Health Authority published a bulletin[18] that stated that acceptable forms of proof of vaccination must include:

- Your vaccination card with your name, your date of birth, and date and location of vaccination
- A photo of your vaccination card, or
- Electronic record through a vaccination application on a smartphone, computer or tablet

Other jurisdictions have noted that the Department of Health's seal or logo is necessary on official records to ensure they are acceptable to external users.

[18] Oregon Health Authority Coronavirus Update, accessed 6/9/2021: https://content.govdelivery.com/accounts/ORDHS/bulletins/2e23dbd

For more information on the role of IIS and vaccine credentials, HLN Consulting has published a number of blogs on this topic and related topics. These blogs are available on the HLN Consulting website.[19]

Importance of health equity

When considering the IIS role to issue vaccine credentials, it is critically important that programs consider accessibility and equal access to information. Can all of a jurisdiction's constituents access immunization records and/or immunization status through the means offered? Are records broadly available in urban and rural areas to populations with high and low socioeconomic status? Is the technology offered accessible to populations that may or may not have smartphones or broadband internet access (i.e., offered in both paper and digital methods)? Is the information offered in multiple languages? Is the presentation of the information culturally relevant?

In part because of the success of the Vaccines for Children program, immunizations have long been a positive example of health equity.[20] As the health information technology community implements consumer access and vaccine credential options, it will be essential to consider these questions of accessibility and equity.

Scenarios

There are many different scenarios in which consumers need to access their records. Here are some examples, but note that this does not represent a comprehensive list:

- A patient loses card for dose one, needs to verify vaccine status for dose two.
- A student requires verification of vaccination status for school or university enrollment.
- An individual is planning for international travel.
- A potential new employee is applying for a position with an organization that requires proof of vaccination.
- A parent needs verification of their child's immunization status prior to school enrollment.
- An individual needs documentation to provide to a skilled nursing facility to prove that their elderly mother is vaccinated.

While the players and context vary, most of these scenarios can be distilled down into the following actions:

1) The consumer requests credentials from issuer.
2) The consumer receives and holds their credentials.

[19] HLN Consulting, accessed 5/24/2021: https://www.hln.com/vaccine-credentials-do-not-replace-full-vaccination-histories/

[20] National Institute for Children's Health Quality, accessed 5/21/2021: https://www.nichq.org/insight/what-health-equity-efforts-can-learn-immunization-initiatives

3) The consumer presents their credentials to a verifier when needed.

The only exceptions above are the cases of the parent or adult child needing verification for their family members. In those cases, the verification process involved in requesting a credential needs to not only authenticate the requester but also confirm the requester's authorization to access the records or immunization status of family members.

Considerations

Consumer access to vaccine records and status and/or vaccine credentialing is already happening in several jurisdictions. New York state has the Excelsior Pass,[21] Louisiana has rolled out LA Wallet,[22] Indiana has My Vax Indiana,[23] New Mexico has Vaxview NM,[24] Utah uses Docket,[25] and North Dakota is one of eight states to use the MyIR application to provide consumer access to IIS records.[26] As more people get the COVID-19 vaccine, there will likely be more demand for vaccine verification.

Each IIS must consider its own unique context as it defines its role in vaccine credentialing. Below are some relevant concepts to think about during this process:

- There is a broad global effort under way to define and operationalize vaccine credentials, and it is not clear how much of it will affect domestic decisions on vaccine credentialing.
- The domestic vaccine credentialing effort is evolving rapidly, and there may be forthcoming guidance that renders some of the information here moot.
- Policies for each IIS and its jurisdiction vary and must be in harmony with any solutions implemented.
- Consider reaching out to IIS peers with similar policies and structures to learn how they are handling comparable challenges.
- Given that there will not be a national vaccine credential, it is likely that multiple vaccine credentialing systems will seek access to each IIS.
- No uniform guidance for vaccine credentialing standards may be forthcoming, so diversity of design and implementation will continue.
- Legislation about vaccine credentialing, consumer access, and other related issues is pending in many jurisdictions. It's important to map out how vaccine credentialing and IIS access may be impacted by forthcoming laws.

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[21] NYS Excelsior Pass, accessed 5/6/2021: https://covid19vaccine.health.ny.gov/excelsior-pass
[22] LA Wallet, accessed 5/21/2021: https://lawallet.com/
[23] My Vax Indiana, accessed 5/7/2021: https://www.in.gov/isdh/17094.htm
[24] Vaxview NM, accessed 6/8/2021: https://nmsiis.health.state.nm.us/webiznet_nm_public/Application/PublicPortal
[25] Docket Care, accessed 5/6/2021: https://docket.care/
[26] North Dakota MyIR, accessed 6/8/2021: https://www.health.nd.gov/immunize/immunization-record-request

- Private organizations might not have a full working knowledge of HIPAA guidelines and IIS law and policy. An IIS is advised to assess the legality of any vaccine credential system and the risk of unlawful access to its data—as well as what to do if that happens.
- If you are planning to modify your system to enable consumer access and/or generation of vaccine credentials, it is wise to get your program's tech team involved as soon as possible, along with your attorney general's office.
- Make a point to understand how proposed vaccine credentialing systems would work with your IIS through asking questions of the connecting entity. You know your IIS best; clarify (and, if necessary, question) assumptions made by others and speak up if something doesn't look right.
- Vaccine credentialing is a political hot potato. It's helpful to draft and share clear, consistent, apolitical messaging about what you choose to do.
- In the absence of clear federal directives, decisions about vaccine credentials are state-level decisions that cannot necessarily be compared across jurisdictions.

Next Steps

AIRA will continue to refine this guidance moving forward. Additional versions will be sent out by email and shared within and across AIRA members.

Key References

World Health Organization (WHO) Smart Vaccination Certificate: https://www.who.int/groups/smart-vaccination-certificate-working-group

WHO International Health Regulations: https://www.who.int/health-topics/international-health-regulations#tab=tab_1

VCI: https://vci.org/

Smart Health Card Framework: https://smarthealth.cards/

W3C Verifiable Credentials Data Model: https://www.w3.org/TR/vc-data-model/

COVID-19 Credentials Initiative: https://www.covidcreds.org/

Good Health Pass Collaborative: https://www.goodhealthpass.org/

EU Digital COVID Certificate: https://ec.europa.eu/info/live-work-travel-eu/coronavirus-response/safe-covid-19-vaccines-europeans/eu-digital-covid-certificate_en?mc_cid=7b73084a87&mc_eid=302aff3c9b

World Wide Web Consortium (W3C) Vaccination Vocabulary: https://w3c-ccg.github.io/vaccination-vocab/

HLN.com Blogs on Vaccine Credential Efforts: https://www.hln.com/vaccine-credentials-do-not-replace-full-vaccination-histories/

NYS Excelsior Pass: https://covid19vaccine.health.ny.gov/excelsior-pass

LA Wallet: https://lawallet.com/

My Vax Indiana: https://www.in.gov/isdh/17094.htm

Vaxview NM: https://nmsiis.health.state.nm.us/webiznet_nm_public/Application/PublicPortal

Docket Care: https://docket.care/

North Dakota MyIR: https://www.health.nd.gov/immunize/immunization-record-request